

Calgary



2022

Corporate Asset Management Plan



Executive summary

The 2022 Corporate Asset Management Plan (CAMP) builds on the 2022 Infrastructure Status Report (ISR) and is a long-term plan created to manage infrastructure and help to ensure The City is meeting service levels and mitigating risk.

The City currently owns \$100.4B in assets. The infrastructure portfolio has grown by \$16.8B since the 2017 CAMP (\$83.6B to \$100.4B). This increase can be explained by the addition of almost \$3B in natural assets, other new assets, increased replacement value unit costs in Calgary Roads and Transit, as well as improved asset inventories and valuation techniques.

As seen in the chart below, the overall health of City assets is good, however, this is a snapshot in time and the general condition of the assets is trending downward.

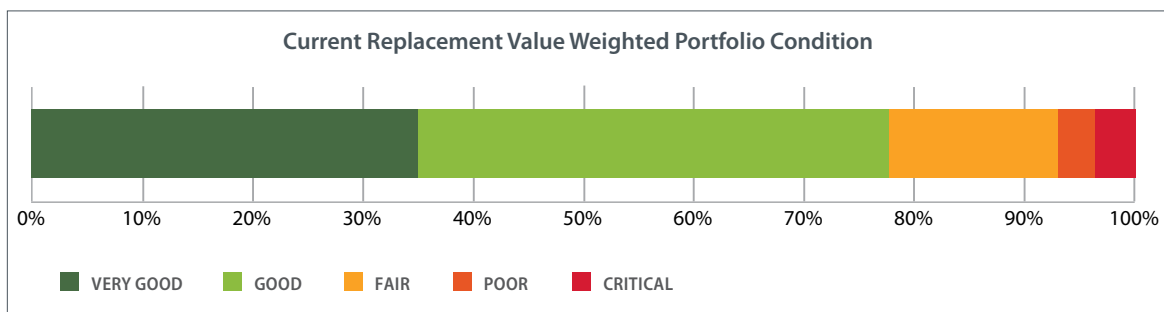
Asset Condition Trend

	2004	2007	2010	2013	2017	2022
Good*	80.0%	76.0%	78.0%	95.0%	86.3%	77.9%
Fair	14.0%	17.0%	16.0%	3.5%	11.0%	15.1%
Poor**	6.0%	7.0%	6.0%	1.5%	2.7%	7.0%

*Very Good and Good combined for comparison with prior years
**Poor and Critical combined for comparison with prior years

Asset condition is a useful indicator to understand the extent of asset deterioration and remaining life of the asset. Assets in poor condition are more likely to fail leading to service disruptions.

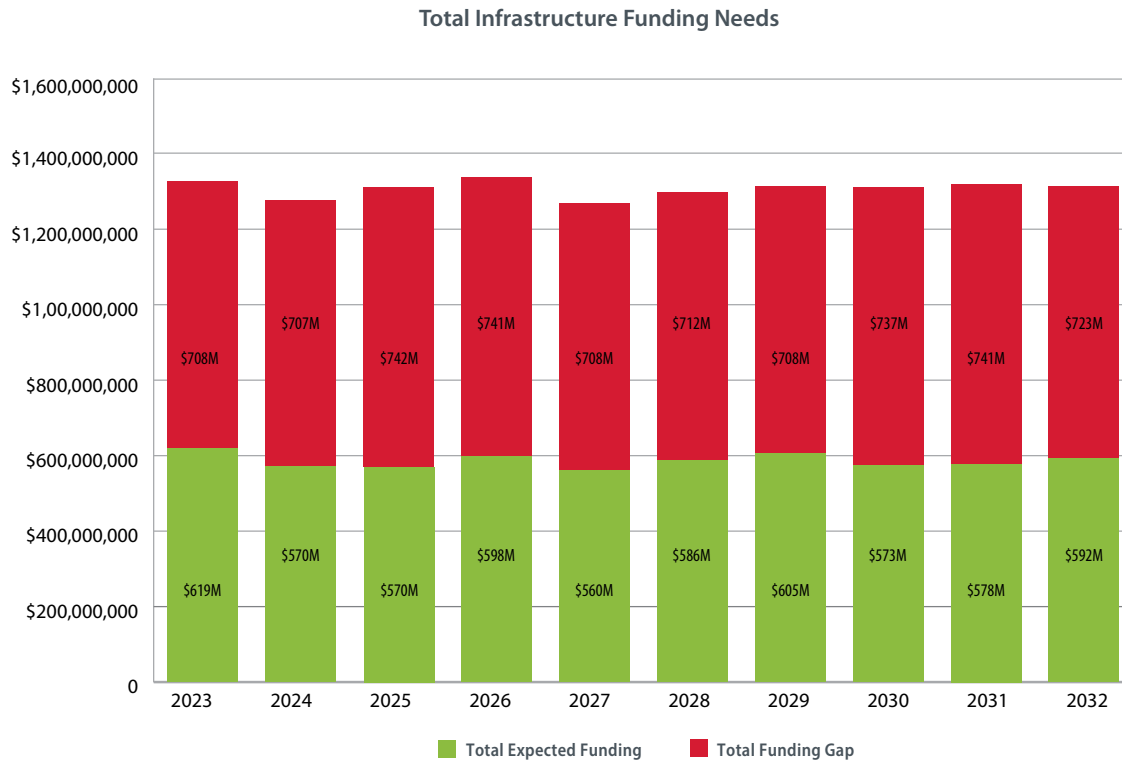
Current Asset Condition



The City has an infrastructure gap of \$7.2B which is the difference between the infrastructure investment needed to meet desired service levels and mitigate risk and the resources made available to address those needs.

Executive summary

Infrastructure Gap



It is unrealistic to expect that all the funding is available to close this gap so The City can employ other means of managing this gap which includes:

1. Exploring alternative service delivery methods and divestiture of assets
2. Adjusting service levels
3. Adjusting risk thresholds
4. Prioritizing investment to key infrastructure

Regardless of the strategies employed to manage the infrastructure gap, it is important to identify critical infrastructure, its condition, the risk of failure, and impact to service delivery.

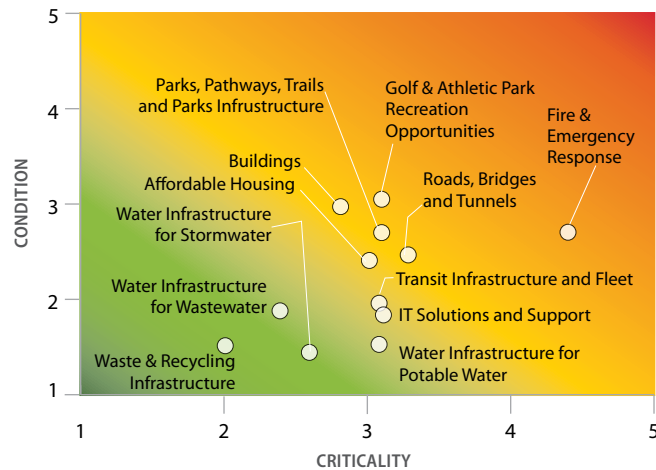
Executive summary

Asset Risk

The graph to the right plots the City's asset risk based on the relationship between condition and criticality. Assets in or near the red zone represent higher risk and present opportunities for investment efficiencies through allocation of funding.

It is important to note asset condition profiles and criticality ratings are established and monitored by the asset owning business units. As a result, a comparison of profiles and importance of service lines cannot be made at this time.

Understanding condition and criticality of the asset base is crucial; however, it's also important to understand how these assets support services and whether service targets are being met. The table below identifies some of the priority areas where investment strategies should be focused. At a high level, utility rate funded (or self-funded) service lines (Water Infrastructure and Waste and Recycling Infrastructure) are in better condition compared to tax funded infrastructure. Buildings, Roads, Bridges and Tunnels are areas where the infrastructure gap needs to be actively managed as these assets have a comparatively higher risk ranking, are in poorer condition, and are not meeting some key service level targets.



Criticality and Service Level

Service Line	Risk /25	Condition /5	Meeting Levels of Service	10-Year Infrastructure Gap (Millions)
Affordable Housing	7.2	2.4	Not available*	\$172.7
Buildings	8.4	3	Red	\$1,973
Fire & Emergency Response	11.9	2.7	Green	\$306
Golf & Athletic Park Recreation Opportunities	9.2	3.0	Red	\$201
IT Solutions and Support	5.8	1.9	Yellow	\$15
Parks, Pathways, Trails and Parks Infrastructure	8.3	2.7	Yellow	\$793
Roads, Bridges and Tunnels	8.0	2.5	Red	\$1,833
Transit Infrastructure and Fleet	6.1	2.0	Yellow	\$1,936
Waste & Recycling Infrastructure	3.0	1.5	Yellow	Utility rate funded
Water Infrastructure for Potable Water	5.1	1.5	Green	Utility rate funded
Water Infrastructure for Stormwater	3.7	1.5	Yellow	Utility rate funded
Water Infrastructure for Wastewater	4.6	1.9	Green	Utility rate funded

* Calgary Housing Company introduced a new level of service framework in 2021, but results are not currently available

At the time of this report, The City is moving into the creation of the 2023-2026 Service Plans and Budgets. Service owners will use the information in the CAMP to help build business cases for funding and prioritizing investments. The information in this report will also be used to develop the City's Long-Range Financial Plan.

The Corporate Asset Management Plan is an evolving document that needs to be adjusted as conditions and asset management maturity change. The CAMP is developed based on assumptions regarding the political, economic, environmental, and social landscape. Changes in these environments and associated assumptions could have a significant impact on the delivery of this plan and may require substantial re-planning efforts, adjustments to priorities and modifications to funding requirements.

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1 Introduction

1.1 Overview

The 2022 Corporate Asset Management Plan (CAMP) builds on the 2020 Infrastructure Status Report (ISR) and aims to promote and improve the practice of asset management at The City of Calgary. The CAMP provides insight into The City's strategic approach to asset management, details key service areas and the assets Calgarians rely on to provide these services. The plan references the City's Asset Management Plans (AMPs), Infrastructure Investment Plans (IIPs) and other information provided by each service line or business unit (BU) to articulate the quantity, value and condition of assets and any associated risks to a particular service. It also highlights the investments required to maintain or adjust service levels and the key projects and programs needed to ensure the continued safe and efficient delivery of the service. All this comes together to help achieve City Council's priorities and objectives.



1.2 Purpose and Goals

Asset management provides a holistic approach to help optimize value from The City's assets and provides clarity on the assets required to achieve long-term outcomes. It is an ever-evolving process, underpinned by continuous improvement that allows The City to plan, optimize and prioritize funding for services, while also helping manage corporate risk. With The City's assets currently valued at \$100.4 billion, a strategic corporate approach for managing our diverse portfolio of assets is critical to our success.

In 2004, senior management approved an Asset Management Strategy and Corporate Asset Management Program to more efficiently guide the use and maintenance of corporate assets. Since then, The City has evolved and improved its asset management capabilities through the development of a more robust policy and updated strategy, the alignment of practices with international standards such as ISO (International Organization for Standardization) 55000, and the development of internal made-in-Calgary-for-Calgary corporate standards and frameworks.

As the economic, social, and environmental landscape changes, specific corporate priorities and goals evolve. Systematic asset management helps The City manage these changes and position the Corporation to meet future challenges. A constant goal is to ensure that services are delivered effectively and efficiently, and the assets relied upon to provide these services are adequately maintained, renewed or upgraded when needed. Key goals for the Corporation and the mechanisms to help achieve these goals are as follows:

Effective Service Delivery: Services, service levels, service plans and budgets for external and internal programs are aligned to long-term goals, policies and citizen priorities through regular review and citizen engagement.

Efficiency: The City delivers services and programs efficiently through a culture of progression and creativity that supports innovation and is adaptable to changing needs and pressures.

Infrastructure Management: The City utilizes quality, cost effective, safe and innovative corporate assets that enable and support the provision of desired public and corporate services. The management of public and corporate assets (both physical and information) are optimized and based on continuous improvement.

The 2022 Corporate Asset Management Plan is presented by service lines in alignment with those in the 2020 Infrastructure Status Report (ISR). The service lines included are as follows:

- Affordable Housing
- Buildings
- Fire & Emergency Response
- Golf & Athletic Park Recreation Opportunities
- IT Solutions and Support
- Parks, Pathways, Trails and Park Infrastructure
- Roads, Bridges and Tunnels
- Transit Infrastructure and Fleet
- Vehicles and Equipment
- Waste & Recycling Infrastructure
- Water Infrastructure for Potable Water
- Water Infrastructure for Wastewater
- Water Infrastructure for Stormwater

The Buildings service line includes buildings operated and managed by the Facility Management business unit only. Other service lines also own building assets and have been included accordingly.

1.3 Strategic and Corporate Alignment

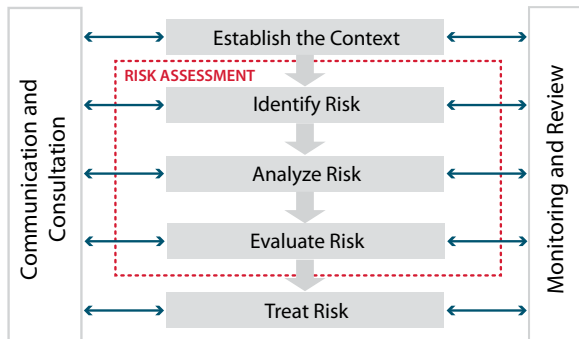
Several asset management objectives were established by the Corporate Asset Management Team, to align with Council priorities and guide the asset management program. The table below summarizes these objectives and their alignment to Council’s Strategic Direction 2023-2026 Guiding Principles:

Asset Management (AM) Objective	Council Guiding Principle				
	Strengthen relationships with Calgarians	Deliver the right services	Build strong communities	Invest in infrastructure	Finance our future
Establish levels of service that define the targets to be achieved in service delivery	✓	✓		✓	
Asset Management planning is integrated with land use planning and operations		✓	✓		✓
Asset Stewards employ evidence-based decision making	✓	✓	✓	✓	✓
Asset Stewards make asset investment decisions in an asset system context		✓		✓	✓
Asset Stewards take a long-term, lifecycle-based approach to estimate asset investment requirements		✓		✓	✓
Infrastructure service delivery includes planning for service continuity during emergency conditions	✓	✓	✓	✓	✓
Asset Management planning and service delivery practices shall be integrated with the City’s sustainability and sustainable development policies and practices.		✓		✓	✓
The City maintains the necessary corporate capacity to support the elements and practices of the Asset Management system.		✓			
Asset Stewards plan for the effective contracting of services that is required to deliver their Asset Management plans effectively over the long term, and in compliance with relevant rules and regulations		✓		✓	

1.4 Risk Management

The CAMP (Corporate Asset Management Plan) establishes risk by understanding the criticality of an asset or system and the chances of it failing. This information is useful in making informed investment decisions and in ensuring the safety of the public and The City's employees.

The chart below illustrates the process for how The City identifies and treats risks. This is discussed in more detail in Section 2.



The City's Asset Management Policy helps to ensure asset related risk is managed by addressing and outlining potential consequences.

As defined in the Asset Management Policy failure to adhere to this Policy may result in:

- the risk that The City is not investing in safe and reliable infrastructure at the most optimal times in the asset's lifecycle. This risk potentially compromises the safety and service delivery provided by The City's infrastructure.
- the risk of sub-optimal planning for growth, maintenance and replacement of existing assets and the development of new assets. This risk potentially compromises The City's ability to meet expected levels of service.
- conflicting service line investment priorities, poor coordination of delivery of service, corporate inefficiencies, and lack of expenditure optimization.
- capital plans that are inconsistent with the needs identified in the asset management plans, resulting in an increase to the infrastructure gap. This risk potentially compromises the alignment of infrastructure, financial, and land-use goals and objectives and the ability to achieve a sustainable urban form.

1.5 Levels of Service

Levels of Service are the specific parameters that describe the extent and quality of service a municipality provides to its users and citizens. Levels of service are heavily linked to risk management as decreasing service can lead to increased risk. Defining and measuring levels of service allows us to determine if our assets are delivering their intended function. This is an important metric in asset management. In challenging economic times, difficult decisions regarding service levels must be made to meet budgetary constraints and these decisions must be understood from a risk perspective as well.

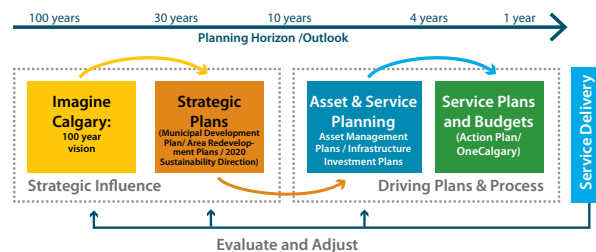
The City uses various inputs across our different service lines to set goals and measurements for assets. This includes considerations such as customer expectations, changes in legislation, growth demands, the changing climate, and an understanding of assets and risks (see Section 2).

The City has developed and will continue to develop targets which include level of service outcomes, service performance measures, and technical indicators of asset and operational performance and health. This year's CAMP has quantified levels of service in order to better understand how we are meeting these targets. Details on service line Levels of Service targets and achievement rates are detailed in Appendix A.

1.6 Service Planning

The Corporate Asset Management Plan is an important input into service plans and budgets cycles at The City of Calgary. It helps to inform capital and operating funding asks for each 4-year cycle which is an important process for managing The City's \$7.2B funding gap.

Asset management planning as an integral part of service planning

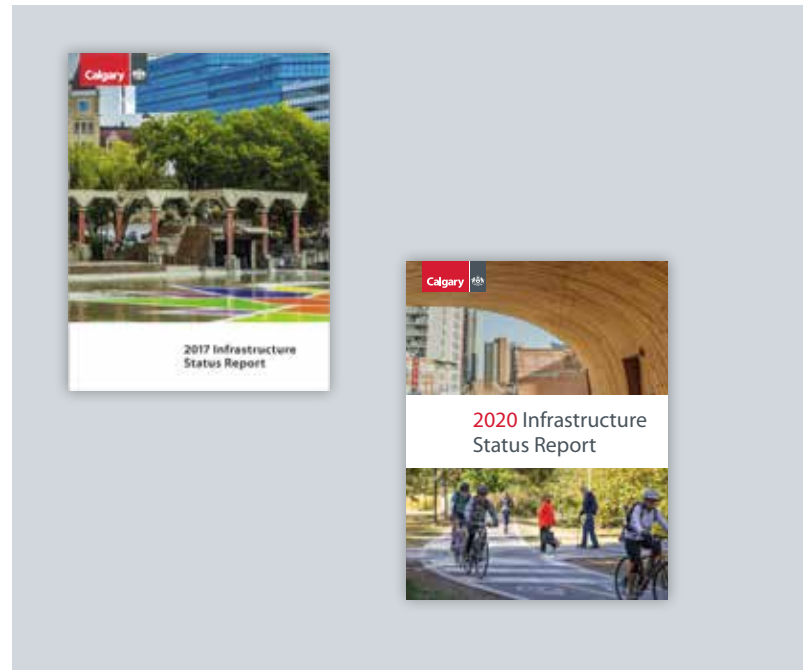


The CAMP identifies key risks and discusses projects for funding to mitigate these risks in Section 4.

1.7 2022 Updates

The 2022 CAMP (Corporate Asset Management Plan) is the latest iteration since the 2017 version and builds on the 2020 Infrastructure Status Report. Some of the key features of the 2022 CAMP include:

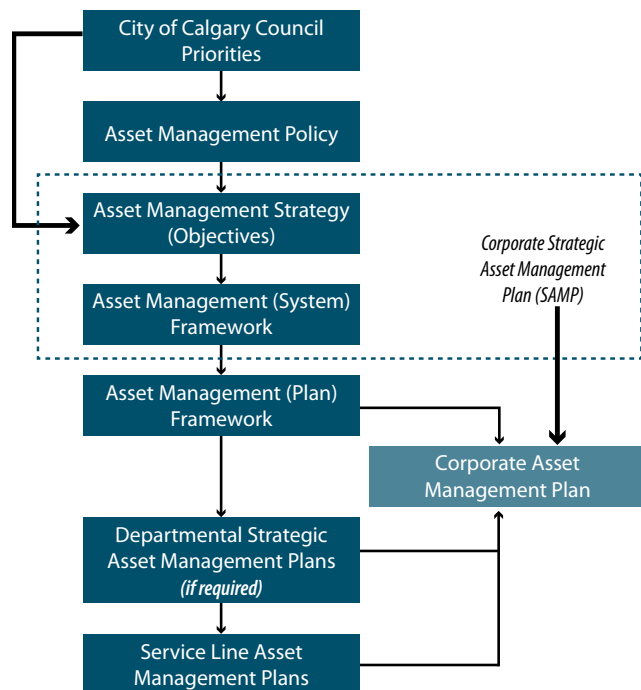
- Increased emphasis on quantification and leveraging asset management data
- Alignment to the service lines in the 2020 Infrastructure Status Report
- Updated condition data
- Updated and improved risk information
- Assessment of levels of service performance in relation to targets
- Increased emphasis on investment needs and infrastructure gap
- Improved energy and climate reporting and planning



1.8 Asset Management Policy and Framework

The City of Calgary has developed an Asset Management Framework that establishes a high-level, systematic approach to support service, asset, and financial sustainability.

The framework is supported by an Asset Management Policy that guides the overall direction of asset management.



1.9 Governance

The City has a comprehensive governance structure in place to manage its assets successfully. The objective is to improve infrastructure resilience, efficiency, and effectiveness by optimizing investment to foster the local economy, environment, and support community health and well-being.

The City is currently undergoing an organizational re-alignment and as this completes the current governance structure will be modified. More information will be available on these changes later this year.

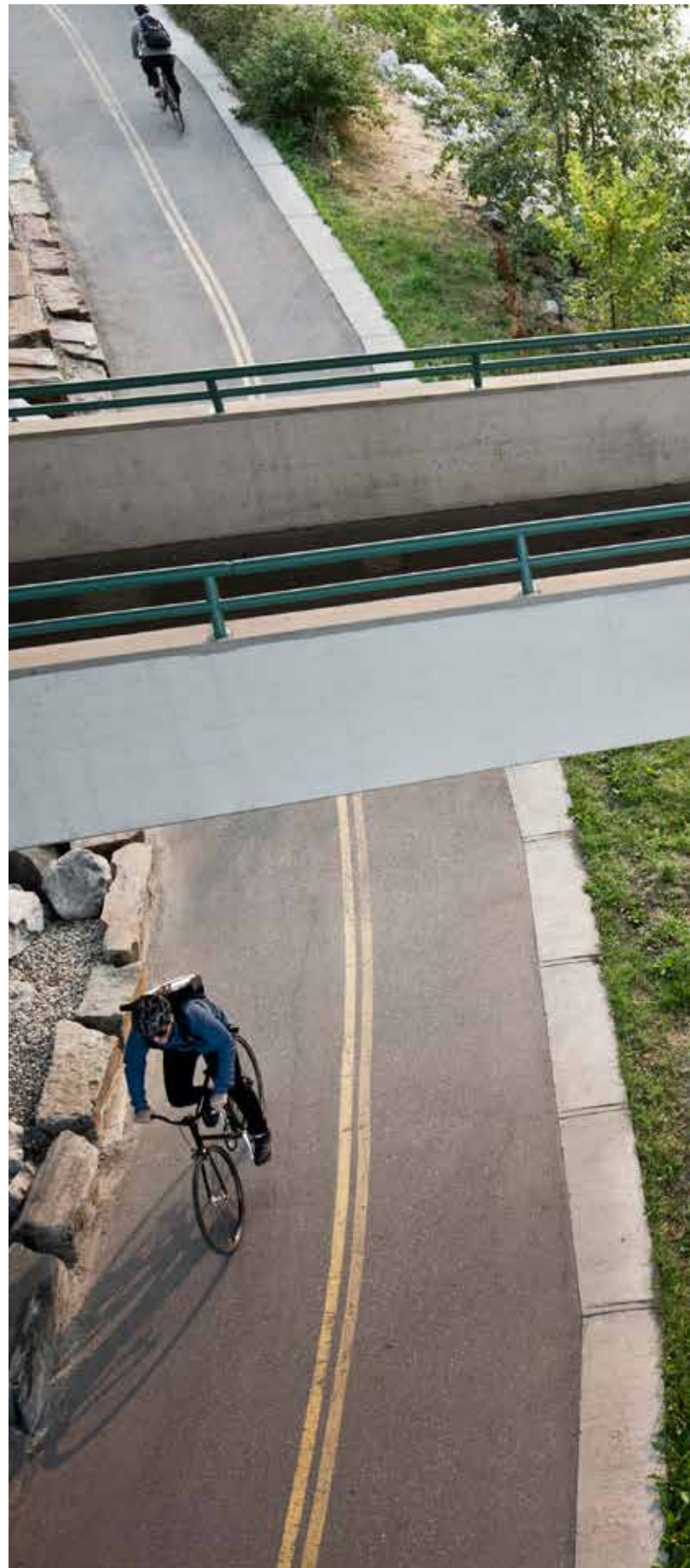
1.10 Legislative Requirements

Legislative requirements impact City planning and management. The City strives to meet regulatory requirements every day in the delivery of our services. It's important to understand federal, provincial, and municipal regulatory and other legal requirements for our infrastructure and assets. When regulations change, the way The City invests and manages assets can be impacted. Where possible, it is important to understand and provide input into any regulatory changes that could impact The City's investment planning.

1.11 Calgary's Climate Change Program

Climate-related impacts have the potential to significantly affect many City of Calgary assets. Developing and implementing resilience strategies that allow The City to mitigate, survive, adapt, and thrive in the face of climate change is a Council Priority. The City's Climate Resilience Strategy consists of two key components; mitigation and adaptation. Both are important considerations for individual service line Asset Management Plans and this CAMP.

Climate change is further discussed in Section 2.7 and Section 4.



2 Current Asset Status

2.1 Introduction

Understanding the current state of our assets is important to determine the actions required to achieve our service targets and objectives, and for budgeting and risk mitigation. The City currently owns \$100.4B in assets. The infrastructure portfolio has grown by \$16.8B since the 2017 CAMP (Corporate Asset Management Plan) (from \$83.6 to \$100.4B). This increase can be explained by the addition of almost \$3B in natural assets, increased replacement value unit costs in Calgary Roads and Transit, as well as improved asset inventories and valuation techniques.

The overall condition of City assets has declined compared to the 2017 CAMP. Declining condition of existing infrastructure typically means maintenance spending is not keeping pace with asset deterioration. This is a lead indicator for asset performance and ultimately service performance. Without added investment The City could experience continued decline over the next business cycle. The following sections of the report recommends focus areas for asset investment and management to manage risk and service levels.

Currently, the overall risk of the City's infrastructure is 5.6 out of 25, indicating a relatively low level of risk. Monitoring risk is imperative for The City to ensure risk levels are maintained within a manageable limit and should be re-evaluated on

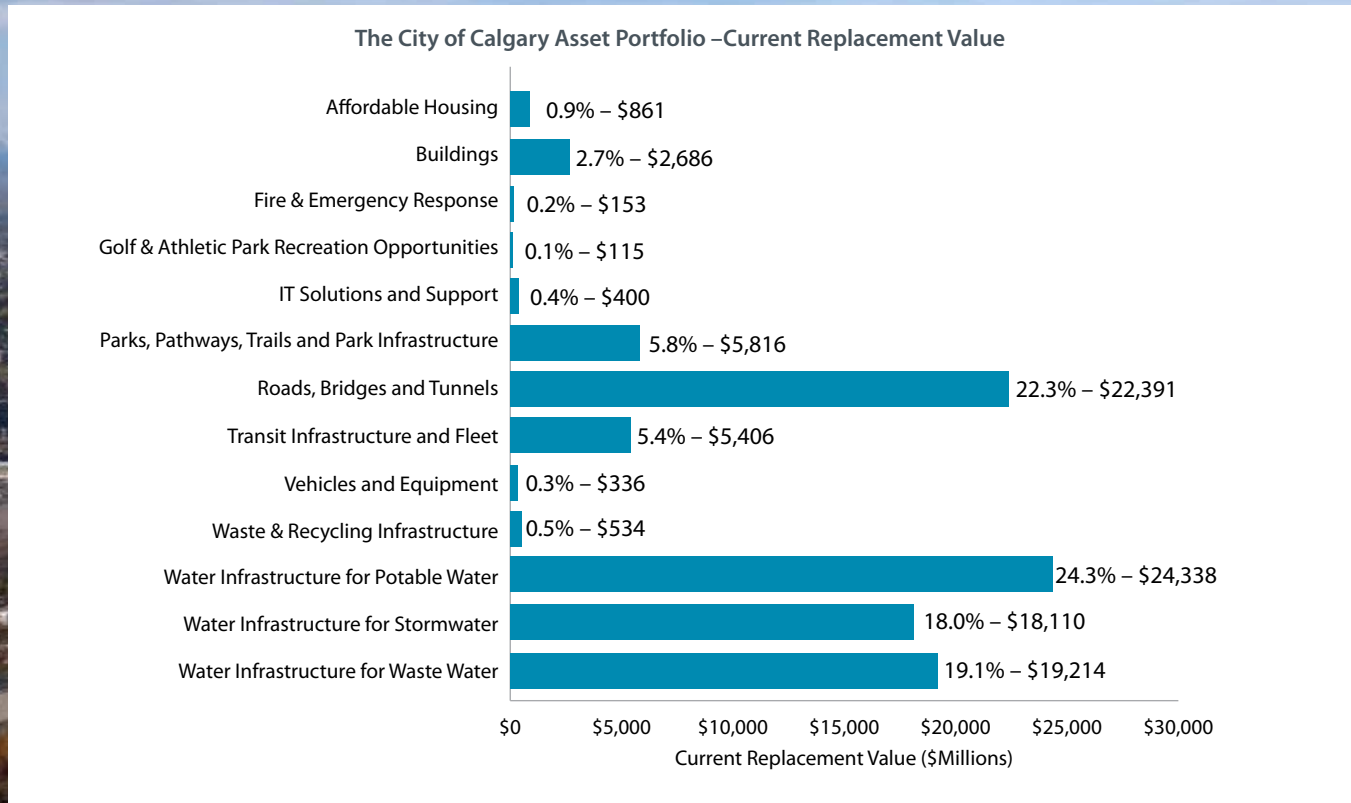
a regular basis. City service line owners are responsible for continued risk monitoring of their assets and for defining acceptable levels of risk.

The performance of our assets is measured by monitoring the rate at which our assets meet their targeted Levels of Service. The service lines included in the CAMP vary with respect to achieving their Levels of Service targets. Levels of Service target achievement rates are used to inform assessments of how well city assets are achieving their strategic objectives and consequently supporting infrastructure investment priorities. Specific Levels of Service targets and achievement rates are provided in Appendix A.



2.2 What Do We Own and What is it Worth?

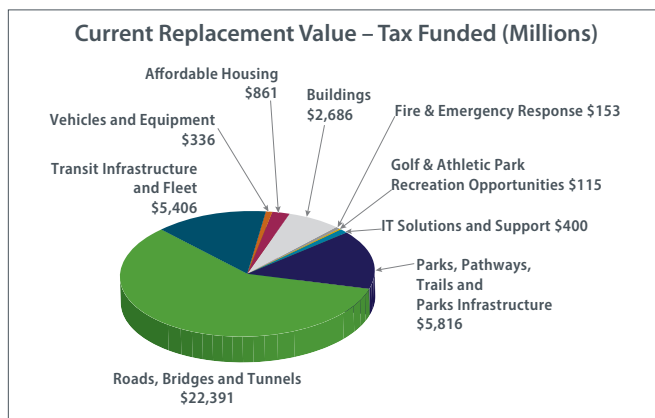
Current Replacement Value



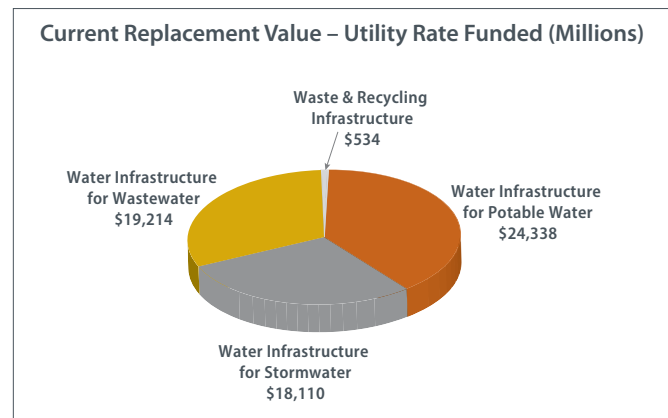
City of Calgary assets have a current replacement value (CRV) of \$100.4B. The 2022 CAMP provides a breakdown of assets by service line to align with the 2020 Infrastructure Status Report. The overall asset portfolio has increased in value from the 2017 CAMP by \$16.8B, and \$6.4B from the 2020 Infrastructure Status Report. This increase can be explained by the addition of almost \$3B in natural assets, increased replacement value unit costs in Calgary Roads and Transit, as well as improved asset inventories and valuation techniques.

The total current replacement value of tax funded assets is \$38.2B while the total current replacement value of utility-rate funded assets is \$62.2B. The service line breakdown for these two funding sources is shown below:

Tax Supported



Utility Rate Funded



The City of Calgary reports the value of its infrastructure assets in its annual financial statements. These statements report depreciated asset values based on original purchase costs depreciated over that asset's useful life in accordance with the Public Sector Accounting Board's, PS3150 Tangible Capital Asset reporting requirements. These depreciated asset values differ from current replacement values as reported in this report. Original purchase cost can form a basis for defining associated asset values through applying escalation rates based on purchase date and original asset costs where current values are not available. Current replacement value or perceived market value is often difficult to verify and will vary depending on market conditions and inflation. Thus, the basis of the value reported in The City's financial report differs from the replacement values reported in the CAMP.

The condition-related information was supplied by each service line owning business unit. Funded operating budget figures are based on current year approved operating budgets extrapolated for the next 10 years. Funded and unfunded capital budget numbers are based on data from the Capital Budget System and further validated by representatives within each service line owner.

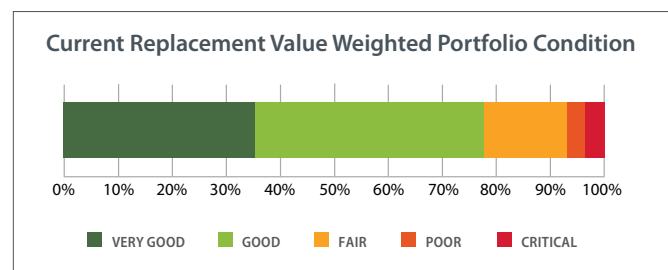
Two City of Calgary documents rely on information contained in the 10-year Capital Plan prepared by various business units to consider infrastructure projections. While these documents are related, each has a different focus and target audience.

Strategic Growth and Capital Investment (SGCI) deals with future infrastructure capital requirements related to population growth, including the geographic location of new infrastructure. It is also part of The City's strategy to manage growth by establishing a framework to inform key decisions in the planning process an ensure alignment of municipal capital projects related to growth.

The Long Range Financial Plan (LRFP) projections include infrastructure, but extend to cover all City operations, including non-infrastructure services plus financial impacts and strategies.

2.3 Asset Condition

Current Replacement Value



Note: condition distribution only includes assets with condition information available

Understanding the condition of assets allows for better planning to sustain the services that these assets provide and support. Asset condition is a useful indicator to evaluate asset deterioration and remaining service life. Assets in Poor condition are more likely to be unreliable, leading to asset failures and potential service disruptions. Asset condition is therefore important information for The City to support decisions on the timing of possible interventions to improve or maintain the levels of service at a desired standard and to avoid failures. As seen in the graph above, the overall health of City assets is in very good to good condition (78 per cent) based on current replacement value and 7 per cent is in Poor to Critical condition. While the assets in Poor condition seem like a small percentage, it translates to a \$6.3B current replacement value.

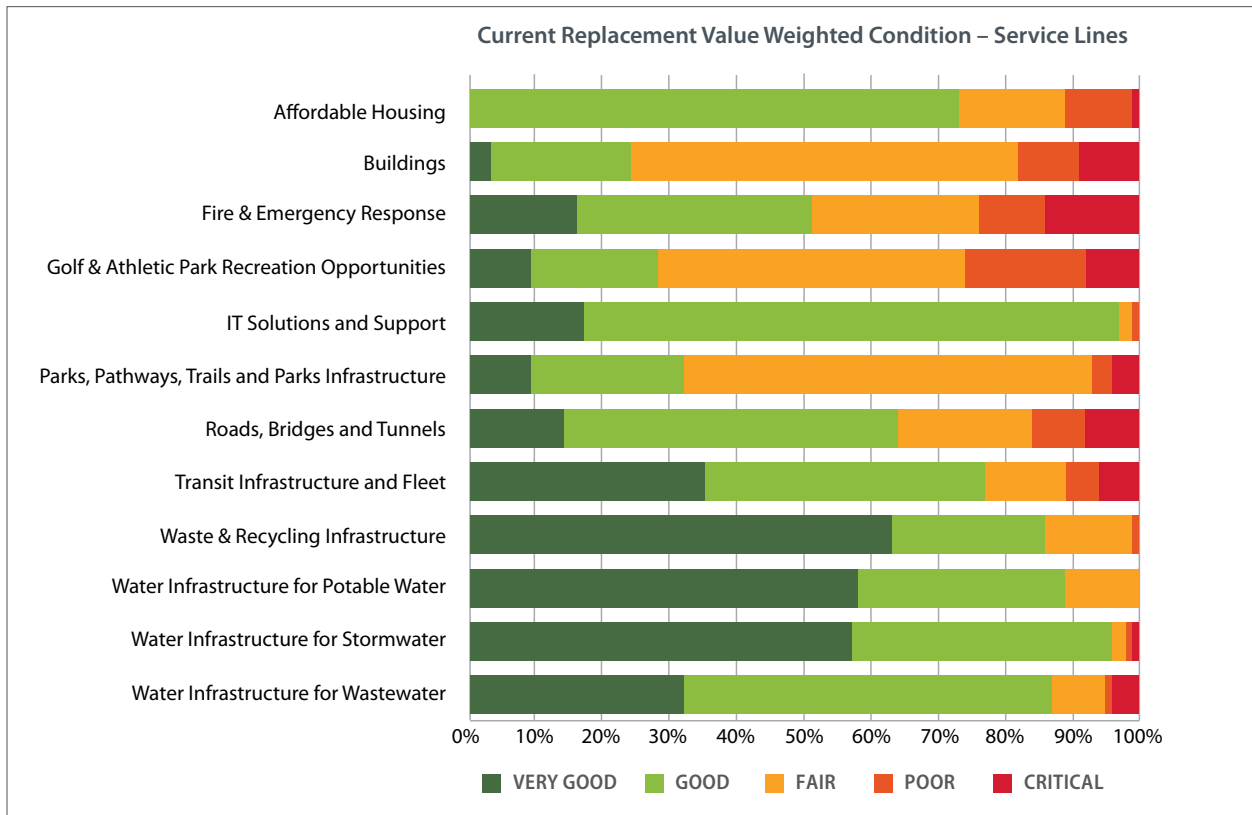
A description of the 1-5 condition rating system used by The City is provided below:

Rating	Condition Description	Description
1	Very Good	Sound or "as new" condition. Only planned maintenance required.
2	Good	Acceptable physical condition. Asset shows only minor deterioration. Minor maintenance required plus planned maintenance.
3	Fair	Tolerable physical condition. Moderate deterioration evident. Advanced maintenance and/or maintenance planning is required.
4	Poor	Asset is near end of life or major deterioration evident. Significant renewal or rehabilitation may be required.
5	Critical	Asset is at end of life or deteriorated to an inoperable or unsafe state. Potentially physically unsound and beyond rehabilitation.



The Service Line current replacement value weighted condition profiles are provided below for comparison purposes:

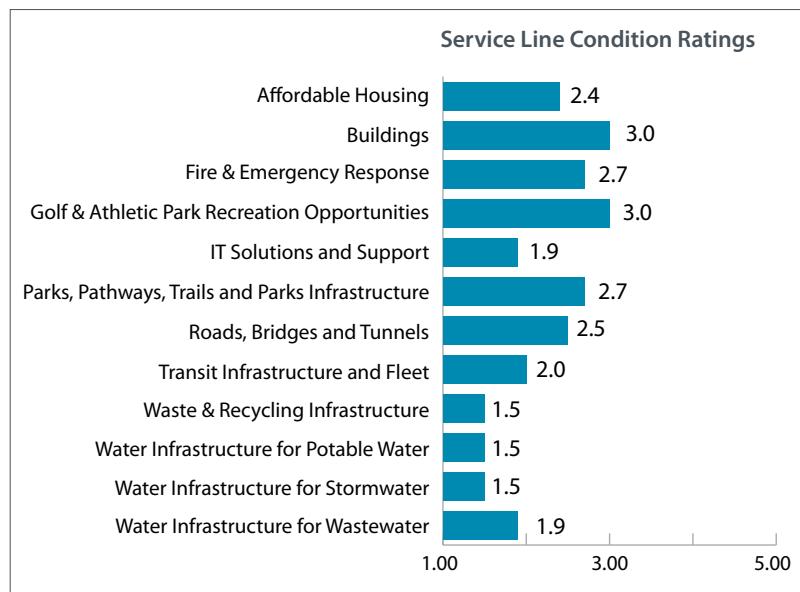
Current Replacement Value Weighted Condition



As seen above, the condition profiles are varied. IT Solutions and Support has the healthiest tax funded profile, and the four utility-rate funded services (Waste & Recycling Infrastructure, Water Infrastructure for Potable Water, Water Infrastructure for Stormwater and Water Infrastructure for Wastewater) also have healthy profiles. Fire & Emergency Response and Golf & Athletic Park Recreation Opportunities have the greatest proportion of their condition profile in the Poor to Critical range at 24 and 27 per cent respectively. Buildings and Parks, Pathways, Trails and Park Infrastructure have a large portion of their assets in the fair category, indicating an importance for maintenance and replacement planning as the assets continue to age and deteriorate.

Weighted asset ratings (by current replacement value) on the one to five scale for each service line are provided below:

Condition Rating



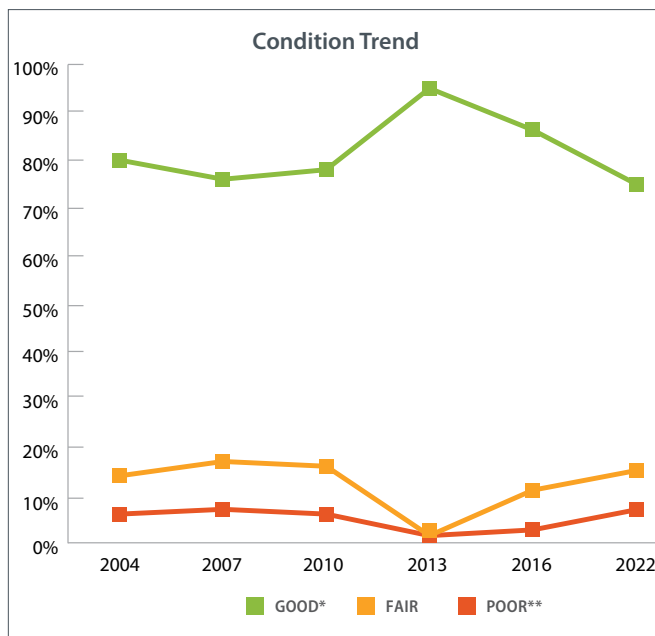
A trend worth noting is that all the utility rate funded services (Waste & Recycling Infrastructure, Water Infrastructure for Potable Water, Water Infrastructure for Stormwater and Water Infrastructure for Wastewater) have among the best overall condition ratings.

The condition trend from 2004-2022 is provided below:

Condition Trend

	2004	2007	2010	2013	2016	2022
Good*	80.0%	76.0%	78.0%	95.0%	86.3%	77.9%
Fair	14.0%	17.0%	16.0%	3.5%	11.0%	15.1%
Poor**	6.0%	7.0%	6.0%	1.5%	2.7%	7.0%

*Very Good and Good combined for comparison with prior years
**Poor and Critical combined for comparison with prior years



*Very Good and Good combined for comparison with prior years
**Poor and Critical combined for comparison with prior years

Since 2013, the proportion of assets in Good condition has been declining while the proportion of assets in Poor condition has increased by 5.5 per cent. The 2022 condition profile is relatively consistent with the profiles from 2004 to 2010. No significant causes have been identified to explain the deviating condition profile in 2013, and the difference is likely the result of The City's ever-evolving asset management maturity.

2.4 Levels of Service

Measuring performance of assets helps The City manage the services it provides. The City tracks a variety of performance measures across all service lines. This tracking provides an indication of how well Levels of Service are being provided and, in turn, how well the infrastructure is providing that service.

Measuring Levels of Service can be a complex task and often contains several metrics. Service line owning business units across The City are responsible for monitoring the performance of their assets. This CAMP rolls up service line Levels of Service results into one of three categories:

	Achieving targeted Levels of Service
	Achieving most or very close to targeted Levels of Service
	Missing key Levels of Service targets

A summary of overall Levels of Service target results for the various service lines is shown below:

Service Line	Meeting Levels of Service
Buildings	
Fire & Emergency Response	
Golf & Athletic Park Recreation Opportunities	
IT Solutions and Support	
Parks, Pathways, Trails and Parks Infrastructure	
Roads, Bridges and Tunnels	
Transit Infrastructure and Fleet	
Waste & Recycling Infrastructure	
Water Infrastructure for Potable Water	
Water Infrastructure for Stormwater	
Water Infrastructure for Wastewater	

Note: Levels of Service information for Affordable Housing is currently unavailable but under development

As shown in the table, Buildings, Golf Recreation & Athletic Park Opportunities and Roads, Bridges and Tunnels are missing some key Levels of Service targets indicating that additional investment is required if achievement of the missed service targets is desired.

Detailed breakdowns of Levels of Service can be found in Section 4: Service Line Summaries and are presented in greater detail in Appendix A.

2.5 Infrastructure Risk Profile

The Integrated Infrastructure Risk Management Framework (IIRMF), that business units have adopted, supports the identification and prioritization of investment needs. The CAMP applies a simple risk evaluation across the corporate asset portfolio drawing on a broad understanding of asset criticality and condition status. The condition of the asset portfolio is used to represent the likelihood of failure and the criticality of asset classes represents consequence. In combination, the risk rating provides an asset health index for the asset class. Below is a summary of the 1-5 ranking criteria for condition and criticality.

	1	2	3	4	5
Condition	Very Good	Good	Fair	Poor	Critical
Criticality	Very Low	Low	Medium	High	Severe

Condition and Criticality are multiplied together producing a risk ranking on a 1-25 scale

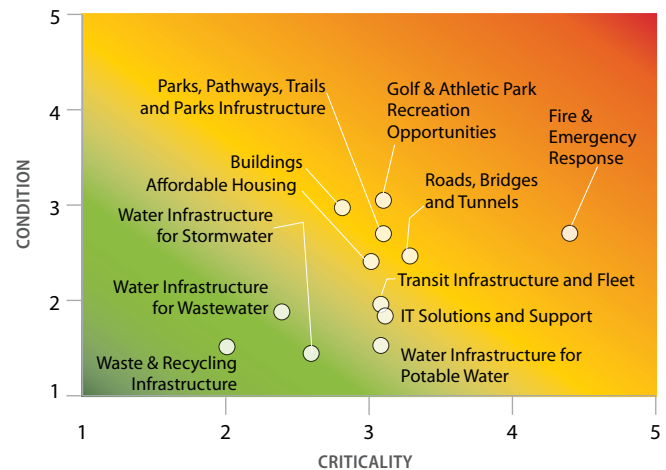


In the Infrastructure Risk Profile to the right, each dot represents the condition and criticality for the different service lines. Assets with high and severe criticality need to be maintained in better condition while very low and low criticality asset classes may be allowed to deteriorate to a lower condition grade. This concept has been used to develop a criticality score to condition grade relationship. This process enables the identification of risk (criticality x condition), to assess whether the average condition of an asset class is tolerable or not.

The threshold for the relationship between condition and criticality is represented by the colour scheme below. Assets in the red zone represent higher risk. The risk threshold helps present opportunities for investment efficiencies, by allocating funding to assets with higher risk. While the process may mask poor condition assets in a class that is generally in good condition it does provide an indicator for further, more focused analysis.

Asset condition profiles and criticality ratings are established and monitored by the asset owning Business Unit's. Currently, there are no cross Business Unit comparisons to value the criticality of one Business Unit's assets against those of another. Rather, the criticality ratings and condition profiles are used in collaboration to monitor asset risk to try to keep risk within the green to yellow zones.

Asset Risk Profile



As seen above, Buildings, Fire & Emergency Response, Parks, Pathways, Trails and Parks Infrastructure, Golf & Athletic Park Recreation Opportunities and Roads, Bridges and Tunnels service lines pose the greatest risk. The utility funded service lines (Waste & Recycling Infrastructure and Water Infrastructure service lines) have the lowest risk, in large part because the funding model allows them to keep their assets in better condition.

Asset condition profiles and criticality ratings are established and monitored by the asset owning Business Unit's. Currently, there are no cross Business Unit comparisons to value the criticality of one Business Unit's assets against those of another. Rather, the criticality ratings and condition profiles are used in collaboration to monitor asset risk to try to keep risk within the green to yellow zones.

Service lines are further broken down into their Asset Subsystems in Section 4: Service Line Summaries.



2.6 Asset Management Related Business Risk

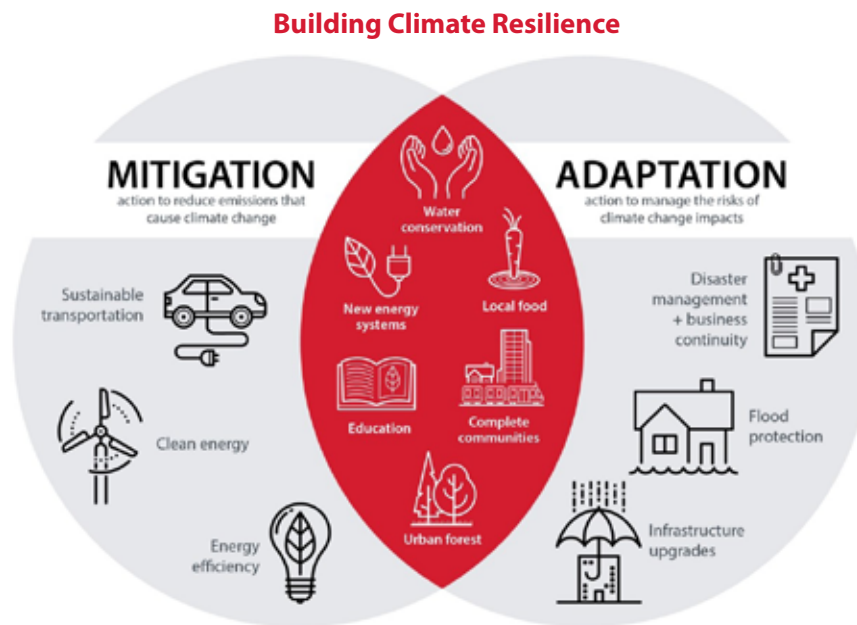
Asset Management related business risks have been pulled from The City's Risk Profile at year-end 2021. The table below demonstrates strategic infrastructure related risks:

Business Risk

Capital Infrastructure Risk	Infrastructure Management Risk	<p>Risks identified include:</p> <ul style="list-style-type: none"> • City-wide infrastructure funding may not be sufficient to maintain existing, or build new infrastructure, due to funding reduction, resulting in an increase in the infrastructure gap. • Lack of budget for maintenance may result in asset failure which could result in property damage, injury, or fatality. • The realignment implementation for Calgary Housing and Affordable Housing and the ambiguity of functions and roles could impact service level agreements, reporting relationships, asset management, and financial obligations. • Major infrastructure projects may be impacted by the changes in federal and provincial orders and this could lead to missed opportunities. • Recent provincial budgets have seen disinvestment in maintenance and construction of affordable housing. • Government of Alberta is expected to release a strategic plan for Affordable Housing in fall 2022, in advance of establishment of relationships between the new City Council and Provincial elected officials.
		<p>Summary of risk ratings:</p> <ul style="list-style-type: none"> • Funding constraints • Supply chain issues
Service Delivery Risk	Infrastructure Risk: Operation, Process Risk	<p>Risks identified include:</p> <ul style="list-style-type: none"> • The COVID-19 Pandemic has resulted in a sharp decline in the number of trips taken for various forms of transportation (public, specialized and vehicle for hire) and this could potentially put a strain on the processes and resources to support a future increase in demands. • Changes to governance functions and budgets due to the realignment could result in increased need for integrated planning between departments and temporary service interruptions or delays. • Non-compliance with policies due to lack of internal process or resources may result in inaccurate reporting or other impacts. • Community Associations may not be able to cover the costs of facility upkeep and may return the facilities to The City in a state which will impact revenues and service delivery . • Insufficient external funding remains the highest risk for affordable housing to maintain existing units and build new units to meet the growing demands.
		<p>Summary of risk ratings:</p> <ul style="list-style-type: none"> • The proposed organizational realignment is a significant change to how The City delivers services and conducts business. Services may be split up, separated or people responsible for monitoring policy requirements may be reassigned resulting in lack of focus and attention to compliance issues. • The Organizational Realignment presents opportunities and risks; identifying future-state concerns can help reduce the risks and elevate the opportunities. • Lack of capacity to update policies and align procedures.

An additional identified business risk is that civic partners and community associations have not been included in the CAMP. The City owns many of these assets, but Asset Management Plan's are not necessarily in place for these facilities. This is an area that has been flagged for improvement going forward.









2.7 Climate Change Related Risk



Climate-related impacts can occur over the short, medium, and long term. Calgary will experience chronic, gradual impacts (such as impacts due to shifting temperature patterns), as well as acute, abrupt disruptive impacts (such as impacts from flooding or severe storm events). These impacts have the potential to significantly affect many City of Calgary assets. The City recognizes the importance of developing and implementing resilience strategies that will allow us to mitigate, survive, adapt, and thrive in the face of climate change. The City's Climate Resilience Strategy is split into two key components: mitigation and adaptation. Both are and will continue to be included in the individual service line Asset Management Plans in addition to this CAMP. A summary of The City's climate mitigation and adaptation components is provided above.

Climate change risk can impact the operations of The City, many of which are critical to Calgarians, such as the Emergency Operations Centre, roads, Calgary's stormwater infrastructure and communications systems. These climate-related impacts have the potential to affect important aspects of The City of Calgary's assets and their levels of service to citizens both now and in the future.

The City defines climate-related risk as the physical impacts of climate-related hazards (i.e. severe weather events, drought, extreme temperatures, etc.) on Calgary's natural environment, built environment (buildings and infrastructure), human systems (community well-being), City operations and service delivery and their associated socio-economic costs. Climate-related risk is also associated with the transition to a lower-carbon economy, legal and policy risk, technology changes, market response, and reputational considerations. The City has identified 8 climate related hazards that could be more likely and/or severe due to climate change:

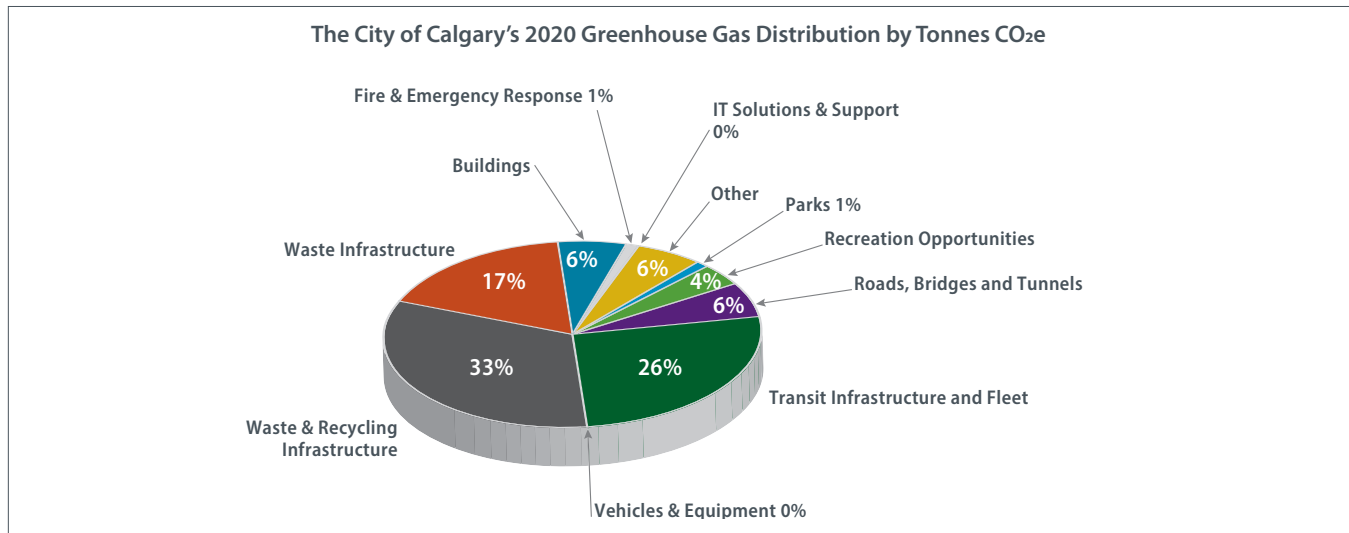
- 
Extreme Heat: Calgary will experience increasingly hot summers with more frequent and longer heat waves
- 
Drought: Drought conditions may become more common, prolonged and widespread
- 
Wildfires: A longer and drier fire season will lead to more frequent, larger and intense wildfires
- 
Shifting seasons: Winters are getting shorter, spring is arriving earlier, summers are longer and fall is arriving later.
- 
Heavy rainfall: More precipitation is falling as short-duration, high-intensity storms (SDHI) which can lead to overland flooding
- 
Heavy snowfall: Damaging winter storms, heavy snow and blizzard conditions will continue to be hazards as core winter months remain below 0°C
- 
Severe storms: Hail, high wind events and tornadoes are likely to occur more frequently and over more months of the year.
- 
River flooding: Flood timing, intensity and frequency is likely increasing

The impacts from these hazards will increasingly be considered in the development and implementation of City Asset Management Plans to help prevent climate change impacts on our assets (mitigation) and to adapt to these hazards now and into the future (adaptation).



On the mitigation side, the key target in the 2018 Climate Mitigation Action Plan is to reduce city-wide greenhouse gas emissions by 80 per cent below 2005 levels by 2050. This target has been updated in the Climate Emergency Declaration to reach net zero emissions by 2050. Infrastructure projects and asset management planning will play an important role in helping The City achieve this objective. Climate projects specific to individual service lines are outlined in Section 4. A summary of the service line contributions to City of Calgary total emissions is provided below:

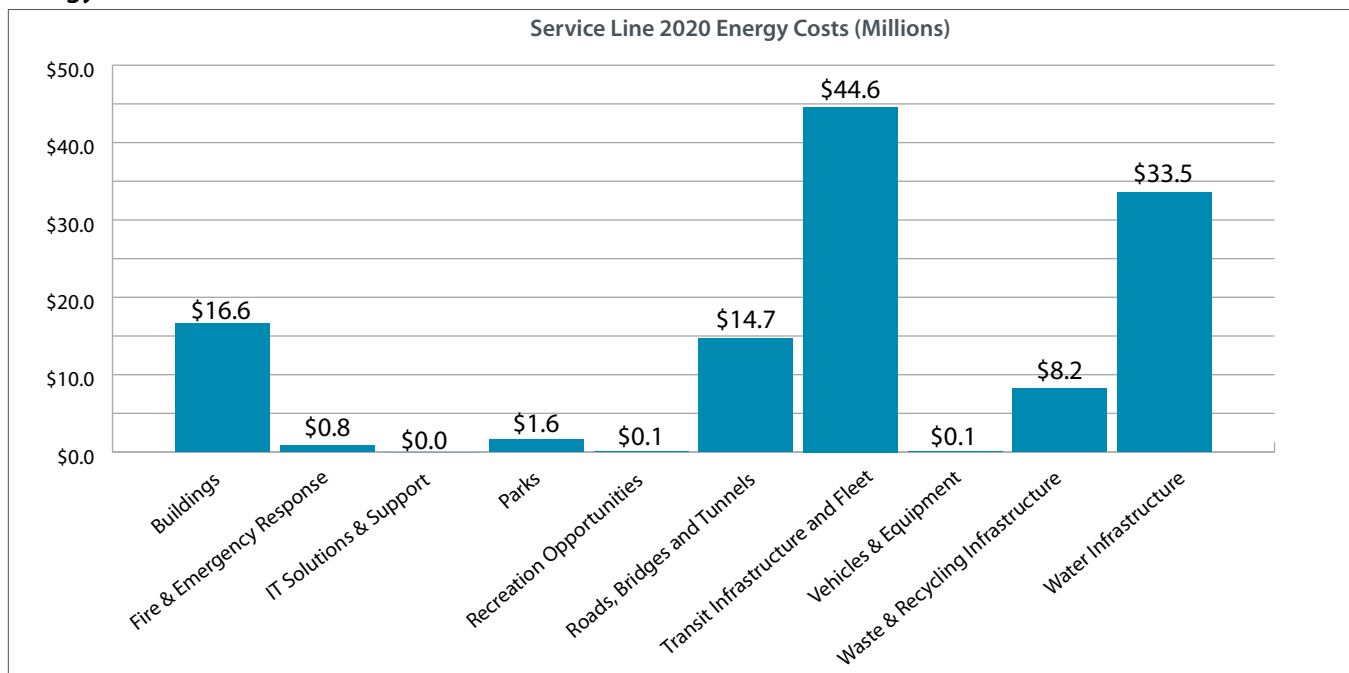
2020 Greenhouse Gas Distribution



Note: Distribution is based on 2020 greenhouse gas emission data from the Environmental & Safety Management Business Unit. In 2020 The City sold 55% of its renewable energy certificates reducing the amount of "green electricity" the City can take credit for. Affordable Housing units are not on the The City's utility contract and not included in overall emissions.

Energy consumption associated with emissions also poses a financial risk to The City in the form of utility costs. Utility rate increases and city growth have continued to increase over the years. A summary of the 2020 service lines utility costs is shown in the graph below:

Energy Cost



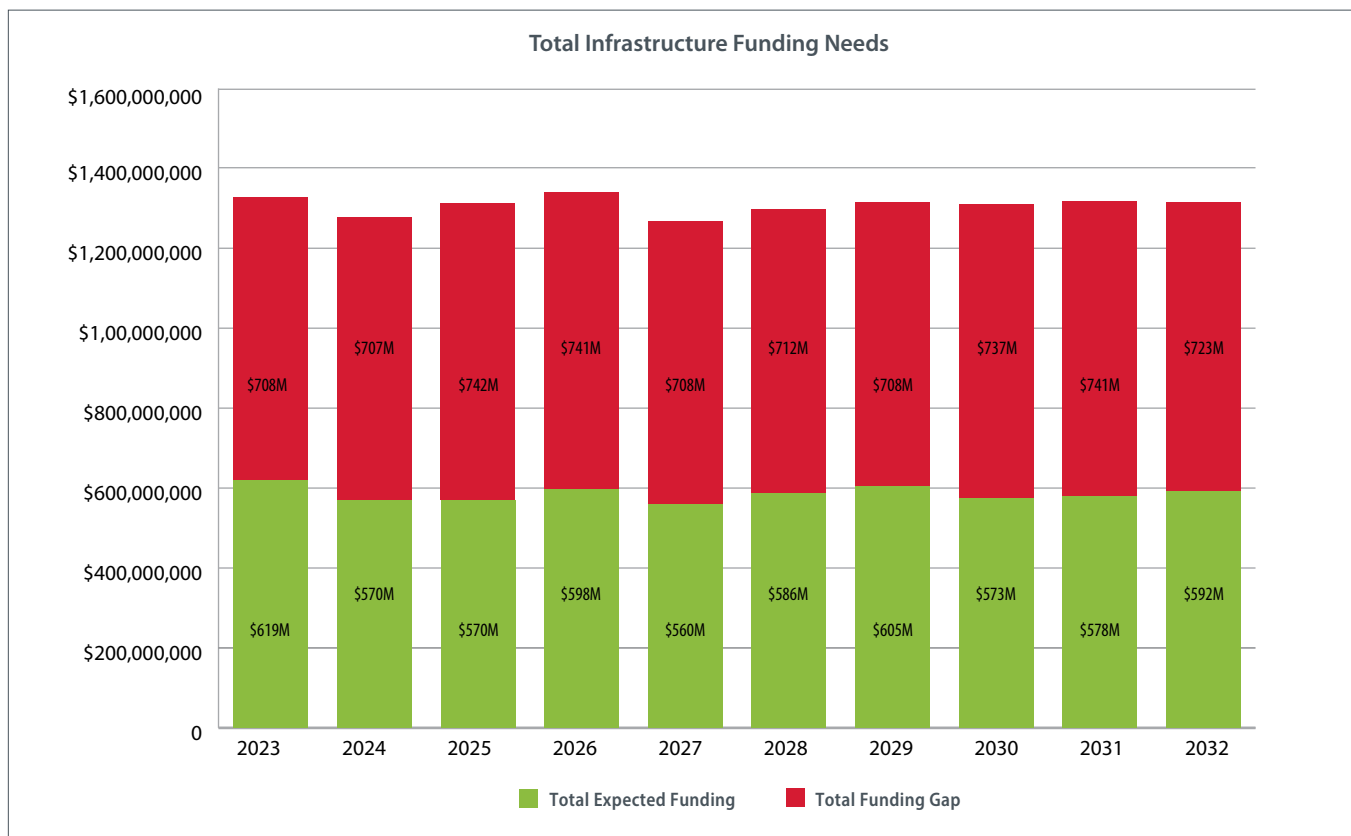
As seen in the two graphs above, service lines that have the greatest greenhouse gas emissions and utility costs are Buildings, Transit Infrastructure and Fleet, Roads, Bridges and Tunnels, Waste & Recycling Infrastructure and Water Infrastructure. These service lines should be areas to focus investment in to reduce greenhouse gas emissions and utility costs across the corporation.

3 Asset Investment Needs and Financing Plans

3.1 Introduction

The CAMP (Corporate Asset Management Plan) is a tool intended to be leveraged to assist in identifying investment needs and to support the service plan and budgeting process. With a focus on providing safe, efficient, and affordable services to citizens, there is a need to effectively prioritize investment to make best use of the available funding. This can be achieved by reviewing infrastructure risk, levels of service and the short and long-term infrastructure gap.

The CAMP uses a 10-year window to identify the financial forecasts and requirements for City infrastructure. A rolled up summary of the infrastructure investment needs and the identified infrastructure funding gap is provided below:



Notes:
 - Information is based on data provided by the service line owning business units.
 - Funding gap information pulled from the Infrastructure Status Report includes: Buildings, Fire & Emergency Response, Transit Infrastructure and Fleet
 - Water Infrastructure is self-funded and financial information was unavailable at the time of writing report
 - Waste & Recycling Infrastructure: Expected funding information is included; infrastructure gap is \$0 because the service is self-funded

3.2 Investment Strategy Guiding Principles and Drivers

Infrastructure Calgary has developed and adopted several guiding principles. While aimed at influencing the culture of the business unit, they are also useful in guiding the development of these strategies.

Guiding principles:

- Support the delivery of programs and services to citizens through maximizing the investment and value of The City's capital infrastructure.
- Employ a collaborative, integrated systems approach.
- Ground infrastructure strategies in resilience and sustainability outcomes.
- Quantify, communicate, and manage risk.
- Exercise collective accountability and individual responsibility.
- Adapt a flexible infrastructure planning process and delivery practice that is responsive to dynamic conditions.

Based on the principles identified, the CAMP identifies asset specific guiding principles to manage the infrastructure gap:

1. Prioritize spending based on mitigating risk and managing service levels.

2. Achieve regulatory compliance.

3. Utilize managed competition to reduce costs.

4. Divest of surplus assets.

5. Utilize new technology.

Establishing priority investment areas is a complicated process and should consider different asset management indicators. Different indicators may recommend different priority areas for investment, and it is important to use them in sync. Key indicators that should be used, and are referenced throughout this report, include risk ratings, condition ratings, level of service performance and the infrastructure gap. Indicator priority will vary as council and citizen priorities change. The CAMP presents the available data recommends investment strategies, but ultimate investments decisions are made during the budgeting process.

Using the indicators together, in the table below, the Buildings and Roads, Bridges and Tunnels service lines are areas where the infrastructure gap should be most actively managed. These service lines have large identified infrastructure gaps, relatively higher risk rankings, poorer condition ratings, and are not meeting serve level targets.

Service Line	Risk / 25	Condition / 5	Meeting Levels of Service	10-Year Infrastructure Gap (Millions)
Affordable Housing	7.2	2.4	Not Available*	\$172.7
Buildings	8.4	3		\$1,973
Fire & Emergency Response	11.9	2.7		\$306
Golf & Athletic Park Recreation Opportunities	9.2	3.0		\$201
IT Solutions and Support	5.8	1.9		\$15
Parks, Pathways, Trails and Parks Infrastructure	8.3	2.7		\$793
Roads, Bridges and Tunnels	8.0	2.5		\$1,833
Transit Infrastructure and Fleet	6.1	2.0		\$1,936
Waste & Recycling Infrastructure	3.0	1.5		Utility rate funded
Water Infrastructure for Potable Water	5.2	1.5		Utility rate funded
Water Infrastructure for Stormwater	3.7	1.5		Utility rate funded
Water Infrastructure for Wastewater	4.6	1.9		Utility rate funded

* Calgary Housing Company introduced a new level of service framework in 2021, but results are not currently available

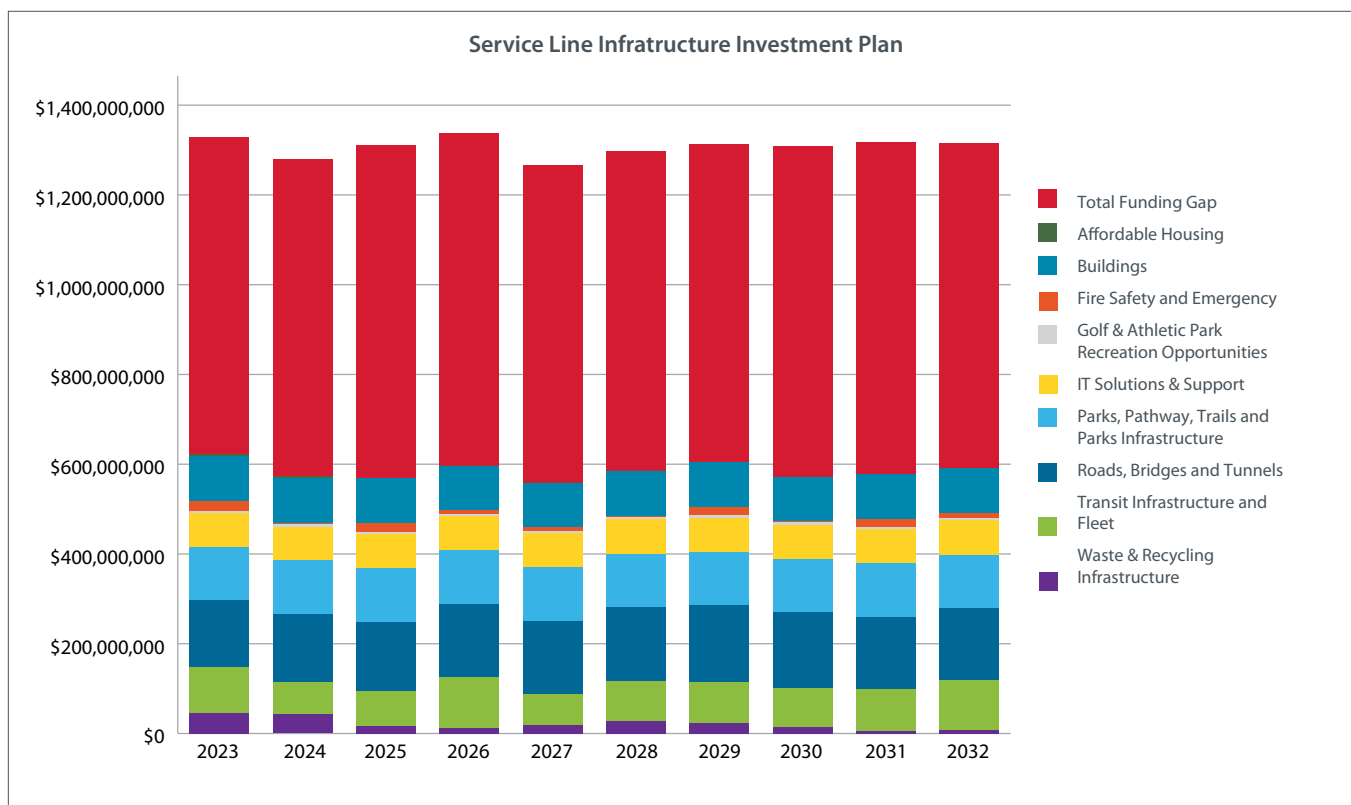


3.3 Investment Strategy Risks

Smart investment planning is a meticulous process. Numerous variables are at play and balancing these priorities is a complicated task. Several investment strategy risks have been identified by the service line providers, including:

- Changing priorities
- Accelerated asset deterioration
- Funding uncertainty (tax revenues, provincial funding, federal funding, etc.)
- Inflation
- Material, equipment, fuel, chemicals and other consumable costs
- Material and product availability
- Material and product lead time (supply chain disruptions)
- Labour costs
- Labour availability
- Climate change
- Technology advances and changes (electric vehicles, 5G and Internet of Things (IoT), etc.)
- Changes from the outcome of COVID-19 pandemic (where and how people work and commute)

3.4 10-year Infrastructure Investment Plan



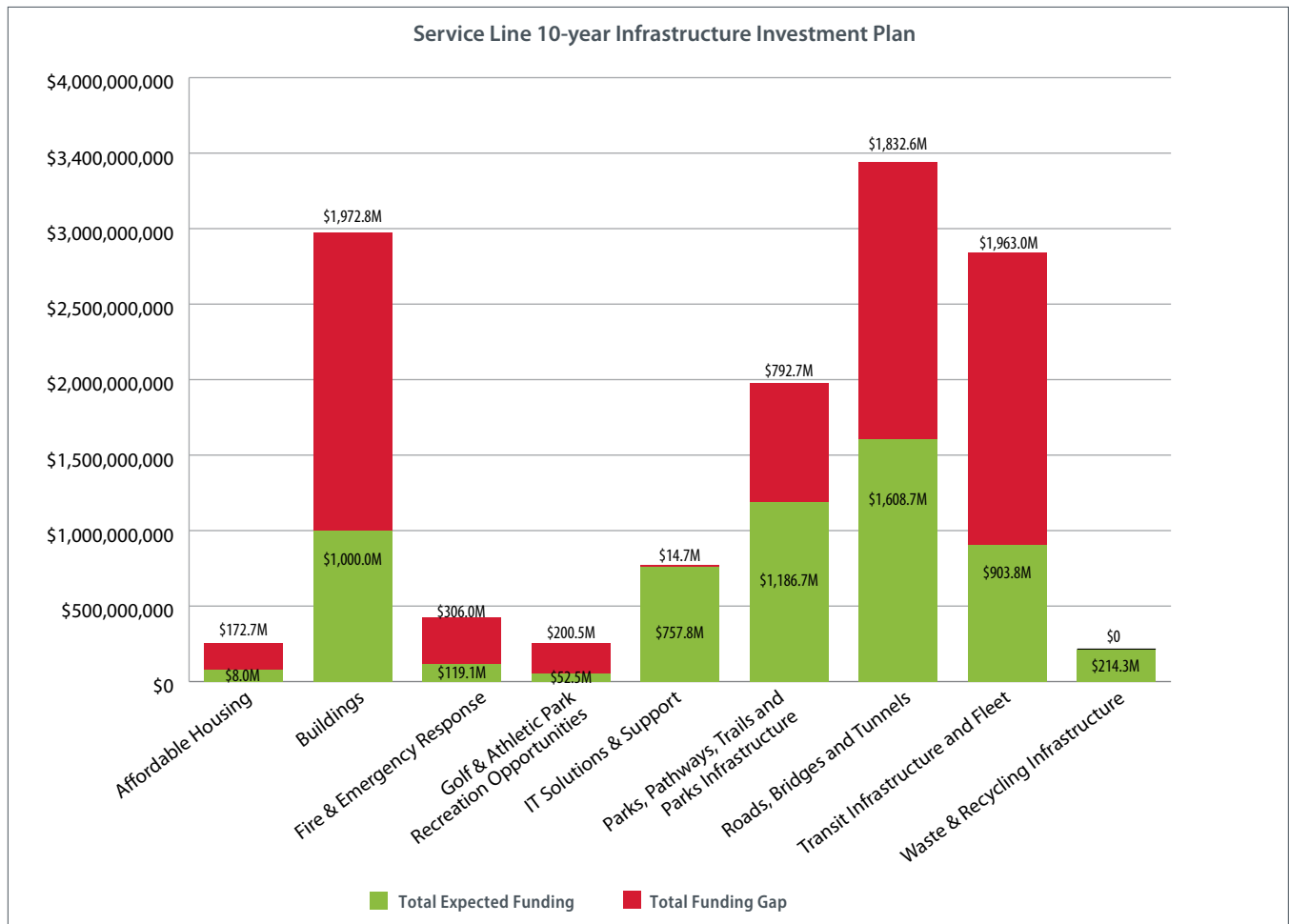
Notes:

- Information is based on data provided by the service line owning business units.
- Funding gap information pulled from the Infrastructure Status Report includes: Buildings, Fire & Emergency Response, Transit Infrastructure and Fleet
- Water Infrastructure is self-funded and financial information was unavailable
- Waste & Recycling Infrastructure: Expected funding information is included; infrastructure gap is \$0 because the service is self-funded

Financial projections have been developed for the 10-year period from the beginning of 2023 to the end of 2032, which includes the next service plan period from 2023 to 2026. These projections are only indicative at this stage and were developed based on data provided by the various asset stewards throughout the Corporation. Much of the service planning continues to be updated and adjusted as the various City business units work through the 2023-2026 budgeting process. In some cases, budgetary and infrastructure gap

information hasn't been made available and hence hasn't been included. More detailed breakdowns are available in Section 4 of the CAMP.

The Total 10-year Infrastructure Investment Plans for the service lines with available funding information is provided below.



Notes:
 - Information is based on data provided by the service line owning business units.
 - Funding gap information pulled from the Infrastructure Status Report includes: Buildings, Fire & Emergency Response, Transit Infrastructure and Fleet
 - Water Infrastructure is self-funded and financial information was unavailable
 - Waste & Recycling Infrastructure: Infrastructure gap is \$0 because the service is self-funded













As seen in the graph Buildings, Roads, Bridges and Tunnels and Transit Infrastructure and Fleet have the largest identified infrastructure gap.

Practice improvement commitment

Investment to support practice improvement plans is not included in these forecasts, but it will be important for service line owners to achieve the objectives of their investment plans. Service line owners need recognition and support to further develop and improve levels of service understanding and reporting, infrastructure risk evaluation, improvement in data management and to support initiatives to integrate asset management practices into core business.



3.5 Forecasted State of Infrastructure

	Service Line	
	Affordable Housing	↓
	Buildings	↓
	Fire & Emergency Response	↔
	Golf & Athletic Park Recreation Opportunities	↓
	IT Solutions and Support	↔
	Parks, Pathways, Trails and Parks Infrastructure	↓
	Roads, Bridges and Tunnels	↓
	Transit Infrastructure and Fleet	↔ ↑
	Waste & Recycling Infrastructure	↔ ↓
	Water Infrastructure for Potable Water	↔
	Water Infrastructure for Stormwater	↔
	Water Infrastructure for Wastewater	↔

Projected infrastructure condition trends are based on the service lines receiving their anticipated funding. Reduced funding risks a reduction in asset condition and its ability to achieve its Levels of Service targets.



3.6 Infrastructure Investment Strategy Recommendations













Based on the criticality and service level information documented in the CAMP, several investment strategies are recommended in the report to manage the infrastructure gap.

Strategies to address Infrastructure Gap	Water Infrastructure for Potable Water	Water Infrastructure for Wastewater	Water Infrastructure for Stormwater	Waste & Recycling Infrastructure	Parks, Pathways, Trails and Parks Infrastructure	Fire & Emergency Response	Roads, Bridges and Tunnels	Golf & Athletic Park Recreation Opportunities	Transit Infrastructure and Fleet	Buildings	Affordable Housing	IT Solutions and Support
Improve Lifecycle Asset Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Improve Risk Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Innovation, Investment in New Technology or other "Spend to Save"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Priority Investment in Critical Infrastructure							✓			✓	✓	✓
Alternative Service Delivery				✓				✓		✓	✓	
Increase Investment (Budget) through increase in taxation and/or user fees												
Pursuit of Alternative Funding Opportunities	✓	✓	✓							✓	✓	

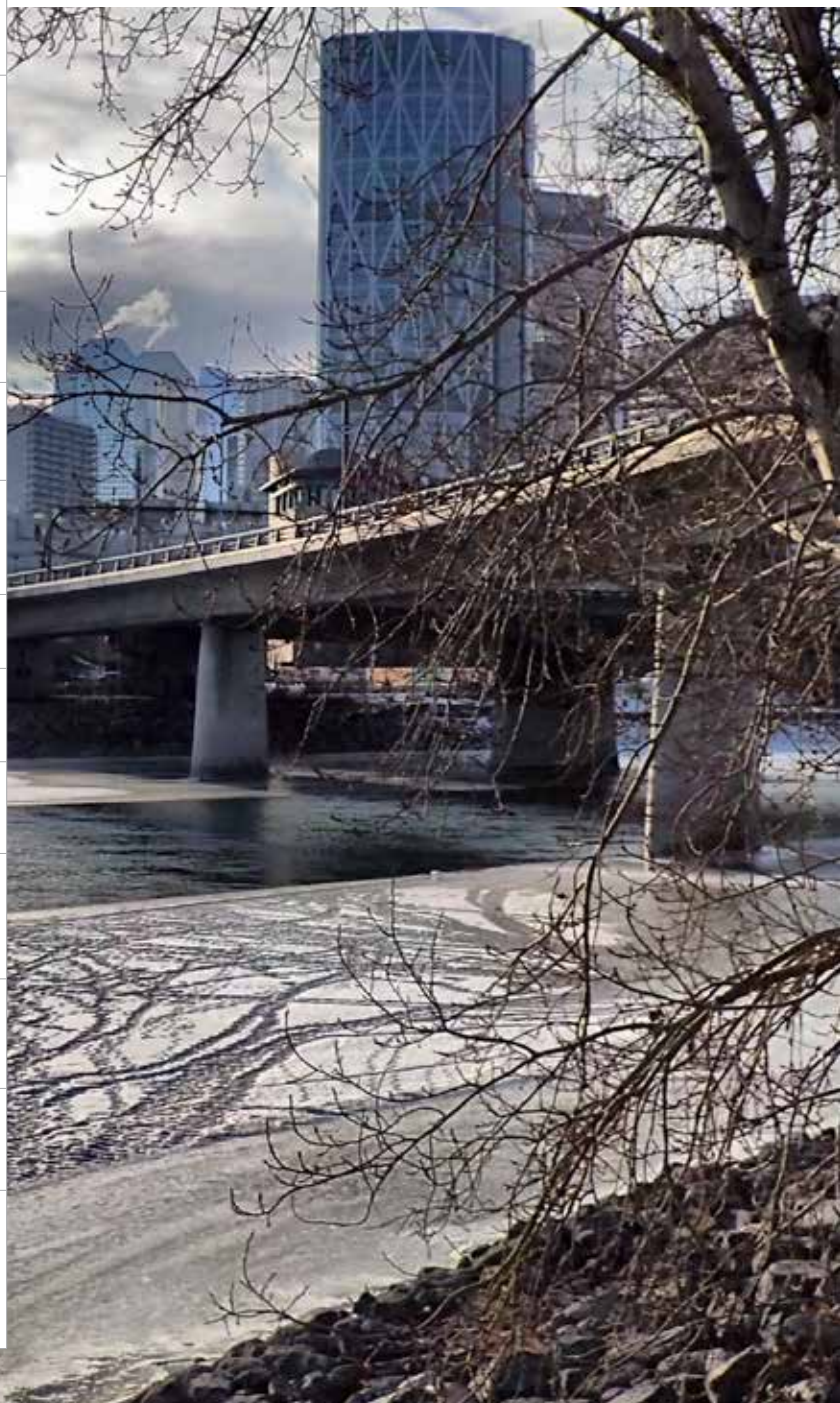
4 Service Line Summaries

4.1 Introduction

Service line asset management summaries are provided in this section. The following service lines are outlined in detail:

	Service Line
	Affordable Housing
	Buildings
	Fire & Emergency Response
	Golf & Athletic Park Recreation Opportunities
	IT Solutions and Support
	Parks, Pathways, Trails and Parks Infrastructure
	Roads, Bridges and Tunnels
	Transit Infrastructure and Fleet
	Waste & Recycling Infrastructure
	Water Infrastructure for Potable Water
	Water Infrastructure for Stormwater
	Water Infrastructure for Wastewater

Although referenced in the CAMP, Vehicles and Equipment does not have their own outline within the service line summary section. Information is limited to current replacement value.





4.2 Affordable Housing



Current Replacement Value	Overall Condition	Condition Trend	Risk
\$861M	2.4 / 5		7.2 / 25
Proposed 10-year Budget			
Current: \$8M		Gap: \$172.7M	

Statement of service

The Affordable Housing service line improves outcomes for individuals and families by transforming the housing system through stakeholder collaboration and by helping to increase the non-market housing supply by using every municipal lever to fund, develop, enable, partner and leverage.

Calgary Housing Company (CHC) is a City of Calgary owned corporation, responsible for the Affordable Housing service line, providing safe and affordable housing solutions to citizens of Calgary since 1978. Calgary Housing Company owns a property portfolio consisting of 1,855 affordable housing residential rental units. Calgary Housing Company is also the property manager for 2,223 affordable housing units owned by the City of Calgary that are managed by the Calgary Housing business unit. Calgary Housing Company is responsible for performing asset management and maintenance services for all Calgary Housing Company and City-owned units.

The current ownership model is under review by the City Audit Committee's Wholly Owned Subsidiary Review. Calgary Housing Company has received board approval to defer the development of an asset management plan pending the outcome of the review.

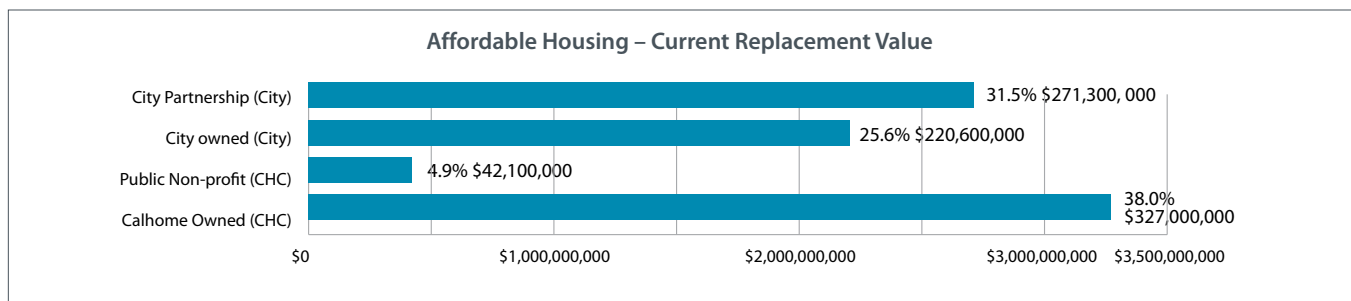
Calgary Housing Company identified aging assets as one of its critical risks. As a result, Calgary Housing Company initiated a program to improve its asset management practices to better balance costs, opportunities and risks and ensure the preservation of the assets it manages.

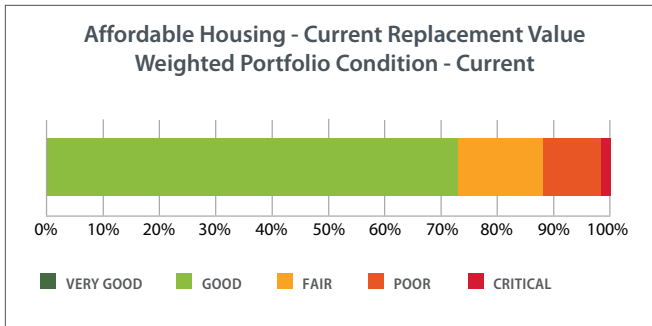
In 2022, the average Calgary Housing Company managed unit is more than 40 years old. The aging infrastructure emphasizes the need for a robust asset management program.



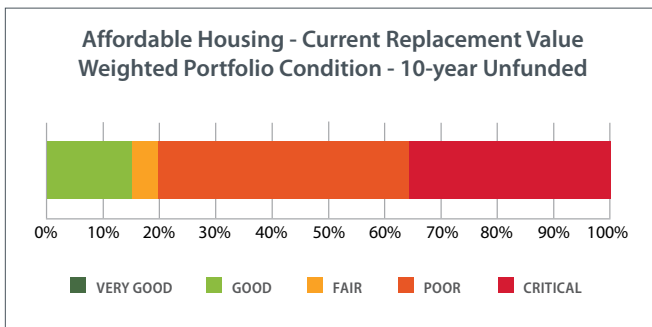
Current Replacement Value

The current replacement value for the Affordable Housing service line is \$861M. The replacement cost of buildings owned by Calgary Housing Company is currently estimated at \$369.1 million. For City-owned properties the replacement cost is \$491.9 million.





2020 Physical Condition – Current (Calgary Housing Company and City owned properties)



2030 Physical Condition – 10-year Unfunded (Calgary Housing Company and City owned properties)

Condition information is currently being updated. The information below is taken from the 2020 Infrastructure Status Report. At the time of the 2020 Infrastructure Status Report submission, Affordable Housing infrastructure was overall in Good condition. A large percentage of Affordable Housing infrastructure is over 50 years old and the level of investment over the next 10 years is important for the longevity of its service life. Condition data is represented in the graphs and table below. Investment has been made during the 2019-2022 business cycle for repair, for new builds and to create asset management plans to understand asset conditions, prioritize investment and to seek out strategic funding opportunities. One such investment opportunity is the \$15M in 2021 Municipal Stimulus Plan funding. This will reduce the 10-year funding gap. The table below shows the impact on facility condition if no additional capital funding is received.

Condition	1 Year	10 Year
Good	73%	15%
Fair	16%	5%
Poor	10%	44%
Very Poor	1%	36%

Percentage of properties by condition rating

The current facility condition index for Calgary Housing Company-owned properties indicates that over 70 per cent of the properties are rated as being in Good condition. This is reflective of properties that have been well maintained from an operational and capital maintenance perspective. The average Calgary Housing Company owned property is 43 years of age with many properties approaching the end of their economical lives. Accelerated investments are required to turn the declining condition curve and maintain acceptable condition levels.

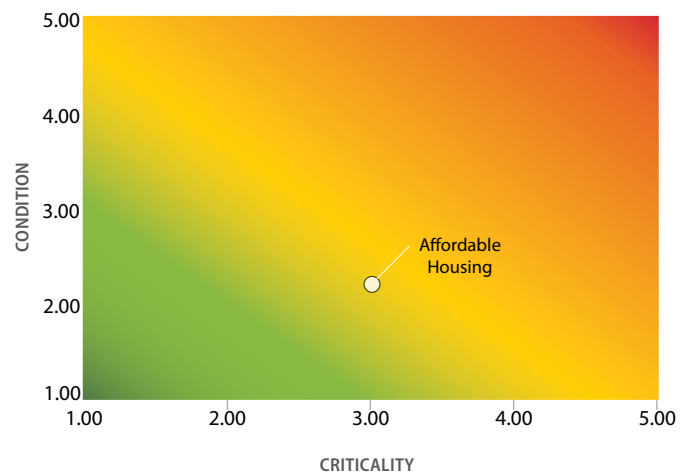
The current facility condition index for City-owned properties indicates that many of the properties are rated as being in a good condition while some properties are trending towards a fair to poor condition rating. Aging properties in the City-owned portfolio reflects a wider distribution across the facility condition index categories. The data indicates that properties have been well maintained from an operational and capital maintenance perspective given historical provincial investment levels in the City-owned portfolio. The average property age in the City-owned portfolio is 50 years while the average property age in the City Partnership portfolio is 19 years. Many properties within the City-owned portfolio are approaching the end of their economical lives within the next decade. Accelerated investments are required to maintain acceptable condition levels.

Asset Criticality and Risk

One of Calgary Housing Company's greatest risk is aging assets. Without proper levels of investment assets will continue to deteriorate resulting in escalating maintenance costs which are anticipated to significantly impact financial sustainability.

Calgary Housing Company introduced a new risk framework in 2021. Asset class specific data will be updated after the 2021-2023 building condition assessment cycle.

At the time of the CAMP the risk rating for Affordable Housing was rated at 7.2 out of 25.



Note: Criticality is estimated at this point in Calgary Housing Company's current asset management maturity.

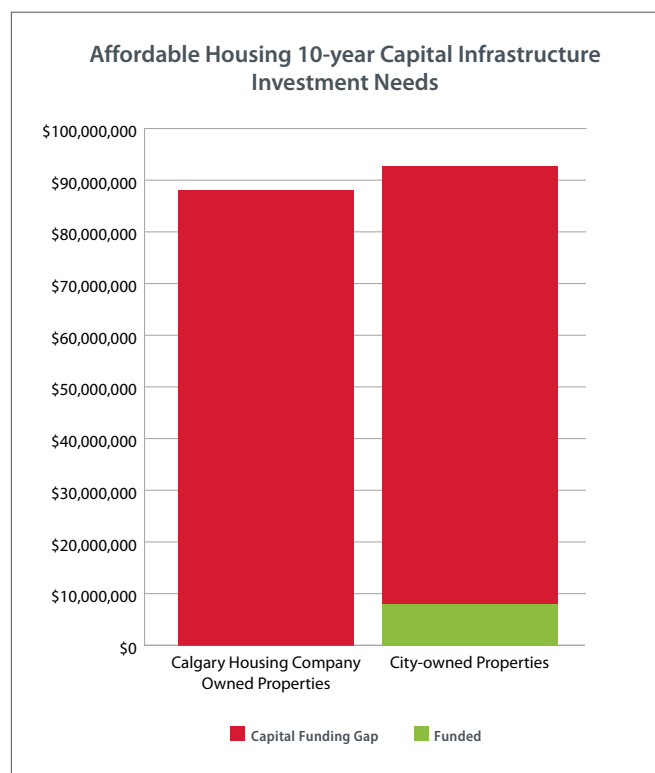
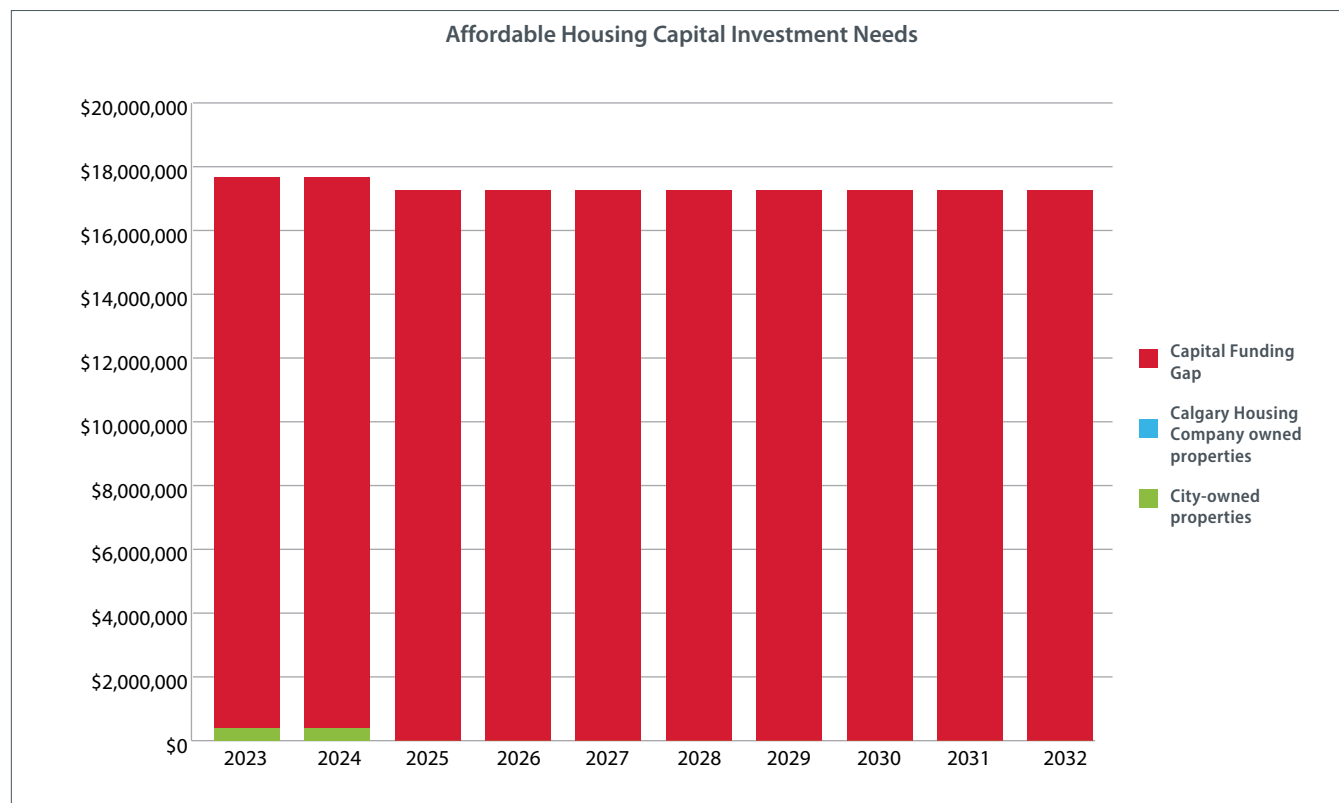
Customer Levels of Service

Calgary Housing Company introduced a new level of service framework in 2021. An assessment methodology has been developed to measure the Customer Level of Service. Property assessments are scheduled for 2022-2023. Data is currently unavailable.

Technical Level of Service

Calgary Housing Company introduced a new level of service framework in 2021. Data will be updated after the 2021-2023 building condition assessment cycle.

Infrastructure Investment Needs



Calgary Housing has identified a \$172.7M 10-year funding gap. The gap is almost evenly distributed between Calgary Housing Company-owned and City-owned properties. If this gap is not addressed the Affordable Housing service line will continue to see a decline in the overall condition of the portfolio as facilities continue to age. To-date Calgary Housing has only secured \$8M in funding for City-owned properties spread over 2023 and 2024.

Ownership	10-year Investment Need	10-year Funding Gap
Calgary Housing Company owned properties	\$ 88.1M Reduced by \$ 68.6M from the 2020 corporate Infrastructure Status Report submission due to implementation of Technical Level of Service Targets	\$ 88.1M
City-owned properties	\$ 92.6M Reduced by \$ 24.9M from the 2020 corporate Infrastructure Status Report submission due to implementation of Technical Level of Service Targets	\$ 84.6M
Total	\$ 180.7M	\$ 172.7M

Future Condition of Infrastructure

Based on the current 10-year funding gap, asset condition is trending downward.

Asset Category	Condition Trend
Affordable Housing	↓

Status of Asset Management and plans for improvement

Calgary Housing Company has received board approval to defer the development of an asset management plan pending the wholly owned subsidiary review.


Specific Climate Change Targets and Investments

Calgary Housing Company units are not on The City’s utility contract and are not currently included in corporate energy and greenhouse gas reporting because consumption and emissions are attributed to the occupants and not the Affordable Housing service line. However, as lifecycle replacements are planned with available funding for electrical, mechanical and building envelope systems, Calgary Housing Company is planning to mitigate climate impacts by reducing greenhouse gas emissions through system upgrades to more energy efficient options instead of replacing like-for-like. This will help ensure Calgary Housing Company’s properties are adapting and increasing climate resiliency as systems come to the end of life and require replacement. Households that spend 6 per cent or more of their after-tax income on utility costs are experiencing energy poverty. Many of Calgary Housing Company’s tenants fall into this category, and energy efficiency improvements by Calgary Housing Company can directly benefit tenants by helping reduce their utility bills to get them out of energy poverty.





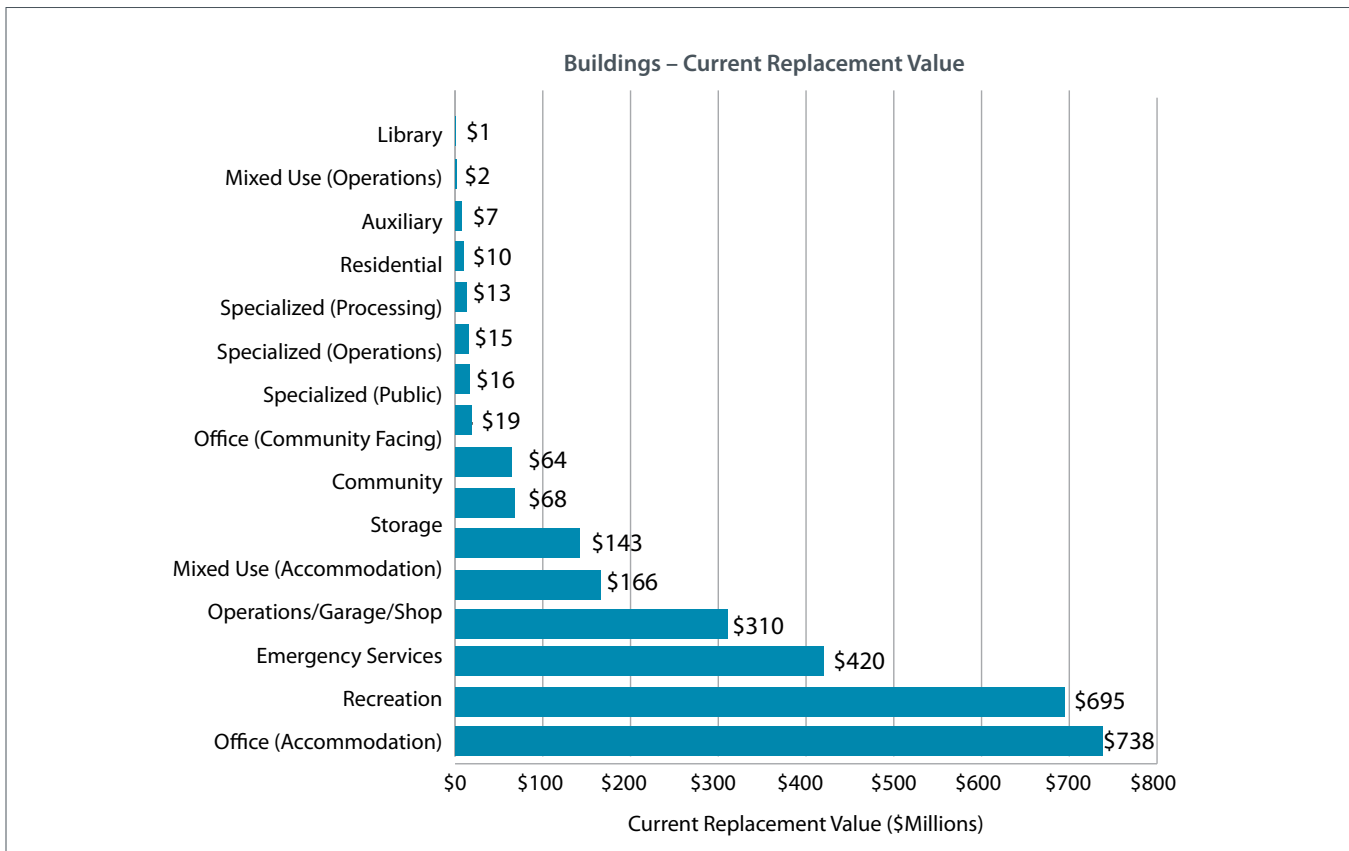
4.3 Buildings

Current Replacement Value	Overall Condition ¹	Condition Trend	Risk
\$2.686B	3 / 5		8.4 / 25
Proposed 10-year Funding			
Current: \$1B		Gap: \$1.973B	

Statement of service

The Facility Management (FM) service line and business unit plans, builds and operates most of the City’s building infrastructure assets. Facility Management is responsible for centralized lifecycle planning including building operations and maintenance along with integrated civic planning.

Current Replacement Value

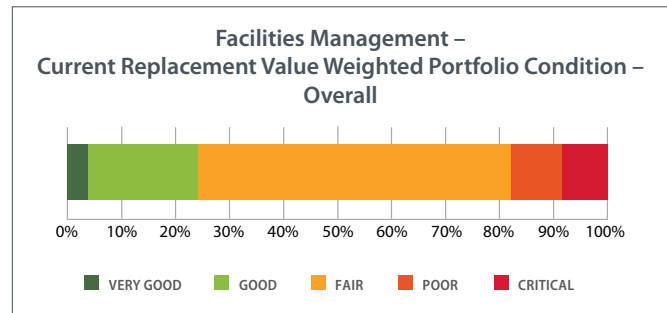


Note: The building assets above are only for the buildings managed by the Facility Management business unit. Other service lines also have buildings under their portfolio.

The total current replacement value (CRV) for the Buildings asset class is \$2.686B. Facility Management is responsible for the building assets for 54 service lines. The distribution between the simplified asset classes is shown in the above graph. This represents 2.7 per cent of The City’s total asset replacement value. This has risen by approximately \$1.727B since the 2017 CAMP (Corporate Asset Management Plan). The primary reason for this significant rise is the result of the Executive Leadership Team’s mandated Corporate Coordinated Operations and Maintenance (CCOM) program which moved entire building portfolios from other business units to Facility Management’s portfolio.

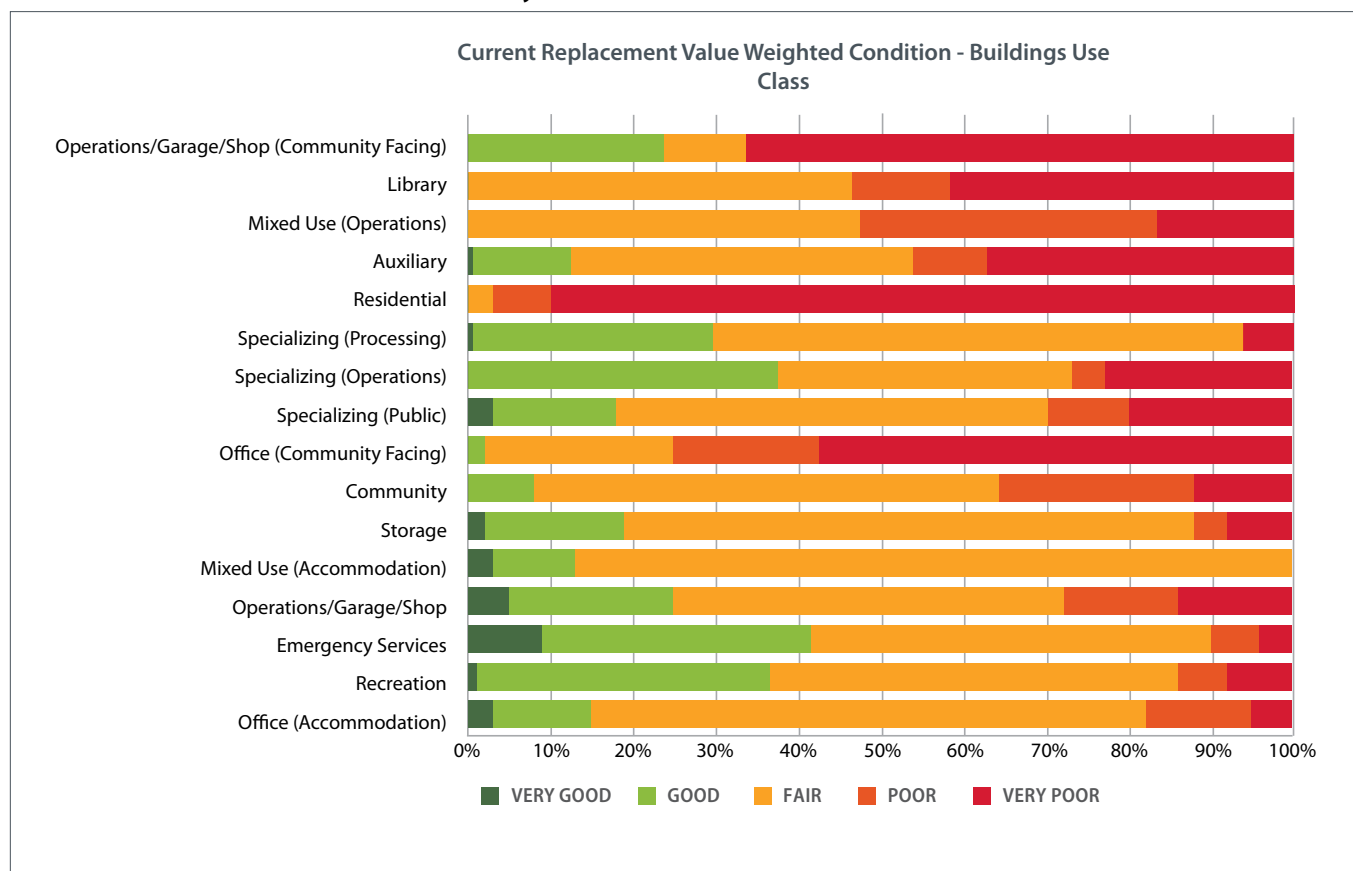
Current Condition of Infrastructure

The overall condition profile for Building assets is provided below:



*Note: condition distributions are only for assets with condition information available (90% of the portfolio)

These Assets Are Further Broken Down by Use Class



Note: condition distributions are only for assets with condition information available

The portion of building assets in Poor to Critical condition amounts to \$422M. A further \$1.4B are in fair condition and will require attention and planning as the assets continue to deteriorate. The Buildings use classes with the largest portfolio percentages in Poor to Critical condition are:

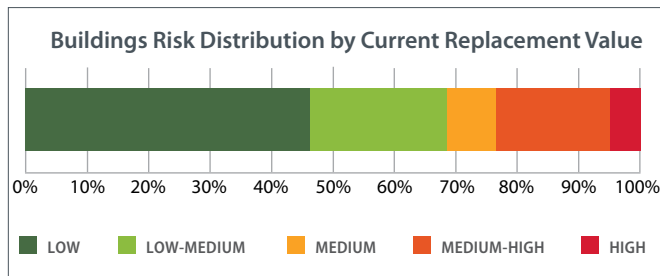
- Residential – 97%
- Office (Community Facing) – 76%
- Operations/Garage/Shop (Community Facing) – 67%
- Library – 53%
- Mixed Use (Operations) – 53%
- Auxiliary – 46%
- Community – 36%

Note that although the residential use class shows 97 per cent in Poor to Critical condition there is only one building in the portfolio, and this building will require extensive renovation before it is occupiable.

Facility Management meets regularly with the service lines they support to discuss building status, plan projects and mitigate risk to help ensure building conditions are maintained to a satisfactory level.

Asset Criticality and Risk

The overall risk distribution for building assets is provided below:



Note: risk ratings only include building assets with risk information available

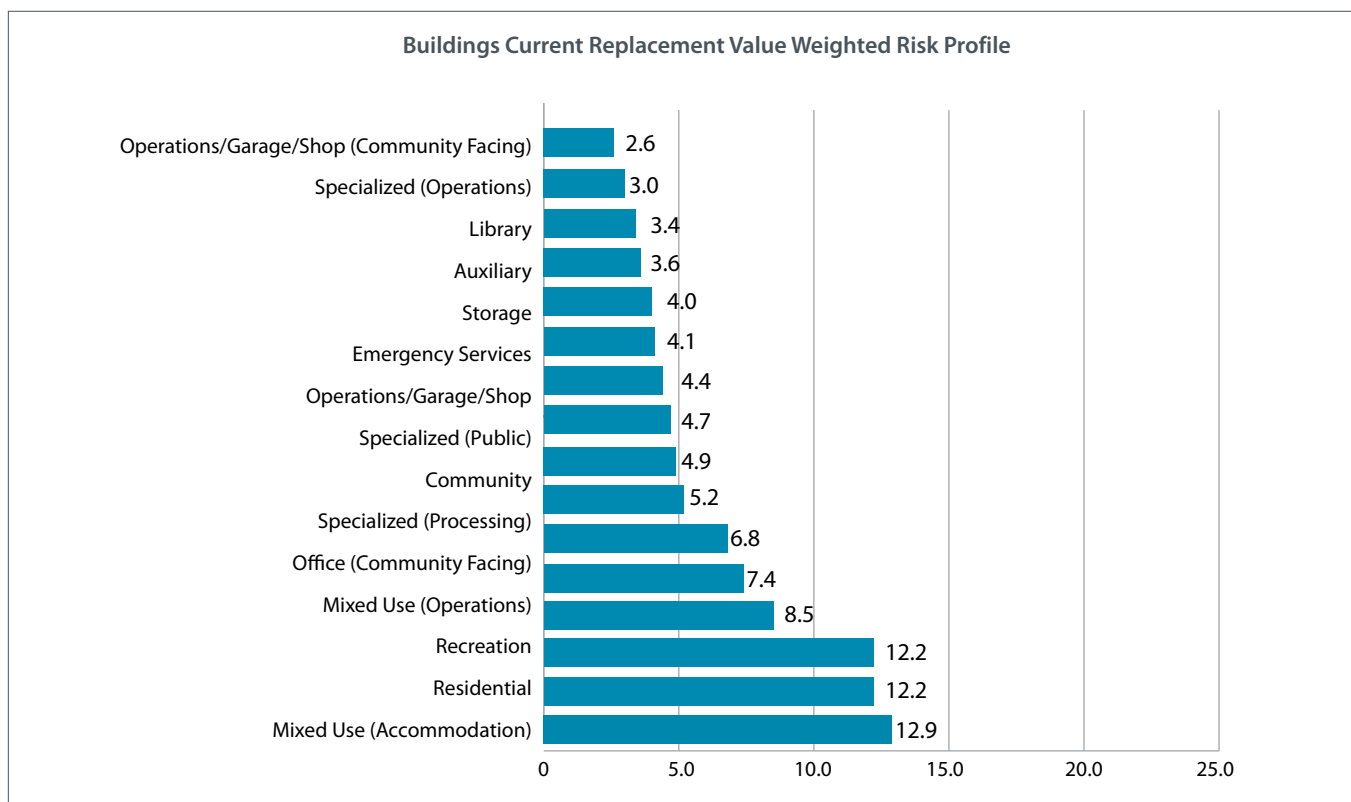
Facility Management has defined risk slightly different from other service lines and business units. Rather than using the product of a criticality and condition rating, assets have been classified as falling into one of five risk categories. Facility Management’s risk classification has been translated to the 25-point rating scheme consistent with what’s used by the other service lines throughout this report so that risk can be considered and applied consistently throughout the CAMP.

A summary table explaining the risk conversion is provided below.

Facility Management Risk Category	Low Risk	Low-Medium Risk	Medium Risk	Medium-High Risk	High Risk
Translation to 25-Point Risk Classification	2.5/25	7.5/25	12.5/25	17.5/25	22.5/25

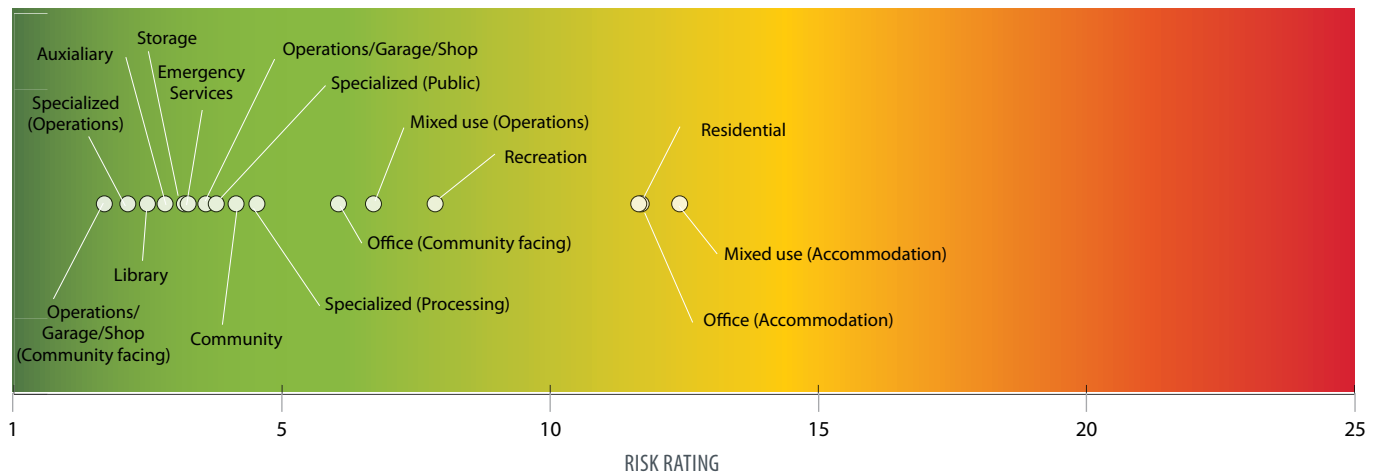


Overall risk ratings for each building service line provided below:



Note risk ratings only include building assets with risk information available

Buildings – Risk Distribution



Facility Management has identified several risks that can potentially impact customer service:

- Aging infrastructure and the current age of the portfolio.
- Unplanned shutdowns
- Programming challenges.
- Budget constraints.
- Building inheritance from third parties with unknown condition information available.

Various risk mitigation methods are currently being discussed. Some of these include:

- A more extensive large scale investment strategy, opposed to smaller life-cycle projects.
- Reducing the overall size of the portfolio (selling off assets, centralizing resources, etc.).
- Evaluating trade-offs and determining priority areas for investment.
- Increased building assessment work for electrical assets.
- Early identification of critical risk elements.

Customer Levels of Service

Buildings

Safety and reliability: plan, build and operate civic facilities creating safe and reliable spaces that enrich citizen quality of life and enable City of Calgary service owners to focus on their service delivery to citizens.

Facility Management is an enabling service that works closely with their customers to better understand their ever-evolving needs. This is completed through active engagement including monthly meetings with customers. Facility Management also utilizes the corporate facility portfolio plan for decision making and investment planning.

Technical Level of Service

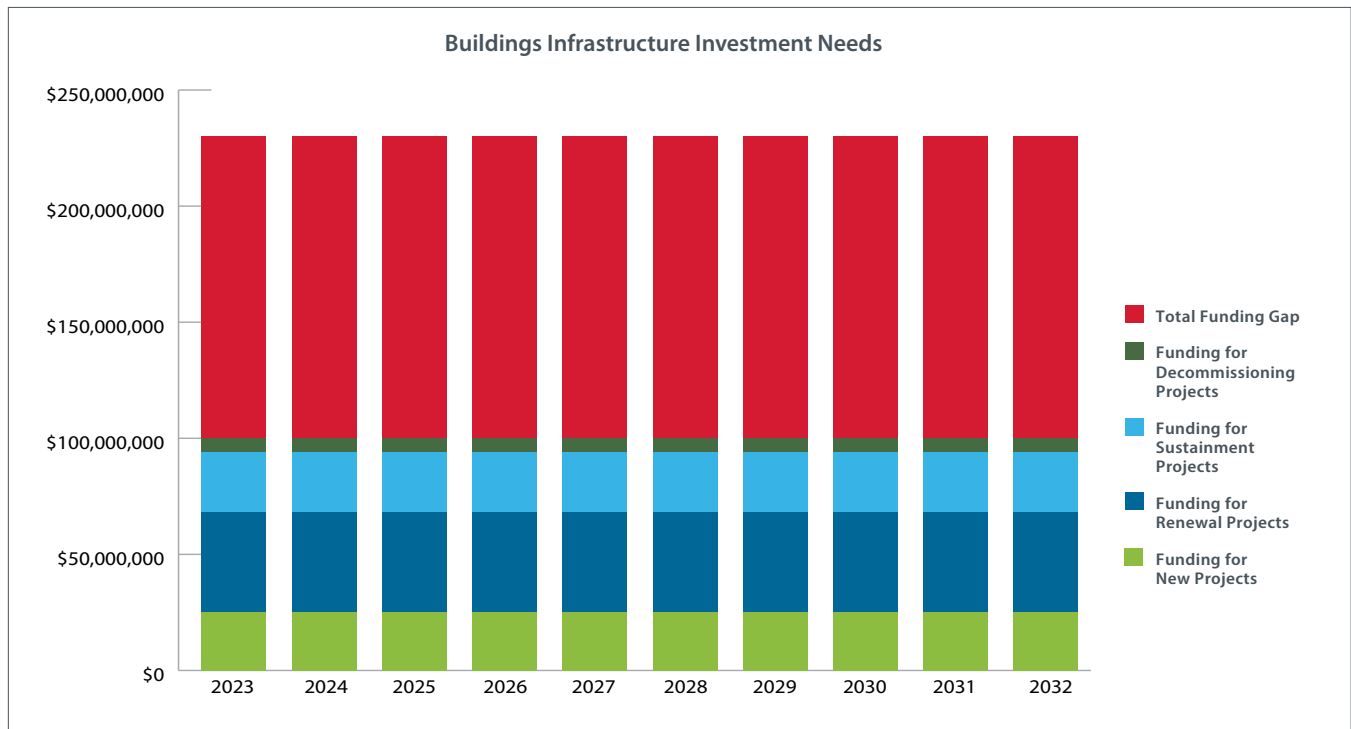
	Service Target Status
Buildings	

Facility Management has defined the current and 10 year projected Levels of Service achievement rates by assuming any building that has not been constructed or renovated within the past 20 years will not meet required Levels of Service. The portfolio level summary is provided below:

Year	% of Total Current Replacement Value of Buildings Meeting Levels of Service Standard (built or renovated in the last 20 years)
2022	27%
2032	33%



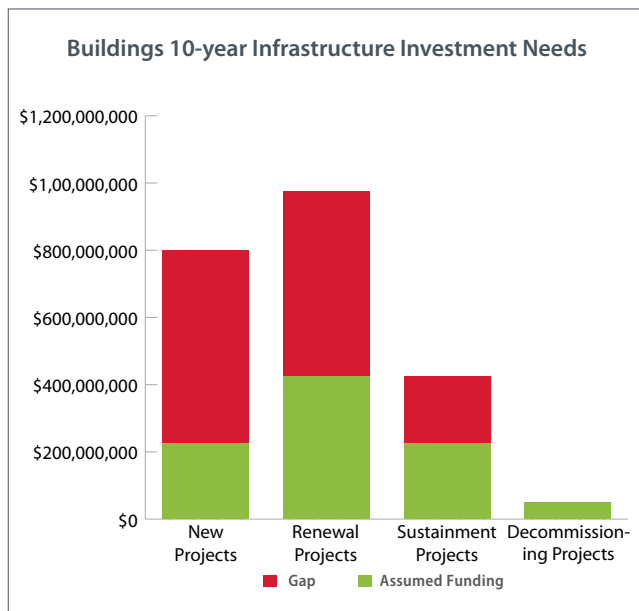
Infrastructure Investment Needs



Assumption: Budgetary information is unavailable past the current budget cycle (2026). Budgetary requirements have been assumed to be equivalent from 2027-2032. Funding gap data was pulled from the 2020 Infrastructure Status Report.

The infrastructure investment needs for Buildings along with the corresponding funding gap is shown in the graph above. Facility Management has split funding into four pools. New, renewal, sustainment, and decommissioning projects.

As seen in the graph below, large funding gaps have been identified for new and renewal projects. This large gap could result in decreases to level of service and could increase risk for the buildings service line.



Assumption: Budgetary information is unavailable past the current budget cycle (2026). Budgetary requirements have been assumed to be equivalent from 2027-2032. Funding gap data was pulled from the 2020 Infrastructure Status Report.

Primary drivers for investment in Buildings include the following priorities:

- Investing in the current portfolio of facilities to ensure civic facilities are safe, accessible, efficient, resilient, and sustainable.
- Accommodation of growth for different services (i.e. Corporate Coordinated Operations & Maintenance (COMP)).
- Balancing maintenance requirements and risk.

Future Condition of Infrastructure

Based on projections for the next budget cycle, the trending condition for buildings is shown below.

Asset Category	Condition Trend
Buildings	↓

With \$1B in planned funding over the next 10 years, the Facility Management business unit is still anticipating a gradual decline in overall portfolio condition. Deferred maintenance is likely going to increase reducing building condition. Facility Management will be managing the most critical issues and looking to maintain assets in manageable condition. There are currently many unknown variables with The City's Building portfolio such as the future of workspaces, the corporate realignment and evaluating alternative methods to provide facility space. Opportunities to reduce the overall size of the buildings portfolio are being evaluated.



Specific Climate Change Targets and Investments

29,525 tonnes of CO _{2e}	6.2% of City of Calgary emissions	2020 energy costs: \$16.6M
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*emissions are based on data set most recently available (2020)

Facility Management is currently collaborating with The City's climate team to develop a program to better align Facility Management operations and planning with climate change mitigation and adaptation. Climate change mitigation assessments are planned to evaluate how resilient different buildings are and how they can be improved. Climate change mitigation "Screening" is completed through the building condition assessment program, with a second level of more rigorous assessment for prioritized buildings. Energy audits are also completed to help reduce emissions and improve energy efficiency.

Climate change is also addressed by means of The City's Sustainable Building Policy. Within this policy there are a number of climate related requirements such as energy objectives, solar photovoltaic and electrical vehicle rough-in requirements, limits and bans on ozone depletion potentials and global warming potentials for refrigerants, stormwater management requirements, indoor water use limits and more.

Status of Asset Management and Plans for Improvement

Facility Management is planning to improve and create a more consistent Asset Management program through the entire building portfolio, including improving the overall Asset Management maturity of the total portfolio. This will be a significant undertaking, especially with the recently rolled out Corporate Coordinated Operations and Maintenance program. Facility Management will also work to improve the maturity of its risk framework and look to better align Levels of Service with facility planning.



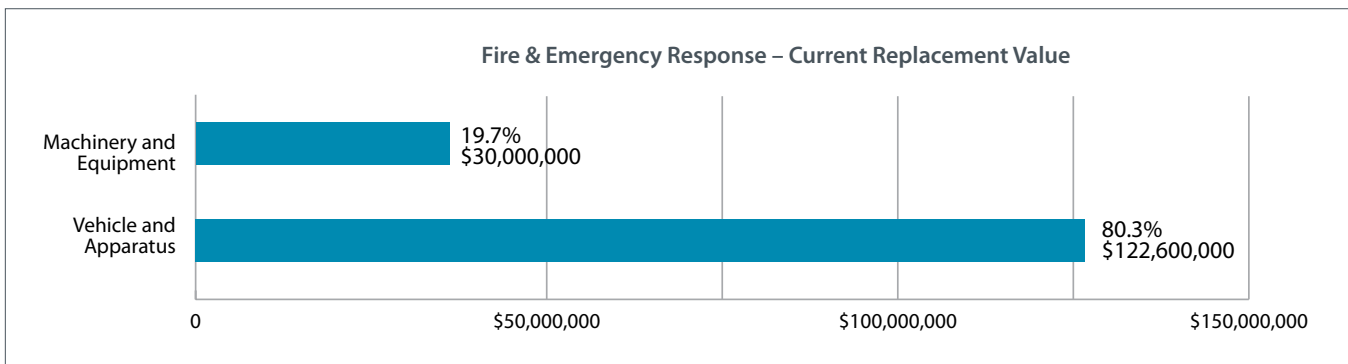
4.4 Fire & Emergency Response

Current Replacement Value	Overall Condition	Condition Trend	Risk
\$153M	2.7 / 5		11.9 / 25
Proposed 10-year Budget			
Current: \$119.1M		Gap: \$306M	

Statement of service

Fire & Emergency Response services include response to fires, emergency medical incidents, chemical and hazardous materials releases, and motor vehicle collisions. In addition, this service line provides specialized rescue services in high or collapsed structures, confined spaces, on our waterways or in situations caused by weather events.

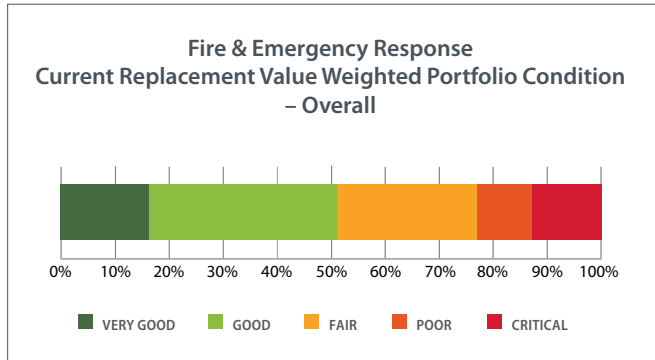
Current Replacement Value



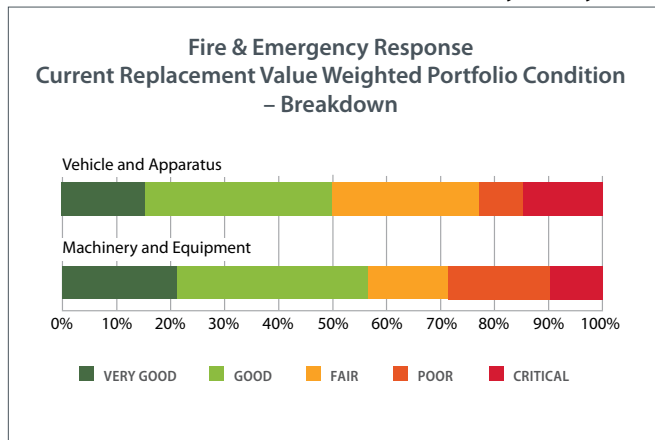
The total current replacement value (CRV) for Fire & Emergency Response assets is \$152.6M and the distribution between the different asset sub systems is shown in the above graph. The 2022 CAMP (Corporate Asset Management Plan) has moved Fire Stations from the Fire & Emergency Response service line into the Buildings category to maintain consistency with the Executive Leadership Team's mandated Corporate Coordinated Operations and Maintenance (CCOM) program. The current replacement value represents 0.2 per cent of The City's total asset replacement value.

Current Condition of Infrastructure

The overall condition profile for Fire & Emergency Response assets is provided below:



These assets are further broken down by subsystem



Fire & Emergency Response assets play a significant role in ensuring the safety and well-being of Calgarians and emergency responders. Asset failure can result in serious injury or loss of life. With 24 per cent of Fire & Emergency Response assets in Poor to Critical condition and 25 per cent in Fair condition, it is important to ensure this asset class is well funded to improve condition where needed and plan for deterioration of the asset class. Based on anticipated funding, the overall condition of the service line is expected to remain consistent.

Asset components of concern include:

Machinery and Equipment

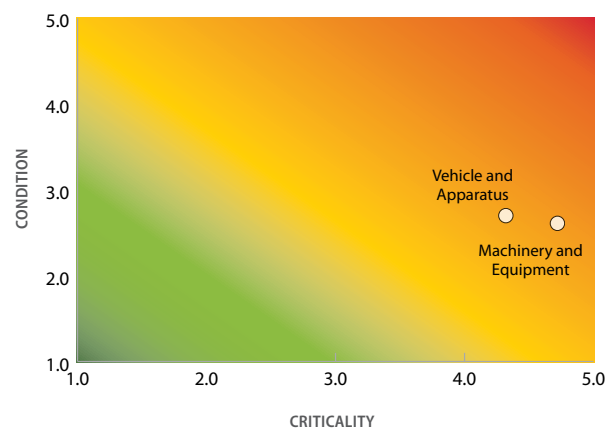
	Assets in Poor to Critical Condition	Current replacement value of Poor to Critical Assets (Millions)
Technical Rescue Equipment	66.0%	\$ 2,289,694.47
Aquatic Personal Protective Equipment	59.0%	\$ 531,774.10
Fire Personal Protective Equipment	24.0%	\$ 4,174,052.88
Total		\$ 6,995,521.46

Vehicles and Apparatus

Asset Component	Assets in Poor to Critical Condition	Current replacement value of Poor to Critical Assets (Millions)	Asset Count in Poor to Critical Condition
Aerial	100.0%	\$5.4	3
Car	76.0%	\$0.6	24
Quint	38.0%	\$8.9	5
Hazmat	40.0%	\$1.6	2
Railrat	100.0%	\$0.1	1
Rescue	59.0%	\$5.8	6
Sport Utility Vehicle	80.0%	\$0.5	8
Tanker	100.0%	\$1.7	2
Truck	56.0%	\$0.2	3
Air/Light	100.0%	\$0.5	1
Hazmat Van	33.0%	\$0.1	1
Van	79.0%	\$0.4	12
Technical Rescue Team	50.0%	\$1.0	2
Bush Buggy	28.0%	\$0.3	2
Parkade	100.0%	\$0.2	1
Chief Cars	50.0%	\$0.2	3
Panel	50.0%	\$0.1	1
Sweepers	100.0%	\$0.1	2
Total		\$27.6	

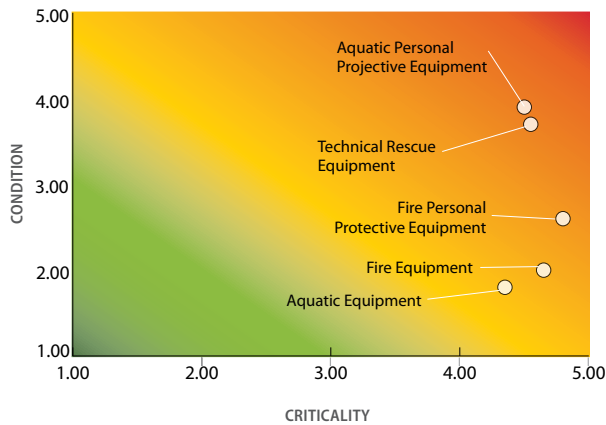
Asset Criticality and Risk

The overall criticality for Fire & Emergency Response assets is shown below:

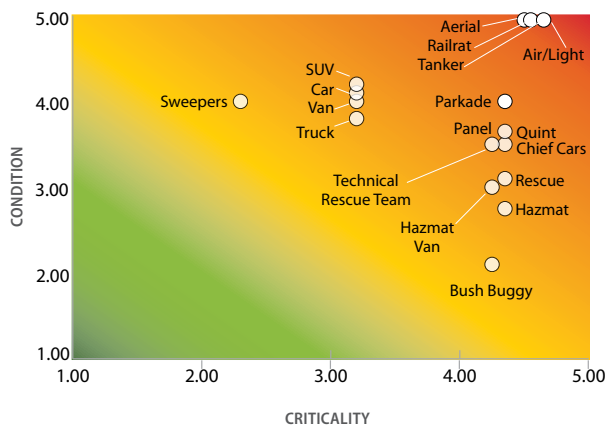


Criticality for Machinery and Equipment components, and the Vehicles and Apparatus subsystems are shown below. There are a significant number of high criticality items across these subsystems that will require significant investment in the future.

Machinery and Equipment



Vehicle and Apparatus



Other identified risks include new community growth in greenfield areas that are located outside the Council approved 7-minute response time target. These areas pose risks to the well-being and safety of citizens/property during fire and critical medical situations. Additional growth and density in established areas of the city may also present an increase in call volumes.

The Calgary Fire Department (CFD) business unit manages and mitigates these risks by analyzing growth patterns, evaluating new community business cases, anticipating new/additional vehicles & apparatus, and projecting where and when a future fire station is needed to provide adequate and effective levels of service.

Calgary Fire Department’s vehicle & equipment target is to always have an available apparatus in station ready to respond to emergencies.

Customer Levels of Service

Machinery and Equipment

Safety and reliability: Always have the correct equipment and Personal Protective Equipment available for responses and training.

Vehicles

Safety and reliability: Always have an available apparatus in station ready to respond to emergencies.

The Fall 2021 bi-annual quality of life and citizen satisfaction survey found citizens rated the importance of Fire & Emergency Response services at 100 per cent, and satisfaction with the services provided at 99 per cent. In addition, when asked if The City should invest more, less or the same in the Calgary Fire Department, 99 per cent of Calgarians said to invest more or the same. This feedback affirms the importance of the Fire Department’s public service role, and its impact on communities and citizens.

Technical Level of Service

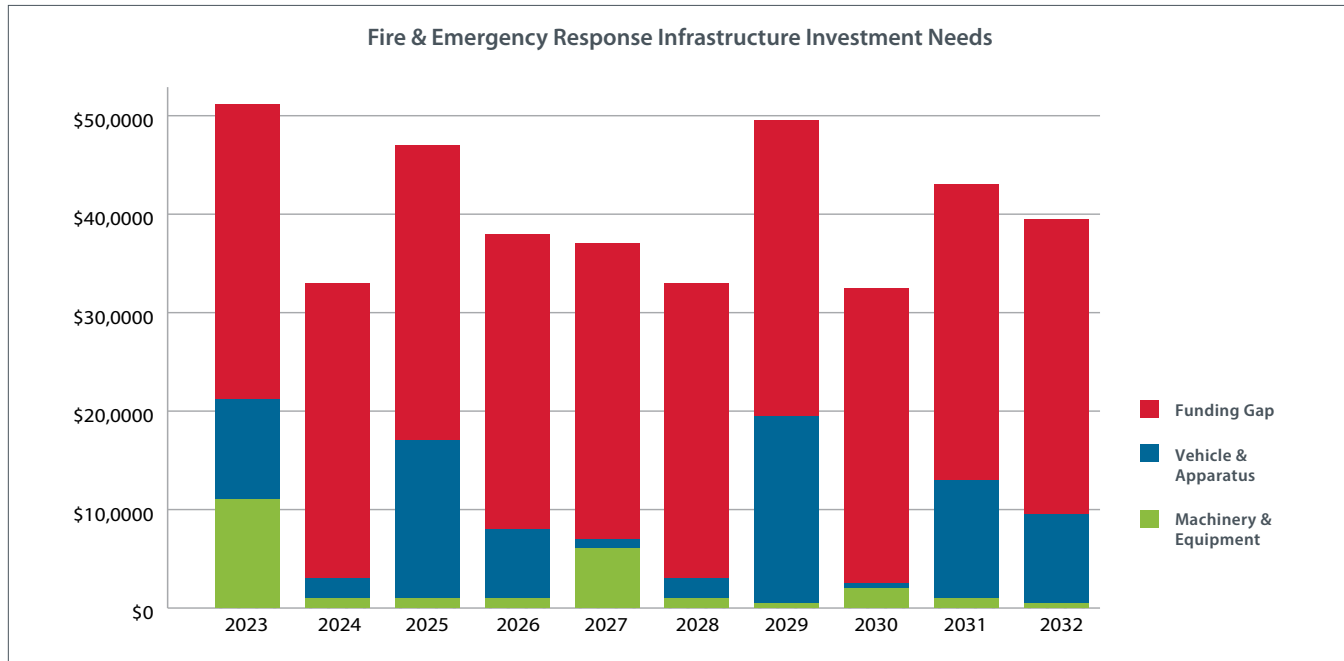
	Service Target Status
Machinery & Equipment	Met
Vehicle and Apparatus	Met

Overall Machinery and Equipment are meeting their service level objectives. A current constraint is aquatic equipment contracts that have lapsed, however, replacement contracts are being drafted.

Levels of service are maintained in the vehicle asset class by owning surplus stock to cover maintenance and damage allowing Fire to always have a unit in station covering for assigned apparatus.

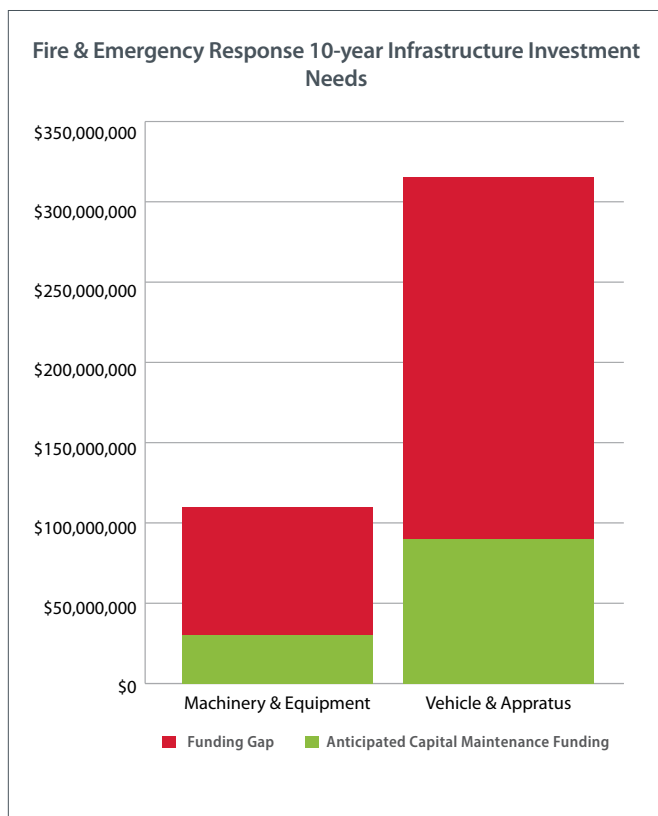


Infrastructure Investment Needs



The infrastructure investment need for Fire & Emergency Response is shown in the graph above. Infrastructure gap information was pulled from the 2020 Infrastructure Status Report for this service line.

The graph below shows the total 10-year funding requirement for Fire & Emergency Response. The funding requirement for vehicles and apparatus is roughly three times as much as that for Machinery and Equipment. Similar to the above, the infrastructure gap was pulled from the 2020 Infrastructure Status Report.



Identified priorities and considerations for investment decisions include:

- Community growth and density.
- Risk management and mitigation.
- Maintaining efficient and acceptable levels of service.

Future Condition of Infrastructure

Based on the investment required to meet proposed service targets, the trending condition for each asset category is shown below.

Asset Category	Condition Trend
Machinery & Equipment	↔
Vehicles	↔

Specific Climate Change Targets and Investments

2,386 tonnes of CO _{2e}	0.5% of City of Calgary emissions	2020 energy costs: \$836K
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*emissions are based on data set most recently available (2020).
*emissions and \$ include consumption from fire stations which are now under the "buildings" service line as part of the Corporate Coordinated Operations and Maintenance program.

Calgary Fire Department has discussed including climate adaptation measures to fleet vehicles internally (i.e. use of electric vehicles in the future). Many Calgary Fire Department climate initiatives have been completed on the fire stations themselves which are now under the Buildings service line as part of the earlier mentioned Corporate Coordinated Operations and Maintenance program.

Status of Asset Management and Plans for Improvement

Calgary Fire Department will continue to improve Asset Management maturity. Details on this plan are under development.



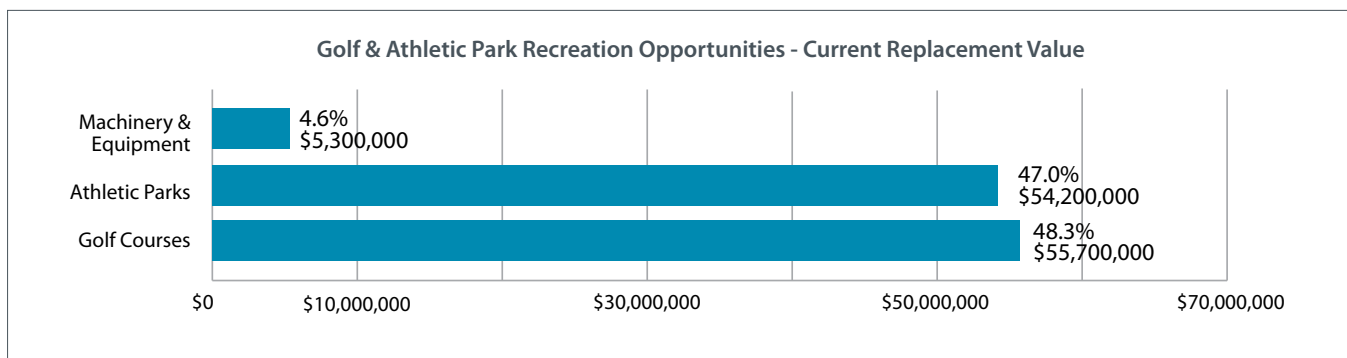
4.5 Golf & Athletic Park Recreation Opportunities

Current Replacement Value	Overall Condition	Condition Trend	Risk
\$115.3M	3.0 / 5		9.2 / 25
10-year Funding			
Anticipated Funding: \$52.5M		Gap: \$200.5M	

Statement of service

Calgary's Golf and Athletic Park Recreation Opportunities service line creates vibrant communities and inspires people to be active and healthy by leading and investing in Calgary's recreation sector. The service line provides opportunities for citizens to participate in a variety of recreation, sport and leisure activities through programs, drop-in activities, rentals and bookings at City and Partner-operated facilities.

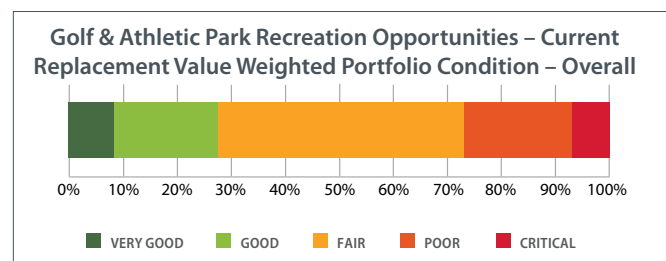
Current Replacement Value



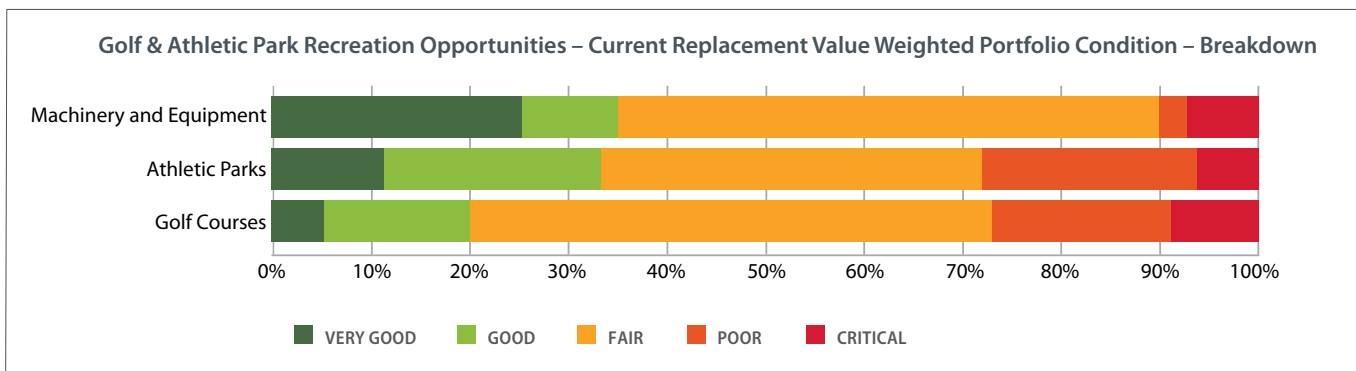
The total current replacement value (CRV) for Golf & Athletic Park Recreation Opportunities assets is \$115.3M and the distribution between the different asset classes is shown in the above graph. This represents 0.1 per cent of The City's total asset replacement value. The 2022 CAMP (Corporate Asset Management Plan) has moved Recreation's building assets from the Golf & Athletic Park Recreation Opportunities service line into the Buildings service line to maintain consistency with the Executive Leadership Team's mandated Corporate Coordinated Operations and Maintenance (CCOM) program.

Current Condition of Infrastructure

The overall condition profile for Golf & Athletic Park Recreation Opportunities assets (excluding buildings) is provided below:



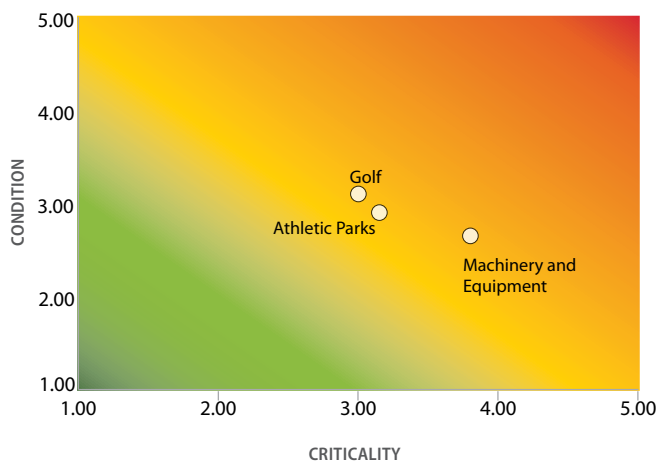
These Assets are Further Broken Down by Subsystem



73 per cent of Recreation Opportunities assets are in Fair or better condition. 27 per cent are in Poor or Critical condition representing \$31.1M in current replacement value. The bulk of this value is in Golf Courses (27 per cent of total current replacement value) and Athletic Parks (28 per cent of total current replacement value). A breakdown of the assets with the largest current replacement value in Poor and Critical condition for golf courses and athletic park sub systems is provided below:

- Golf Courses – \$15.0M
- Athletic Parks – Ball Diamonds – \$5.7M
- Athletic Parks – Rectangular sports fields (natural turf) – \$4.3M
- Athletic Parks – Track and Athletics – \$3.0M

Asset Criticality and Risk



The risk profile for Golf & Athletic Park Recreation Opportunities assets is provided above.

Recreation has identified irrigation assets in Athletic Parks and Golf Courses as a key risk due to a lag in lifecycle maintenance. This can impact the reliability of the system and result in loss of water resources, and in worst case scenario, damage the turf from lack of timely irrigation. To mitigate the risk, operations closely monitors the systems and works on break fixes with internal capabilities and augments project execution resources with help from other business units in cases of emergency.

With vertical assets transitioned to Facility Management’s portfolio under Corporate Coordinated Operations and

Maintenance, Recreation is now managing the capital lifecycle of horizontal assets at Athletic Parks and Golf courses. Recreation is in phase 1 of the Asset Management Plan (AMP) maturity level and has worked over the last 2 years to develop a comprehensive asset list and lifecycle plan. Risk management strategies were and are used to develop lifecycle planning and Asset Management Plans. The focus of risk management strategies will consider the impact of significant deferred maintenance on the reliability of service delivery, as well as a cascading effect of asset failure of of high importance or concern. Risk management will also include preparedness to deal with climate change impacts on golf courses and athletic parks.

Customer Levels of Service

Golf Courses

Accessible and affordable: committed to building an active, creative and vibrant city by offering affordable and accessible products and services to citizens, facilitating numerous city festivals and events, establishing unique partnerships with other recreation, sport, art, culture, tourism, parks and social services providers.

Athletic Parks

Accessible and affordable: committed to building an active, creative and vibrant city by offering affordable and accessible products and services to citizens, facilitating numerous city festivals and events, establishing unique partnerships with other recreation, sport, art, culture, tourism, parks and social services providers.

Machinery & Equipment

Accessible and affordable: committed to building an active, creative and vibrant city by offering affordable and accessible products and services to citizens, facilitating numerous city festivals and events, establishing unique partnerships with other recreation, sport, art, culture, tourism, parks and social services providers.

Levels of service and customer expectations are reviewed through regular surveys completed by Recreation’s operating team.

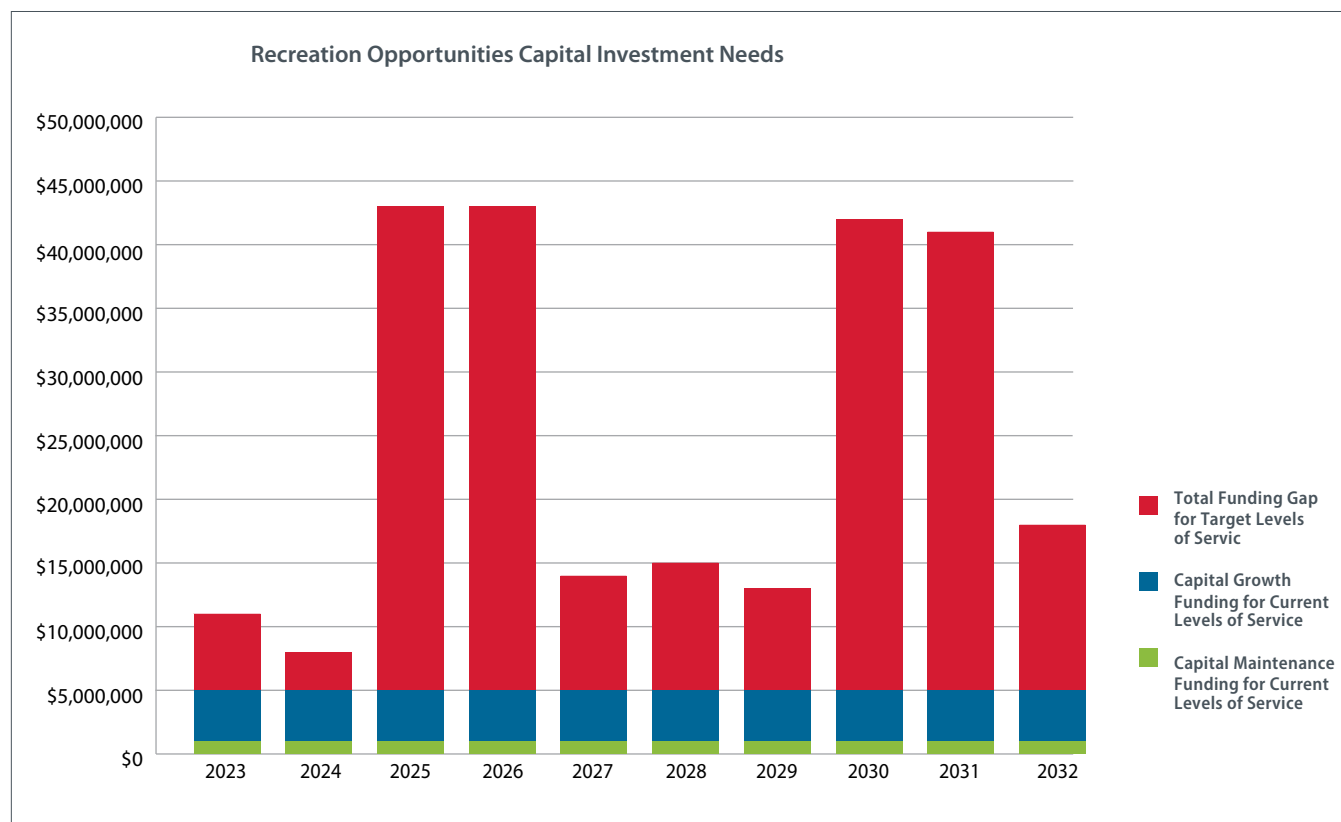
Technical level of service

	Service Target Status
Golf Courses	
Athletic Parks	
Machinery & Equipment	

Overall Levels of Service targets for the Recreation Opportunities service line are to have greater than 50 per cent of the assets in Good or Very Good condition and to have less than 5 per cent of the assets in Very Poor condition. None of the asset classes are meeting these objectives indicating that additional investment is required if these targets are to be reached.

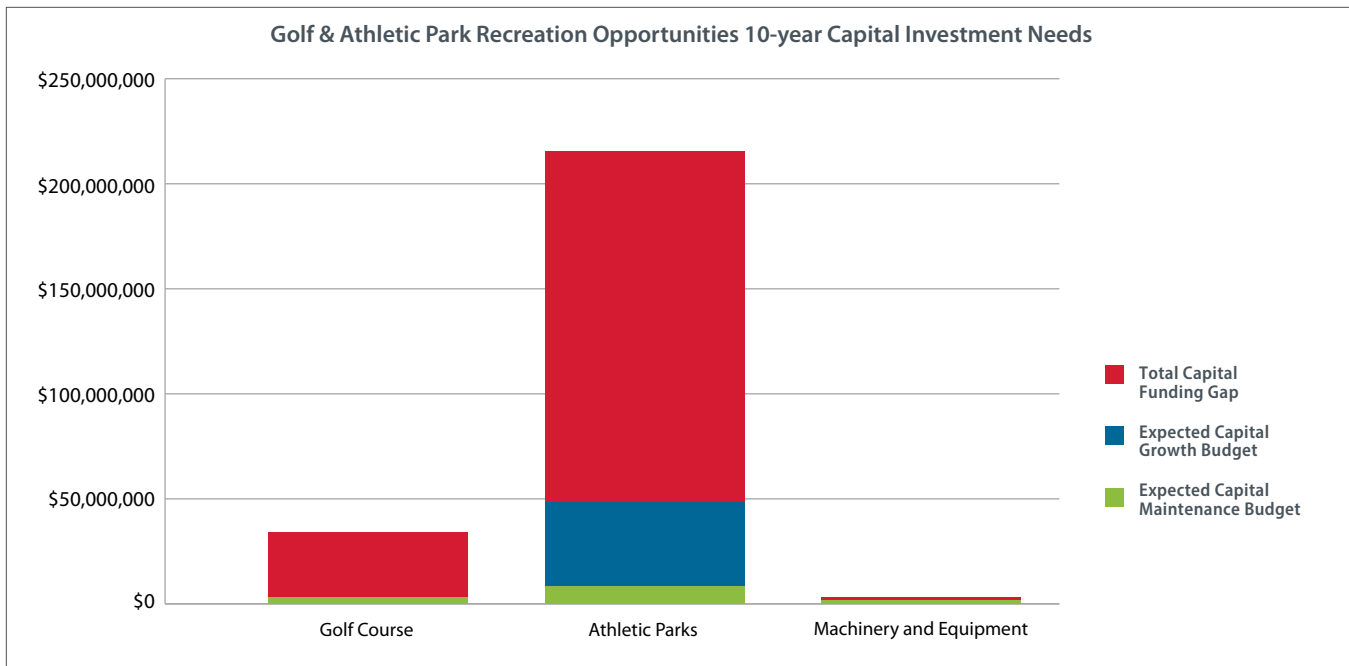


Infrastructure Investment Needs



Note: Expected funding has been averaged for the current budget cycle and has been extrapolated going forward.

The infrastructure investment need for Golf & Athletic Park Recreation Opportunities assets is shown in the graph above. The 10-year year investment need broken down by asset class is shown in the graph below. As seen in the next chart, there is a considerable infrastructure gap of \$200.5M, for Athletic Parks over the next 10 years.



Note: Expected funding has been averaged for the current budget cycle and has been extrapolated going forward.

Proposed investment for the 2023-26 business cycle is categorized into the following categories:

- **Lifecycle:** The main objective of lifecycle investment is to maintain service levels and mitigate the risk of failure.
- **Improvement:** The objective of these investments is to identify the existing facilities that are in Poor condition, require substantial lifecycle investment and are not in line with market demand. Typically, these investments have a 50-50 split between lifecycle maintenance and improvement.
- **Growth:** These investments are growth-oriented and address lack of service, typically in newly developed catchments.

Future Condition of Infrastructure

Based on the investment required to meet proposed service targets, the trending condition for each asset category is shown below.

Asset Category	Condition Trend
Golf Courses	↓
Athletic Parks	↓
Machinery & Equipment	↓

Recreation is anticipating funding levels that will lead to assets continuing to deteriorate over the next business cycle.

Specific Climate Change Targets and Investments

20,325 tonnes of CO _{2e}	4.3% of City of Calgary emissions	2020 energy costs: \$109K
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*emissions are based on most recently available data set 2020.

*emissions include consumption from Recreation Buildings which are now under the "Buildings" service line as part of the Corporate Coordinated Operations and Maintenance program. Corresponding \$ values are lower than expected because Recreation's building portfolio had been transitions to Facility Management.

Most of Recreation's climate investments have been made into the Buildings asset class which is now a part of Facility Management's portfolio under Corporate Coordinated Operations and Maintenance. For horizontal infrastructure, in the current business cycle, Recreation invested in advanced irrigation controllers at athletic parks to improve water consumption efficiency and increase the reliability, enhanced monitoring and control capabilities of the irrigation systems. These capabilities will help manage turf effectively and address hotter summer seasons in Calgary.

Climate change impacts on golf courses and athletic parks will be considered through Recreation's risk management practices.

Status of Asset Management and plans for improvement

In the current business cycle, Recreation developed a basic Asset Management Plan for the remainder of assets post Corporate Coordinated Operations and Maintenance. Recreation plans to build on these capabilities and further invest in asset condition assessments and develop an Asset Management Plan that is a closed loop with Levels of Service and risk management.



4.6 IT Solutions and Support

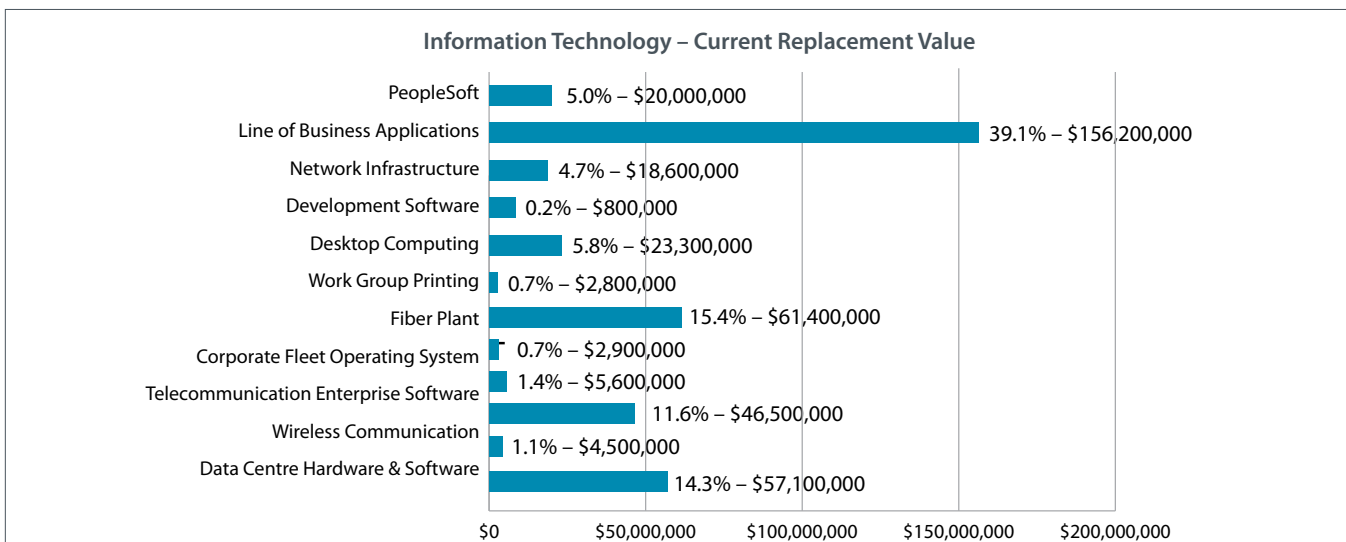


Current Replacement Value	Overall Condition	Condition Trend	Risk
\$399.7M	1.9 / 5		5.8 / 25
Proposed 10-year Budget			
Capital: \$285M Capital Gap: \$11.1M		Operating: \$472.8M Operating Gap: \$3.6M	

Statement of Service

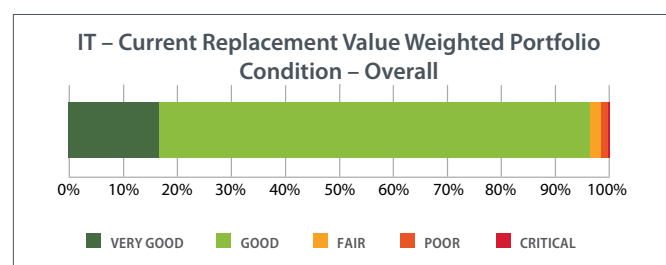
The IT Solutions and Support service line provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City. This service develops and maintains both corporate-wide and line-of-business applications and improves and automates business processes to enable City business units to deliver internal and citizen-facing services.

Current Replacement Value

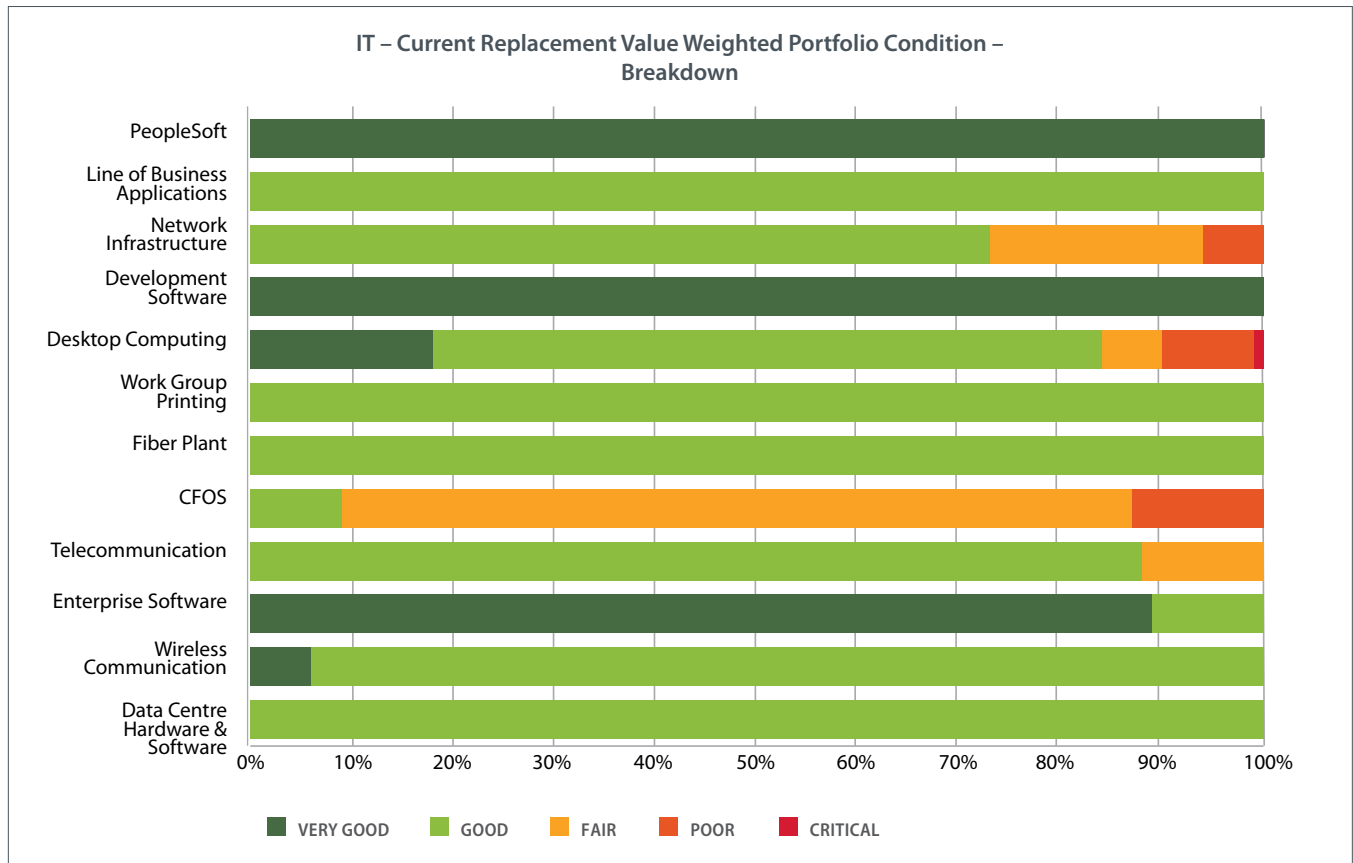


The total current replacement value (CRV) for IT Solutions and Support assets is \$399.7M and the distribution between the different asset classes is shown in the above graph. This represents 0.4 per cent of The City's total asset replacement value. The total IT current replacement value has decreased by approximately \$20.3M since the 2017 CAMP (Corporate Asset Management Plan). This decrease is attributed to improvements in asset valuation practices and inventory reporting.

Current Condition of Infrastructure



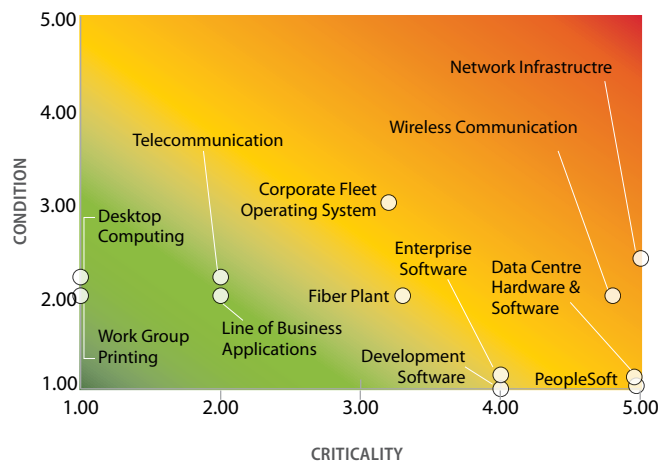
These assets are further broken down by subsystem



97 per cent of IT's infrastructure is in very good to good condition. Only 0.9 per cent is in Poor to Critical condition equalling a current replacement value of \$3.6M. Desktop computers and network infrastructure make up the majority of assets in Poor to Critical condition.

IT has utilized the Integrated Infrastructure Risk Management Framework (IIRMF) to develop a consistent, sustainable, transparent and organizationally aligned approach to identifying, evaluating and mitigating infrastructure risks. This work was used to develop the risk ratings above. The risk criteria that have been applied to all IT assets are provided below:

Asset Criticality and Risk



Risk Category	Definition
Technology	Any risk associated with an organization's capacity and sustainability of information technology. This encompasses both architecture and use of technological applications.
External	Risks to the organization that arise from outside the organization. The root cause of these risks is not internal to The City. These risks are related to trends in employment rates, social economic status, market values, political and legislation changes.
Financial	Risks related to The City's structures and processes that ensure sound management of financial resources and compliance with relevant policies and standards.
Operations	Any risk to processes or systems that will affect the City's ability to meet its objectives.

Customer Levels of Service

Data Centre Hardware & Software

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Work Group Printing

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Wireless Communication

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Desktop Computer

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Enterprise Software

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Network

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Telecommunication

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Development Software

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Corporate Fleet Operating System

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Network Infrastructure

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Fibre Plant

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.

Line of Business Applications

Safety and reliability: provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City.



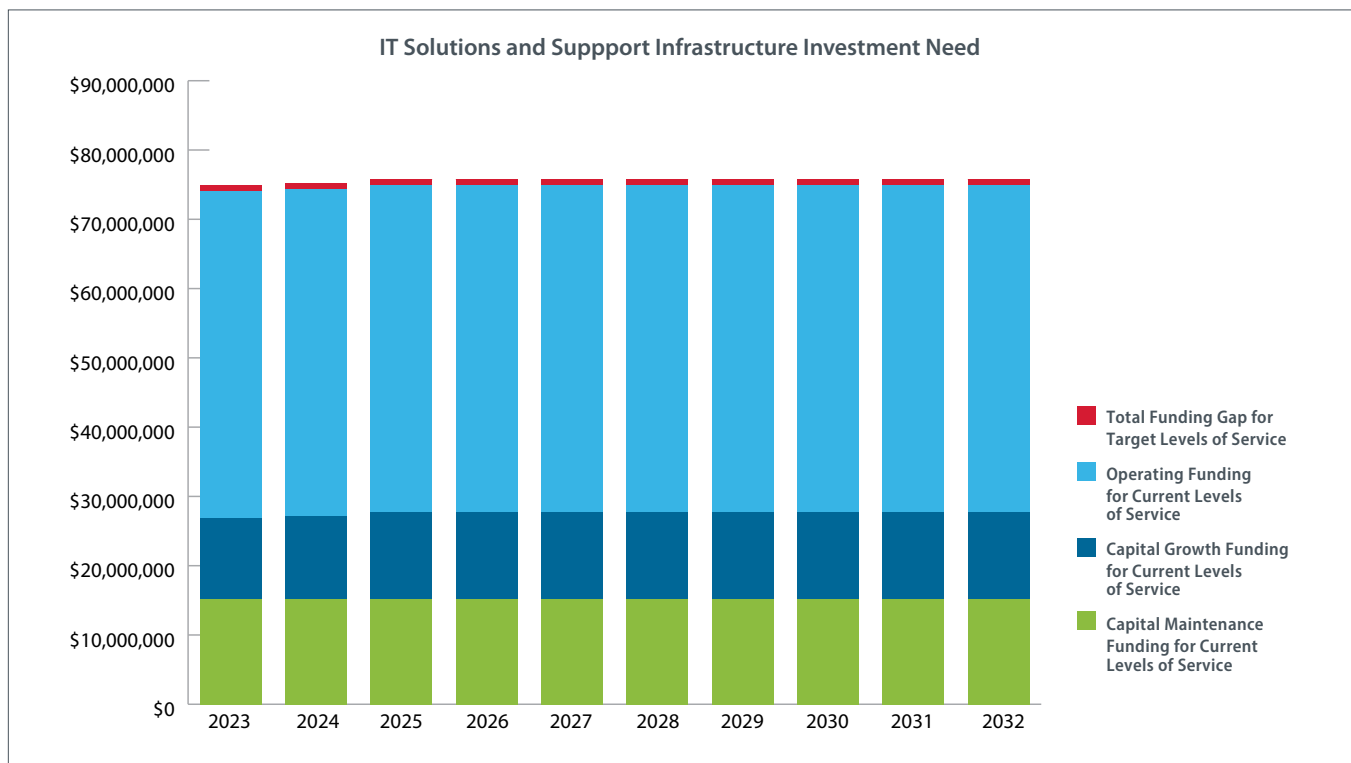
Technical Level of Service

Technical level of service	Service Target Status
Data Centre Hardware & Software	Green
Wireless Communication	Yellow
Enterprise Software	Green
Telecommunication	Yellow
Corporate Fleet Operating System (CFOS)	Yellow
Fiber Plant	Green
Work Group printing	Green
Desktop Computing	Yellow
Development Software	Green
Network Infrastructure	Yellow
Line of Business Applications	Green
PeopleSoft	Green



IT assets have a high service level target achievement rate. Although some are slightly below a 100 per cent target rate, all assets are achieving or are near their target achievement rate.

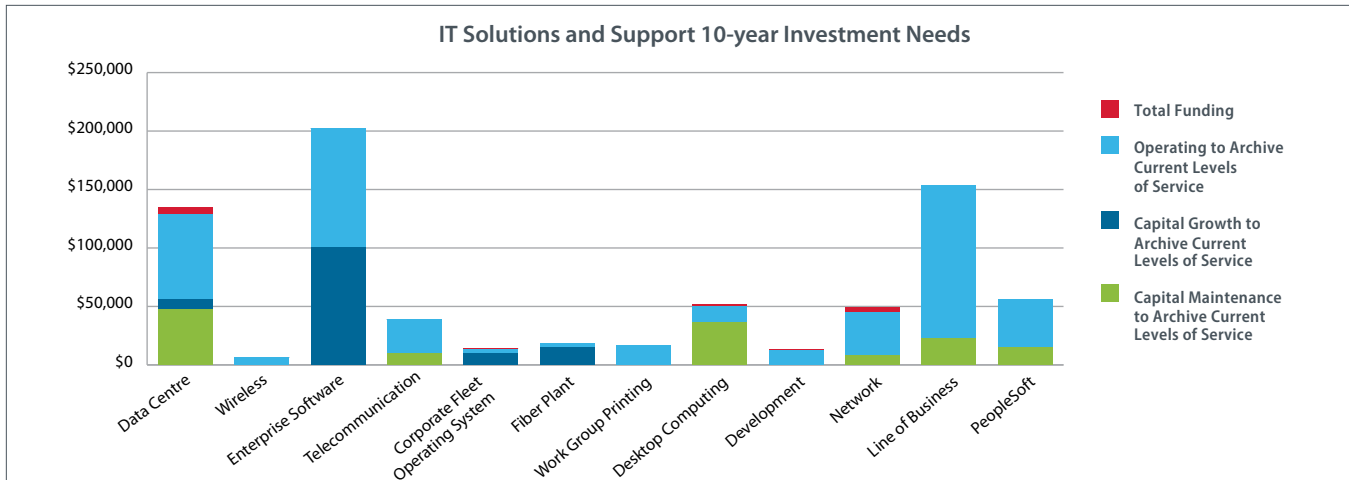
Infrastructure Investment Needs



*Note: investment information only includes asset subsystems and funding pools with available financial projections

The Infrastructure Investment need for the IT Solutions and Support service line is shown in the graph above. As seen in the graph, the bulk of the funding requirement is for ongoing operations. The service line has a relatively low infrastructure gap indicating it's well funded.

The next graph breaks down the 10-year investment needs by asset subsystem. As shown in the graph, all asset subsystems have a low or no infrastructure funding gap.



Future Condition of Infrastructure

Based on the investment required to meet proposed service targets, the trending condition for each asset category is shown below. Condition trends are based on assumed funding. Overall IT's assets are already in Good to Very Good condition (97 per cent).

Asset Category	Condition Trend
Machinery and Equipment	↔
Vehicles	↔
Enterprise Software	↔
Telecommunication	↔
Corporate Fleet Operating System	↔
Fiber Plant	↔
Work Group Printing	↔
Desktop Computing	↔
Development Software	↔
Network Infrastructure	↔
Line of Business Applications	↔
PeopleSoft	↔

IT has incorporated a number of asset related equipment and technology upgrades into their standard operations to improve the climate impact of the service line. Such upgrades include:

- Monitors: all must be higher efficiency LCD/LED.
- Desktop: power consumption - towers consume more power, and IT now has micro-form factor which consumes less power.
- Wake-on-Local Area Network: go to sleep to save energy.
- Printer draft quality.
- Printer paper uses matching tree replacement program.
- Repurpose, recycle and resale assets through investment recovery.

Status of Asset Management and plans for improvement

IT's Asset Management maturity continues to improve. Plans for improvement were included in the 2016 – 2018 Asset Management Plan (AMP). Key improvement plans identified in the Asset Management Plan include:

- Overarching Plan Improvement Strategies.
- IT Asset Management focus areas for improvement (nine identified).
- Improved capital investment planning:
 - Prioritized infrastructure investment planning and project portfolio management to ensure investments are directed toward highest business value.
 - Coordination and evaluation of projects that support growth and City development objectives to ensure that those investments are optimized.
- Refined and detailed customer service levels.
- Asset lifecycle cost forecasting (e.g. maintenance plans to optimize asset life cycle costs for all asset classes).
- The development of a technology plan for asset information.
- Registration of asset risk (e.g. condition and risk assessments for all asset classes to ensure reinvestments are directed to higher risk assets).
- Continuous improvement of asset knowledge.

Specific Climate Change Targets and Investments

54 tonnes of CO _{2e}	0.0% of City of Calgary emissions	2020 energy costs: \$34K
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*emissions are based on most recently available data set 2020



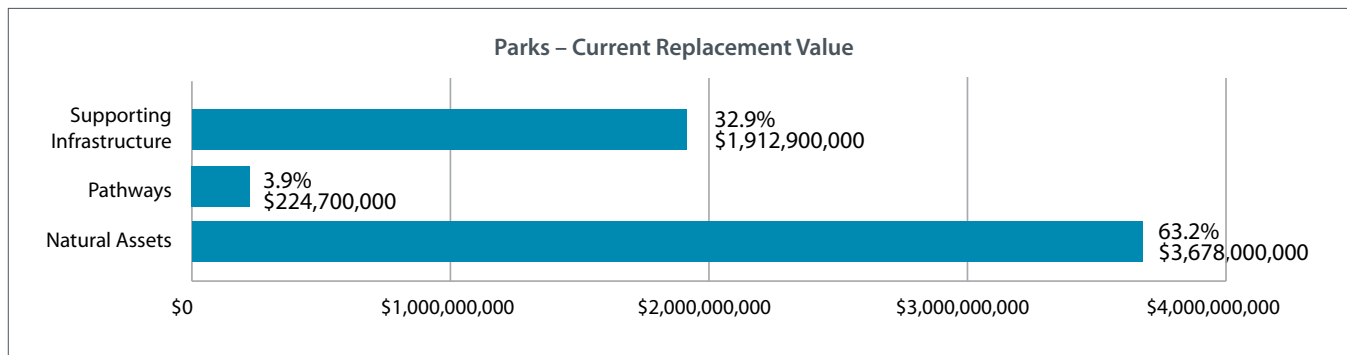
4.7 Parks, Pathways, Trails and Parks Infrastructure

Current Replacement Value	Overall Condition	Condition Trend	Risk
\$5.816B	2.7 / 5		8.3 / 25
Proposed 10-year Funding			
Capital: \$367.5M Capital Gap: \$777.7M		Operating: \$819.2M Operating Gap: 15M	

Statement of service

The Parks section of the CAMP (Corporate Asset Management Plan) includes infrastructure asset information for three lines of service as well as a fourth one shared with Roads. The Parks and Open Spaces service line provides cherished places that connect citizens to nature, our heritage and one another through conservation and promotion of biodiverse ecosystems and cultural landscapes. It also connects Calgarians with nature in the city and safe, inclusive, social and active opportunities. Parks also owns many pathways which contribute to the Sidewalks and Pathways service line, providing Calgarians with safe and accessible year-round opportunities to walk, cycle, run, ride and use mobility devices throughout the city. Parks' customers are the citizens of Calgary, and as such the measure of success should be whether our customers, the citizen, use our services.

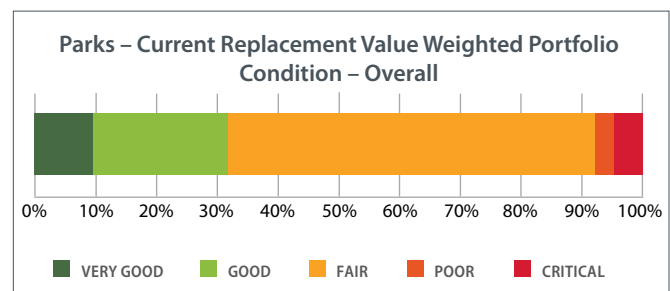
Current Replacement Value



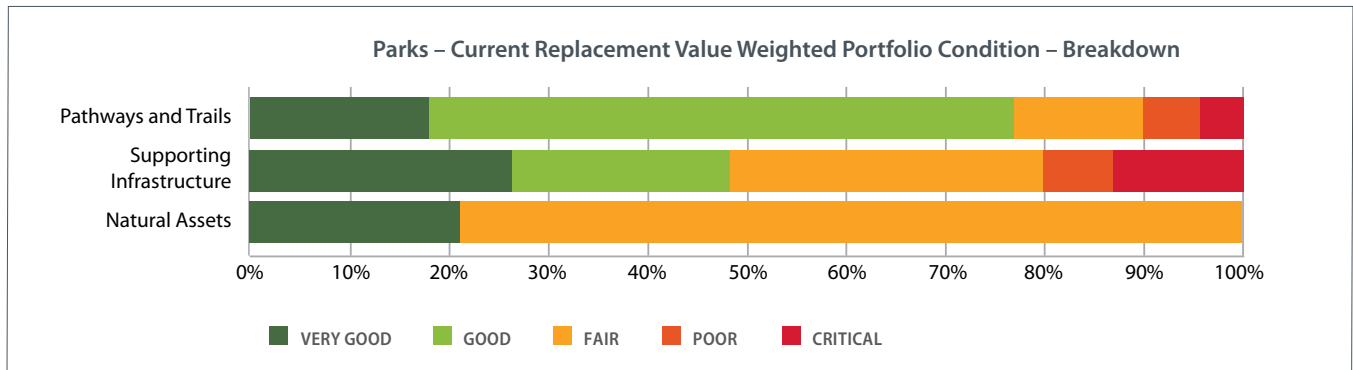
The total current replacement value (CRV) for Parks assets is \$5.816B and the distribution between the different asset classes is shown in the above graph. This represents 5.8 per cent of The City's total asset replacement value. This number has risen by approximately \$3.236B since the 2017 CAMP. The primary reason behind this significant rise is the result of advancement in the valuation methods for Parks natural assets and the inclusion of these assets.

Current Condition of Infrastructure

The overall condition profile for Parks assets is provided below:



These assets are further broken down by subsystem

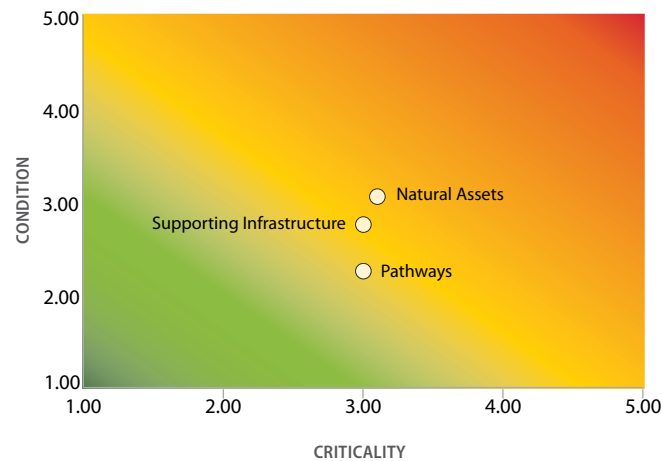


Most of Park’s assets are in Fair to Very Good condition. However, 7.1 per cent, or \$410.5M of the asset current replacement value is in Poor to Critical condition. These assets are in the supporting infrastructure and pathways subsystems. The assets of biggest concern are identified below and their corresponding Poor to Critical current replacement value are:

- Other Parks Infrastructure* – \$354.7M
- Irrigation – \$30.0M
- Pathways – \$20.9M
- Playground Infrastructure – \$4.8M

*Includes: Amenity and sports equipment, garbage containers, lights, plumbing & water features, seating, signage, structures and monuments, Barriers including Sports Barriers, Sport Surfaces and Hard Surfaces

Asset Criticality and Risk



Parks has identified risks to customers, their potential impact and mitigation strategies in the table below:

Trends / Risks	Potential Impact	Mitigation Strategies
Changes in available funding as a result of economic trends	Reduced funding for Operations & Maintenance (O&M) activities. Loss of corporate sponsorship. A depressed economy may also affect numbers of people using Parks.	Streamlining and prioritizing Operations & Maintenance activities using asset and level of service information
Change in priority and direction as a result of Council changes	Change in focus and resources to execute Parks Asset Management Plan and desired improvements	Use Asset Management plan and strategies to communicate impacts to services and assets due to lack of focus and resources
Changes in market costs for supplies materials and services	Increased costs of capital projects and delivering services	Prioritize capital projects. Coordination of purchasing strategies across BUs
Change in organizational structure at the business unit, or department level	Loss of focus and resources while the organization adapts to changes	Execution of Communication and Change Management strategies
Staff and resource level changes	Changes in resource availability, potential conflicting priorities	Communication and work plan development. Identify opportunities for collaboration between groups
Demographic, population and population density changes	Increased and differing demand for Parks assets	Use Customer Level of Service and other indicators to inform service level adjustment decisions
Increasing Asset Base (growth)	Continued developer-driven growth without matching maintenance funding	Clearly communicate maintenance funding requirements and impacts to budget cuts
Mismatch of amenities to citizen needs	Decreased Level of Service to those citizen groups	Use Customer Level of Service and other indicators to inform service level adjustment decisions
Increased awareness of inclusion and accessibility in designing Parks spaces	Positive societal impact, however may increase asset costs and there may be fewer suppliers of these types of assets. Staff may be unfamiliar with topic.	Collaborate with Supply to source appropriate assets, increase diversity and inclusion training to staff
Climate Change	Parks is working to better understand the impacts of climate change on service delivery. Sustainable Management and Conservation and Ecosystem Resiliency are indicators of success currently being developed as part of the imagineParks Strategic Plan that will set the overall direction for Calgary Parks. In addition, environment and climate change policy is underdeveloped in relation to the Parks Open Space Plan.	Parks is considering the impacts of climate change while developing the risk management and investment strategies for asset specific Asset Management Plans. Many Parks projects have a touch point with climate change, and consider aspects of economy, social issues and environment.

Risks are identified through Parks asset-specific Asset Management Plans and Lifecycle Planning that is rolled up into the overall Parks Asset Management Plan, which is refreshed every 4 years. Risks related to funding for both Capital and Operating asks are mitigated collaboratively and coordinated at the leadership level. Lifecycle planning is informed by the use of Powerplan Asset Management software. Risk management will be improved through continued development of portfolio-specific Asset Management Plans that help feed into budget planning and forecasting for the future. The focus will be on strategies and practices that link to the imagineParks strategic plan.

Customer Levels of Service

Natural Assets

Safety, conservation, inclusivity: conserve and promote connected biodiverse ecosystems and cultural landscapes that provide Calgarians with nature in the city and safe, inclusive, social and active opportunities.

Supporting Infrastructure

Safety, connection and experience: support a high-level customer experience in alignment with imagineParks Strategic Plan indicators and reduce barriers to access.

Pathways

Safety, connection and access: support a high-level customer experience in alignment with imagineParks Strategic Plan indicators and reduce barriers to access..

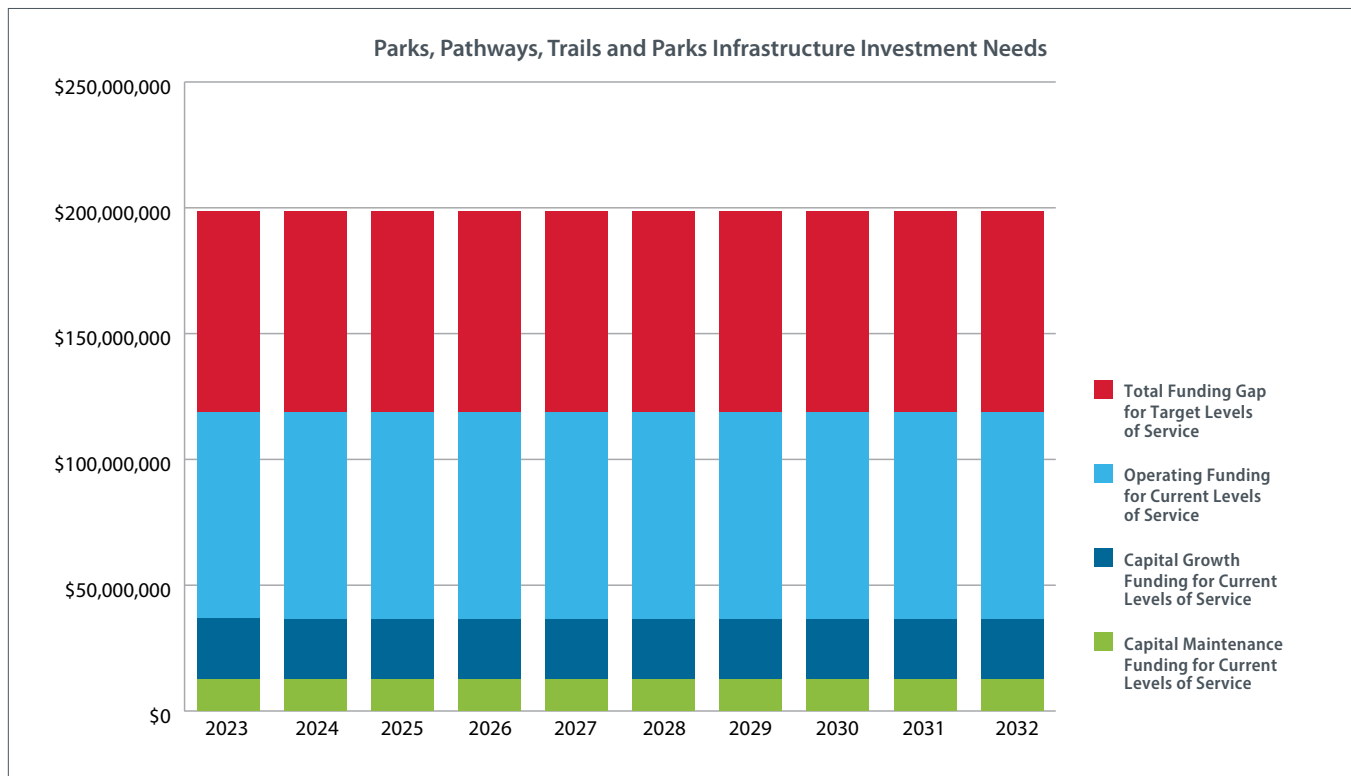
There is a current project to refresh the Customer Level of Service framework that is underway, to be completed in 2022. It will include customer surveys as well as a plan for future engagement to ensure the Customer Levels of Service ratings are up to date.

Technical level of service

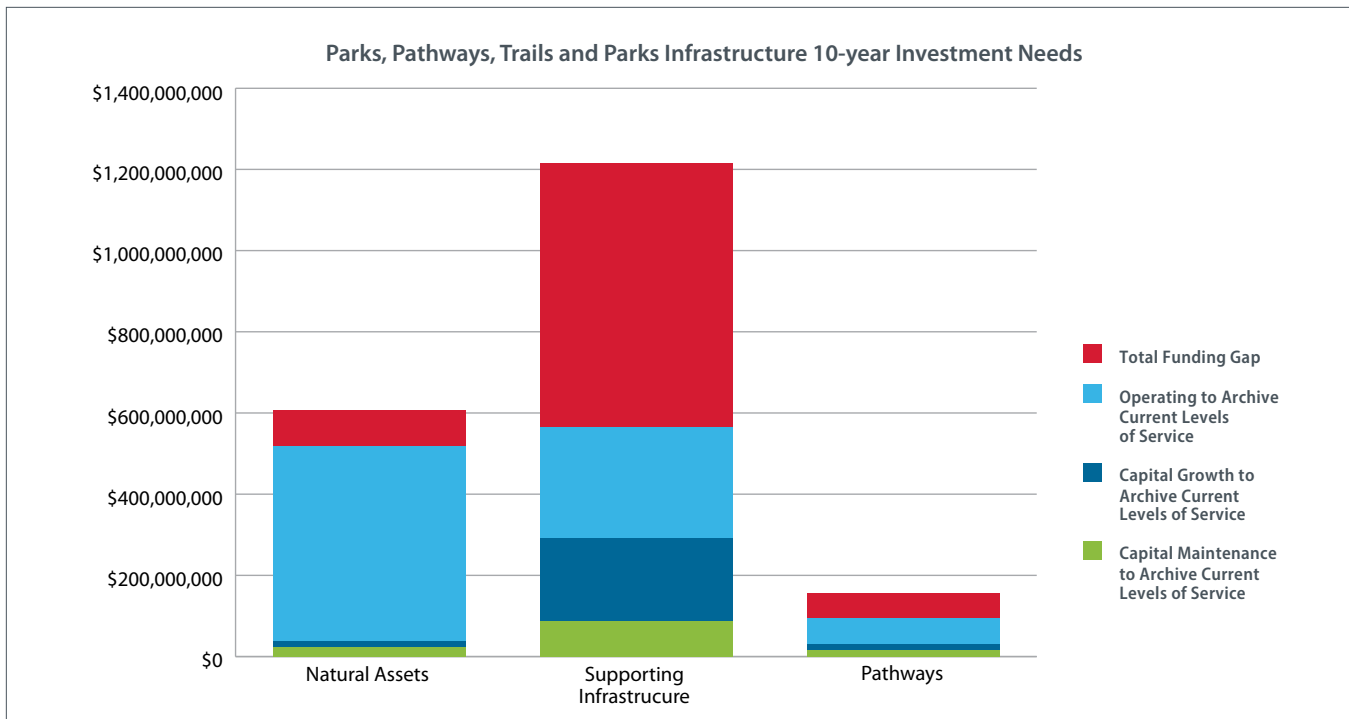
	Service Target Status
Buildings	
Supporting Infrastructure	
Pathways	

Parks Customer Levels of Service and accessibility targets will be further developed in 2022. Existing accessibility targets have a very high achievement rate of 99.8 per cent however this measure is based on distance from one point to another and is not reflective of actual walking experience. Levels of Service are anticipated to decline as Parks has identified a \$1.065B infrastructure gap over the next 10 years.

Infrastructure Investment Needs



The Infrastructure Investment Needs for Parks, Pathways, Trails and Parks assets is shown in the graph below. The majority of funding is allocated to operating, and a relatively large funding gap has been identified which could impact levels of service and increase risk to The City. As seen in the 10-year investment need graph, the majority of the funding gap is in the supporting infrastructure asset-subsystem. The operating funding gap for natural assets is disproportionately higher because the restoration and maintenance of natural areas requires significant investment and sustainment to maintain the overall health of the ecosystem.



Primary drivers for investment in Parks infrastructure include the following priorities:

- Maintain/improve Service Levels as they link to the imagineParks strategic plan.
- Improve overall asset condition
- Accommodate growth while not minimizing overall service levels.
- Increase awareness of inclusion and accessibility in designing and operating Parks spaces.
- Address climate change impacts as included in imagineParks strategic plan.

Future Condition of Infrastructure

Based on the investment required to meet proposed service targets, the trending condition for each asset category is shown below.

Asset Category	Condition Trend
Natural Assets	↓
Supporting Infrastructure	↓
Pathways	↓

Due to a considerable funding gap, particularly in Parks supporting infrastructure capital maintenance (\$508M), the asset condition and service levels are trending downward if Parks maintains the same level of investment as previous years without increased renewal of assets.

Specific Climate Change Targets and Investments

4,162 tonnes of CO _{2e}	0.9% of City of Calgary emissions	2020 energy costs: \$1.6M
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*Emissions are based on most recently available data set 2020

Parks and Open Space understands the integral role its assets play in the mitigation and adaption of climate change. It has been incorporating the principles of climate resiliency into the operation, management and development of The City's parks and open spaces. Nine indicators and targets were developed to implement the imagineParks strategic plan providing a clear direction for the operations and management of parks and open space. Two of those indicators directly contribute and incorporate climate resilient practices. The Conservation and Ecosystem Resiliency indicator sets out an ambitious target to increase the health of the city's ecological network and the Sustainable Management indicator measures the social, economic, and environmental impacts on decision-making, programs, improvements, and investments, such as evaluating biodiversity and air and water quality. Parks and Open Space is also reviewing its policy catalogue to ensure climate resilient policy is incorporated in the development and redevelopment of all future parks and open space. This work has begun with a master policy document, the Open Space Plan. This plan has identified climate change resiliency as a key principle of the plan, ensuring that all policy being developed are filtered through an adaption and mitigation lens. Parks is considering the impacts of climate change while developing the risk management and investment strategies for asset specific Asset Management Plans. Many Parks projects have a touch point with climate change, and consider aspects of economy, social issues and environment.

Some of the identified projects include:

	Project/Program	Cost (\$000)	Funded / Unfunded	Year (confirmed / targeted)
1	Pathways & Trails Lifecycle	25,000	Unfunded	2023-2026
2	Pathways & Trails Missing Links	30,000	Unfunded	2023-2026
3	Urban Conservation – Habitat Restoration Program	21,000	Unfunded	2023-2026
4	Urban Forestry – Leveraged Tree Infrastructure Program	3,300	Unfunded	2023-2026
5	Urban Forestry – Municipal Development Plan Target Commitment	16,837	Unfunded	2023-2026
6	Urban Forestry – Lifecycle Tree Planting	35,538	Unfunded	2023-2026
7	Investment Optimization Program	4,000	Unfunded	2023-2026
8	Parks Delivery Program	To be determined	Unfunded	2023-2026
9	Local Park Improvements	To be determined	Unfunded	2023-2026
10	Infrastructure Lifecycle & Upgrades	To be determined	Unfunded	2023-2026
11	Leveraged Partners Program	To be determined	Unfunded	2023-2026
12	Medicine Hills Regional Park Development	To be determined	Unfunded	2023-2024
13	River Access Upgrades	6,000	Unfunded	2023-2026
14	Current funded projects have a touch point with climate change, but none of the projects are specifically only for climate change. All the projects support aspects of economy, social issues, environment, and climate change. Climate change is a factor but not the only factor.	various	Funded	various

ISC: Unrestricted

Status of Asset Management and plans for improvement

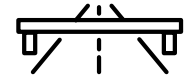
An Asset Management Improvement Plan was included in the 2017 Parks Asset Management Plan. Since then, some other continuous improvement projects are underway, including:

- In-depth sub-Asset Management Plans have been completed for some asset types which have specific improvement plans to those asset types.
- Customer Levels of Service model and ratings being refreshed with Subject Matter Expert input and Customer Survey data.
- imagineParks indicators of success have been developed, with the following themes and indicators most relevant to asset management: Experiences (Customer Levels of Service), Reducing Barriers to Access (Walkability), Best Practices (Yardstick score for Best Practices) and Sustainable Management (to be determined). Measures and targets are being developed to steer towards the goals outlined in imagineParks.
- Paris 2.0 Asset Management system implementation in progress.
- Powerplan implementations are continuing for improved lifecycle planning.
- Advancements in Powerplan configurations such as advanced depreciation curves and Lifecycle Project Prioritization formulas to include Asset Condition, Park Typology, and other “demand” factors such as booking hours and population density have been implemented.
- GIS Apps for asset management information collection such as condition rating assessments have been developed and are in-use by multiple portfolios.





4.8 Roads, Bridges and Tunnels

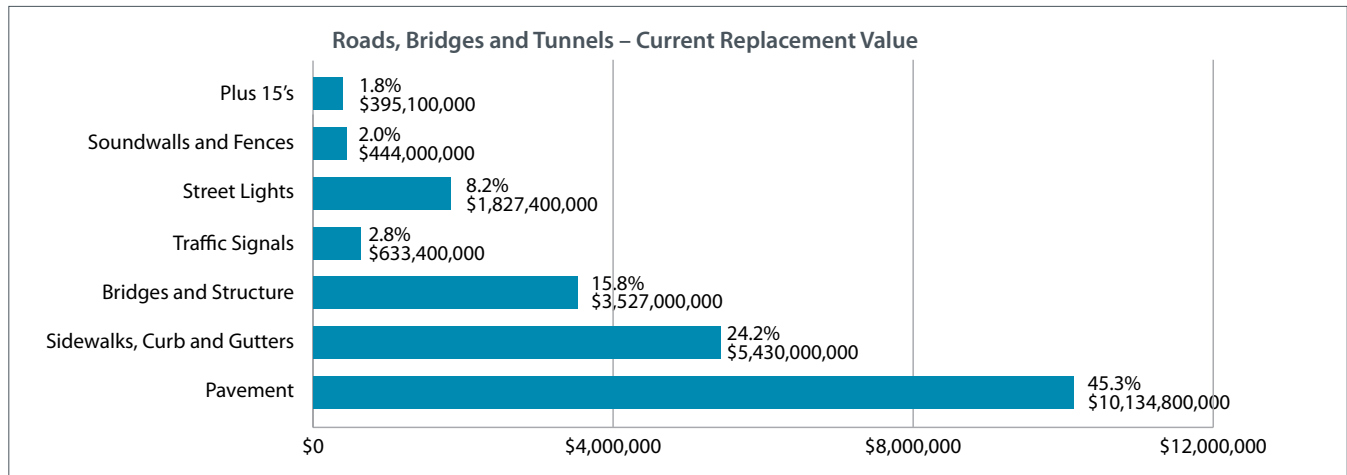


Current Replacement Value	Overall Condition	Condition Trend	Risk
\$22.4B	2.5 / 5		8.0 / 25
Proposed 10-year Budget			
Current: \$1.609B		Gap: \$1.833B	

Statement of service

The Roads, Bridges and Tunnels service line is responsible for operations and maintenance of all public roadways at The City as well as sidewalks, bridges, traffic signals, streetlights, sound walls and plus 15's.

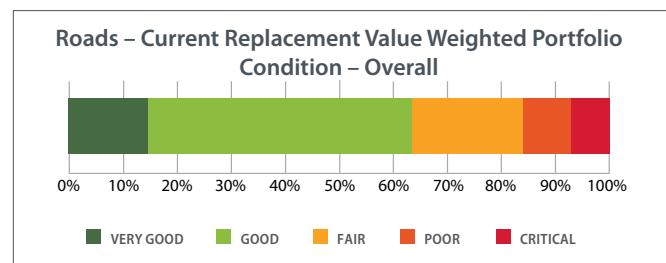
Current Replacement Value



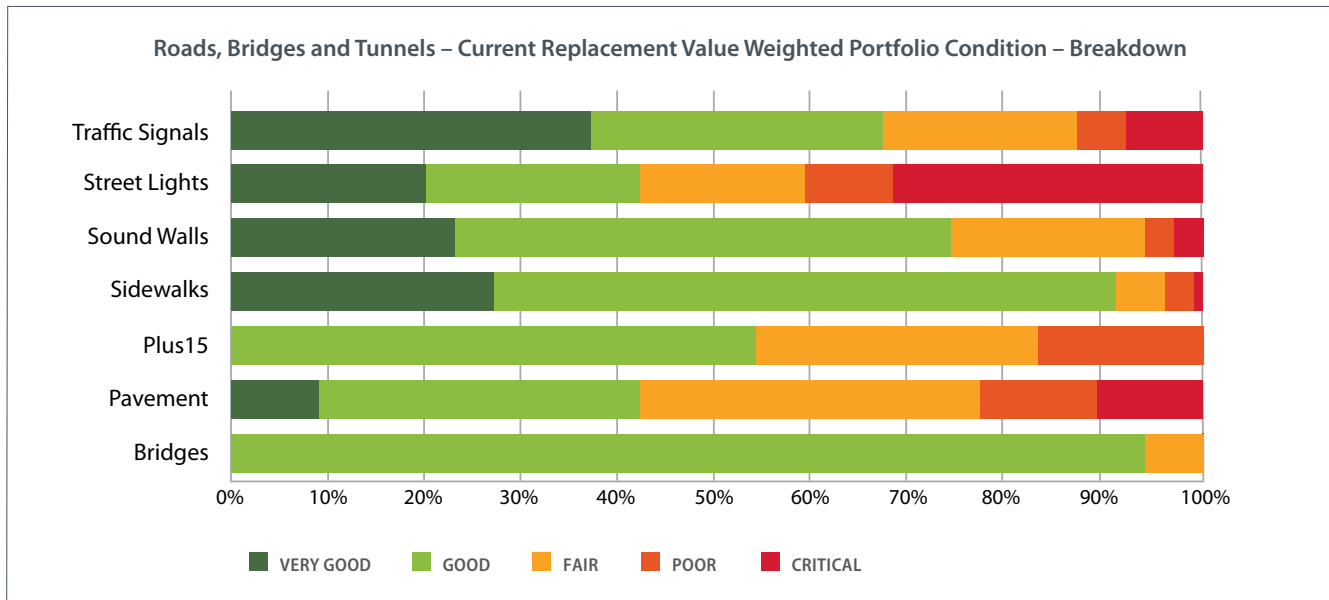
The total current replacement value (CRV) for Roads, Bridges and Tunnels assets is \$22.39B, and the distribution between the different asset subsystems is shown in the above graph. This represents 22.4 per cent of The City's total asset replacement value. This figure has risen by approximately \$1.97B since the 2017 CAMP (Corporate Asset Management Plan).

Current Condition of Infrastructure

The overall condition profile for Roads Assets is provided below

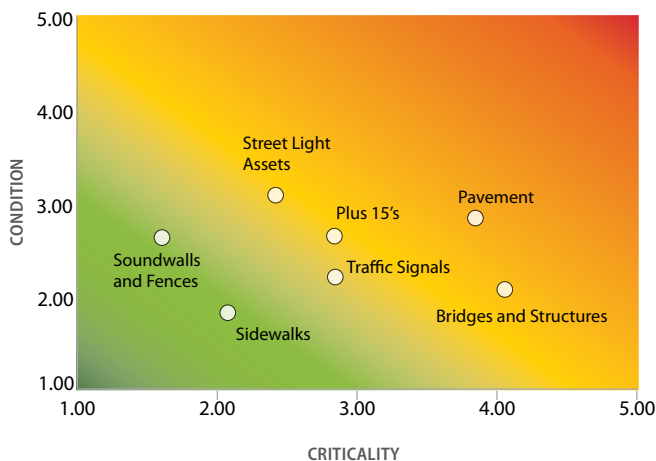


These assets are further broken down by subsystem



Bridges and structures are the only asset subsystems that do not have assets in Poor to Critical condition. Of particular concern are street lights, where over 40 per cent of assets are rated Poor to Critical and pavement where this number is over 20 per cent. Significant additional investment will be required in these and other asset subsystems to achieve desired service levels and arrest a continued decline in asset condition that will further impact service reliability in the future. More information can be found in the Investment Needs Section.

Asset Criticality and Risk



Roads adopts a risk-informed evidence-based approach for managing infrastructure risks. Infrastructure risks for the major asset categories are identified, assessed, and analyzed. Below is a summary of some of the key risks identified in the Asset Management Plans drafted by the Roads business unit:

- 12 bridges are older than 100 years which are due for major rehabilitation.
- 67 per cent bridges and tunnels were built during the period of 1970 – 1999. There will be increased lifecycle requirements in the next 10 years.

- Deferred rehabilitation of pavement increases the likelihood of road base damage, requiring full road reconstruction at 4 to 5 times the cost of surface repaving.
- A growing investment gap has resulted in higher costs to regain the condition of paved infrastructure in the future. 40 communities in the city have local roads that average at Poor condition.
- A 10-year backlog has been accumulated in the sidewalk replacement program due to inadequate capital investment. Particularly in older communities, poor sidewalks that have reached the end of their service life are posing tripping and falling risks to pedestrians.
- More than 650 (10 per cent) of Corten or grey signal trunks servicing traffic signals are in Very Poor condition and due for lifecycle replacement. The current capital budget allows replacement of these trunks in 10 years.
- 19,000 (21 per cent) critical street light poles have exceeded their service life, among these over 1,300 poles are at risk of short-term failure.
- 140 km failed underground wires have caused street light outages in older communities
- The previous annual budget of \$500K approved in One Calgary was proven insufficient for the lifecycle needs of sound walls. In 2020, Council approved \$4 million from the Lifecycle Maintenance and Upgrade Reserve (LMNR) to replace walls that are already in imminent risks.
- Approximately 2.8km of sound attenuation walls currently identified as Poor or Very Poor condition are remaining in the inventory. These walls will need to be replaced in the next two to three years.
- Over 50 per cent of the Plus15 inventory is 25 to 40 years old and there is currently insufficient funding for lifecycle maintenance.

Customer Levels of Service

Bridges and Structures

Safety: Bridges, tunnels, retaining structures and timber stairways provide safe and efficient passage for pedestrians, vehicles and bicycles across physical barriers/grade separations on the transportation network.

Pavement

Safe and Well Run: The roadway network allows access to properties and for the safe, efficient and reliable movement of people and goods.

Sidewalks, Curb and Gutter

Safety and Accessibility: A pedestrian network that is safe, accessible and provides for efficient connectivity to destinations.

Traffic Signals

Efficiency and Safety: Signals provide an effective means of optimizing and regulating traffic flow for all modes — contributing to the delivery of an efficient and safe transportation system.

Street Lights

Safety: Appropriate levels of lighting within Calgary's public spaces is provided between dusk and dawn to support crime prevention, vehicle and pedestrian collision reduction, and to enhance security for pedestrians and residents.

Plus 15's

Safety and Well-Run: Plus15 pedestrian overpasses enable safe pedestrian travel in an elevated all-weather transportation network, and support for ongoing business investment and expansion in the downtown core.

Sound Walls

Safety: Sound walls create a barrier between arterial major roads and residential areas to reduce the noise level for residents. The sound walls are required to be maintained to ensure safety for motorists, pedestrians and cyclists and a lower decibel level of noise emitted by traffic.

Technical level of service

	Essential Service Target Status	Enhanced Service Target Status
Bridges & Structures	Red	Red
Pavement	Red	Red
Plus 15s	Red	Red
Sidewalks*	Green	Red
Sound Walls & Fences	Green	Red
Street Lights	Red	Red
Traffic Signals	Green	Yellow

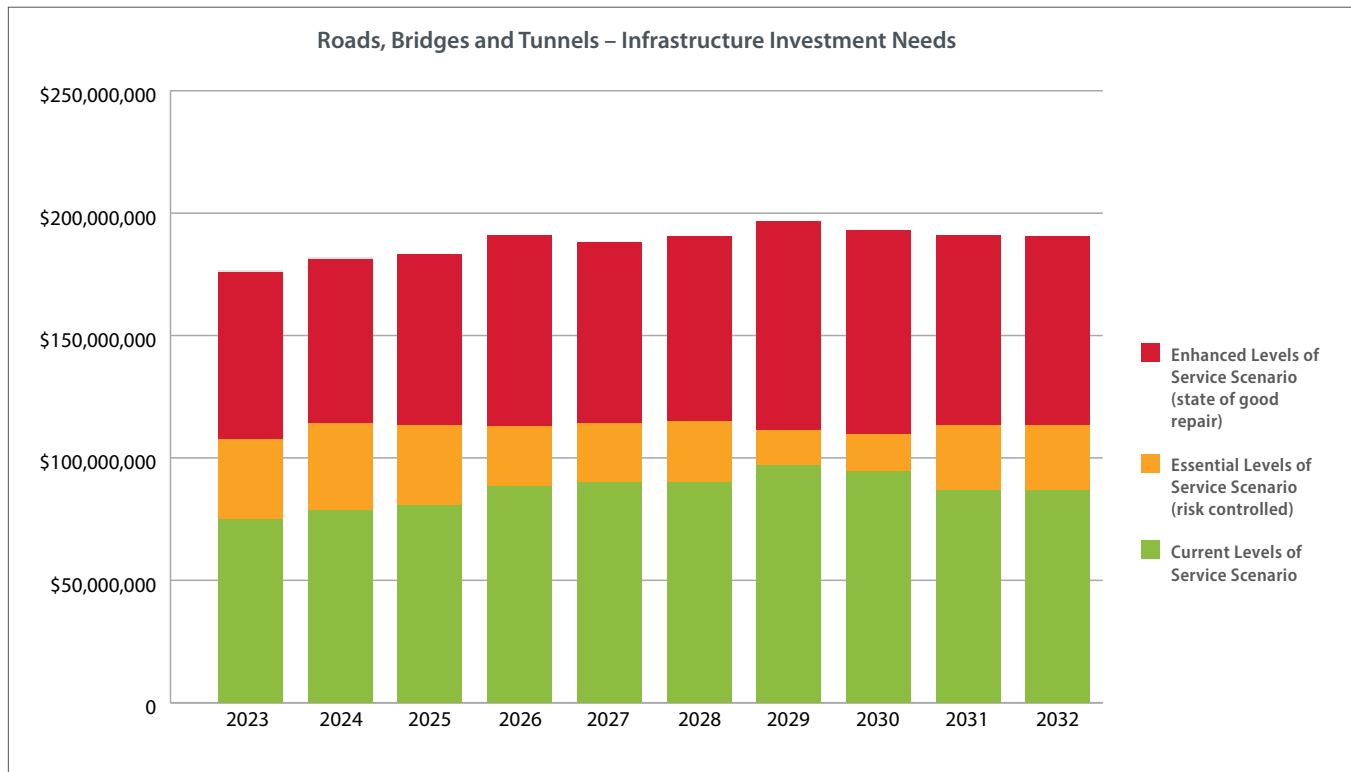
*Only partial assessment data available

Roads has one of the City's more mature Asset Management programs and has defined two service target thresholds. The targets are essential Levels of Service, which are the minimum targets to control/manage risk and the second are the enhanced service targets which are the thresholds to achieve a state of good repair. For each target, Roads has defined an objective for percentage of assets in Good or better condition and a maximum threshold for percentage of assets in Poor condition.

The Roads Bridges and Tunnels asset class has a relatively large current replacement value of assets in Poor to Very Poor condition and a large identified infrastructure gap. This has translated to a number of asset subsystems with essential service targets below their minimum thresholds. Bridges and structures timber assets are well below target rates. Pavements assets are performing below minimum service targets for all asset components (arterial, collector/industrial and local). Plus 15 assets are below all targets and street lights as an overall subsystem are also performing below essential service targets. Traffic signals are performing the best, achieving above their enhanced Good to Very Good target but are below the enhanced target for percentage of assets in Very Poor condition.



Infrastructure Investment Needs



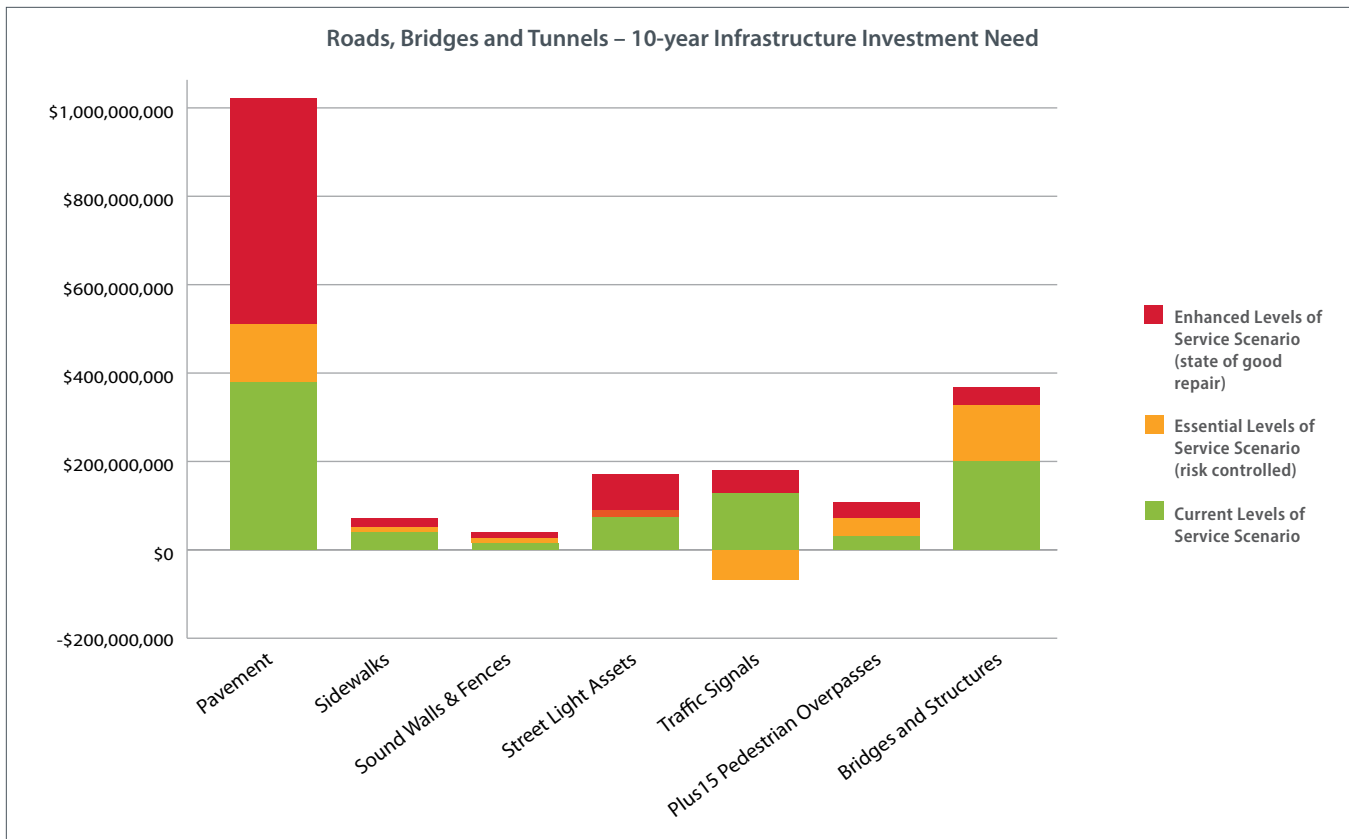
*Note: Essential and Enhanced scenario infrastructure gap does not include gap for growth

Roads, Bridges and Tunnels 10-year investment needs and the anticipated infrastructure gap is shown in the graph above. This graph rolls-up all budgetary requirements for Roads, Bridges and Tunnels. The current Levels of Service scenario is the assumed level of funding currently available. The Roads business unit has defined two infrastructure gaps:

1. The funding gap to bring assets up to the defined essential Levels of Service which allows a minimum threshold of risk management.
2. The funding gap to bring assets up to an enhanced level or state of good repair. The dollar amount shown at the top of the enhanced Levels of Service scenario is the budget required to achieve a state of good repair.

As seen in the graph, a funding increase is required to achieve essential Levels of Service and to manage risk to the desired level. To bring the service line to a state of good repair would require a significant increase in budget.





*Note: Essential and Enhanced scenario infrastructure gap does not include gap for growth

The ten-year infrastructure investment needs for the different asset subsystems are provided above. As seen in the graph, Pavement makes up the bulk of the funding requirement. A noteworthy opportunity in the graph is shown in the Traffic Signals subsystem, where the asset class has more funding than needed to achieve essential Levels of Service. The funding surplus identified could be re-allocated to reduce the essential Levels of Service gap in another asset class.

Some of the primary drivers for investment decisions for different asset subsystems include:

- Structures / Signals: maintaining service level, risk mitigation.
- Concrete / Sound Walls: risk mitigation.
- Street Lights / Pavement: risk mitigation, improve asset condition.

Future Condition of Infrastructure

Based on the investment required to meet proposed service targets, the trending condition for each asset category is shown below.

Asset Category	Condition Trend
Bridges (large only)	↓
Plus15's	↓
Pavement	↓
Sidewalks	↓
Sound Walls	↓
Signals	↓
Street Lights	↓

Conditions for all asset categories are trending downward as the asset base continues to age. This is based on the assumption that budgets will remain the same.

Specific Climate Change Targets and Investments

28,320 tonnes of CO _{2e}	6.0% of City of Calgary emissions	2020 energy costs: \$14.7M
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*emissions are based on most recently available data set 2020

Roads has identified a number of climate change related programs in the areas of water management, extreme heat management, back-up power and infrastructure. These programs are being undertaken in collaboration with other City business units. Examples of these programs are as follows:

Asset Category	Program	Status	Project
All	Extreme Heat Management	Ongoing	Develop Heat Emergency Business Continuity Plans for Transportation Department business units, with an emphasis on field staff and construction / maintenance activities
Traffic Signals	Back-up Power Supplies for Critical Infrastructure	New Unfunded	Ensure critical traffic signals have standalone backup power and ensure backup power is functional (prioritize sites for back-up power generation).
Bridge and Structures	Infrastructure	New Unfunded	Update bridge specifications to increase bridge deck drainage capacity during short-duration, high-intensity storms
Pavement	Infrastructure	Ongoing	Review and update design and construction standards for road infrastructure to increase resilience to changing climate conditions
All	Infrastructure	New Unfunded	Design transportation infrastructure in flood-prone areas to be resilient to major flood events. Appropriate flood return periods (e.g. 1 in 100 year) and flow level projections to be determined in collaboration with Water Utility
All	Water Management	New Unfunded	Develop and install temporary flood warning systems ahead of vulnerable roadway / transit locations
All	Water Management	New Unfunded	Identify locations at high risk of localized or river flooding and evaluate ways to increase network resilience (e.g. alternate routes, detour information, variable speed limits, etc.) to respond to flood events

A significant number of the Roads climate change programs are currently unfunded.

Status of Asset Management and plans for improvement

Key focus areas for Roads to improve Asset Management practices are inventory accuracy, condition assessment processes, performance forecasting and project planning process and strategy.



4.9 Transit Infrastructure and Fleet



Current Replacement Value	Overall Condition*	Condition Trend	Risk*
\$5.406B	2.0 / 5		6.1 / 25
Proposed 10-year Funding			
Capital: \$432.4M Capital Gap: \$788M		Operating: \$471.4M Operating Gap: \$1,148M	

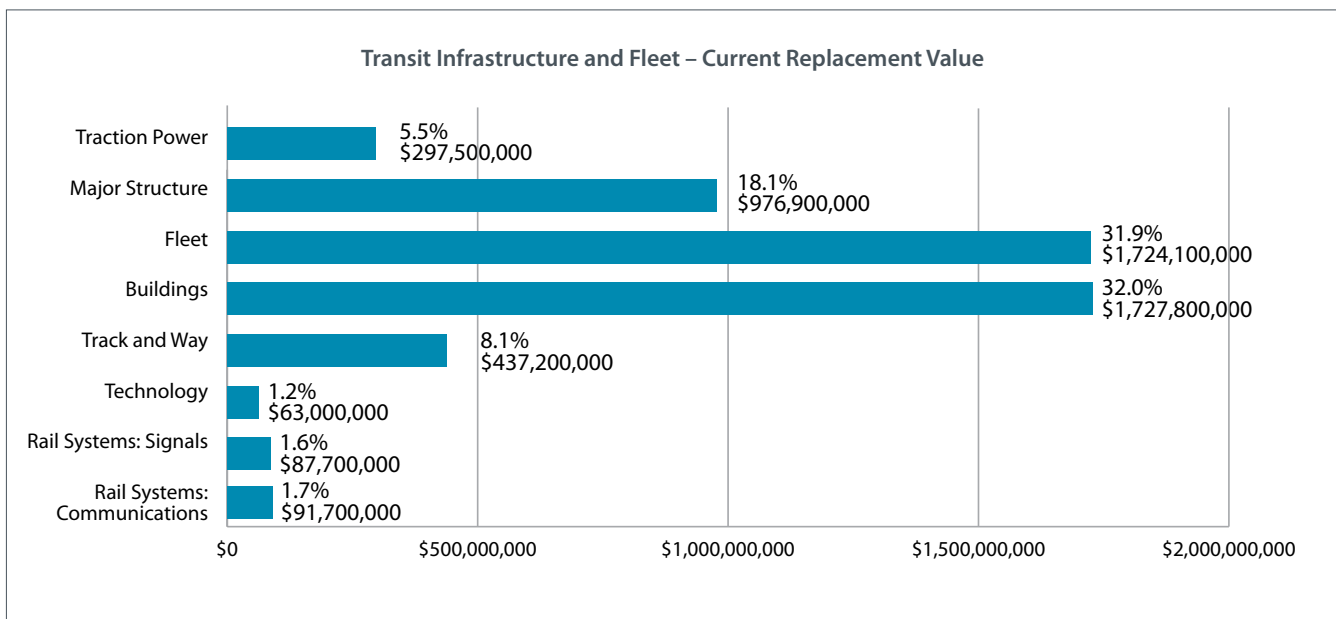
*Condition and risk information is calculated only for those assets with condition and criticality information available (88% of Current replacement value)

Statement of service

Transit Infrastructure supports the Public Transit service line that provides a network of train and bus transportation for citizens and visitors to Calgary to get from place to place safely, reliably and affordably.

Current Replacement Value

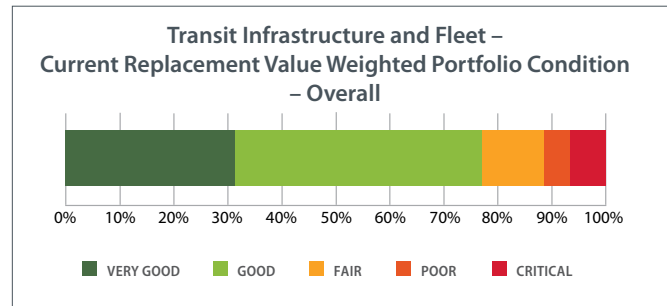
Transit Infrastructure supports the Public Transit service line that provides a network of train and bus transportation for citizens and visitors to Calgary to get from place to place safely, reliably and affordably.



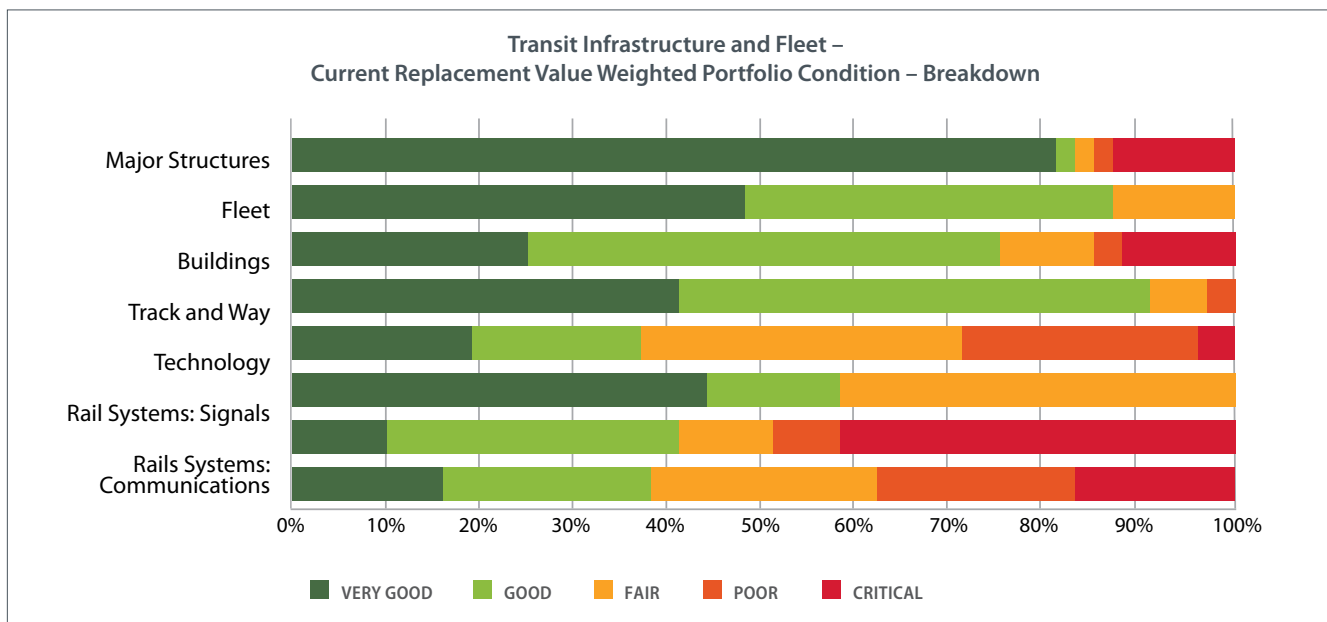
The total current replacement value (CRV) for Transit Infrastructure assets is \$5.406B and the distribution between the different asset classes is shown in the above graph. This represents 5.4 per cent of The City’s total asset replacement value. This has risen by approximately \$1.52B since the 2017 CAMP (Corporate Asset Management Plan). This increase is the result of better asset management practices which have led to the inclusion of assets that have not been included in past Asset Management Plans or the Infrastructure Status Report.

Current Condition of Infrastructure

The overall condition profile for Transit Infrastructure and Fleet assets is provided below:



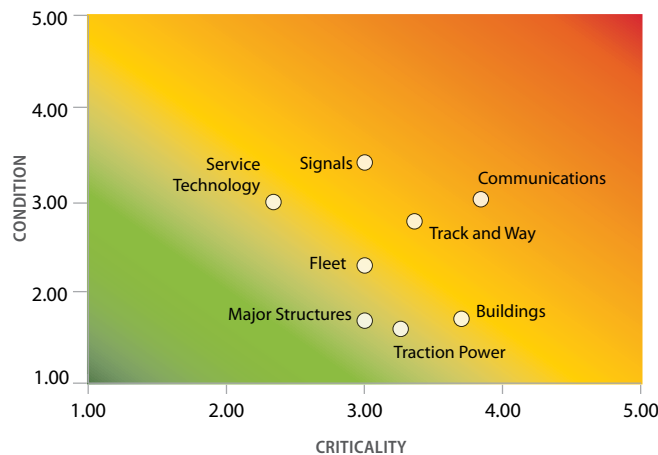
These assets are further broken down by subsystem



76.6 per cent of Transit Infrastructure’s assets are in Good to Very Good condition. However, 11.8 per cent, or \$560.7M of the asset current replacement value value is in Poor to Critical condition. Some of the asset subsystems asset components with the highest current replacement value in Poor to Critical condition are:

- Fleet – Light Rail Vehicle - \$202.8M
- Track and Way – Ballasted Track - \$78.1M
- Signals – Right of Way - \$30.9M
- Buildings – Light Rail Vehicle Stations and Platforms - \$28.2M
- Fleet – 40 ft Bus - \$27.8M
- Service Technology – Computer-aided dispatch/automatic vehicle location- \$25M
- Traction Power – Substation Equipment (transformers, switches, relays) – Substation System - \$20.6M
- Track and Way – Direct Fixation - \$20.3M
- Fleet – Calgary Transit Accessible Shuttle - \$11.8M
- Buildings – Garages - \$10.4M
- Track and Way – Turnout - \$10.3M
- Traction Power – Calgary Transit Overhead Catenary System - \$10.2M
- Communications – Duct Banks - \$9.2M
- Fleet – Community Shuttle - \$9M
- Communications – Radio - \$8.8M
- Track and Way – Imbedded - \$8.3M
- Traction Power – Electrical distribution systems for substations – Distribution System - \$7.6M
- Track and Way – Crossing - \$6.5M
- Signals – Signal Room - \$6.3M

Asset Criticality and Risk



Aging assets, budget limitations, service level requirement changes, resource constraints and potential cybersecurity threats have been identified as key risks to the public transit service line. Risk mitigation occurs through lifecycle planning & application of asset management principles/best practices, project prioritization, service & resource planning, proactive maintenance practices and continuous improvement. Risk management strategies are incorporated in the development of Calgary Transit’s Asset Management Plan, starting with basic risk identification and opportunities to further evolve risk management practices including itemizing risks with periodic review and capitalizing on future opportunities to engage in more detailed asset criticality and risk analysis.

Customer Levels of Service

Buildings

Reliability: provide reliable facilities for transit users and transit staff to help move people safely to their destination and protect them from the elements.

Signals

Safe and reliable: provide reliable signals for safe train movements.

Communications

Effective, secure resilient: provide informative audio for Light Rail Vehicle customers that is effective, secure and resilient.

Service Technology

Safe and reliable: provide software and hardware to support fare collection, security and communication for customers that is reliable, information and improves safety.

Fleet

Safe and reliability: provides vehicles for the transport of people in a safe, and reliable manner.

Track and Way

Safe and reliable: provides all the infrastructure to safely and reliably move customers and operators through the city by Light Rail Vehicle.

Major Structures

Safe and reliable: provides the bridges, tunnels, retaining structures, access stairways, draining systems, platforms, canopies and ramps to safely move customers and operators along the public transit network.

Calgary Transit uses customer surveys and data collection techniques to acquire data regarding customer satisfaction, service level suitability and service provision adherence to customer commitment principles.



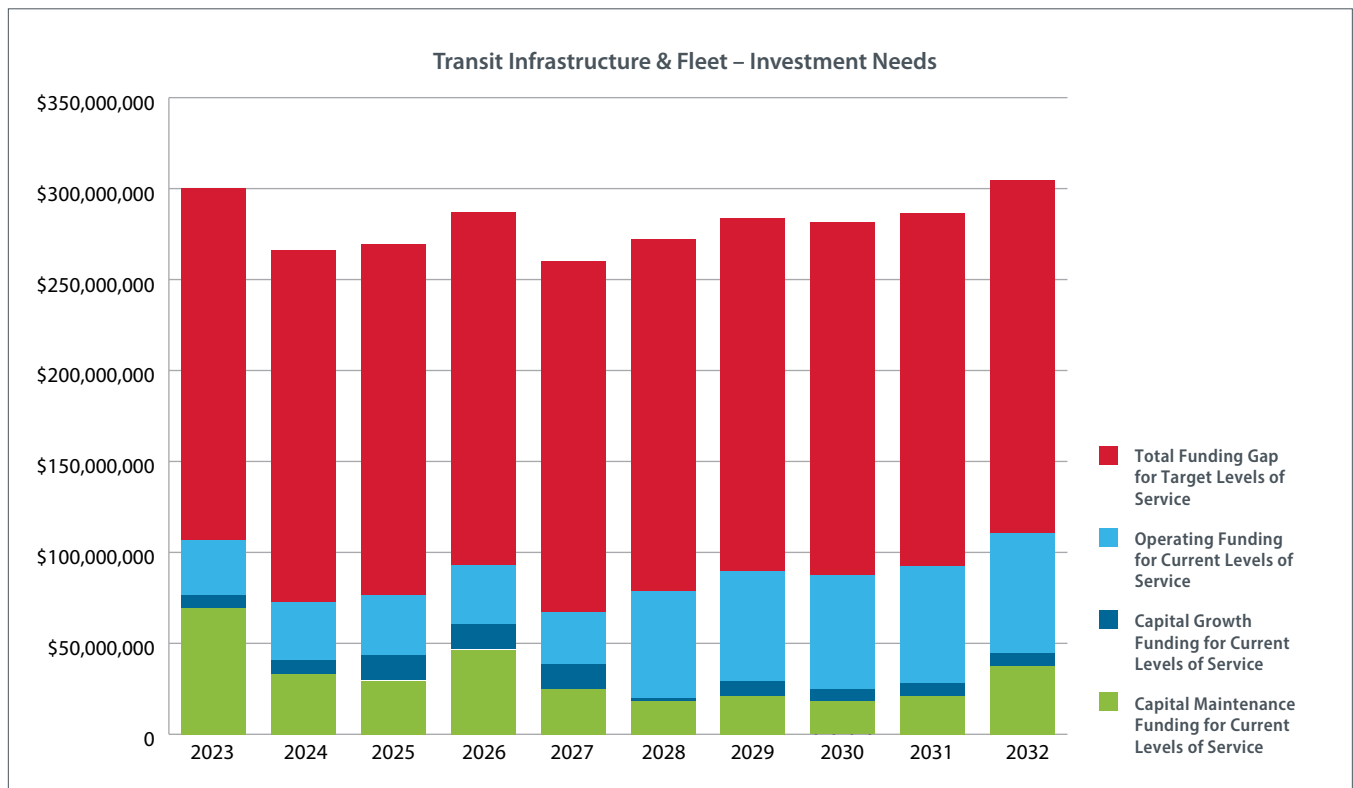
Technical level of service

	Service Target Status
Buildings	Yellow
Signals	Yellow
Communications	Yellow
Service Technology	Yellow
Fleet	Yellow
Track and Way	Yellow
Major Structures	Dark Green
Traction Power	Yellow

Transit infrastructure has a varied achievement rate for its Levels of Service targets. A summary of transit infrastructure subsystems is provided below:

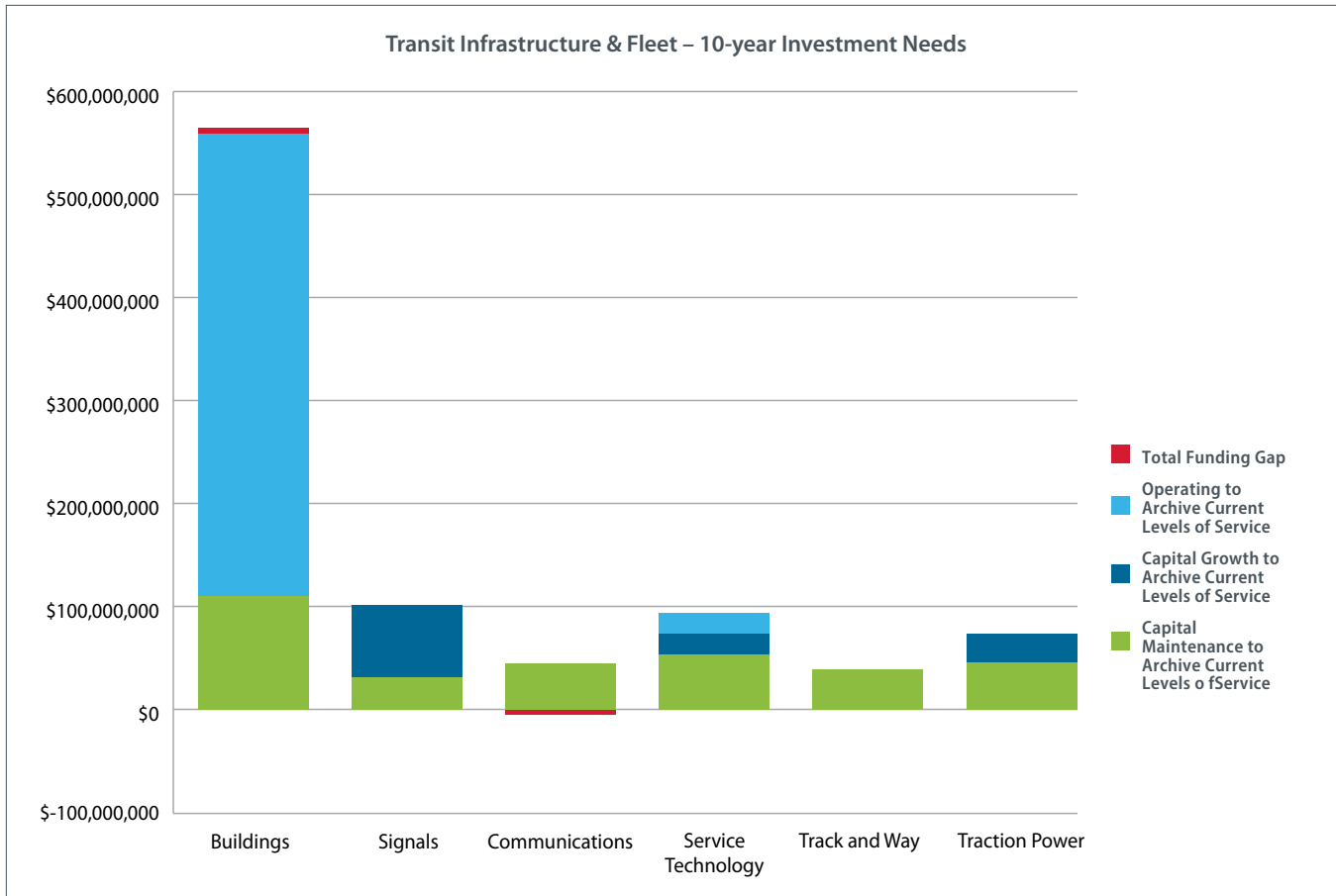
- **Buildings:** achieving at least 92 per cent of all service targets.
- **Signals:** achieving at least 99.7 per cent of all service targets.
- **Communications:** achieving at least 90 per cent of all service targets.
- **Service Technology:** 42 per cent of the assets subsystems current replacement value is in Poor condition which has resulted in some service level target achievement rates less than 80 per cent.
- **Fleet:** \$203M worth of assets are in Poor to Critical condition translating to a 90 per cent reliability Levels of Service target achievement rate.
- **Track and way:** all assets are meeting Levels of Service targets.
- **Major structures:** 100 per cent safety Levels of Service achievement rates and, 95 per cent reliability Levels of Service achievement rate.
- **Traction Power:** At least 95 per cent of assets are meeting safety targets, at least 80 per cent of assets are meeting reliability targets, 100 per cent of assets are meeting clean targets.

Transit Infrastructure & Fleet – Investment Needs



*Investment needs only include asset subsystems with funding information available. Fleet and major structures information was unavailable. Little infrastructure gap information was available. Infrastructure gap data was taken from the 2020 Infrastructure Status Report and averaged over the 10-year span. Investment needs don't include the Greenline

The graph above shows investment needs for Transit Infrastructure & Fleet. A large infrastructure gap has been identified equaling \$1.936B over ten years.



Fleet and major structures information was unavailable. Funding gap information is based on the available data. The total 10-year infrastructure gap from the 2020 Infrastructure Status Report is 1.94B. It is assumed the majority of this gap is for the asset subsystems with no available data (Fleet and Major Structures).

The graph above shows that the majority of identified investment needs are in the Buildings asset subsystems. It's also worth noting that approximately \$6M in surplus funding for Communications has been identified that can be re-allocated to fund the \$5.5M and \$1.5M funding gap identified in Buildings and Signals respectively. No funding information is available for Fleet or Major Structures. It is assumed a large portion of the infrastructure gap identified in the above graph is attributed to those two asset sub systems.

Primary drivers for investment in transit infrastructure include the following priorities:

- Maintaining and enhancing transit network safety.
- Risk mitigation.
- Maintaining or improving reliability and levels of service.
- Lifecycle management.
- Opportunities for innovation.

Future Condition of Infrastructure

Based on the investment required to meet proposed service targets, the trending condition for each asset category is shown in the chart to the right.

Asset Category	Condition Trend (for Good to Very Good condition assets)	Condition Trend (for Fair to Very Poor condition assets)
Buildings	↔	↑
Signals	↔	↑
Communications	↔	↑
Service Technology	↔	↑
Fleet	↔	↑
Track and Way	↔	↑
Major Structures	↔	↑
Traction Power	↔	↑

Condition trends are based on anticipated budget allocations, current projects and future projects. Should financing for transit infrastructure be reduced the condition of the assets is anticipated to further decline.

Specific Climate Change Targets and Investments

121,723 tonnes of CO _{2e}	25.8% of City of Calgary emissions	2020 energy costs: \$44.6M
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*emissions are based on most recently available data set 2020

Climate change considerations and reduced dependency on single occupancy vehicle use is a primary purpose for transit infrastructure assets. The Calgary Transit business unit considers climate change mitigation and adaptation in its investment planning strategies.

Some current or planned transit infrastructure projects that consider climate change are provided below:

	Project	Cost (\$000)	Funded / Unfunded	Year (confirmed / targeted)
1	Electric Shuttle Bus Demonstration Project	14	Funded	2022
2	19th ST LED Tunnel Lighting Project (Increase efficiency, lower utility usage, lower greenhouse gas emissions, and reduction of heavy metals)	2500	Unfunded	2024
3	7th Ave Lighting station (Canopy LEDs) (Increase efficiency, lower utility usage, lower greenhouse gas emissions, and reduction of heavy metals)	350	Unfunded	To be determined
4	36th St LED Tunnel Lighting Project (Increase efficiency, lower utility usage, lower greenhouse gas emissions, and reduction of heavy metals)	2500	Unfunded	2025
5	42nd Ave LED Tunnel Lighting Project (Increase efficiency, lower utility usage, lower greenhouse gas emissions, and reduction of heavy metals)	2500	Unfunded	2026
6	69th St Parkade LED Lighting Project (Increased efficiency, lower utility usage, lower greenhouse gas emissions, and reduction of heavy metals)	330	Unfunded	2022
7	Spring Gardens Bus Wash Project (Reduced water and energy usage through recycled water and energy efficiency)	550	Unfunded	2023
8	Light Rail Vehicle Station Reflective Glazing Project – N.E. and S.E. Network (Reduced energy usage through engineered heat retention)	1000	Unfunded	2023-2026
9.	Light Rail Vehicle Station Engineering Assessment Project (Greenhouse gas reduction)	80	Unfunded	2022
10.	Light Rail Vehicle Station Electric Heat Installation Project (Greenhouse gas)	400	Unfunded	2022-2023
11.	Light Rail Vehicle Wayside Energy Storage Project	To be determined	Unfunded	To be determined
12.	Light Rail Vehicle Network Manhole Design Project (Flooding-Related) (Flooding-Related)	To be determined	Unfunded	To be determined

Status of Asset Management and plans for improvement

Calgary Transit plans to continue aligning various areas of risk with asset management and service planning objectives and strategies. Areas for alignment include reliability-centered maintenance, criticality assessments, key performance indicators, states of good repair, technical and customer levels of service, lifecycle planning and budget constraint sensitivity.

Calgary Transit's continuous improvement plan consists of various techniques including engagement with subject matter experts, research and innovation, best practice adoption and periodic asset management practice reviews using assessment tool methodology, asset management planning and prioritization strategies based on periodic analysis.

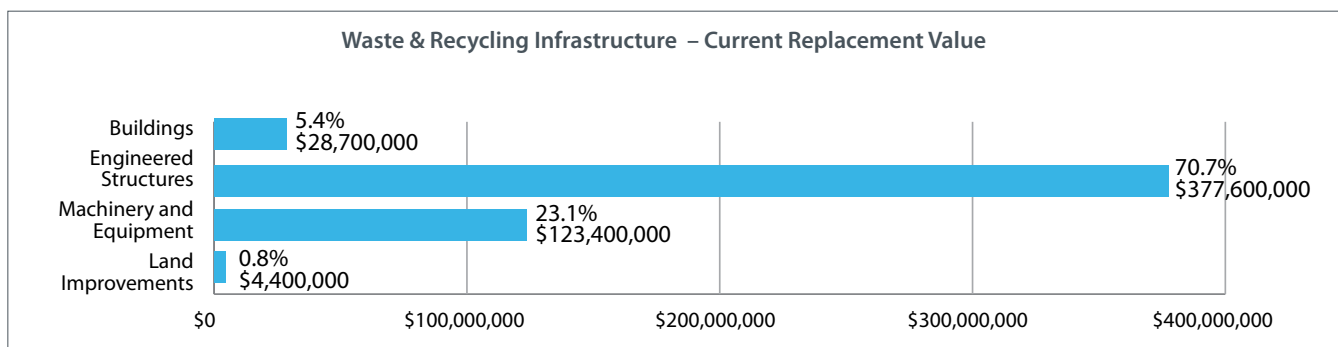


4.10 Waste & Recycling Infrastructure

Current Replacement Value	Overall Condition	Condition Trend	Risk
\$534.1M	1.5/ 5		3.0 / 25
Proposed 10-year Budget			
Current: \$214.3M		Gap: N/A rate funded	

Statement of Service

Waste & Recycling Services (WRS) collects waste, manages landfills, operates waste diversion programs and facilities for waste generators and haulers in Calgary and region.

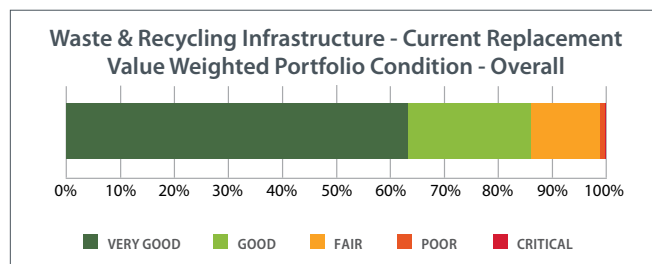


Current Replacement Value

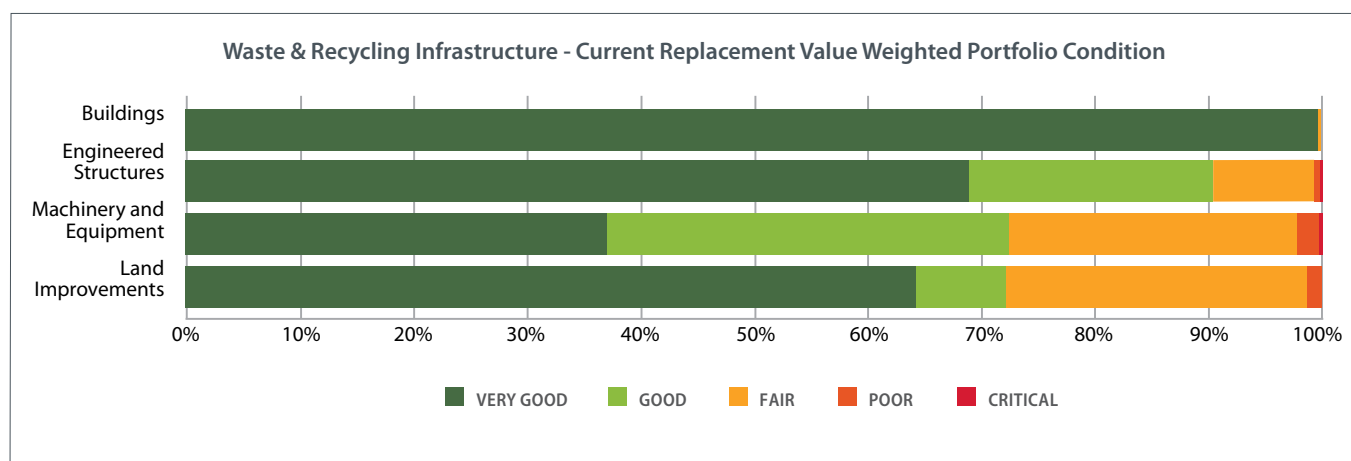
The total current replacement value (CRV) for Waste & Recycling Infrastructure assets is \$534.1M and the distribution between the different asset classes is shown in the above graph. This represents 0.5 per cent of The City's total asset replacement value. This has risen by approximately \$215M since the 2017 CAMP (Corporate Asset Management Plan).

Current Condition of Infrastructure

The overall condition profile for Waste & Recycling is provided below:



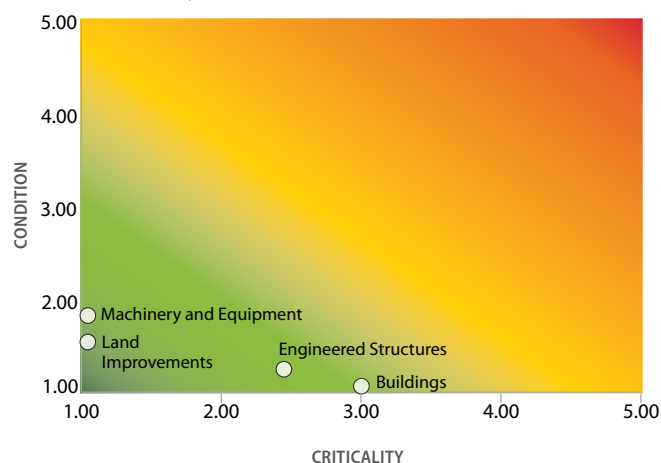
These assets are further broken down by subsystem



86.5 per cent of the asset class is in in Very Good to Good condition with only 0.8 per cent in Poor to Critical condition, translating to a current replacement value of \$4.3M. The assets of greatest concern are the million residential carts within Machinery and Equipment. A recent cart lifecycle strategy review is predicting steep increases in annual maintenance and operating costs, due to an aging population of carts breaking more frequently, along with recent increases in cart and transportation costs.

Bins within Machinery and Equipment is another area of concern. Bins have 30 per cent of assets in Poor to Critical condition representing a current replacement value of \$2.6M, although they are often refurbished several times within Waste & Recycling Services before they are finally recycled and replaced.

Asset Criticality and Risk



By implementing the Integrated Risk Management (IRM) processes, Waste & Recycling Services has been proactive in identifying and managing risks. In terms of the risks impacting infrastructure, the Waste & Recycling Services business unit's

risk register features a dedicated risk category of "asset". This category covers risks that are both strategic (e.g. planning and delivering assets to meet growth demands) as well as specific to an asset class (e.g. managing landfill leachate). Key infrastructure risk themes tracked on the Waste & Recycling Services risk register are as follows.

- Evolving regulatory environment, e.g. more stringent requirements driven by greenhouse gas emissions and climate change considerations.
- Financial challenges, e.g. cart costs are increasing roughly 25 per cent, state of economy and competition from commercial enterprises.
- Customer expectations, e.g. level of service and effectiveness of waste diversion initiatives.
- Asset lifecycle maintenance and renewal, e.g. better asset information and decision processes
- Extreme weather and natural disasters, e.g. severe floods, and snow events.
- Safety, e.g. dangers to employees and the public.

Waste & Recycling Services has previously undertaken a pilot exercise to implement Integrated Infrastructure Risk Management Framework methods on leachate, liners, and gas collections systems. These groups of assets have the highest infrastructure risk for Waste & Recycling Services. The pilot implementation involved applying risk-centric methodologies at various stages of infrastructure planning and management processes. The knowledge outcomes from this exercise informed: (i) the business unit and department level Integrated Risk Management analyses regarding infrastructure risks and (ii) the development and investment prioritization of the next Waste & Recycling Services Infrastructure Investment Plan (WRIP). Moving forward, the intent is to revisit the outcomes of this pilot exercise to better utilize the outcomes for infrastructure investment prioritization.

Customer Levels of Service

Buildings

Reliability: to be fit for purpose so as not to adversely affect engineered processes within the buildings now and in the future.

Engineered Structures

Safety and reliability: to support the achievement of all regulatory requirements and to be fit for purpose to not adversely affect process function.

Machinery & Equipment

Safety and reliability: to support the achievement of all regulatory requirements and to be fit for purpose to not adversely affect process function.

Land Improvements

Safety: Asset includes security fences to protect public and support the achievement of all regulatory requirements.

The Compost Facility Expansion project, once complete, will increase composting capacity to meet current and future needs of Calgarians. It will also significantly increase the life expectancy of the Waste Management Facilities.

Waste & Recycling Services reviews the customer satisfaction survey on an annual basis to review and validate customer levels of service.

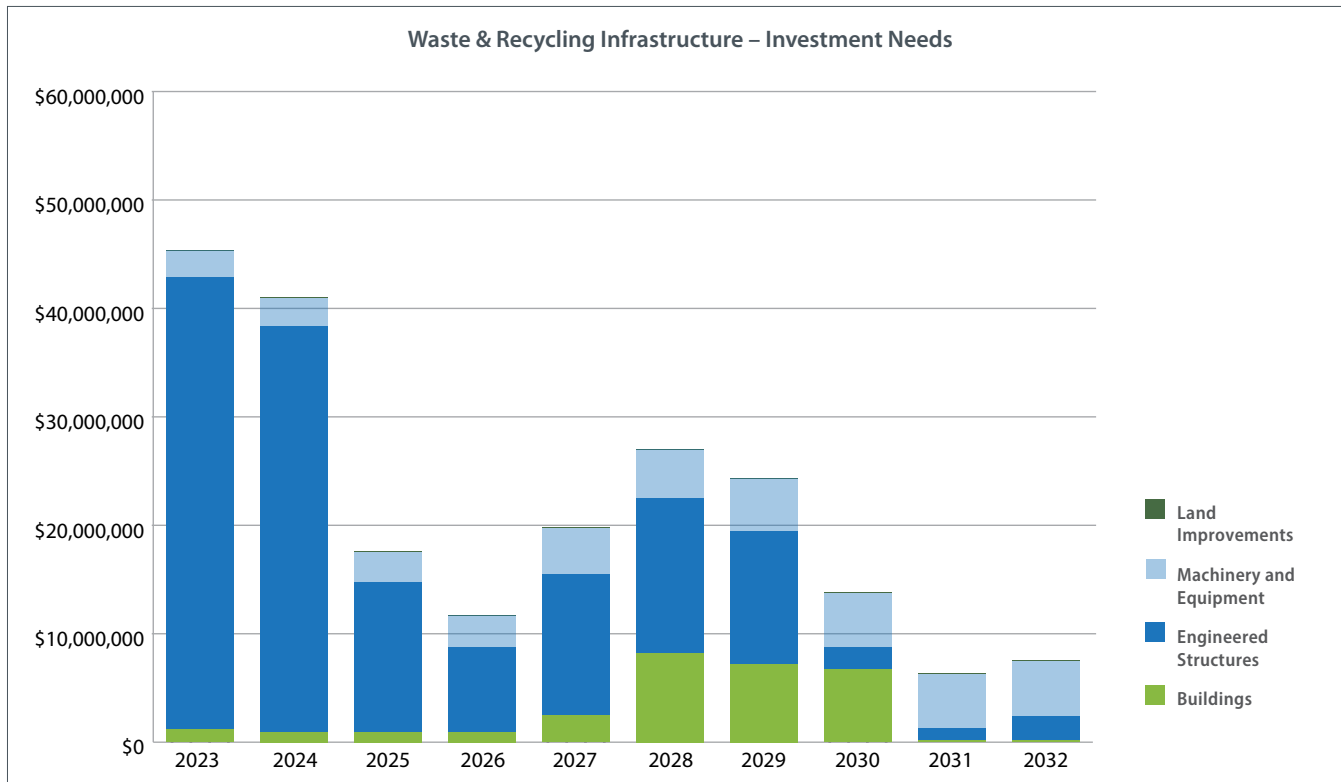
Technical Level of Service

	Service Target Status
Buildings	Green
Engineered Structures	Yellow
Machinery & Equipment	Yellow
Land Improvements	Yellow

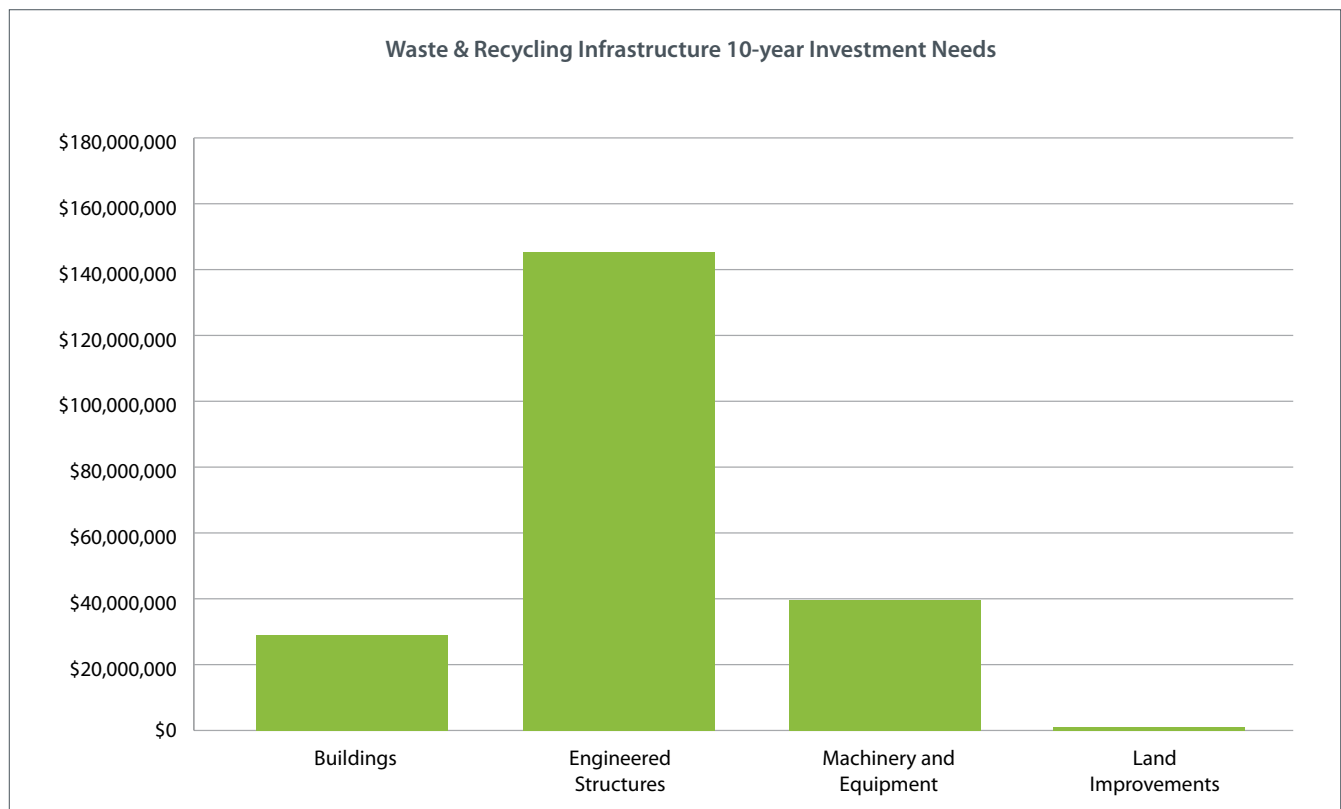
Currently all assets are achieving their regulatory targets. Buildings are meeting all targets. Engineered Structures are achieving all regulatory and demand targets. Each Engineered Structure subsystem has a minimum 95 per cent achievement rate and are expected to meet their intended operational useful life. Machinery & Equipment is an area of concern due to increasing cart capital and maintenance costs, and 30 per cent of bins are in Poor to Critical condition. However, through refurbishments many of these revenue generating bins continue to provide the intended service to Calgarians, well past the bins expected useful life. Land improvements consists of security fences and 98.7 per cent of the asset class is meeting its service level target.



Infrastructure Investment Needs



The Waste & Recycling Infrastructure investment need is shown in the graph above. No infrastructure gaps have been identified as the service line is self-funded. As seen in the graph below the engineered structures asset subsystem makes up the largest portion of funding requirements.



Future Condition of Infrastructure

Based on the investment required to meet proposed service targets, the trending condition for each asset category is shown below.

Asset Category	Condition Trend
Buildings	↔
Engineered Structures	↔
Machinery & Equipment	↓
Land Improvements	↔

Overall Waste & Recycling Services's asset conditions are relatively stable. The exception is the carts which are aging and will experience increasing failure and repair rates. This has been identified as a risk and will require significant capital and operating expenditures to maintain the current cart service.

Waste & Recycling Services has put in place programs and resources to routinely assess the performance and condition of its assets. The scope and frequency of the performance/condition assessments of many of Waste & Recycling Services' assets, particularly the ones used for environmental monitoring and control, is heavily dictated by regulatory requirements.

Specific Climate Change Targets and Investments

157,901 tonnes of CO _{2e}	33.4% of City of Calgary emissions	2020 Energy Cost: \$8.2M
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*emissions are based on most recently available data set 2020

Landfill gas and composting emissions are the largest contributors to corporate emissions, at approximately 33 per cent. These emissions are produced by decomposition of organic waste (primarily food and yard waste) to produce methane, a potent greenhouse gas. Unlike other, more direct types of corporate emissions, landfill gas is caused by the consumption and disposal behaviours of Calgarians and is emitted over the course of decades. This means that The City stewards these emissions for the lifetime of its waste management facilities, and they create a future liability for The City.

The City can further reduce landfill gas emissions by enabling Calgarians to reduce the amount of organic waste that is disposed in black carts / landfills and by expanding collection systems to increase the volume of landfill gas destroyed or converted to useable biogas or electricity.

The Waste and Recycling Services business unit has identified the following climate projects:

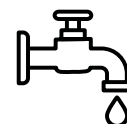
Project	Status
Landfill Gas Collection Expansion Projects on both Active and Closed Sites	Ongoing
Landfill Gas to Energy Project at East Calgary Waste Management Facility	Ongoing
Compost Facility Expansion Project at Shepard Waste Management Facility	Ongoing

Status of Asset Management and plans for improvement

Key ongoing asset management improvement projects are briefly described as follows.

- Asset Management Continuous Improvement initiatives to increase Work Order/Asset Management System Infor EAM (Enterprise Asset Management) Functionality, by implementing Preventative Maintenance Work Order capabilities and improved Waste & Recycling Services processes.
- Better documented Roles and Responsibilities RACI (responsible, accountable, consulted, informed) charts for Disposal Processing Services (DPS).
- Creation of Disposal Processing Services specific work instructions.
- Creation and delivery of improved Infor EAM (Enterprise Asset Management) and Work Management Training.
- Creation of an improved Infor Data Standard.
- Building on success from the Cart Lifecycle Strategy, further improve Waste & Recycling Services analysis capabilities for asset management decisions.
- Alignment of Waste & Recycling Services Infor EAM (Enterprise Asset Management) Asset Hierarchy to the Waste & Recycling Services Financial Model.
- Work with Application Support to get better reporting functionality out of Infor EAM (Enterprise Asset Management), specifically around cart inventory and maintenance reports.
- Utilizing the insights learned from the pilot implementation of Integrated Infrastructure Risk Management Framework, it is expected that the application of risk-based methods will be expanded to further asset groups.
- Working with PowerPlan to improve cost forecasting capabilities, and data quality.





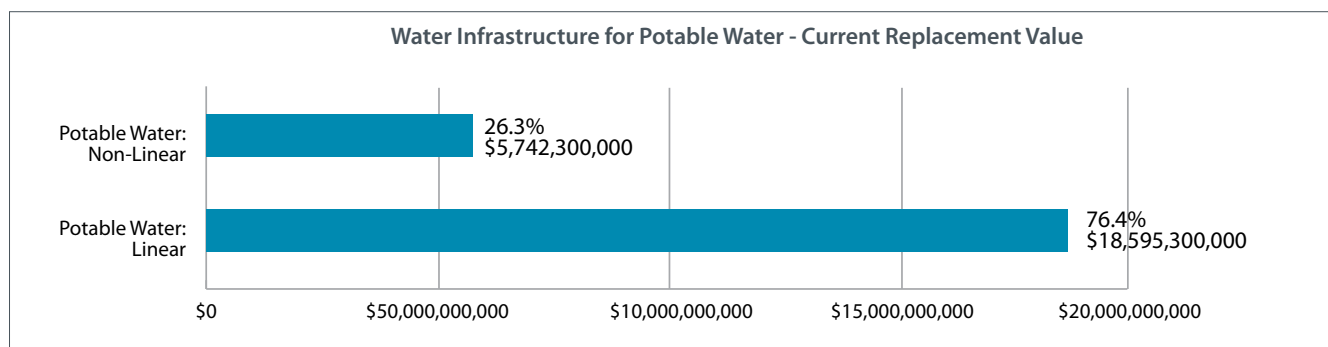
4.11 Water Infrastructure for Potable Water

Current Replacement Value	Overall Condition	Condition Trend	Risk
\$24.338B	1.5 / 5		5.2 / 25
Proposed 10-year Budget			
Not Available		Not Available	

Statement of service

The Water Infrastructure for Potable Water service line works to ensure all Calgarians have a safe and reliable supply of drinking water. Calgary's water treatment plants operate 24 hours a day, 365 days a year.

Current Replacement Value

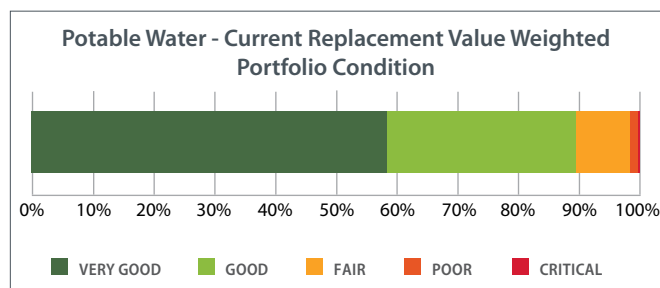


Current Replacement Value

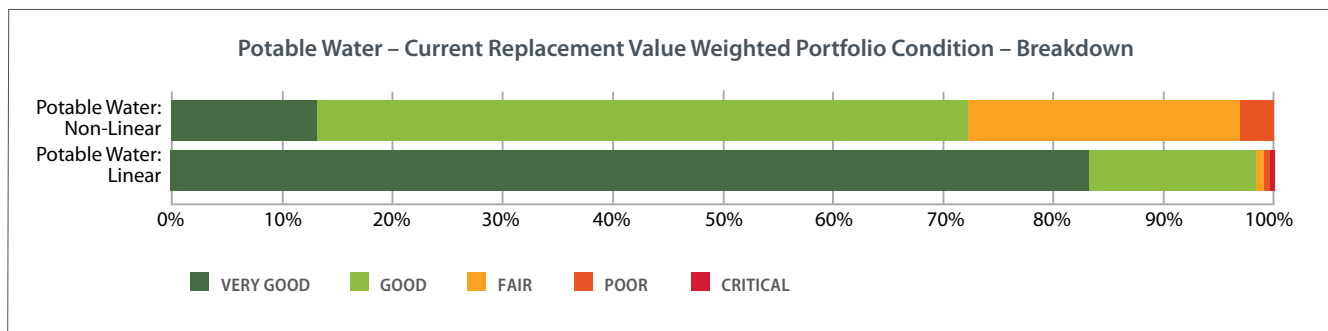
The total current replacement value (CRV) for Water Infrastructure for Potable Water assets is \$24.34B, the distribution between the different asset sub systems is shown in the above graph. This represents 24.3 per cent of The City's total asset replacement value. This has risen by approximately \$2.02B (from \$22.32B to \$24.34B) since the 2017 CAMP (Corporate Asset Management Plan).

Current Condition of Infrastructure

The overall condition profile for the Water Infrastructure for Potable Water service line, with condition information available (\$16.0B of \$24.3B), is provided below:

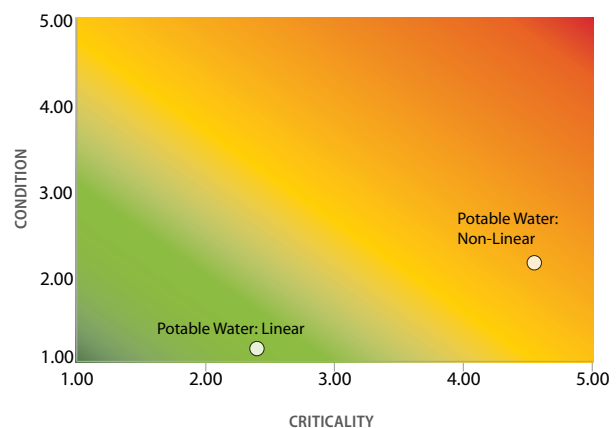


These assets are further broken down by subsystem



The overall condition of the asset class is in Very Good to Good condition with approximately 1.5 per cent in Poor to Critical condition. Although this is a small percentage, this is one of The City’s larger service lines translating the 1.4 per cent to a Current Replacement Value of \$223.3M. An additional \$1.45B is in Fair condition and long-term planning and asset monitoring is needed as the infrastructure deteriorates over time.

Asset Criticality and Risk



*Note: condition information is only available for \$10.2B of the \$18.6B in linear assets. The remaining \$8.4B have been excluded.

Water Infrastructure for Potable Water: Summary of significant risks, impacts and mitigation

Theme	Risks	Impact to service levels	Mitigation
Capacity	Increasing risk of interruption to water supply as a result of a growing city and aging water treatment plants that may not have enough plant capacity or redundancy to meet growing water demand.	Reliability: Properties and businesses impacted by interruption to water service.	Investments to ensure adequate level of servicing and reliability of our existing infrastructure to support existing customers and growth. More investment improving Glenmore Water Treatment Plant Reliability, and upgrades to aging infrastructure at the plant.
Customer perception of quality	There is a risk that we don’t meet customer expectations about water that is safe to drink from the tap and aesthetically pleasing. Climate change resulting in warmer water temperatures in the Glenmore reservoir leading to ‘taste and odour’ events in recent years.	Quality: Regulations met for treated drinking water. Quality: My water is aesthetically pleasing. Environment: Quality of our source water meets Calgary’s needs now and, in the future.	Investments to progress the Lead Replacement program. Investments to bring Fluoride infrastructure online. Strategies to build our understanding around service risks to water quality including – water tap sampling program, Glenmore reservoir stormwater sampling program. This will guide future investment decisions.
Climate Change/ Drought Resiliency	Climate change will result in there being less water when we need it during peak water use months.	Environment: Total population Calgary can provide water to on a peak day.	Investments may be required for water loss and to deliver on an Advance Meter Strategy. These investments will have long term water efficiency benefits, and have implications on plant expansion decisions.

It is within the Water Service team’s mandate to oversee service risks and issues to establish risk tolerance and align priorities to mitigating measures. Over the next 4 years, Water will aim to improve practices with Service Teams to align risk conversations to the customer value and customer level of service and implications. Targeted outcomes include:

- Defining service risk.
- Defining residual risk associated with the capital investment plan, and determining if risk levels are tolerable.
- Ensure required strategies and/or operating investments (levers) are in service of risk mitigation.
- Establishing measures to monitor progress.

Customer Levels of Service

Water has been focusing efforts on identifying, developing and measuring the Customer Levels of Service and Technical Levels of Service for the Water line of service. The Levels of Service helps identify key service risks that impact the ability to meet the Levels of Service. Once Levels of Service have been established, Water plans to revisit the Technical Asset Management Plans and will include risk mitigation strategies.

Potable Water – Linear/Non-Linear
Reliability, Quality and Environmental Sustainability: provide access to drinking water now and for generations to come. This service treats and delivers water to customers, ensuring reliability and availability.

Water actively engages customers to inform and validate Levels of Service with a focus on residential customers. Customer value focus groups have helped to surface customer values in relation to Water’s services (Q4, 2019) and informed a quantitative survey through The City’s online research panel (Q4, 2020) where Water explored customers’ priorities and general expectations in relation to the Levels of Service Water provides. The insights gathered enabled the identification of Customer Levels of Service measures, and considers how well aligned current Customer Levels of Service performance is to customer expectations. Going forward, a formal insights strategy driven by needs of the business and changing expectations (trends) will support deeper exploration of customer expectations, willingness to pay, trade-offs and understanding the needs of different customer groups and will continue to inform Levels of Service.

Technical Level of Service

	Service Target Status
Potable Water – Linear	
Potable Water – Non-linear	

Although not all Potable Water – Linear assets are meeting their service targets, the target success rate is very high with at least a 99 per cent service target success rate for asset subsystems.

Infrastructure Investment Needs

Water Infrastructure for Potable Water is self-funded and budgetary information has not been included in the CAMP.

Primary Drivers for investment include:

1. Reliability
2. Water Quality
3. Environment / Sustainability

Investment Priorities Include:

- Ensuring reliable service delivery to a growing city (North Calgary Water Services Alternative, South 1 Feeder main redundancy and failure mitigation, Glenmore Water Treatment Plant upgrades).
- Water quality related programs to ensure safe drinking water, including lead replacement program, dead end main retrofits and taste and odour management.
- Ensuring water now and into the future. Investments may be required for water loss and to deliver on Advanced Meter Strategy. These investments will have long term efficiency benefits, and have implications on plant expansion decisions.
- Ensuring future service reliability – in the next cycle critical decisions will be made on approach to building plant capacity and sequencing of investments.

Future Condition of Infrastructure

Asset Category	Condition Trend
Potable Water – Linear	↔
Potable Water – Non-linear	↔

Overall, the condition of the asset portfolio is expected to remain stable based on the current key performance metrics. For Water Infrastructure for Potable Water assets there is extensive knowledge and advanced Asset Management practices. Water understands the condition of the assets and can correlate the appropriate amount of investment to maintain the condition of this service line.



Specific Climate Change Targets and Investments

82,024 tonnes of CO _{2e}	17.4% of City of Calgary emissions	2020 energy costs: \$33.5M
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*emissions are based on most recently available data set 2020
*emissions are for all Water service lines. Breakdown into Potable Water, stormwater and wastewater is not currently available.

Water has actively participated and supported the review and approval of Water’s Climate Change Strategy which was approved and published Q4 2021. This strategy formalizes Water’s climate change goals, actions and indicators while also providing City staff with a direct connection to the Climate Resilience Strategy.

Water is currently participating in the next phase of climate change planning which includes the development and finalization of Water’s Climate Change Action Plan. This plan will formalize the work that will be done in the next year to support climate action, determine priority actions to be highlighted and set a trajectory for action and funding in the next 4-year service plan.

Status of Asset Management and Plans for Improvement

The Water Infrastructure for Potable Water is Water’s most mature service line with respect to asset management. Water’s technical Asset Management Plans include a section that captures the continuous improvement plan and how Water plans to improve Asset Management practices.

	Project	Cost (\$000)	Funded / Unfunded	Year (confirmed / targeted)
1	Incorporate climate change considerations in a dam safety tool/program.	100	Unfunded	2024
2	Incorporate climate change considerations in a river asset management tool.	100	Unfunded	2024
3	Continue to factor uncertainty into scalable flood protection assets.		Funded	underway
4	Create an asset management plan to inform decision making and address climate vulnerabilities for grey green and natural stormwater infrastructure.		Funded	2023
5	Continue to explore how climate change will impact raw/treated water throughout the distribution system.		Funded	underway
6	Continue to consider climate change impacts on our water treatment systems as we design and upgrade our water treatment infrastructure.		Funded	Underway





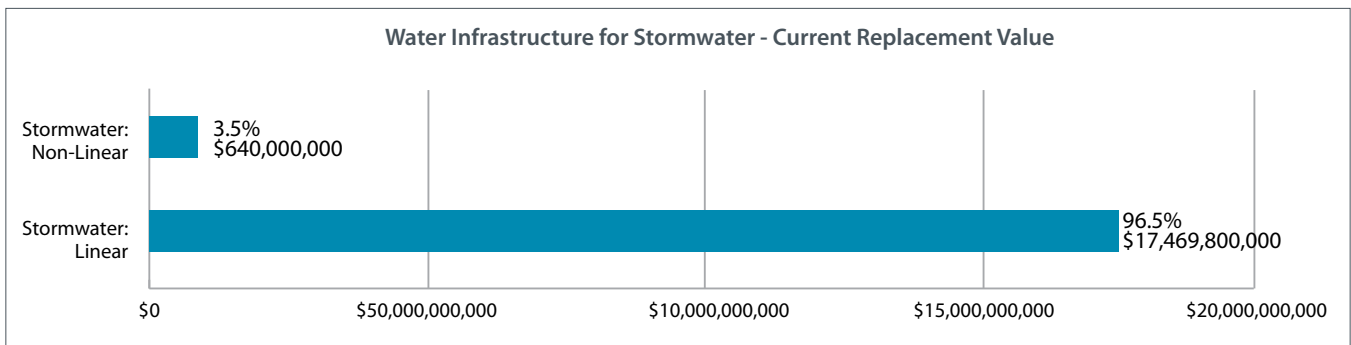
4.12 Water Infrastructure for Stormwater

Current Replacement Value	Overall Condition	Condition Trend	Risk
\$18.110B	1.5 / 5		3.7 / 25
Proposed 10-year Budget			
Not Available		Not Available	

Statement of service

The Water Infrastructure for Stormwater service line reduces the impact of flooding, pollution and stream erosion. These assets improve the quality and decrease the volume of stormwater entering Calgary's waterways.

Current Replacement Value

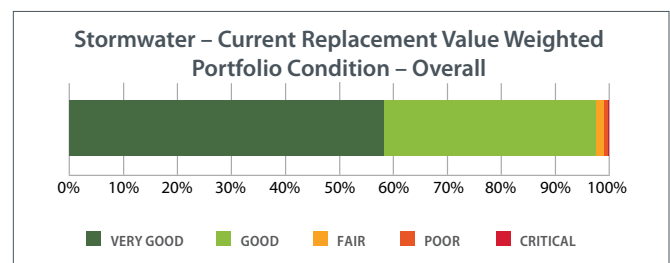


Current Replacement Value

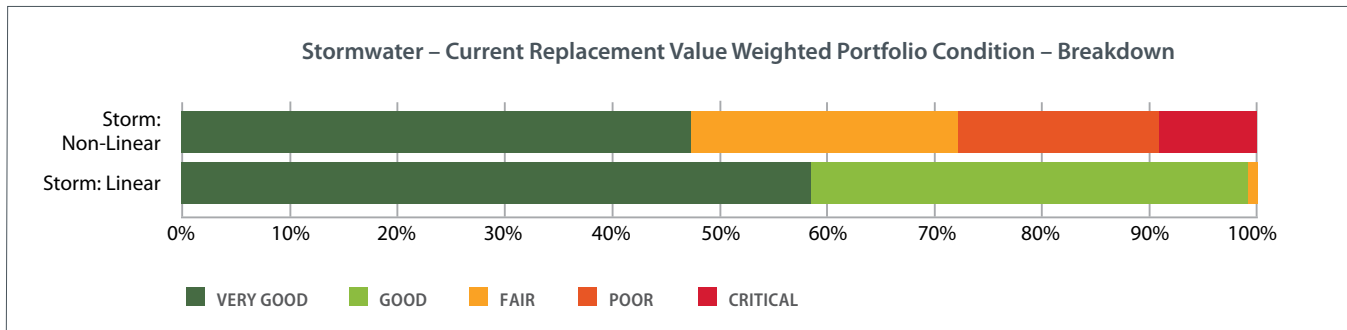
The total current replacement value (CRV) for Water Infrastructure for Stormwater assets is \$18.11B, with the distribution between the different asset subsystems shown in the graph above. This represents 18.1 per cent of The City's total asset replacement value. This has risen by approximately \$5.33B since the 2017 CAMP (Corporate Asset Management Plan).

Current Condition of Infrastructure

The overall condition profile for the Water Infrastructure for Stormwater service line is provided below:

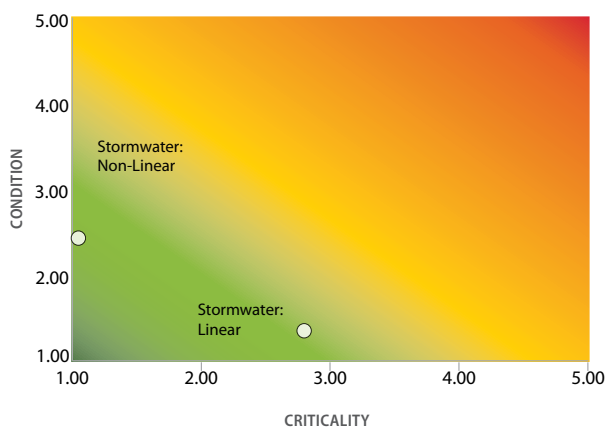


These assets are further broken down by subsystem



The Stormwater – Linear sub-system is in excellent shape with 99 per cent of assets in Very Good to Good condition. The Stormwater – Non-linear sub-system requires investment as 27 per cent is in Poor to Critical condition which translates to a \$173.1M Current Replacement Value. Another 27 per cent or \$172.8M is in Fair condition and needs to be monitored as the infrastructure deteriorates over time.

Asset Criticality and Risk



It is within the Stormwater Service team’s mandate to oversee service risks and issues to establish risk tolerance and align priorities to mitigating measures. Over the next 4 years, Water will aim to improve practices with Service Teams across all service lines to align risk conversations to customer value and level of service. Targeted outcomes include:

- Defining service risk.
- Defining residual risk associated with the capital investment plan, and determining if risk levels are tolerable.
- Ensuring required strategies and/or operating investments (levers) are in service of risk mitigation.
- Establishing measures to monitor progress.



Water Infrastructure for Stormwater: Summary of significant risks, impacts and mitigation

Theme	Risks	Impact to service levels	Mitigation
River Water Quality	There is an environmental risk to stormwater quality entering the Bow and Elbow rivers as the city continues to grow. If untreated, stormwater can carry suspended solids and contaminants to our river bodies.	Environment: Stormwater quality entering the Bow river.	Stormwater management and treatment investments in new communities and to support re-development growth.
Storm Ponds	There is a risk that the design purpose of storm ponds and customer expectations relating to perceived amenity value is leading to increased public safety incidents i.e. skating activities.	Safety/Responsiveness: Public safety incidents related to the stormwater system.	Investments in pond retrofits to meet safety needs.
	There is a reputation and operating risk that climate change leads to higher stormwater temperatures and increases incidents of algae and odour events.	Safety/Responsiveness: Nuisance complaints related to stormwater system.	There is an opportunity to align safety retrofits to the pond condition assessments to prioritize multi-beneficial improvements (environmental, nuisance).
Impacts of Climate Change and Innovation	Stormwater is a growing line of service, facing service risks around climate change and implementing new types of green and natural infrastructure to manage stormwater quality and quantity. It is a goal within the Stormwater Strategy to maximize service value by providing infrastructure and services that meet customer needs.	Well run utility: I trust the fees I pay are used reasonably. Reduces Risk: Buildings and infrastructure at high risk of localized or river flooding.	Investments in aligned plans to improve the asset management and investment decision making for the Stormwater service. Asset Management plan for Stormwater Infrastructure Build integrated Stormwater infrastructure investment plan Condition assessment for Outfalls, Oil in grit and separator, Linear Green Stormwater infrastructure program

Customer Levels of Service

Water has been focusing efforts on identifying, developing and measuring the Customer Levels of Service and Technical Levels of Service for the stormwater line of service. The Levels of Service helps identify key service risks that impact the ability to meet the Levels of Service. Once Levels of Service have been established, Water plans to revisit the Technical Asset Management Plans and will include risk mitigation strategies.

Stormwater – Linear

Reliability: ensures drainage capacity from rainfall and snow melt now and for generations to come, ensuring full time reliability.

Stormwater – Non-linear

Reliability and quality: prevent flooding from rainfall now and for generations to come. This service treats stormwater to receiving waterbodies, ensuring quality runoff standards.

Water actively engages customers to inform and validate Levels of Service with a focus on residential customers. Customer value focus groups have helped to surface customer values in relation to Waters services (Q4, 2019) and informed a quantitative survey through The City's online research panel (Q4, 2020) where Water explored customers' priorities and general expectations in relation to the Levels of Service Water provides. The insights gathered enabled the identification of Customer Levels of Service measures, and considers how well aligned current Customer Levels of Service performance is to customer expectations. Going forward, a formal insights strategy driven by needs of the business and changing expectations (trends) will support deeper exploration of customer expectations, willingness to pay, trade-offs and understanding the needs of different customer groups and will continue to inform Customer Levels of Service.

Technical Level of Service

	Service Target Status
Stormwater – Linear	
Stormwater – Non-linear	

Linear stormwater assets are achieving relatively high levels of service. 95 per cent of pump stations and stormwater pipes with diameters under 1500mm are achieving their service targets, while 90 per cent of stormwater pipes with diameters greater than 1500mm are achieving their service targets. Non-linear assets are meeting 100 per cent of their discharge rate and volume targets and 85 per cent are meeting their pollution targets.

Infrastructure Investment Needs

Water Infrastructure for Stormwater is self-funded and budgetary information has not been included in the CAMP.

Primary Drivers for investment include:

- Safety
- Growth
- Asset Management planning for improved decision making

Investment Priorities Include:

- Pond safety retrofits to meet requirements identified from hazard assessments and reduce number of public safety incidents related to the stormwater system. Align safety retrofits to condition assessments to prioritize.
- Growth projects related to Council approved new communities or in support of re-development: to protect stormwater quality entering the river systems.
- Aligned plans to improve asset management and investment decision making for the S.W. line of Service to improve Service Value for customers. (Asset management plan, Integrated Stormwater Infrastructure investment plan, Condition assessments, Green Stormwater Infrastructure)

- Maintain (same level) investments to reduce risk of localized and river flooding, with a lens on understanding the right level of investment to adapt to a changing climate. Continue to leverage external funding opportunities

Future Condition of Infrastructure

Asset Category	Condition Trend
Stormwater – Linear	
Stormwater – Non-linear	

Overall, the condition of the asset portfolio is expected to remain stable based on the current key performance metrics.

Specific Climate Change Targets and Investments

82,024 tonnes of CO _{2e}	17.4% of City of Calgary emissions	2020 energy costs: \$33.5M
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*emissions are based on most recently available data set 2020

*emissions are for all Water service lines. Breakdown into Potable Water, stormwater and wastewater is not currently available.

Water has actively participated and supported the review and approval of Water's Climate Change Strategy which was approved and published Q4 2021. This strategy formalizes Water's climate change goals, actions and indicators while also providing City staff with a direct connection to the Climate Resilience Strategy.

Water is currently participating in the next phase of climate change planning which includes the development and finalization of Waters Climate Change Action Plan. This plan will formalize the work that will be done in the next year to support climate action, determine priority actions to be highlighted and set a trajectory for action and funding in the next 4-year service plan.

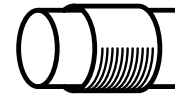
	Project	Cost (\$000)	Funded / Unfunded	Year (confirmed / targeted)
1.	Incorporate climate change considerations in a dam safety tool/program.	100	Unfunded	2024
2.	Continue to factor uncertainty into scalable flood protection assets.		Funded	underway
3.	Create an asset management plan to inform decision making and address climate vulnerabilities for grey green and natural stormwater infrastructure		Funded	2023
4.	Explore how climate change will impact sediment loading to storm ponds and how we can adapt our ponds to changing environmental conditions.	200	Unfunded	2024

Status of Asset Management and plans for improvement

Water's Stormwater infrastructure is younger in asset management maturity compared to Potable Water and Wastewater and requires different assessment and analysis tactics. This will be a focus area for Asset Management going forward. Water aims to improve asset management and investment decision making for the Stormwater line of service to improve Service Value for customers.



4.13 Water Infrastructure for Wastewater

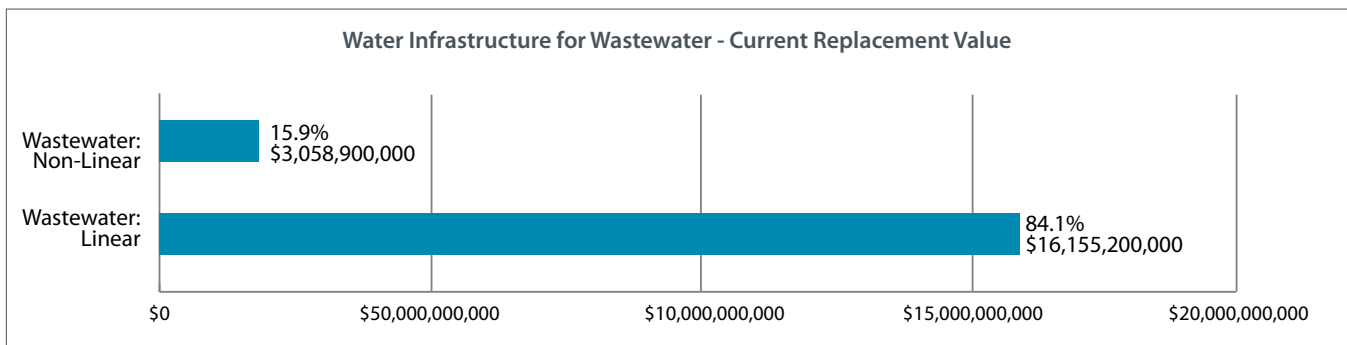


Current Replacement Value	Overall Condition	Condition Trend	Risk
\$19.214B	1.9 / 5		4.6 / 25
Proposed 10-year Budget			
Not Available		Not Available	

Statement of service

The Water Infrastructure for Wastewater service line works to collect, move and treat our wastewater through a series of processes before it is released as clean water into the Bow River.

Current Replacement Value

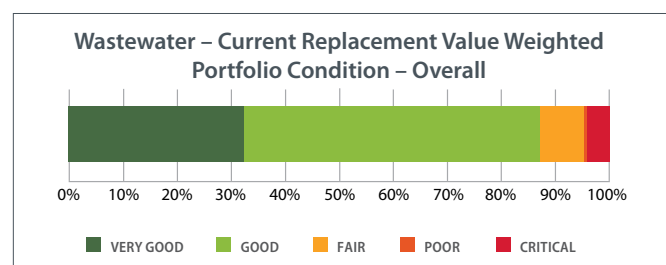


Current Replacement Value

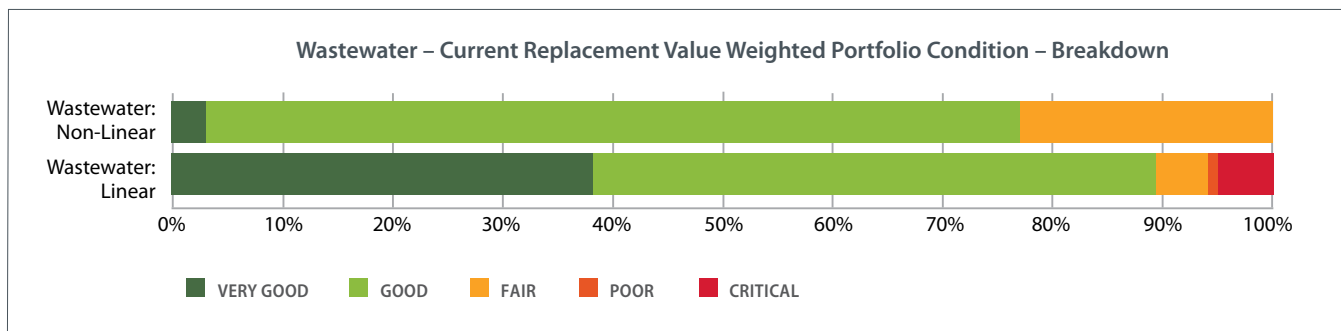
The total current replacement value (CRV) for Water Infrastructure for Wastewater assets is \$19.21B, and the distribution between the different asset sub systems is shown in the above graph. This represents 19.2 per cent of The City's total asset replacement value. This has risen by approximately \$1.98B since the 2017 CAMP (Corporate Asset Management Plan).

Current Condition of Infrastructure

The overall condition profile for the Water Infrastructure for Wastewater service line, where condition information is available (\$16.0B of \$24.3B), is provided below:

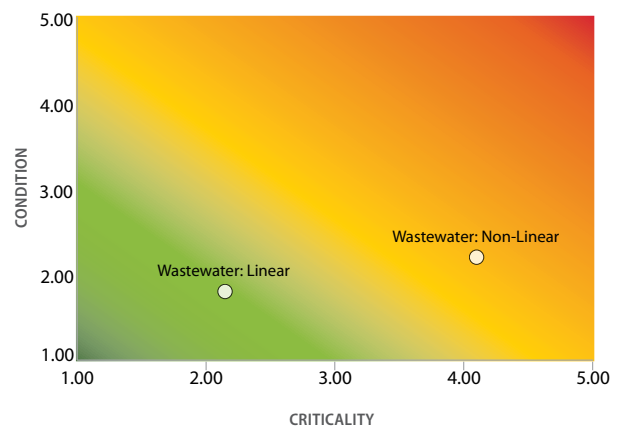


These assets are further broken down by subsystem



The overall condition of the asset class is in in Very Good to Good condition with roughly 4.6 per cent in Poor to Critical condition. Although this is a small percentage, this is one of The City’s larger service lines translating the 1.4 per cent to a Current Replacement Value of \$883.9M. An additional \$1.565B is in Fair condition and long-term planning and asset monitoring is needed as the infrastructure deteriorates over time.

Asset Criticality and Risk



Water Infrastructure for Wastewater: Summary of significant risks, impacts and mitigation

Theme	Risks	Impact to service levels	Mitigation
Service Interruption	Increasing risk of wastewater backups due to growth and aging infrastructure.	Properties impacted by interruption to wastewater service.	Increased investments to ensure adequate level of servicing for existing customers and growth .
			More investment in condition assessment activities to inform project prioritization.
Compliance with Regulations	There is a risk of being out of compliance with operating approval and Environmental Protection and Enhancement Act (EPEA) regulatory requirements.	Regulations met for treated wastewater returned to the river.	Increase investment to ensure 100 per cent compliance with regulations. Fish Creek Wastewater Treatment Plant (Plants): To ensure regulatory compliance (as currently planned in the Water Infrastructure Investment Plan.
	There is a risk of a sewage release to the environment, which is reportable to the Regulator and could result in environmental damage and regulatory actions.		Increase investment in struvite, centrate and supernatant treatment (Plants): to mitigate operational challenges & create capacity
	Climate change resulting in low river flows and river temperature impacting the standards needed to maintain quality to meet approval.		Increase preventative maintenance to reduce risk of pipe blockages and invest in capacity upgrades to accommodate growth.
			Increase understanding of potential impacts and additional investment in improved wastewater treatment infrastructure as required.

It is within the Service teams mandate to oversee service risks and issues to establish risk tolerance and align priorities to mitigating measures. Over the next 4 years, Water will aim to improve practices with Service Teams to align risk conversations to the customer value and customer level of service and implications. Targeted outcomes include:

- Defining service risk.
- Defining residual risk associated with the capital investment plan, and determining if risk levels are tolerable.
- Ensure required strategies and/or operating investments (levers) are in service of risk mitigation.
- Establishing measures to monitor progress.

Customer Levels of Service

Water has been focusing effort on identifying, developing and measuring the Customer Levels of Service and Technical Levels of Service for the water line of service. The Levels of Service help identify key service risks that impact the ability to meet the Levels of Service. Once Levels of Service have been established Water plans to revisit the Technical Asset Management Plans and will include risk mitigation strategies.

Wastewater – Linear
Reliability, Quality and Safety: collect, treat and return wastewater to the river. This service protects public health and our rivers by ensuring necessary investment is made in the pipes and people necessary to deliver this service.

Wastewater – Non-linear
Reliability, Quality and Safety: collect, treat and return wastewater to the river. This service protects public health and our rivers by ensuring necessary investment is made in the treatment plants and people necessary to deliver this service.

Water actively engages customers to inform and validate Levels of Service with a focus on residential customers. Customer value focus groups helped to surface customer values in relation to Waters services (Q4, 2019) and informed a quantitative survey through The City’s online research panel (Q4, 2020) where Water explored customers’ priorities and general expectations in relation to the Levels of Service Water provides. The insights gathered enabled the identification of Customer Levels of Service measures, and consider how well aligned current Customer Levels of Service performance is to customer expectations. Going forward, a formal insights strategy driven by needs of the business and changing expectations (trends) will support deeper exploration of customers’ expectations, willingness to pay, trade-offs and understanding the needs of different customer groups (Industrial, Commercial, Institutional for example) and will continue to inform Levels of Service.

Technical Level of Service

	Service Target Status
Wastewater – Linear	Not available
Wastewater – Non-linear	

100 per cent of wastewater non-linear assets are currently achieving their service level targets. Service target rates for wastewater linear assets are not currently available. Benchmarking the performance of these assets will be worked on in the future.

Infrastructure Investment Needs

Water Infrastructure for Wastewater is self-funded and budgetary information has not been included in the .

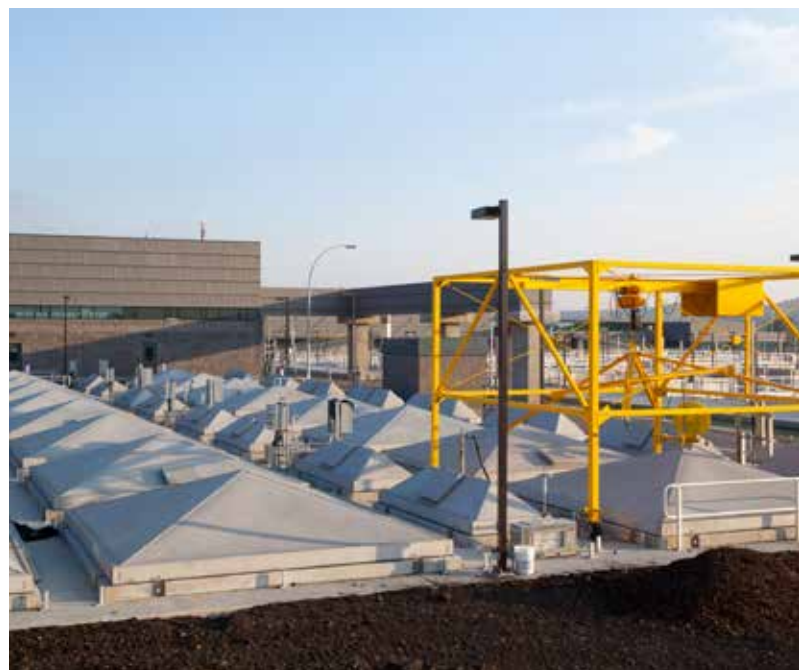
Water has been attempting to improve how investments are connected to advancing Levels of Service and by addressing service risks.

Primary Drivers for investment include:

1. Environment - Remaining compliant with regulations
2. Safety – zero tolerance for loss of life
3. Reliability – maintain ‘essential’ service levels for our customers

Investment Priorities Include:

- Fish Creek Wastewater Treatment Plant : To ensure regulatory compliance (as currently planned in the Water Infrastructure Investment Plan)
- Capital upgrades (Linear): More investments to ensure adequate level of servicing for existing customers and growth
- Condition assessments (linear): More investment to inform targeted investments
- Struvite, centrate and supernatant treatment (plants): to mitigate operational challenges and create capacity



Future Condition of Infrastructure

Asset Category	Condition Trend
Wastewater – Linear	
Wastewater – Non-linear	

Overall, the condition of the asset portfolio is expected to remain stable based on the current key performance metrics.

Specific Climate Change Targets and Investments

82,024 tonnes of CO _{2e}	17.4% of City of Calgary emissions	2020 energy costs: \$33.5M
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*emissions are based on most recently available data set 2020

*emissions are for all Water service lines. Breakdown into Potable Water, stormwater and wastewater is not currently available.

Water has actively participated and supported the review and approval of Water’s Climate Change Strategy which was approved and published Q4 2021. This strategy formalizes Water’s climate change goals, actions and indicators while also providing City staff with a direct connection to the Climate Resilience Strategy.

Water is currently participating in the next phase of climate change planning which includes the development and finalization of Waters Climate Change Action Plan. This plan will formalize the work that will be done in the next year to support climate action, determine priority actions to be highlighted and set a trajectory for action and funding in the next 4-year service plan.

	Project	Cost (\$000)	Funded / Unfunded	Year (confirmed / targeted)
1	Incorporate climate change considerations in a dam safety tool/program.	100	Unfunded	2024
2	Incorporate climate change considerations in a river asset management tool.	100	Unfunded	2024
3	Continue to factor uncertainty into scalable flood protection assets.		Funded	underway
4	Create an asset management plan to inform decision making and address climate vulnerabilities for grey green and natural stormwater infrastructure		Funded	2023
5	Continue to explore how climate change will impact raw/treated water throughout the distribution system.		Funded	underway
6	Continue to consider climate change impacts on our water treatment systems as we design and upgrade our water treatment infrastructure.		Funded	Underway

Status of Asset Management and Plans for Improvement

The Water Infrastructure for Wastewater service line requires improved asset management maturity to match that of the Water Infrastructure for Potable Water service line. Condition assessment efforts on wastewater treatment plant assets will continue to be worked on.

5 Asset Management Practices and Improvement Strategies

5.1 Corporate Realignment

The City is in the process of a significant corporate re-alignment to modernize the organization as part of its Rethink to Thrive strategy. The re-alignment has the potential to reconfigure the structure of the various groups responsible for managing The City's different assets. The exact impact is unclear at this time, but it is believed that the realignment will improve the centralization of asset management across the corporation. This in turn will allow The City to improve the Asset Management maturity for some of the less resourced service lines.

5.2 Asset Management Practices

Adoption, development, and continual improvement of asset management practices is a key strategy for The City to meet service delivery targets. The City initiated the formal practice of asset management in 2004 and recognized that it would require several business cycles to establish a mature program. Since 2004, The City has been building asset management capability and a culture of continuous improvement to better align with ISO (International Organization for Standardization) 55000 standards.

The importance of asset management is well understood across the corporation. One of the challenges The City continues to experience is in part due to the size of the portfolio. The \$100.4B in assets requires an extensive network of Asset Management professionals regularly monitoring and updating their Asset Management data and practices. A lack of human resources dedicated solely to Asset Management has prevented a consistent evolution of Asset Management maturity across the various service lines. This causes reporting challenges due to inconsistencies and gaps in data. It is anticipated that the corporate re-alignment, referenced above, will help bridge the gap with some of these inconsistencies by creating a more centralized Asset Management network.

The City's Asset Management Framework is founded on the Plan, Do, Check, Act Model (The "Deming" Cycle), i.e.:

- Plan: Policy, Strategy, Objectives, and Plans.
- Do: Asset Management Enablers and Controls, Implementation of Asset Management Plans.
- Check: Management Review and Performance Assessment.
- Act: Improvement Planning and Implementation.

This CAMP (Corporate Asset Management Plan) document and the service line Asset Management Plans are naturally focused on the Plan stage of the cycle, together with

identification of the work to be executed during the Do stage, including both investment activities (operating expenditures and capital expenditures) and asset management improvement activities. The effective and efficient execution of the plan and the mechanisms for monitoring and control during the Do, Check and Act stages of the cycle are equally important to successful delivery and, consequently, the achievement of corporate objectives.

Following corporate level approval and funding provisions for the investment activities and improvement plans at the Plan stage, the primary responsibility for delivery sits with the individual service lines. However, an appropriate level of corporate governance and oversight must be maintained throughout the cycle to provide the required co-ordination, monitoring and control to keep both the investment activities and improvement plan activities on target to deliver against Council Directives and long-term organizational objectives.

5.3 Corporate Practice Improvement Strategies

Service line owners have identified the status of their Asset Management program and plans for improvement in Section 4. Common areas for corporate and service line improvement have been identified during the development of the 2022 CAMP including:

- Overall improvement in Asset Management maturity
- Improved consistency in data quality across different service lines
- More accurate asset repository and inventory counts
- Improved condition and criticality information resulting in improved risk calculations
- Improved risk management
- Better alignment with the budgeting process
- Improved budgeting and infrastructure gap data quality
- Better understanding of budgetary requirements for utility-rate funded assets
- Priority investment in critical infrastructure
- More clearly defined level of service targets
- More closely connecting budget with Levels of Service outcomes
- Improve lifecycle approach to Asset Management including early spending to save long term
- Innovation and investment in new technologies
- Alternative service delivery
- Pursuit of alternative funding opportunities

5.4 Asset Management Policy Update

The City's Asset Management Policy is being updated this year to better align with the corporate re-alignment organizational structure as well as the ISO55000 standard that is the benchmark for asset management. The updated policy will also help to solidify the practice of asset management across the corporation, particularly related to governance and compliance.

5.6 Responding to Market Trends

The Corporate Asset Management Plan is an evolving document that needs to be adjusted as conditions change. The CAMP is developed based on assumptions regarding the political, economic, environmental, and social landscape. Changes in these environments and associated assumptions could have a significant impact on the delivery of this plan and may require substantial re-planning efforts, adjustments to priorities and modifications to the required levels of funding. Some of the identified market trends that could impact the political, economic, environmental, and social assumptions include:

Market Trend	Description
Climate Change	Climate change is considered throughout the CAMP, but the exact impacts and regulatory requirements are evolving and unknown.
Growth forecasts and densification	Growth forecasts are closely tied to the economy. Calgary has experienced many economic uncertainties over the past 10 years and it is expected this will continue into the future. Calgary's densification rate compared to growth on the outer city limits will also have a significant impact on the locations to focus infrastructure investment.
Inflation and cost uncertainties	At the time of this report Calgary, and Canada in general, are experiencing high inflation rates. This is impacting material costs, fuel costs and labour costs. Identified infrastructure gaps could increase exponentially if the market continues to experience this level of inflation
Funding source uncertainties	Over the past ten years, Calgary has experienced a significant decline in the property value of its downtown core, a significant source of property taxes. This has led to various challenges with respect to tax revenue generated. Provincial and Federal contributions also have the potential to fluctuate which can create various challenges.
COVID-19	Short and long-term impacts from COVID-19 are still largely unknown. Some of these impacts could have significant impacts on long-term asset management planning. An example is the shift to telework which could have significant impacts on user demand for public transit and required office space.

Appendix A: Levels of Service

Buildings

Year	Total # of Buildings Facility Management Manages	# of Buildings Meeting Levels of Service Standard (built or renovated in the last 20 years)	% of Buildings Meeting Levels of Service Standard (built or renovated in the last 20 years)	Total Current Replacement Value of Buildings Facility Management Manages	Current Replacement Value of Buildings Meeting Levels of Service Standard (built or renovated in the last 20 years)	% of Total Current Replacement Value of Buildings Meeting Levels of Service Standard (built or renovated in the last 20 years)
Today(2022)	558	176	32%	\$ 2,685,721,955.17	\$ 731,566,025.13	27%
2032	538	165	31%	\$ 2,589,459,519.50	\$ 843,137,065.51	33%

Fire & Emergency Response

Machinery and Equipment					
Service Objectives: To purchase, maintain and decommission the correct aquatic, fire, and technical rescue equipment and Personal Protective Equipment for the Calgary Fire Department to ensure all divisions can meet their service targets.					
	% of Assets Meeting Service Targets				
Service Target	Aquatic Equipment	Fire Equipment	Technical Rescue Equipment	Aquatic Personal Protective Equipment	Fire Personal Protective Equipment
To always have the correct equipment and Personal Protective Equipment available for response and training.	95.0%	100.0%	100.0%	95.0%	100.0%

Vehicles	
Service Objectives: To purchase, commission, maintain and decommission the correct fire apparatus that is assigned to a station. Helping operations meet their service objectives.	
	% of Assets Meeting Service Targets
Service Target	Target is to always have an available apparatus in station ready to respond to emergencies
Aerial	100.0%
Boat	100.0%
Car	100.0%
Quint	100.0%
Engine	100.0%
Hazmat	100.0%
Mobile Comm	93.0%
Railrat	100.0%
Rescue	100.0%
Sport Utility Vehicle	100.0%
Tanker	100.0%
Trailers	100.0%
Truck	100.0%
Air / Light	92.0%
Fire Prevention Van	100.0%
Hazmat Van	100.0%
Van	100.0%
Pod Trucks	100.0%
Technical Rescue Team	100.0%
FRP	92.0%
Bush Buggy	100.0%
Boat Tow	100.0%
Parkade	99.0%
MRU	100.0%
DC Vans	100.0%
Chief Cars	100.0%
Panel	100.0%
Aquatics	92.0%
Fan	100.0%
Special Events	100.0%
Driver Trainer	100.0%
ATV/ UTV	100.0%
Sweepers	100.0%

IT Solutions and Support

IT Solutions and Support

Service Objectives: This service provides the technology, devices and infrastructure that underpins the delivery of all technology solutions for The City. This service develops and maintains both corporate-wide and line-of-business applications and improves and automates business processes to enable City business units to deliver internal and citizen-facing services.

Data Centre Hardware & Software

Service Target	% of Assets Meeting Service Targets
Keep the same level as current.	100.0%
1 min down time/server/month.	100.0%

Wireless Communication

Service Target	Wireless Towers	Wireless Software
	% of Assets Meeting Service Targets	
100% of assets are in Good to Fair condition over the next 10 years.	100.0%	N/A
100% of assets are in Very Good condition over the next 10 years.	N/A	100.0%

Enterprise Software

Service Target	% of Assets Meeting Service Targets
100% assets are very Good to Fair and no assets are Poor or Critical condition over the next 10 years.	100.0%

Telecommunication

Service Target	% of Assets Meeting Service Targets
Provide 99.99% uptime for wireless and landline telecommunications.	95.0%
Keep the same service level for the next 10 years. > 90% of assets in Good to Fair condition. <10.0% of assets in less than Fair condition.	95.0%

Fiber Plant

Service Target	% of Assets Meeting Service Targets
Assets are fully functional.	100.0%

Corporate Fleet Operating System

Service Target	% of Assets Meeting Service Targets
> 90% of assets are Very Good to Fair and < 10% assets are Poor or Critical condition over the next 10 years.	97.1%

Work Group Printing

Service Target	% of Assets Meeting Service Targets
Keep print devices operating at 95% service level for next 10 years. 80% of print assets at Good to Fair condition and 20% and Poor to Critical condition.	100.0%

Desktop Computing

Service Target	% of Assets Meeting Service Targets
Keep the same service level for the next 10 years. > 89.3% of assets are Very Good to Fair and < 10.7% assets are Poor or Critical condition.	98.6%

Development Software

Service Target	% of Assets Meeting Service Targets
All assets are in Good or Very Good condition.	100.0%

Network Infrastructure

Service Target	% of Assets Meeting Service Targets
>99% availability of the network infrastructure over the next 10 years.	99.7%

Line of Business Application

Service Target	% of Assets Meeting Service Targets
Maintain assets in Good condition over the next 10 years.	100.0%

PeopleSoft

Service Target	% of Assets Meeting Service Targets
100% of assets need to be in Very Good or Good condition over the next 10 years.	100.0%

Parks, Pathways, Trails and Parks Infrastructure

Natural Assets

Service Objectives: Parks service plans, builds, maintains and stewards an accessible parks system. Parks conserve and promote biodiverse ecosystems and cultural landscapes. Parks provides Calgarians with nature in the city and safe, inclusive, social and active opportunities.

Service Target	% of Assets Meeting Service Targets		
	Habitat, Landscaping (Turf and Planting Beds), Urban Forests	Landscaping (Turf and Planting Beds)	Urban Forests
Customer Levels of Service – Maintain a Customer Level of Service rating of 2 in Regional Parks/Destination Parks and a rating of 3 in Community Parks and Natural Environmental Parks until 2030	Under development	Not assessed	Not assessed
Accessibility – The % of people within 450m walking distance of a multifunctional park and open space is increased	99.8%	Not assessed	Not assessed

Pathways

Service Objectives: Parks service plans, builds, maintains and stewards an accessible parks system. Parks conserve and promote biodiverse ecosystems and cultural landscapes. Parks provides Calgarians with nature in the city and safe, inclusive, social and active opportunities. The urban forestry service manages public trees to improve air quality, reduce stormwater runoff, provide shade and cooling, provide wildlife habitat, increase property values and create stress reducing environments for citizens. Parks plants trees to replace those lost to construction and natural decline and to increase the urban canopy for future generations.

Service Target	% of Assets Meeting Service Targets		
	Pathway Segments	Trails	Bollards
Customer Level of Service – Maintain a Customer Level of Service rating of 2 in Regional Parks/Destination Parks and a rating of 3 in Community Parks and Natural Environmental Parks until 2030	Under development	Under development	Not assessed
Accessibility – The % of people within 450m walking distance of a multifunctional park and open space is increased	99.8%	99.8%	Not assessed

Supporting Infrastructure

Service Objectives: Parks service plans, builds, maintains and stewards an accessible parks system. Parks conserve and promote biodiverse ecosystems and cultural landscapes. Parks provides Calgarians with nature in the city and safe, inclusive, social and active opportunities. The urban forestry service manages public trees to improve air quality, reduce stormwater runoff, provide shade and cooling, provide wildlife habitat, increase property values and create stress reducing environments for citizens. Parks plants trees to replace those lost to construction and natural decline and to increase the urban canopy for future generations.

Service Target	% of Assets Meeting Service Targets						
	Irrigation	Playground Infrastructure	Bollards	Barriers Including Sports Barriers	Structures and Monuments	Hard Surfaces	Park Infrastructure
Customer Level of Service – Maintain a Customer Level of Service rating of 2 in Regional Parks/Destination Parks and a rating of 3 in Community Parks and Natural Environmental Parks until 2030	Under development	Under development	Under development	Under development	Under development	Under development	Under development
Accessibility - The % of people within 450m walking distance of a multifunctional park and open space is increased	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%	99.8%

Recreation Opportunities

Recreation Opportunities

Service Objectives: The City of Calgary Recreation is committed to building an active, creative and vibrant city. We are able to work towards our vision by offering affordable and accessible products and services to citizens, facilitating numerous city festivals and events, establishing unique partnerships with other recreation, sport, art, culture, tourism, parks and social services providers.

Service Target	% of Assets Meeting Service Targets							
	Golf Courses	Athletic Parks						Machinery & Equipment
		Ball Diamonds	Rectangular Sports Fields (natural turf)	Artificial Turf Sports Fields	Outdoor Tennis and/ or Pickleball Courts	Track and Athletics	Other Land Improvement Assets	
>50% in "Good or Very Good" condition	20.0%	15.6%	10.8%	N/A	N/A	N/A	50.0%	35.0%
>70% in "Good or Very Good" condition	N/A	N/A	N/A	66.7%	50.0%	50.0%	N/A	N/A
<5% in Very Poor condition	9.0%	12.5%	10.8%	0.0%	0.0%	0.0%	0.0%	8.0%

Roads, Bridges and Tunnels

Bridges and Structures

Service Objectives: Bridges, tunnels, retaining structures and timber stairways in the City of Calgary provide safe and efficient passage for pedestrians, vehicles and bicycles across physical barriers/grade separations on the transportation network. The City's goal is to ensure these structures remain in good physical condition and structural capacities to support users of the roadway, pathway and cycle networks.

Asset Description	Essential Level of Service (Risk Controlled)		Enhanced Level of Service (State of Good Repair)		% of Assets Meeting Service Targets	
	Service Targets		Service Targets		Good Assets	Poor Assets
Major Bridges and Structures (Vehicular / Pedestrian)	90% of assets in Good condition	0% of assets in Poor Condition	94% of assets in Good condition	0% of assets in Poor Condition	93.5%	0.6%
Timber Bridges and Structures	65% of assets in Good condition	5% of assets in Poor Condition	80% of assets in Good condition	0% of assets in Poor Condition	54.5%	22.8%

Plus 15s

Service Objectives: The Plus15 pedestrian overpass network is an integral part of Calgary's downtown that enables pedestrian travel in an elevated all-weather transportation network. The network is comprised of City owned Plus15 bridges connected through a series of links inside private buildings. The increased pedestrian traffic that Plus15 bridges attract to private buildings encourages new businesses to lease vacant floor space and activate new retail opportunities. The Plus15 network supports the Council priority of "a city that moves" by providing a safe transportation network to pedestrians and "a prosperous city" by encouraging economic growth in the downtown core.

Asset Description	Essential Level of Service (Risk Controlled)		Enhanced Level of Service (State of Good Repair)		% of Assets Meeting Service Targets	
	Service Targets		Service Targets		Good Assets	Poor Assets
Major Bridges and Structures (Vehicular / Pedestrian)	65% of Assets in Good Condition	10% of Assets in Poor Condition	75% of Assets in Good Condition	10% of Assets in Poor Condition	58.1%	18.8%

Sidewalks

Service Objectives: Sidewalk and curb and gutter networks in the City of Calgary provide two distinct services, but are physically related assets that are often managed together. Sidewalks, stairways and engineered walkways provide a primary pedestrian network that is safe, accessible and provides for efficient connectivity to destinations. Curbs and gutters and concrete medians channel excess water from the pavement surface to drainage which is critical to protecting the integrity of the pavement.

	Essential Level of Service (Risk Controlled)		Enhanced Level of Service (State of Good Repair)		% of Assets Meeting Service Targets	
Asset Description	Service Targets		Service Targets		Good Assets	Poor Assets
Monolithic Sidewalks	80% of the pedestrian network is in Good or Very Good condition.	Less than 5% of the the pedestrian network is in Poor or Very Poor condition.	90% of assets in Good or Very Good condition	0% of the the pedestrian network is in Poor or Very Poor condition.	86.5%	4.4%
Separate Sidewalks					90.0%	3.1%
Concrete Stairways					Not Assessed	
Engineered Walkways					Not Assessed	
Curbs and Gutters	Curbs and Gutters levels of service should align with the pavement levels of service, and budget allocated accordingly.				99.6%	0.1%
Concrete Medians					Not Assessed	

Street Lighting

Service Objectives: Street Lights provide appropriate levels of lighting within Calgary's public spaces. Streetlighting is a key service in urban roadway environments between dusk and dawn that supports crime prevention, the reduction of vehicle accidents and enhanced security for pedestrians and communities. This is a key element in the delivery of a safe transportation system.

	Essential Level of Service (Risk Controlled)		Enhanced Level of Service (State of Good Repair)		% of Assets Meeting Service Targets	
Asset Description	Service Targets		Service Targets		Good Assets	Poor Assets
Street Light Poles and Bases	60% of street light poles in Good or Very Good condition	Less than 20% of street light poles in Very Poor condition	75% of street light poles in Good or Very Good condition	Less than 15% of street light poles in Very Poor condition	59.5%	30.3%
Luminaires					91.0%	3.7%
Wires					37.5%	31.6%
Cabinets					50.0%	31.0%
Controllers					18.7%	67.1%

Pavement

Service Objectives: The City of Calgary's goal is to provide a safe roadway network that allows access to properties and for the safe, efficient and reliable movement of people and goods. Calgary's roadway is the primary transportation asset under the "Streets" line of service as it provides for movement of private, commercial and City vehicles throughout Calgary. It is critical that the roadway network is of good quality and sufficient capacity to support usage requirements.

	Essential Level of Service (Risk Controlled)		Enhanced Level of Service (State of Good Repair)		% of Assets Meeting Service Targets	
Asset Description	Service Targets		Service Targets		Good Assets	Poor Assets
Arterial	>70% in Good or Very Good"	<3% in Very Poor	>80% in Good or Very Good	5% in Very Poor or Poor	43.3%	7.9%
Collector/Industrial	>50% in Good or Very Good	<4% in Very Poor			31.7%	6.6%
Local	>50% in Good or Very Good"	<5% in Very Poor"			44.5%	14.1%

Sound Walls

Service Objectives: Sound walls create a barrier between arterial major roads and residential areas to reduce the noise level for residents. Roads is responsible for the maintenance of the sound walls that fall under its jurisdiction within the City of Calgary. The sound walls are required to be maintained to ensure safety for motorist, pedestrians and cyclists and a lower decibel level of noise emitted by traffic.

	Essential Level of Service (Risk Controlled)	Enhanced Level of Service (State of Good Repair)	% of Assets Meeting Service Targets	
Asset Description	Service Targets	Service Targets	Good Assets	Poor Assets
Sound Walls	< 2% in Very Poor condition	>80% in Good or Very Good Condition"	1.9%	74.8%

Traffic Signals

Service Objectives: Signal assets as an important component of Calgary's Traffic Management Systems (TMS) provide an effective means of monitoring, optimizing and regulating traffic flow. Risk Controlled Levels of Service aligns with the national average and focuses on eliminating lifecycle backlog and reducing assets in imminent risks. State of Good Repair Levels of Service sustains the signal network for a long term.

	Essential Level of Service (Risk Controlled)		Enhanced Level of Service (State of Good Repair)		% of Assets Meeting Service Targets	
Asset Description	Service Targets		Service Targets		Good Assets	Poor Assets
Signal trunks	60% of signal assets in Good or Very Good condition	Less than 15% of signal assets in Very Poor condition	65% of signal assets in Good or Very Good condition	Less than 5% of signal assets in Very Poor condition	78.6%	10.0%
Cabinets					45.1%	26.2%
Signal bases					70.3%	2.8%
Signal heads					57.9%	11.4%
Signal devices (iSLOW, RRFs, PTZ)					46.3%	27.8%
Overhead sign structures					86.7%	8.4%
Permanent traffic count stations					53.1%	31.3%

Transit Infrastructure and Fleet

Rail Systems Communications														
Service Objectives: Calgary Transit's Levels of Service(Customer Commitment) provides a quantitative translation of the customer's perspective of Quality of Service. Calgary Transit's Customer Commitment are as follows. Safe, Reliable, Helpful, Informative, Easy to use, Clean.														
Asset Description	Levels of Service													
	Safe		Reliable/ Responsive		Helpful		Informative		Easy to use		Clean		Business Efficiency/ Essential	
	Design and operate a safe & secure transit system	% Assets Meeting Targets	Will provide a dependable transit service by minimizing delay and being on time	% Assets Meeting Targets	Will provide a service that is friendly and helpful e.g. websites	% Assets Meeting Targets	Will provide a customers with accurate, consistence and timely information (customers experience, public reputation)	% Assets Meeting Targets	Will make it easy to get around on Calgary Transit	% Assets Meeting Targets	Will keep our vehicles and, stops and station clean	% Assets Meeting Targets		% Assets Meeting Targets
APIS		%		%		%	< 24 incidents per year	90.0%	< 24 incidents per year	90.0%		%		%
CCN		%		%		%		%		%		%		%
Comm Cabinet		%		%		%		%		%		%		%
Comm Room		%		%		%		%		%		%		%
DMS		%		%		%		%		%		%	< 36 incidents per year < 4 hrs MTTR (un-planned)	90.0%
Duct Bank		%		%		%		%		%		%		%
Help Phones	< 24 incidents per year < 96 hrs MTTR (un-planned)	95.0%		%		%		%		%		%		%
OCC		%		%		%		%		%		%	< 36 incidents per year < 4 hrs MTTR (un-planned)	
OTN		%		90.0%		%		%		%		%		%

PA	< 48 incidents per year < 16 hrs MTTR (un-planned)	95.0%		%	%	< 48 incidents per year < 16 hrs MTTR (un-planned)	95.0%		%	%		%
Radio	< 36 incidents per year < 4 hrs MTTR (un-planned)	95.0%		%	%		%		%	%	< 36 incidents per year < 4 hrs MTTR (un-planned)	90.0%
SCADA	< 48 incidents per year < 16 hrs MTTR (un-planned)	95.0%		%	%		< 48 incidents per year < 16 hrs MTTR (un-planned)	95.0%		%	< 48 incidents per year < 16 hrs MTTR (un-planned)	95.0%
TPSS		95.0%		%	%			%		re		95.0%
TTSC		%	< 48 incidents per year < 16 hrs MTTR (un-planned)	95.0%	%			%		%		95.0%
UPS		%		%	%			%		%		%
Audio-Visual		%		%	%			%		%		%

Rail Systems Communications

Asset Description	Levels of Service												
	Service Objectives	Safe		Reliable/ Responsive		Helpful		Informative		Easy to use		Clean	
		Design and operate a safe transit system. List Safety KPI Targets	% Assets Meeting Targets	Will provide a dependable transit service by minimizing delay and being on time. List Reliability + Availability KPI Targets	% Assets Meeting Targets	Will provide a service that is friendly and helpful e.g. websites	% Assets Meeting Targets	Will provide a customers with accurate, consistence and timely information. List Informative KPI Targets	% Assets Meeting Targets	Will make it easy to get around on Calgary Transit	% Assets Meeting Targets	Will keep our vehicles and, stops and stations clean	% Assets Meeting Targets
Teleride Service (Enghouse IVR Technology)	Provide audio announcements to customers regarding bus arrivals in real time or schedule time. Also provide audio announcements to the operators for the work shift assignments	N/A (not safety related)	N/A	<3 incidents /month	<80%	Y Customer /operator phone lines.	100.0%	<2 incidents /month 99% accurate and timely info	<90%	Y	100.0%	N/A	N/A
Wireless modems	Provide reliable cell/wifi/gps info for the systems (computer-aided dispatch/automatic vehicle location, fleet fuel management, and bus-only gates) that use modems.	<9 incidents /mo	>99%I	<10 incidents /month	<80%	Y (feeds data to websites indirectly)	100.0%	<80% - obsolete	>99%I	Y	100.0%	N/A	N/A
CAD/AVL system (Conduent)	Provide accurate location and real-time schedule information for Calgary Transit staff and customers, enhance safety, provide 2-way communications	Bus Hardware <17 incidents /mo Servers >99.9% uptime/mo	>98%II			Y Calgary Transit website and App.	100.0%	Bus Hardware <17 incidents /mo Servers >99.9% uptime/ mo	>98%II	Y	100.0%	N/A	N/A
Cameras on buses (Seon)	Enhance safety for Calgary Transit employees and customers.	<9 incidents /mo	>99%			Y not customer facing. But is critical to CPS/PSE/ Legal for example	100.0%	N/A Not customer facing	N/A	Y	100.0%	N/A	N/A
Automatic Passenger Counter (APC) system	Provide accurate passenger counts for Planning.	N/A (not safety related)	N/A	<3 incidents/ mo	>99%	Y not customer facing but is needed to improve service for customers	100.0%	N/A Not customer facing	N/A	Y	100.0%	N/A	N/A

Traffic Signal Priority (TSP) system	Enhance customer service (on time performance) by pre-empting traffic lights and opening gates.	<3 incidents/mo	>99%III			Y not customer facing but improves customer satisfaction by improving on-time performance	100.0%	N/A - Not customer facing.	N/A	Y	100.0%	N/A	N/A
Ticket Vending Machines & Backoffice system		N/A (not safety related)	N/A	<? incidents per month	90.0%	Y	100.0%		100.0%	Y	100.0%	N/A	N/A
Mobile Ticket System (MTS)	Provide customers with the capability of scanning electronic tickets upon boarding	N/A (not safety related)	N/A	99.9% reliable	99.9%	Y - friendly and convenient	100.0%	consistent service	>95%	Y	100.0%	N/A	N/A

Notes - Explanation if KPI < 100%

I: Example - Modem WiFi failure is not safety related. GPS or Cellular failure is safety related.

II: Example - Route schedule adherence, or signs/announcements not working is not safety related. Failure of EA alarm and/or radio comms is safety related.

III: Example - TSP not opening gate can lead to Operator slips/trips/falls.

Track and Way

Service Objectives: Calgary Transit's Levels of Service(Customer Commitment) provides a quantitative translation of the customer's perspective of Quality of Service. Calgary Transit's Customer Commitment are as follows. Safe, Reliable, Helpful, Informative, Easy to use, Clean.

Asset Description	% of Assets Meeting Service Level Targets					
	Safe	Reliable/ Responsive	Helpful	Informative	Easy to use	Clean
	Design and operate a safe transit system.	Will provide a dependable transit service by minimizing delay and being on time	Will provide a service that is friendly and helpful e.g. websites	Will provide a customers with accurate, consistence and timely information	Will make it easy to get around on Calgary Transit	Will keep our vehicles and, stops and stations clean
Ballasted Track	100.0%	100.0%	N/A	N/A	N/A	N/A
Crossing	100.0%	100.0%	N/A	N/A	N/A	N/A
Direct Fixation	100.0%	100.0%	N/A	N/A	N/A	N/A
Fencing	100.0%	100.0%	N/A	N/A	N/A	N/A
Imbedded	100.0%	100.0%	N/A	N/A	N/A	N/A
Rail Lubricator	100.0%	100.0%	N/A	N/A	N/A	N/A
Switch heater	100.0%	100.0%	N/A	N/A	N/A	N/A
Turnout	100.0%	100.0%	N/A	N/A	N/A	N/A

Rail Systems Communications

Service Objectives: Calgary Transit’s Levels of Service(Customer Commitment) provides a quantitative translation of the customer’s perspective of Quality of Service. Calgary Transit’s Customer Commitment are as follows. Safe, Reliable, Helpful, Informative, Easy to use, Clean.

Asset Description	Levels of Service											
	Safe		Reliable/Responsive		Helpful		Informative		Easy to use		Clean	
	Design and operate a safe & secure transit system	% Assets Meeting Targets	Will provide a dependable transit service by minimizing delay and being on time	% Assets Meeting Targets	Will provide a service that is friendly and helpful e.g. websites	% Assets Meeting Targets	Will provide a customers with accurate, consistence and timely information (customers experience, public reputation)	% Assets Meeting Targets	Will make it easy to get around on Calgary Transit	% Assets Meeting Targets	Will keep our vehicles and, stops and stations Clean	% Assets Meeting Targets
Garages			Staffing levels, 95% of maintenance staff can preform their duties without interruption	92.00%								
Administration Buildings			Staffing levels, 95% of administration staff can preform their duties without interruption	94.00%								
Light Rail Vehicle Stations and Platforms			Customer usage/ accessibility occurs at least 95% of the time without interruption.	94.00%								
Sub Stations			Building functioning within its parameters at least 95% of the time without interruption	94.00%								
Bus Loops												
Washrooms												
Utility Buildings												
Tunnel(lighting)												
BRT Station												
Parking lots												
Lift Stations												
Leased Space												
Land												

Fleet

Service Objectives: Maintain reliable vehicles. Meet vehicle commitment. Achieve Target Spares Ratio. Maintain safe vehicles.

	Levels of Service											
	Safe		Reliable/Responsive		Helpful		Informative		Easy to use		Clean	
	Design and operate a safe transit system	% Assets Meeting Targets	Will provide a dependable transit service by minimizing delay and being on time	% Assets Meeting Targets	Will provide a service that is friendly and helpful e.g. websites	% Assets Meeting Targets	Will provide a customers with accurate, consistence and timely information	% Assets Meeting Targets	Will make it easy to get around on Calgary Transit	% Assets Meeting Targets	Will keep our vehicles and, stops and stations clean	% Assets Meeting Targets
40 ft Bus	List Safety KPI Targets: N/A	100.0%	List Reliability + Availability Targets: N/A	90.0%		%		%		%		%
40 ft Bus Refurb.		100.0%		90.0%		%		%		%		%
60 ft Articulated		100.0%		90.0%		%		%		%		%
Calgary Transit Access (CTA) Shuttle		100.0%		90.0%		%		%		%		%
Light Rail Vehicle (LRV)		100.0%		90.0%		%		%		%		%
Community Shuttle		100.0%		90.0%		%		%		%		%

Rail Systems: Signals

Service Objectives: Calgary Transit’s Levels of Service(Customer Commitment) provides a quantitative translation of the customer’s perspective of Quality of Service. Calgary Transit’s Customer Commitment are as follows. Safe, Reliable, Helpful, Informative, Easy to use, Clean.

	Levels of Service											
	Safe		Reliable/Responsive		Helpful		Informative		Easy to use		Clean	
	Design and operate a safe transit system	% Assets Meeting Targets	Will provide a dependable transit service by minimizing delay and being on time	% Assets Meeting Targets	Will provide a service that is friendly and helpful e.g. websites	% Assets Meeting Targets	Will provide a customers with accurate, consistence and timely information	% Assets Meeting Targets	Will make it easy to get around on Calgary Transit	% Assets Meeting Targets	Will keep our vehicles and, stops and stations clean	% Assets Meeting Targets
Crossing	Safe Signaling System for revenue service operation with Zero safety concerns. Authenticated Signals Bypasses issued during closure weekends for circuit modifications for safe revenue service operation.	100.0%	Rail Signal Availability (>99.5%). Mean duration of signal outages (<60 min). Average response time for service affecting call (30 min). Average response time for Non-revenue service affecting call (<60 min). Number of Incidents - Revenue service affected (<15 incidents). Number of Incidents - Non-Revenue service affected (<24 incidents).	99.7%	%	%	%	%	%	%		
Interlocking		100.0%		99.7%	%	%	%	%	%			
Right of Way	Corrective actions in place (including slow orders) within 2 hours of a reported safety concern caused by external factors. Approach time readings to be taken at crossings every 2 months to ensure safe approach times. Switch machines, Signals room and Crossing maintenance to be completed every month to ensure system is safe for revenue service operation. Track Magnet testing to be completed every 2 years to ensure train dumping operation is functioning properly.	100.0%		99.7%	%	%	%	%	%			
Signals Room		100.0%		99.7%	%	%	%	%	%			

Major Structures

Service Objectives: Calgary Transit's Levels of Service(Customer Commitment) provides a quantitative translation of the customer's perspective of Quality of Service. Calgary Transit's Customer Commitment are as follows. Safe, Reliable, Helpful, Informative, Easy to use, Clean.

	Levels of Service											
	Safe		Reliable/Responsive		Helpful		Informative		Easy to use		Clean	
	Design and operate a safe transit system	% Assets Meeting Targets	Will provide a dependable transit service by minimizing delay and being on time	% Assets Meeting Targets	Will provide a service that is friendly and helpful e.g. websites	% Assets Meeting Targets	Will provide a customers with accurate, consistence and timely information	% Assets Meeting Targets	Will make it easy to get around on Calgary Transit	% Assets Meeting Targets	Will keep our vehicles and, stops and stations clean	% Assets Meeting Targets
Light Rail Vehicle Bridges	Slow orders on the network from Capital Projects (Major Structures)	100.0%	Number of unplanned (Major Structures) infrastructure incidents affecting availability of Light Rail Vehicle system for train movement (>= 5 min). Number of Category 2 and 3 structures inspected by Roads. Number of addition Category 2 and 3 structures inspected in detail by RJC. Impacts to Service.	95.0%	%	%	%	%	%	%		
Pedestrian Bridges		100.0%		95.0%	%	%	%	%	%			
Retaining Walls		100.0%		95.0%	%	%	%	%	%			
Tunnels		100.0%		95.0%	%	%	%	%	%			
Tunnel Ventilation					%	%	%	%	%			
Drainage		100.0%		95.0%	%	%	%	%	%			

Traction Power

Service Objectives: Calgary Transit’s Levels of Service(Customer Commitment) provides a quantitative translation of the customer’s perspective of Quality of Service. Calgary Transit's Customer Commitment are as follows. Safe, Reliable, Helpful, Informative, Easy to use, Clean.

	Levels of Service											
	Safe		Reliable/Responsive		Helpful		Informative		Easy to use		Clean	
	Design and operate a safe transit system	% Assets Meeting Targets	Will provide a dependable transit service by minimizing delay and being on time	% Assets Meeting Targets	Will provide a service that is friendly and helpful e.g. websites	% Assets Meeting Targets	Will provide a customers with accurate, consistence and timely information	% Assets Meeting Targets	Will make it easy to get around on Calgary Transit	% Assets Meeting Targets	Will keep our vehicles and, stops and stations clean	% Assets Meeting Targets
Calgary Transit-Substation Equipment (transformers, switches, relays) Substation System	Safe Power System for revenue service operation with Zero safety concerns.	99.0%	OCS Availability Mainline (% of 100 per cent metre-minute uptime) (>99.90%). Metre-minutes of unplanned, unavailable OCS. Mean duration of unplanned OCS outages (<240 min).	95.0%		%	%			%		100.0%
Calgary Transit-Overhead Catenary System	Authenticated Power Cut drawings issued during closure weekends for maintenance for safe revenue service operation.	95.0%	MTBF for unplanned OCS outages (>92 days). Mean pantograph passes between outages (>100k cycles - passes). Average response time for service affecting call (90 minutes).	90.0%		%	%			%		100.0%
Calgary Transit-Distribution System	Corrective actions in place (including slow orders) within 2 hours of a reported safety concern caused by external factors. Substation maintenace carried out routinely to maintain safe and reliable service.)	100.0%	Average response time for Non-revenue service affecting call (120 minutes). Number of Incidents - Revenue service affected (< 6 occurrences). Number of Incidents - Non-Revenue service affected (<45 occurrences). Scout - # Open Urgent OCS Defects - monitored. Scout - # Open Urgent OCS Defects - planned. Scout - # Open Urgent OCS Defect - fixed.	100.0%		%	%			%		100.0%
Calgary Transit-Maintenance Service Facilities		100.0%		80.0%		%	%			%		100.0%

Waste & Recycling Infrastructure

Buildings			
Service Objectives: To Manage/Divert Waste.			
	REGULATORY COMPLIANCE Meet (or exceed) all applicable Landfill Regulatory Requirements including Site Specific Landfill Approval Requirements, along with Composting Regulations.	DEMAND (CAPACITY) System has sufficient capacity to meet current demands.	ASSET CONDITION Buildings are fit for purpose: well maintained, in Very Good or Good condition so as not to adversely affect engineered processes within the buildings now and in the future.
Asset Description	% of Assets Meeting Service Targets		
Landfill Buildings (19 Buildings)	100%	100%	100%
Organics Facility Buildings (3 Buildings)	100%	100%	100%

Engineered Structures			
Service Objectives: To Manage Waste.			
	REGULATORY COMPLIANCE Meet (or exceed) all applicable Landfill Regulatory Requirements including Site Specific Landfill Approval Requirements, along with Composting regulations.	DEMAND (CAPACITY) System has sufficient capacity to meet current demands.	ASSET CONDITION Engineered Processes are fit for purpose: well maintained, in Very Good to Fair condition so as not to adversely affect process function.
Asset Description	% of Assets Meeting Service Targets		
Landfill Cell Liners (Prepared Airspace)	100%	100%	100%
Landfill Cell Caps	100%	100%	100%
Leachate Systems	100%	100%	99.5%
Gas Collection Systems	100%	100%	100%
Drainage Systems	100%	100%	95.0%
Landfill Roads and Pads	100%	100%	99.6%
Diversion Infrastructure (Organics Process Equip)	100%	100%	100%

Machinery and Equipment

Service Objectives: To Collect/Manage Waste.

	REGULATORY COMPLIANCE	DEMAND (CAPACITY)	ASSET CONDITION
	Meet (or exceed) all applicable Landfill Regulatory Requirements including Site Specific Landfill Approval Requirements.	System has sufficient capacity to meet current demands.	Engineered Processes are fit for purpose: well maintained, in Very Good to Fair condition so as not to adversely affect system function.
Asset Description	% of Assets Meeting Service Targets		
Carts - Recycle	N/A	100%	100%
Carts - Waste	N/A	100%	100%
Carts - Organics	N/A	100%	100%
Bins	N/A	100%	70.0%
Specialized Vehicles and Portable Equipment	100%	100%	90.0%
Fences - Litter	100%	100%	100.0%

Land Improvements

Service Objectives: Manage Waste.

	REGULATORY COMPLIANCE	DEMAND (CAPACITY)	ASSET CONDITION
	Meet (or exceed) all applicable Landfill Regulatory Requirements including Site Specific Landfill Approval Requirements.	System has sufficient capacity to meet current demands.	Engineered Processes are fit for purpose: well maintained, in Very Good to Fair condition so as not to adversely affect system function.
Asset Description	% of Assets Meeting Service Targets		
Fences - Security	100%	100%	98.7%

Water Infrastructure for Potable Water

Potable Water – Linear

Service Objectives: This service ensures access to drinking water now and for generations to come. This service treats and delivers water to customers, ensuring reliability and availability.

	Properties impacted by interruptions to water service per 1,000 (2017 - 2020 has ranged from 30 to 36 properties impacted per 1000 per year)
Asset Description	% of Assets Meeting Service Targets
Distribution Pipes (diameter < 500mm)	99.2%
Transmission pipes (diameter ≥ 500mm)	99.8%
Distribution valves	99.5%
Hydrants	100.0%
Distribution chambers	100.0%
Feedermain manholes	100.0%
Feedermain valve chambers	100.0%
Services and service valves	99.9%
Billing meters	100.0%

Potable Water – Non-Linear

Service Objectives: This service ensures access to drinking water now and for generations to come. This service treats and delivers water to customers, ensuring reliability and availability.

	Service Target #1	Service Target #2	Service Target #3
	Regulations met for treated drinking water quality	Total population Calgary can provide water to on a peak day	Properties impacted by interruptions to water service per 1,000
Asset Description	% of Assets Meeting Service Targets		
Water Treatment Facilities	100.0%	100.0%	100.0%
Water Reservoirs (before intake)	100.0%	100.0%	100.0%
Storage Tanks (after intake, not part of treatment plant)	100.0%	100.0%	100.0%
Water Pump Stations	100.0%	100.0%	100.0%

Water Infrastructure for Stormwater

Stormwater – Linear	
Service Objectives: This service ensures drainage capacity from rainfall and snow melt now and for generations to come, ensuring full time reliability.	
	Number of homes at risk of flooding
Asset Description	% of Assets Meeting Service Targets
Storm water pipes with diameter less than 450 mm (millimetres)	95.0%
Storm water pipes with diameter greater than or equal to 450 mm (millimetres) and less than 1500 mm (millimetres)	95.0%
Storm water pipes diameter greater than or equal to 1500 mm (millimetres)	90.0%
Pump stations	95.0%

Stormwater – Non-Linear		
Service Objectives: This service prevents flooding from rainfall now and for generations to come. This service treats stormwater to receiving waterbodies, ensuring quality runoff standards.		
	Service Target #1	Service Target #2
	Discharge rate and volume to receiving waterbodies	Pollution reduction
Asset Description	% of Assets Meeting Service Targets	
Storm water management facilities - Storm water management ponds and storm water wetlands	100.0%	85.0%

Water Infrastructure for Wastewater

Wastewater – Linear

Service Objectives: Linear Wastewater assets provide the service of wastewater collection and treatment for The City of Calgary. This service ensures that over one million customers in Calgary and the region can trust that their wastewater is taken care of and the health of the river is protected. The wastewater collection and treatment service collects wastewater from toilets, sinks and drains, treats it, and returns it to the river. This service protects public health and our rivers by ensuring the necessary investments are made in treatment plants, pipes and people to keep pace with the needs of a growing population.

	Service Target #1	Service Target #2
	Customer Service Impact: Properties impacted by interruptions to wastewater service per 1,000	Environmental Impact: Sewage releases from the collection system that reached a waterbody, which has resulted in regulatory enforcement actions
Asset Description	% of Assets Meeting Service Targets	
Sewer pipes (diameter < 450 mm)	Not Assessed	Not Assessed
Sewer pipes (diameter ≥ 450 and < 1500 mm)	Not Assessed	Not Assessed
Sewer pipes (diameter ≥ 1500 mm)	Not Assessed	Not Assessed
Sanitary force mains	Not Assessed	Not Assessed

Wastewater – Non-Linear

Service Objectives: Non-Linear Wastewater assets provide the service of wastewater collection and treatment for The City of Calgary. This service ensures that over one million customers in Calgary and the region can trust that their wastewater is taken care of and the health of the river is protected. The wastewater collection and treatment service collects wastewater from toilets, sinks and drains, treats it, and returns it to the river. This service protects public health and our rivers by ensuring the necessary investments are made in treatment plants, pipes and people to keep pace with the needs of a growing population.

	Service Target #1
	Regulation met for treated wastewater returned to the river
Asset Description	% of Assets Meeting Service Targets
Wastewater Treatment Plants	100.0%