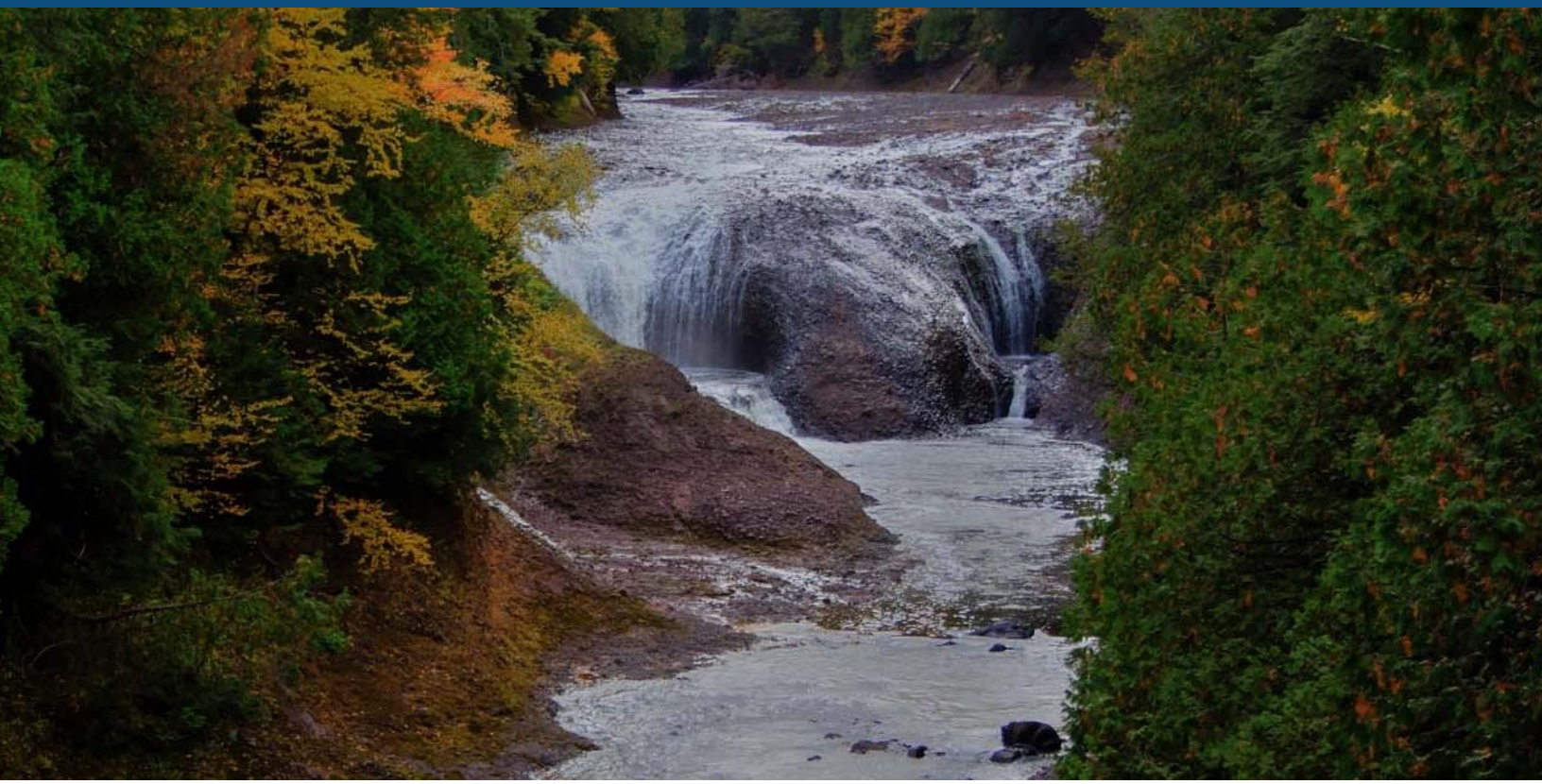
Levels of Service

The preparation of this project was carried out with assistance from the Government of Canada and the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.



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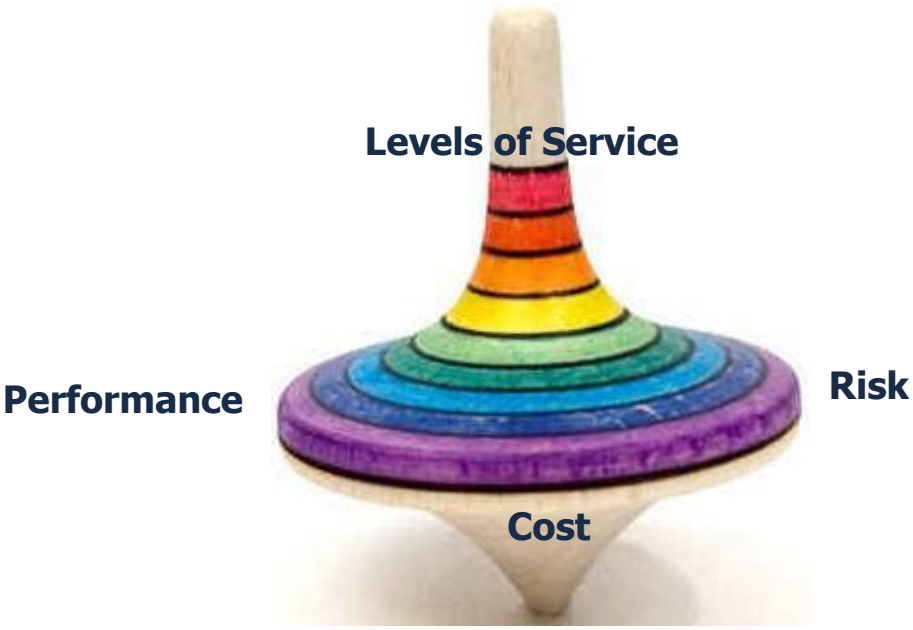
Introduction

Levels of Service – Introduction

The primary responsibility of a municipality is to provide adequate and sustainable services to their community. This should be supported by organizational objectives, mission statements, and official plans.

To ensure that organizational objectives align with expected service outcomes, it is necessary to develop a process for the systematic measurement, monitoring and evaluation of an organization's level of service. A level of service (LOS) can be defined as the user-focused outcome of an asset's performance. Simply put, a level of service is a measure of how well a municipality provides for its citizens in a cost-effective and efficient manner.

Managing levels of service involves balancing three key factors: cost, performance, and risk. Any decision to increase or decrease the provided levels of service will have an impact on each factor. Increasing a level of service will lead to higher costs but would lead to a decrease in risk and an increase in asset performance. For example, improving the condition of roads is a level of service increase, but comes with an added cost to the tax-payer. Conversely, a decrease in level of service will mean lower costs but an increase in risk and a decrease in asset performance. Managing levels of service is about understanding the trade-offs involved, and aligning cost, performance and risk with both organizational objectives and stakeholder needs.



PSD Asset Management Programme Development: Workshop

On February 15th, 2022, PSD met with the Municipality of Calvin staff to develop a customized levels of service framework. The initial presentation and discussion illustrated the importance of levels of service in an asset management programme and the role that it should play in decision-making. The workshop was focused on developing meaningful level of service statements, technical and customer levels of service that take into consideration the availability of data and the ability of these indicators to provide actionable data.

The workshops concluded with an interview of Municipality staff on the various internal and external factors and trends that may affect their ability to provide expected levels of service in the future. The results of this interview are summarized in the Section titled **Factors Impacting Levels of Service in the Municipality of Calvin**.

Municipality of Calvin Attendees

Cindy Pigeau, Former Clerk-Treasurer

Aleysha Blake, Administrative Assistant

Jacob Grove, Deputy Fire Chief, Municipal Enforcement Office

Chris Whalley, Public Works Supervisor

PSD Attendees

Jordan Gonda, Senior Asset Management Consultant

Camille Zeng, Asset Management Specialist

Developing a Level of Service Framework

How to Measure Levels of Service

Performance measurement is a key component of the effective management of levels of service; it allows you to analyze how well you are meeting the needs and expectations of your stakeholders and identify where there are gaps that need to be addressed. Developing realistic levels of service using meaningful key performance indicators (KPIs) is instrumental in managing citizen expectations, identifying areas requiring higher investments, driving organizational performance, and securing the highest value for money from public assets.

To facilitate this process, it is useful to develop a framework for tracking and evaluating the levels of service. This requires the translation of organizational objectives and expected service outcomes into key performance indicators that reflect evolving demands on infrastructure, and the organization's fiscal capacity. Using a centralized workbook that houses levels of service alongside the KPIs that measure/assess the achievement of those LOS will enable the Municipality to better identify the current performance of their assets. In addition, the Municipality will be able to establish proposed levels of service that reflect the current fiscal capacity of the municipality, its corporate and strategic goals, and changes in demographics that may place additional demand on service areas.

Core Values

As a guide to developing and measuring levels of service, it is useful to understand what the public values in the provision of municipal services. Table 1 provides an overview of the values that the Municipality should strive to accommodate when delivering services to the public:

Table 1 - Core Values

Value	Description
Accessible	Services are available and accessible for customers who require them.
Reliable	Services are provided with minimal service disruption and are available to customers in line with needs and expectations.
Safe	Services are delivered such that they minimize health, safety and security risks.
Regulatory	Services meet regulatory requirements of all levels of government.
Affordable	Services are delivered at an affordable cost for both the organization and customer.
Sustainable	Services are designed to be used efficiently and long-term plans are in place to ensure that they are available to all customers into the future.

Figure 1 provides a simple guide to develop a Level of Service Framework in four steps. Each stage includes a definition, process, and example.

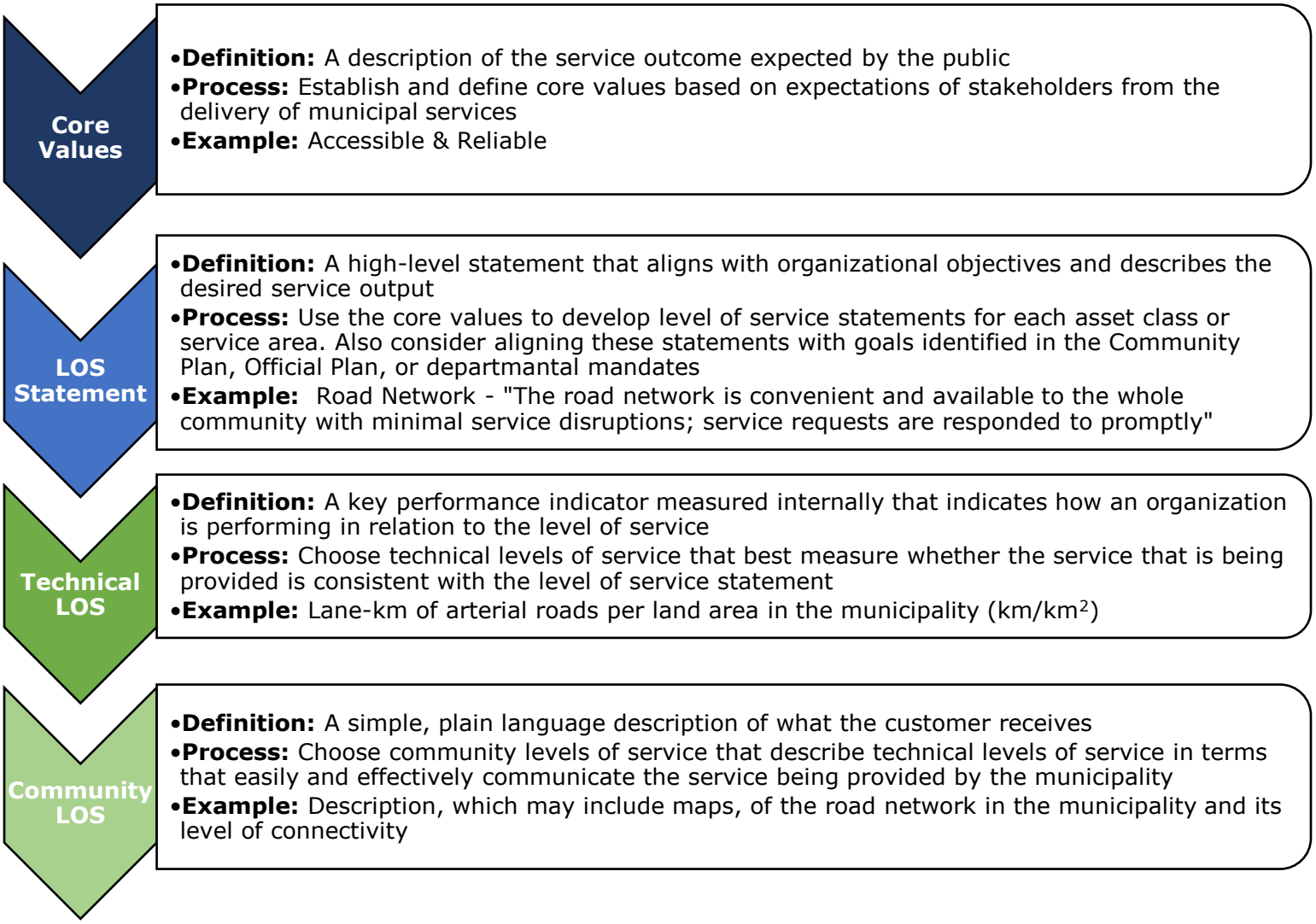


Figure 2: Levels of Service Framework

High-level Service Indicators

While technical levels of service provide a more detailed look at how the Municipality is providing services to the community, they may not always represent the true level of service being provided to the public. When analyzing levels of service, the Municipality should consider both the overall cost, risk and performance being provided (high-level service indicators) as well as more detailed and specific service metrics (technical levels of service).

Measuring and evaluating levels of service is a matter of finding a balance between three key indicators: cost, performance and risk. Within this framework these indicators are measured according to the following criteria outlined in Table 2:

Table 2 - Levels of Service Key Indicators

Indicator	Metric	Measurement
Cost	Annual Reinvestment Rate	$\frac{Annual\ Capital\ Expenditures}{Total\ Asset\ Class\ Replacement\ Value} \times 100$
	Target Reinvestment Rate	$\frac{Annual\ Capital\ Requirement}{Total\ Asset\ Class\ Replacement\ Value} \times 100$
Performance	Overall Condition	% of assets in very good, good, fair, poor and very poor condition
Risk	Overall Risk Distribution	% of assets in very low, low, moderate, high and very high state of risk

Appendix A provides an example of how this data can be integrated into the Municipality's Level of Service Framework. As the Municipality of Calvin's Asset Management Plan (AMP) is developed, these high-level service indicators can be updated accordingly for more accurate, realistic reporting. Finally, these three indicators can be monitored to determine an overall level of service trend over the next 10+ years. Future levels of service are projected for each asset class. This provides an understanding of the service trajectory of assets as a result of their condition and performance and enables the Municipality to evaluate where best to allocate money to improve level of service trends.

Factors Impacting Levels of Service in the Municipality of Calvin

A robust levels of service framework needs to consider the context of the region. The natural environment, infrastructure age, growth & demographics, and fiscal capacity are all factors that influence the way services are used, maintained, and managed over the long-term. These influencers will also affect what residents and business expect from a service. Tracking effective Levels of Service metrics and setting realistic targets requires these influencers be considered.

During the levels of service workshop hosted in February of 2022, the Municipality's staff identified extreme weather, aging infrastructure, growth and demographic shifts, fiscal capacity, and COVID-19 as key factors influencing service delivery.

Extreme Weather Events

The number of extreme weather events and cost incurred by these events have increased through the years in Canada (Figure 2). Severe rainfall and drought, or increased temperature can impact service availability and usage. Droughts may lead to increased water consumption, whereas flooding can tax the existing drainage system and damage roads. More rapid freeze-thaw cycles can cause roads to deteriorate quicker. Heavy equipment and vehicles during freeze-thaw seasons will cause extra damages to the roads. These events can contribute to unexpected road failures can result in safety concerns, liabilities, and larger capital spending.

Severe rainfall and snowfall events also increase the water penetration of the external claddings of buildings. When the steel inside the concrete gets wet it rusts and expands, cracking the concrete and weakening the structure. Seepage and flooding may exist without sufficient drainage around the buildings and affects the durability of the building materials. Higher energy consumption may be required to maintain expected indoor climate to counteract to the extreme weather events.

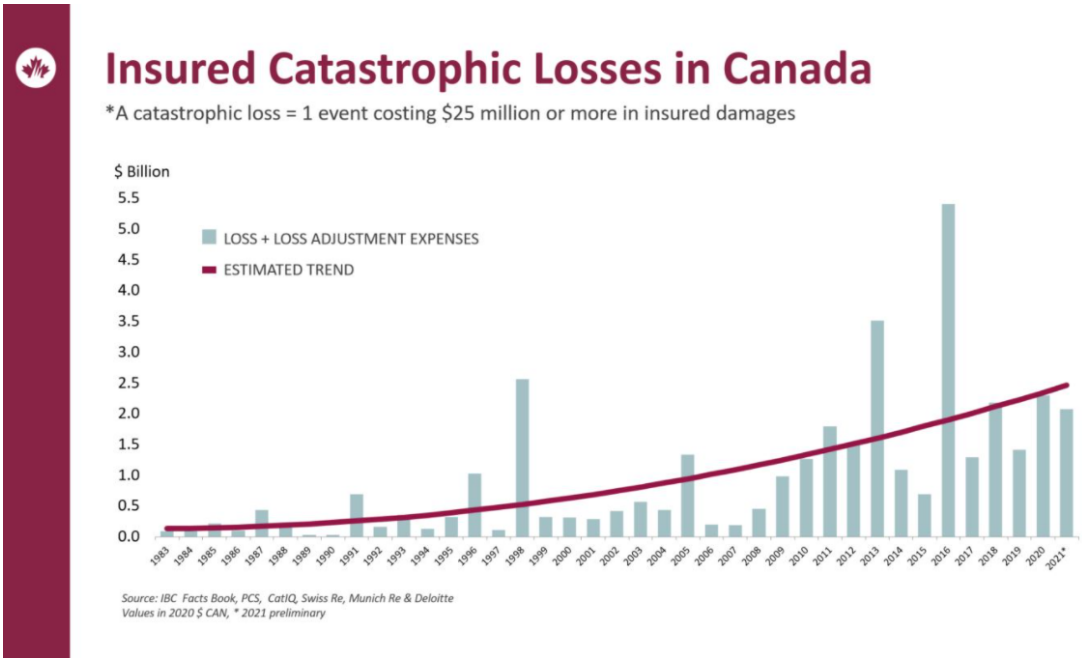


Figure 2 - Historical Damages Due to Extreme Weather Across Canada (Insurance Bureau of Canada, http://www.ibc.ca/ns/resources/media-centre/media-releases/severe-weather-in-2021-caused-2-1-billion-in-insured-damage#:~:text=January%2018%2C%202022%20(TORONTO),to%20both%20insurers%20and%20taxpayers.)

Aging Infrastructure

Figure 3 displays the installation profile for each of the Municipality's asset categories by decade, projected to current day replacement cost, from 1970 onwards. Significant investments in the road network of over $13 M took place from 2010 onwards. These assets are reaching their estimated end of life in the next decade. Over $5 M of the buildings were invested before 1990s and these assets require higher frequency of inspection and maintenance to meet safety compliance. Over $400,000 of the equipment have ages over 10 years and are expected to be renewed in the next decade. Equipment with high usage, such as snowplows or lawn mow, exposes to the risk of deterioration acceleration. The probability of failure of the aged equipment is increasing and it may lead to the risks of not meeting capacity or servicing requirements.

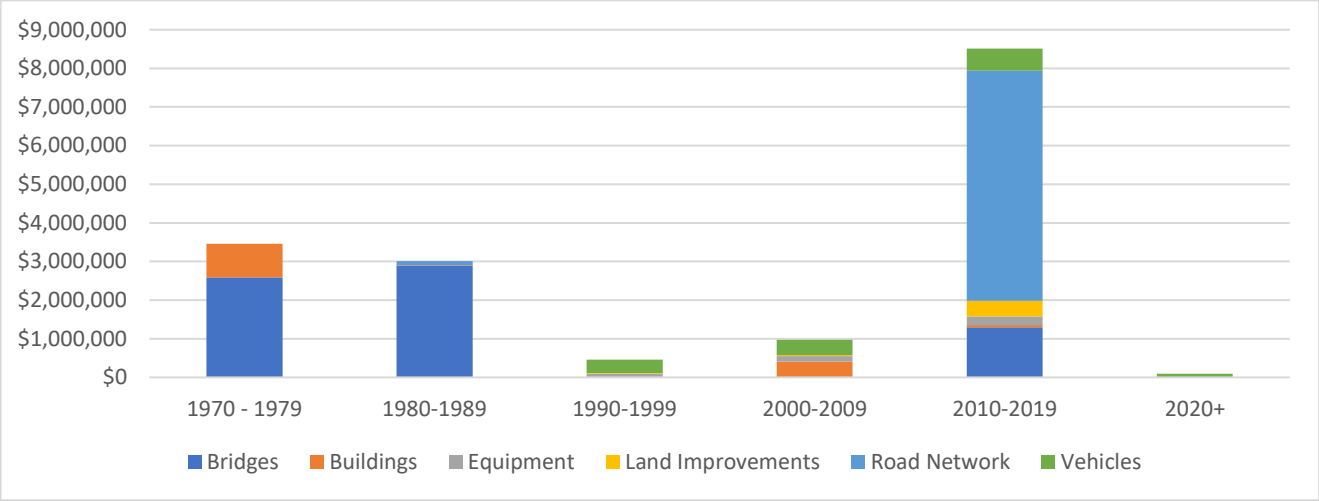


Figure 3 - Historical Capital Expenditures

The historical installation profile are estimations based on inventory records and may not reflect the true backlogs experienced by the Municipality. The Municipality as a whole has had increased spending year-over-year for preservation works and is looking to implement plans for preventative maintenance / replacement. The current strategy of "worst first" is not sustainable long term; Municipality staff are looking into more strategic renewal of infrastructure. Shifting priorities from the oldest, or worst condition assets, to prioritizing by risk and cost-avoidance will eventually lead to lower capital expenditures. Unfortunately, in the short-term the Municipality will have to reconcile competing demands between affordability and performance / risk.

Socio-political Expectations and Demographics

Figure 4 displays the distribution of population by age groups across the Municipality in 2021. The overall population (555 people in 2021) remain relatively constant while a significant portion of the population will be approaching retirement in the next decade. An aging population can affect the local economy, as well as causing changing service expectations. As residents age, the demand for accessible services will increase. These accessibility enhancements will require retrofits and upgrades within the structures, as well as other services, such as paramedics, to perform wellness checks. Together, these enhancements and new services will increase capital and operating costs of long-term care and housing assets.

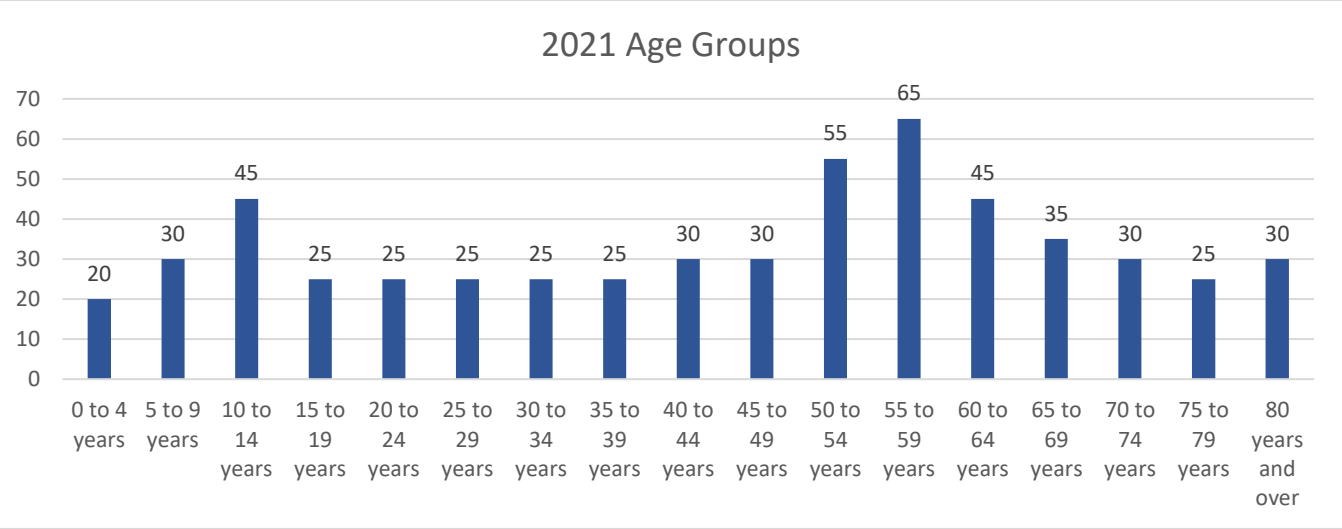


Figure 4 - Population by Age Groups – Municipality of Calvin

Fiscal Capacity

The Municipality's 2020 budget adopted a 1% tax increase. While infrastructure was identified as a strategic priority, contributions to the Municipality's infrastructure capital reserve has been increased for about 6% for 2021. Increasing contributions to a capital reserve may be required to mitigate the large spikes in capital demands in the future.

In 2020, the capital budget for Municipality of Calvin is about $0.9 million however the annual capital requirement is more than $1.3 million. The Municipality's current level of financial investment does not sufficiently address maintenance and capital rehabilitation requirements proactively. When grants are not available, large rehabilitation projects may be deferred. This may also lead to the decline in levels of service and the risk of not meeting capacity or servicing requirements.

Recommendations/Next Steps

Operationalizing Levels of Service

Establishing a holistic and realistic level of service framework for all core and non-core infrastructure assets is arguably the most impactful part of the AMP process because it dictates the kind of lifecycle management and financial strategy that a municipality should employ. The Municipality's main priority is to develop and measure current LOS for each asset class. Once evaluated, these LOS metrics act as indicators or thresholds by which the municipality can gauge how efficiently and effectively it is maintaining its assets. Upon setting those thresholds, the Municipality should then look at the proposed levels of service that it wants to target. The Municipality can choose to maintain, increase, or decrease their level of service deliverable based on informed and calculated decisions that involve different stakeholders and in

corporate a prioritization technique, risk matrix, and financial forecast.

A simple example of this procedure is as follows: if upon the evaluation of the Municipality's road network, only 6% of roads are found to be in a Good to Very Good condition, then the Municipality may propose an increase in the level of service to 50%; this decision to increase the roads level of service, however, can come at the cost of allocating less funding to other assets and will alter the kind of lifecycle activities performed on the roads network. Municipalities, then, must have a clear

understanding of what they are able to afford and provide to their citizens in terms of expected levels of service, and how best to prioritize and allocate their limited funding to achieve those deliverables.

Recommendations

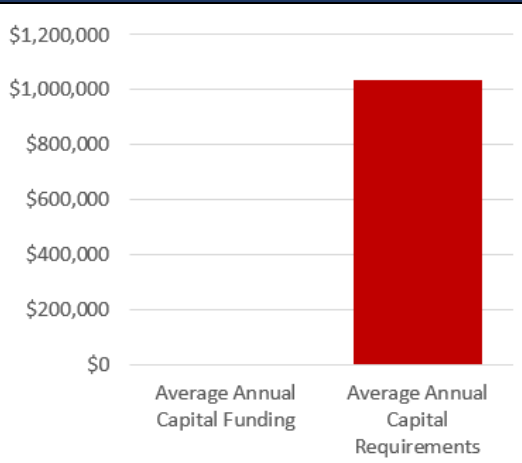
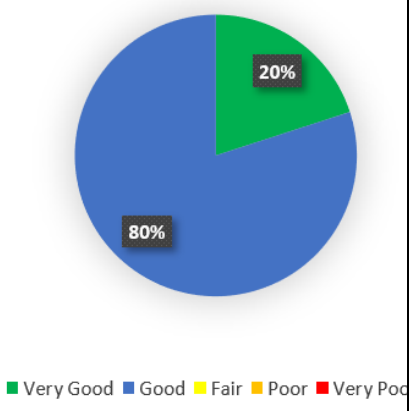
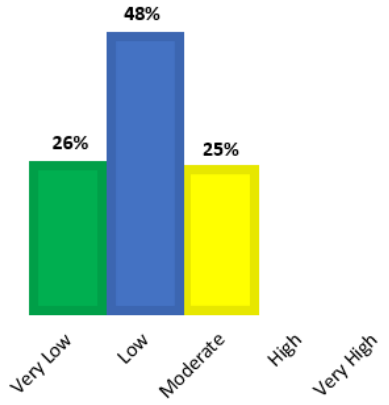
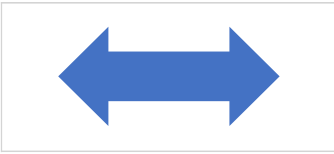
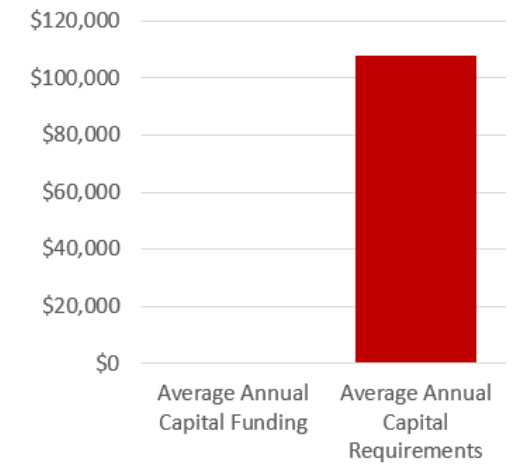
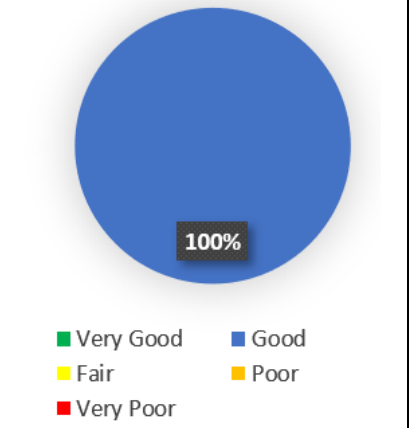
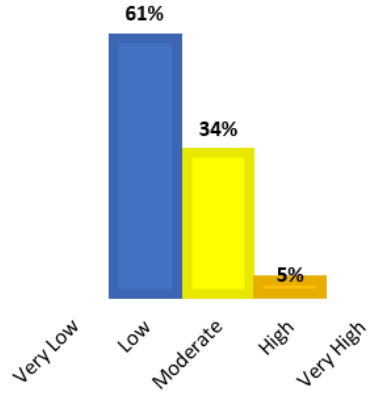
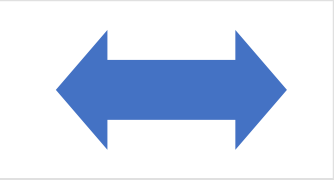
The impact of each recommendation, and the effort to complete it, are identified at a high-level. This is based on an understanding of the Municipality's current state of asset management practice, organizational capacity, and financial condition.

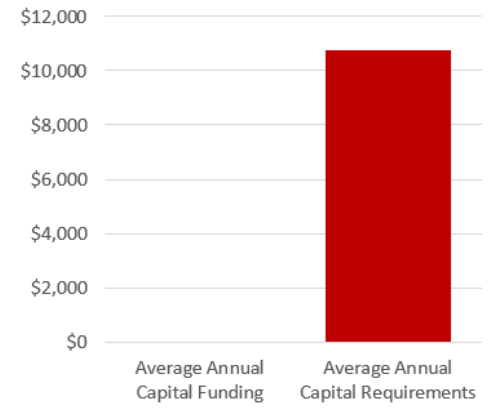
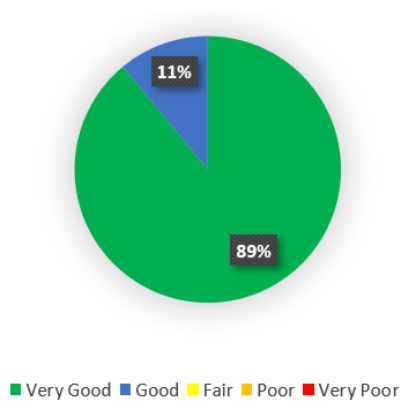
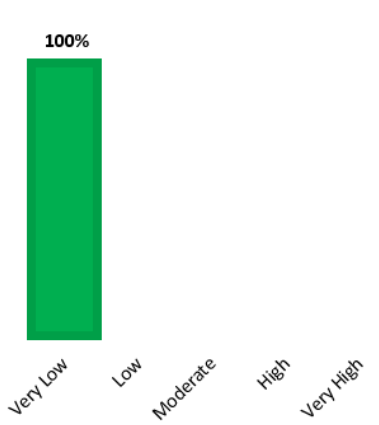
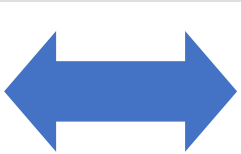
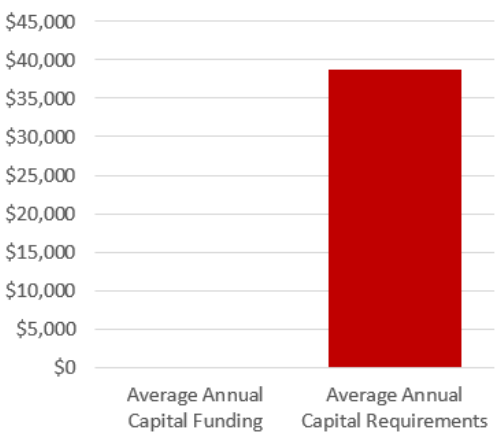
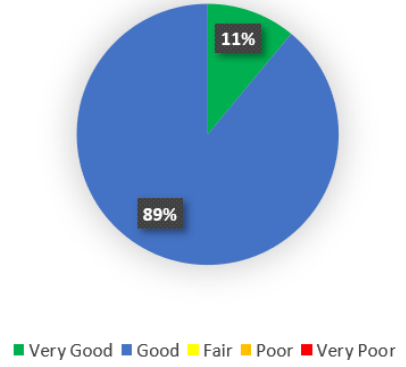
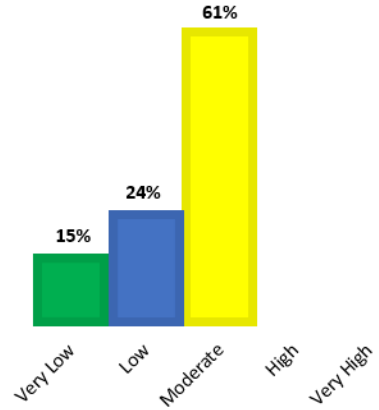
Figure 3 – Recommendations

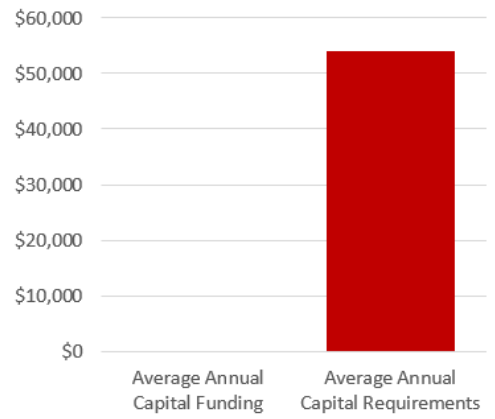
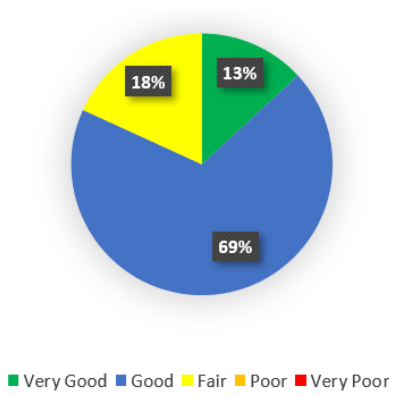
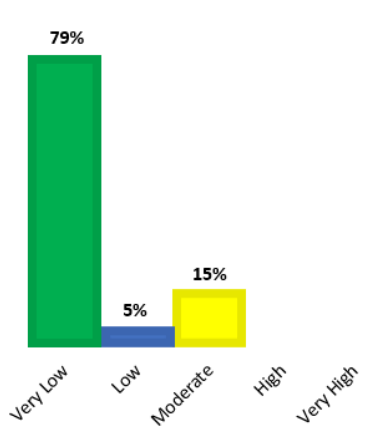
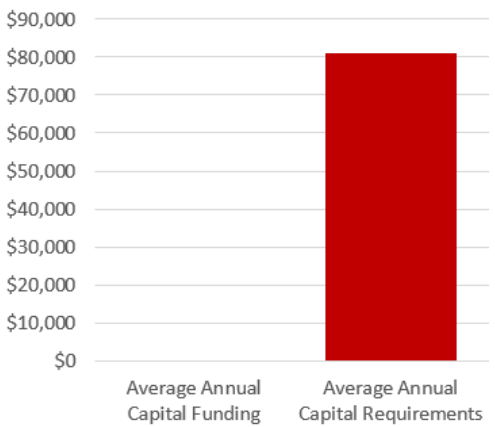
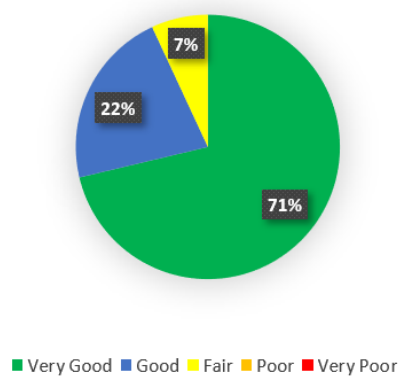
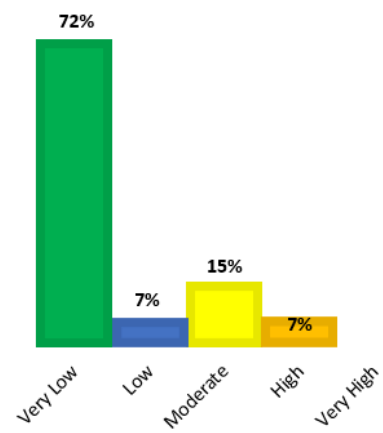
Recommendations	Estimated Impact and Effort	Time for Completion
Measure current levels of service for core assets • This includes roads, bridges & culverts, and storm as defined in O. Reg. 588/17. • At a minimum, this should include the metrics identified in Table 1-5 of O. Reg. 588/17 • This data must be included in your AMP and current as of two years prior to its completion.	**Impact:** High **Effort:** Medium	July 1, 2021
Measure current levels of service for all assets • The requirements above should be expanded to encompass all municipal infrastructure asset categories as outlined in O. Reg. 588/17. • This data must be included in your AMP and current as of two years prior to its completion.	**Impact:** High **Effort:** Medium	July 1, 2024
Collaborate across deparments to track levels of service data • The Core Asset Management Team should work with Service Area Representatives to keep the condition, replacement cost, risk models, and lifecycle models up to date in CityWide AM • The asset management team should facilitate and centralize data gathering between departments. • Finance should provide the annual reinvestment rates to the asset management team to populate, coming from the capital budget allocations. • A representative from each service area should be repsonsible for providing department specific level of service information to the asset management team to populate the framework.	**Impact:** High **Effort:** High	July1, 2022 Continuous
Communicate current levels of service with the public and engage in public consultation to identify emerging perceptions and priorities	**Impact:** Medium **Effort:** High	Continuous (Starting 2022)

• A regular public consultation process should be developed to align proposed levels of service with commuity expectations. • The impact of increasing or decreasing a level of service should be commmunicated in terms of the impact on cost, risk and performance. • Translating costs to a household level, or percentage increase on taxes and rates, will be more meaningful to the public.		
Identify proposed levels of service for all asset categories • The Municipality's AMP must include proposed levels of service each year over the next 10 years from when it is developed.	**Impact:** High **Effort:** Medium	July 1, 2025
Evaluate levels of service on an annual basis and adjust proposed levels of service in collaboration with Council in an effort to balance community expectations with cost, risk and performance • A formal process should include defined stakeholders, roles, responsibilities, and timelines for completion. • This may be further institutionalized through a formal Levels of Service policy.	**Impact:** High **Effort:** Low to Medium	Annually after July 1, 2025
Provide adequate staff capacity to meet requirements • The above recommendations will require significant demands on staff to undertake. The Municipality should continue to monitor the capacity of the Core Asset Management Team to ensure resources are adequate. • The Municipality should evaluate existing capacity and identify resources required to meet the requirements outlined in O. Reg. 588/17.	**Impact:** High **Effort:** Medium	Continuous

Appendix A: Level of Service Dashboard

Asset Class	Annual Asset Class Reinvestment Rate	Condition	Risk	Level of Service Trend
Road Network				
Bridges and Culverts				

Land Improvements				
Buildings				

Equipment				
Vehicles				

Appendix B: Level of Service Framework

Road Network

Core Value	Level of Service Statement	Community Level of Service	Technical Level of Service	Current and Historical Performance				
				2021	2022	2023	2024	2025
Accessible & Reliable	**Customer Value:** The road network is reliable and provides reasonable access to properties throughout the municipality	Description, which may include maps, of the road network in the municipality and its level of connectivity	Lane-km of arterial roads (MMS classes 1 and 2) per land area in the municipality (km/km^2)	0				
			Lane-km of collector roads (MMS classes 3 and 4) per land area in the municipality (km/km^2)	0.84				
			Lane-km of local roads (MMS classes 5 and 6) per land area in the municipality (km/km^2)	0.09				
	Alignment to Strategic Plan		% of road users are satisfied that the network is reliable and travel times are predictable	TBD				
Safe & Regulatory	**Customer Value:** The road network is managed in accordance with minimum maintenance standards and all other regulatory requirements **Alignment to Strategic Plan**	Description of minimum maintenance standards compliance for road network	% of signs inspected for reflectivity	0%				
			# of reported motor vehicle crashes	TBD				
Affordable	**Customer Value:** The road network is managed cost-effectively for the established level of service **Alignemnt to Strategic Plan**	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on the road network	O&M costs for paved roads / lane-km (excluding winter control)	$27				
			O&M costs for unpaved roads / lane-km (excluding winter control)	$104				
			Winter control costs / lane-km	$1,314				
			Annual capital reinvestment rate	PSD				
Sustainable	**Customer Value:** There are long-term plans in place for the renewal and replacement of the road network **Alignment to Strategic Plan**	Description or images that illustrate the different levels of road class pavement and sidewalk condition	Average pavement condition index for paved roads in the municipality	79.97%				
			Average surface condition for unpaved roads in the municipality	74.41%				

Bridges & Culverts

Core Value	Level of Service Statement	Community Level of Service	Technical Level of Service	Current and Historical Performance				
				2021	2022	2023	2024	2025
Accessible & Reliable	**Customer Value:** Bridges and culverts provide reliable access to the road network for vehicles and/or pedestrians **Strategic Alignment**	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	% of bridges in the municipality with loading or dimensional restrictions	0%				
			Average detour distance (minutes) of all Bridges and Culverts	15min - 30min				
			# of unplanned Structure closures	0				
Safe & Regulatory	**Customer Value:** Bridges and culverts provide safe vehicular and/or pedestrian passage, and all structures are compliant with regulatory inspection requirements **Strategic Alignment**	Description of the OSIM inspection process	% of bridges and structural culverts (3m) inspected every two years	100%				
			# of Minimum Maintenance Standards non-compliance events	0				
			% of bridges with load limits posted	0				
Affordable	**Customer Value:** Bridges and culverts are managed cost-effectively to meet the established level of service **Strategic Alignment**	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on bridges & culverts	O&M costs for bridges & culverts	$8,355				
			Annual capital reinvestment rate	TBD				
Sustainable	**Customer Value:** There are long-term plans in place for the renewal and replacement of all bridges and culverts **Strategic Alignment**	Description or images of the condition of bridges and how this would affect use of the bridges	Average bridge condition index value for bridges in the municipality	71%				
		Description or images of the condition of culverts and how this would affect use of the culverts	Average bridge condition index value for structural culverts in the municipality	N/A				

Land Improvements

Core Value	Level of Service Statement	Community Level of Service	Technical Level of Service	Current and Historical Performance				
				2021	2022	2023	2024	2025
Assessible and Reliable	**Customer Value:** Parks and landfill provide adequate physical access and are available for their defined use within prescribed working hours **Strategic Alignment:**	List of parks and amenities available to the public	# of parks and recreation features available	2				
			Distance of furtherst customer from the landfill	32 km				
Affordable	**Customer Value:** Parks are managed cost-effectively to meet the established level of service **Strategic Alignment**	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on parks, cemetaries, and landfills	O&M for the park	TBD				
			O&M cost for the cemetary	$26,261				
			O&M cost for the landfill	$108,837				
			Annual capital reinvestment rate	TBD				
Sustainable	**Customer Value:** There are long-term plans in place for the renewal and replacement of all parks assets **Strategic Alignment**	Description of the current condition of parks assets and the plans that are in place to maintain or improve the provided level of service	% of land improvements in good or very good condition	100%				
			% of land improvements in poor or very poor condition	0%				

Buildings

Core Value	Level of Service Statement	Community Level of Service	Technical Level of Service	Current and Historical Performance				
				2021	2022	2023	2024	2025
Accessible & Reliable	**Customer Value:** Facilities provide adequate physical access and are available for their defined use within prescribed working hours **Strategic Alignment:**	List of facilities that meet accessibility standards and any work that has been undertaken to achieve alignment	% of facilities that are open to the public meeting AODA standards	TBD				
			Gross square footage of all facilties owned and leased	9457.1				
Safe & Regulatory	**Customer Value:** Facilities are safe for occupants and do not cause a hazard to the public **Strategic Alignment**	Description of monthly and annual facilities inspection process	# of health and safety inspections per facility per year	TBD				
Affordable	**Customer Value:** Facilities are managed cost-effectively to meet the established level of service **Strategic Alignment**	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on municipal facilities	O&M cost / # of municipal facilities	$6,142				
			Total equivalent kWh energy consumption / ft^2 of all buildings and facilities	4.41				
Sustainable	**Customer Value:** There are long-term plans in place for the renewal and replacement of all facilities **Strategic Alignment**	Description of the current condition of municipal facilities and the plans that are in place to maintain or improve the provided level of service	Average annual reinvestment rate (%)	TBD				
			% of buildings and facilities inspected by the CBO over the last (5) years	TBD				
			% of facilities that are in good or very good condition	100%				
			% of facilities that are in poor or very poor condition	0%				

Equipment

Core Value	Level of Service Statement	Community Level of Service	Technical Level of Service	Performance Measurement and Projection				
				2019	2020	2021	2022	2023
Accessible & Reliable	**Customer Value:** Equipment is available and accessible to reliably support business operations **Strategic Alignment**	Description of redundancies available to ensure equipment is available for operations	% of repair hours spent on unscheduled repairs and service	TBD				
			% of Assets where Age > Useful Life (IT)	92%				
Safe & Regulatory	**Customer Value:** Equipment is safe for use by staff and adheres to regulatory requirements **Strategic Alignment**	Description of the timelines for equipment inspections and timing for IT software and hardware upgrades	# of workplace injuries due to equipment failures	TBD				
			# of equipment safety inspections per year completed for safety and protective equipment	100%				
Affordable	**Customer Value:** Equipment operations and services are managed cost-effectively, affordable for residents and businesses **Strategic Alignment**	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on equipment assets	O&M cost to maintain equipment	$31,641				
			Annual Maintenance and Warranty Fees (IT)	$848				
Sustainable	**Customer Value:** There are long-term plans in place for the renewal and replacement of all equipment assets **Strategic Alignment**	Description of the current condition of equipment and the plans that are in place to maintain or improve the provided level of service	Average annual reinvestment rate of equipment and IT assets	TBD				
			% of assets in poor or very poor condition	0%				
			% of assets in good or very good condition	82%				

Vehicles

Core Value	Level of Service Statement	Community Level of Service	Technical Level of Service	Performance Measurement and Projection				
				2019	2020	2021	2022	2023
Accessible & Reliable	**Customer Value:** Vehicles are in good repair and are available for use during service hours **Strategic Alignment**	List of vehicles that have an out of service due to repairs	Number of public works and fire vehicles	4 fire; 2 plow; 1 grader; 1 backhoe				
			% of repair hours spent on unscheduled repairs	TBD				
Safe & Regulatory	**Customer Value:** Vehicles are safe for operations and meet all relevant regulations **Strategic Alignment**	Description of the regulatory vehicle inspection process undertaken each year	% of regulated MTO maintenance inspections complete	0				
			# of fleet vehicles involved in a collision per year	0				
			# of vehicles safety inspections per year per vehicle	2				
Affordable	**Customer Value:** Vehicles are managed cost-effectively, ensuring affordable service delivery	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on vehicles	O&M cost per vehicle	$9,893				
Sustainable	**Customer Value:** There are long-term plans in place for the renewal and replacement of all vehicles **Strategic Alignment**	Description of the current condition of vehicles and the plans that are in place to maintain or improve the provided level of service	Average annual reinvestment rate of vehicle assets	TBD				
			% of fleet assets with less than 5 years remaining	0				
			% of fleet assets with 10 or more years remaining	13%				