Asset Management Plan

Town of Caledon

2020

This Asset Management Program was prepared by:

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

Key Statistics

$1.34 billion Replacement cost of asset portfolio	**$ 60,892** Replacement cost of infrastructure per household (2016 Census)
3.09% Target average annual infrastructure reinvestment rate	**1.99%** Actual average annual infrastructure reinvestment rate
72% Percentage of assets in fair or better condition[1]	**59%** Percentage of assets with assessed condition data
22% Percentage of sustainable capital funding that comes from the Federal Gas Tax/OCIF	**64%** Percentage of annual infrastructure needs funded from sustainable revenue sources
$14.7 million Annual capital infrastructure deficit	**15 years** Recommended timeframe for eliminating annual infrastructure deficit

[1] Key statistics in this AMP are weighted by replacement cost.

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Acknowledgements

The Corporate Asset Management team would like to acknowledge the efforts of the staff across the Town's service areas for their contribution to the development of this Asset Management Plan. Staff have dedicated notable time and effort to provide their expertise and support in developing the asset management plan. In particular, this Plan was especially made possible through the guidance and continued support provided by Dan Labrecque (Acting Chief Administrative Officer), Myuran Palasandiran (Director, Finance/Chief Financial Officer), Andrew Pearce (Director, Engineering), Brian Baird (Director, Operations), Erin Britnell (Director, Corporate Strategy and Innovation), Colleen Lipp (Chief Librarian), Heather Savage (Director, Community Services), Darryl Bailey (Fire Chief), and Heather Haire (Treasurer, Finance).

The Corporate Asset Management team would also like to acknowledge PSD Citywide Inc. for their efforts in working with the Town over the past year in developing this Plan and continuing to advance the Town's asset management program.

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Executive Summary

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

All municipalities in Ontario are required to complete an asset management plan (AMP) in accordance with Ontario Regulation 588/17 (O. Reg. 588/17). This AMP outlines the current state of asset management planning in the Town of Caledon. It identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Town can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP is based on inventory data from 2019 and includes the following tax-funded asset categories:

Core Assets	Non-Core Assets
Road Network	Buildings, Furniture & IT Equipment
Bridges & Culverts	Land Improvements
Stormwater System	Machinery & Equipment
	Vehicles

The overall replacement cost of the asset categories included in this AMP totals $1.34 billion. 72% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 59% of core assets.[2] For the remaining assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP has used a combination of proactive lifecycle strategies (paved roads) and

[2] Key statistics in this AMP are weighted by replacement cost.

replacement only strategies (all other assets) to determine the lowest cost option to maintain the current level of service.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Town's average annual capital requirement totals $41.4 million. Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $26.7 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $14.7 million.

A financial strategy was developed to address the annual capital funding gap. The following table compares to total and average annual tax/rate change required to eliminate the Town's infrastructure deficit:

Funding Source	Years Until Full Funding	Total Tax/Rate Change	Average Annual Tax/Rate Change
Tax-Funded Assets	15 Years	19.5%	1.1%

This AMP represents a snapshot in time and is based on the best available processes, data, and information at the Town. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources. Several recommendations have been developed to guide the continuous refinement of the Town's asset management program. These include:

a) regular and ongoing asset inventory data review to ensure that asset management planning and long-term projections are based on completed and accurate data
b) the development of a condition assessment strategy on a regular schedule according to defined criteria
c) the continuous review, development, and implementation of optimal lifecycle management strategies
d) the development of short- and long-term capital plans for each asset category to ensure adequate revenue is available to meet capital requirements
e) the measurement of current levels of service across all asset categories and eventually the identification of proposed levels of service that are realistic and sustainable

The evaluation of the above items and further development of a data-driven, best-practice approach to asset management is recommended to ensure the Town is providing optimal value through its management of infrastructure and delivery of services.

With the development of this AMP the Town has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2022. There are additional requirements concerning proposed levels of service and growth that must be met by July 1, 2024, and 2025.

1 Introduction & Context

Key Insights

1. The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio

2. The Town's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management

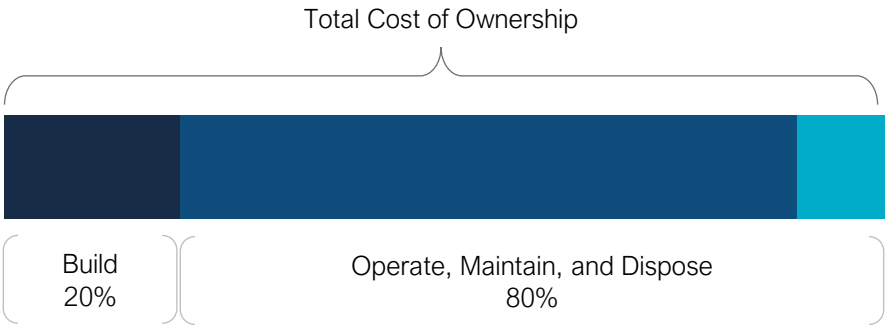
3. An asset management plan is a living document that should be updated regularly to inform long-term planning

4. Ontario Regulation 588/17 outlines several key milestones and requirements for asset management plans in Ontario between July 1, 2022, and 2025

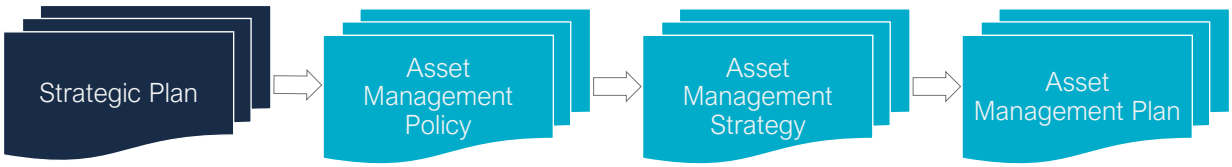
1.1 An Overview of Asset Management

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

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



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



The diagram, adopted from the Institute of Asset Management (IAM), illustrates the concept of 'line of sight', or alignment between the corporate strategic plan and various asset management documents. The strategic plan has a direct, and cascading impact on asset management planning and reporting.

1.1.1 Asset Management Policy

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

The Town's Asset Management Policy was developed in 2019 (Schedule A to Report 2019-4) in satisfaction of the requirements outlined in O. Reg. 588/17.

This Asset Management Plan satisfies the policy statement outlined in Section D, Subsection 3:

> *The Town will develop an asset management plan (AMP) that incorporates all infrastructure categories and municipal infrastructure assets that are necessary to the provision of services. This may include assets that fall below their respective capitalization thresholds as outlined in the Town's Tangible Capital Asset Procedure.*
>
> *The scope of these assets will be determined, according to relevance, based on the professional judgment of Town senior staff. The AMP will be reviewed annually to address the Town's progress in implementing its asset management plan and updated at least every five years in accordance with O. Reg. 588/17 requirements, to promote, document and communicate continuous improvement of the asset management program.*

1.1.2 Asset Management Plan

The asset management plan (AMP) provides a snapshot in time of the current state of municipal infrastructure assets as well as the current strategies in place to assist with planning and decision-making.

The focus of the AMP is not simply about identifying the money or resources that are required to meet lifecycle needs of infrastructure and maintain an adequate level of service. It should also identify the processes and strategies that are and can be implemented to improve decision-making outcomes.

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

1.2 AM Program Maturity

The following table outlines the current state of maturity of the Town's asset management program. This is a cursory overview meant to identify areas of strengths and weaknesses. A series of recommendations have been developed to address any identified opportunities to advance the state of maturity.[3]

Program maturity has been assessed across three key competencies:

1. Organization & People – the resources in place that support asset management planning
2. Data & Information – the data and information that is used to support asset management planning and decision-making
3. Processes & Planning – the asset management strategies and processes that are in place to analyze data and inform decision-making

Defining Maturity Levels

The 3-point scale used to assess the Town's maturity level aligns with the 5-point readiness scale used by the Federation of Canadian Municipalities (FCM). The FCM readiness scale provides a high-level corporate wide assessment whereas PSD's Maturity scale provides an asset-specific assessment within similar key competencies. Recommendations within the AM Program Maturity section also build upon the results of the Town's most recent FCM Readiness assessment.

The tables below summarize the maturity scales used for the three key competencies and identify key attributes typically found within each level.

Defining Maturity Levels - Organization and People

Basic	Intermediate	Advanced
Minimal understanding of asset management concepts and principles among staff.	Some understanding of asset management concepts and principles among staff.	Expert understanding of asset management concepts and principles among staff.
Asset management a low priority.	Asset management a medium priority.	Asset management a high priority.
Absence of adequate human resource capacity for asset management.	Adequate human resource capacity for asset management	High human resource capacity for asset management, with dedicated staff.
Processes and tools do not facilitate asset management planning; may impede planning.	Processes or tools facilitate asset management planning.	Processes and tools facilitate asset management planning.
Lack of strategic communications on asset management initiatives.	Some or ad hoc communications related to asset management initiatives.	Strategic communications on asset management initiatives.

[3] As a separate and ongoing exercise, the Town is in the process of assessing asset management maturity within each department against the ISO 55001 standard.

Defining Maturity Levels – Data & Information

Basic	Intermediate	Advanced
Many gaps in primary datasets, including replacement costs, historical costs, estimated useful life, in-service dates, and condition.	Some gaps in primary datasets, including replacement costs, historical costs, estimated useful life, in-service dates, and condition.	Minimal gaps in primary datasets, including replacement costs, historical costs, estimated useful life, in-service dates, and condition.
Minimal secondary or attribute data, including physical properties, size, material	Some secondary or attribute data, including physical properties, size, material	Detailed secondary or attribute data, including physical properties, size, material
Inventory is decentralized across many systems.	Inventory is centralized, but may not be fully accessible, current, accurate, completed, or verified.	Inventory is highly centralized, accessible, current, accurate, verified, complete, linked to GIS
No established cycle for updating replacement costs.	Replacement costs are updated on an ad hoc basis.	Replacements costs are updated on an established cycle.
Replacement costs are updated primarily using inflation.	Replacement costs are updated using a combination of inflation and procurement data.	Replacement costs are updated using procurement data and/or prevailing market conditions.
No strategic and scheduled condition assessment programs in place.	Condition assessment programs is scheduled but not strategic.	Strategic and scheduled condition assessment program is in place.
Data governance is informal.	Some elements of formal data governance and management are in place and documented, including data governance policies and procedures.	Most elements of formal data governance and management are in place and documented, including data governance policies and procedures.

Defining Maturity Levels – Processes & Planning

Basic	Intermediate	Advanced
Asset needs lists are produced primarily based on age data. No documented understanding of the probability of asset failure, and the various financial, social, health & safety, and environmental risks associated with assets (risk frameworks). Minimal, or no documentation on current technical or customer-oriented levels of service to track and monitor service delivery.	Assets needs lists are produced based on a combination of age data and condition assessments. Some documentation on the probability of asset failure, and the various financial, social, health & safety, and environmental risks associated with assets.	Assets needs lists are produced based on a combination of age, condition assessment data, and recommendations from various technical or economic studies. Various financial, social, health & safety and environmental risks are well-documented for most or all assets. Probability of asset failure is also quantified. Detailed risk frameworks in place.
Growth and demand projects not identified in long-term budgets.	Growth and demand projects identified in long-term budgets.	Growth and demand projects identified in long-term budgets.
No infrastructure master planning process to determine which growth and demand projects are coordinated into budgets. No formal and documented risk management process to prioritize infrastructure related spending.	An infrastructure master planning process determines which growth and demand projects are coordinated into budgets.	An infrastructure master planning process determines which growth and demand projects are coordinated into budgets. Accounts for public affordability expectations.

Basic	Intermediate	Advanced
No formal project prioritization process to develop budgets and capital plans Levels of service data is managed primarily using non-structured methods, e.g., paper records, or disconnected sheets and databases	A formalized project prioritization process is used to develop budgets and capital plans. Formal risk management process to inform project prioritization and infrastructure related spending; may not be documented. Levels of service reporting is used for some, but not all of the following: set targets and trends for service delivery; prioritize capital projects; adjust operating practices; conduct financial analyses; inform public on the municipality's performance and discuss trade-offs.	A formalized project prioritization process is used to develop budgets and capital plans and includes lifecycle analysis, treatment options, and risk management. Levels of service reporting is used for most or all of the following: set targets and trends for service delivery; prioritize capital projects; adjust operating practices; conduct financial analyses; inform public on the municipality's performance and discuss trade-offs.

The Town's Maturity Level in summary:

Asset Management Competency	Subject Area	Asset Categories		
		Road Network	Bridges & Culverts	Stormwater Assets
Organization & People	Knowledge & Understanding	Intermediate	Intermediate	Intermediate
	Resource Capacity	Basic	Basic	Basic
Data & Information	Inventory Data	Advanced	Advanced	Basic
	Attribute Data	Intermediate	Advanced	Basic
	Condition Data	Advanced	Advanced	Basic
	Valuation Data	Intermediate	Intermediate	Basic
Processes & Planning	Lifecycle Management Strategies	Basic	Basic	Basic
	Risk Management	Basic	Basic	Basic
	Levels of Service	Basic	Basic	Basic
	AM Software Understanding[4]	Basic	Basic	Basic

Recommendations specific to each core asset category are presented in Chapter 3, 4, and 5.

1.3 Key Concepts in Asset Management

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

[4] While there are several information systems that comprise the Town's Asset Management Information System, this subject area narrowly assesses staff knowledge and capacity to use Citywide Asset Manager, the primary tool used to develop this AMP.

1.3.1 Lifecycle Management Strategies

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

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

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

Lifecycle Activity	Description	Example (Roads)	Cost
Maintenance	Activities that prevent defects or deteriorations from occurring	Crack Seal	$
Rehabilitation/ Renewal	Activities that rectify defects or deficiencies that are already present and may be affecting asset performance	Mill & Re-surface	$$
Replacement/ Reconstruction	Asset end-of-life activities that often involve the complete replacement of assets	Full Reconstruction	$$$

Depending on initial lifecycle management strategies, asset performance can be sustained through a combination of maintenance and rehabilitation, but at some point, replacement is required. Understanding what effect these activities will have on the lifecycle of an asset, and their cost, will enable staff to make better recommendations.

The Town's approach to lifecycle management is described within each asset category outlined in this AMP. Developing and implementing a proactive lifecycle strategy will help staff to determine which activities to perform on an asset and when they should be performed to maximize useful life at the lowest total cost of ownership.

1.3.2 Risk Management Strategies

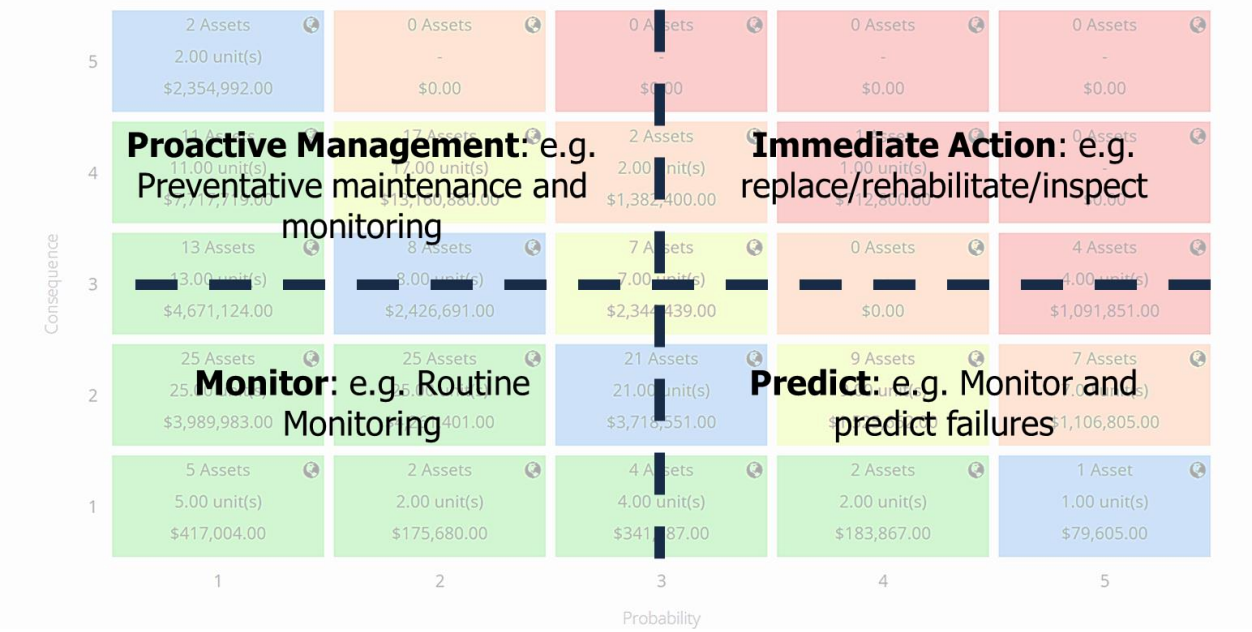
Municipalities generally take a 'worst-first' approach to infrastructure spending. Rather than prioritizing assets based on their importance to service delivery, assets in the worst condition are fixed first, regardless of their criticality. However, not all assets are created equal, and some assets pose a greater risk to service delivery if they were to fail.

For example, a road with a high volume of traffic that provides access to critical services poses a higher risk than a low volume rural road servicing a handful of properties. Asset risk and criticality is a key component of both short- and long-term planning.

$$\boldsymbol{Risk\ Rating} = Probability\ of\ Failure\ x\ Consequence\ of\ Failure$$

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

Risk matrices are a useful tool used to visualize risk across a group of assets. The following image provides an example of the actions or strategies that may be considered depending on an asset's risk rating.



Resilient Caledon Plan

In 2021, the Town approved a Climate Change Action Plan (CCAP) called the Resilient Caledon Plan. The Plan contains over 60 action items to prepare for the local impacts of climate change and reduce greenhouse gas (GHG) emissions to 36% below 2016 levels by 2030 and reach net zero GHG emissions by 2050.

This strategic document was developed with input from Caledon residents and key stakeholders. The primary goals of Resilient Caledon are to reduce GHG emissions and increase the Town's resiliency to the impacts of current and future projected climate conditions – notably flooding, extreme weather events, and extreme heat – on residents, businesses, and natural and built infrastructure.

The Plan includes strategies to increase the resiliency of infrastructure by enhancing the capacity of roads and bridges to withstand extreme weather impacts; upgrading stormwater plans and practices to reduce risks; and include climate change considerations into the Town's asset management planning processes.

This AMP reflects the objectives to enhance infrastructure resiliency and creates an avenue to further advance infrastructure resiliency in the future. Utilizing the risk mitigation models and strategies that were developed during the AMP process, staff can factor in risks associated with climate change and sustainability. Staff can take into consideration infrastructure resiliency when rehabilitating existing infrastructure, constructing new assets, and disposing/decommissioning other assets. There are also opportunities to embed costs related to lowering GHG emissions of Town's assets, specifically fleet and buildings.

The Town is currently developing the Green Fleet Strategy which will outline an approach to replacing fleet assets and fuel with lower carbon sources and technology, which can inform asset replacement costs in future updates of the AMP. Second, the Town is updating its Corporate Green Building Strategy, with more stringent energy and emissions performance requirements, aligned with the Resilient Caledon Plan. Once finalized, these documents will further advance the Town's capacity to develop asset management strategies that incorporate climate change mitigation and adaptation considerations.

1.3.3 Levels of Service

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

These measures include a combination of those that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the Town as worth measuring and evaluating. The Town measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

Community Levels of Service

Definition: a simple, plain language description or measure of the service that the community receives.

Example: Description or images that illustrate the different levels of road class pavement condition

Technical Levels of Service

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

Example: Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)

Current and Proposed Levels of Service

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

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Town. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability.

Once proposed levels of service have been established, and prior to July 2025, the Town must identify a lifecycle management and financial strategy which allows these targets to be achieved.

1.4 Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

1. Current levels of service
2. Inventory analysis
3. Lifecycle activities to sustain LOS
4. Cost of lifecycle activities
5. Population and employment forecasts
6. Discussion of growth impacts

2024

Asset Management Plan for Core and Non-Core Assets

2025

Asset Management Policy Update and an Asset management Plan for All Assets with the following additional components:

1. Proposed levels of service for next 10 years
2. Updated inventory analysis
3. Lifecycle management strategy
4. Financial strategy and addressing shortfalls
5. Discussion of how growth assumptions impacted lifecycle and financial

2 Asset Portfolio Overview

Key Insights

1. The total replacement cost of the Town's asset portfolio is $1.34 billion

2. The Town's target re-investment rate is 3.09%, and the actual re-investment rate is 1.99%, contributing to an expanding infrastructure deficit

3. 72% of all assets are in fair or better condition

4. 32% of assets are projected to require replacement in the next 10 years

5. Average annual capital requirements total $41.4 million per year across all assets

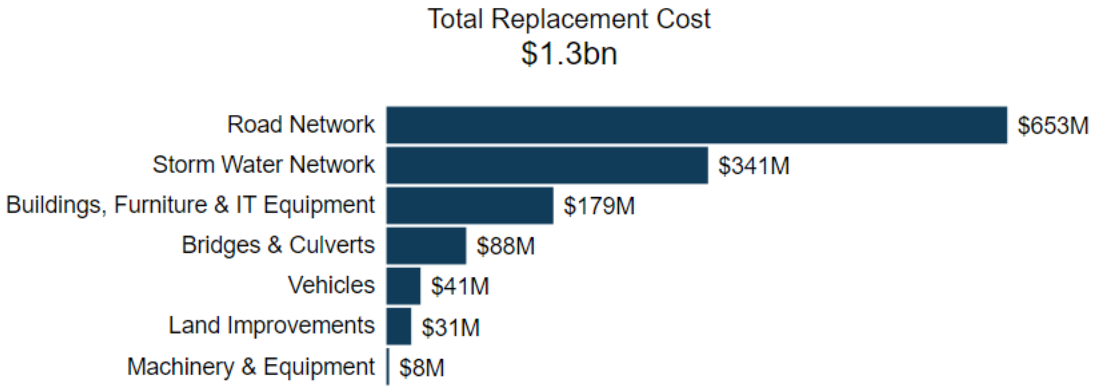
2.1 State of the Infrastructure

2.1.1 Asset Management Report Card

Asset	Replacement Cost (million)	Asset Condition	Maturity		Financial Capacity	
Road Network	$652.5	Good (60%)	Organization & People:	Intermediate	Annual Requirement:	$21,254,000
			Data & Info:	Advanced	Funding Available:	$14,115,000
			Processes & Planning:	Basic	**Annual Deficit:**	**$7,139,000**
Bridges & Culverts	$88.5	Good (72%)	Organization & People:	Intermediate	Annual Requirement:	$2,062,000
			Data & Info:	Advanced	Funding Available:	$3,068,000
			Processes & Planning:	Basic	**Annual Deficit:**	**-$1,007,000**
Stormwater Network	$340.6	Good (70%)	Organization & People:	Intermediate	Annual Requirement:	$5,065,000
			Data & Info:	Basic	Funding Available:	$2,539,000
			Processes & Planning:	Basic	**Annual Deficit:**	**$2,525,000**
Buildings, Furniture & IT Equipment	$179.3	Good (68%)	N/A		Annual Requirement:	$7,088,000
					Funding Available:	$3,983,000
					Annual Deficit:	**$3,104,000**
Machinery & Equipment	$8.0	Good (71%)	N/A		Annual Requirement:	$1,252,000
					Funding Available:	$628,000
					Annual Deficit:	**$624,000**
Vehicles	$40.8	Poor (30%)	N/A		Annual Requirement:	$3,212,000
					Funding Available:	$1,610,000
					Annual Deficit:	**$1,601,000**
Land Improve-ments	$31.1	Poor (35%)	N/A		Annual Requirement:	$1,460,000
					Funding Available:	$732,000
					Annual Deficit:	**$728,000**
Overall	$1,340.9	Fair (58%)	Organization & People:	Intermediate	Annual Requirement:	$41,392,000
			Data & Info:	Intermediate	Funding Available:	$26,676,000
			Processes & Planning:	Basic	**Annual Deficit:**	**$14,716,000**

2.1.2 Total Replacement Cost of Asset Portfolio

This AMP includes 7 asset categories and provides comprehensive analysis for the 3 core asset categories: Road Network, Bridges & Culverts, and Stormwater System. A high-level analysis with a focus on financial data and strategies is provided for non-core assets: Buildings, Furniture & IT Equipment, Machinery & Equipment, Land Improvements, and Vehicles. This AMP is based on Inventory data from 2019.



This AMP relies on two methods to determine asset replacement costs:

- Unit Cost: A unit-based cost (e.g. per metre) determined through a review of recent contracts, reports and/or staff estimates
- Historical Cost Inflation: Inflation of the asset cost recorded at the time it was initially acquired to today's value using an index (e.g. CPI or NRBCPI)

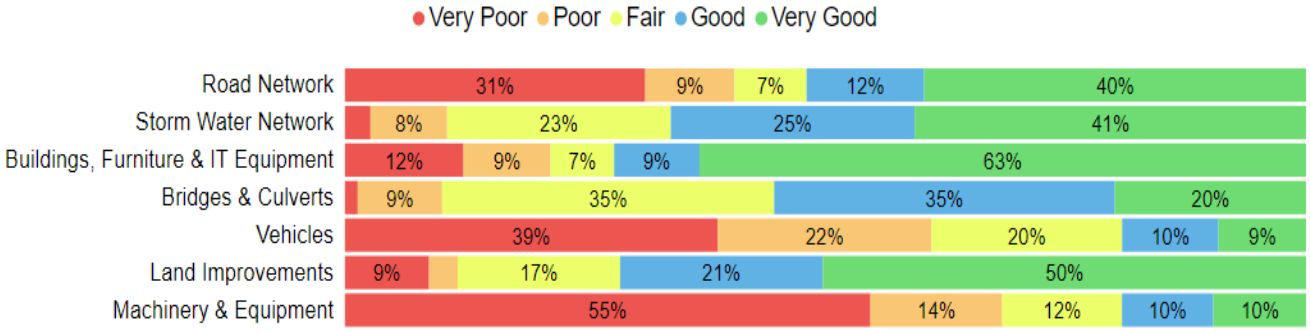
The following table identifies the methods employed to determine replacement costs across each asset category:

Asset Category	Replacement Cost Method		
	Unit Cost	Cost Inflation	Year of Inflated Data
Road Network	89%	11%	Historical
Bridges & Culverts	8%	92%	2019[5]
Stormwater System	88%	12%	2019[6]
Buildings, furniture & IT Equipment	0%	100%	2018[7]
Land Improvements	70%	30%	2019
Machinery & Equipment	28%	72%	Historical
Vehicles	91%	9%	2019
Overall	**63%**	**37%**	

[5] Costings for structures being replaced within 10-years is from 2019 OSIMs. Other costing is inflated from 2017 unit costs.
[6] Unit costing for linear mains were obtained from Region of Peel tenders.
[7] Costing is inflated from 2018 AMP, which used costing from 2016 building assessments, plus new acquisitions, additions, disposals.

2.1.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. 72% of all assets in Caledon are in fair or better condition. Collectively, 63% of core assets in Caledon are in fair or better condition. This estimate relies on both age-based and assessed condition data.



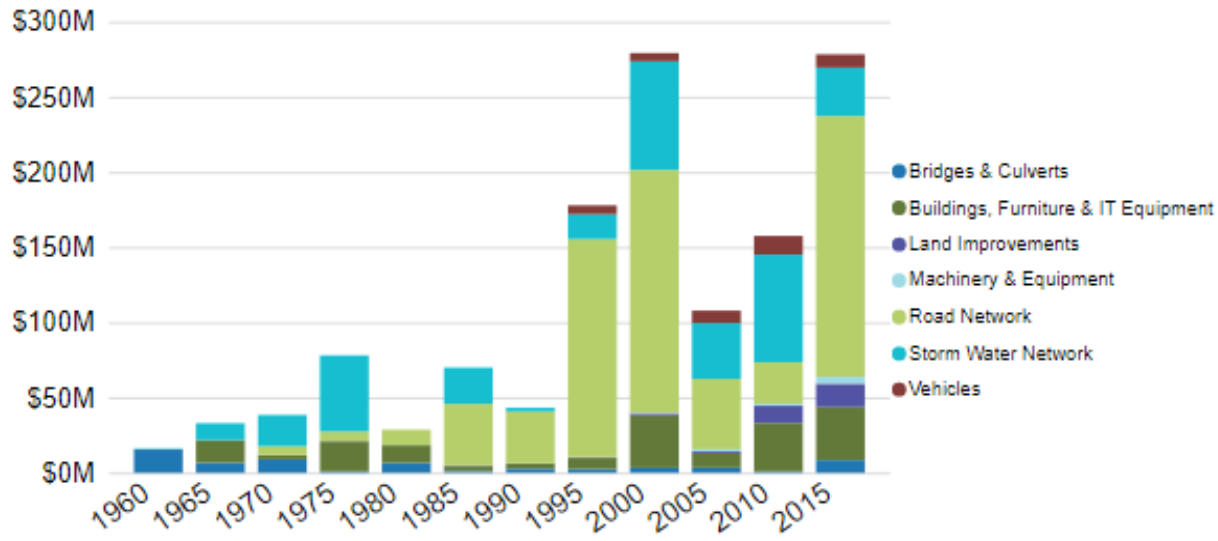
This AMP relies on assessed condition data for 61% of core assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	% of Assets with Assessed Condition	Source of Condition Data
Road Network	84%	2020 Englobe Assessment
Stormwater System	8%	CCTV Inspections
Bridges & Culverts	93%	OSIM Inspection Report
Buildings, Furniture & IT Equipment	54%	Staff Assessed
Land Improvements	1%	Staff Assessed
Machinery & Equipment	-	N/A
Vehicles	-	N/A
Overall	**59%**	

The development of a condition assessment program across all asset categories is critical to confidence in long-term asset management planning. Appendix I provides a high-level overview of the role of asset condition data and key considerations in the development of a condition assessment program.

2.1.4 Asset Age/Acquisition

The following graph illustrates the age of infrastructure based on their in-service date and current replacement value.



Category	Estimated Useful Life Range (Years)	Average Age (Years)
Road Network	20-35 Years	5.5
Bridges & Culverts	50-75 Years	50.8
Stormwater System	50-75 Years	22
Buildings, Furniture & IT	1-81 Years	10.5
Land Improvements	10-50 Years	9.1
Machinery & Equipment	2-20 Years	6.4
Vehicles	1-30 Years	7.8

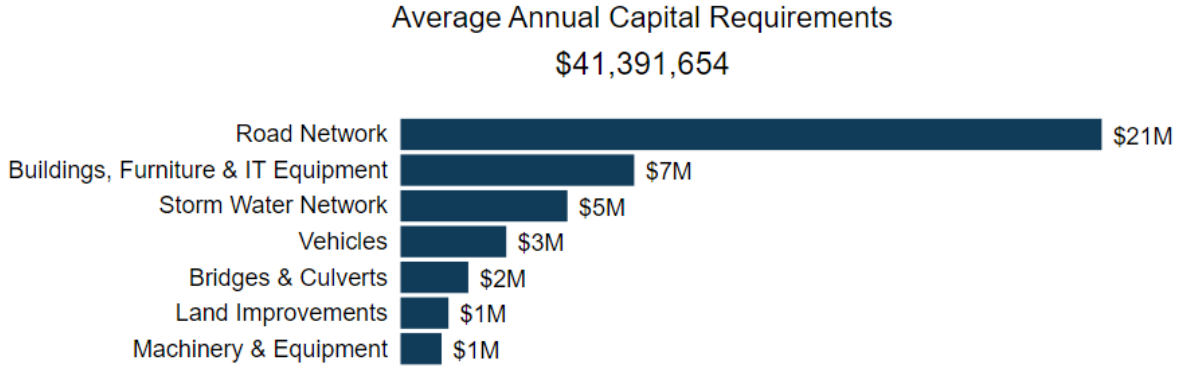
While capital planning horizons tend to be short (<10 Years), a sustainable lifecycle and financial strategy should consider the full lifecycle of all assets. Short-term capital costs may be low for asset categories with long useful lives where infrastructure is relatively new. However, planning and saving for long-term capital costs is a key component of asset management planning.

The calculation of an average annual capital requirement considers the estimated useful life and cost of infrastructure to identify the amount that the Town should be allocating to meet capital needs regardless of whether the project costs will be incurred in the short- or long-term. The capital requirement projections in this AMP do not take into consideration growth and the addition of new assets. Long-term capital planning should include considerations for growth to ensure residents continue to receive the same level of service over time.

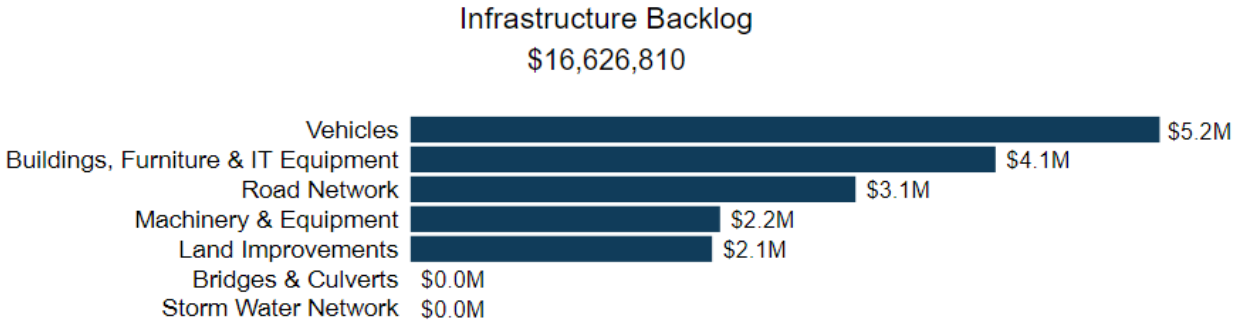
2.2 **Capital Requirements**

2.2.1 Average Annual Capital Requirements

Annual capital requirements represent the amount the Town should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. This figure does not factor in costs associated with operations and maintenance.

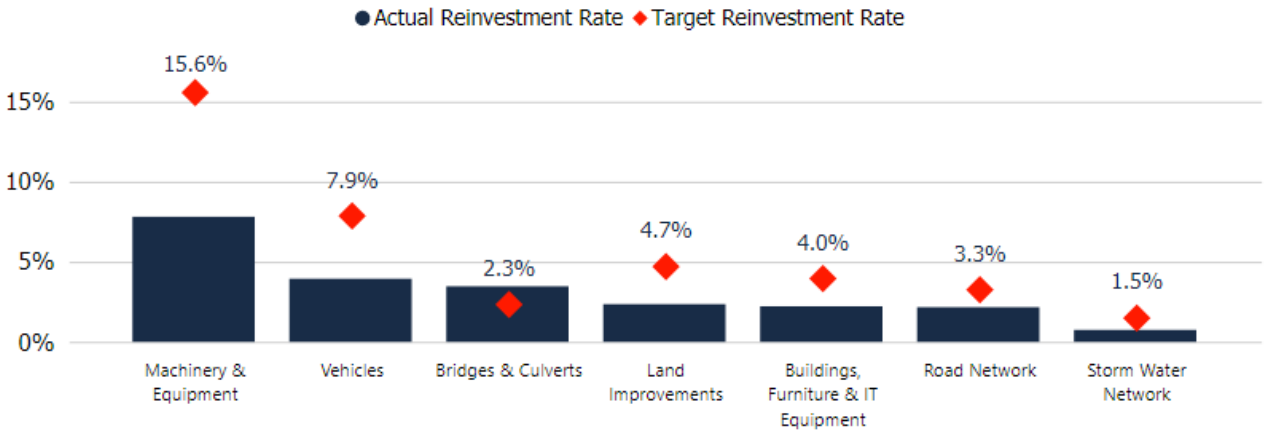


In total, the Town must allocate approximately $41.4 million annually to address capital requirements for the assets included in this AMP. The annual requirements, however, do not incorporate the backlog costs or value of assets that have reached their end of useful life by the 2019 reporting year. The graph below shows the amount of backlog that the Town has accumulated.

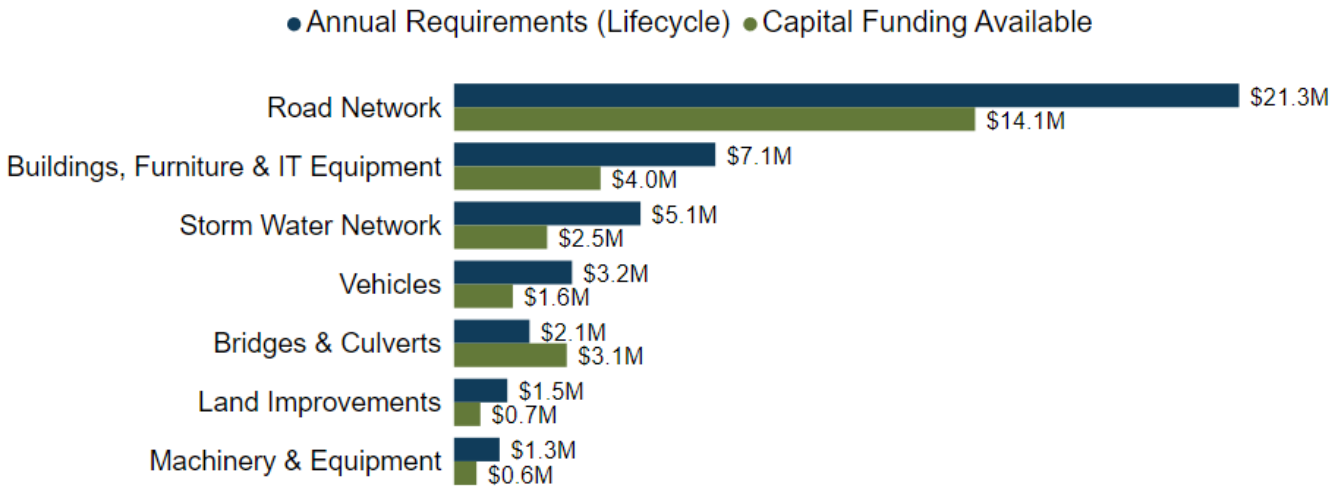


2.3 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Town should be allocating approximately $41.4 million annually, for a target reinvestment rate of 3.09%. Actual annual spending from sustainable revenue sources totals approximately $26.7 million, for an actual reinvestment rate of 1.99%.[8]



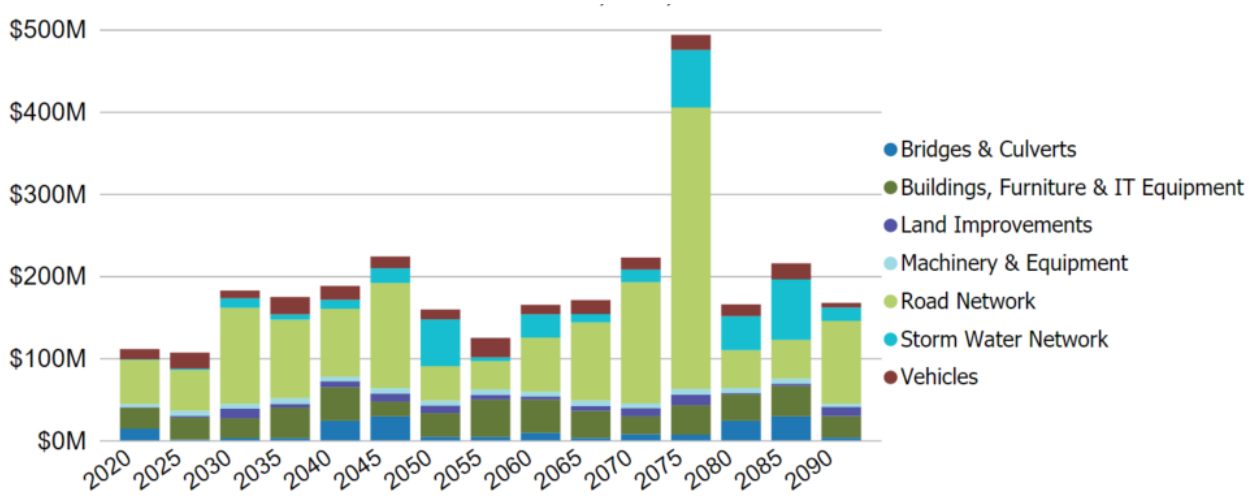
To highlight the monetary magnitude of the reinvestment rates, the graph below compares the capital annual requirements (target reinvestment) versus maintain the current level of service to the capital annual funding that is available (actual reinvestment). This comparison is examined in more detail under Section 8.1.1.



[8] See section 8.1.1 for a graph comparing actual annual funding and annual requirements.

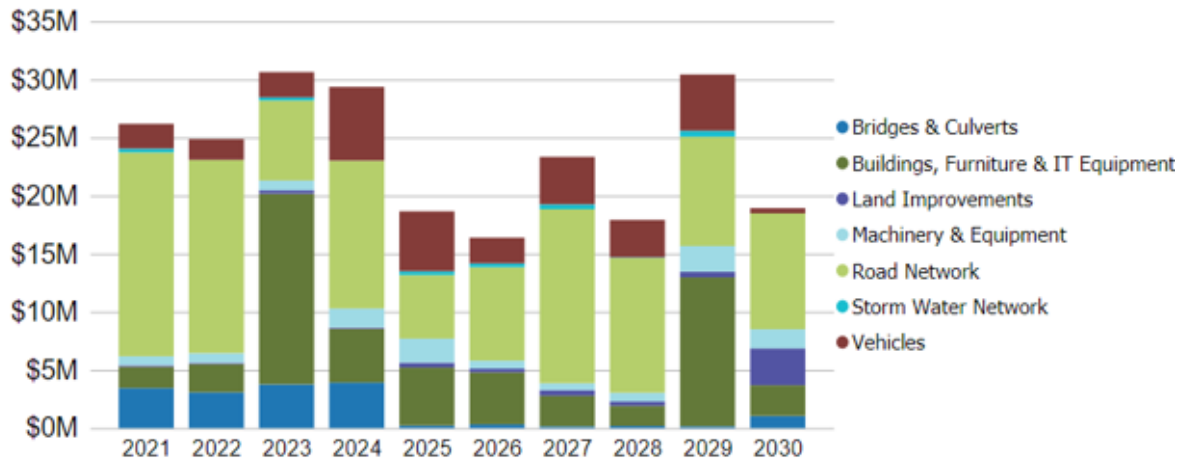
2.3.1 Projected Capital Requirements (50 Years)

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Municipality can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 70 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins; the average annual capital requirements are $41.4 million or $207 million every 5 years.



2.3.2 Projected Capital Requirements (10 Years)

To provide a closer look at the Town's short-term annual capital requirements, the following graph showcases the first 10 years of projected capital requirements in accordance with O. Reg. 588/17.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix D.

3 Road Network

Key Insights

1. Road network assets are valued at $652.5 million

2. 59% of road network assets are in fair or better condition

3. The average annual capital requirement to sustain the current level of service for road network assets is approximately $21.3 million

3.1 Asset Category & Service Description

The Road Network serving Caledon is comprised of provincial highways and arterial, collector and local roadways. The town has jurisdiction for all collector and local roadways. Region of Peel is responsible for most arterial roads, while the province has jurisdiction for the 400-series and provincial highways.

The state of the infrastructure for roads is summarized in the following table.

Replacement Cost	Condition	Maturity		Financial Capacity	
$652.5 million	Good (60%)	Organization & People:	Intermediate	Annual Requirement:	$21,254,000
		Data & Info:	Advanced	Funding Available:	$14,115,000
		Processes & Planning:	Basic	Annual Deficit:	$7,139,000

Roads are the responsibility of the Engineering Department and are managed by both the Engineering and Transportation divisions.

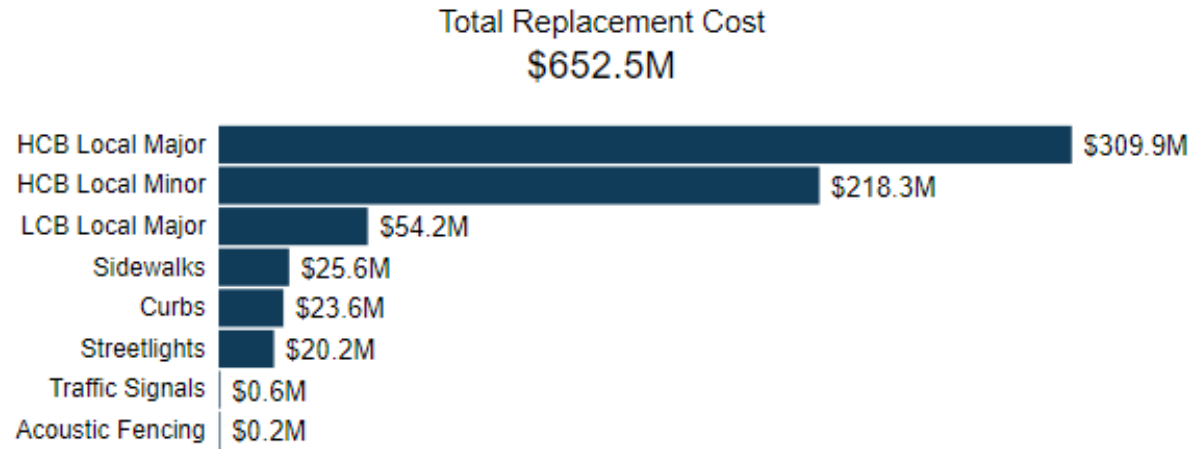
The following core values and level of service statements are a key driving force behind the Town's asset management planning.

Core Values	Level of Service Statement
Availability	The road network service is conveniently accessible to the whole community in sufficient capacity (meets traffic demands) and is available under all weather conditions.
Reliability	The road network is in good condition with minimal unplanned services and road closures.
Cost-effectiveness	The road network service is provided to all customers at an affordable cost.
Safe	The road network meets the provincial maintenance standards (MMS) and the Town's road policy.
Sustainable	The road network service is consistently provided at an acceptable level over long-term by developing resiliency to extreme precipitation and temperature swings, and by supporting the transition to a low-carbon transportation system.

3.2 **Asset Inventory & Costs**

The table below includes the quantity, total replacement cost, and annual capital requirements of each asset segment in the Town's Road Network inventory.

Asset Segment	Quantity[9]	Replacement Cost	Annual Capital Requirement
Acoustic Fencing	148 m	$224,483	$11,224
Curbs	172 km	$23,587,835	$692,197
Gravel Roads	104 km	Not Planned for Replacement	
HCB Local Major	366 km	$309,892,526	$9,615,669
HCB Local Minor	249 km	$218,252,841	$7,166,444
LCB Local Major	112 km	$54,213,833	$2,147,291
Sidewalks	163 km	$25,647,401	$783,310
Streetlights	4,687	$20,152,797	$815,045
Traffic Signals	4	$576,030	$23,041
Total		**$652,547,746**	**$21,254,222**



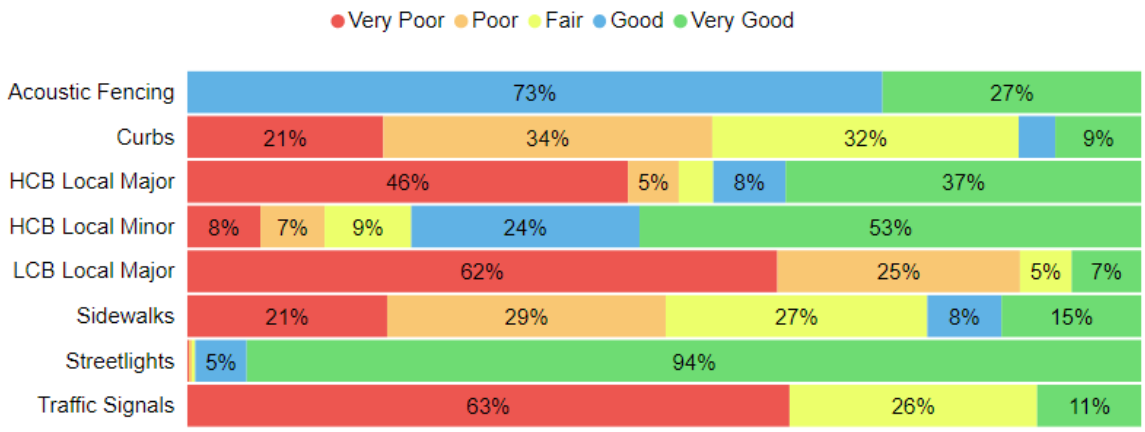
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

[9] Staff are not confident in the accuracy of quantities of acoustic fencing and gravel roads.

3.3 Data Insights: Useful Life, Age & Condition

The following table outlines key data on the current state of infrastructure to inform asset management planning. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Acoustic Fencing	20	3.8	93% - Very Good
Curbs	35	19.5	38% - Poor
HCB Local Major	25	14.6	55% - Fair
HCB Local Minor	25	15.1	79% - Good
LCB Local Major	20	20.6	25% - Poor
Sidewalks	25	16.0	55% - Fair
Streetlights	25	1.3	95% - Very Good
Traffic Signals	25	15.2	60% - Good
Average		**5.5**	**60% - Good**



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

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

3.3.1 Current Approach to Condition Assessment

- Network-wide condition assessments are completed for all paved roads every 2 years and are carried out by an external contractor to ensure consistency and standardization.
- Each road receives a Pavement Condition Index (PCI) rating which considers the quantity and severity of road surface distresses, and an Overall Condition Index (OCI) rating which combines the PCI rating with a Roughness Index (RI) to provide a more complete picture of the driving quality associated with each road surface.
- PCI and OCI ratings are critical in determining the overall condition of the road network, appropriate maintenance, and rehabilitation strategies, and developing capital plans.

In this AMP we use the PCI rating to determine the current condition of road segments and forecast future capital requirements using the following rating criteria:

Condition Rating	PCI Rating
Very Good	85-100
Good	70-85
Fair	55-70
Poor	40-55
Very Poor	0-40

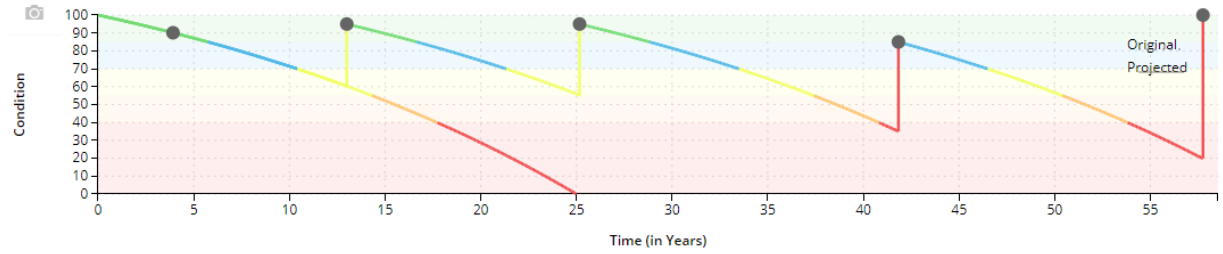
3.4 Lifecycle Management Strategy

3.4.1 Lifecycle Models

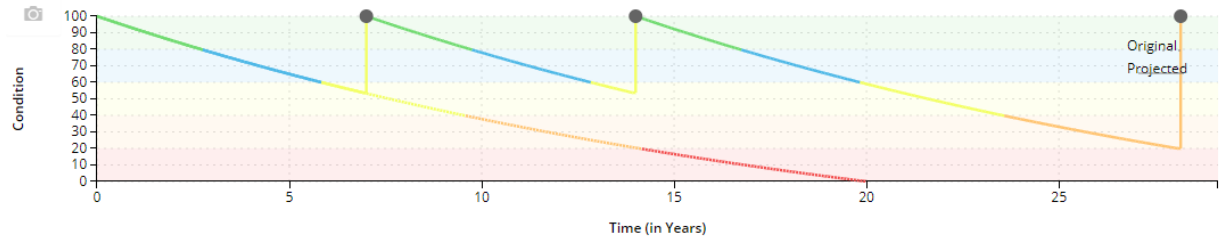
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of Paved Roads. Instead of allowing the roads to simply deteriorate until replacement is required, timely interventions extend the service life of roads at a lower total lifecycle cost.

Paved Roads (HCB)		
Event Name	Event Class	Event Trigger
Crack Sealing	Maintenance	Condition: 90
Resurfacing	Rehabilitation	Condition: 60
Partial Rehabilitation	Rehabilitation	Condition: 55
Partial Rehabilitation	Rehabilitation	Condition: 35
Reconstruction	Replacement	End-of-life (~58 Years)



Paved Roads (LCB)		
Event Name	Event Class	Event Trigger
Double Surface Treatment	Rehabilitation	7 Years
Slurry Seal	Maintenance	14 Years
Reconstruction	Replacement	End-of-life (~28 Years)



3.4.2 Overview of Current Lifecycle Strategies

Activity Type	Description of Current Strategy
Maintenance	Crack sealing program is in place for HCB roads, and staff are currently developing a more robust preventative maintenance program that will include hot asphalt patching.
	The current approach emphasizes the importance and benefits of preventative maintenance in extending the life of pavement and minimizing capital rehabilitation and reconstruction costs.
Rehabilitation	With a greater focus on preventative maintenance and an aggressive road reconstruction program to accommodate growth, there has not been a significant capital rehabilitation program for roads in recent years.
Replacement	Priority roads for reconstruction are those that are required for growth and can be funded through development charges.
	There has been a rapid conversion from gravel to paved roads in recent years and it is expected that a significant increase in annual capital budget is required to address rehabilitation and replacement needs.
	Capital planning horizon for roads is 10 years with named projects identified over the first 5 years.

Small Roads Program

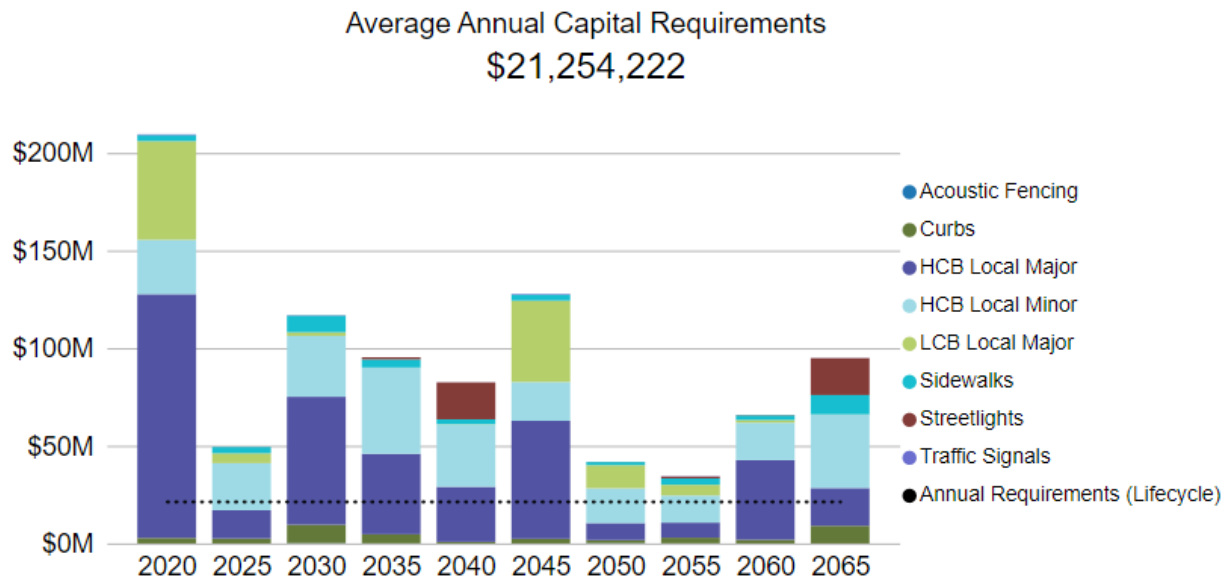
With capital budget being directed primarily towards high volume corridors and areas experiencing rapid growth, there has been concern that “small roads” (primarily crescents and cul-de-sacs) were not being kept in a state of good repair. Small roads can also be defined as low volume – with less than 300 vehicles per day.

To address the concerns of stakeholders and ensure that these small roads are kept in a state of good repair, Council directed staff to develop a Small Roads Program. The Program includes $500,000 annually towards capital construction of small roads.

3.5 **Forecasted Capital Requirements**

The following graph forecasts capital requirements for the Road Network over the next 50 years.

The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs to meet future capital needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix D.

The following table compares two scenarios for the Road Network:

1. Replacement Only Scenario: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. Lifecycle Strategy Scenario: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required

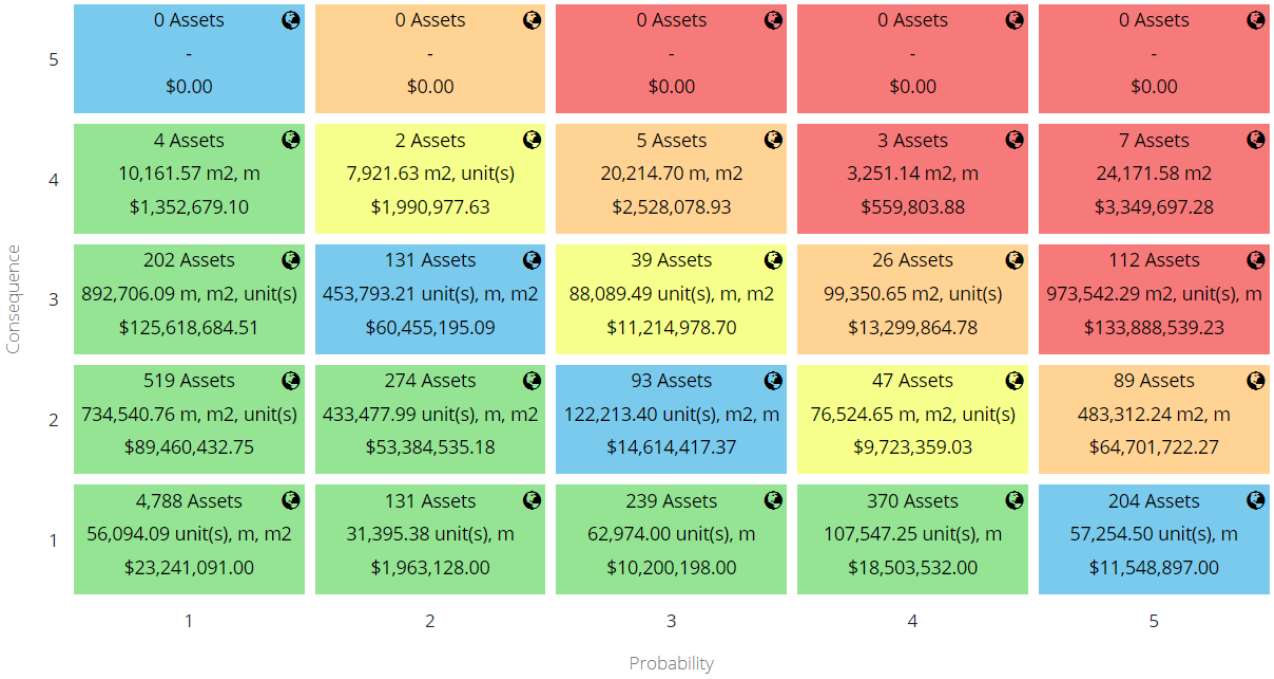
Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$26,167,000	$21,254,000	$4,913,000

As the lifecycle strategy scenario represents the lowest cost option available to the Town, we have used these annual requirements in the development of the financial strategy.

3.6 Risks to Current Asset Management Strategy

3.6.1 Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix F.



This is a high-level model developed for the purposes of this AMP and Town staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets will allow the Town to determine appropriate risk mitigation strategies and treatment options. This may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

3.6.2 Risk to Current Asset Management Strategies

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

Lifecycle Management Strategies

There is some concern that the lack of defined lifecycle management strategy for roads in the past resulted in the inadequate maintenance of road pavement structures. Staff are working on the development of deterioration curves and the identification of a suitable lifecycle management strategy for roads that accounts for their current condition and how they have been historically maintained.

Staff Resources & Capacity

Staff resources have been focused primarily on accommodating the infrastructure requirements of rapid population growth. This leaves little time to dedicate towards asset management planning activities such as data refinement and lifecycle strategy development. Recent changes to the Town's organizational structure are expected to have a positive impact on establishing asset management priorities.

Financial Reinvestment

Within the past few years staff have prioritized road reconstruction and the expansion of the road network to accommodate growth and increased demand. The current level of financial reinvestment does not sufficiently address maintenance and capital rehabilitation requirements to ensure roads remain in an adequate state of repair and achieve their intended service life. The financial strategy in this report addresses the extent of this underfunding.

Climate Change & Extreme Weather Events

An increase in the frequency and intensity of precipitation events can result in flooding of sections of the road network. The drainage capacity of the road network is not sufficient to withstand heavy water flow, particularly on gravel roads. Further issues can arise as a result of flooding and poor drainage including accelerated deterioration caused by freeze/thaw cycles. To improve asset resiliency, Staff should identify problem areas and improve drainage through enhanced lifecycle strategies.

Other significant climate change impacts may result from increasing temperatures. For example, higher temperatures can accelerate the deterioration of road surfaces and weaken the foundation.

3.7 **Current Levels of Service**

Service Attribute	Community Levels of Service	
Availability	The road network serving Caledon is comprised of arterial, collector, and local roadways. The arterial and collector roads generally form block grids and function as main thoroughfares. The Town's collector road system generally forms smaller block grids between the arterial road system. These roads are generally continuous and carry moderate traffic volumes. Within the rural service centers, villages, and hamlets, the collector roads provide address to the local road system. The local roads connect to the collector roads and provide access to individual properties in residential and commercial areas. A map of the Town's Road Network can be found in Appendix E.	
	Technical Levels of Service	**2020**
	Number of lane-km of roads / sq. km of land area[10]	4.36 lane-km/km^2
Reliability	**Community Levels of Service**	
	See Section 3.3.1 for a description of the Town's current approach to assessing road class pavement condition.	
	Technical Levels of Service	**2020**
	Average PCI rating for paved roads	75.7 (Good)
	Average surface donation of unpaved roads	Fair - Poor
Cost-Effectiveness	**Community Levels of Service**	
	See Section 3.4 for a description of the lifecycle activities performed on the road network.	
	Technical Levels of Service	**2019**
	O&M costs for paved and unpaved roads/km	$763
Safety	**Community Levels of Service**	
	Minimum Maintenance Standards (MMS) for roads are outlined in Ontario Regulation 239/02. This Regulation sets out the minimum standards or repair for roadways under municipal jurisdiction. The Town's current road maintenance strategies are directly informed by the MMS, and staff make every reasonable effort to meet all outlined standards.	
	Technical Levels of Service	**2020**
	% of sidewalks/pathways inspected	90%
	% of roads inspected	100%
Sustainability	**Community Levels of Service**	
	The Town's Long-Term Strategic Financial Plan is a framework to guide Council and the Town's departments, boards and committees in their financial planning and decision-making processes. The results of this Asset Management Plan will be integrated into this process to inform: -General Reserve Fund Policies -Capital Budget Management Policies -Debt Management Policies In an effort to address sources of corporate transportation-related emissions. The Town is in the process of developing a Corporate Green Fleet Strategy. The goal is to prioritize and create the business cases for lower carbon options that can be undertaken with fleet asset renewal.	
	Technical Levels of Service	**2020**
	% of streetlights with LED or low energy fixtures (or % of LED streetlights inspected every year)	32%
	Annual capital reinvestment rate	2.2%

[10] The Town's road inventory does not include the required level of detail to determine lane-km for each road classification (Arterial/Collector/Local). The road classification structure is currently under review as part of ongoing Official Plan revisions.

3.8 **Maturity & Recommendations**

Asset Management Competency	Subject Area	Maturity	Recommendations
Organization & People	Knowledge & Understanding	Intermediate	Staff exhibit an in-depth understanding of the strategies required to manage road infrastructure. Staff can identify where the opportunities of improvements are and how asset needs can be addressed through proactive maintenance, rehabilitation, and replacement strategies. The Town can advance knowledge and understanding by educating and training a greater number of staff on database management and optimal use of CityWide Asset Manager. Furthermore, the Town should seek to develop a medium- to long-term external communication strategy to engage the public on asset management and obtain feedback to inform development of proposed levels of service.
	Resource Capacity	Basic	With low resource capacity and the impacts of an evolving organizational structure, there have been some difficulties with prioritizing asset management planning activities. The Town's asset management program would benefit from additional GIS experts and staff resources to ensure a streamlined process for updating the asset inventory and GIS database and managing the growing backlog of work. The Town's corporate asset management team is responsible for overseeing and monitoring asset management progress as the Town develops a more proactive and planned approach to their lifecycle strategies. A RACI Chart can be a useful exercise to identify the roles, responsibilities, and the extent of involvement of individuals around key AM activities. It can identify areas or activities that could benefit from increased capacity.
Data & Information	Inventory Data	Advanced	The Town has a high level of confidence in asset data which is updated regularly through studies completed by external contractors. This data is adequately reflected in Citywide. The Town should seek to develop a more streamlined approach for updating the asset inventory, specifically as it relates to asset additions. Resource capacity makes it difficult to maintain an accurate and up to date inventory.
	Attribute Data	Intermediate	The surface material and maintenance class are identified for all road segments. However, some segments are missing area measurements and there is no data on the number of lanes which is needed to develop the lane-km attribute. Staff should consider developing a data governance framework that details the type and format of attribute information to be collected during internal and/or external assessments. This information can be used to further develop the Town's risk management strategies and levels of service metrics utilized.
	Condition Data	Advanced	Network-wide condition assessments are planned biennially and are completed by an external contractor to ensure consistency and standardization. The roads are assessed through PCI and OCI criteria. The condition data is used to determine appropriate maintenance, rehabilitation, and replacement strategies. The Town should leverage condition data for long-term projections of capital needs.

	Valuation Data	Intermediate	Historical costs are verified and accurate. Replacement costs are defined by unit costs based on average construction prices, however, the costs per unit are only updated during an AMP update. The Town should seek to update costs per unit every two years. The Engineering department should provide updated numbers based on contracts completed over several years for various rehabilitation and reconstruction projects.
Processes & Planning	Lifecycle Management Strategies	Basic	Staff has a strong understanding of the need for a more proactive lifecycle management strategy for roads to address lack of maintenance strategies in the past. Staff should develop a more proactive lifecycle management strategy that is attainable considering resource capacity. Staff should also seek to evaluate multiple lifecycle strategies to identify the lowest cost strategy to maintain current LOS. This is a difficult task to achieve without the proper staff resourcing in place and the Town's current reactive approach when repairing/reconstructing their roads.
	Risk Management	Basic	The Town currently has an informal process of documenting economic, financial, social, and environmental risks associated with roads. Continued population growth and increased demand will limit staff capacity to develop proactive risk management strategies. Identified risks should be leveraged to develop comprehensive risk matrices within Citywide to support project prioritization. Staff may consider conducting a climate risk assessment – such as the Public Infrastructure Engineering Vulnerability Committee (PIEVC) – to improve climate change considerations.
	Levels of Service	Basic	The Town has engaged various staff internally to develop current levels of service through technical and qualitative KPIs that can be used for internal benchmarking on an annual basis. This will help in developing and assessing the trend of services being provided by capturing data and benchmarking internally on an annual basis. There is an opportunity to integrate these service levels in Citywide to corresponding assets and tie it with maintenance management system. LOS metrics tied to full-time employment at the Town would promote a better understanding of resource capacity issues and concerns related to growth. External benchmarking can be used to later develop desired LOS.
	AM Software Understanding	Basic	Citywide software acts as a comprehensive asset register for assets and all asset attributes. Linkage with GIS is critical for accurate asset documentation and capital planning among other uses. Lifecycle models and risk matrices can be built into the software to further support the advanced of the Town's asset management and lifecycle strategies. With time, metrics and information from the Maintenance Manager module can also be incorporated into the Town's strategies. All key staff members should be trained to update the database and utilize Citywide tools as a resource for planning. The Town should consider hiring a dedicated GIS expert for Engineering Services to support the maintenance of an updated and accurate asset inventory and GIS system.

4 Bridges & Culverts

Key Insights

1. Bridges and culvert assets are valued at $88.5 million

2. 90% of bridge and culvert assets are in fair or better condition

3. The average annual capital requirement to sustain the current level of service for bridge and culvert assets is approximately $2.1 million

4.1 Asset Category & Service Description

Bridges & Culverts are a critical component of the Town's transportation network. They facilitate the movement of passenger vehicles, trucks, pedestrians, and cyclists. All bridge and structural culverts (>=3m in span) are subject to biennial inspections as per the Ontario Bridge Inspection Manual (OSIM).

The state of the infrastructure for bridges and culverts is summarized in the following table.

Replacement Cost	Condition	Maturity		Financial Capacity	
$88.5 million	Good (72%)	Organization & People:	Intermediate	Annual Requirement:	$2,062,000
		Data & Info:	Advanced	Funding Available:	$3,068,000
		Processes & Planning:	Basic	Annual Deficit:	-$1,007,000

Bridges and Culverts are the responsibility of Engineering Department and are managed by both the Engineering and Transportation divisions.

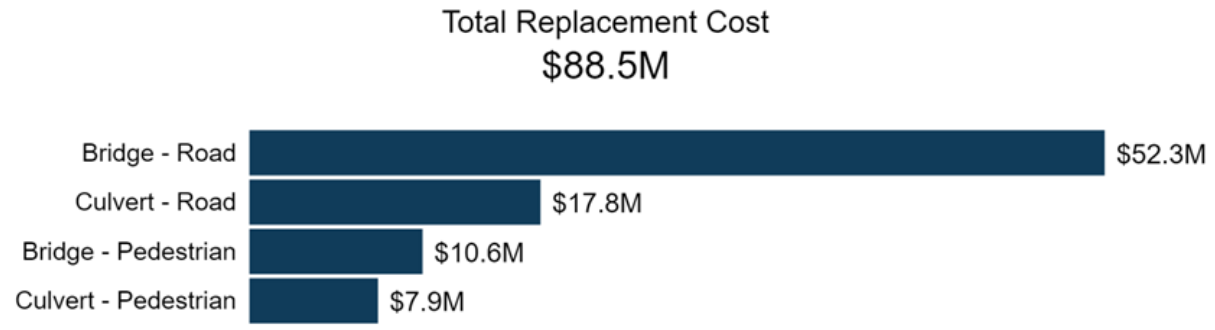
The following core values and level of service statements are a key driving force behind the Town's asset management planning.

Core Values	Level of Service Statement
Availability	The bridges and culverts are accessible to most of the community with only 13% of the bridges having load restrictions.
Reliability	The bridges and culverts are in good condition with minimal unplanned services and closures.
Cost-effectiveness	The bridge and culvert service is provided to all customers at an affordable cost.
Safe	The bridges and culverts meet the Ontario Provincial Standards for Roads and Municipal Services and follows the Ontario Structural Inspection Manual (OSIM).
Sustainable	The bridge and culvert service is consistently provided at an acceptable level over long-term by developing resiliency to extreme precipitation and temperature swings, and by supporting the transition to a low-carbon transportation system.

4.2 **Asset Inventory & Costs**

The table below includes the quantity, total replacement cost, and annual capital requirements of each asset segment in the Town's Bridges & Culverts inventory.

Asset Segment	Quantity	Replacement Cost	Annual Capital Requirement
Bridge - Pedestrian	18	$10,577,148	$228,486
Bridge - Road	60	$52,250,054	$1,214,090
Culvert - Pedestrian	28	$7,853,465	$196,337
Culvert - Road	34	$17,780,649	$422,620
Total		**$88,461,316**	**$2,061,533**

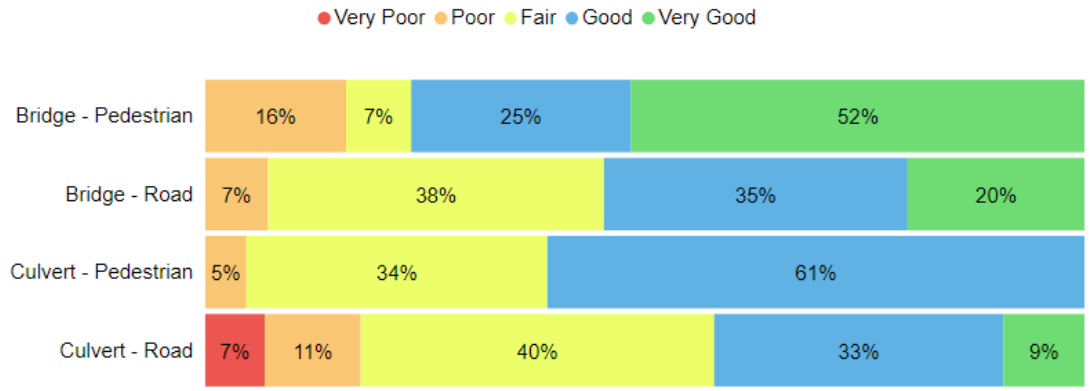


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.3 Data Insights: Useful Life, Age & Condition

The following table outlines key data on the current state of infrastructure to inform asset management planning.[11] The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Bridge - Pedestrian	50-75	32.4	77% - Good
Bridge - Road	50-75	50.0	72% - Good
Culvert - Pedestrian	50	63.8	68% - Good
Culvert - Road	50-75	51.8	66% - Good
Average		**50.8**	**72% - Good**



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

[11] The Town attributes an EUL of 50 years for bridges built before 2012 and an EUL of 75 years for bridges built after 2012 to take into consideration the increased resilience of new infrastructure.

4.3.1 Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets more confidently. The following describes the Town's current approach to condition assessment:

- All municipally owned bridges and structural culverts with a span greater than or equal to 3 metres are required to be inspected every 2 years according to the Ontario Structure Inspection Manual (OSIM).
- All structures receive a Bridge Condition Index (BCI) Rating between 0-100.
- The most recent inspection was completed in the spring of 2019 totalling 140 structures.

In this AMP we use the BCI rating to determine the current condition of structures and forecast future capital requirements. The BCI rating is adapted from International Infrastructure Management Manual (IIMM) standards & from the Ministry of Transportation (MTO). This AMP uses the following rating criteria:

Condition Rating	BCI Rating
Very Good	80-100
Good	70-80
Fair	60-70
Poor	40-60
Very Poor	0-40

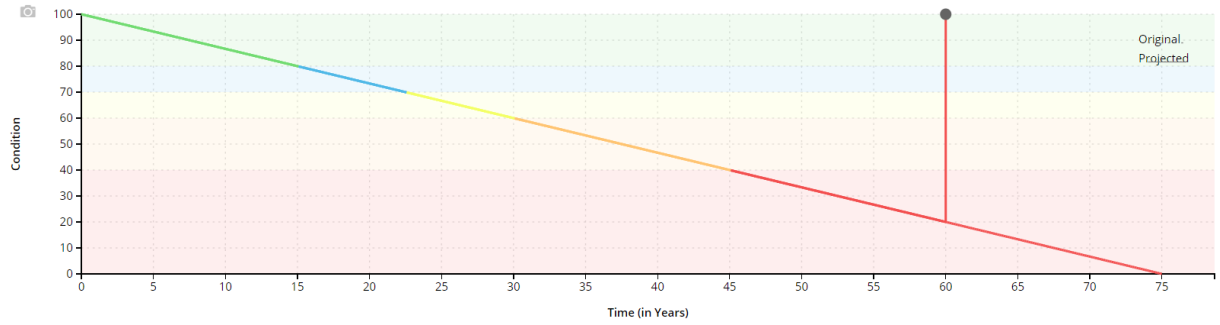
4.4 Lifecycle Management Strategy

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

4.4.1 Lifecycle Models

The following high-level lifecycle strategies have been developed as a proactive approach to managing the lifecycle of bridges and culverts. Instead of allowing the bridges and culverts to simply deteriorate until replacement is required, timely interventions extend the service life at a lower total lifecycle cost.

Bridges & Culverts		
Event Name	Event Class	Event Trigger
Capital Rehabilitation (2019 OSIM Inspection Report)	Rehabilitation	Condition: 0-100[12]
Reconstruction	Replacement	End-of-life (~60 Years)



[12] Lifecycle strategies for structural bridges and culverts are determined based on priority ratings defined by the biennial OSIM report.

4.4.2 Overview of Current Lifecycle Strategies

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

Activity Type	Description of Current Strategy
Maintenance	Maintenance strategy for bridges and culverts is primarily reactive due to lack of budget and resource capacity.
	Staff are developing a more comprehensive approach to structure maintenance (e.g. bridge washing, expansion joint replacmeent, deck sweeping) in alignment with the recommendations of structural engineers.
Rehabilitation /Replacement	In recent years, capital rehabilitation or reconstruction work has been heavily dependent on the availability of grant funding.
	The Priority in recent years has been on replacing structures with low BCI ratings.
	Staff plan to focus more on major capital rehabilitation projects in the near future once a handful of priority structures have been replaced.

4.4.3 Shared Structures[13]

There are ten bridges and culverts for which the Town shares with other municipalities using a 50/50 split, summarized in the following table:

Structure ID	Road Name	Location	Other Owner	Share
B22110003	King Caledon Town Line	0.86 km north of King Street E	Township of King	50%
B22110004	Caledon King Townline	0.7 km north of King Street E.	Township of King	50%
B22110005	Caledon King Townline	0.6 km north of King Street E.	Township of King	50%
B22110006	Caledon Townline South	0.1 km north of King Road	Township of King	50%
B24504007	Albian-Vaughan Road	0.2 km south of King Road	Township of King	50%
B26002030	Winston Churchill Blvd	0.11 km north of Highpoint Sideroad	Town of Erin	50%
B26002326	Winston Churchill Blvd	1.5 km north of Highpoint Sideroad	Town of Erin	50%
B26218346	East Garafraxa / Caledon Townline	0.3 km east of Shaws Creek Road	Town of East Garafraxa	50%
B26220347	East Garafraxa / Caledon Townline	1.7 km east of Shaws Creek Road	Town of East Garafraxa	50%
C22110009	Caledon King Town Line	1.67 km north of King Street E	Township of King	50%

[13] Please note there is a railway bridge, Structure ID B20032046, that the Town maintains but does not own. It was excluded from this AMP.

4.4.4 Structures with Loading/Dimensional Restrictions

There are seven structures with loading restrictions and eleven structures with dimensional restrictions as identified in the following table:

Restriction	Structure ID	Location
Load Restrictions	B04135	Innis Lake Road, 1.27 km South of Old Church Road
	B22068009	Duffy's Lane, 1.3 km North of Castlederg Sideroad
	B26060021	Willoughby Road, 0.14 km North of Highpoint Sideroad
	B26064020	Kennedy Road, 1.4 km North of Old Base Line
	P003	Caledon Trailway, 0.04 km East of Avellino Court
	P004	Caledon Trailway, 0.14 km East of Giles Road
	P005	Caledon Trailway, 0.02 km West of Airport Road
Dimensional Restrictions	B26064020	Kennedy Road, 1.4 km North of Old Base Line
	B25054050	Glasgow Road, 0.05 km East of Deer Valley Drive
	B27326026	Dominion Street, 0.03 km North of Forks of the Credit Road
	B26222058	Quarry Road, 0.7 km West of McLaren Road
	B26038024	McLaren Road, 1.4 km North of the Grange Sideroad
	B22302015	Mill Lane, 1.0 km East of The Gore Road
	B27632040	Credit Street, 0.1 km North of Queen Street
	P35230012	Caledon Trailway, 0.37 km South of Olde Base Line Road
	B22074053	Duffy's Lane Structure, 0.2 km North of Patterson Sideroad
	B22302052	Caledon Trailway, 1.0 km West of Humber Station Road
	P002	Caledon Trailway over Highway 10, 1.32 km South of the Grange Sideroad

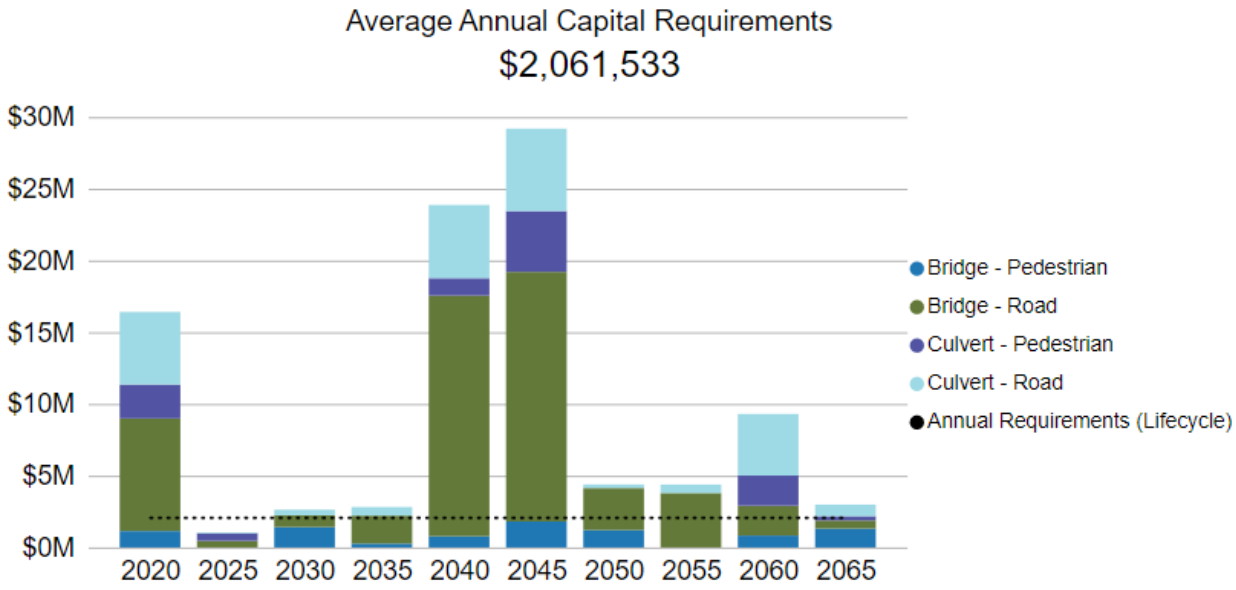
4.4.5 Structures Considered for Disposal/Transfer/Download

The following structures are being considered by the Town for disposal, transfer, or downloading and will reduce the associated investment needs over the forecast period if they are successfully disposed or transferred to another organization:

Structure ID	Structure Name
B22062008	Humber Grove Structure, Duffy's Lane, 1.2 km North of Glasgow Road
B22072010	Duffy's Lane, 0.03 km South of Patterson Side Road
B22302052	Caledon Trailway, 1.0 km West of Humber Station Road
B26222058	Quarry Road, 0.7 km West of McLaren Road
P35230012	Caledon Trailway, 0.37 km South of Olde Base Line Road

4.4.6 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.

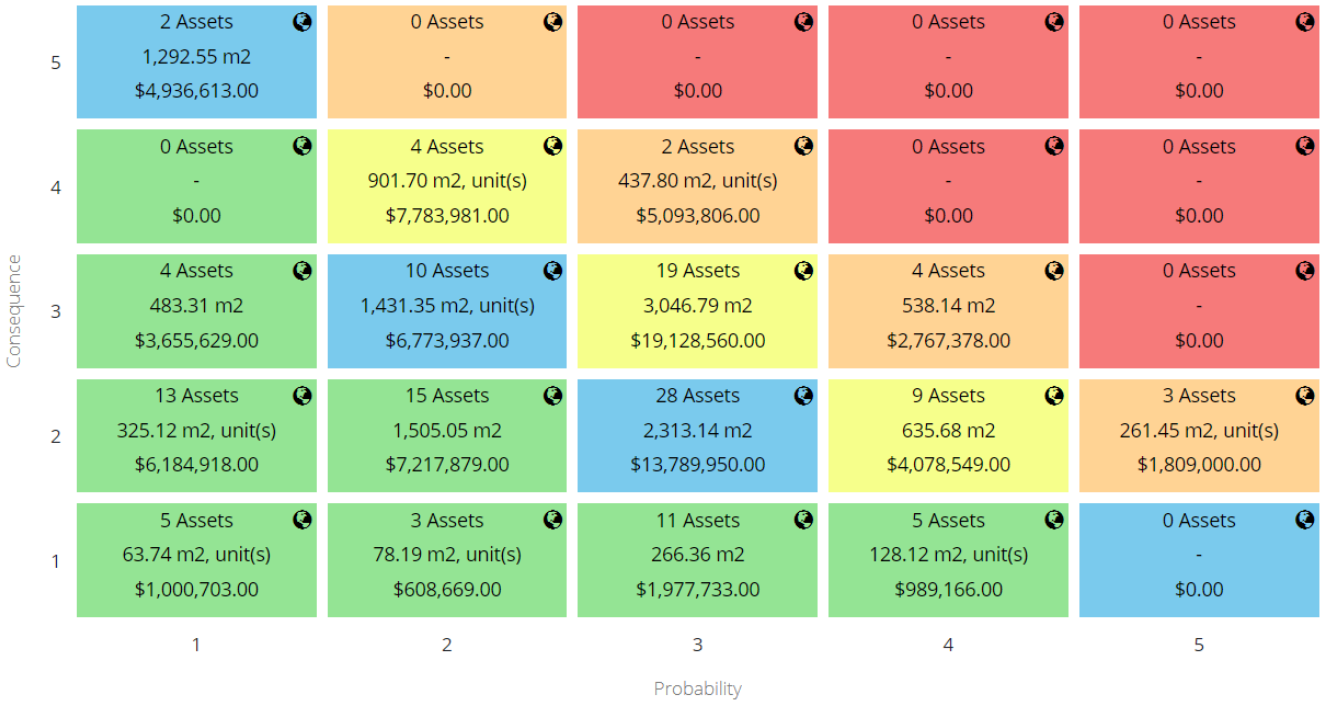


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix D.

4.5 **Risk & Criticality**

4.5.1 Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix F.



This is a high-level model developed for the purposes of this AMP and Town staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets will allow the Town to determine appropriate risk mitigation strategies and treatment options. This may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

4.5.2 Risk to Current Asset Management Strategies

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

Aging Infrastructure

Historically, the lifecycle management strategy for bridges and structural culverts has been reactive. In recent years staff have focused on replacing poor condition structures but are still playing catch up on deferred lifecycle activities. Staff plan to pivot from build/replace strategy towards the implementation of a proactive maintenance and capital rehabilitation strategy to extend the service life of structures at a lower cost.

Staff Capacity and Cognizance

Through biennial bridge inspections staff receive a list of recommended maintenance and rehabilitation activities for bridges. Staff are reviewing whether there are currently sufficient staffing resources in place to implement a more proactive bridge maintenance strategy.

Asset Ownership

Staff are aware of a handful of structures with uncertainty around who actually owns them. Without clarity of ownership these structures may face neglect. Determining ownership will ensure that someone is accountable for maintaining, rehabilitating, and replacing these structures when required.

Climate Change & Extreme Weather Events

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

4.6 Current Levels of Service

Service Attribute	Community Levels of Service	
Availability	The Town's structures are designed in accordance with the Public Transportation and Highway Improvement Act, R.S.O. 1990, c.P.50, Ontario Regulation 104/97 Standards for Bridges and provide access to different users according to the structure class and crossing over type. Users range from heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, and cyclists.	
	Technical Levels of Service	**2019**
	% of bridges that have loading or dimensional restrictions	13.3%
Reliability	**Community Levels of Service**	
	See the condition rating scale and images in Appendix E that describes how the BCI Rating is used to assess the condition of bridges and structural culverts.	
	Technical Levels of Service	**2019**
	Average bridge condition index for bridge structures	72 (Good)
	Average bridge condition index for structural culverts	63 (Fair)
Cost-Effectiveness	**Community Levels of Service**	
	See Section 4.4 for a description of the lifecycle activities performed on bridges & culverts	
	Technical Levels of Service	**2019**
	O&M cost for bridges & culverts	$267,180
Safety	**Community Levels of Service**	
	Biennial structure inspections are performed on all bridges and major structures in accordance with Ontario Regulation 104/97 Standards for Bridges to ensure structures are kept safe and in good repair. The detailed visual inspections follow the guidelines in Ontario's Structure Inspection Manual (OSIM) which sets standards for the visual inspection and condition rating of bridges and their elements. Bridge condition is typically reported in terms of a single value called the Bridge Condition Index (BCI).	
	Technical Levels of Service	**2019**
	% of bridges and culverts subjected to condition assessment study	100%
Sustainability	**Community Levels of Service**	
	The Town's Long-Term Strategic Financial Plan is a framework to guide Council and the Town's departments, boards and committees in their financial planning and decision-making processes. The results of this Asset Management Plan will be integrated into this process to inform: -General Reserve Fund Policies -Capital Budget Management Policies -Debt Management Policies	
	Technical Levels of Service	**2020**
	Annual capital reinvestment rate	3.5%

4.7 **Maturity & Recommendations**

Asset Management Competency	Subject Area	Maturity	Recommendations
Organization & People	Knowledge & Understanding	Intermediate	Staff exhibit an in-depth understanding of the strategies required to manage bridge infrastructure. Staff can also identify where the opportunities of improvements are and how asset needs can be addressed through proactive maintenance, rehabilitation and replacement strategies. Due in part to low resource capacity and the impacts of an evolving organizational structure there has been some difficulties with prioritizing asset management planning activities. Staff often have to rely on external contractors to complete various maintenance activities that could be performed internally if staff had the necessary tools and expertise. Furthermore, the Town should seek to develop a medium- to long-term external communication strategy to engage the public on asset management and obtain feedback to inform development of proposed levels of service.
	Resource Capacity	Basic	It is very difficult to dedicate resources to asset management planning when operations take up the bulk of available resource time. The Town's corporate asset management team is responsible for overseeing and monitoring asset management progress as the Town develops a more proactive and planned approach to their lifecycle strategies.
Data & Information	Inventory Data	Advanced	The Town has a high level of confidence in the structural bridges and culverts asset data which is updated regularly through studies completed by external contractors. This data is adequately reflected in CityWide. The Town should seek to develop a more streamlined approach to updating the asset inventory for these structural assets. As it relates to non-structural assets, that are not inspected through the Ontario Structural Inspection Manual (OSIMs), some of them are repaired or replaced as capital projects so there is more work to be done to inventory them within the asset management database.
	Attribute Data	Advanced	Attribute data include bridge material, number of lanes, deck length and width, number of spans, and span length. Road class and load limits are also linked to the bridges and culverts.
	Condition Data	Advanced	Biennial inspections are conducted by a licensed bridge inspector and condition is assessed according to BCI. Accurate condition data is used to determine appropriate maintenance, rehabilitation, and replacement strategies.
	Valuation Data	Intermediate	The Town is confident in the accuracy of replacement costs. Replacement costs are defined by unit costs based on average construction prices, however, the costs per unit are only updated during an AMP update based on the most recent OSIM report. The Town should seek to update costs per unit every two years.

Processes & Planning	Lifecycle Management Strategies	Basic	Staff has a strong understanding of the need for a more proactive lifecycle management strategy for bridges / culverts to address lack of maintenance strategies in the past. Staff should develop a more proactive lifecycle management strategy that is attainable considering resource capacity. Staff should also seek to evaluate multiple lifecycle strategies to identify the lowest cost strategy to maintain current LOS. Resource capacity makes it challenging to maintain an accurate inventory, complete with the appropriate lifecycle strategies assigned. The Engineering department should be responsible to provide the lifecycle strategies built into the asset management database in order to create work orders annually. The Town needs to ensure that Operations department has the necessary requirements to do this.
	Risk Management	Basic	While risk is an informal consideration across all departmental decision-making; there are no formal or documented procedures to measure or evaluate risks at the network or asset-level. Identified risks should be leveraged to develop comprehensive risk matrices within Citywide to support project prioritization.
	Levels of Service	Basic	The Town has engaged various staff internally to develop current levels of service through technical and qualitative KPIs that can be used for internal benchmarking on an annual basis. This will help in developing and assessing the trend of services being provided by capturing data and benchmarking internally on an annual basis. There is an opportunity to integrate these service levels in Citywide to corresponding assets and tie it with maintenance management system. LOS metrics tied to full-time employment at the Town would promote a better understanding of resource capacity issues and concerns related to growth. External benchmarking can be used to later develop desired LOS.
	AM Software Understanding	Basic	Citywide software acts as a comprehensive asset register for assets and all asset attributes. Lifecycle models and risk matrices can be built into the software to further support and advance the Town's asset management and lifecycle strategies. All key staff members should be trained to update the database and utilize Citywide tools as a resource for planning. The Town should consider assessing resourcing capacity to support the maintenance of an updated and accurate asset inventory in Citywide and GIS system.

5 Stormwater Management System

Key Insights

1. Stormwater assets are valued at $340.6 million

2. 89% of stormwater assets are in fair or better condition

3. The average annual capital requirement to sustain the current level of service for stormwater assets is approximately $5.1 million

4. Findings in this section rely on an incomplete asset inventory, including an unknown length of underground assets, age-based condition, and inflated historical costs

5.1 Asset Category & Service Description

The Stormwater Management System serving Caledon manages minor and major storm events. Minor events historically have the probability of occurring 1 in every 10 years and major storm events historically have the probability of occurring between the 1 in 10 year events and the 1 in 100 year events.

Staff have actively been working towards identifying the location of all stormwater infrastructure across the Town and assessing the condition. While effort is underway to identify and assess the extent of stormwater infrastructure, the Town continues to provide planning, operations, maintenance, and management of approximately 300 kilometres of storm sewers and several kilometres of individual surface drainage inlet connections and associated catchbasins, manholes and outfalls, overland flow routes, green infrastructure, and stormwater management ponds. The management of the stormwater system is further complicated as a result of the natural environment and the Region of Peel stormwater infrastructure.

The state of the infrastructure for the stormwater network is summarized in the following table.

Replacement Cost	Condition	Maturity		Financial Capacity	
$340.6 million	Good (70%)	Organization & People:	Intermediate	Annual Requirement:	$5,065,000
		Data & Info:	Basic	Funding Available:	$2,539,000
		Processes & Planning:	Basic	Annual Deficit:	$2,525,000

The stormwater management system is managed by the Engineering Department with shared responsibility for maintenance activities with the Operations Department.

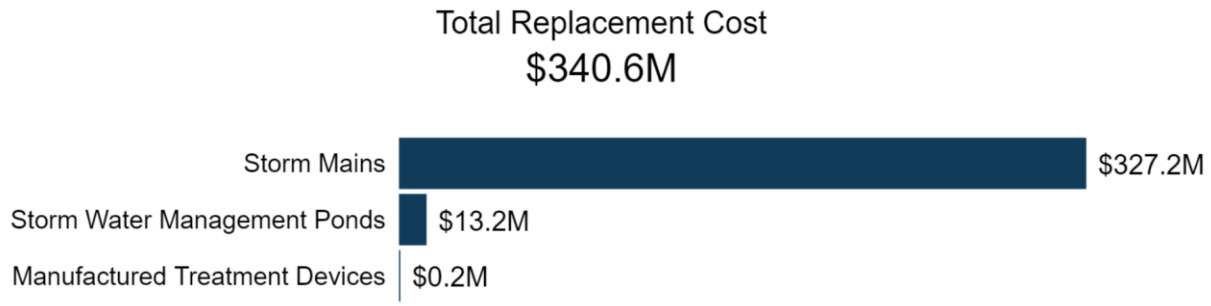
The following core values and level of service statements are a key driving force behind the Town's asset management planning.

Core Values	Level of Service Statement
Cost effectiveness	Ensure that stormwater services are efficiently provided to all existing and new customers at an affordable and manageable cost for the proposed level of service.
Reliability	Provide a reliable, continuous, and effective delivery of stormwater services and infrastructure to all the existing and new customers with minimal to no service disruptions.
Safety & Regulatory	Ensure that the stormwater services and infrastructure provided to the community are safe, integrated with industry best practices, complies with all the regulatory requirements, and supports the protection of the community from the impacts of severe weather events.
Sustainability	Provide a sustainable delivery of stormwater services and infrastructure which supports the protection of environment, resilient to future climate projections, minimizes the impact to the water resource system and enhancing the quality of life of the Town's residents.

5.2 **Asset Inventory & Costs**

The table below includes the quantity, total replacement cost, and annual capital requirements of each asset segment in the Town's Stormwater System inventory. The figures in this table may not be accurate as they rely on an incomplete data inventory and inflated historical costs.

Asset Segment	Quantity	Total Replacement Cost	Annual Capital Requirements
Manufactured Treatment Devices	3	$223,857	$3,789
Storm Mains	179 km	$327,175,831	$4,362,344
Storm Water Management Ponds	55	$13,170,215	$698,385
Total		**$340,569,903**	**$5,064,518**

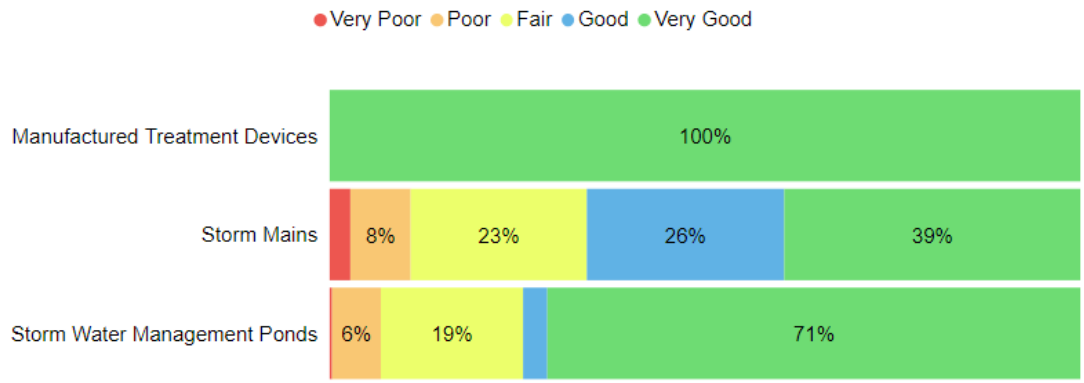


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

5.3 Asset Condition

The following table outlines key data on the current state of infrastructure to inform asset management planning.[14] The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Manufactured Treatment Devices	50	1.4	99% - Very Good
Storm Mains	75	22.2	69% - Good
Storm Water Management Ponds	50	26.0	79% - Good
Average		22.0	**70% - Good**



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

[14] The figures in this table may not be accurate as they rely on an incomplete data inventory and age-based condition.

5.3.1 Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing and maintaining assets more confidently. The following describes the Town's current approach to condition assessment of stormwater infrastructure:

- Staff have undertaken a seven-year program to assess the condition of all the Town's storm sewers, manholes, catchbasins and outfalls.
- To date, approximately 11 km of storm sewers and 550 manholes and catch basins have been fully inspected using the National Association of Sewer Services Companies Pipeline Assessment Certification Program and Manhole Assessment Certification Program, an industry standard for sewer and manhole inspection providing a standard system for the identification, classification and reporting of the type, severity and extent of structural and operational defects.
- The Town completed its first Stormwater Management Master Plan in 2016. The Master Plan characterized the condition of existing stormwater management ponds within the Town. Up to date, the Town has completed two Environmental Assessments for the rehabilitation of two stormwater ponds. The Town will be updating the Stormwater Management Master Plan in 2021 and will look to develop a regular inspection program to inform maintenance and rehabilitation.

In this AMP we use a 1-5 condition rating scale based on the PACP Structural Quick Rating provided during recent CCTV inspections:

Condition Rating	PACP Quick Rating
Very Good	0-1
Good	1-2
Fair	2-3
Poor	3-4
Very Poor	4-5

5.4 **Lifecycle Management Strategy**

5.4.1 Linear Stormwater Infrastructure

The Town owns, operates, and maintains an interconnected system of linear stormwater infrastructure. Examples of the Town's linear stormwater infrastructure includes ditches, culverts, catchbasins, manholes, storm sewers and leads, and outfalls. The 2016 Stormwater Management Master Plan provided direction on the maintenance and rehabilitation efforts required to achieve an improved level of service.

Activity Type	Description of Current Strategy
Maintenance	Mainteance of linear infrastructure include mowing and regrading ditches, street sweeping, sediment removal from culverts and catch basins, flushing of storm sewers, and storm sewer relining.
	The majority of maintenance practices are not formally regulated through a maintenance program and are often performed as budget becomes available. However, the Town has dedicated a fixed budget of $350,000 annually to maintain roadside ditches, $6,700 to maintain the manufactured treatment devices, and approximately $77,000 for spring sweeping clean up. With limited resourcing capacity, staff focus on meeting legislative requirements and tackling as many complaints as possible. With the development of a formal program and the addition of more resources, Staff would be able to document and track the full costs of these maintenance activities.
Rehabilitation /Replacement	No rehabilitation or replacement program is currently in place for storm sewers, manholes, and catchbasins. To date, this work has been budgeted on an as needed basis or aligned with Road Capital Programs.
	As the storm sewer network ages, and the Condition Assessment Program is further underway, the Town will investigate sustainable methods for planning rehabilitation and replacement of poor storm sewer network infrastructure.
	To better plan for the future staff would like to evaluate the impacts of climate change on potential capacity needs, and lifecycle management strategies.

5.4.2 Stormwater Management Facilities

The Town owns and maintains several different types of stormwater management facilities that require unique maintenance and rehabilitation strategies. They include:

1. Water Quality Control Facilities – examples include wet ponds and constructed wetlands[15]
2. Water Quantity Control Facilities – examples include dry ponds
3. Green Infrastructure Practices – examples include bioretention and bioswales
4. Manufactured Treatment Devices – examples include oil grit separators and jellyfish filters

Activity Type	Description of Current Strategy
Maintenance	Regular maintenance of stormwater management facilities includes drainage area preventative measures, vegetation management, debris and litter removal, and inlet and outlet structures cleared. To date, the Town has cleaned nine stormwater management facilities. The Town does not currently have a stormwater maintenance program but will look to develop one as part of the update to the Stormwater Master Plan.
Rehabilitation /Replacement	The Town is completing rehabilitation of stormwater management facilities in line with the priorities set forth in the 2016 Stormwater Management Plan.
	Stormwater management facilities require dredging and cleaning at regular intervals to remove sediment and restore full function in line with the Environmental Compliance Approvals.

The cost to maintain and rehabilitate a stormwater management facility is dependent on a number of factors including the size of the drainage area, the amount of impervious cover, the catchment land use, and the features of the facility (e.g. forebay).

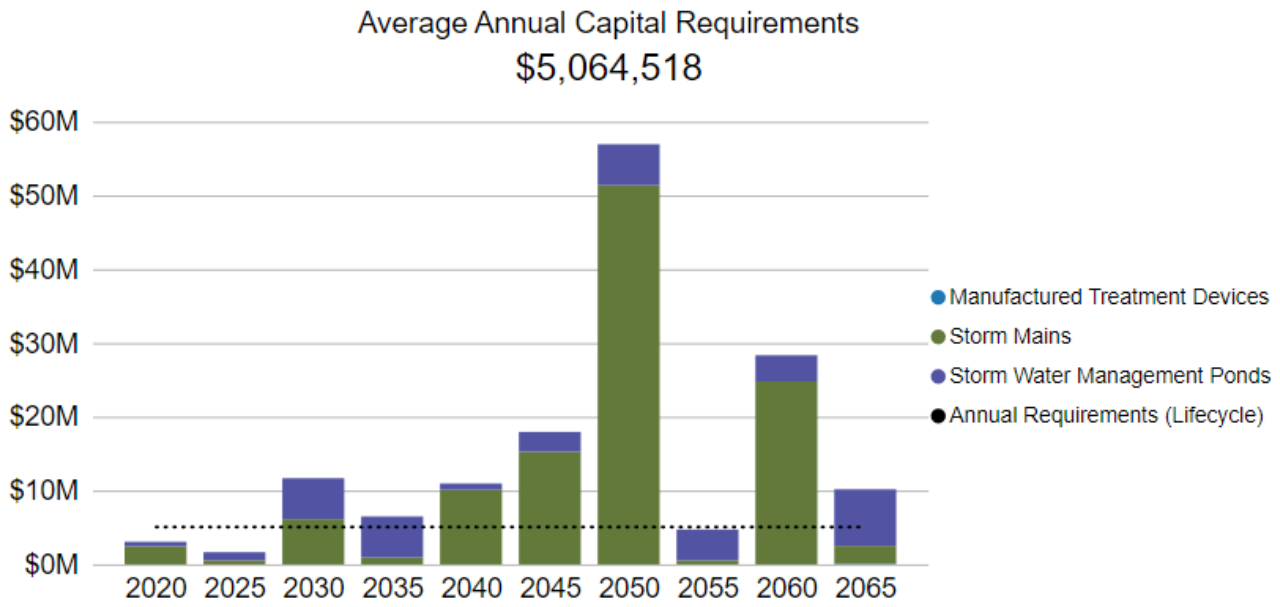
To ensure that the cost of these activities is included in capital cost projections this AMP includes the following lifecycle strategy.

Facility Type	Useful Life	Frequency of Dredging	Estimated Unit Cost to Rehab
Wet Ponds/Wetlands	50 Years	20 Years	$285,000 per facility
Dry Ponds	50 Years	20 Years	$115,000 per facility
Infiltration/Detention Facilities	50 Years	20 Years	$165,000 per facility

[15] See Appendix D for a Map identifying stormwater management ponds in the Town of Caledon.

5.4.3 Forecasted Capital Requirements

The graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.[16]



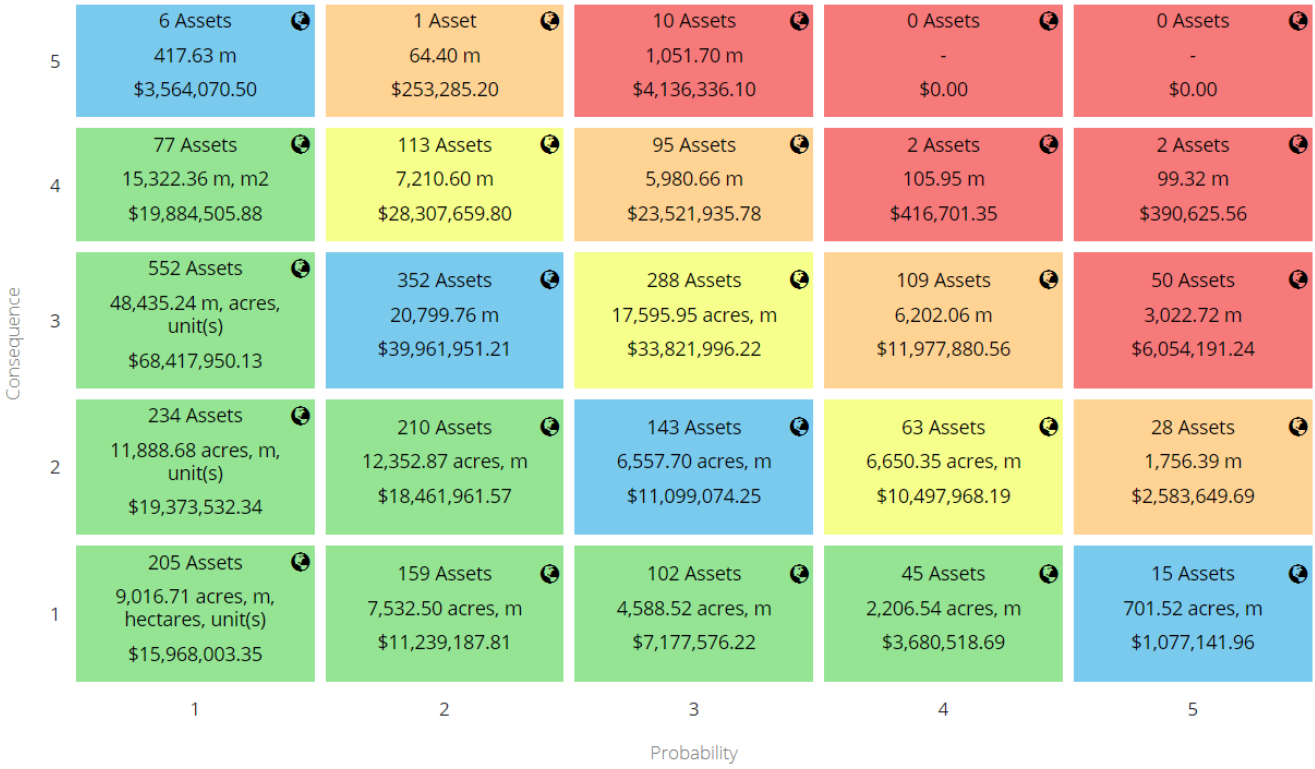
The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix D.

[16] Staff do not have confidence in the accuracy of replacement costs used to develop this graph.

5.5 **Risk & Criticality**

5.5.1 Risk Matrix

The following risk matrix provides a visual representation of the level of risk exposure for this asset category. It considers both the probability of failure and consequence of failure. The metrics that have been used to determine both can be found in Appendix F.



This is a high-level model developed for the purposes of this AMP and Town staff should review and adjust the risk model to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets will allow the Town to determine appropriate risk mitigation strategies and treatment options. This may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

5.5.2 Risks to Current Asset Management Strategy

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

Asset Data & Information

There is some concern with the accuracy of the Town's current asset inventory for stormwater infrastructure. A lack of confidence in the completeness of this data impacts the reliability of asset management and financial planning. Staff are in the process of evaluating the resources and activities required to build and/or improve the existing asset inventory.

Bylaws, Policies & Education

There are no formal mechanisms to address private connections or illicit dumping into storm sewers which. Public safety and environmental protection should be prioritized by setting strict limits on what can be discharged into the storm sewer network and receiving systems through municipal bylaws. The Town should put an emphasis on public education to avoid misuse and mistreatment of the stormwater system. The Town should develop formal policies to govern the stormwater system to have a consistent approach and to maximize the efficiency of program delivery.

Climate Change & Extreme Weather Events

Staff need a better sense of the impacts of climate change on the stormwater network to inform retrofitting and replacement planning. Additional data will help address concerns with system capacity and the ability of the stormwater network to handle any potential increase in the intensity, frequency, and duration of rainfall events. Incorporating a monitoring and maintenance program for all stormwater infrastructure into the asset management plan can further support infrastructure resiliency and reduce risk.

5.6 **Current Levels of Service**

Service Attribute	Community Levels of Service	
Reliability	Refer to Section 5.3.1 for a description of the Town's current approach to assessing the condition of stormwater infrastructure.	
	Technical Levels of Service	**2020**
	% of stormwater facilities in Good or Very Good condition	68.4% (Fair)
	% of storm sewermains CCTV inspected	5.93%
	# of service requests related to surface flooding	75
Cost-Effectiveness	**Community Levels of Service**	
	Refer to Section 5.4 for a description of the lifecycle activities performed on the stormwater network	
	Technical Levels of Service	**2019**
	O&M Cost / km of stormsewer mains	$1,120
	O&M Costs for SWM facilities / # of SWM facilities (wet ponds only)	$34,286
Safety	**Community Levels of Service**	
	The majority of Caledon is rural country side, comprised of open space, agriculture and natural areas, where stormwater runoff is conveyed through a series of rural ditches and culverts. Urban developments include commercial, industrial and residential areas that are designed with an urban road right-of-way cross section (curb and gutter), and may be serviced by storm sewers and facilities. Urban development makes up close to 9% of Caledon. Estate subdivisions include single-family dwellings on large lots within a rural landscape. Estate subdivisions make up approximately 4% of Caledon.	
	Technical Levels of Service	**2019**
	% of the municipal stormwater management system resilient to a 5-year storm	95%[17]
	% of properties resilient to a 100-year storm	96%
Sustainability	**Community Levels of Service**	
	The challenge of changing precipitation patterns is met by a steadfast commitment to ensuring that as Caledon continues to grow, a treatment train approach is applied, which includes managing rainfall (at the source), along the conveyance, and at the end-of-pipe. The use of a treatment-train approach to stormwater management provides the necessary framework to building a sustainable and resilient stormwater infrastructure network.	
	Technical Levels of Service	**2020**
	Annual capital reinvestment rate	0.75%

[17] The Town has made a best effort attempt to complete a rigorous analysis with the information that is available. To assess with accuracy the amount of area that adequately conveys the 5-year and 100-year event with no impact to infrastructure, a hydrologic and hydraulic model would need to be developed. While Town staff have begun efforts to measure the Town's asset performance against the indicated metrics in the O. Reg, that work remains ongoing and a more accurate representation of the Town's level of services will be provided in a future AMP.

5.7 **Maturity & Recommendations**

Asset Management Competency	Subject Area	Maturity	Recommendations
Organization & People	Knowledge & Understanding	Intermediate	Staff exhibit an in-depth understanding of the strategies required to manage stormwater infrastructure and where the opportunities of improvements are and how asset needs can be addressed through proactive maintenance, rehabilitation, and replacement strategies. The Town can advance knowledge and understanding by educating and training a greater number of staff on the optimal use of CityWide Asset Manager. As well, it is critical to enhance the knowledge and understanding of maintenance and operation practice of stormwater management facilities, low impact development practices, and manufactured treatment devices amongst Operation staff. Furthermore, the Town should seek to develop a medium- to long-term external communication strategy to engage the public on asset management and obtain feedback to inform development of proposed levels of service.
	Resource Capacity	Basic	With low resource capacity and the impacts of an evolving organizational structure there has been some difficulties with prioritizing asset management planning activities. The Town depends on only one permanent staff member that manages stormwater assets. To address additional pressures on the system caused by expected growth and climate change related risks, it is vital for the Town of Caledon to analyze the benefits of increasing staff capacity for the Storm Network. The Town's corporate asset management team is responsible for overseeing and monitoring asset management progress as the Town develops a more proactive and planned approach to their lifecycle strategies.
Data & Information	Inventory Data	Basic	The Town is undertaking a complete inventory of all storm sewers, catchbasins, manholes, outfalls, manufactured treatment devices, and stormwater management practices. Engineering staff need to develop a consistent condition assessment protocol to inform lifecycle management strategies. Improved processes and procedures are needed to bring new stormwater assets into the Town's GIS database and Citywide. Engineering staff need to identify a consistent naming convention for stormwater assets to ensure new assets acquired by the Town reflect this new standard.
	Attribute Data	Basic	Through completion of the inventory update, Staff will be able to update the storm attribute information with material, location, length, type of manufactured treatment devices, and stormwater pond characteristics.
	Condition Data	Basic	Staff are in the process of assessing the condition of all of the Town's stormwater assets and verifying the inventory data that is currently available. The Town is in the early stages of gathering condition data on storm sewers, manholes and catchbasins using a CCTV program in line with the National Association of Sewer Services Companies Guideline Specification. The Town completed a condition assessment on stormwater management ponds in 2008 and in 2014. Condition data should be integrated into the asset inventory to support the development of appropriate maintenance, rehabilitation, and replacement strategies.

	Valuation Data	Basic	The asset inventory has accurate historical costs. Replacement costs are developed based on unit costs provided by the Region of Peel which have been adjusted as necessary. There is no current process in place for updating these costs regularly. Replacement costs based on accurate unit costs should be reviewed and updated on every two years.
Processes & Planning	Lifecycle Management Strategies	Basic	The Town's Stormwater Management Plan from 2016 document's lifecycle management strategies, however, there are plans to update the document in 2021. Town staff are working to develop a program that includes routine and preventative annual maintenance. Staff should also seek to evaluate multiple lifecycle strategies to identify the lowest cost strategy to maintain current LOS. Lifecycle strategies should take into consideration climate change and the risks posed to the stormwater management system, such details should be present in the updated Plan.
	Risk Management	Basic	While risk is an informal consideration across all departmental decision-making; there are no formal or documented procedures to measure or evaluate risks at the network or asset-level. Compounding factors of aging infrastructure, population growth, and limited condition data have resulted in reactive asset risk management practices. Limited resource capacity does not allow for proactive risk management strategies to take place. Funding is focused on addressing asset failures and does not allow for regular risk management practices such as relining or flushing. Identified risks should be leveraged to develop comprehensive risk matrices within Citywide to support project prioritization.
	Levels of Service	Basic	The Town has engaged various staff internally as well as external staff from the Town's conservation authorities to develop current levels of service through technical and qualitative KPIs that can be used for internal benchmarking on an annual basis. This will help in developing and assessing the trend of services being provided by capturing data and benchmarking internally on an annual basis. There is an opportunity to integrate these service levels in Citywide to corresponding assets and tie it with maintenance management system. LOS metrics tied to full-time employment at the Town would promote a better understanding of resource capacity issues and concerns related to growth. External benchmarking can be used to later develop desired LOS.
	AM Software Understanding	Basic	Citywide software acts as a comprehensive asset register for assets and all asset attributes. Linkage with GIS is critical for accurate asset documentation and capital planning among other uses. Lifecycle models and risk matrices can be built into the software to further support the advanced of the Town's asset management and lifecycle strategies. All key staff members should be trained to update the database and utilize Citywide tools as a resource for planning. The Town should consider assessing resource capacity to support the maintenance of an updated and accurate asset inventory in Citywide and GIS system.

6 Overview of Other Assets

Key Insights

1. Non-core assets are valued at $259.3 million

2. 72% of non-core assets are in fair or better condition

3. The average annual capital requirement to sustain the current level of service for non-core assets is approximately $13 million

6.1 Asset Category & Service Description

This AMP primarily focuses on core asset categories as defined in O. Reg. 588/17. The following asset categories are considered non-core infrastructure:

- Buildings, Furniture, & IT Equipment
- Land Improvements
- Machinery & Equipment
- Vehicles

The following table provides a summary of the state of the infrastructure for each non-core asset category.

Asset	Replacement Cost	Asset Condition	Financial Capacity	
Buildings, Furniture & IT Equipment	$179.3 million	Good (68%)	Annual Requirement:	$7,088,000
			Funding Available:	$3,983,000
			Annual Deficit:	**$3,104,000**
Machinery & Equipment	$8.0 million	Good (71%)	Annual Requirement:	$1,252,000
			Funding Available:	$628,000
			Annual Deficit:	**$624,000**
Vehicles	$40.8 million	Poor (30%)	Annual Requirement:	$3,212,000
			Funding Available:	$1,610,000
			Annual Deficit:	**$1,601,000**
Land Improvements	$31.1 million	Poor (35%)	Annual Requirement:	$1,460,000
			Funding Available:	$732,000
			Annual Deficit:	**$728,000**

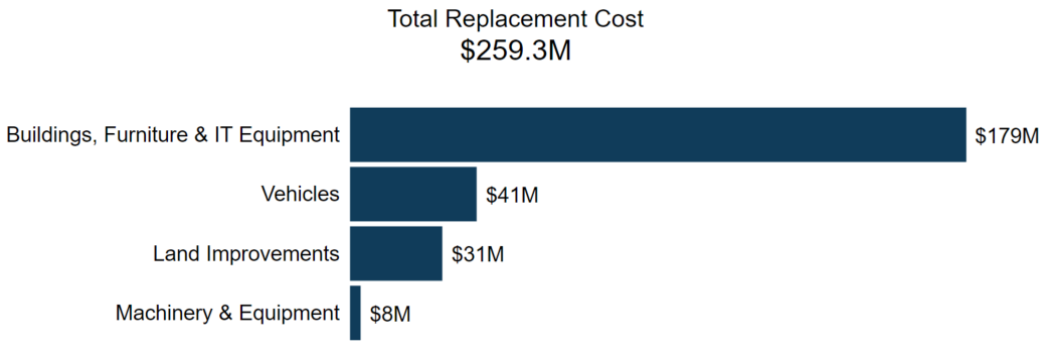
This AMP provides a high-level analysis of these asset categories. For the majority of these assets the Town does not currently have assessed condition data available and replacement costs are based primarily on historical cost inflation. As Staff work towards the next iteration of this plan, to meet 2024 O.Reg. 588/17 requirements, these non-core asset categories will be analyzed and refined in much more detail to provide an accurate portrayal of their true value and performance.

The Town will work towards improving data quality and meeting all requirements required prior to July 1, 2024.

6.2 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost method and total replacement cost of each asset category.[18] The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Quantity	Total Replacement Cost	Annual Capital Requirements
Buildings, Furniture & IT Equipment	2,200	$179,321,015	$7,087,923
Land Improvements	304	$31,130,007	$1,460,157
Machinery & Equipment	741	$8,034,863	$1,251,710
Vehicles	184	$40,846,354	$3,211,591
Total		$259,332,240	$13,011,381



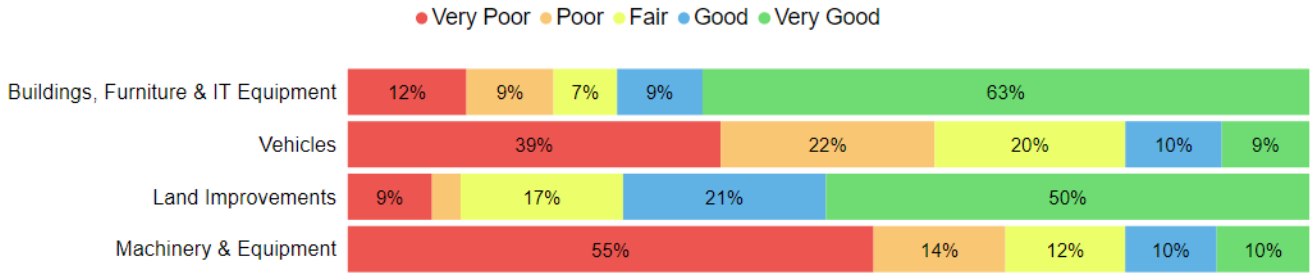
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

[18] This inventory provides a high-level look at key data and insights, and additional scrutiny and refinements are expected prior to completion of the 2024 AMP.

6.3 **Asset Condition**

The table below identifies the current average condition and source of available condition data for each asset categories. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Condition
Buildings, Furniture & IT Equipment	1 - 81 Years	10.5	68% - Good
Land Improvements	10 - 50 Years	9.1	71% - Good
Machinery & Equipment	2 - 20 Years	6.4	30% - Poor
Vehicles	1 - 30 Years	7.8	35% - Poor
Average		**9.5**	**40% - Fair**



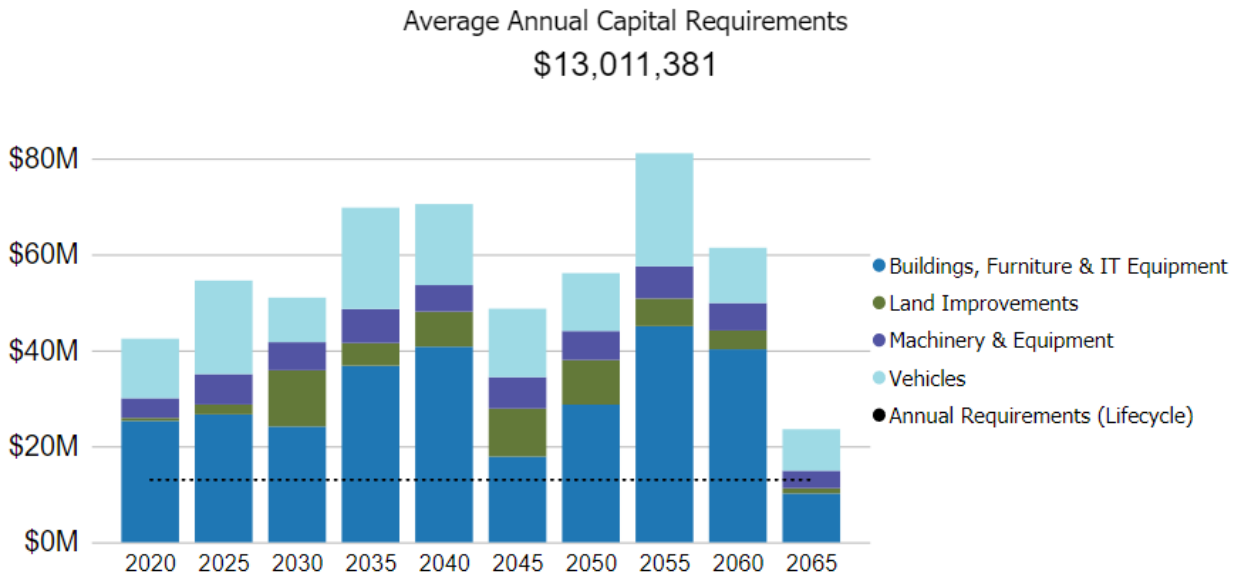
6.3.1 Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets more confidently. The following describes the Town's current approach:

- The data in this AMP is not informed by a formal condition assessment strategy; The Town performs ad-hoc condition assessments for the majority of non-core assets.
- The Town is seeking to develop condition assessment strategies and conduct assessments on a scheduled basis.

6.4 Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix D.

6.5 Asset Management Strategies

The documentation of lifecycle management strategies, current levels of service, and risk is critical to the development of a comprehensive asset management program. These components of the asset management plan support effective short- and long-term capital planning and contribute to more proactive asset management practices, thus extending the estimated useful life of many assets and a providing a higher level of service.

In accordance with O. Reg. 588/17, the Town will continue gather data and information in order to detail and review the lifecycle management strategies, levels of service, and risk of all non-core asset categories by July 1, 2024.

6.6 **Recommendations**

Asset Type	Buildings, Furniture & IT Equipment	Land Improvements	Machinery & Equipment	Vehicles
Replacement Costs	Develop User-Defined Replacement Costs from appraisals or current contractor prices – Staff rely entirely on historical costs and CPI inflation for replacement cost.	Enhance Inventory Data – 70% of replacements costs are user-defined.	Develop User-Defined Replacement Costs – Less than 30% of replacement costs are user-defined.	Refine Inventory – The majority of replacement costs are user-defined. Staff should review and refine replacement costs on a regular basis.
Condition Assessment Strategies	Enhance Condition Assessment Strategies – Over half of the assets have assessed condition.	This AMP relies entirely on age-based data for asset condition, however, staff have developed condition assessment strategies. Incorporate assessed condition in the AMP by 2024. Assessed condition data can support proactive decision-making and contribute to more accurate risk management strategies.		
Lifecycle Management Strategies	Update Long-Term Capital Plan - Staff should start planning for future requirements to ensure that adequate reserves are available when those needs become realized.			
Risk Management Strategies	Develop Risk Models and Qualitative Risk Analysis – Develop risk models and review models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure. Implement Risk-Based Decision-Making – Integrate risk as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.			
Levels of Service	Measure Current Levels of Service – This AMP contains a basic measurement of the Town's current level of service according to the metrics established in O. Reg. 588/17 Staff should continue to measure the current level of service according to these metrics to allow for trend analysis that informs long-term planning. Identify Additional LOS Metrics – Staff should identify additional LOS metrics that would inform both short and long-term asset management planning. Identify Proposed Levels of Service - Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.			

7 Impacts of Growth

Key Insights

1. Understanding the key drivers of growth and demand will allow the Town to plan for new infrastructure more effectively

2. The Town of Caledon has historical experience high levels of population growth and is projected to continue to grow in the future

3. The costs of growth should be considered in long-term funding strategies that are designed to maintain the current level of service

7.1 Description of Growth Assumptions

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

7.1.1 Peel Region – Official Plan (Growth Forecast)

The Regional Official Plan is currently under review. Peel Regional Council approved the current Plan in October 1996. The Regional Official Plan review, *Peel 2041+*, began in May of 2013. The review process will incorporate new provincial legislation, regulations, and policies (including the A Place to Grow Growth Plan for the Greater Golden Horseshoe); implement new regional policy initiatives and plans; lead meaningful community engagement; and guide growth and development to the year 2051.

The following table outlines forecasted population and employment growth for the Town of Caledon:

	2001	2006	2021	2031
Population	52,800	59,500	87,000	108,000
Households	16,100	18,200	28,000	33,500
Employment	18,400	21,400	40,000	46,000
Activity Rate	34.85%	35.97%	45.98%	42.59%

7.1.2 Town of Caledon – Development Charges Background Study

The Town of Caledon prepared a Development Charges Background Study in 2019, pursuant to Section 10 of the Development Charges Act, 1997 (DCA). The DC Background Study addresses: the forecast amount, type, and location of growth; the requirement for rules governing the imposition of the charges; and the proposed by-law (No. 2019-31) which was written to impose and provide for the payment of development charges for municipal services in the Town.

The Study presents proposed new development charges based on costing and related assumptions found in this Background study and compares the proposed charges to the pre-existing charges. Development charges are broken down by each municipal-wide service for non-residential development and four different types of residential development. The proposed development charges – which have since been adopted – are higher than the pre-existing charges for each development type.

The Background Study, pursuant to the DCA, includes a reference to an Asset Management Plan (AMP) for the purposes of developing an asset management program that considers future growth. This AMP supports the objectives defined in the Development Charges Background Study.

The Study also provides a residential growth forecast summary in the table below:

	Year	Population	Housing Units						Person Per Unit:
			Singles & Semi-Detached	Multiple Dwellings	Apartments	Other	Total Households	Institutional Households	Total Pop/Total Households
Historical	Mid 2006	59,040	16,605	1,110	445	60	18,220	223	3,131
	Mid 2011	61,540	17,304	1,184	559	39	19,086	445	3,115
	Mid 2016	68,820	19,015	1,695	510	30	21,250	256	3,130
Forecast	Mid 2019	75,290	20,107	2,298	852	30	23,287	281	3,124
	Mid 2029	103,080	26,033	4,380	1,850	30	32,292	385	3,085
	Mid 2031	108,000	26,990	4,788	2,054	30	33,852	403	3,082

7.2 Impact of Growth on Lifecycle Activities

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

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Town's AMP. These lifecycle costs associated with these assets should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

7.2.1 Lifecycle Costs for Growth-related Assets

Municipal expenditures are expected to increase with growth in population. The following table, pulled from the 2019 DC Background Study, depicts the annual impact resulting from the proposed gross capital projects. It is critical to note that the costs associated with the new infrastructure would be delayed until the works are in place.

Service	Gross Cost Less Benefit to Existing	Annual Lifecycle Expenditures	Annual Operating Expenditures	Total Annual Expenditures
Highway	$331,580,480	$21,260,819	$3,918,402	$25,179,221
Operations	$28,214,380	$1,972,641	$4,686,855	$6,659,496
Fire Protection	$20,705,370	$1,452,341	$4,847,550	$6,299,891
Parkland and Trail Development	$18,200,473	$1,191,984	$1,273,708	$2,465,692
Indoor Recreation Facilities	$94,329,061	$5,094,290	$6,390,234	$11,484,524
Library Services	$8,712,500	$645,573	$1,622,689	$2,268,262
Development Related Studies	$11,654,555	$-	$-	$-
Animal Control	$4,155,000	$314,322	$165,445	$479,767
Provincial Offences Act	$5,180,000	$309,930	$744,941	$1,054,871
Total	**$522,731,819**	**$32,241,900**	**$23,649,824**	**$55,891,724**

The following tables outlines projected capital costs for growth assets between 2022-2031.

Funding Source	2022	2023	2024	2025	2026
Development Charges	$6,184,286	$6,184,286	$6,184,286	$11,755,714	$11,755,714
Tax Levy	$3,330,000	$3,330,000	$3,330,000	$6,330,000	$6,330,000
Total	**$9,514,286**	**$9,514,286**	**$9,514,286**	**$18,085,714**	**$18,085,714**

Funding Source	2027	2028	2029	2030	2031
Development Charges	$19,184,286	$24,755,714	$26,612,857	$32,184,286	$34,041,429
Tax Levy	$10,330,000	$13,330,000	$14,330,000	$17,330,000	$18,330,000
Total	**$29,514,286**	**$38,085,714**	**$40,942,857**	**$49,514,286**	**$52,371,429**

This 10-year capital plan includes a high-level projection of capital costs for the next 10 years. The Town is spending approximately $20 million on growth for roads with further increase expected in the future depending on planning outcomes. At this time, the Town has detailed a 5-year Roads Forecast that relies in part on growth costs identified in the 2019 DC Background Study. A review and update of the Town's Official Plan, Transportation Master Plan, Stormwater Master Plan and 2021 DC Background Study are currently ongoing. Once these are complete there will be additional data available to determine the cost of growth-related infrastructure costs more confidently for all core assets.

Under O.Reg. 588/17 municipalities with a population above 25,000 must include the following details in their Asset Management Plan by July 1, 2025:

1. The estimated capital expenditures and operating costs to achieve the proposed levels of service in order to accommodate growth;
2. The funding projected to be available by source as a result of increased population and economic activity; and
3. An overview of risks associated with implementation of the asset management plan.

The Town is currently working towards gathering more accurate data to support these requirements but will need to develop proposed levels of service and a more in-depth overview of risks associated with their asset management program for the AMP by July 1, 2025.

8 Financial Strategy

Key Insights

1. The Town is committing approximately $26.7 million towards capital projects per year from sustainable revenue sources

2. Given the annual capital requirement of $41.4 million, there is currently a funding gap of $14.7 million annually

3. For tax-funded assets, we recommend increasing tax revenues by 1.1% each year for the next 15 years to achieve a sustainable level of funding

8.1 Financial Strategy Overview

For an asset management plan (AMP) to be effective and meaningful, it must be integrated with a long-term financial plan (LTFP).[19] The development of a comprehensive LTFP plan will allow the Town of Caledon to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

This report serves as a starting point for initial financial planning, specific for existing capital assets, by presenting several scenarios for consideration and culminating with final recommendations. This report is based on the 2020 budget and does not take into consideration growth or funding that has been set aside for future development. As outlined below, the scenarios presented model different combinations of the following.

1. The financial requirements for:
    a. Existing assets
    b. Existing service levels
    c. Requirements of contemplated changes in service levels (none identified for this plan)
    d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt
    e. Development charges
3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. Gas tax
    b. Annual grants

Note: Periodic grants are normally not included due to Provincial requirements for firm commitments. However, if moving a specific project forward is wholly dependent on receiving a one-time grant, the replacement cost included in the financial strategy is the net of such grant being received.

[19] PSD understands the Town has not prepared a corporate-wide Long-term Financial Plan (LTFP) as at the date of this Asset Management Plan completion.

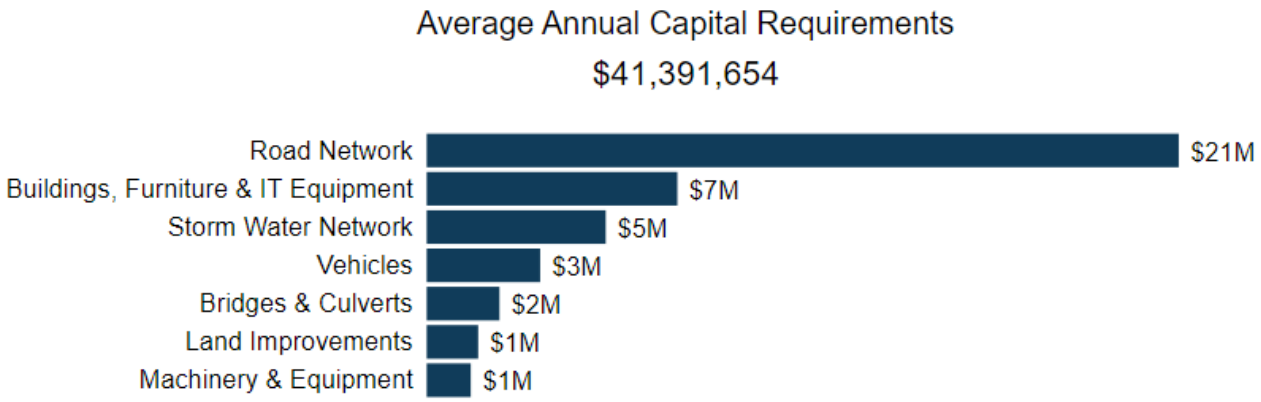
If the financial plan component results in a funding shortfall, the Province may require the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, the Province may evaluate the Town's approach to the following:

1. Consideration given to revising service levels, as required for financials.
2. Various asset management and financial strategies have been considered. For example:
    a. If a zero-debt policy is in place, is it warranted? If not the use of debt should be considered.
    b. Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

8.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Town should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlog and achieve long-term sustainability. This financial strategy does not take into consideration growth and the addition of new assets. In total, the Town must allocate approximately $41.4 million annually to address capital expenditures (CapEx) for the assets included in this AMP.



For most asset categories the annual requirement has been calculated based on a "replacement only" scenario, in which CapEx are only incurred at the construction and replacement of each asset. However, for the Road Network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Town's roads. The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented.

The following table compares two scenarios for the Road Network:

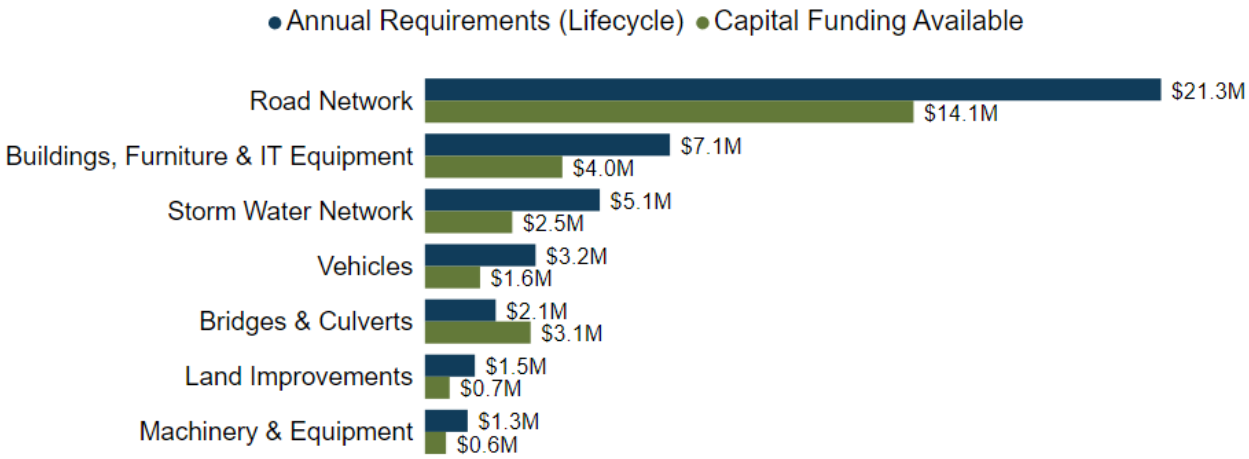
3. Replacement Only Scenario: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
4. Lifecycle Strategy Scenario: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required.

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$26,167,000	$21,254,000	$4,913,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $4,913,000 for the Road Network. This represents an overall reduction of the annual requirements for roads by 19%. As the lifecycle strategy scenario represents the lowest cost option available to the Town, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $26.7 Million towards capital projects per year. Given the annual capital requirement of $41.4 Million there is currently a funding gap of $14.7 Million annually.



8.2 **Funding Objectives**

We have developed a scenario that would enable Caledon to achieve full funding within 1 to 20 years for the following assets:

> Tax Funded Assets: Road Network, Stormwater Network, Bridges & Culverts, Buildings, Furniture & IT Equipment, Machinery & Equipment, Land Improvements and Vehicles.

Note: For the purposes of this AMP, we have excluded gravel roads since they are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they can theoretically have a limitless service life.

For each scenario developed we have included strategies, where applicable, regarding the use of cost containment and funding opportunities.

8.3 Financial Profile: Tax Funded Assets

8.3.1 Current Funding Position

The following tables show, by asset category, Caledon's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Asset Category	Avg. Annual Requirement	Annual Funding Available						Annual Deficit
		Taxes	Gas Tax	OCIF	Region of Peel	Aggregate Levy	Total Available	
Road Network	21,254,000	10,655,315	2,461,000	609,000	70,000	320,000	14,115,315	7,138,685
Stormwater Network	5,065,000	2,539,248					2,539,248	2,525,752
Bridges & Culverts	2,061,000	1,033,246	1,231,000	804,000	430,000		3,068,246	-1,007,246
Buildings, Furniture & IT Equipment	7,088,000	3,553,443					3,983,443	3,104,557
Machinery & Equipment	1,252,000	627,668					627,668	624,332
Land Improvements	1,460,000	731,945					731,945	728,055
Vehicles	3,212,000	1,610,279					1,610,279	1,601,721
Total	**41,392,000**	**20,751,144**	**3,692,000**	**1,413,000**	**500,000**	**320,000**	**26,676,144**	**14,715,856**

The average annual investment requirement for the above categories is $41.4 Million. Annual revenue currently allocated to these assets for capital purposes is $26.7 Million leaving an annual deficit of $14.7 Million. Put differently, these infrastructure categories are currently funded at 64% of their long-term requirements.

8.3.2 Full Funding Requirements

In 2020, the Town of Caledon has annual tax revenues of $75.5 Million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	9.5%
Stormwater Network	3.3%
Bridges & Culverts	-1.3%
Buildings, Furniture & IT Equipment	4.1%
Machinery & Equipment	0.8%
Land Improvements	1.0%
Vehicles	2.1%
Total	**19.5%**

The following changes in costs and/or revenues over the next number of years should also be considered in the financial strategy:

a) Caledon's Debt payments for these asset categories will be increasing by $401,000 over the next 5 years, decreasing by $1,453,000 over the next 10 years, and then debt payment decreases will be $1,872,000 over the next 15 and 20 years respectively.

Our recommendations include capturing the above changes and allocating them to the infrastructure deficit outlined above. The table below outlines this concept and presents several options:

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	14,715,856	14,715,856	14,715,856	14,715,856	14,715,856	14,715,856	14,715,856	14,715,856
Change in Debt Costs	N/A	N/A	N/A	N/A	400,755	-1,453,245	-1,872,245	-1,872,245
Change in OCIF Grants	N/A	N/A	N/A	N/A				
Resulting Infrastructure Deficit:	**14,715,856**	**14,715,856**	**14,715,856**	**14,715,856**	15,116,611	13,262,611	12,843,611	12,843,611
Tax Increase Required	19.5%	19.5%	19.5%	19.5%	20.0%	17.6%	17.0%	17.0%
Annually:	**3.9%**	**2.0%**	**1.3%**	**1.0%**	**4.0%**	**1.8%**	**1.1%**	**0.9%**

8.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 15-year option. This involves full funding being achieved over 15 years by:

a) Maintaining the debt load and loan repayment for the existing infrastructure;
b) increasing tax revenues dedicated to CapEx by approximately 1.1% each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP;
c) allocating the government transfer revenues for capital assets as outlined previously; and
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. Based on best practices, this periodic funding should not be incorporated into an AMP unless there are firm commitments in place. We have included the government transfer funding, as provided by the Finance Department[20].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes may be challenging. However, a lack of intentional asset funding planning today may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 15 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $3.1 Million for the Road Network, $4.1 Million for the Buildings, Furniture & IT Equipment, $2.2 Million for Machinery & Equipment, $2.1 for Land Improvements, and $5.2 Million for Vehicles.

Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

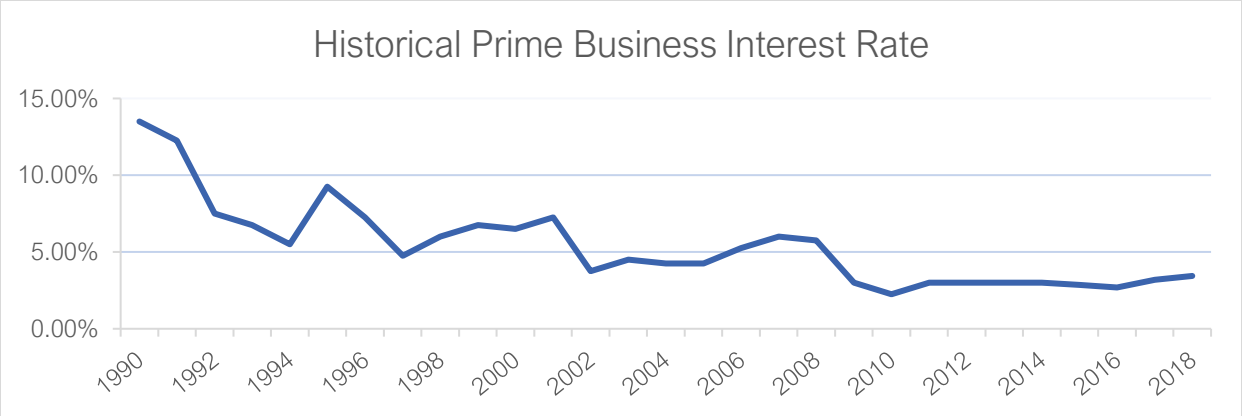
[20] The Town should take advantage of all available grant funding programs and transfers from other levels of government. The financial strategy within this AMP has only included the known capital funding as provided by the Town's finance department, and there is an expectation the Town should be eligible for additional capital funding from senior governments within the next twenty years that could reduce the tax burden. Depending on the outcome of this review, there may be changes that impact its availability.

8.4 **Use of Debt**

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[21] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

Interest Rate	Number of Years Financed					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.5%	2%	3%	4%	5%	7%	8%
0.0%	0%	0%	0%	0%	0%	0%

It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:



[21] Current municipal Infrastructure Ontario rates for 15-year money is 3.2%.

A change in 15-year rates from 3% to 6% would change the premium from 26% to 54%. Such a change would have a significant impact on a financial plan.

The following tables outline how Caledon has historically used debt for investing in the asset categories as listed. There is currently $10,998,300 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $1,902,245, well within its provincially prescribed maximum of $19,078,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Road Network	10,998,300	3,100,000		7,000,000	3,610,000	4,100,000
Stormwater Network						
Bridges & Culverts						
Buildings, Furniture & IT Equipment						
Machinery & Equipment						
Land Improvements						
Vehicles						
Total Tax Funded	**10,998,300**	**3,100,000**		**7,000,000**	**3,610,000**	**4,100,000**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	1,902,245	1,937,000	2,351,000	2,337,000	2,321,000	2,303,000	449,000
Stormwater Network							
Bridges & Culverts							
Buildings, Furniture & IT Equipment							
Machinery & Equipment							
Land Improvements							
Vehicles							
Total Tax Funded	**1,902,245**	**1,937,000**	**2,351,000**	**2,337,000**	**2,321,000**	**2,303,000**	**449,000**

The revenue options outlined in this plan allow Caledon to fully fund its long-term infrastructure requirements without further use of debt.

8.5 **Use of Reserves**

8.5.1 Available Reserves

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

a) the ability to stabilize tax rates when dealing with variable and sometimes uncontrollable factors
b) financing one-time or short-term investments
c) accumulating the funding for significant future infrastructure investments
d) managing the use of debt
e) normalizing infrastructure funding requirement

By asset category, the table below outlines the details of the reserves currently available to Caledon.

Asset Category	Balance at December 31, 2020
Road Network	15,650,000
Stormwater Network	3,205,000
Bridges & Culverts	769,000
Buildings, Furniture & IT Equipment	5,400,000
Machinery & Equipment	474,000
Land Improvements	12,401,000
Vehicles	1,604,000
Total Tax-Funded	**39,503,000**

There is considerable debate in the municipal sector as to the appropriate level of reserves that a Town should have on hand. There is no clear guideline that has gained wide acceptance. Factors that municipalities should take into account when determining their capital reserve requirements include:

a) breadth of services provided
b) age and condition of infrastructure
c) use and level of debt
d) economic conditions and outlook
e) internal reserve and debt policies.

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Caledon's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

8.5.2 Recommendation

In 2025, Ontario Regulation 588/17 will require the Town of Caledon to integrate proposed levels of service for all asset categories in its asset management plan update. We recommend that future planning should reflect adjustments to service levels and their impacts on reserve balances.

9 Appendices

Key Insights

1. Appendix A identifies additional key terms and concepts for this AMP
2. Appendix B includes an overview of this document's compliance with O. Reg. 588/17
3. Appendix C depicts Caledon's asset data hierarchy
4. Appendix D provides the 10-Year capital requirements for each asset category
5. Appendix E includes several maps that have been used to visualize the current level of service
6. Appendix F includes a breakdown of the risk rating criteria
7. Appendix G summarizes condition assessment guidelines

Appendix A: Additional Key Terms and Concepts

Deriving Replacement Costs

Replacement costs should reflect the total costs associated with the full replacement or reconstruction of an asset. They should include the combined cost of materials, plant, labour, engineering and administrative costs.

This AMP relies on two methods to determine asset replacement costs:

- Unit Cost: A unit-based cost (e.g. per metre) determined through a review of recent contracts, reports and/or staff estimates
- Historical Cost Inflation: Inflation of the asset cost recorded at the time it was initially acquired to today's value using an index (e.g. CPI or NRBCPI)

Historical cost inflation is typically used in the absence of reliable unit cost data. It is a fairly reliable method for recently purchased and/or constructed assets where the cost is reflective of the total capital costs that the Town incurred. As assets age, and new products and technologies impact procurement costs and construction methods, cost inflation becomes a less reliable technique to determine replacement cost.

All unit costs were reviewed by Town of Caledon staff and determined to be the best available cost estimates at the time this AMP was developed.

Estimated Useful Life

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

Reinvestment Rate

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

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

$$Target\ Reinvestment\ Rate = \frac{Annual\ Capital\ Requirement}{Total\ Replacement\ Cost}$$

$$Actual\ Reinvestment\ Rate = \frac{Annual\ Capital\ Funding}{Total\ Replacement\ Cost}$$

Deriving Asset Condition

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

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

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

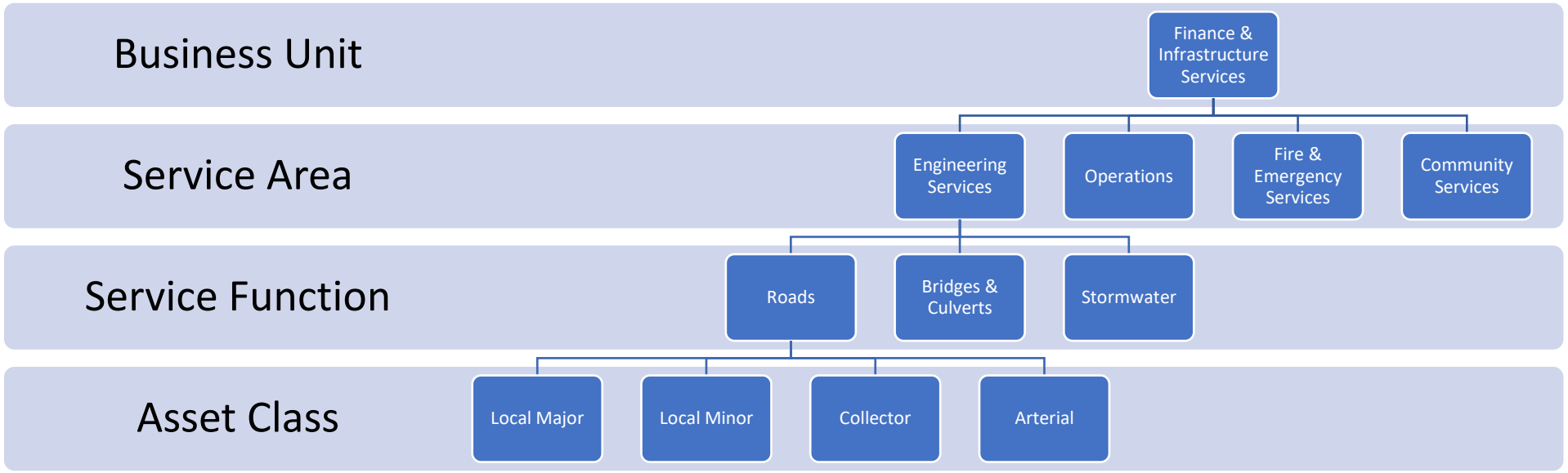
The analysis in this AMP is based on assessed condition data only as available. In the absence of assessed condition data, asset age is used as a proxy to determine asset condition.

Appendix B: O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2022. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4.1.1 - 5.2.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1.1 - 5.2.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.1.3 - 5.2.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.1.2 – 5.2.2	Complete
Description of Town's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.1.2 – 5.2.2	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.1.6 - 5.2.6	Complete for Core Assets Only
Current performance measures in each category	S.5(2), 2	4.1.6 - 5.2.6	Complete for Core Assets Only
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.1.4 - 5.2.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix A	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	6.1-6.2	Complete

Appendix C: Asset Data Hierarchy



Appendix D: 10-Year Capital Requirements

The following tables identify the capital cost requirements for each of the next 10 years in order to meet projected capital requirements and maintain the current level of service.

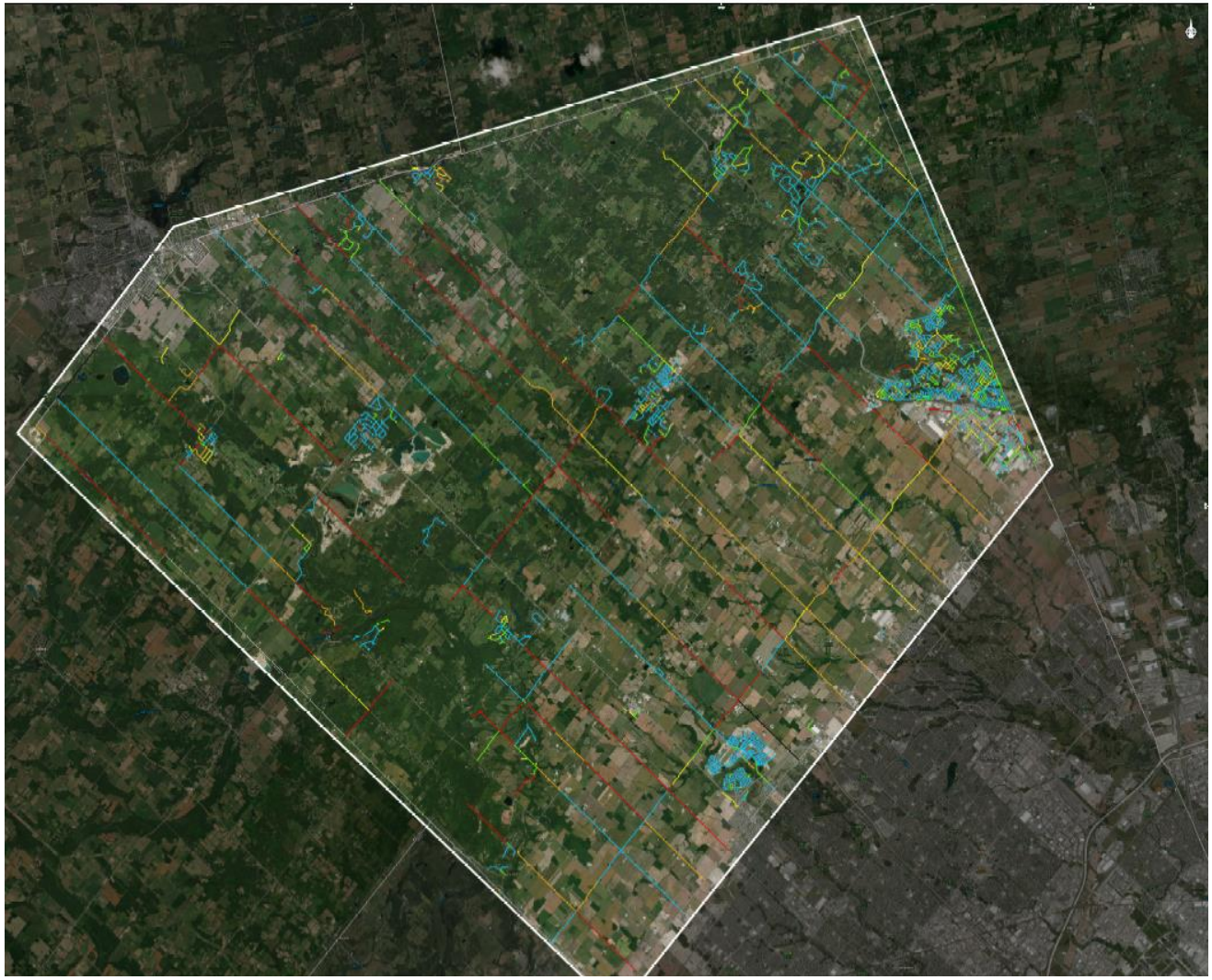
Road Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Acoustic Fencing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Curbs	$1,139,984	$812,226	$477,830	$227,274	$240,970	$1,042,564	$201,878	$270,146	$478,551	$1,306,132	$263,200
HCB Local Major	$385,652	$118,000,000	$12,620,659	$6,634,591	$1,322,177	$1,221,598	$1,689,186	$1,542,548	$4,275,971	$3,144,859	$3,844,456
HCB Local Minor	$463,046	$11,478,775	$4,583,779	$5,757,372	$3,122,933	$3,539,182	$3,186,683	$5,594,695	$5,174,323	$5,802,401	$4,399,437
LCB Local Major	$0	$38,741,647	$0	$4,493,704	$1,510,449	$5,815,020	$2,826	$0	$4,486,964	$0	$520,450
Sidewalks	$1,107,025	$905,812	$502,517	$297,589	$305,992	$1,240,902	$372,066	$626,158	$534,388	$1,327,792	$362,157
Streetlights	$0	$0	$0	$8,220	$16,440	$8,220	$16,440	$8,220	$20,550	$12,330	$8,220
Traffic Signals	$0	$0	$0	$0	$363,528	$0	$0	$0	$0	$0	$0
Total	**$3,095,707**	**$169,938,460**	**$18,184,785**	**$17,418,750**	**$6,882,489**	**$12,867,486**	**$5,469,079**	**$8,041,767**	**$14,970,747**	**$11,593,514**	**$9,397,920**

Bridges & Culverts											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Bridge - Pedestrian	$0	$240,000	$283,500	$289,000	$270,500	$65,000	$0	$0	$0	$0	$0
Bridge - Road	$0	$1,354,330	$1,622,500	$1,515,000	$1,765,000	$1,584,870	$0	$107,000	$93,000	$130,000	$130,000
Culvert - Pedestrian	$0	$423,000	$423,000	$417,000	$407,000	$697,000	$184,000	$217,000	$41,000	$61,000	$30,000
Culvert - Road	$0	$166,000	$1,122,000	$864,000	$1,329,000	$1,577,705	$44,600	$0	$22,000	$0	$0
Total	**$0**	**$2,183,330**	**$3,451,000**	**$3,085,000**	**$3,771,500**	**$3,924,575**	**$228,600**	**$324,000**	**$156,000**	**$191,000**	**$160,000**

Stormwater System											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Manufactured Treatment Devices	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Mains	$2,449,870	$0	$0	$0	$0	$0	$0	$0	$24,223	$0	$520,237
Storm Water Management Ponds	$0	$0	$495,000	$330,000	$1,255,000	$0	$330,000	$0	$400,000	$47,795	$0
Total	**$2,449,870**	**$0**	**$495,000**	**$330,000**	**$1,255,000**	**$0**	**$330,000**	**$0**	**$424,223**	**$47,795**	**$520,237**

Non-Core Asset Categories											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Buildings, Furniture & IT Equipment	$5,538,677	$1,010,281	$1,143,209	$2,067,410	$1,548,622	$15,787,055	$4,429,047	$5,021,382	$4,771,165	$986,197	$1,739,989
Land Improvements	$2,360,134	$70,964	$123,610	$110,748	$292,440	$99,836	$408,974	$312,344	$476,941	$369,628	$304,944
Machinery & Equipment	$2,288,220	$1,835,606	$718,431	$882,658	$2,567,922	$504,438	$3,220,391	$744,713	$536,549	$3,578,554	$233,422
Vehicles	$9,361,198	$1,849,290	$2,126,488	$1,792,384	$2,159,519	$2,924,257	$8,573,440	$2,213,059	$4,081,050	$3,230,190	$1,420,552
Total	**$19,548,229**	**$4,768,161**	**$4,113,759**	**$4,855,222**	**$6,570,526**	**$19,317,610**	**$16,633,877**	**$8,293,524**	**$9,867,732**	**$8,166,597**	**$3,700,936**

Appendix E: Level of Service Maps & Images



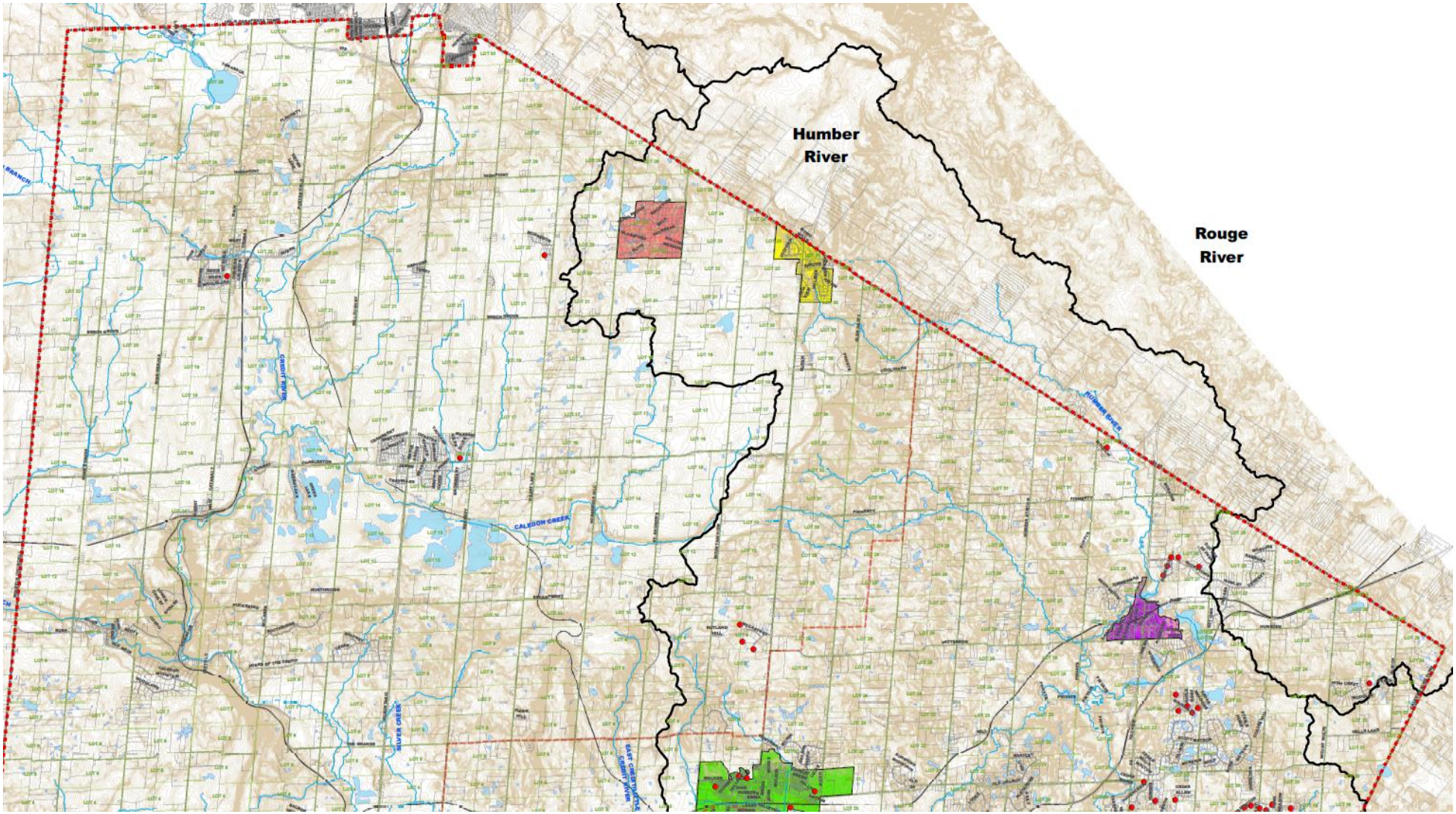
Road Network – Town of Caledon

Description of the Condition of Bridges

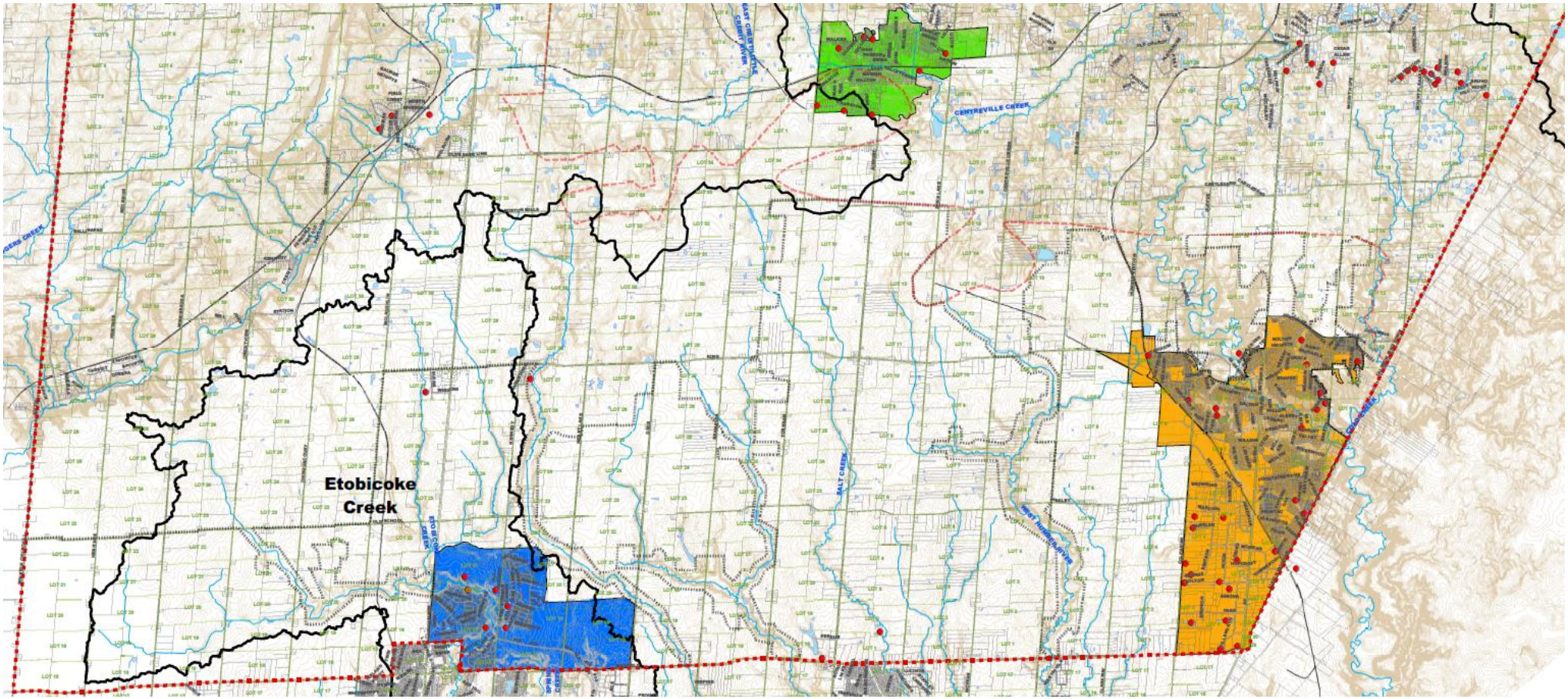
Condition Grade	Bridge ID 2017 BCI	Road Bridge Example	
Very Good	B27082236 BCI=98.84		
Good	B26180048 BCI=70.94		

Condition Grade	Bridge ID 2017 BCI	Road Bridge Example	
Fair	B26218346 BCI=68.14		
Poor	B26064020 BCI=55.45		
Very Poor	B26146032 BCI (2015) = 35.6	B26146032 Grange Side Road, 0.4 km East of McLaughlin Road: bridge is currently under construction	

Storm Water Management Pond Locations: Map 1/2



Storm Water Management Pond Locations: Map 1/2



GENERAL

- SWM Facilities
- Town of Caledon Municipal Limits
- Watersheds
- Oak Ridges Moraine Boundary
- Greenbelt Boundary
- 1m Contour

PEEL REGION GIS DATA

- Watercourse
- Waterbodies
- Roads
- Lot Destinations

TOWN CAD & GIS DATA

- Land Parcels

Settlement Areas (in SWM-MP Scope)

- Bolton
- Caledon East
- Mayfield West
- Mono Mills
- Palgrave
- Tamarack - (Source - Peel Region Website)

Appendix F: Risk Rating Criteria

Probability of Failure

Asset Category	Criteria & Weight	Value/Range	Probability of Failure Score
Road Network	Condition (PCI) 100%	0-40	5
		40-55	4
		55-70	3
		70-85	2
		85-100	1

Asset Category	Criteria & Weight	Value/Range	Probability of Failure Score
Bridges & Culverts (BCI)	Condition (BCI) 100%	0-40	5
		40-60	4
		60-70	3
		70-80	2
		80-100	1

Asset Category	Criteria & Weight	Value/Range	Probability of Failure Score
Stormwater Mains	Condition (PACP) 100%	4-5	5
		3-4	4
		2-3	3
		1-2	2
		0-1	1

Consequence of Failure

Asset Category	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Surface Type	HCB Local Major	4
		HCB Local Minor	3
		LCB Local Minor	2
	Maintenance Class	1	5
		2	4
		3	3
		4	3
		5	3
		6	2
		7	1

Asset Category	Risk Criteria	Value/Range	Consequence of Failure Score
Bridges & Culverts	Replacement Cost (100%)	>$2,000,000	5
		$1M-$2M	4
		$400k-$1M	3
		$200k-$400k	2
		<$200k	1
	Road Class	Arterial	5
		Collector	3
		Local	2
		Freeway	2
		Footbridge	1

Asset Category	Criteria & Weight	Value/Range	Probability of Failure Score
Stormwater Mains	Pipe Diameter	2100mm+	5
		1000-2100mm	4
		525-1000mm	3
		375-525mm	2
		200-350mm	1

Appendix G: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that should be used and the assets that require a discrete condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project.
There are many options available to the Town to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

Developing a Condition Assessment Schedule

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

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

The preparation of this document 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.