Town of Stouffville

2022 Asset Management

Transportation, Stormwater, Water and Wastewater Services

Prepared by SLBC Inc.
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Rev. 3

Final submission

Executive Summary

Introduction

The Town of Stouffville (the Town) provides a range of services to its residents and businesses, including transportation services on local roads, bridges and culverts, sidewalks and walkways; stormwater management; water and wastewater services. To deliver these services, the Town relies on infrastructure assets with a replacement value of $955.5 million, including 487.6 lane-km of roadways, 15 bridges and culverts (greater than 3m span), 100 km of sidewalks and walkways, and close to 300 km of underground pipes.

This 2022 Asset Management (AM) Plan describes the actions required to manage this portfolio of assets in a way that supports established service levels, while managing risks and costs. The AM Plan focuses on the 10-year period from 2022 to 2031 and fulfils the year 2022 requirements of Ontario Regulation (O.Reg.) 588/17 Asset Management Planning for Municipal Infrastructure.

In accordance with the requirements of O.Reg. 588/17, this AM Plan is publicly available on the Town's web site, along with related background documents, such as condition assessments.

State of the Infrastructure

As shown in Figure ES-1, 80.1% ($765.1 million) of the Town's assets are in Fair condition or better, while 10.4% of assets are in Poor or Very Poor condition and another 9.5% are in Unknown condition. The condition distribution is presented by service in Figure ES-2. That Figure shows that assets in Very Poor condition are primarily in the transportation service, and consist of roads ($2.7 million), traffic signals ($0.9 million) and transportation fleet and equipment ($0.1 million). Other assets in Very Poor condition include vehicles and equipment supporting the water service ($0.18 million), water meters ($0.04 million) and equipment supporting the wastewater service ($0.01 million).

Figure ES-1: Condition Overview – Core Services

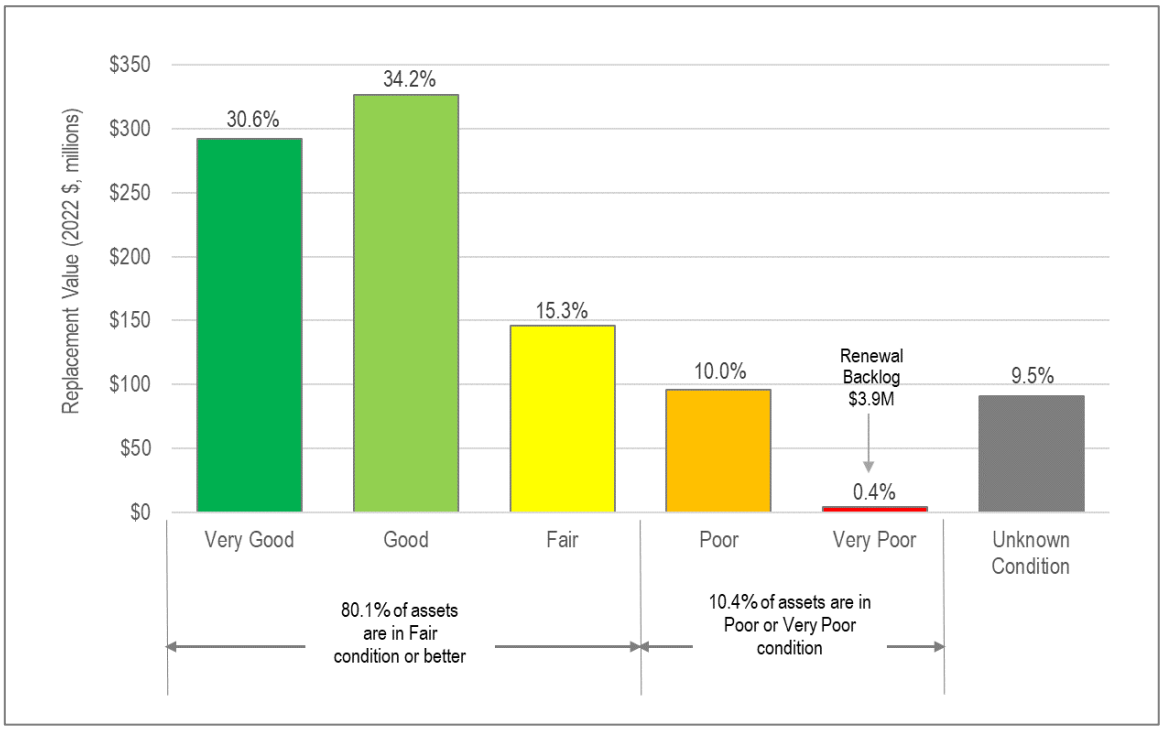
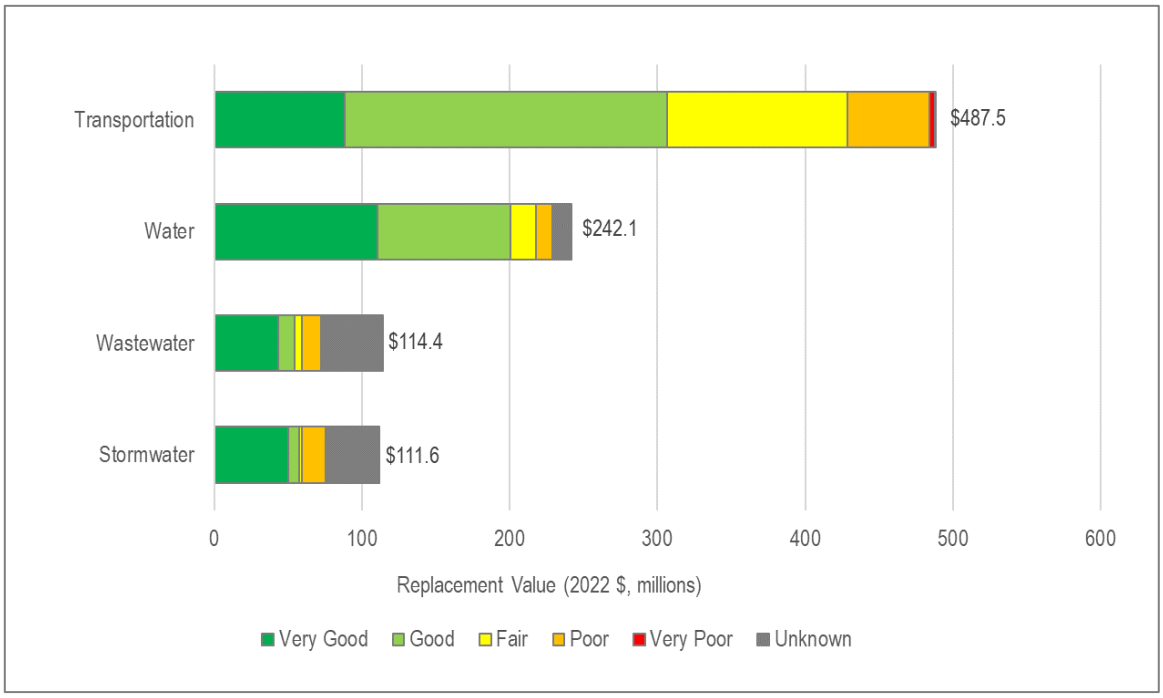


Figure ES-2: Condition Distribution by Service



** Values sum to $995.6 due to rounding; however, total inventory value is $955.5.*

Levels of Service

Key findings from the reported Level of Service (LOS) metrics are as follows:

- For Transportation Service:
  - Average road condition ranges from Very Poor to Very Good. Paved roads have an average Pavement Condition Index (PCI) of 69.3 (Fair). Gravel roads do not have an associated PCI score, but are in Fair condition due to on-going re-shaping and addition of gravel throughout the year.
  - No vehicular load restrictions currently exist on any Town bridge or culvert structures
- For Water Service:
  - There were no boil water advisories during the previous three years (2019-2021).
  - The number of connection-days per year (where service is interrupted) due to water main breaks for the previous three years were:
    - 2021: 4 breaks, 0 connection-days lost
    - 2020: 5 breaks, 136.7 connection-days lost
    - 2019: 7 breaks, 5.4 connection-days lost
- For Wastewater Service:
  - Sewer backups are proactively monitored and tracked. The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system for the previous three years were:
    - 2021: no backups, 0 connection-days lost
    - 2020: 1 backup, 0 connection-days lost
    - 2019: 1 backup, 0 connection-days lost
- For Stormwater Service:
  - 98.5% of 17,983 lots are resilient to a 100-year storm
  - Storm sewers and ponds are designed to be resilient to 5-year storms

Performance targets were not set for this iteration of the AM Plan. Instead, current performance was reported and will be monitored to support future target-setting. O.Reg. 588/17 requires proposed targets to be defined in an AM Plan for all services by July 1, 2025.

Risk Management Strategy

Table ES-1 shows that $0.9 million of renewal needs Very High risk, consisting of traffic signals beyond their service life at the following three intersections:

- Main Street & Stouffer Street Intersection
- Main Street & Park Drive Intersection
- Main Street & Mill Street Intersection

Table ES-1: Renewal Risk Exposure – Core Services

Probability of Failure	1	2	3	4	5
5	$ 0.1	$ 3.0	$ 0.0	$ 0.9	-
4	$ 0.0	$ 34.1	$ 38.3	$ 23.2	$ 0.0
3	$ 0.0	$ 58.1	$ 42.2	$ 45.8	$ 0.0
2	$ 0.2	$ 119.3	$ 151.5	$ 41.3	$ 14.4
1	$ 0.1	$ 73.4	$ 138.3	$ 80.4	-

Consequence of Failure

Risk Legend: Very Low | Low | Moderate | High | Very High

Risk Category	Renewal Need (2021 $, millions)
Very High	$ 0.9
High	$ 107.3
Moderate	$ 135.0 *
Low	$ 547.6
Very Low	$ 73.8
Unknown Risk	$ 91.0
TOTAL	**$ 955.5***

** Value differs from summation of chart values due to rounding*

Life Cycle Management Strategy

Table ES-2 shows that the average annual renewal needs over the next 20 years (from 2022 to 2041) is $11.8 million/year. The third column of the table shows that over the full lifecycles of the existing assets, the average annual renewal need is $15.9 million/year. This means that beyond the 20-year forecast period, a significant amount of renewals will be needed. To sustain the current portfolio of assets throughout their lifecycle, the municipality needs to contribute $15.9 million toward asset renewal or reserves each year.

Table ES-2: Renewal Needs Summary by Service Area

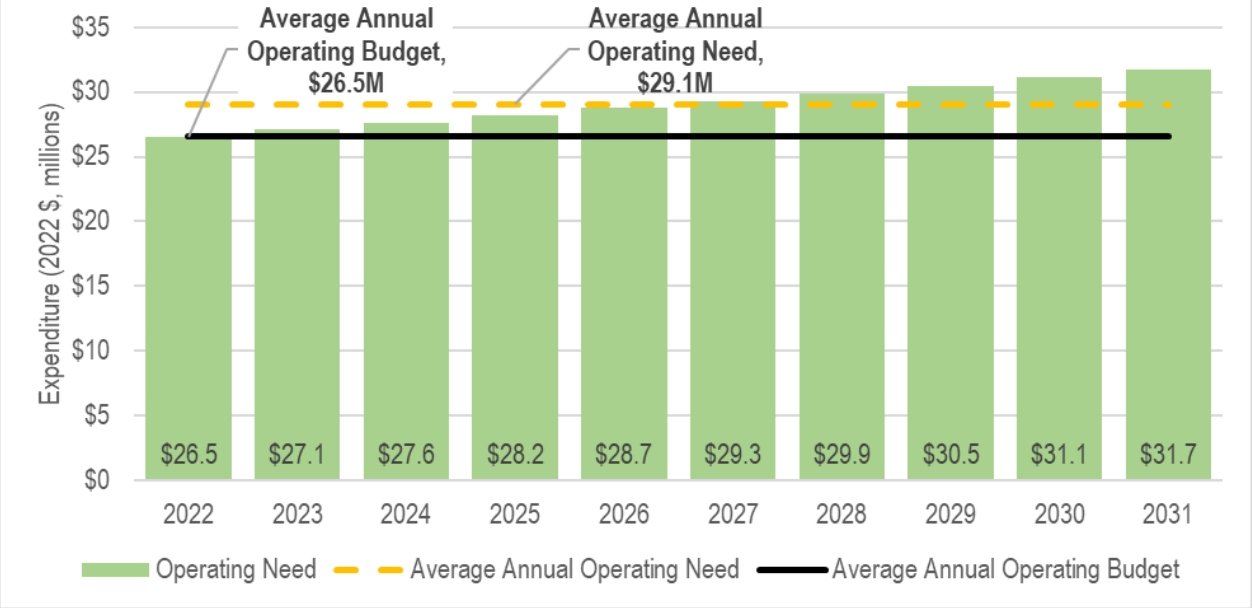
Service Area	20-Year Average Annual Renewal Needs (2022 $, millions)*	Average Annual Renewal Needs over Asset Lifecycles (2022 $, millions)**
Transportation	$7.2	$8.1
Water	$1.0	$3.5
Wastewater	$0.7	$1.4
Stormwater	$2.9	$2.9
TOTAL	**$11.8**	**$15.9**

** Excludes assets with unknown condition since it is not known whether those assets will require renewal within the 20-year period.*

*** Includes assets with known and unknown condition.*

Figure ES-3 summarizes the forecast operations and maintenance expenditures related to asset activities for the period 2022-2031, with an annual average forecast of $26.5 million for core services. The forecast operations and maintenance expenditures are based on current needs plus needs associated with assets anticipated to be acquired over the next ten years. As the Town gains more clarity around the quantity of new assets to be acquired, operational budget planning will be better informed and more accurately reflect operations and maintenance needs for core infrastructure assets.

Figure ES-3: Operating Needs Forecast



In general, the associated Operating needs forecast are focused on asset activities and does not include non-asset related expenses such as salaries, programming, office supplies and insurance. This forecast also does not include the potential cost increases due to inflation, market conditions or pandemic impacts. The Town will monitor price increases and adjust future forecasts as necessary.

Financial Impact

Asset renewal is funded by Repair and Rehabilitation (R&R) Reserve accounts. For long-term sustainability, the Town's annual contributions to R&R accounts must equal or exceed the annual average renewal needs.

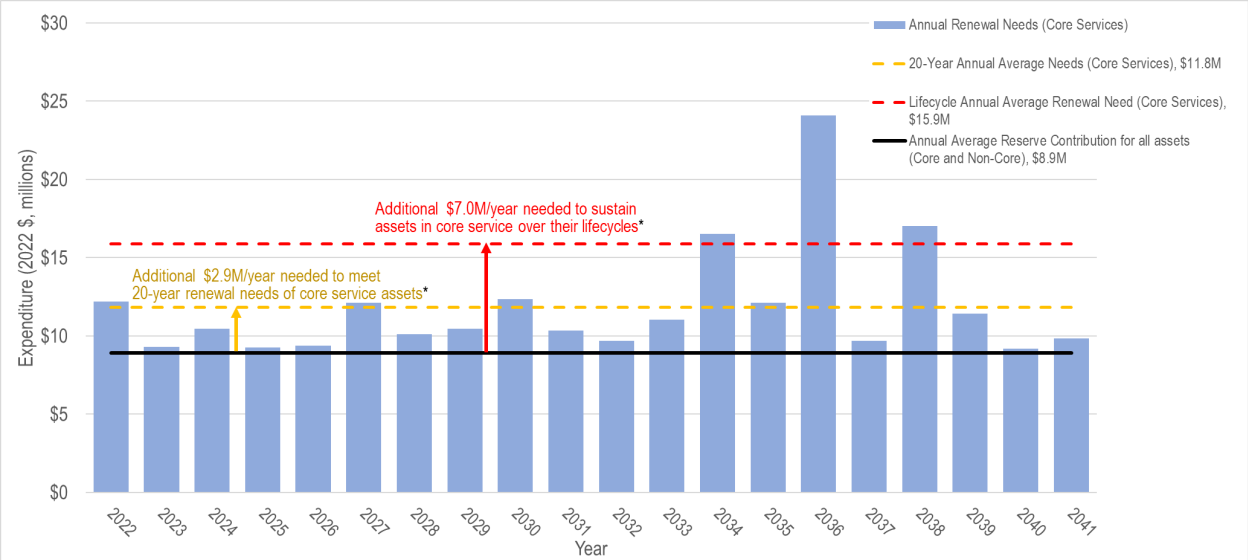
For 2022, the Town's contributions to R&R reserves included:

- $4.2 million to be used for any core and non-core assets
- $4.7 million to be used for water, wastewater or stormwater assets

Assuming that the annual reserve contribution is held at that amount, this represents a commitment of $8.9 million/year to cover all the Town's asset renewal needs (including core and non-core assets).

As shown in Figure ES-4, an annual reserve contribution of $8.9 million/year (solid black line) leaves an annual average infrastructure gap of $2.9 million relative to the 20-year annual average renewal needs for core service assets (orange dotted line), and a gap of $7.0 million relative the renewal needs for lifecycle sustainability for core service assets (red dotted line). The gap will be even larger when the renewal needs of non-core service assets are considered.

Figure ES-4: Renewal Funding Analysis



Similar to the Operating budget, the estimated Capital forecast and funding shortfall do not consider for rising costs due to inflation, market conditions or pandemic impacts.

Funding gaps may be closed by one or more of the following strategies:

- Reduce near-term renewal needs by deferring capital renewal projects on lower risk assets, thereby lengthening the period in which the backlog is addressed beyond the 10- and 20-year outlook, but likely increasing maintenance costs.
- Increase available funds through property tax increases, water and wastewater fees (rates), third-party grants, capital infrastructure fees, or drawing down reserves.
- Investigate implementing a stable stormwater user fee to recover the full cost of stormwater management.

AM Plan Monitoring & Improvement

In accordance with O.Reg. 588/17, the Town's progress towards implementing this AM Plan will be reported to Council by July 1 each year to demonstrate:

- Status of expansion, upgrade and renewal needs and projects listed in Section 6
- Updated service level performance for LOS metrics listed in Section 4

- Service level targets as they are established (to be incorporated into Section 4).

The AM Plan will be updated every five years (or more frequently) to ensure that service level targets, asset values, and projected asset lifecycle expenditures are accurately represented and support the Town's financial and infrastructure planning.

The following improvements to asset data are recommended to support future iterations of the AM Plan:

1. Establish unique asset IDs and naming conventions for each asset, and ensure that asset IDs are consistent across all data sets. For example, road segments should have the same asset ID in GIS, RoadMatrix and TCA.
2. Collect further GIS data to enhance geo-location and mapping.
3. Merge storm resiliency data to asset inventory for LOS reporting.
4. Collect inventory data and assess condition of vertical process equipment (Gormley Fire Protection System).
5. Establish centralized asset register update processes and listing of AM improvement needs.

Ontario Regulation 588/17 requires proposed levels of service to be reported in an AM Plan update by July 1, 2025. To achieve compliance with those requirements, the AM Plan will need to:

- Propose LOS targets for the next 10 years and provide an explanation of why those proposed LOS targets are appropriate.
- Identify the lifecycle activities that would need to be undertaken to provide the proposed LOS for each of the next 10 years, based on risk and lowest lifecycle cost analyses.
- Forecast annual funding projected to be available to undertake lifecycle activities and the options examined to maximize the funding projected to be available.
- Identify which lifecycle activities will be funded if there are funding shortfalls, and for those not funded, identify the risks of not undertaking them.
- Provide an overview of the risks associated with implementation of the AM Plan and any actions that would be proposed in response to those risks.

Table of contents

List of Tables

List of Figures

1 Introduction

The Town of Stouffville (the Town) provides a range of services to its residents and businesses, including transportation services on local roads, sidewalks and trails; stormwater management; water and wastewater services. To deliver these services, the Town relies on infrastructure assets with a replacement value of $955.5 million, including 487.6 lane-km of roadways, 15 bridges and culverts (greater than 3m span), 100 km of sidewalks and walkways, and close to 300 km of underground pipes.

Historically, the Town has proactively and responsibly managed its infrastructure portfolio. As infrastructure ages and demands increase, so will the challenge of ensuring the needs of the community are effectively met with the limited resources available. This Asset Management Plan (AM Plan) seeks to address that concern by providing a framework for considering, prioritizing, and optimizing asset management efforts, and providing direction for effective management of the Town's infrastructure to best achieve established goals and objectives. As an integrated plan, it considers the lifecycles and needs of all infrastructure assets and classes within the plan's scope, providing a sustainable, holistic view of the asset portfolios. The AM Plan is not only focused on managing individual assets but considers the condition and performance of complete asset systems through a systematic, risk-based decision-making process. The resulting AM Plan is intended to provide the optimal allocation of resources towards meeting prescribed goals, objectives, and levels of service.

This AM Plan supports three strategic priorities defined in the Town's 2019-2022 Strategic Plan: (i) Fiscal Sustainability, (ii) Service Excellence, and (iii) Asset Planning, Maintenance and Development. The AM Plan is a medium- to long-range planning document that supports these priorities by documenting key items such as:

- The size, replacement value, and condition of the Town's asset portfolio
- The Town's levels of service
- Lifecycle management strategies to prolong asset life and reduce lifecycle costs
- Funding forecasts to sustain the Town's asset portfolio and support decision making
- Key asset management practice improvement actions

The AM Plan will assist the Town in developing appropriate capital and operating programs and ensure that its infrastructure portfolio is managed in a financially sustainable way.

1.1 Purpose of the Plan

The 2022 AM Plan is an update to the Town's 2018 AM Plan, intended to meet the July 2022 requirements of Ontario Regulation (O.Reg.) 588/17 "Asset Management Planning for Municipal Infrastructure" under the Infrastructure for Jobs and Prosperity Act, 2015. Specifically, by July 2022, O.Reg. 588/17 requires municipalities to adopt an AM Plan for core assets (roads, bridges and culverts, and assets used to deliver stormwater, water, and wastewater services), reporting current levels of service, and lifecycle needs to sustain those levels of service.

This AM Plan includes the core assets identified by O.Reg. 588/17, as well as non-core assets in the transportation service. This enables a Town-wide asset management analysis of the following four services:

- Transportation
- Water
- Wastewater
- Stormwater

For these services, this AM Plan provides a lifecycle plan for the 20-year period from 2022-2041, as well as average annual renewal needs to sustain assets over their full lifecycles.

1.2 Alignment with Regulatory Requirements

This AM Plan fulfils the year 2022 requirements of Ontario Regulation (O.Reg.) 588/17 Asset Management Planning for Municipal Infrastructure made under the Infrastructure for Jobs and Prosperity Act 2015. O.Reg. 588/17 requires that municipalities develop an AM Plan that reports current Levels of Service (LOS) and associated costs for core infrastructure by July 1, 2022. Core assets include roads, bridges, and assets used to deliver water, wastewater and stormwater services; while non-core assets refer to all other assets. This AM Plan includes core, as well as non-core assets that support the transportation service.

O.Reg. 588/17 further requires that by July 1, 2024 all core and non-core assets be included in an AM Plan and that by July 1, 2025 municipalities update their AM Plans to include costs and risks associated with proposed LOS (including core and non-core assets). This AM Plan provides recommendations for closing data gaps to enable analysis and reporting on proposed LOS for the assets included in this AM Plan.

In accordance with the requirements of O.Reg. 588/17, this AM Plan is posted on the Town's website, along with related background documents, such as condition assessments.

1.3 Relationship with Other Municipal Documents

AM Planning is a medium- to long-term planning activity that relies on input from strategic planning activities and informs shorter-term decision-making. The AM Plan provides a framework to validate the Town's budgeting processes and assist in prioritizing work activities, including capital projects, based on risk. It also discusses levels of service that support goals in the Town's 2019-2022 Strategic Plan and lifecycle management strategies intended to reduce the overall cost of asset ownership.

The AM Plan is intended to be read with other Town planning documents, including the following:

- 2019-2022 Strategic Plan Report (2019)
- Development Charges Background Study (2018)
- Development Charges Background Study Addendum (2018)
- Transportation Master Plan (2017)
- Water and Wastewater Master Plan (2018)
- Bridge Inspection Report (2020)
- Condition Assessment – Gormley Fire Pump Station (2020)
- Operating and Capital Budgets
- Tangible Capital Asset (Fixed Asset) Annual Financial Statements
- Water System Annual Reports
- Policies
    - Corporate Asset Management Policy AP82
    - Corporate Debt Management Policy AP84
    - Reserve Fund Policy AP86
    - Operating and Capital Budget Policy AP89
    - Multi-year Budget Policy AP90

1.4 Scope

This AM Plan includes all assets owned by the Town to support the transportation, water, wastewater and stormwater services, and for which asset data was available. Where data gaps were encountered, recommendations for closing data gaps are provided to enable the Town to continually improve its AM Planning capabilities.

1.5 Asset Management Service Groups

This AM Plan includes four (4) service areas, as follows:

A. Transportation Service
The Town's transportation network comprises roads, bridges, culverts, sidewalks, traffic signals, traffic signs and streetlights. A fleet of vehicles support operations and maintenance, including heavy vehicles and equipment for road maintenance, winter control vehicles and equipment for roads and sidewalks, and light vehicles (primarily pick-up trucks) for crew transport to inspection and job sites.

B. Stormwater Management
The Town's stormwater network includes storm sewers, catch basins, maintenance holes and an underground stormwater reservoir in the community of Stouffville urban area. A streetsweeper is used to remove sand, silt and other debris from roads before it can accumulate in the stormwater ponds. Dry ponds and wet ponds exist throughout the Town to capture stormwater.

C. Water Service
The Town operates two drinking water systems: the Stouffville Drinking Water System, and the Ballantrae Drinking Water System. These systems receive treated water from York Region and distribute it to residents and businesses in the communities of Stouffville and Ballantrae-Musselman's Lake, respectively.

The Town also operates the Gormley Fire Protection Water System, which provides water for fire protection to the Gormley business community.

D. Wastewater Service
For wastewater services, the Town operates and maintains a network of wastewater mains and maintenance holes in the community of Stouffville. Wastewater is collected from residents and businesses in that community and transmitted to wastewater treatment facilities operated by York and Durham Region.

1.6 Assets Not Included

Due to lack of inventory data, this Core Infrastructure AM Plan does not include the following assets:

- Roadside guiderails and guide cables
- Roadside retaining walls and fences

These will be discussed in Section 8 as opportunities for improvement for the next iteration of the AM Plan.

1.7 Organization of the Document

The AM Plan is organized to meet the requirements of Ontario Regulation 588/17 (Current Levels of Service) and the Province's "Guide for Municipal Asset Management Plans". The contents of this AM Plan follow the recommended elements of a detailed AM Plan:

- **Executive Summary:** Summary of AM Plan
- **1 – Introduction:** Outlines scope, background information, relationship to other Town documents and plans, and applicable legislation
- **2 – Inventory and Replacement Value:** Summarizes the inventory and valuation of the Town's assets by service and asset type
- **3 – State of the Infrastructure:** Summarizes the condition and remaining life of the assets in the inventory by service and asset type
- **4 – Levels of Service:** Defines levels of service through performance indicators, and presents current performance. Describes external trends or issues that may affect expected levels of service
- **5 – Lifecycle Management Strategy:** Summarizes the asset management strategies (i.e., planned actions) that will enable the assets to provide the required levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost

- **6 – Expenditure Forecasts and Financing Plan:** Summarizes the financial planning and budgeting associated with asset management planning
- **7 – AM Plan Monitoring and Improvement:** Summarizes the next steps including monitoring of AM Plan implementation progress, and improving future iterations of the AM Plan. Recommended improvements consider the 2025 requirements of Ontario Regulation 588/17
- **Appendix A – Compliance with O.Reg. 588/17 (2022 Deadline)**

2 Inventory & Replacement Value

The infrastructure assets addressed in this report include transportation, water, wastewater and stormwater asset groups. These services rely on a portfolio of assets with an estimated replacement value of **$ 955.5 million** (2022 $), including:

- $ 487.5 million of transportation assets
- $ 242.1 million of water assets
- $ 114.4 million of wastewater assets
- $ 111.6 million of stormwater assets

Table 2-1 shows a breakdown of the inventory by service and asset type.

Table 2-1: Asset Inventory – Core Services

Service	Asset Class	Quantity	Replacement Value (2022 $, millions)
A – Transportation			**$487.5**
	Roads	487.6 lane km	$408.2
	Bridges	7	$14.2
	Culverts	8	$9.1
	Sidewalks and Walkways	100.0 km	$38.4
	Traffic Signs	2312	$0.3
	Traffic Signals	14 intersections	$3.5
	Streetlights	3000+	$9.0
	Vehicles & Equipment	22 light duty vehicles, 10 dump trucks, 8 trailers, various equipment	$4.8
B – Water			**$242.1**
	Watermains	141.9 km	$210.1
	Valves (including box or chamber)	1703 valves	$10.4
	Hydrants	1,442	$14.4
	Water Meters	13,051	$4.8
	Gormley Fire Protection System Facility	1 facility	$1.8
	Bulk Water Station	1 facility	$0.1
	Vehicles and Equipment	4 vans, 4 pick-up trucks, 2 trailers, various equipment	$0.5
C – Wastewater			**$114.4**
	Wastewater Mains	112.8 km	$114.2
	Vehicles and Equipment	1 van, various equipment	$0.2
D – Stormwater Management			**$111.6**
	Storm Sewer Pipe Network	42.4 km 534 maintenance holes 3590 catch basins	$53.1

Service	Asset Class	Quantity	Replacement Value (2022 $, millions)
	Stormwater Ponds	18 Dry Ponds (172k sq.m) 29 Wet Ponds (264k sq.m)	$54.5
	Oil-grit Separators	11	$0.4
	Discharge Points	88	$1.7
	Minto Stormwater Tank	1 Facility	$1.8
	Vehicles	1 street sweeper	$0.1
TOTAL			**$955.6**

Table 2-2: Sources of Replacement Value Estimates

Asset Class	Source of Replacement Value
Roads	Unit costs based on recent procurements
Bridges & Culverts*	2016 Structure Condition Inspection Report
Roadside Assets	Unit costs based on recent procurements at similar-sized, Ontario municipalities
Mains, pipes and pipe network appurtenances	Unit costs based on recent procurements Replacement Values for Discharge Points were from the Tangible Capital Asset (TCA) Register (inflated to 2022 costs)
Stormwater ponds	Unit costs based on recent procurements
Vertical Facilities	From TCA Register (inflated to 2022 costs)
Vehicles & Equipment	From TCA Register (inflated to 2022 costs)

**Due to an incomplete assessment of full structure replacement values reported within the 2020 Structure Condition Inspection Report, the 2016 Structure Condition Inspection Report values were utilized (and inflated to 2022 dollars).*

3 State of the Infrastructure

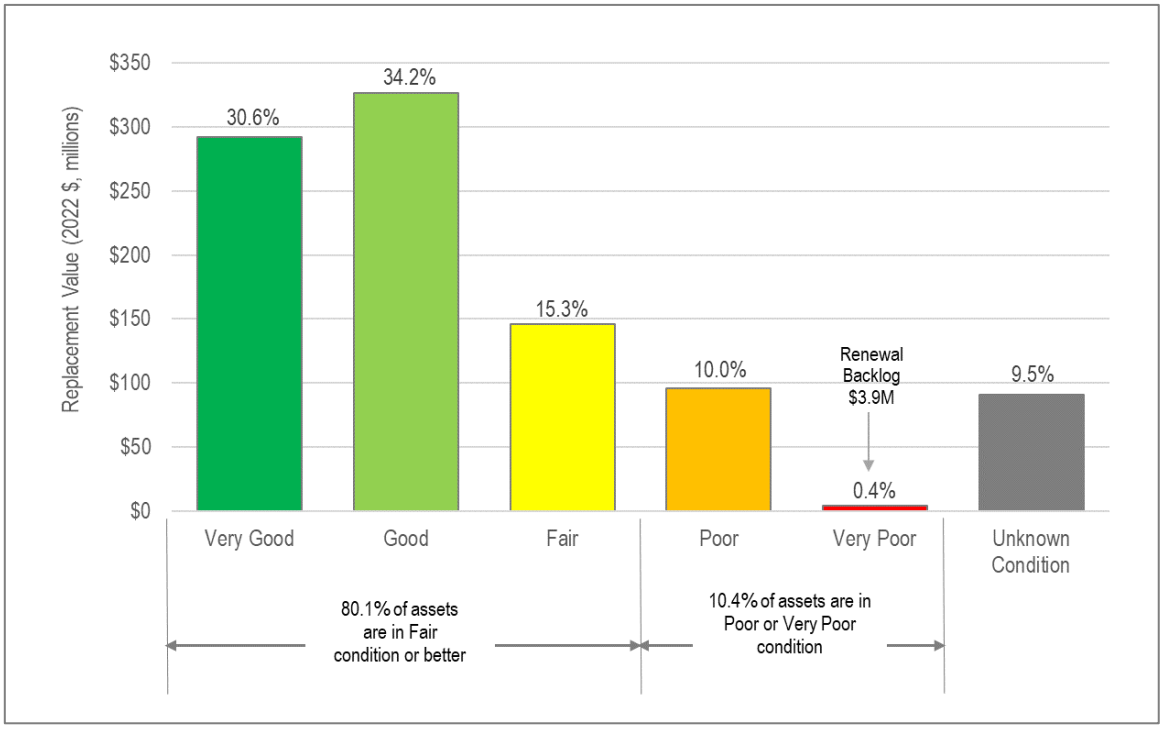
This section presents the asset condition distribution for the four core services combined and explains the condition scoring methodology. Next, condition and age are presented in more detail by service, beginning with Transportation, followed by Water, Wastewater, and Stormwater.

3.1 Overview of Core Services

Figure 3-1 shows the condition distribution of the Town's asset portfolio. The Figure shows that 81.8% ($781.4 million) of the Town's assets are in Fair condition or better, while 10.4% of assets are in Poor or Very Poor condition. Of those, 0.4% ($3.9 million) are in Very Poor condition, indicating hat those assets are overdue for renewal. The bulk of those are transportation assets, consisting of roads ($2.7 million), traffic signals ($0.9 million) and transportation fleet and equipment ($0.1 million). Other assets in Very Poor condition include vehicles and equipment supporting the water service ($0.18 million), water meters ($0.04 million) and equipment supporting the wastewater service ($0.01 million).

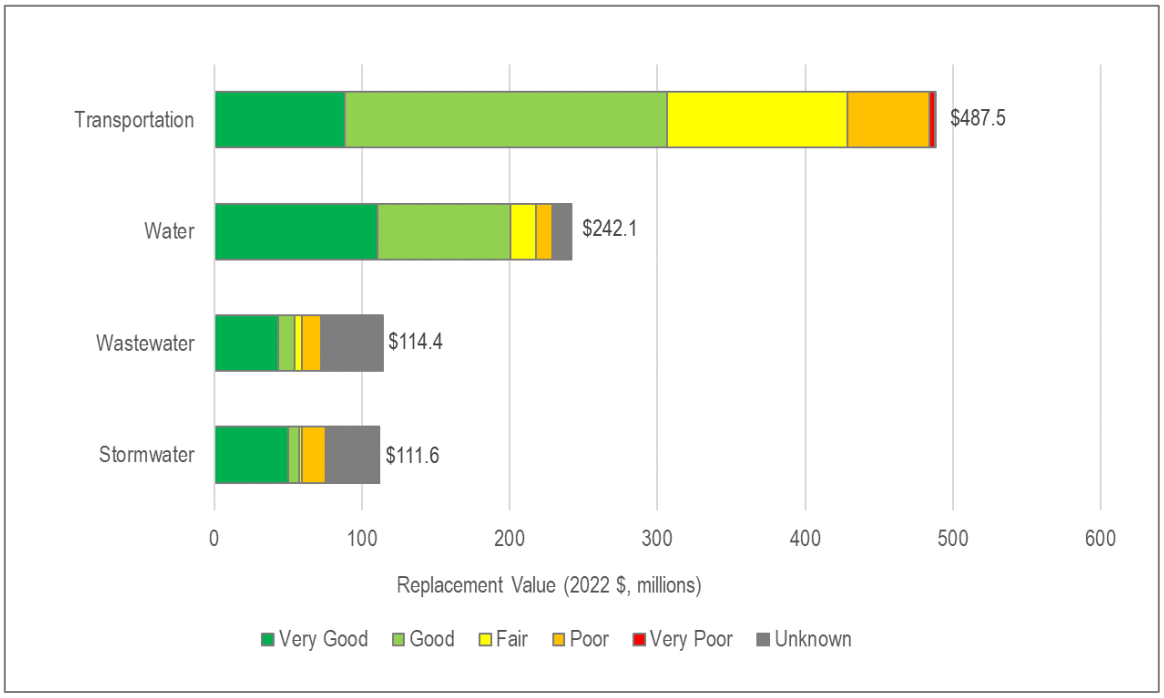
Nine percent (9.5% or $90.8 million) of the assets are of Unknown condition due to lack of condition or installation year data. These assets consist of watermains ($4.5 million), water valves ($6.1 million), hydrants ($2.2 million), wastewater mains ($41.9 million), stormwater mains ($6.3 million), stormwater ponds ($29.5 million) and oil-grit separators ($0.2 million).

Figure 3-1: Condition Overview – Core Services



The condition distribution is presented by service in Figure 3-2.

Figure 3-2: Condition Distribution by Service



Values sum to $995.6 due to rounding. Total inventory value is $955.5.

For this AM plan, condition assessment data was incorporated where available, specifically for:

- Roads (2018 Roads Needs Study); and,
- Bridges and culverts (2020 Structure Condition Inspection Report).

For the remaining assets, staff input and asset age were used to estimate asset condition and remaining life.

To standardize the condition ratings across asset classes, the International Infrastructure Management Manual's (IIMM) five-point condition scale is applied. As shown in Table 3-1, asset condition was rated from Very Good (VG) to Very Poor (VP), in accordance with the criteria listed.

Table 3-1: Condition Grading Criteria

Grade	Description	Condition Criteria
VG	Very Good	Asset is physically sound and is performing its function as originally intended. Required maintenance costs are well within standards and norms. Typically, asset is new or recently rehabilitated.
G	Good	Asset is physically sound and is performing its function as originally intended. Required maintenance costs are within acceptable standards and norms but are increasing. Typically, asset has been used for some time but is within mid-stage of its expected life.
F	Fair	Asset is showing signs of deterioration and is performing at a lower level than originally intended. Some components of the asset are becoming physically deficient. Required maintenance costs exceed acceptable standards and norms and are increasing. Typically, asset has been used for a long time and is within the later stage of its expected life.
P	Poor	Asset is showing significant signs of deterioration and is performing to a much lower level than originally intended. A major portion of the asset is physically deficient. Required maintenance costs significantly exceed acceptable standards and norms. Typically, asset is approaching the end of its expected life.
VP	Very Poor	Asset is physically unsound and/or not performing as originally intended. Asset has higher probability of failure or failure is imminent. Maintenance costs are unacceptable, and rehabilitation is not cost effective. Replacement / major refurbishment is required.

Table 3-2 shows how the five-point scores from VG to VP were determined from the asset data available, specifically remaining useful life and other condition scoring systems, such as Pavement Condition Index (PCI). Descriptions of condition scores for roads and bridges are provided in Tables 3-3 and 3-4, respectively.

Closed Circuit Television Video (CCTV) condition inspections have been undertaken for some areas of the sewer and storm main networks, however, were not considered in the evaluation of asset condition due to poor integration with the GIS asset registry.

Table 3-2: Conversion Table for Condition Grades

Condition Grade	Pavement Condition Index (roads only, if available)	Bridge Condition Index (BCI)	Culvert Condition Index (CCI)	Traffic Signs	Fleet & Fleet Equipment	% Remaining Useful Life (remaining asset types)
Very Good	85 – 100	85 – 100	80 – 100		90 – 100%	90 – 100%
Good	70 – 85	60 – 80	50 – 80	Good	50 – 90%	50 – 90%
Fair	50 – 70	40 – 60	25 – 50	Fair	30 – 50%	25 – 50%
Poor	30 – 50	20 – 40	10 – 25	Poor	0 – 30%	10 – 25%
Very Poor	0 – 30	< 20	< 10		< 0%	< 10%

Table 3-3: Descriptions Road Condition Scores

Scale	Numerical Scale	Pavement Condition Index	Asphalt or Surface Treated Roads	Gravel Roads
Very Good	**1**	85 – 100	The road segment is relatively new, or recently reconstructed. There are no visible cracks and no structural issues. The ride for the user is smooth.	Excellent surface condition and ride. Excellent drainage. Dust controlled. No Distress.
Good	**2**	70 – 85	The road segment is starting to exhibit few, if any, signs of surface deterioration, random cracks, and rutting. The ride for the user is relatively smooth.	Good crown and drainage throughout. Dust under dry conditions. Moderate loose aggregate. Slight wash-boarding.
Fair	**3**	50 – 70	The road segment is exhibiting signs of surface deterioration, random cracks, rutting, and some patching of surface defects. The ride for the user is becoming rough.	Good crown (3" – 6"). Ditches present on more than 50% of roadway. Some culvert cleaning needed. Some loose aggregate (2" deep). Moderate washboarding (1" – 2"), over 10% - 25% of the area. Moderate dust, partial obstruction of vision. No or slight rutting (<1" deep). An occasional pothole (<2" deep).
Poor	**4**	30 – 50	The road segment shows signs of deterioration, cracks, rutting, and patching of surface defects that occurs over 50 percent of the surface. Some structural issues are starting to show. The ride for the user is uncomfortable.	Little or no roadway crown (<3"). Adequate ditches on less than 50% of roadway, with portions of the ditches filled, overgrown and/or show erosion. Culverts partially full of debris. Severe loose aggregate (> 4"). Some areas (25%) with little or no aggregate. Moderate to severe washboarding (>3" deep) over 25% of area. Moderate rutting (l" – 3") and/or moderate potholes (2" – 4"), over 10% - 25% of area.
Very Poor	**5**	0 – 30	The road segment is reaching the end of its useful life. There are significant structural issues with large visible cracks, rutting and patching surface defects that occurs over 75 percent of the surface. The road is difficult to drive at the posted speed limit.	No roadway crown or road is bowl shaped with extensive ponding. Little if any ditching. Filled or damaged culverts. Many areas (over 25%) with little or no aggregate. Severe rutting (>3" deep) and/or severe potholes (>4" deep), over 25% of areas.

Table 3-4: Structure Condition Index scores and Associated Descriptions

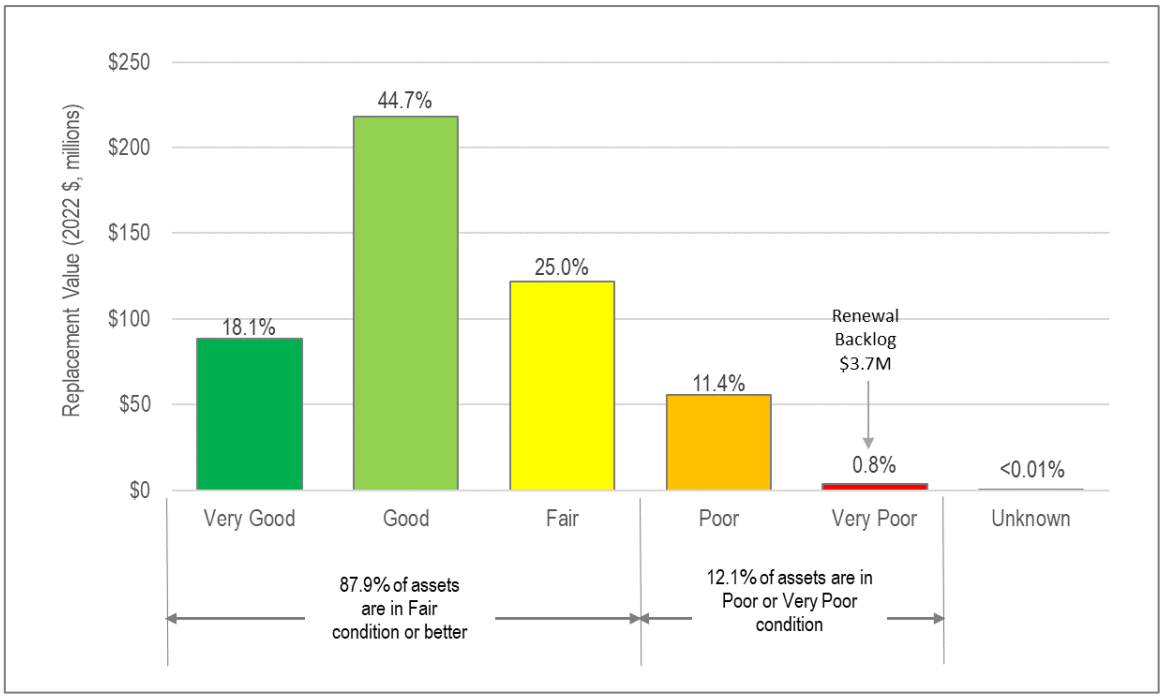
Scale	Bridge Condition Index	Culvert Condition Index	Description
Very Good	85 – 100	80 – 100	Structure condition is as constructed, with no visible deterioration.
Good	60 – 80	50 – 80	Minor defects are visible, but these do not affect overall performance and would not normally trigger remedial action. E.g. Light corrosion, light scaling, narrow cracks in concrete.
Fair	40 – 60	25 – 50	Medium defects are visible and may trigger preventive maintenance and remedial action. E.g. Medium corrosion with up to 5% section loss, medium cracks in concrete.
Poor	20 – 40	10 – 25	Medium defects are visible, requiring remedial action. E.g. Medium corrosion with up to 10% section loss, medium cracks in concrete.
Very Poor	< 20	< 10	Severe defects are visible, affecting the overall performance of the structure. E.g. Severe corrosion with over 10% section loss, spalling, delamination.

3.2 Transportation Service

Figure 3-3 shows the condition distribution of the Town's transportation assets. The Figure shows that 87.9% ($428.4 million) of the Town's transportation assets are in Fair condition or better, while 12.1% ($59.1 million) are in Poor or Very Poor condition. Of these, 0.8% ($3.7 million) of transportation assets are in Very Poor condition, indicating that those assets are overdue for renewal. Those assets consist of roads ($2.7 million), traffic signals ($0.9 million) and transportation fleet and equipment ($0.1 million) .

A small amount (less than 0.01% or $0.002 million) of transportation assets are of Unknown condition, consisting of 12 street signs.

Figure 3-3: Condition Overview – Transportation Service



Figures 3-4 and 3-5 show the condition distribution of roads by functional class and surface type, respectively.

Figure 3-4: Condition Overview – Roads by Functional Class

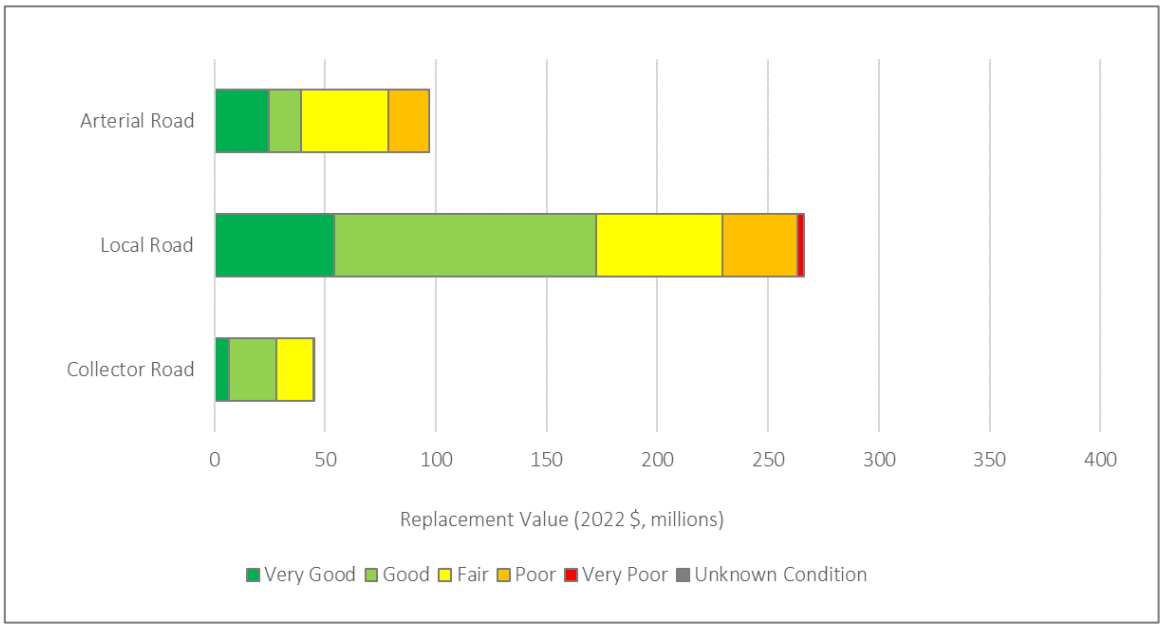
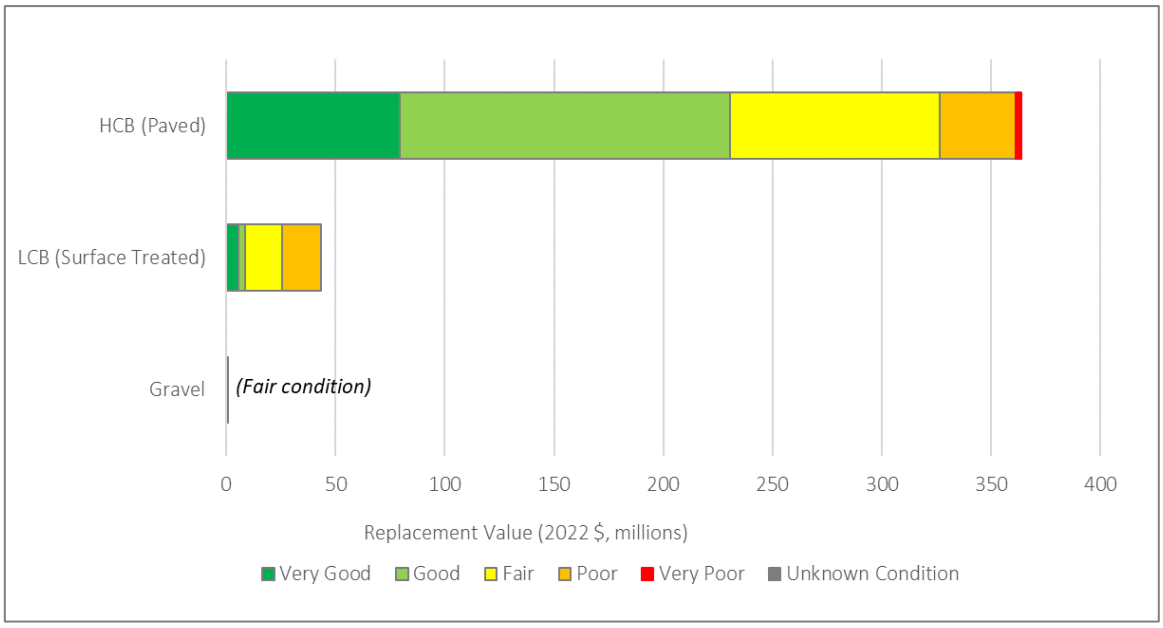


Figure 3-5: Condition Overview – Roads by Surface Type



Paved (HCB) roads in Very Poor condition consist of the following (all are Local roads):

• Lloyd Street	Main Street – Rose Avenue	0.74 lane-km
• Obrien Avenue	Main Street-Somerville Street	0.27 lane-km
• Market Street	Somerville Street – Burkholder Street	0.22 lane-km
• Edward Street	Second Street – Rupert Avenue	0.22 lane-km
• Edward Street	Schell Street – End	0.15 lane-km
• William Avenue	Bloomington Road – Reesor Place	0.25 lane-km
• Gemmill Drive	Joyce Boulevard – End	0.12 lane-km
• Valleyfield Road	Ninth Line – Victor Drive	0.38 lane-km
• Victor Drive	Valleyfield Road – End	0.39 lane-km
• Churchill Drive South	Churchill Drive East – End	0.34 lane-km
• Elmvale Boulevard	Cedarvale Boulevard – Maple Crescent	0.24 lane-km

Figure 3-6 shows that on average, paved roads have reached 31 years of their 70-year service life, and surface treated roads have reached 37 years of their 60-year service life. Age of gravel roads is not reported, because annual maintenance keeps the roads in overall Fair condition.

Figure 3-6: Average Age – Roads by Surface Type

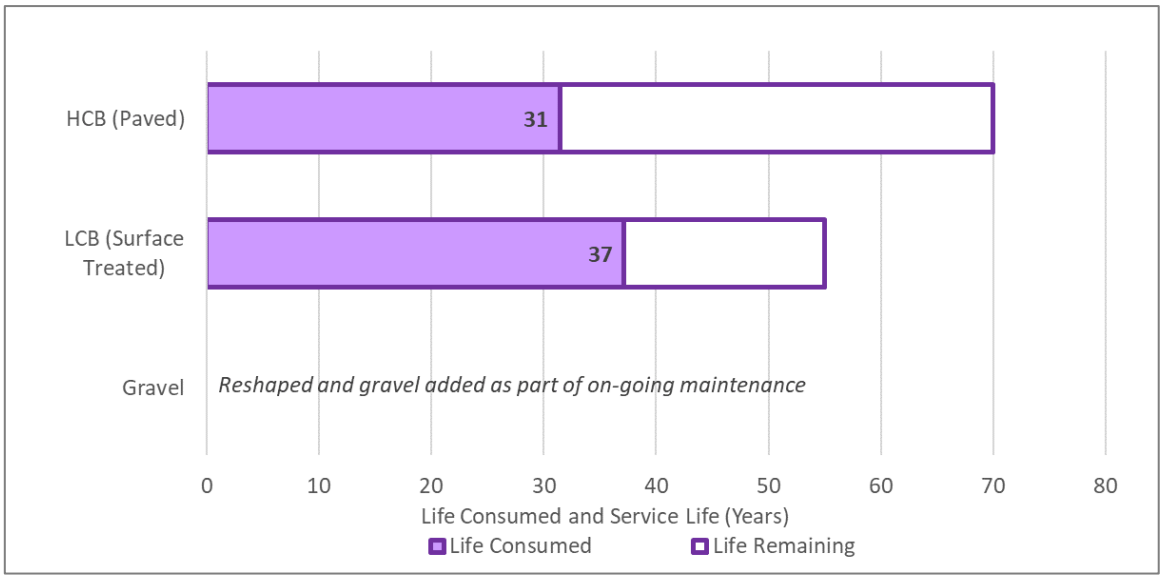


Figure 3-7 shows the condition of the remaining transportation assets. As shown in the Figure, $0.9 million traffic signals are in Very Poor condition, along with $0.1 million of transportation fleet and equipment.

Figure 3-7: Condition Overview – Transportation Assets (excluding Roads)

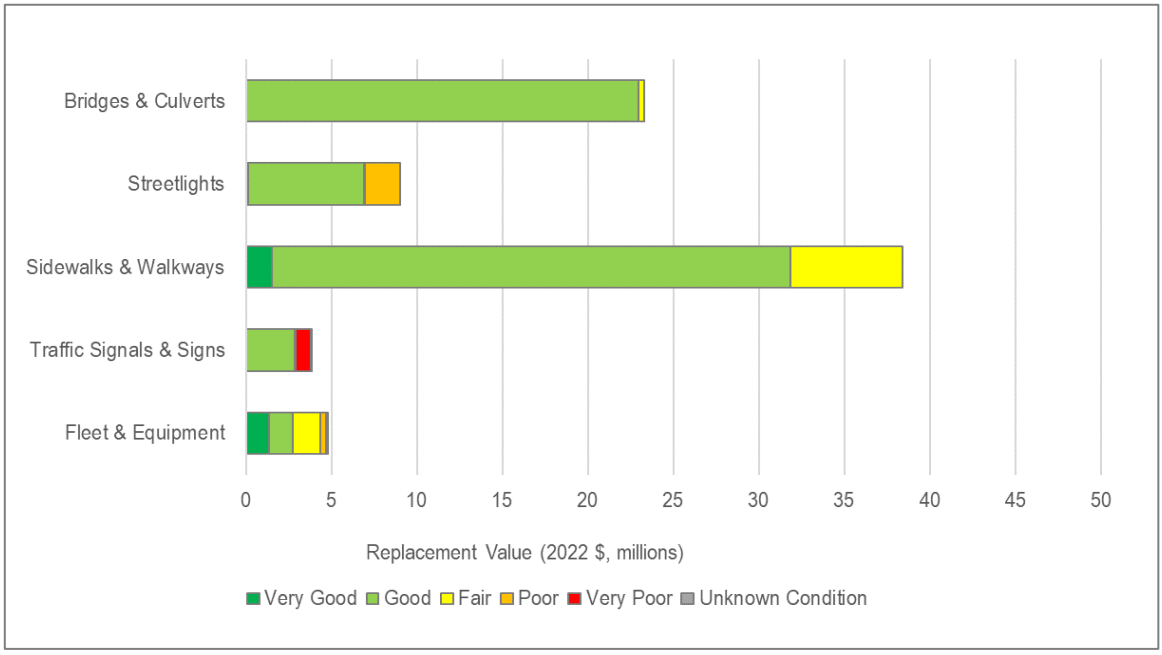
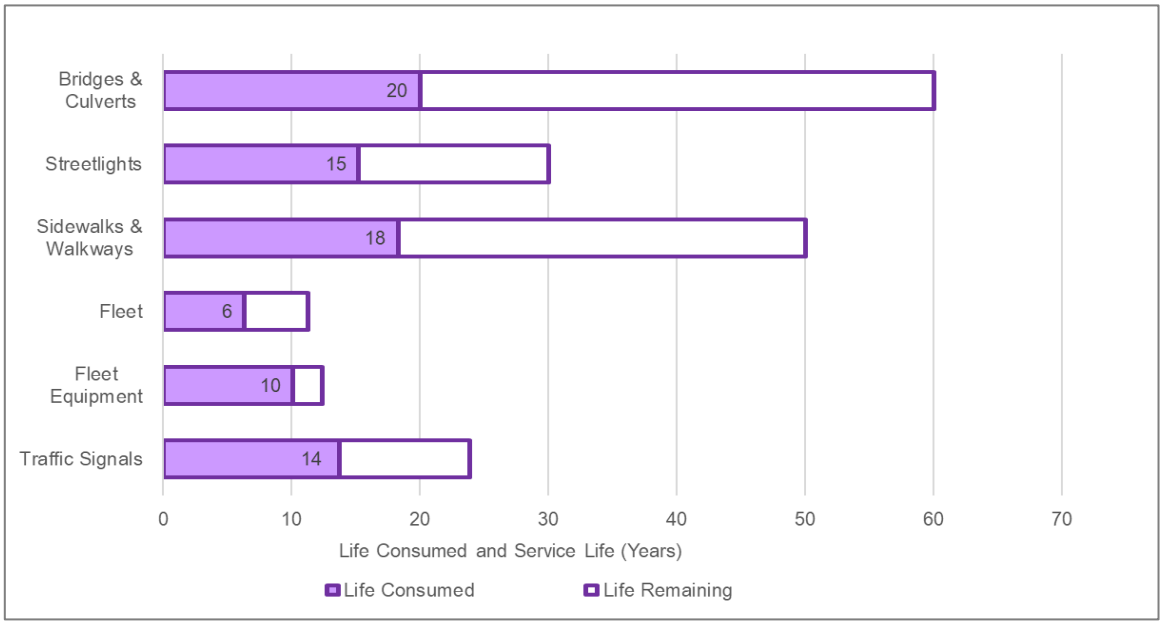


Figure 3-8 shows the average age of these transportation assets. As shown in the figure, on average, bridges, culverts, sidewalks and walkways have not yet reached half of their service life. The Figure also shows that fleet and fleet equipment have shorter service lives, therefore have reached a later stage in their respective lifecycles. Traffic signals have reached an average age of 14 of their 25-year average service life.

Figure 3-8: Average Age – Transportation Assets (excluding Roads)



3.3 Water Service

Figure 3-9 shows the condition distribution of the Town's asset portfolio. The Figure shows that 90.0% ($217.9 million) of the Town's water assets are in Fair condition or better, while 4.6% ($11.2 million) are in Poor or Very Poor condition. The Figure also shows that 0.1% ($0.2 million) of the water assets are in Very Poor condition, indicating that those assets are overdue for renewal. These assets consist of vehicles and equipment supporting the water service ($0.18 million) and water meters ($0.04 million).

Five point three percent (5.3% or $12.8 million) of the water assets are of Unknown condition due to lack of condition or installation year data. These assets consist of watermains ($4.5 million), water valves ($6.1 million), and hydrants ($2.2 million).

Figure 3-9: Condition Overview – Water Service

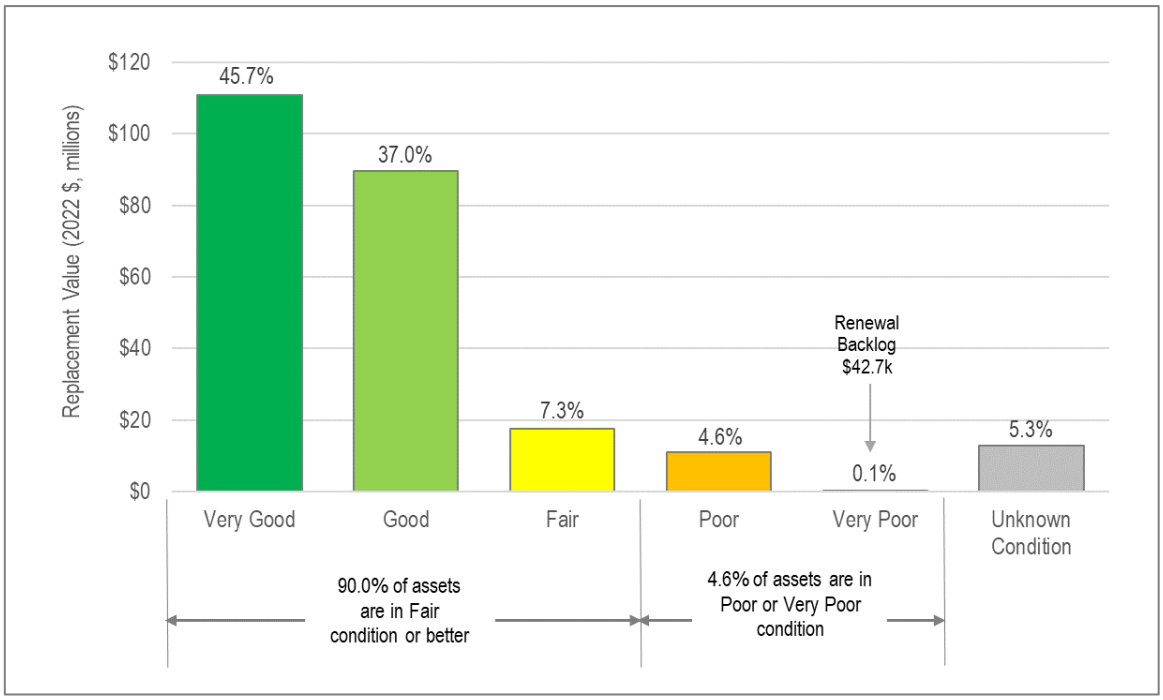


Figure 3-10 shows the condition distribution of watermains in the Stouffville Water System by material. Most of the water mains are PVC, which were installed in recent decades. The system also includes ductile iron and cast iron mains, which were installed in earlier decades resulting in a higher proportion in Poor condition.

Figure 3-10: Condition Overview – Stouffville Water System Watermains by Material

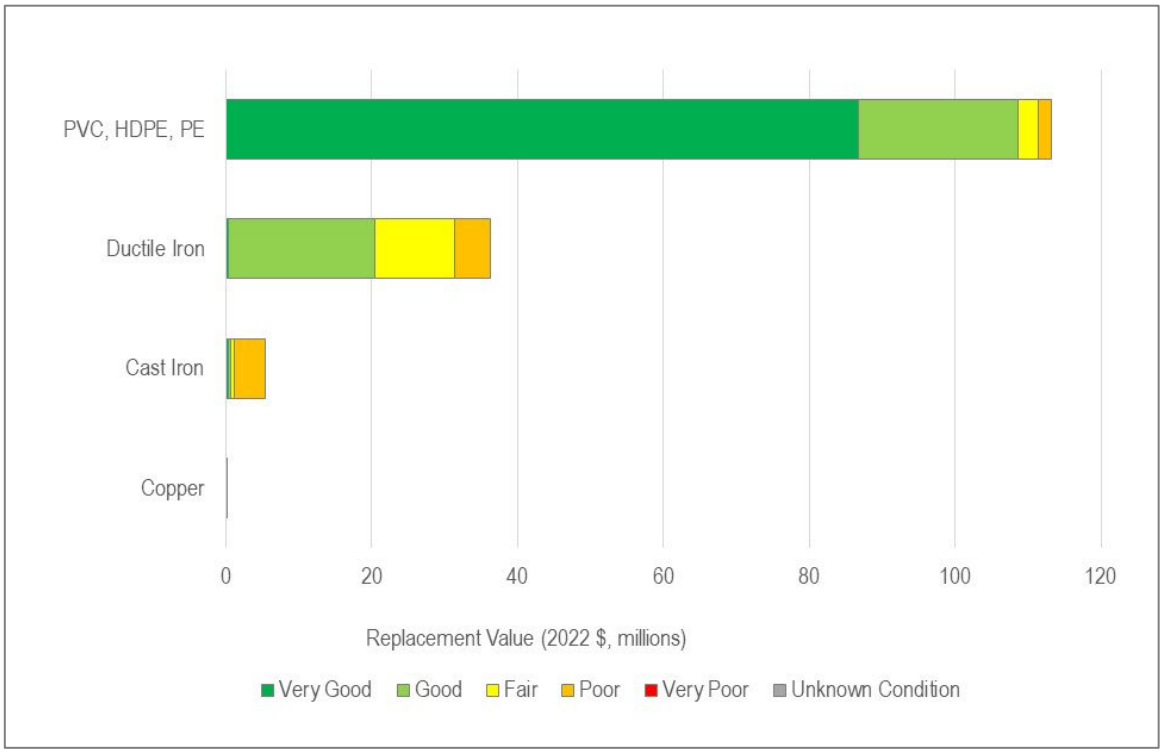


Figure 3-11 shows the condition distribution of watermains in the Ballantrae/Musselman's Lake Drinking Water System and the Gormley Fire Protection System. All of these mains are PVC or HDPE, and are in Very Good or Good condition (with a some segments in Unknown condition).

Figure 3-11: Condition Overview – Watermains in Ballantrae/Musselman's Lake Water System and Gormley Fire Protection System

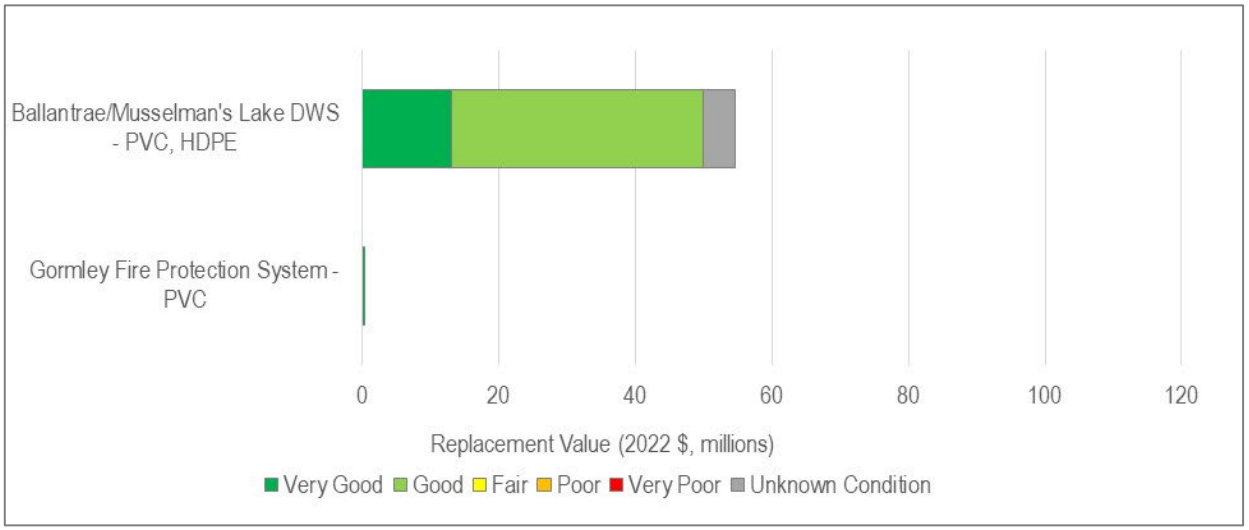


Figure 3-12 shows the average age of watermains (all systems) by material. On average, PVC, high density polyethylene (HDPE) and polyethylene (PE) mains are 21 years old. Ductile iron mains are on average 45 years old, cast iron mains are on average 61 years old, and copper pipes are on average 34 years old. All mains are assumed to have a service life of 80 years.

Figure 3-12: Average Age – Watermains by Material

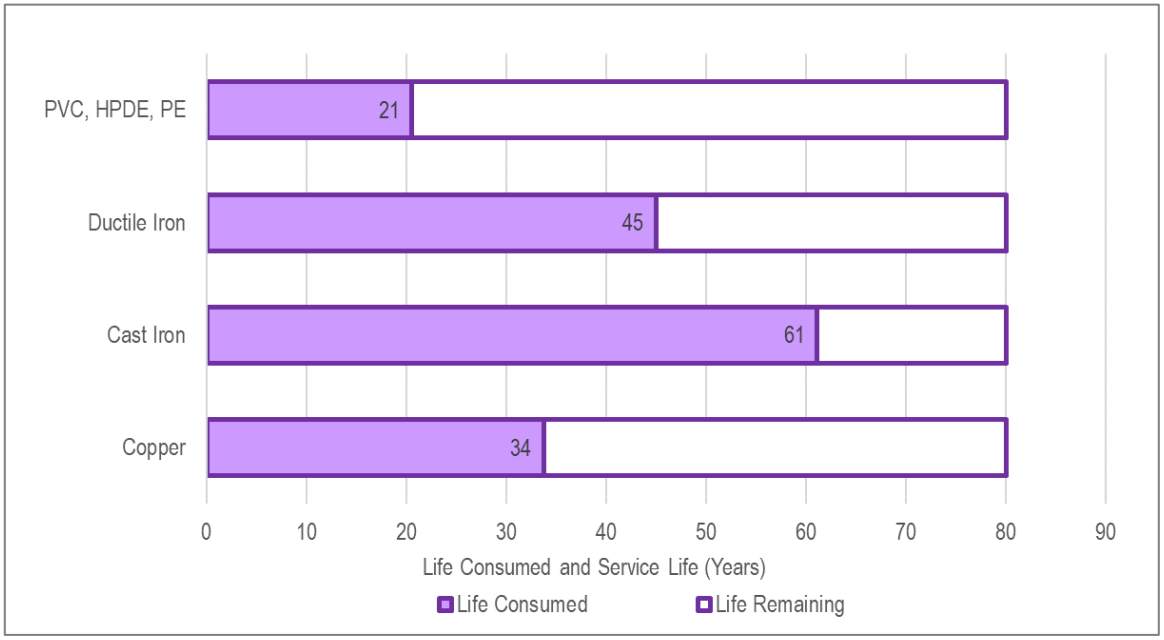


Figure 3-13 shows the condition distribution (based on age) of mainline valves by system. As shown in the figure, condition and age data were not available for most valves. For the valve types where age data was available, average age is shown in Figure 3-14.

Figure 3-13: Condition Overview – Water Valves by System

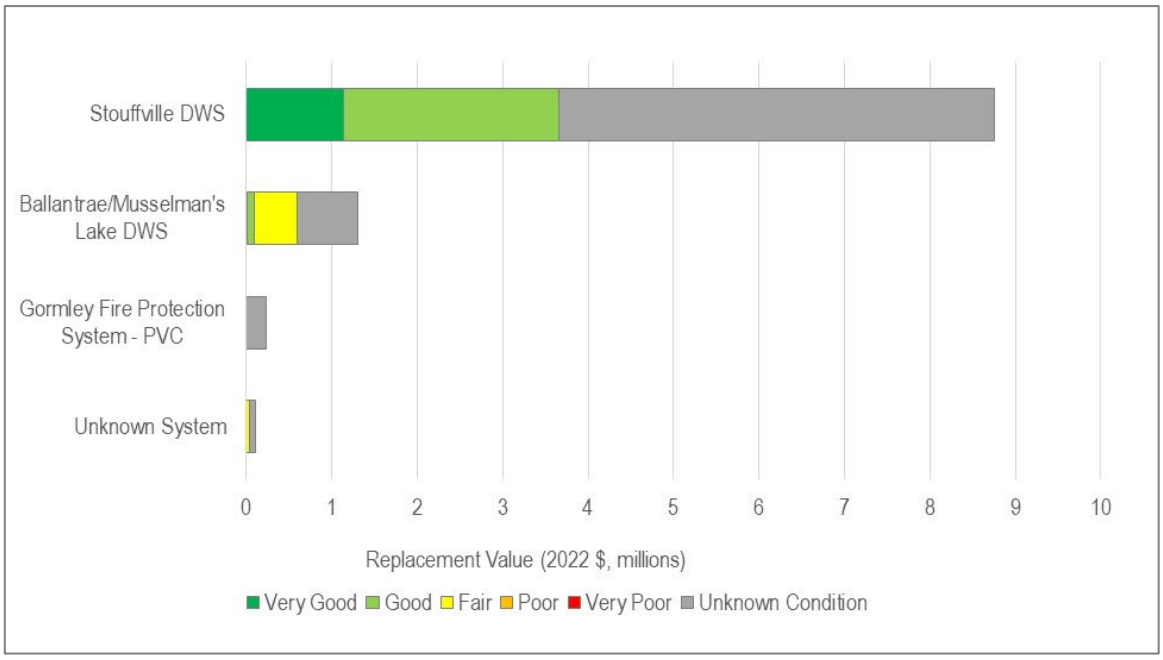
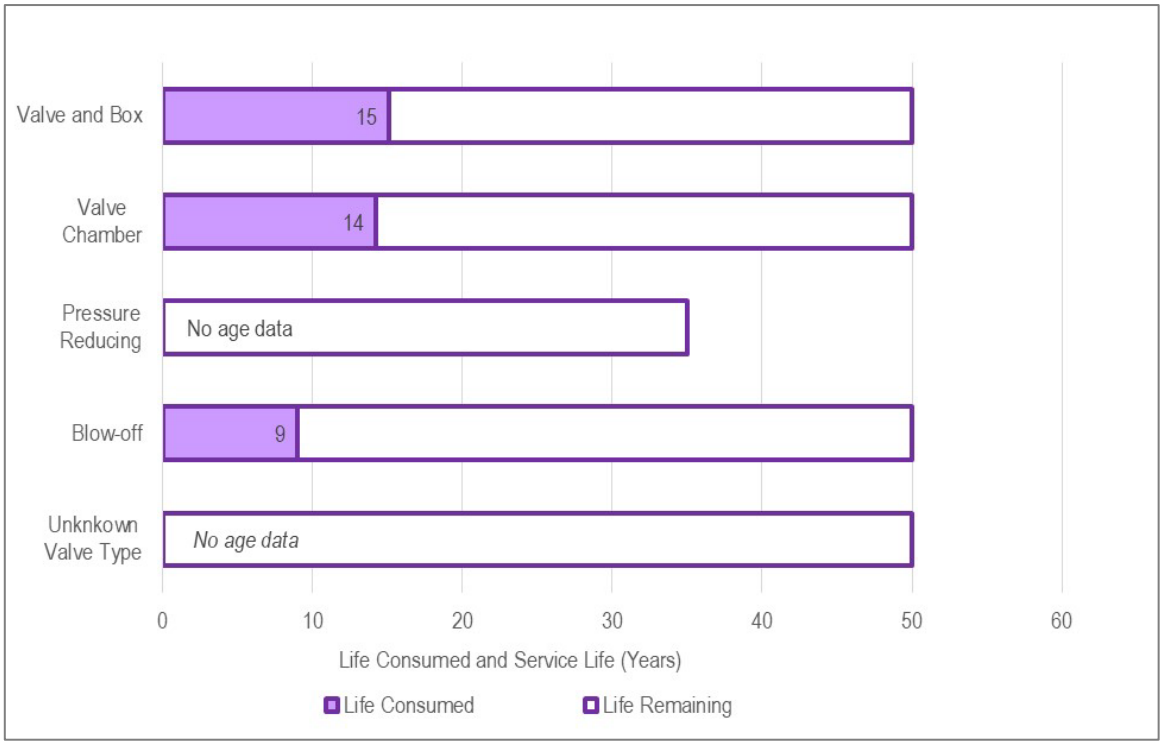


Figure 3-14: Average Age – Water Valves by Type



Figures 3-15 shows the condition distribution of the remaining assets in the water service inventory, specifically, the hydrants, meters, Gormley Fire Protection System (vertical asset) and fleet and equipment. Figure 3-16 shows the average age of those asset classes. The Figures show that on average, water meters are relatively new (only 3 years old), with only approximately $43 thousand worth in Very Poor condition that are due for replacement.

The Figures highlight that on average, fleet and equipment assets are nearing the end of their service life. Specifically, a van, a pick-up truck and a trailer are due for replacement, along with two centrifugal pumps and a Honda I-25L pump.

Figure 3-15: Condition Overview – Hydrants, Water Meters, Gormley Fire Protection System (vertical asset), Bulk Water Station, Fleet and Equipment

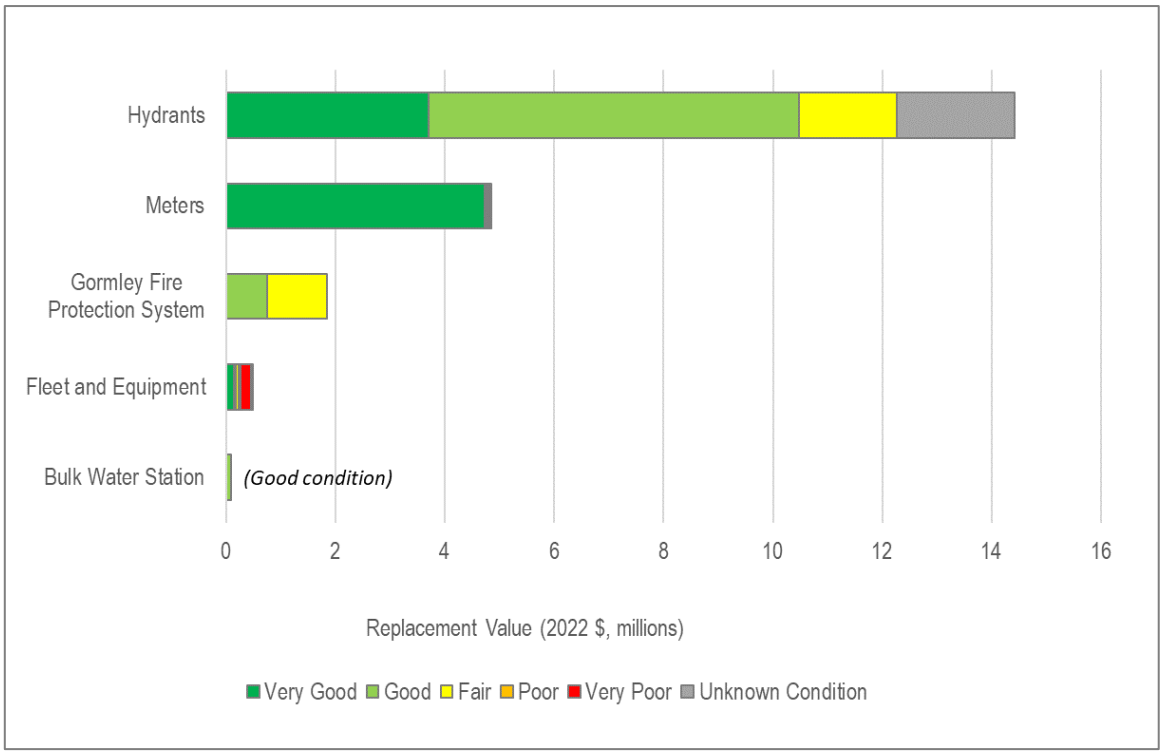
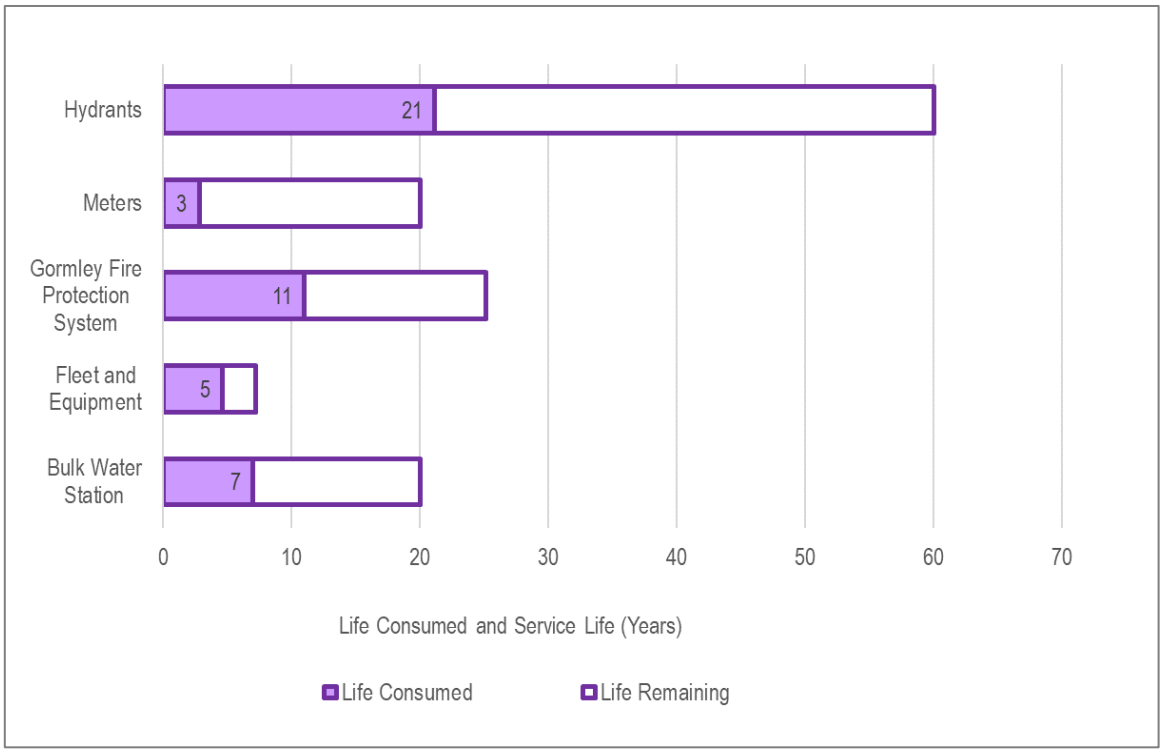


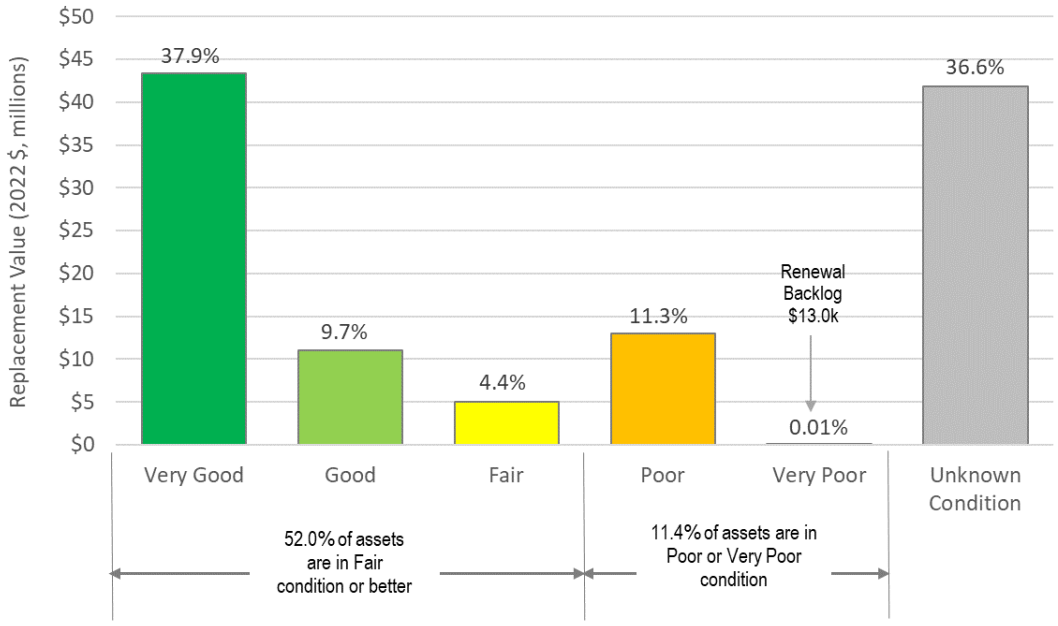
Figure 3-16: Average Age – Hydrants, Water Meters and Gormley Fire Protection System (vertical asset), Bulk Water Station, Fleet and Equipment



3.4 Wastewater Service

Figure 3-17 shows the condition distribution of the Town's wastewater assets. The Figure shows that 52.0% ($59.5 million) of the Town's assets are in Fair condition or better, while 11.4% ($13.0 million) are in Poor or Very Poor condition. Of those, 0.01% ($13 thousand) of assets are in Very Poor condition, consisting of a sewer rodding machine, which is due for renewal.

Figure 3-17: Condition Overview – Wastewater Service



Figures 3-18 and 3-19 show the condition distribution (based on age) and average age, respectively, of the Town's wastewater mains by material. The Figures show that PVC, HDPE, PE and concrete pipes are generally younger, and are in Good or Very Good condition. Vitrified clay and asbestos cement pipes are generally older and are thus in Fair or Poor condition. The Figures also show that condition and age are Unknown for approximately a third of the pipes.

Figure 3-18: Condition Overview – Wastewater Mains by material

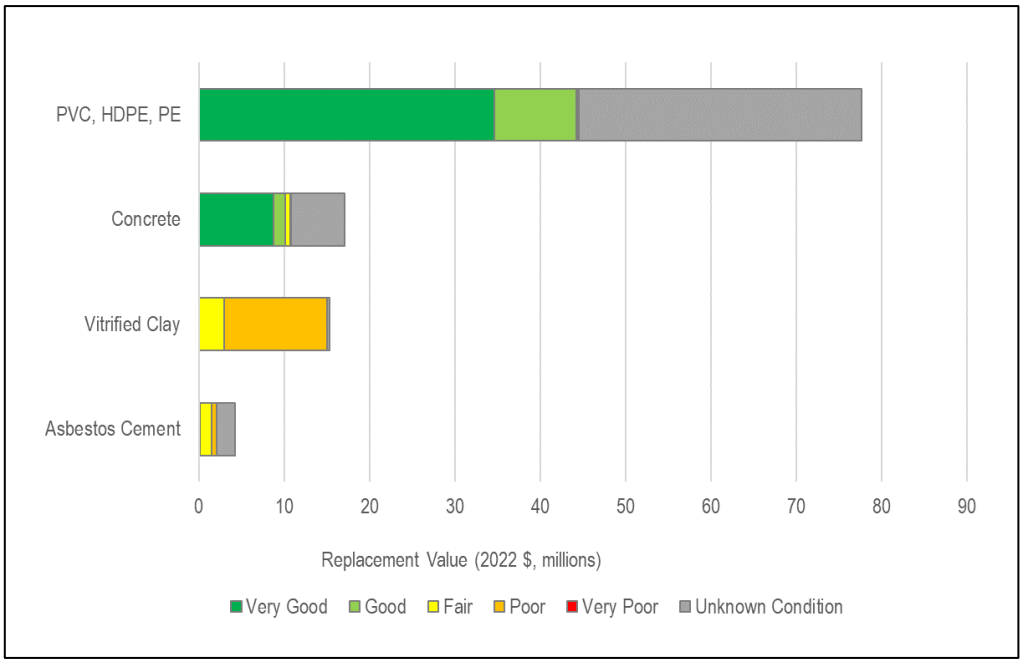


Figure 3-19: Average Age – Wastewater Mains by Material

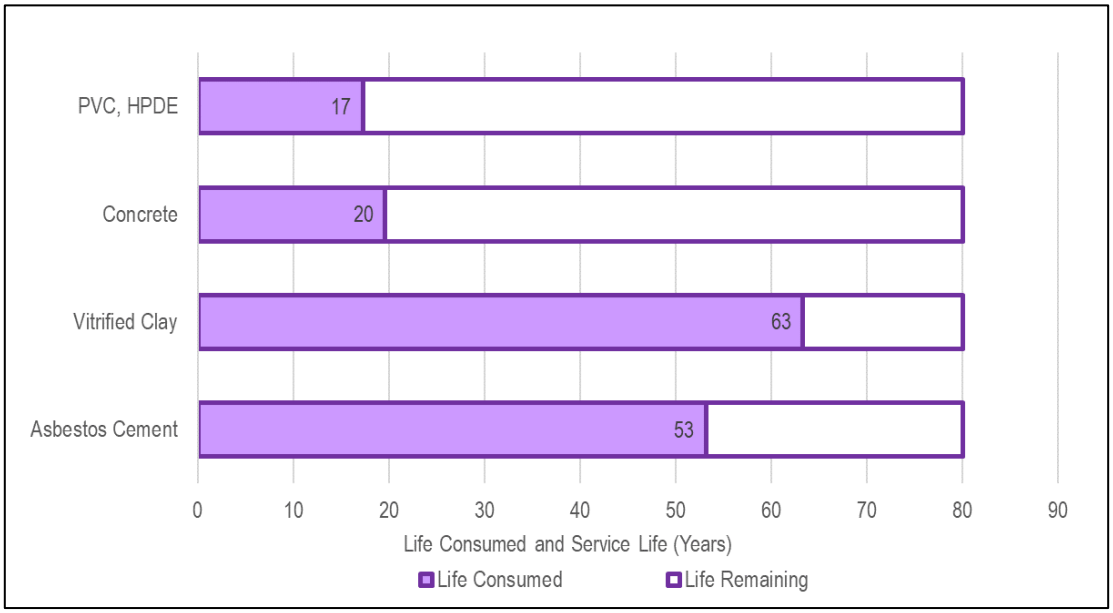


Figure 3-20 shows the condition distribution (based on age) of fleet and equipment that support the wastewater service. The Figure shows that the wastewater service van is in Fair condition. Most equipment assets are in Very Good or Good condition; however, a sewer rodding machine ($13 thousand) is in Very Poor condition. On average, vehicles and equipment are 4 years old.

Figure 3-20: Condition Overview – Wastewater Vehicles and Equipment

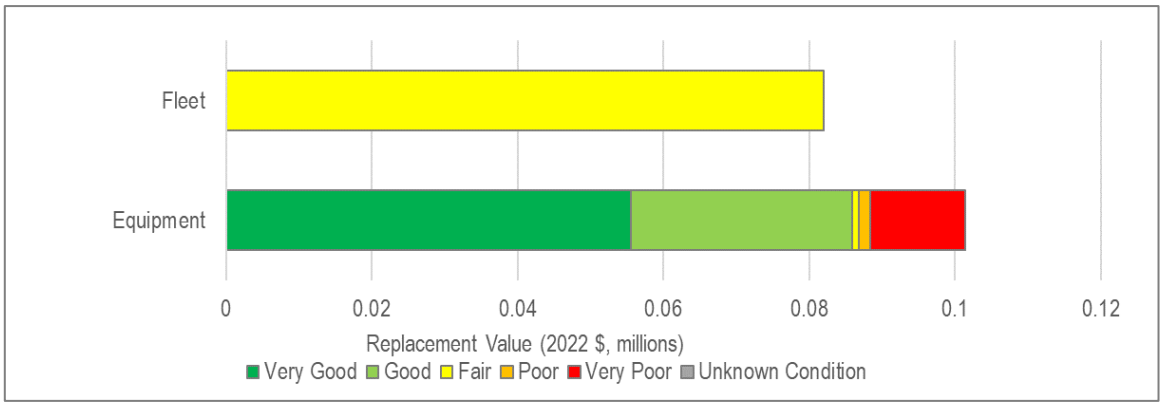
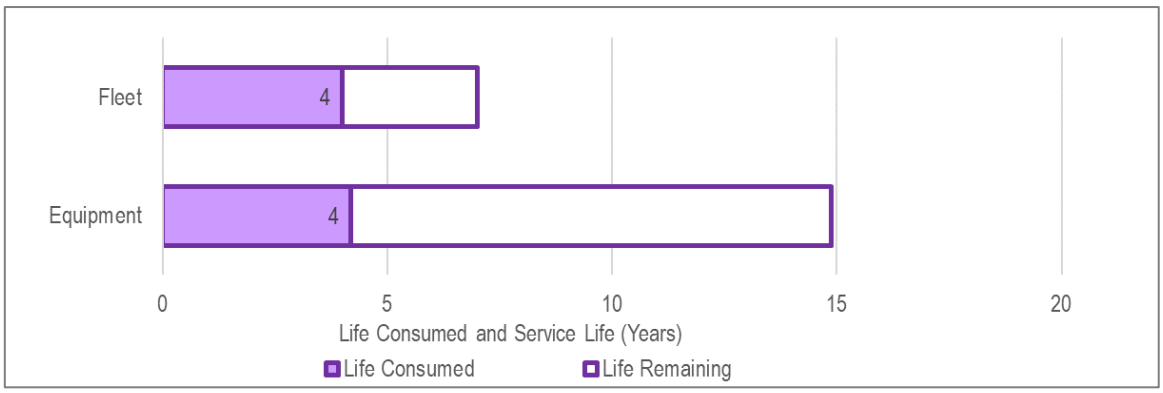


Figure 3-21: Average Age – Wastewater Vehicles and Equipment

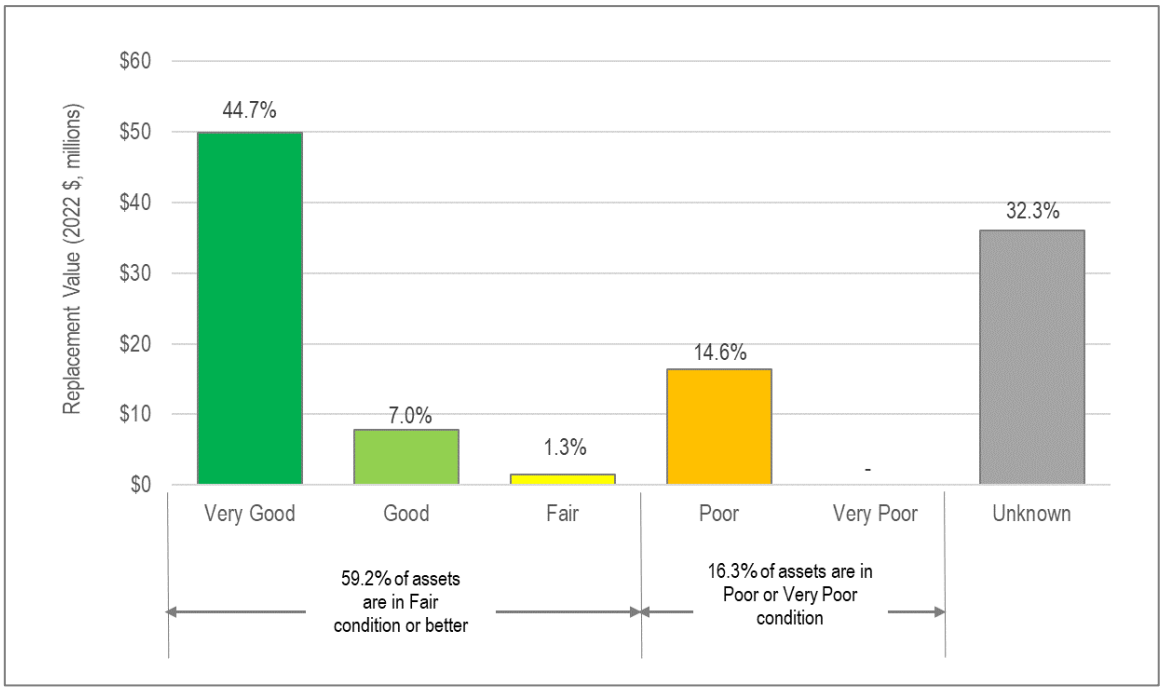


3.5 Stormwater Service

Figure 3-22 shows the condition distribution of the Town's stormwater assets. The Figure shows that 59.2% ($75.5 million) of the Town's assets are in Fair condition or better. Fourteen point six (14.6% or $16.3 million) are in Poor condition, consisting of wet ponds that are beyond their service life. The Town is currently assessing the condition of wet ponds to confirm this condition rating and to prioritize them for cleaning. None of the stormwater assets are known to be in Very Poor condition, indicating that there is no renewal backlog for this service.

Thirty-two point three percent (32.3% or $36.0 million) are of Unknown condition due to lack of observed condition data or age (installation year) data. These assets consist of stormwater mains ($6.3 million), stormwater ponds ($29.5 million) and oil-grit separators ($0.2 million).

Figure 3-22: Condition Overview – Stormwater Service



Figures 3-23 and 3-24 show the condition distribution (based on age) and average age, respectively, of the Town's stormwater mains by material. The Figures show that most mains are on average 12 years old and in Very Good condition. The remainder are in Unknown condition.

Figure 3-23: Condition Overview – Stormwater Mains by Material

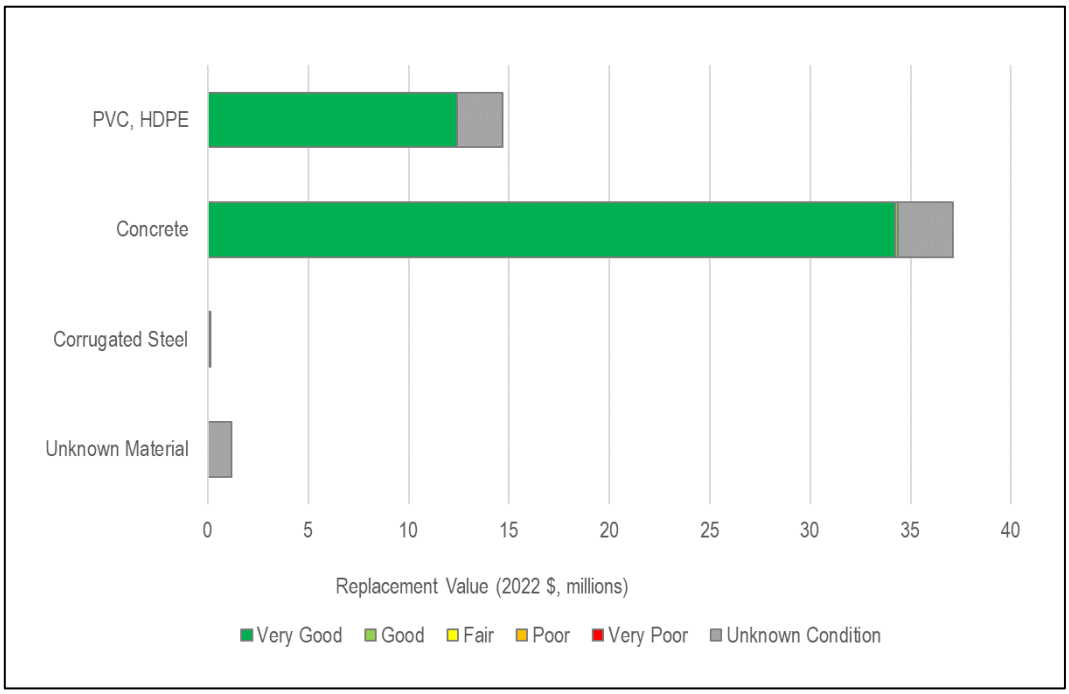


Figure 3-24: Average Age – Stormwater Mains by Material

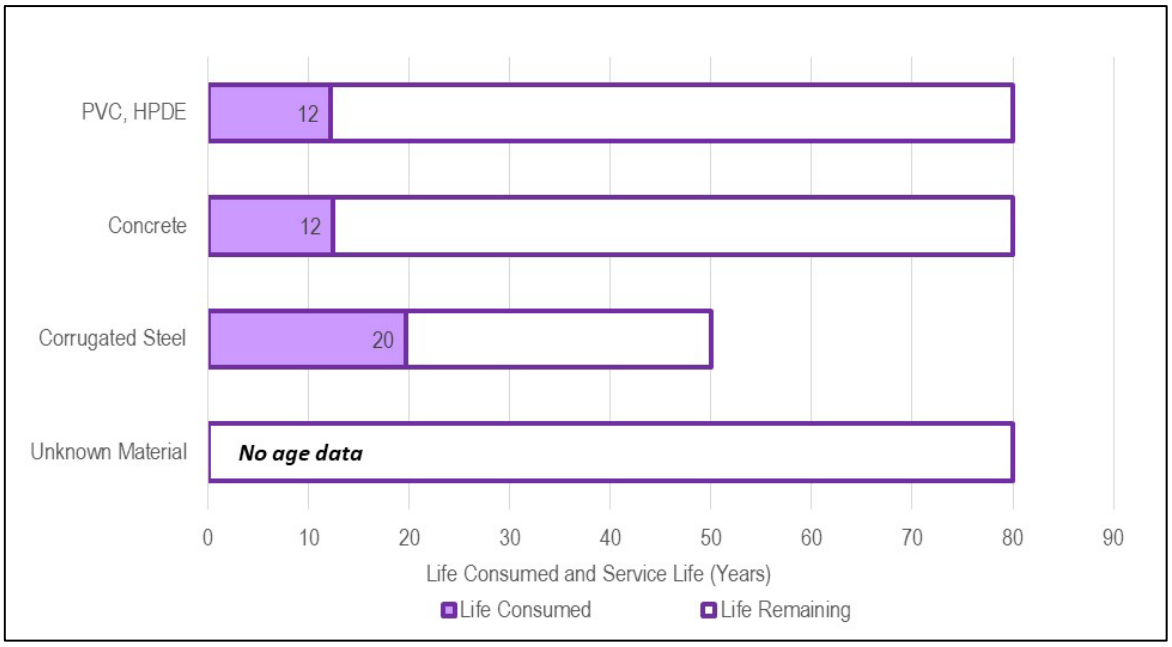


Figure 3-25 shows the condition distribution (based on age) of the Town's stormwater ponds by type. As shown in the graph, many of the wet ponds are in Poor condition, based on age. Moreover, the condition of many ponds is listed as Unknown, due to lack of installation year data. The Town has initiated a multi-year program to inspect the ponds to determine their condition and confirm condition ratings that were estimated based on age. Based on the assessment, the pond cleaning activities will be prioritized.

Figure 3-25: Condition Overview – Stormwater Ponds

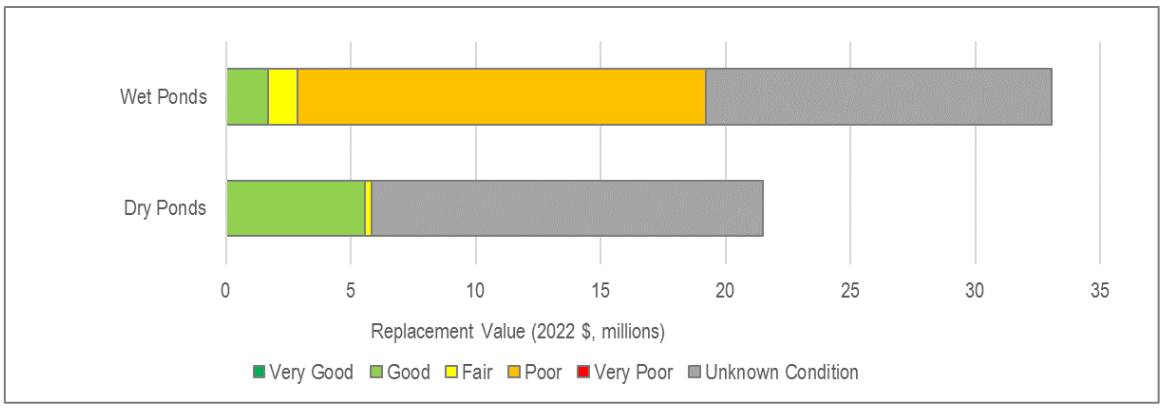
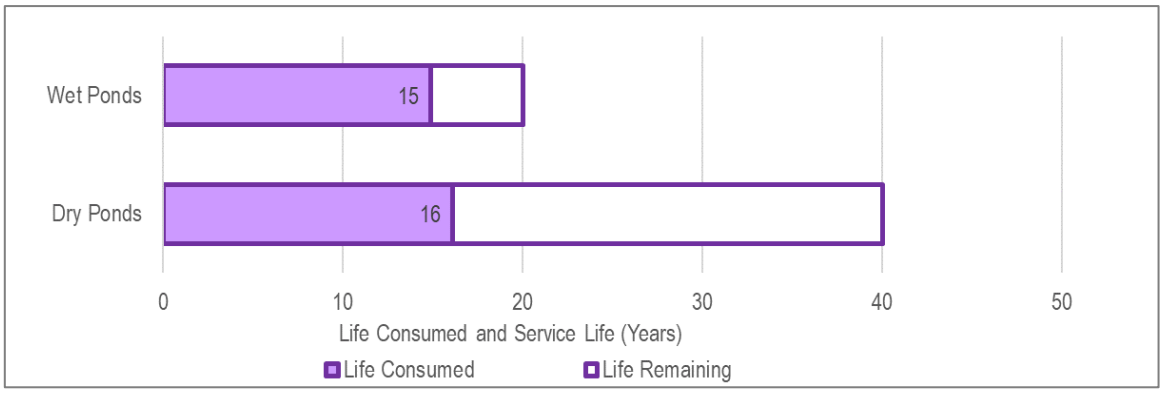


Figure 3-26 shows the average age of the ponds, where known (age reflects the age since installation or age since last cleaning). On average, wet ponds have reached 15 years (75%) of their expected service life of 20 years, while dry ponds have reached 16 years (40%) of their 40-year service life. However, these averages reflect only the age of approximately 54% of the ponds, since installation year data is not available for the remainder.

Figure 3-26: Average Age – Stormwater Ponds



Figures 3-27 and 3-28 show the condition distribution (based on age) and average age, respectively, of the remainder of the stormwater assets, specifically, the stormwater reservoir, outfalls, inlets and oil grit separators. The Figures show that these assets are on average in the first quarter of their service life, and in Very Good or Good condition.

Figure 3-27: Condition Overview – Stormwater Reservoir, Outfalls, Inlets and Oil Grit Separators

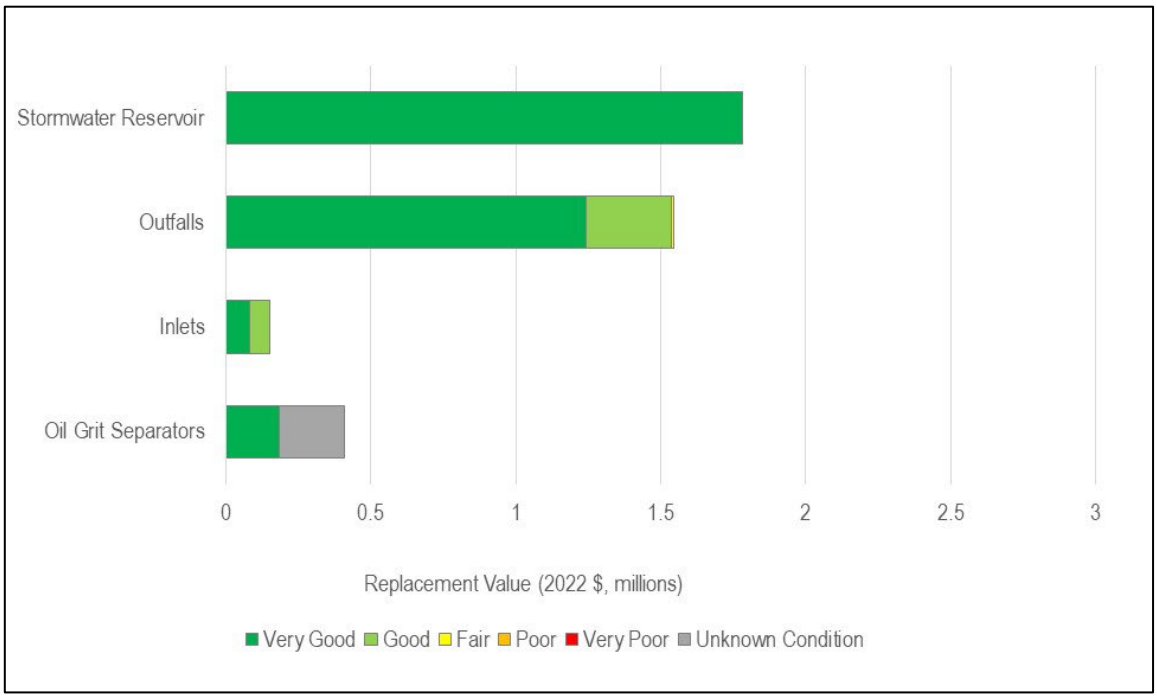
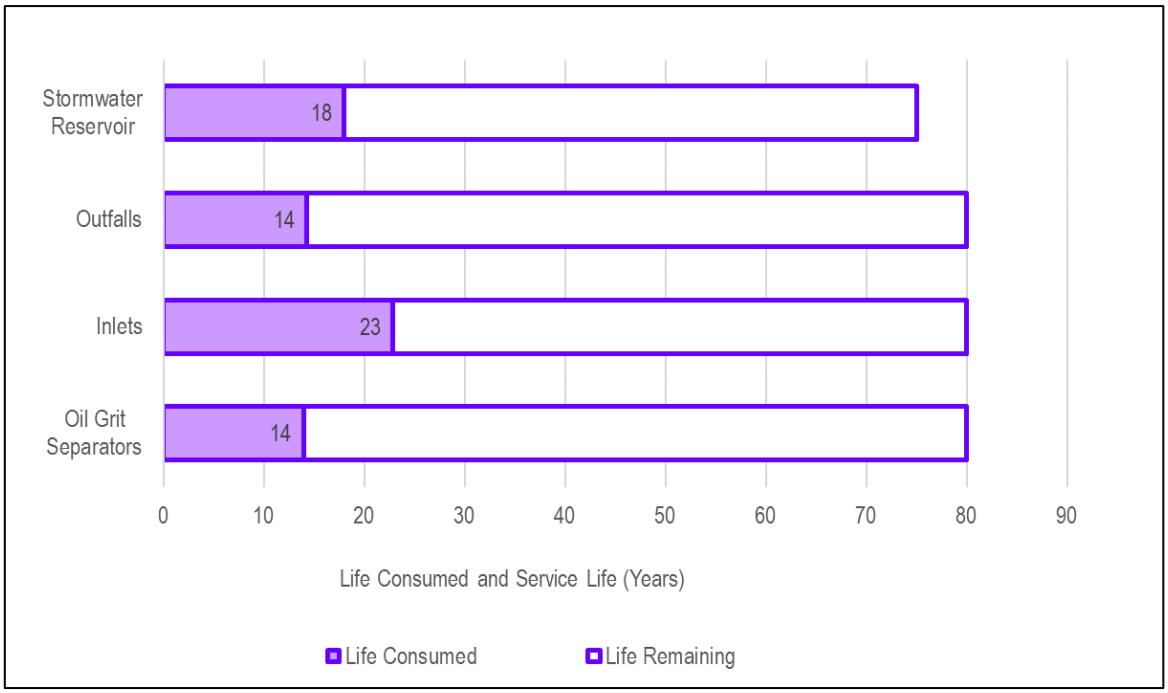


Figure 3-28: Average Age – Stormwater Reservoir, Outfalls, Inlets and Oil Grit Separators



4 Levels of Service

Levels of Service (LOS) are statements that describe the outputs and objectives the Town intends to deliver to its citizens, businesses, and other stakeholders. Developing, monitoring and reporting on LOS are all integral parts of an overall performance management program which is aimed at improving service delivery and demonstrating accountability to the Town's stakeholders.

In general, LOS are guided by a combination of customer expectations, legislative requirements, and internal guidelines, policies, and procedures. In many cases, LOS are also implied based on past service delivery, community expectations, and infrastructure system design. Effective asset management requires that LOS be formalized and supported through a framework of performance measures, targets, and timeframes to achieve targets, and that the costs to deliver the documented LOS be understood.

The following lists the LOS metrics and current performance for each service area broken into community and technical LOS:

- **Community LOS:** Qualitative descriptions that articulate the Town's customer and other stakeholder expectations of Town services.
- **Technical LOS:** Technical metrics that translate customer expectations into technical objectives and performance measures.

These LOS will then drive the Risk and Lifecycle Management Strategies of this AM Plan. The Town monitors current performance and will use it to support future target-setting. O.Reg. 588/17 requires proposed targets to be reported in the AM Plans for all services by July 1, 2025.

Key findings from the reported Level of Service (LOS) metrics are as follows:

- For Transportation Service:
    - Average road condition ranges from Very Poor to Very Good. Paved roads have an average Pavement Condition Index (PCI) of 69.3 (Fair). Gravel roads do not have an associated PCI score, but however are in Fair condition based on asset age.
    - No vehicular load restrictions currently exist on any Town structures
- For Water Service:
    - There were no boil water advisories during the previous three years (2019-2021).
    - The number of connection-days per year (where service is interrupted) due to water main breaks for the previous three years were:
        - 2021: 4 breaks, 0 connection-days lost
        - 2020: 5 breaks, 136.7 connection-days lost
        - 2019: 7 breaks, 5.4 connection-days lost
- For Wastewater Service:
    - Sewer backups are proactively monitored and tracked. The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system for the previous three years were:
        - 2021: no backups, 0 connection-days lost
        - 2020: 1 backup, 0 connection-days lost
        - 2019: 1 backup, 0 connection-days lost
- For Stormwater Service:
    - 98.5% of 17,983 lots are resilient to a 100-year storm
    - Storm sewers and ponds are designed to be resilient to 5-year storms

4.1 Roads

4.1.1 Community LOS: Road Network Description and its Connectivity

In 2017, the Town developed the Transportation Master Plan (TMP), which:

- assessed current travel conditions and the impacts of growth to identify issues,
- identified and evaluated alternative solutions to address the above issues, and
- selected a preferred alternative for a sustainable, multimodal transportation network that decreases auto dependency and is truly accessible to all.

As described in the TMP, the Town is serviced by a grid-based road network comprised of provincial highways, regional arterial roads, and the Town's system of arterial, collector, and local roadways. Arterial Road concessions are approximately 2.0km apart for east-west roads and 4.1km apart for north-south roads.

Highway 404 forms the westerly boundary of the Town and provides a high-speed and high-capacity north-south route through York Region. Highway 404 terminates in Georgina to the north, and transitions into the Don Valley Parkway which enters downtown Toronto to the south. Highway 48 is a rural provincial highway which also runs north south through the middle of the Town and just west of the Town Centre.

Highway 48 continues to the north to the south side of Lake Simcoe; to the south, Highway 48 passes through the City of Markham and the City of Toronto and terminates near Lake Ontario. Highway 48 and Highway 404 both connect to Highway 7, Highway 407 and Highway 401.

York Region maintains several arterial roadways in the Town. North-south regional roads include Woodbine Avenue, Warden Avenue, Kennedy Road, McCowan Road, Ninth Line, and York/Durham Line. East-west regional roads include Davis Drive, Vivian Road, Aurora Road, Bloomington Road, and Stouffville Road.

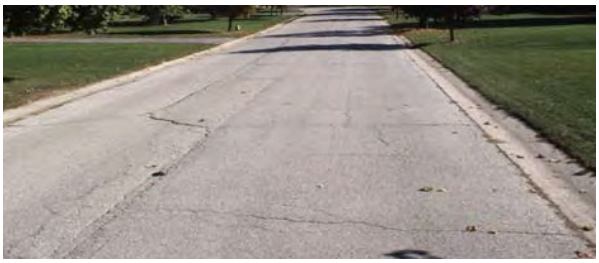
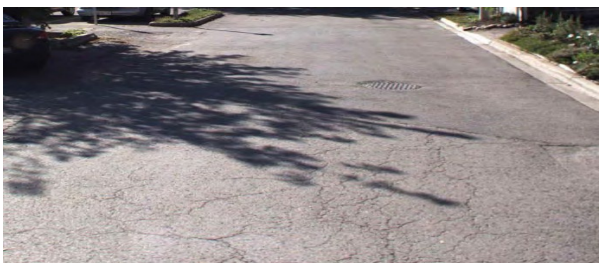
The Town's transportation facilities for cyclists and pedestrians include sidewalks, trails, walkways, bicycle paths, on-road signed bicycle routes, and multi-use trails. The majority of active transportation facilities in the Town serve the Community of Stouffville. The TMP identified the lack of connectivity of sidewalks and other active transportation facilities, making it difficult for pedestrians and cyclists to travel throughout the Town and between communities. Some of the opportunities to provide active transportation connections throughout the Town are identified in the Active Transportation Servicing Plan, Community of Stouffville Trails and Parks Plan and the Ballantrae-Musselman Lake Secondary Plan.

4.1.2 Community LOS: Levels of road class pavement condition

Pavement condition data is collected on the entire road network every two years. Data collected includes the type, extent and severity of distresses (cracks and rutting) and smoothness or ride comfort of the road. An overall PCI is calculated from all collected data and is used as input into the annual road resurfacing and reconstruction program.

The index is scaled from zero to 100 and has been divided into ranges to assess condition. Examples of roads in each of the PCI rating categories are provided in Table 4-1.

Table 4-1: Pavement Condition Grade Examples

Condition Grade	Urban Road Example
Very Good (PCI = 85 to 100)	
Good (PCI = 70 to 84)	
Fair (PCI = 50 to 69)	
Poor (PCI = 30 to 49)	
Very Poor (PCI = 0 to 29)	

4.1.3 Technical LOS

The Table below summarizes the mandatory Technical LOS for the Town's roads as prescribed in O.Reg 588/17.

Table 4-2: Technical LOS for Roads

Service Attribute	Technical levels of service	Road Type	Lane-km	Town Area (sq.km.)	2022 Performance
Scope / Capacity	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality.	Arterial Road	111.1	206.22	0.54 lane-km/sq.km.
		Collector Road	45.9	206.22	0.22 lane-km/sq.km.
		Local Road	320.6	206.22	1.55 lane-km/sq.km.
Quality	For paved roads in the municipality, the average pavement condition index value.	Paved and Surface Treated	n/a	n/a	69.3 (Fair)
	For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor).	Gravel	n/a	n/a	Fair

4.2 Structures

4.2.1 Community LOS: The traffic that is supported by municipal bridges

The Ontario Ministry of Transportation (MTO) defines:

- A bridge as "a structure which provides a roadway or walkway for the passage of vehicles, pedestrians or cyclists across an obstruction, gap or facility and is greater than or equal to 3.0 m in span".
- A structural culvert as "a structure that forms an opening through soil and has a span of 3 meters or more, or has the sum of the individual spans of 3 meters or more, for adjacent multiple cell culverts".

The Town's bridges have been designed in accordance with the Bridge Design Code current at the time of construction to carry heavy transport vehicles, motor vehicles, emergency vehicles, cyclists and pedestrians.

4.2.2 Community LOS: The levels of bridge and structural culvert condition and the impact on use

The need for mobility requires that the Town's roadway system be kept in a state of good repair. Structures are a vital part of this system. The efficiency of the system is impaired and the public inconvenienced if a structure fails or its load-carrying capacity is reduced for any reason. To avoid such failings, an effective structure management system is required. An essential component of the structure management system involves the systematic inspection of the structures on the roadway network. In accordance with O. Reg. 104/97 Standards for Bridges, the Town conducts

detailed inspections of all of its bridges every two years. All inspections are supervised by a trained, professional engineer following the guidelines in Onta'io's Structure Inspection Manual (OSIM) which sets standards for the visual inspection and condition rating of bridges and their elements. The inspector assesses each bridge element and records the quantity of the element in each of four condition states: Excellent, Good, Fair, and Poor. The inspector also records suspected performance deficiencies and recommends maintenance and renewal activities, with costs. The typical follow-up action for a suspected load carrying capacity deficiency would be to carry out a strength evaluation of the structure (or element) to determine the load carrying capacity in accordance with the requirements of the Canadian Highway Bridge Design Code.

An overall Bridge Condition Index (BCI) or Culvert Condition Index (CCI) is calculated from all collected data and informs the annual bridge and structural culvert rehabilitation and reconstruction program. The index is scaled from zero to 100 and has been divided into ranges to assess condition. The BCI is not used to rate or indicate the safety of a bridge or structural culvert. Any safety issues are immediately reported by the inspector to supervising engineers and maintenance crews. For the Asset Management Plan, the BCI and CCI are converted to the 5-point condition scale (Very Good, Good, Fair, Poor and Very Poor) to enable reporting with other asset types in the organization. See Table 3-4 in the previous section for descriptions of these condition scores.

4.2.3 Technical LOS

The Table below summarizes the mandatory Technical LOS for the Town's structures as prescribed in O.Reg 588/17.

Table 4-3: Technical LOS for Structures

Service Attribute	Technical levels of service	2022 Performance
Scope	Percentage of bridges in the municipality with loading or dimensional restrictions.	None
Quality	For bridges in the municipality, the average bridge condition index value.	76.7 (Good)
	For structural culverts in the municipality, the average culvert condition index value.	73.4 (Good)

4.3 Water Services

The Town provides potable water to the communities of Stouffville, Ballantrae and Mussel'an's Lake. The Town of Whitchurch-Stouffville purchases its water from the Regional Municipality of York. For the residents of the community of Stouffville (including Highway 48), the Region operates and maintains six groundwater wells and treatment systems and supplements the supply by purchasing treated lake water from the City of Toronto. For Ballantrae and Musselman's Lake, the Region operates and maintains three groundwater wells and treatment systems.

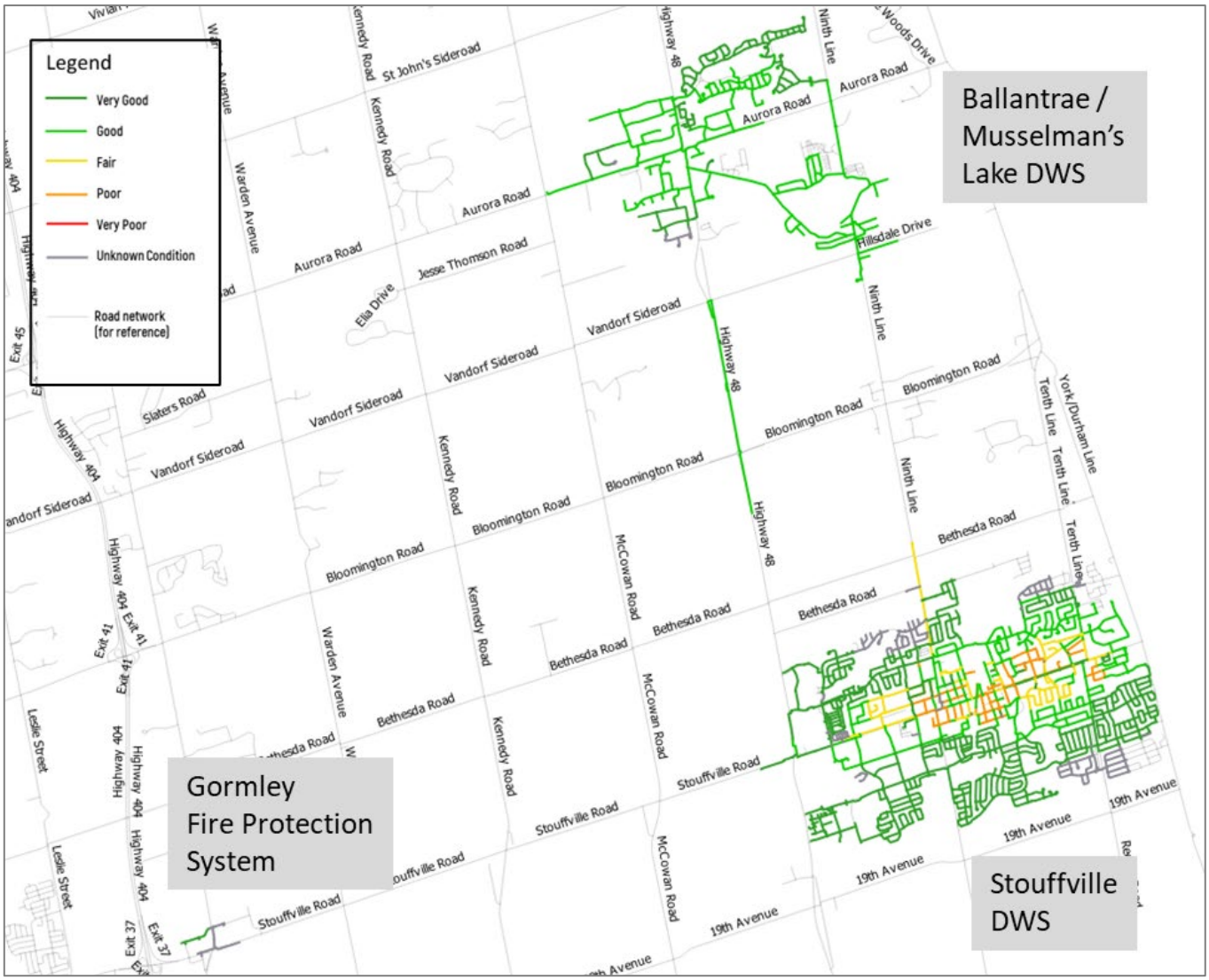
The Town of Stouffville is responsible for the operation and maintenance of the following water distribution systems:

- Stouffville Water Distribution System (including Highway 48)
- Ballantrae/Mussel'an's Lake Water Distribution system.

These systems consist of water mains, valves, hydrants, service connections and meters which service the residents and businesses within Stouffville, Ballantrae and Mussel'an's Lake. Residents who live outside the serviced areas obtain their water from private wells.

A map of the Town's water main system by condition is provided in the Figure below.

Figure 4-1: Map of Town Water Main System by Condition



4.3.1 Community LOS: Areas with Fire Flow

The Town of Stouffville, Ballantrae and Musselman's Lake are connected to fire flow through the two water distribution systems.

The Town does not have the detailed hydraulic model results from the W-WW Master Plan to determine how many properties are affected by fire flow concerns mentioned in the 2018 Master Plan. However, the Town will be receiving updated Fire Flow modelling results later this year as part of the Master Plan update.

4.3.2 Community LOS: Description of boil water advisories and service interruptions

Boil water advisories are issued when conditions or concerns may adversely affect the quality or safety of the potable water supply. A boil water advisory is put in place to protect the community from potentially harmful organisms that may

be in the water that may be detrimental to the health of the community. The Town has not issued any boil water advisories in the past three years (2019 – 2021).

On the other hand, service interruptions have occurred due to watermain breaks. Specifically, seven (7) breaks occurred in 2019, resulting in 5.4 lost connection-days, and 5 breaks occurred in 2020, resulting in 136.7 lost connection-days. In 2021, there were 4 watermain breaks with no outage of service. These breaks were attributed to deteriorated watermain condition and highlight the need for regular renewal of watermains.

4.3.3 Technical LOS for Water

The Table below summarizes the mandatory Technical LOS for the Town's water network as prescribed in O.Reg 588/17.

Table 4-4: Technical LOS for Water Network

Service Attribute	Technical levels of service	2022 Performance
Scope / Capacity	Percentage of properties connected to the municipal water system	70.4% (12,912 / 18,330 properties)
Scope / Capacity	Percentage of properties with fire flow	70.6% (12,934 / 18,330 properties)
Reliability	The number of connection-days per year where a boil water advisory is in place, compared to the total number of properties connected	No boil water advisories reported
Reliability	The number of connection-days per year due to water main breaks, compared to the total number of properties connected	2021: 4 breaks, 0 connection-days 2020: 5 breaks, 136.7 connection-days 2019: 7 breaks, 5.4 connection-days

4.4 Wastewater Services

4.4.1 Community LOS: Areas connected to the municipal wastewater system

Sanitary sewage for Town residences and business is discharged into the Stouffville sanitary collection system, operated and maintained by the Town. The sewage outfalls to the York-Durham Sewage System (YDSS) operated and maintained by York Region. Residents in some rural areas discharge their sewage to private septic systems and are not connected to the Town's sanitary system.

A map of the Town's wastewater main system by condition is provided in the Figure below.

Figure 4-2: Map of Town Wastewater Main System by Condition

4.4.2 Technical LOS for Wastewater

The Table below summarizes the mandatory Technical LOS for the Town's wastewater network as prescribed in O.Reg 588/17.

Table 4-5: Technical LOS for Wastewater System

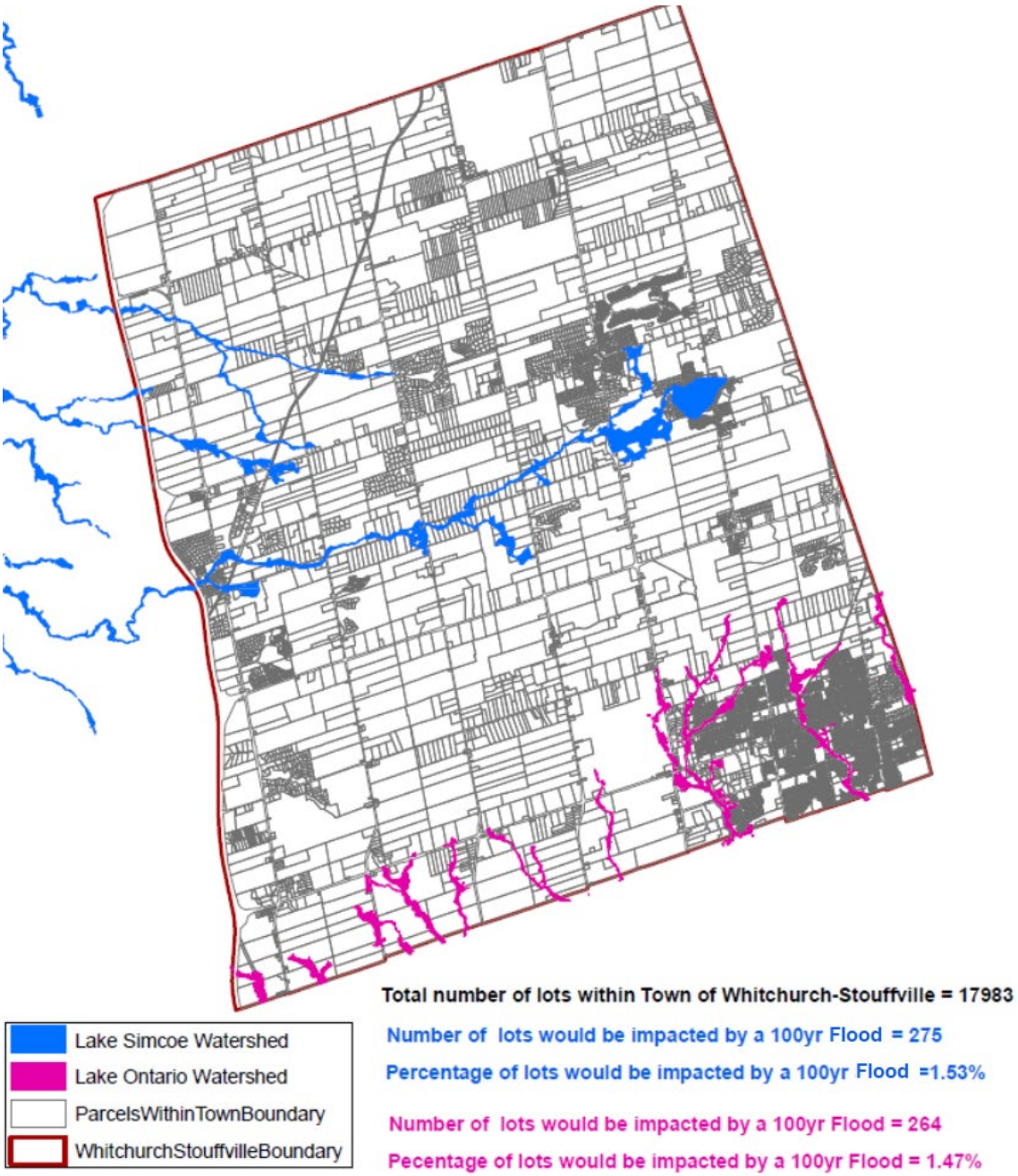
Service Attribute	Technical levels of service	2022 Performance
Scope / Capacity	Percentage of properties connected to the municipal wastewater system	58.9 % (10,795 connections, 18,330 total properties)
Reliability	The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system	2021: no backups, 0 connection-days 2020: 1 backup, 0 connection-days 2019: 1 backup, 0 connection-days

4.5 Stormwater Services

4.5.1 Community LOS: Areas protected from flooding

The Town generally lies within two distinct watersheds. Duffins Creek watershed and Rouge watershed. Stormwater from the east areas of the Town contribute to Stouffville Creek and Reesor Creek within Duffins watershed. The west areas of the Town contribute to Little Rouge Creek within the Rouge watershed. The Town maintains a network of storm sewers, catch basins, and stormwater management ponds that protect areas from flooding and control water quality and quantity. The TRCA has identified the Rouge River watershed as requiring Level 1 protection; therefore, Total Suspended Solids (TSS) removal is required to be 80% or greater in wet ponds. A map illustrating the areas within the Town impacted from both 100-year storm and flood events is shown in Figure 4-3.

Figure 4-3: Lots Impacted by 100-year Flood Events



4.5.2 Technical LOS for Stormwater

The Table below summarizes the mandatory Technical LOS for the Town's stormwater network as prescribed in O.Reg 588/17.

Table 4-6: Technical LOS for Wastewater System

Service Attribute	Technical levels of service	2022 Performance
Scope / Capacity	Percentage of properties in municipality resilient to a 100-year storm.	% of properties = 98.5% Historical Flooded Areas include Vandorf Sideroad between Kennedy and Warden, Bethesda Sideroad between Warden and Tenth Line.
Reliability	Percentage of the municipal stormwater management system resilient to a 5-year storm.	Not able to quantify at this time; storm sewers and ponds are designed for 5- year storms at the Town; however, further hydraulic modelling would be required to determine actual network resiliency.

5 Risk Management Strategy

Risk exposure associated with renewal needs are shown in Table 5-1 below. The Figure lists the respective asset replacement costs within each appropriate cell, based on Probability of Failure (condition) and Consequence of Failure.

Table 5-1 shows that $0.9 million of renewal needs Very High risk, consisting of traffic signals beyond their service life at the following three intersections:

- Main Street & Stouffer Street Intersection
- Main Street & Park Drive Intersection
- Main Street & Mill Street Intersection

Table 5-1: Renewal Risk Exposure – Core Services

Probability of Failure	1	2	3	4	5
5	$ 0.1	$ 3.0	$ 0.0	$ 0.9	-
4	$ 0.0	$ 34.1	$ 38.3	$ 23.2	$ 0.0
3	$ 0.0	$ 58.1	$ 42.2	$ 45.8	$ 0.0
2	$ 0.2	$ 119.3	$ 151.5	$ 41.3	$ 14.4
1	$ 0.1	$ 73.4	$ 138.3	$ 80.4	-

Consequence of Failure

Risk Legend: Very Low | Low | Moderate | High | Very High

Risk Category	Renewal Need (2021 $, millions)
Very High	$ 0.9
High	$ 107.3
Moderate	$ 135.0 *
Low	$ 547.6
Very Low	$ 73.8
Unknown Risk	$ 91.0
TOTAL	$ 955.5*

** Value differs from summation of chart values due to rounding*

The probability of physical failure was determined based on condition (values not included have Unknown asset condition). Specifically, the five-point condition scale is mapped to the five-point Probability of Failure (PoF) scale shown in Table 5-2.

Table 5-2: Mapping of Probability of Failure to Condition

Probability of Failure (PoF)	Probability of Failure (PoF) Rating	Description	Corresponding Condition Rating
Rare	1	Asset is physically sound and is performing its function as originally intended. Asset is new or at the beginning of its service life.	Very Good
Unlikely	2	Asset is physically sound and is performing its function as originally intended. Typically, asset has been used for some time but is within mid-stage of its expected life.	Good
Possible	3	Asset is showing signs of deterioration and is performing at a lower level than originally intended.	Fair
Likely	4	Asset is showing significant signs of deterioration and is performing to a much lower level than originally intended.	Poor
Certain	5	Asset is physically unsound and/or not performing as originally intended. Asset has reached end of life and failure is imminent.	Very Poor

Asset criticality, or Consequence of Failure (CoF), is also rated on a five-point scale based on the importance of an asset to the Town's delivery of services or, in technical terms, the potential consequences of the asset failing and therefore failing to provide the required service levels. Asset criticality is determined based on the degree to which the failure of the asset would impact the following considerations:

- **Financial** impact considerations such as asset replacement cost, damages to Town or private property and infrastructure, loss of revenue, and fines
- **Health & Safety** considerations such as degree and extent of injury, from negligible injuries to loss of life
- **Availability and Reliability of service delivery**, such as disruption of non-essential service to widespread and long-term disruption of essential service
- **Environmental** considerations, such as length and extent of damages to the natural environment.
- **Reputational** considerations, such as negative media coverage.

Table 5-3 lists the asset criticality profiles for the five considerations above. For each asset, the criticality is assessed against the five considerations, and the highest criticality rating is assigned as the asset's overall CoF, which is used to determine the Risk Exposure in Table 5-1.

Table 5-3: Asset Criticality (Consequence of Failure) Table

Consequence Categories	CoF = 1 Insignificant	CoF = 2 Minor	CoF = 3 Moderate	CoF = 4 Major	CoF = 5 Catastrophic
Financial	Damages, losses (including 3rd party) or fines of $1k to $10k	Damages, losses (including 3rd party) or fines from $10k to $100k	Damages, losses (including 3rd party) or fines from $100k to $500k	Damages, losses (including 3rd party) or fines from $500k to $1M	Damages, losses (including 3rd party) or fines > $1M
Health & Safety	No obvious potential for injury or affects to health.	Potential for minor injury or affects to health of an individual. Full recovery is expected; or minor medical attention may be required.	Potential for serious injury or affects to health. May affect many individuals and / or result in short-term disability; or hospitalization may be required for a short period of time.	Potential for serious injury or affects to health of one or more individuals with a possibility of loss of a life and the certainty of long-term disability; or emergency hospitalization required for one or more individuals.	Potential for death or multiple deaths with probable permanent damage; or emergency and long-term hospitalization required for several individuals.
Availability/ Reliability	Small number of customer experiencing disruption / impact (less than 100 people or up to a few hours)	Localized service disruption / impact (100 to 1,000 people or up to 1 day)	Significant localized disruption / impact (1,000 to 2,000) people or less than 1 week)	Major service disruption / impact (2,000 to 5,000) people or for more than a week)	Area wide service disruption / impact (greater than 5,000 people or permanent loss of services)
Environment	Very negligible impact or can be restored within 1 day	Minor (within 1 week) very isolated damage / impact to the environment, local importance	Significant short-term impact (up to 2 weeks), local importance	Significant long-term impact (up to 1 month), Provincial importance.	Major long-term impact (greater than 1 month), Federal importance.
Reputational	No media exposure	Moderate local media exposure lasting for several days	Intense local media exposure lasting several days and/or Municipality wide exposure	Significant provincial exposure lasting several days or weeks	Significant national exposure lasting several days or weeks

Based on the factors above, the criticality scores assessed for each asset class are outlined in the Table 5-4. When assessing the overall criticality, the highest value was utilized across all consequence categories.

Table 5-4: Consequence of Failure Scores

Level 0	Level 1	Level 2	Criticality (1-5)
Transportation	Road Network	Arterial Road	4 - Major
		Collector Road	3 - Moderate
		Local Road	2 - Minor
	Bridges		5 - Catastrophic
	Culverts		3 - Moderate
	Traffic Signals		4 - Major
	Streetlights		4 - Major
	Sidewalk		3 - Moderate
	Walkway		3 - Moderate
	Dump Truck		3 - Moderate
	Light Duty Vehicle		2 - Minor
	Tractor/Loader		2 - Minor
	Trailers		2 - Minor
	Large Tools		1 - Insignificant
	Plowing Equipment		1 - Insignificant
	Power Tools		1 - Insignificant
	Trailers		1 - Insignificant
Water	Mains	Pipe diameter, <100 mm	2 – Minor
		Pipe diameter, 100 – 300 mm	3 – Moderate
		Pipe diameter, 300 mm +	4 - Major
	Valves	Pressure Reducing Valve	4 - Major
		All Other Valves	3 - Moderate
	Hydrants		4 - Major
	Meters		2 - Minor

Level 0	Level 1	Level 2	Criticality (1-5)
	Gormley Fire Protection System Building		3 - Moderate
	Bulk Water Station (BWS)		3 - Moderate
Wastewater	Mains	Pipe diameter, <200 mm	2 - Minor
		Pipe diameter, 200 – 450 mm	3 - Moderate
		Pipe diameter, 500 mm +	4 - Major
Stormwater	Mains	Pipe diameter, <400 mm	2 - Minor
		Pipe diameter, 400 – 1200 mm	3 - Moderate
		Pipe diameter, 1200 mm +	4 - Major
	Oil Grit Separators		3 - Moderate
	Discharge Points		2 - Minor
	Ponds		3 - Moderate
	Underground Stormwater Tank		4 - Major

6 Lifecycle Management Strategy

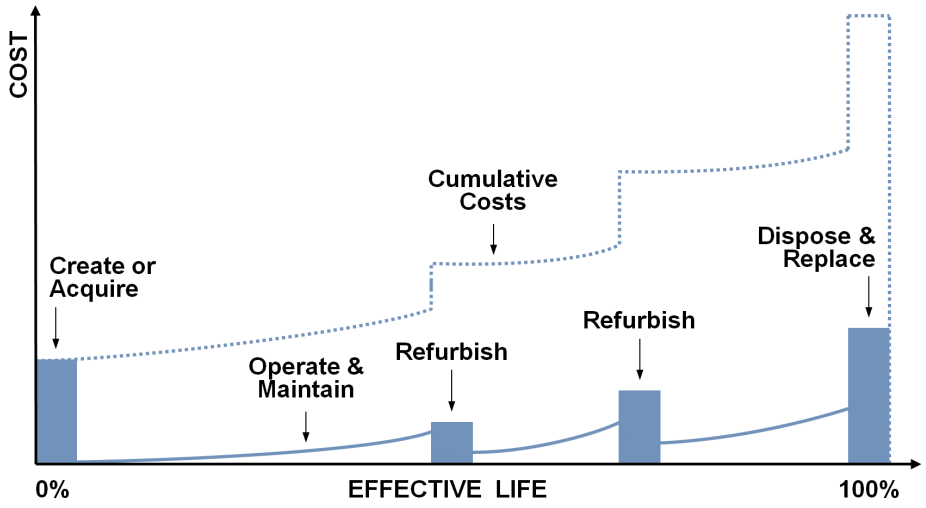
6.1 Overview of Lifecycle Management

The Town uses its understanding of service delivery gaps and risk exposure to inform the timing and amount of needed investments in infrastructure assets. The Town aims to provide sufficient service capacity to meet demand and manages the upgrade and renewal of assets to meet defined service levels, including legislated and other corporate requirements. Asset life cycle management strategies are typically organized into the following categories:

- **Operations and Maintenance activities** – Operations refers to regular activities during the process of utilising an asset which consume resources such as person-power or labour, equipment rental and purchase, energy, chemicals and materials. Maintenance refers to activities including regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events to retain an asset as near as practicable in an appropriate service condition.
- **Renewal activities** – Significant rehabilitation designed to extend the life of the asset and replacement activities that are expected to occur once an asset has reached the end of its useful life and rehabilitation is no longer an option.
- **Upgrade activities** – Planned activities to increase the level of service or meet other requirements such as changes in functional requirements or legislation.
- **Expansion activities** – Planned creation or acquisition of assets required to extend services to previously unserved areas or expand services to meet growth demands. Also includes redevelopment activities.
- **Disposal activities** – The activities associated with disposing of an asset once it has reached the end of its useful lifeor is otherwise no longer needed by the Town.
- **Non-asset solutions** – Actions or policies that can lower costs, lower demands, or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, education of public).

The Town assesses the costs of potential lifecycle activities to determine the lowest lifecycle cost strategy to manage each asset type while still meeting expected LOS. The sum of lifecycle activity costs informs the minimum cost to sustain each asset type over the asset life cycle. Sufficient investment of the right type and at the right time minimizes the total cost of ownership for that asset and also prevents other potential impacts (i.e. risks) such as interruption to service delivery or damage to other infrastructure. Maintenance and renewal activities are timed to reduce the risk of service failure from deterioration in asset condition and are part of the total cost of ownership. The conceptual life cycle model is illustrated in the Figure below where the costs associated with creating and sustaining the asset over time are depicted.

Figure 6-1: Conceptual Life Cycle Cost Model



Maintenance and renewal work directly enable the Town to meet state of good repair service levels (percentage of assets in Fair condition or better). In principle, maintenance activities ensure that an asset continues to deliver defined levels of services, while renewals extend the asset useful life; however, in practice, the distinction between renewals (capital programs) and maintenance (operating expenses) is typically set by accounting practices and standard operating procedures.

Renewals and maintenance are strongly linked; maintenance strategies can accelerate or delay the need for renewals, and if renewals are deferred, maintenance needs will often increase to ensure that assets are kept in a state of good repair. Finding the right balance of operation, maintenance, rehabilitation and renewal activities is the objective of the asset management program. That balance be one that minimizes asset lifecycle costs, while managing risks and enabling the required level of service delivery.

The AM Plan presents the Town's current operation, maintenance, rehabilitation and renewal strategies. As the Town matures its asset management processes and technologies, it will begin collecting more detailed data on asset operations, maintenance and repair costs, and asset failure data. This data will allow the Town to adjust and optimize its asset lifecycle strategies.

6.2 Forecast Needs – Growth and Expansion

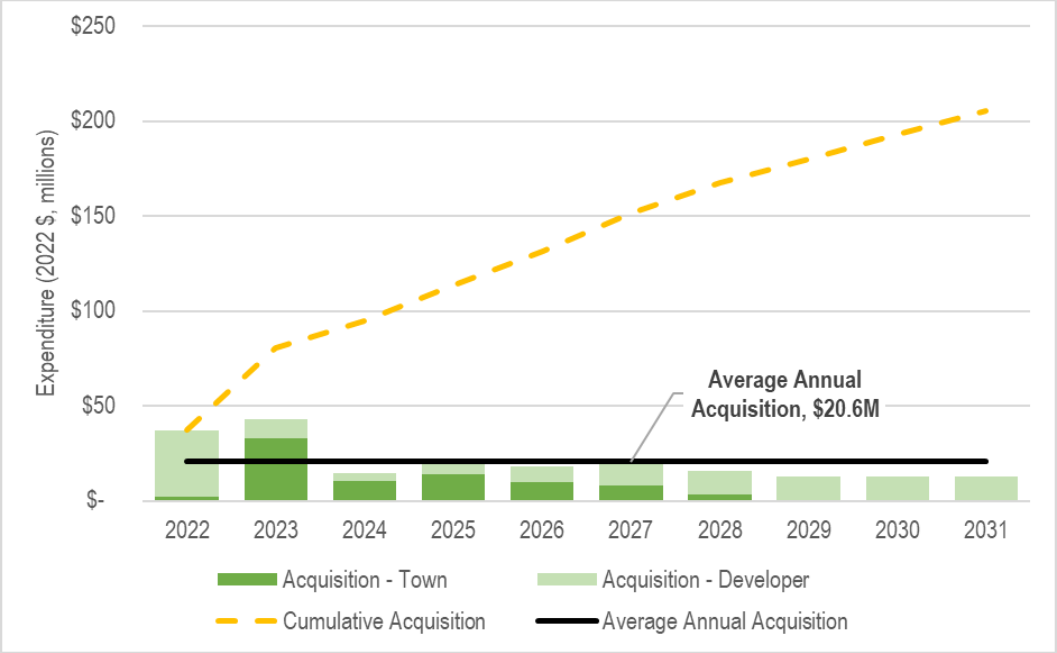
The Growth Plan for the Greater Golden Horseshoe (2017) has forecasted the population for York Region to grow from 680,000 to 1,790,000 by 2041. The Region's 2041 Preferred Growth Scenario summarizes how this growth is distributed between its nine local area municipalities. The Town of Whitchurch-Stouffville's population is expected to grow from 45,837 (2016 Census) to 101,400 in 2051, with the growth focused more in the community of Stouffville rather than the rural communities. This growth forecast translates into a 1.38% annual compounded growth rate over the next 25 years.

The expected growth in Town population will place additional pressure on existing assets and create demand for new assets. The Town is currently updating and developing various master plans that outline current service levels and identify the actions required to move from the current to future state including requirements for new, expanded and enhanced assets. The master planning processes and other studies provide the focus for non-asset solutions and expansion of the asset portfolio.

The expected growth assets for Development Charge (DC) eligible projects, and the associated impact of this growth is detailed in the Town's 2018 Development Charges Background Study (note: the Town is currently undergoing an update of this document).

Proposed new assets include both assets constructed by developers and assumed by the Town and assets constructed by the Town. Figure 6-2 below provides a summary of the combined growth expected at the Town over the next 10 years.

Figure 6-2: Acquired Assets



** This Figure was revised subsequent to Council approval of the Asset Management Plan.*

The projected new assets constructed by the Town are based on the projects identified as "growth" within the 2022-2031 Capital Forecast. Expenditure on new assets and services in the 2022 Capital Budget will be accommodated as approved through the 2022 budget process. The estimated expenditures identified in the forecast will be funded to the extent that there is available funding as assessed through the Long-Range Financial Plan (LRFP) process. The largest expected growth projects planned within the next ten years at the Town include:

- Main St Reconstruction, Ninth Line to Stouffer St. W22 ($5.5M, 2023)
- Subtrunk #1 Ext, 600mm Sewer on RR#30 N. of Hoover Pk Dr to Main St WW08 ($4.9M, 2023)
- Bethesda Side Rd Reconstructi–n - Ninth Line to Tenth Line with Creek Crossing ($4.8M, 2027)
- Subtrunk #1 Ext, 450mm Sewer on Forsyth Farm Dr form RR#30 to Keeler Ave WW11 ($3.4M, 2023)
- Creek Crossing-Structure, Forsyth Farm Rd at Reesor Creek (RB05) ($3.3M, 2023)
- Main St Reconstruction, Ninth Line to Stouffer St. W22 ($3.2M, 2025)
- Subtrunk #1 Ext, 450mm Sewer on RR#30 from Main St to N. Limit of Cam Fella WW09 ($2.9M, 2023)
- Bethesda SideRd Hwy48 to Ninth Line, Reconstruction, including Creek Crossing and Paved Shoulders ($2.9M, 2026)
- Lloyd St. Reconstruction (W27) ($2.4M, 2025)
- Sanitary Pumping Stn & Forcemain-S. of 'am's Way to Rougeview SPS Forcemain (WW03 & WW04) ($2.2M, 2026)
- W34 Future Rd #15 S. of Bethesda and E. of Ninth Line 300mm Watermain ($2.1M, 2023)

The projected new assets constructed by developers and assumed by the Town are derived from the Town's future development projects with an anticipated build within the next 10 years. The construction and acquisition of new assets will commit the funding of ongoing operations, maintenance, and renewal costs for the service period that is required for the assets.

6.3 Forecast Needs – Renewal

Renewal efforts focus on rehabilitation and replacement activities to enable the Town to meet its quality and reliability objectives. The renewal activities forecasted in this AM Plan are expected to be needed to sustain asset condition over the next 10 years. Over time, as the Town refines the asset management strategies through tracking of actual condition and actual costs and benefits of the strategies, the Town will improve its understanding of the deterioration rates and the lowest lifecycle cost for each asset type. For renewal projects, the Town considers coordinating multiple activities through project bundling where possible to reduce total costs.

Rehabilitation activities extend the life of an asset and reduce its risk of failure. These activities and associated benefits are deemed more cost effective than allowing the asset to reach its end of life and then replacing it. An example of a rehabilitation activity is concrete repair work on a bridge or culvert, which will improve the condition of the structure and extend its life such that the overall lifecycle cost is minimized.

At a certain point in an asset's lifecycle, it is no longer cost-effective to rehabilitate the asset, and replacement is required. The Town has identified estimated service lives for each of its assets. These replacement intervals are developed to minimize lifecycle costs while considering service levels and the associated risk. The renewal forecast considers the asset's current condition or age, the Town's planned rehabilitation and replacement activities, as well as the recommended strategies from the following:

- Engineering based studies such as the Roads Needs Study and Structure Condition Inspection Report
- Projection of renewal timing (acquisition year plus useful life to determine the renewal/rehabilitation year)
- Discussion with Town staff to document other applicable renewal needs and strategies

A summary of renewal timings and costs used to develop projected asset renewal forecasts are shown in the Table below.

Table 6-1: Asset Renewal Strategies

Service Area	Asset Type	Asset Sub-Type	Renewal Frequency	Average Renewal Cost
Transportation	Roads	HCB – Asphalt	20 years	$54.16/sq.m
		LCB – Surface Treated	15 years	$7.28/sq.m.
		Gravel	7 years	$4.50/sq.m.
	Bridges		As recommended in the OSIM Inspection Report	As recommended in the OSIM Inspection Report
	Culverts		As recommended in the OSIM Inspection Report	As recommended in the OSIM Inspection Report
	Traffic Signals	Signal Structures & Equipment	25 years	$232,823 ea
		Signal Controller Systems	25 years	$14,160 ea
	Streetlights	Luminaires	20 years	TCA Cost*

Service Area	Asset Type	Asset Sub-Type	Renewal Frequency	Average Renewal Cost
	Sidewalks/Walkways	Concrete	50 years	$232.13/sq.m
		Asphalt	50 years	$63.65/sq.m
Water	Mains		80 Years	Per Diameter
	Valves	PRV	35 years	Per Size
		All other Valves	50 years	Per Size
	Hydrants		60 years	$10,000 ea
	Meters		20 years	Per Size and Model
	Gormley Fire Protection System	Structural/Architectural	37 years	$0.75M*
		Process/Instrumentation	17 years	$1.09M*
	Bulk Water System		20 years	$0.09M*
Wastewater	Mains (& Appurtenances)		80 years	Per Diameter
Stormwater	Mains (incl. Catch basins/Manholes)		By Material	Per Diameter
	Oil Grit Separators		80 years	Per Size*
	Discharge Points		80 years	Per Size*
	Ponds	Wet Ponds	20 years	$125/sq.m
		Dry Ponds	40 years	$125/sq.m
	Stormwater Reservoir		75 years	$1.8M*

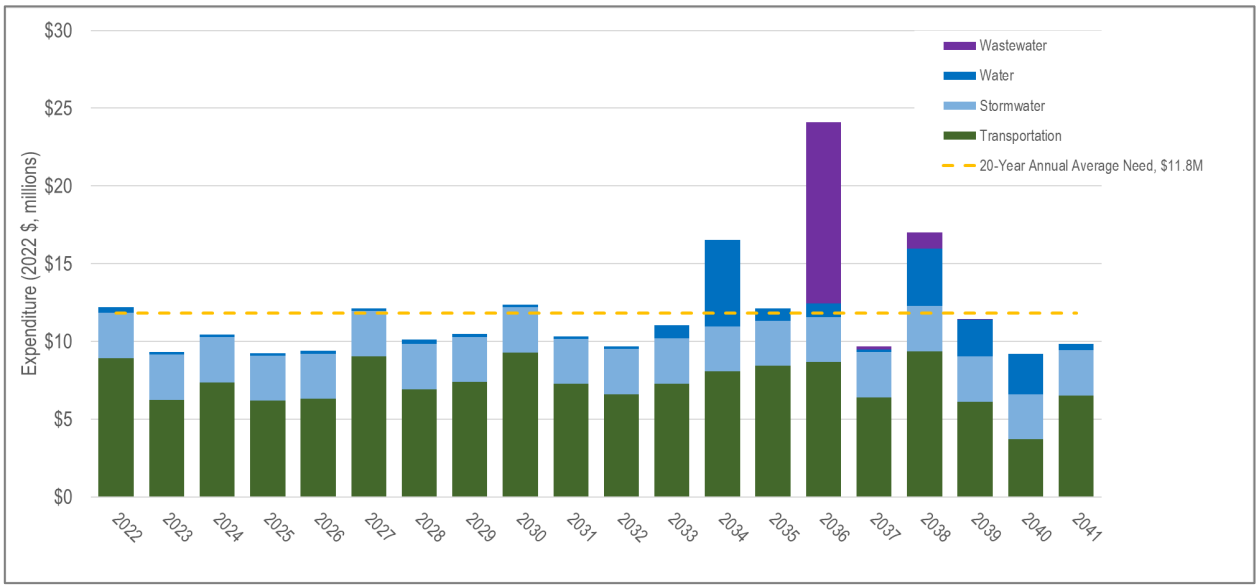
**Replacement values have been derived from the Town's Tangible Capital Asset (TCA) Register and are deemed to be 'low confidence' due to current software limitations (TCA replacement values are calculated in the current software using a predetermined annual percentage increase rather than reflecting current day market construction costs). It is recommended that the Town gain a better understanding of current day market values to replace these assets to help support future investment planning.*

An "optimized" asset lifecycle strategy is the lowest cost strategy for the specified Levels of Service. Although not economically analysed as optimal, the asset lifecycle strategies outlined in the above table are those generally applied and adjusted by Town staff based on knowledge of asset construction variations and operating environments. Risk is

considered by planning for interventions at the specified frequencies to enable sustained service delivery at an acceptable performance level. The lifecycle strategies are to be improved over time as the Town gains more data and knowledge on the benefits of treatments and the true lifecycle costs of its assets.

The Figure below shows the renewal needs over the next twenty years by service area. The average renewal need is estimated at $11.8 million per year for the period 2022-2041. This excludes renewal of stormwater ponds, for which the Town is in the process of developing a cleaning schedule based on physical condition assessments. This forecast also excludes assets with unknown condition, which consist of $91.0 million of assets, since it is not known whether those assets will require renewal within the 20-year window.

Figure 6-3: Renewal Needs Forecast



A summary of the 20-year renewal needs is shown by service area is provided in Table 6-2 below, along with forecast, the average annual renewal needs over the asset lifecycle. The average annual renewal needs over the asset lifecycle, estimated at $15.9 million/year, represents the annual investment needed to sustain the current asset portfolio, regardless of whether renewals are needed within the 20-year period or later. This amount represents the investment required to ensure generational equity. Moreover, this amount includes all assets, including those with unknown condition, which were excluded from the 20-year renewal needs forecast.

Table 6-2: Renewal Needs Summary by Service Area

Service Area	20-Year Average Annual Renewal Needs (2022 $, millions)*	Average Annual Renewal Needs over Asset Lifecycles (2022 $, millions)**
Transportation	$7.2	$8.1
Water	$1.0	$3.5
Wastewater	$0.7	$1.4
Stormwater	$2.9	$2.9
TOTAL	**$11.8**	**$15.9**

** Excludes assets with unknown condition, since it is not known whether those assets will require renewal within the 20-year period.*

*** Includes assets with known and unknown condition.*

6.4 Forecast Needs – Operations & Maintenance

Along with timely renewal of assets, operations and maintenance (O&M) work directly enables the Town to meet state of good repair service levels (percentage of assets in fair or better condition) to support the reliable/quality service delivery objective. The distinction between renewals (capital programs) and operations and maintenance (operating expenses) is defined by the Town's accounting policies and standard operating procedures. Operations and maintenance activities ensure the asset continues to deliver defined levels of service, while renewal activities extend the useful life of the asset.

The Table below summarizes the Town's main asset-related operations and maintenance activities.

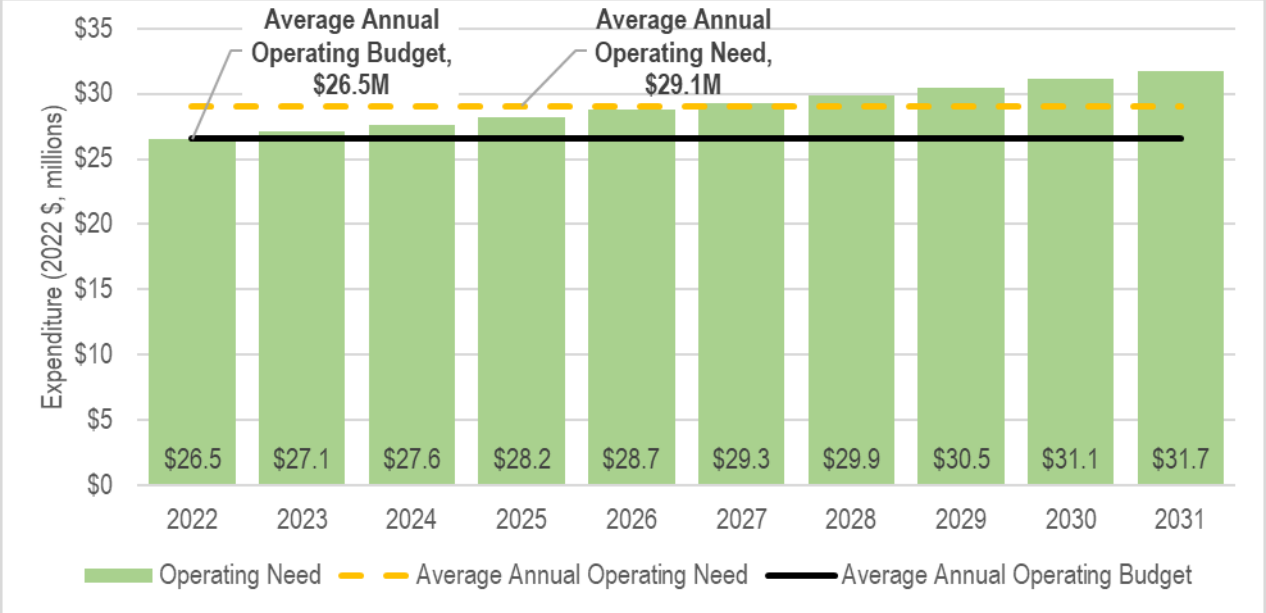
Table 6-3: Operations and Maintenance Activities

Asset Type	Operations	Maintenance
Transportation		
Roads	• Winter control– per MMS • Road Patrol – per MMS • Sweeping • Roadside mowing • Brushing – remove trees & branches	• Pot-hole filling as-needed/complaint • Ditching (not associated with a re-surface) • Washout repairs • Condition assessment (Road Needs Study)
Roads – Gravel	• Winter control • Dust control • Roadside mowing • Brushing – remove trees & branches	• Grading - Add maintenance gravel • Ditching (not associated with a re-gravel)
Bridges	• Brushing • Sweep	• Inspection every 2 years • Maintenance/repair as needed
Structural Culverts	• Brushing • Sweep • Clear inlet & outlet	• Inspection every 2 years • Maintenance/repair as needed
Other Transportation Assets		• Maintenance/repair/replacement as needed (signs, signal components, guiderails, flashing beacons, entrances)
Water		
Water Mains	• Track break history	• Spot repair
Water Facilities	• Inspect (weekly per MECP mandate), backflow testing (annual)	• Spot repair
Water Appurtenances	• Test, exercise, inspect: valves, hydrants, curb stops	• Spot repair
Wastewater		
Sewer Mains & Appurtenances	• Flush, clean, CCTV inspect	• Spot repair based on CCTV
Stormwater		
Storm Sewers	• Flush, clean, CCTV inspect	• Spot repair based on CCTV
Stormwater Ponds	• Bathometric survey & inspection • Test, exercise, inspect and clean subcomponents	• Spot repair based on inspection (sediment removal is capital)
Fleet & Equipment		
Vehicles	• Fuel, licensing	• Vehicle GPS installations

Asset Type	Operations	Maintenance
		• Inspections and Preventative Maintenance (PM) activities • Maintenance/repairs as needed
Equipment	• Testing of equipment per applicable regulations	• Repair as needed • Security updates • Software updates • Maintenance contracts • Firewall renewals

The Figure below summarizes the operations and maintenance expenditures forecast related to asset activities for the period 2022-2031, at an annual average of $26.5 million (year 2022 $) for core services. The operations and maintenance expenditures forecast is based on current needs plus needs due to assets to be acquired over the next ten years. As the Town gains more clarity around the quantity and extent of new assets to be acquired, operational budget planning will be better informed and more accurately reflect operations and maintenance needs for core infrastructure assets.

Figure 6-4: Operating Needs Forecast



In general, the associated Operating needs forecast is focused on asset activities and does not include non-asset related expenses such as salaries, programming, office supplies and insurance. This forecast also does not include the significant potential cost increases due to the pandemic and current economic environment. The Town will monitor price increases and adjust future forecasts as necessary.

7 Financial Impact

7.1 Overview

The financial strategy is informed by the preceding sections of the Asset Management Plan: the value and condition of the assets, the current levels of service, the risks to service delivery, and the lifecycle activities needed to reduce the risks to acceptable levels. The Financing strategy considers how the Town will fund the planned asset management actions to meet the current service levels.

A municipality is in a financially sustainable position if it:

- Provides a level of service commensurate with willingness and ability to pay
- Can adjust service levels in response to changes in economic conditions
- Can adjust its implementation plans in response to changes in the rate of growth
- Has sufficient reserves and/or debt capacity to replace infrastructure when it needs to be replaced to keep its infrastructure in a state of good repair.

The key challenges to financial sustainability are:

- A discrepancy between level of service decisions and fiscal capacity
- Possible future changes in the cost of infrastructure investments
- Unforeseen impacts to funding.

Per O.Reg. 588/17, this section of the AM Plan identifies the annual funding projected to be available to undertake the recommended lifecycle activities and discusses strategies to address potential funding shortfalls.

7.2 Available Funding Amounts and Sources

Through the Town's annual budget process, capital project and operating activity expenditure information is gathered from service areas, including investment needs, trends, and priorities to enable preparation of the capital and annual operating plans. Once the expenditure plans are finalized, a financing plan is developed which includes several key sources of funding as outlined in the Table 7-1.

Table 7-1: Key Sources of Funding and Financing

Funding Source	Description
Tax Levy	• Town property owners pay an annual tax to the Town
Debt	• Long term borrowing, to be paid for by future taxpayers
Canada Community Building Fund (formerly Federal Gas Tax)	• A long-term grant agreement with the Association of Municipalities of Ontario (AMO), that provides a portion of the Federal gas tax revenues to municipalities for revitalization of infrastructure that achieves positive environmental results
Grants	• Project specific grants / subsidies
User Fees	• Funds collected for the use of Town services or infrastructure

In addition to the above sources, capital reserves are established as a source of pay-as-you-go funding for the Town's capital program. Funding for these reserves is obtained through annual contributions. These annual reserve contributions sustain reserve balances at appropriate levels to address infrastructure replacement costs in the future

and inherent uncertainties in capital funding needs. Reserve contributions are evaluated annually to ensure adequate funds are raised to meet future capital requirements and to smooth out the impact on the annual operating budget.

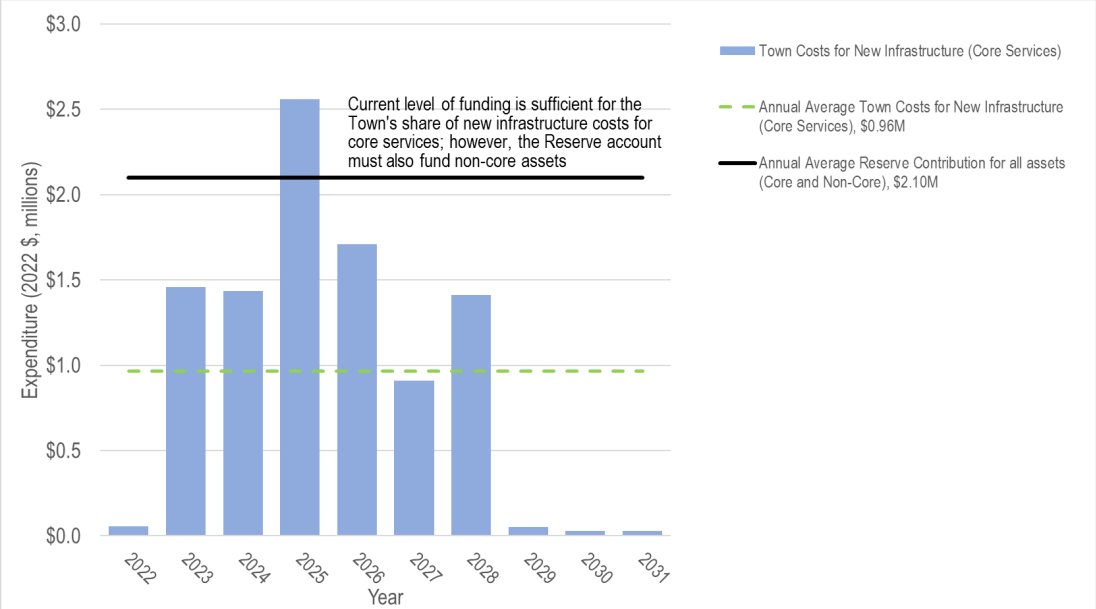
Transportation assets (roads and related assets, bridges and culverts) are generally funded through property and other taxes, while the water, wastewater and stormwater systems are funded through user fees (i.e. rates). The forecasted funding derives from the Town's 10-year Capital Forecast, which is delineated by growth, renewal and replacement, and strategic initiative projects.

7.3 Capital for Growth and Expansion Assets

New infrastructure, including growth and expansion needs listed in Section 6.2, is funded from a variety of sources, including Development Charges and grants. Portions not funded for growth-related projects are funded by the Town's New Infrastructure Reserves. For the core services, the Town's average annual portion of growth and expansion costs is $0.96 million for projects identified from 2022-2031.

For 2022, the Town's contributions to the New Infrastructure Reserve was $2.10 million (see Figure 7-1). As an annual contribution, this amount would be sufficient for the projects identified for core services, but must also be used for non-core assets. When the Asset Management Plan for Non-Core Assets is completed, it will become clear whether $2.10 million/year is sufficient for all growth and expansion needs, or whether there is a gap.

Figure 7-1: New Infrastructure Funding Analysis



7.4 Capital Renewal Financial Sustainability

Asset renewal is funded by Replacement and Rehabilitation (R&R) Reserve accounts. For long-term sustainability, the Town's annual contributions to R&R accounts must equal or exceed the annual average renewal needs.

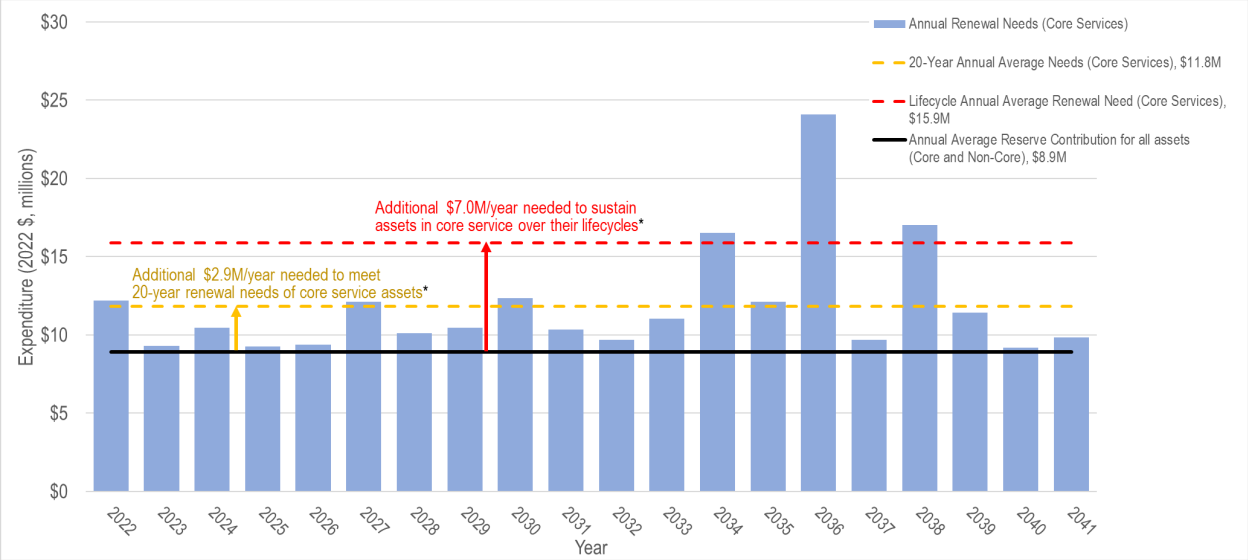
For 2022, the Town's contributions to R&R reserves included:

- $4.2 million to be used for any core and non-core assets
- $4.7 million to be used for water, wastewater or stormwater assets

Assuming that the annual reserve contribution is held at that amount, this represents a commitment of $8.9 million/year to cover all the Town's asset renewal needs.

As shown in Figure 7-2, an annual reserve contribution of $8.9 million/year (solid black line) leaves an annual average infrastructure gap of $2.9 million relative to the 20-year annual average renewal needs for core service assets (orange dotted line), and a gap of $7.0 million relative the renewal needs for lifecycle sustainability for core service assets (red dotted line). The gap will be even larger when the renewal needs of non-core service assets are considered.

Figure 7-2: Renewal Funding Analysis



Similar to the Operating budget, the estimated Capital forecast and funding shortfall do not consider for rising costs due to inflation, market conditions or pandemic impacts.

7.5 Strategies to Close Funding Gap

Funding gaps may be closed by one or more of the following strategies:

- Reduce near-term renewal needs by deferring capital renewal projects on lower risk assets, thereby lengthening the period in which the backlog is addressed beyond the 10- and 20-year outlook, but likely increasing maintenance costs.
- Increase available funds through property tax increases, water and wastewater fees (rates), third-party grants, capital infrastructure fees, or drawing down reserves.
- Investigate implementing a stable stormwater user fee to recover the full cost of stormwater management.

8 AM Plan Monitoring & Improvement

8.1 AM Plan Monitoring

This AM Plan will be reviewed during annual budget planning processes and amended to show:

- Status of expansion, upgrade and renewal needs and projects listed in Section 6
- Updated service level performance for LOS metrics listed in Section 4
- Service level targets as they are established (to be incorporated into Section 4).

The AM Plan will be updated every five years (or more frequently as required) to ensure it represents the current service level, asset values, projected operations, maintenance, capital renewal and replacement, capital upgrades, asset disposal expenditures, and projected expenditure values incorporated into the long-term financial plan.

The effectiveness of the asset management plan can be measured in the following ways:

- The degree to which the required projected expenditures identified in this asset management plan are incorporated into the long-term financial plan
- The degree to which the current one-year budget and four-year forecast take into account the forecast needs provided by the AM Plan
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks and residual risks are incorporated into Council's Strategic Plan and associated plans
- The Asset Funding Ratio achieving the target of 1.0.

8.2 AM Plan Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. This section provides an overview of the compliance of this AM Plan with Ontario Regulation 588/17 for current levels of service and the improvements required to become compliant with Regulation 588/17 for proposed levels of service by July 1, 2025.

The following improvement activities are planned to enable the Town to comply with Ontario Regulation 588/17 Asset Management Planning for Municipal Infrastructure, Proposed Levels of Service by July 1, 2025.

- **State of Infrastructure:** Continue to improve knowledge of asset replacement costs and current condition of the assets based on asset criticality, with a focus on vertical assets.
- **Levels of Service:** Continue to assess current performance and, for each asset category, document the LOS that the Town proposes to provide for the next 10 years and an explanation of why the proposed LOS targets are appropriate.
- **Asset Management Strategy:** For each asset category, identify the lifecycle activities that would need to be undertaken to provide the proposed LOS for each of the next 10 years, based on risk and lowest lifecycle cost analyses.
- **Financing Strategy:** For each asset category, provide the costs of the lifecycle activities that would need to be undertaken to achieve the proposed LOS for each of the next 10 years, separated into capital expenditures and significant operating costs. Also provide the annual funding projected to be available to undertake lifecycle activities and the options examined to maximize the funding projected to be available. For any funding shortfalls, identify which lifecycle activities will be funded and, for those not funded, the risks of not undertaking them.
- **Other:** Provide an overview of the risks associated with implementation of the AM Plan and any actions that would be proposed in response to those risks. Provide an explanation of any other key assumptions underlying the plan that have not previously been explained.

The following improvements to asset data are recommended to support future iterations of the AM Plan:

1. **Establish unique asset IDs that are consistent across all data sets.**
   Establish unique asset IDs and naming conventions for each asset and ensure that asset IDs are consistent across all data sets. For example, road segments should have the same asset ID in GIS, RoadMatrix and TCA.

2. **Collect further GIS data to enable geo-location and mapping.**
   GIS data will be needed in the future work order system to enable operations staff to locate specific assets, including:
   - Guiderails and cables
   - Retaining walls and fences

   This data will also support AM planning and communication. The Town is encouraged to continue to close gaps in relevant data such as asset install years.

3. **Merge storm resiliency data to asset inventory for LOS reporting.**
   O.Reg. 588/17 requires reporting of percentage of the municipal stormwater management system resilient to a 5-year storm. For this AM Plan, a data set was not available to merge with the asset inventory and asset replacement values, as would be required to report percentage of assets (by replacement value) resilient to a 5-year storm. To enable reporting on this LOS metric in the next iteration of the AM Plan, it is recommended that the storm resiliency data be merged into the asset inventory.

   In addition, complete a condition assessment of stormwater assets to fill gaps in condition data. Based on the condition assessment, develop a plan for renewing the assets.

4. **Collect inventory data and assess condition of vertical process equipment.**
   For this AM Plan, vertical facility inventories were captured based on rolled-up single values reported within the TCA register (i.e. not broken down by detailed components). To help identify the true renewal needs and replacement costs of vertical facilities in the future, it is recommended that the Town undergo an exercise to collate an asset register, broken down by component, for their vertical facilities.

5. **Establish a centralized asset register and update processes and listings of AM improvement needs.**
   For the development of the AM Plan, multiple inventory sources were used – all which had inconsistencies in data formatting and reporting. It is recommended that the Town establish an inventory update process to ensure a centralized asset register is easily retrieved and updated for future iterations of the AM Plan.

   In addition, as asset needs are identified (i.e. from CCTV inspections, Roads Needs Study, OSIM Studies etc.), they should be recorded in a centralized location for tracking, prioritization and resourcing. Each identified need should indicate the source or justification of the need (for example Strategic Plan, Master Plan, Council direction or public complaints), an estimated cost to resolve the need, the risk exposure associated with not addressing the need, and the estimated cost of resolving the need. A status field should indicate whether needs have been resourced (turned into capital projects) or resolved.

   This AM needs registry will support future iterations of the AM Plan, annual AM Plan monitoring, and annual budgeting and prioritization.

Appendix A Regulatory Compliance

The following chart represents the Town's position with respect to the asset management requirements identified in O.Reg. 588/17 for Core Assets (July 1, 2022).

Table A-1: Compliance with O. Reg. 588/17 (Phase 1 Deadline)

Plan Section	O.Reg. 588/17 Compliance Practices (Current LOS)	Transportation Services assets	Stormwater Service assets	Water Service assets	Wastewater Service assets
State of Local Infrastructure	For each asset category, the AM Plan provides • a summary of the assets, • the replacement cost of the assets, • the average age of the assets, • the condition of the assets, • the approach to assessing condition of assets.	Section 2 Section 3	Section 2 Section 3	Section 2 Section 3	**Section 2** **Section 3**
Levels of Service	For each asset category, the AM Plan reports the current LOS performance. For core assets, the AM Plan provides the qualitative community descriptions and technical metrics as required by O.Reg. 588/17, and the current performance.	Section 4	Section 4	Section 4	Section 4
Asset Management Strategy	For each asset category, the AM Plan provides the lifecycle activities that would need to be undertaken to provide the proposed LOS for each of the next 10 years.	Section 6	Section 6	Section 6	Section 6
Financial Strategy	A description of assumptions regarding future changes in population or economic activity. For each asset category, the AM Plan provides the costs of providing the lifecycle activities that would need to be undertaken to maintain the current LOS for each of the next 10 years.	Section 7	Section 7	Section 7	Section 7
Background Information	The AM Plan indicates how the background information and reports upon which the state of infrastructure section is based will be made available to the public.	Section 1	Section 1	Section 1	Section 1