2022

ASSET MANAGEMENT PLAN

For CORE INFRASTRUCTURE

TOWN OF GRIMSBY

TOWN OF GRIMSBY

Executive Summary

Introduction

The Town of Grimsby is a growing community in Niagara driven by a mix of residential, light industrial, commercial, and agricultural activities. It relies on a range of assets to deliver a variety of services to the community. As these assets age, and demands on the infrastructure increase, the Town manages the challenge of ensuring the needs of the community are effectively met with the limited resources available.

The 2022 Asset Management (AM) Plan describes the actions required for the Town to manage its core portfolio of assets in a way that supports current service levels while managing risks and costs. It supports the following principle guiding the Town's strategic priorities by establishing transparency and sustainable financial management of the Town's limited resources to deliver services.

> Guiding Principle: We build trust with our community through meaningful communication, transparency, leading financial management and responsive service.

The Town's goals and objectives of transparency and responsive service align with Ontario Regulation (O.Reg.) 588/17 Asset Management Planning for Municipal Infrastructure, which requires municipalities to demonstrate financial sustainability through the AM Plan by identifying the forecasted expenditures to maintain current services levels. This AM Plan fulfils year 2022 requirements for core assets, which is defined as any municipal infrastructure asset that is a road, structure (bridge or culvert), water asset, wastewater asset, or stormwater asset. This AM Plan also covers retaining walls and other road-related assets such as sidewalks, streetlights, traffic signals, and traffic signs, which are categorized with roads and structures under the Transportation service.

State of the Infrastructure

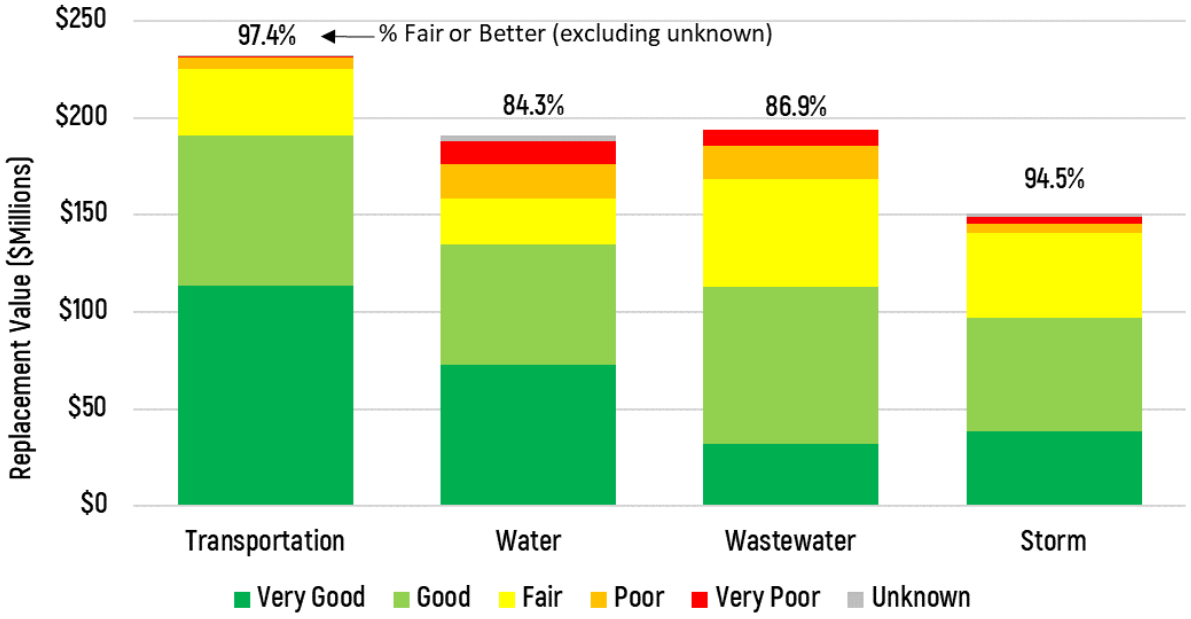
The Town's first step in developing the AM Plan is understanding the assets that it owns. As shown in Table ES-1, the estimated replacement value of the Town's core assets is $768.4 million, with transportation assets accounting for 30.3% of the core asset portfolio. All values in the AM Plan are reported in 2022 dollars.

Table ES-1: Replacement Value of Town Core Assets ($M)

Service	Replacement Value	Percentage of Total
Transportation	$232.5	30.3%
Storm	$150.8	19.6%
Wastewater	$193.8	25.2%
Water	$191.3	24.9%
Total	**$768.4**	**100.0%**

The Town's core assets are generally in good condition, as shown in the condition distribution in Figure ES-1. 90.2% of the Town's assets are estimated to be in Fair condition or better. The condition of the Town's assets informs the timing of required lifecycle activities to maintain service levels. Assets in Poor and Very Poor condition represent 9.0% ($69.1 million) of the core asset portfolio. The condition estimates are supported through detailed inspection programs such as the Road Needs Study, Ontario Structure Inspection Manual (OSIM) inspections on structures, CCTV inspections for sewers, break history tracking for watermains, and data on each asset's age and estimated service life. Water assets have a higher proportion of very poor assets due to the cast iron and ductile iron pipes which have a shorter estimated service life and are being replaced by the Town with longer-lasting PVC pipes.

Figure ES-1: Condition Overview – All Services



Levels of Service

Levels of Service (LOS) builds on the State of Infrastructure by defining the performance that the Town's assets are expected to deliver over their service lives. LOS measures include those defined by O.Reg. 588/17, as well as measures defined by the Town to support achievement of the Town's higher level strategic priorities. In general, the LOS measures can be classified into the following three categories:

- Capacity & Use LOS demonstrate if services have enough capacity and are accessible to the customers.
- Functional LOS demonstrate if services meet the community's needs and meet their intended or required purpose.
- Reliability LOS demonstrate if services are reliable and responsive to customers. These LOS measures focus on ensuring that assets are kept in a state of good repair.

Understanding current service levels on measures such as the average pavement condition index sets the foundation for developing appropriate proposed service levels per O.Reg. 588/17 by 2025 that consider the associated costs and risks.

Risk Management Strategy

A key asset management principle is to manage risk while meeting service levels and minimizing lifecycle costs. Providing lower service levels typically results in lower immediate costs, but is associated with higher risk and potentially higher costs in the long term. Understanding the risk exposure from each asset informs the Town on which projects to prioritize across asset classes and service areas. To understand the current risk exposure of its assets, the Town's preliminary risk strategy estimates the reliability-related risk exposure of its assets, determined from the multiplication of two factors:

Risk Exposure = Consequence of Failure x Likelihood of Failure

Consequence of Failure, or criticality, is evaluated based on an asset failure's impact on health and safety, service delivery, the Town's financial position, the Town's reputation, and the environment. Likelihood of failure (LoF) is the probability that an asset failure may occur, and is based on the estimated condition of the asset.

The Town has developed preliminary risk assessments through continuous improvement asset management initiatives over the past few years, and these risk assessments were further refined through development of this AM Plan. The Town takes advantage of specific asset data maintained through its Geographical Information System (GIS), which assigns LoF, CoF, and overall risk scores to each asset. This approach includes a geospatial analysis that considers an asset's proximity to different property types to assist in determining the criticality of each asset. For example, a road experiencing more daily traffic (e.g. in the downtown area, near a hospital or school, etc.) would be considered more critical than a low travelled road (e.g. serving a rural area).

$4.3 million (0.6%) of the Town's assets are currently in the Very High risk category. These assets consist mainly of older cast iron and ductile iron watermains servicing critical areas. The Town mitigates this risk through the watermain replacement program, as part of the asset Lifecycle Management Strategy.

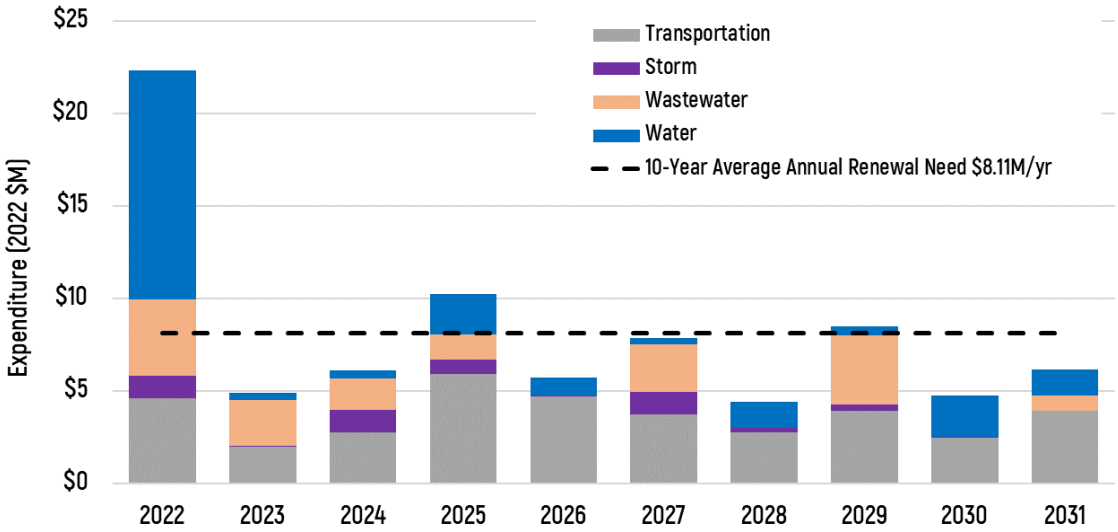
Lifecycle Management Strategy

Asset lifecycle management strategies are the planned activities that enable assets to provide service levels in a sustainable way, while managing risks. Lifecycle strategies include new infrastructure assets to meet capacity needs, asset upgrades to meet functional needs, and repairing and renewing existing assets to maintain asset reliability.

The Town performs a wide range of inspections, cleaning, flushing, and repair activities to ensure that its infrastructure continues to perform reliably. These operations and maintenance (O&M) activities are funded through the Town's Operating Budget. Lifecycle activities also include renewal (rehabilitation and replacement) activities funded through the Capital Budget. This would include things like road reconstruction and pipe replacement projects, that when completed, reduce risks to acceptable levels. Rehabilitation strategies such as road resurfacing and pipe relining will extend asset service lives and ultimately lead to lower overall lifecycle costs. Capital renewal needs are informed by detailed studies such as the Road Needs Study and Ontario Structural Inspection Manual (OSIM) inspections, as well as the current condition and estimated service lives of each asset. The lifecycle strategies address higher risks and ensure that critical asset needs are prioritized over less critical asset needs. Less critical assets such as driveway culverts and water services can be scheduled with road and watermain replacements to take advantage of cost savings by bundling work and minimizing disruptions to the public.

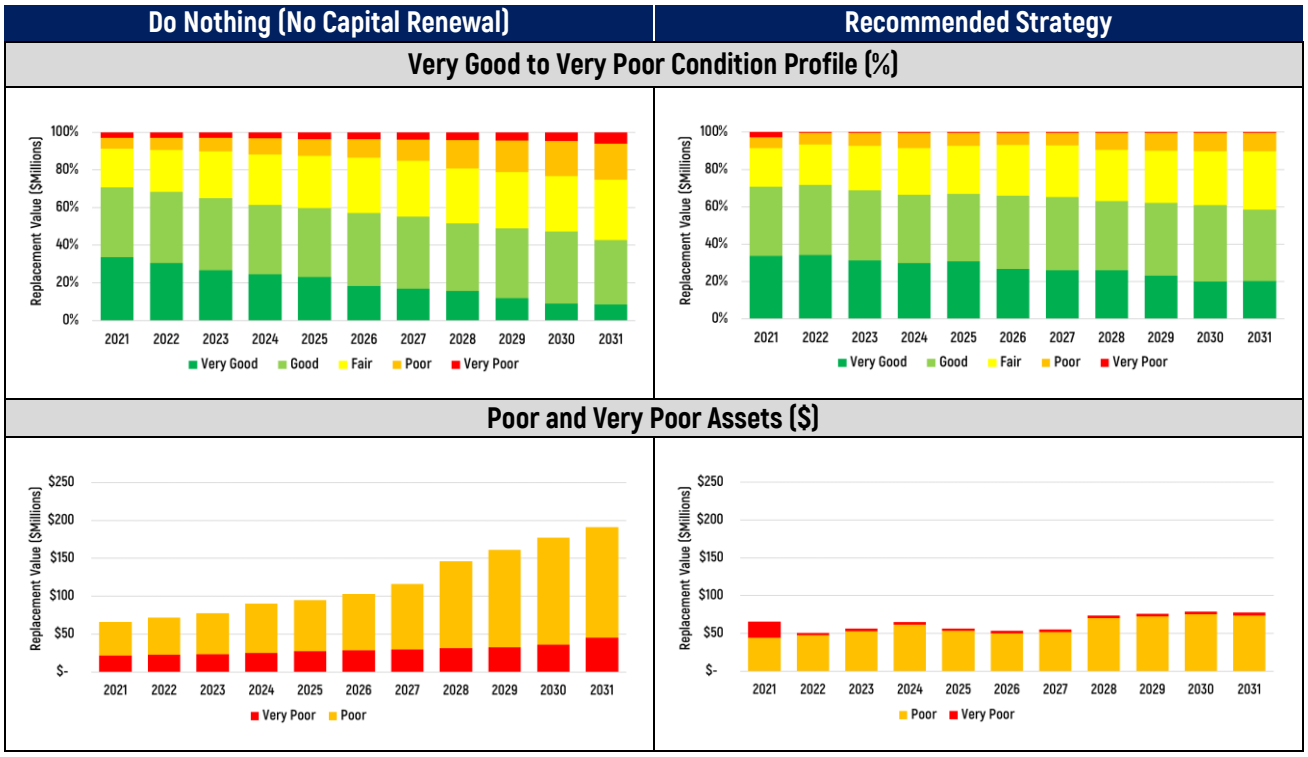
The forecasted cost for renewal across the core assets is estimated at an average of $8.11 million per year over the next 10 years, as shown in Figure ES-2. The 2022 forecasted expenditure includes the backlog of assets that are past their estimated end-of-life, such as older cast iron and ductile iron watermains that are overdue for replacement.

Figure ES-2: 10-Year Capital Renewal Needs Forecast



If the Town does not invest in renewing its infrastructure, there is potential for significant deterioration in asset condition over time. The recommended asset management strategy, as shown in Figure ES-3, ensures that the Town's core assets are maintained and renewed in a state of good repair. With the recommended strategy, the percentage of assets in fair or better is relatively stable at around 90% over the forecast. If no capital investments are made, the value of assets in Poor and Very Poor would increase from $66 million to $191 million by 2031.

Figure ES-3: Asset Condition Forecast Comparison – Do Nothing versus Recommended Strategy



Climate change will likely increase the Town's asset risk exposure, requiring the Town to incorporate more frequent or additional strategies to mitigate risk. For core assets, one of the Town's main initiatives for climate change

adaptation is carrying out an inflow and infiltration study to fully develop the scope of the I&I reduction strategy recommendations from the Baker Road WWTP Pollution Prevention and Control Plan (PPCP). The Baker Road PPCP developed these recommendations in consideration of system resiliency and network vulnerability to climate change related failures such as flooding.

Financial Strategy

The financial strategy is informed by the preceding sections of the AM 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 recommended asset lifecycle strategies, and the affordability of maintaining current service levels.

The Town's capital and operating budgets are proposed with careful line-of-sight to financial sustainability and affordability for the Town's residents and businesses, and considers a range of funding sources including property tax, debt, grants, user fees, and development charges. Reserve contributions sustain reserve balances at appropriate levels to address future infrastructure renewal costs and inherent uncertainties in capital funding needs.

For capital renewal, the water assets are estimated to be fully funded but there are significant funding shortfalls estimated for the Town's transportation assets to maintain service levels over the next 10 years, as summarized in Table ES-2. The estimated amount of funding available is based on the 5-year Capital Budget, with years 6 to 10 generally assumed to continue at the same level of funding.

Table ES-2 Summary of Capital Renewal Estimated Funding Gaps ($M)**

Service	Average Annual Need	Average Annual Funding Available	Percentage of Needs Funded	Average Annual Gap
Transportation	$3.69	$2.49	67%	$1.20
Storm	$0.51	$0.47	91%	$0.04
Wastewater (Sewers only)	$0.55	$0.34	62%	$0.21
Wastewater (Baker Road PPCP Projects)	$1.13	$0.56*	50%*	$0.57*
Water	$2.23	$2.37	Fully Funded	-$0.14

*assumes 50% funded by Region's Combined Sewer Overflow Control Program
**Gap plus Funding Available may not total Annual Need due to rounding

Renewal of transportation assets is estimated to be 67% funded over the next 10 years ($2.49 million per year budget versus $3.69 million per year need), representing an average annual gap of $1.20 million per year.

For wastewater related assets, the main potential funding gap relates to the Baker Road PPCP recommendations, as 50% of the costs will need to be funded outside of the Region's Combined Sewer Overflow (CSO) Control Program. The magnitude of this funding gap is estimated at an average or $0.57 million per year over the next 10 years, but the true needs and associated shortfall will be better understood after the completion of inflow and infiltration studies.

Strategies that may be considered in closing the funding gaps and addressing pressures on operating budgets include increasing available funding sources such as property tax, debt, or drawing down on reserves. The Town focuses on strategies that minimize the financial impacts on residents by maximizing external revenue sources. The Town may also consider dedicated user fees to recover the full cost of wastewater and stormwater services. Continued review of newer and less expensive renewal strategies such as pipe lining will further extend asset life and may reduce the forecasted need. For the remaining unfunded amounts, the Town may decide to defer renewals on lower risk assets by adjusting risk tolerance and accepting lower service levels.

The Town can consider one or a mix of approaches to close or accept the funding gap. The Town will be able to gain a more holistic understanding of needs and the funding shortfall when non-core assets are included in the next AM Plan, such as fleet, information technology, facilities, and parks.

The Town's goals and objectives of transparent and responsible decision-making aligns with O.Reg. 588/17, which requires municipalities to demonstrate financial sustainability through the AM Plan. This AM Plan is proactive in setting the stage for meeting O.Reg. 588/17 requirements for year 2025 by identifying the potential funding shortfalls above. This proactive approach enables the Town to start the needed discussions on the affordability of current service levels such that it will be able to determine the appropriate service levels for the Town by year 2025 that effectively balances the associated costs and risks along with Council and community priorities.

Monitoring and Improvement

Development of AM Plans is an iterative process that includes improving data, processes, systems, staff skills, and organizational culture over time. General improvements include refining lifecycle strategies as data is collected on asset lifecycles and treatment benefits. Data collection and tracking will be greatly improved through the procurement and implementation of the Computerized Maintenance Management and Enterprise Asset Management System. Other improvements include completing CCTV inspections for storm sewers, calibrating risk scoring across asset classes and service areas, and extending capital budget forecasts to ten years. The next AM Plan should also consider the recommendations from on-going and future initiatives such as the inflow & infiltration studies and the Transportation Master Plan. These and other improvements will continue to refine the 10-year forecasted outlook, and support the Town in demonstrating financial sustainability and in continuing to deliver services that maintain the trust and confidence of the community.

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1 Introduction

The Town of Grimsby (Town) is located in Niagara between Lake Ontario and the Niagara Escarpment with a population of approximately 28,883. Its economy is driven by a mix of residential, light industrial, commercial, and agricultural activities. The Town is responsible for providing a range of services including core services, to its community to support the local lifestyle and economy. The ability to deliver these services at the required levels depends on the performance and condition of the respective core assets. These assets include local roads, bridges and culverts, stormwater collection systems and management facilities, water distribution systems, and wastewater collection systems.

The AM Plan directly supports one of the Town's main guiding principles:
We build trust with our community through meaningful communication, transparency, leading financial management and responsive service.

As infrastructure ages and demands on the infrastructure increase, the Town manages 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 this challenge by providing a framework for prioritizing Asset Management (AM) efforts and providing direction for effective management of the Town's assets to best achieve expected goals and objectives. As an integrated Plan, it considers the lifecycles and needs of the infrastructure assets within the AM Plan's scope, providing a sustainable and holistic view of the Town's asset portfolios. The AM Plan helps the Town achieve its Strategic Priorities related to Accountability and Transparency.

1.1 Purpose of the Plan

The 2022 AM Plan describes the actions required to manage the Town's "core" portfolio of assets in a way that supports current service levels, while managing risks and costs. It establishes transparency and prudent financial management of limited resources. The Town's core assets include roads, bridges and culverts, stormwater management infrastructure, and water and wastewater systems. This AM Plan also includes sidewalks and other transportation assets considered an integral part of the roadway. The 2022 AM Plan focuses on the 10-year period from 2022 to 2031 and provides a framework for continuously improving the Town's AM practices.

1.2 Alignment with Regulatory Requirements

This AM Plan fulfils the Phase 1 requirements of Ontario Regulation (O.Reg.) 588/17 Asset Management Planning for Municipal Infrastructure for AM Plans for core assets. Specifically, this AM Plan establishes current Levels of Service (LOS) and recommends actions and financial strategies to maintain current service levels within an acceptable level of risk over the next 10 years. Proposed Levels of Service with target performance levels will be included in future updates to this AM Plan to meet year 2025 O.Reg. 588/17 requirements. For details on how this AM Plan complies with content requirements defined by O.Reg. 588/17, refer to Section 7. Development of AM Plans is an iterative process that requires improving processes, data, systems, and staff skills over time to continuously increase confidence in the outputs and forecasts of the AM Plan.

1.3 The Town's Asset Management Program

In December of 2016, the Town established an Asset Management Team (AMT). The AMT allows for collaboration across all departments to meet the asset management goals for the Town. In 2018, the Town developed its Strategic Asset Management Plan (SAMP) and AM Policy as stand-alone documents in line with International best practices. The SAMP helps guide the Town's Asset Management System and defines how the objectives of the AM Policy will be realized in the tactical AM Plan. These documents form a "Line of Sight" or link in the AM System between the high

level corporate vision and strategy to the tactical level of the AM Plan and operational strategies, as shown in Figure 1-1.

Figure 1-1: Town's Asset Management System

The AM Plan provides a framework to validate the Town's budgeting processes and assists in prioritizing work activities, including capital projects, based on risk while supporting the Town's strategic priorities. AM Planning is a key tactical (medium term) planning activity that relies on input from strategic planning activities and informs shorter-term decision making. The AM Plan is intended to be read with other Town planning documents, including the following:

- Town Official Plan
- Council's Strategic Priorities 2019-2022
- Strategic Asset Management Plan
- Asset Management Policy
- Operating and Capital Budgets
- Baker Road WWTP Pollution Prevention and Control Plan and Master Servicing Plan

1.4 Supporting Growth at the Town

The Town monitors trends in its population to ensure that its impacts on service levels are well understood and that strategies are developed to address additional demands due to growth and changes in demographics. Per the Region of Niagara's Official Plan and updated with recent data from the 2021 Census, the Town's population is expected to increase from 28,883 in 2021 to 29,400 in 2031, as shown in Table 1-1. Employment is currently at 8,120 jobs, and is expected to reach 8,550 jobs by 2031. The Region's draft 2022 Official Plan projects a population of 37,000 in year 2051.

Table 1-1: Town Population History and Forecast to 2051

Year	Population	Employment
2006	23,900	7,380
2011	25,900	7,880
2016	27,100	8,060
2021	27,900 (28,883*)	8,120
2026	28,400	8,310
2031	29,400	8,550
2051	37,000**	14,960**

*Population from the 2021 Census

**2051 population and employment from the draft 2022 Region of Niagara Official Plan

1.5 AM Plan Scope

This AM Plan includes all core assets owned by the Town and for which asset data was available, and provides recommendations for the period 2022-2031, inclusive. Where data gaps were encountered, recommendations for closing data gaps are provided. These recommendations will enable the Town to continually improve its AM planning capabilities. All values and forecasts are estimated in 2022 dollars.

1.6 Asset Hierarchy and Data Sources

The AM Plan discusses the Town's assets by the service areas the assets support. Table 1-2 summarizes the service areas and their link to associated assets. It also summarizes the main data sources used for the asset inventory, replacement cost, and condition data.

Table 1-2: Asset Hierarchy and Data Sources

Asset Category	Inventory Source	Replacement Cost	Condition
Transportation			
Roads	GIS geodatabase	Road Needs Study & Unit Construction Costs	PCI based on Road Needs Study
Structures *	MS Access Database	OSIM Report	BCI based on OSIM Reports
Traffic Signals	MS Excel	Unit Construction Costs	Age-based
Sidewalks	GIS geodatabase	Unit Construction Costs	Age-based
Streetlights	GIS geodatabase	Unit Construction Costs	Age-based
Traffic Signs	GIS geodatabase	Unit Construction Costs	GIS condition attribute (only for regulatory signs)
Stormwater			
Storm Sewers	GIS geodatabase	Unit Construction Costs	Age-based
Laterals	GIS geodatabase	Unit Construction Costs	Age-based
Catchbasins	GIS geodatabase	Unit Construction Costs	Age-based
Maintenance Holes	GIS geodatabase	Unit Construction Costs	Age-based
Oil Grit Separators	GIS geodatabase	Unit Construction Costs	Age-based
Storm Ponds	GIS geodatabase	Included in other asset categories	Age-based
Storm Culverts	GIS geodatabase	Unit Construction Costs	Age-based

Asset Category	Inventory Source	Replacement Cost	Condition
Water			
Watermains	GIS geodatabase	Unit Construction Costs	Break history and age-based (if no breaks: only age-based)
Laterals	GIS geodatabase	Unit Construction Costs	Age-based
Hydrants	GIS geodatabase	Unit Construction Costs	Age-based
Valve Chambers	GIS geodatabase	Unit Construction Costs	Age-based
Valves	GIS geodatabase	Unit Construction Costs	Age-based
Pressure Control Valves	GIS geodatabase	Unit Construction Costs	Age-based
Water Meters	MS Excel	Unit Construction Costs	Age-based
Bulk Water Station	GIS geodatabase	Unit Construction Costs	Age-based
Wastewater			
Sanitary Sewers	GIS geodatabase	Unit Construction Costs	CCTV structural rating (if no CCTV: age-based)
Laterals	GIS geodatabase	Unit Construction Costs	Age-based
Maintenance Holes	GIS geodatabase	Unit Construction Costs	Age-based

*includes road, pedestrian bridges (not including those in parks), and culverts greater than or equal to 3 metres in span, and retaining walls

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:
  Summarizes key findings and recommendations of the AM Plan.
- Chapter 1 – Introduction:
  Outlines scope, background information, relationship to other Municipal documents and plans, and applicable legislation
- Chapter 2 – State of the Infrastructure:
  Summarizes the inventory, condition, and remaining life of the assets in the inventory by service and asset type
- Chapter 3 – Levels of Service:
  Defines levels of service through performance indicators and targets, and outlines current performance
- Chapter 4 – Risk Management Strategy:
  Defines the framework for identifying critical assets and quantifying risk to enable prioritization of lifecycle activities
- Chapter 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
- Chapter 6 – Expenditure Forecasts and Financing Plan:
  Summarizes the financial planning and budgeting associated with asset management planning
- Chapter 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.

2 State of the Infrastructure

2.1 Overview

The Town provides a range of services to its residents, businesses and visitors, including core services that rely on Town roads, bridges and culverts, stormwater infrastructure, water distribution assets, and wastewater collection. Understanding the value, age, and condition of its assets is the starting point for a municipality to develop a plan for managing them. The replacement value of an asset represents the expected cost to replace an asset to the same functional standard with a 'like for like' new version based on current market conditions and construction standards. Replacement value estimates assume that replacements are conducted as part of planned and bundled capital projects where applicable, rather than as individual unplanned replacements, which would typically be more costly. Table 2-1 provides a breakdown of the replacement value of assets by service area.

Table 2-1: Replacement Value of Town Core Assets ($M)

Service	Replacement Value	Percentage of Total
Transportation	$232.5	30.3%
Storm	$150.8	19.6%
Wastewater	$193.8	25.2%
Water	$191.3	24.9%
Total	**$768.4**	**100.0%**

The Town's portfolio of core assets has an estimated replacement value of $768.4 million (2022$). Transportation assets account for 30.3% of the core asset portfolio.

Understanding an asset's remaining life and current condition informs the timing of required lifecycle activities to maintain quality and reliability-related service levels. Using observed asset conditions through inspection programs provides a higher degree of confidence in the state of the assets, more than what is provided in a strictly age-based analysis. Observed conditions are used in this AM Plan where such data is available. When observed condition data is not availabe, the remaining life is determined by estimating a useful life for each asset and comparing this value to its age. The observed condition, or age-based condition, is then expressed on a Very Good to Very Poor rating scale as defined in Table 2-2, aligned with the International Infrastructure Management Manual's (IIMM) 5-point condition scale.

Table 2-2: Condition Grading Criteria

Condition	Condition Criteria
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.
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.
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.
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.
Very Poor	Asset is physically unsound and/or not performing as originally intended. Asset has higher likelihood of failure or failure is imminent. Maintenance costs are unacceptable, and rehabilitation is not cost effective. Replacement / major refurbishment is required.

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

- Roads, based on the 2019 Road Needs Study Report
- Bridges and Culverts, based on the 2021 OSIM Inspection Reports
- Signs (regulatory only), based on the GIS geodatabase with inspection data
- Watermains, based on both break history and age
- Sanitary sewers, based on CCTV inspection structural ratings

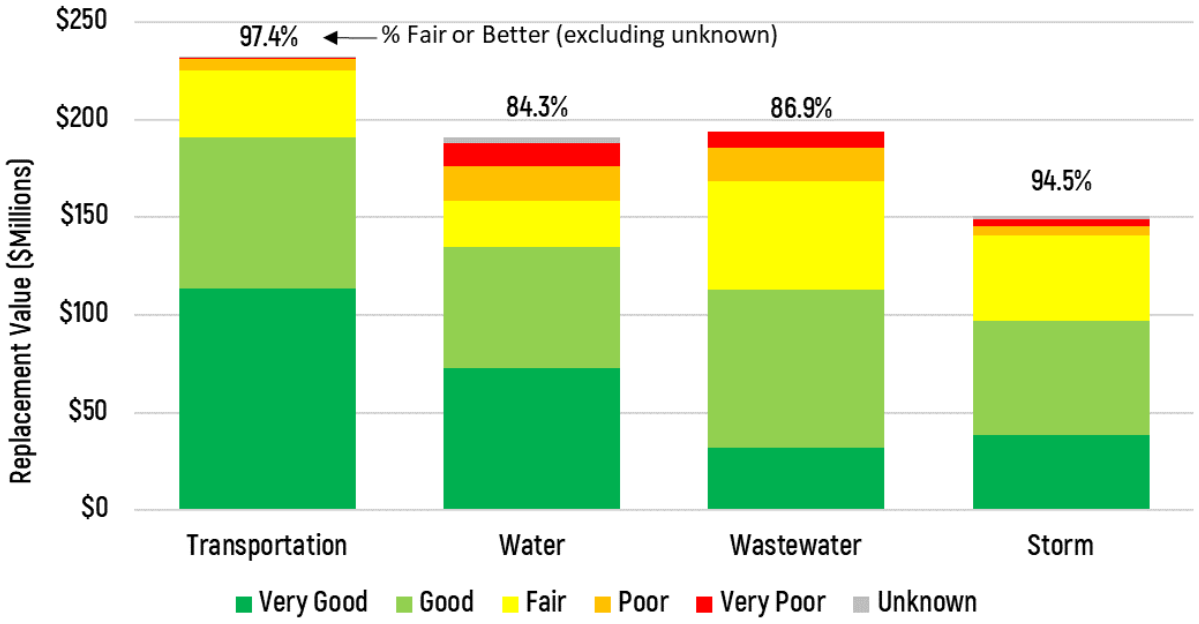
For the remaining assets, condition was estimated based on age and estimated service life. Table 2-3 summarizes how the five-point scores from Very Good to Very Poor were determined for the age-based assessment. Additional details about observed conditions such as Pavement Condition Index (PCI) and Bridge Condition Index (BCI) and how they are mapped using the five-point scale, are discussed in further in Sections 2.2 to 2.5.

Table 2-3: Conversion Table for Age-Based Condition

Condition Grade	% Remaining Service Life
Very Good	>75 – 100%
Good	>50 – 75%
Fair	>25 – 50%
Poor	>0 – 25%
Very Poor	<= 0%

The condition distribution of the Town's core assets is shown in Figure 2-1. 90.2% ($693.2 million) of the Town's assets are estimated to be in Fair condition or better where condition could be estimated, and conversely, 9.0% ($69.1 million) of assets are estimated in Poor or Very Poor condition. Assets in Very Poor condition are overdue or due in the current year (2022) for rehabilitation or replacement. 0.8% ($6.0 million) of assets were not estimated for condition mainly due to missing installation dates for less critical assets such as stormwater culverts and water meters.

Figure 2-1: Condition Overview by Services



2.2 Transportation

Transportation assets include roads, structures (bridges, culverts and retaining walls), traffic signals, sidewalks, streetlights, and traffic signs. By value, roads account for $179.4M (77%) of the $232.5M estimated replacement value of the Town's transportation assets. Table 2-4 below shows a detailed breakdown of the quantity and estimated

replacement value of each asset type within the Town's Transportation asset portfolio. 59% of roads, by centreline km, are considered rural or semi-urban roads. A breakdown of arterial, collector, and local roads is provided in the Levels of Service discussion in Table 3-1 in Section 3.5.1. The majority of roads (70% by length) are local roads. Structures include those that were evaluated as part of the 2021 OSIM inspections and consist of 10 road bridges, 10 structural culverts, 8 retaining walls, and one pedestrian bridge. Park pedestrian bridges will be considered in the next AM Plan with the Town's non-core assets.

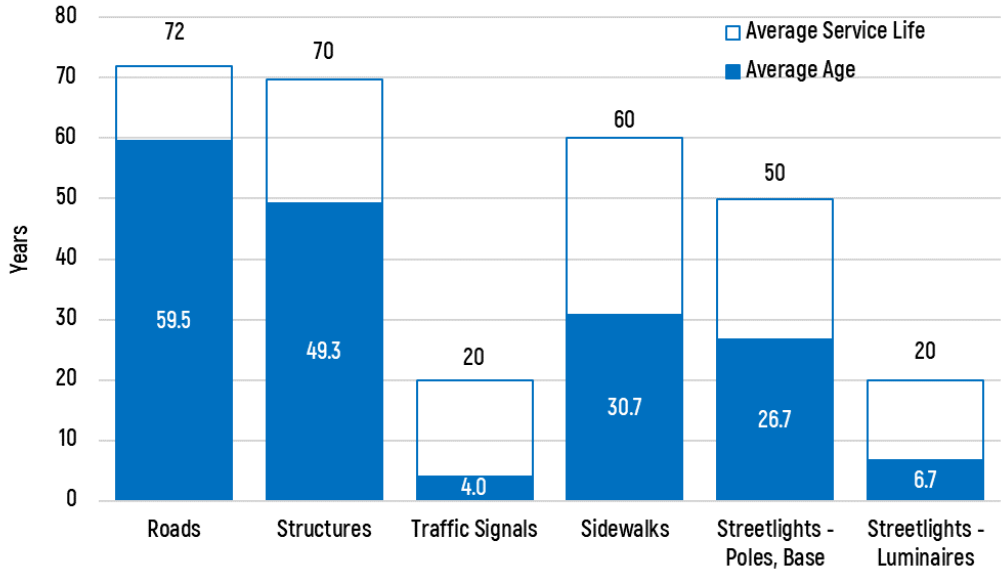
Table 2-4: Inventory of Transportation Assets

Asset Category	Quantity	Unit	Replacement Value
Roads	175.5	centreline km	$179.4
Structures	28	asset	$24.1
Traffic Signals	2	asset	$0.2
Sidewalks	93.8	km	$22.1
Streetlights	3940	asset	$4.9
Traffic Signs	4918	asset	$1.8
Total			**$232.5**

2.2.1 Asset Age

The average age and estimated service life of the Town's transportation assets, weighted by replacement value, is summarized in Figure 2-2. On average, the Town's sidewalk assets are approximately mid-life, and roads and structures are past mid-life. Road construction year data has not been historically tracked and is estimated in this AM Plan based on the construction year of the oldest house/building on that road. The age may be overstated as historical road reconstruction data is not currently available. For streetlights, luminaires are separated from the pole and base to show their differing service lives. Signs are replaced regularly as needed through the Operating Budget. Historical sign installation dates are not tracked but are currently being documented going forward.

Figure 2-2: Average Age – Transportation Assets



2.2.2 Asset Condition

A 2019 Road Needs Study was conducted to identify deficiencies in the network and identify renewal strategies to maintain service levels. An overall PCI was calculated for each road segment to represent the road condition based on a survey of the number and types of distresses on each pavement segment. Asphalt roads were inspected for distresses such as distortion, ravelling, and transverse cracking. Surface treated road distresses included distortion, rutting, and edge cracking. Descriptions for each of the PCI rating categories and the mapping of PCI to the five-point condition scale is provided in Table 2-5.

Table 2-5: Road Pavement Condition Description

Condition Grade	PCI	Road Condition Description	
Very Good	76 to 100	The road segment is relatively new, or recently reconstructed. There are no visible cracks and no structural issues. The ride is smooth.	
Good	61 to 75	The road segment is starting to exhibit few, if any, signs of surface deterioration, random cracks, and rutting. The ride is relatively smooth.	
Fair	51 to 60	The road segment is exhibiting signs of surface deterioration, random cracks, rutting, and some patching of surface defects. The ride is becoming rough.	
Poor	31 to 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 is uncomfortable.	
Very Poor	0 to 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.	

In accordance with O.Reg. 104/97: Standards for Bridges, the Town conducts detailed Ontario Structure Inspection Manual (OSIM) inspections of its municipal structures every two years. An overall Bridge Condition Index (BCI) is calculated from the inspection data and informs the rehabilitation and reconstruction program. Descriptions for each of the BCI rating categories is provided in Table 2-6 with example photos of good and fair condition bridges.

Table 2-6: Structure Condition Description

Condition Grade	BCI	Structure Condition Description
Very Good	80 to 100	Overall the components of the structure are in very good condition. Generally the structure has been constructed within the last 10 years and does not require any work within the next 10 years.
Good	70 to 79	Overall the components of the structure are in good condition. Generally the structure is adequate or requires only minor maintenance within the next 10 years.
Fair	60 to 69	Overall the components of the structure are in fair condition. Generally the structure requires major rehab or replacement within the next 10 years, or requires a Condition Survey (C/S), Load Capacity Evaluation (LCE) or Rehabilitation/Replacement Analysis (RRA).
Poor	40 to 59	Overall the components of the structure are in poor condition. Generally the structure requires replacement within the next 5 years.
Very Poor	0 to 39	Overall the components of the structure are in very poor condition. Generally the structure requires replacement within the next 5 years.

The asset condition for sidewalks, signals, and streetlights is rated based on age and estimated service life, as outlined previously in Figure 2-2.

The condition distribution of the Town's Transportation assets is summarized in Figure 2-3. The figure shows the relative replacement value by asset category, and the proportion of assets by condition grade. All transportation assets are generally in good condition, with over 80% of assets in fair or better condition in each category. The condition profile for signals and signs are not easily visible in Figure 2-3 and the value of assets in each condition rating is provided in tabular format in Table 2-7. Sign condition was estimated based on reflectivity assessments completed in 2021 for regulatory and warning signs, of which only 1.7% did not meet the reflectivity requirements. All reflectivity issues have since been addressed. All other signs are not estimated for condition, as installation dates prior to 2010 were generally not tracked.

Figure 2-3: Condition Overview by Replacement Value – Transportation

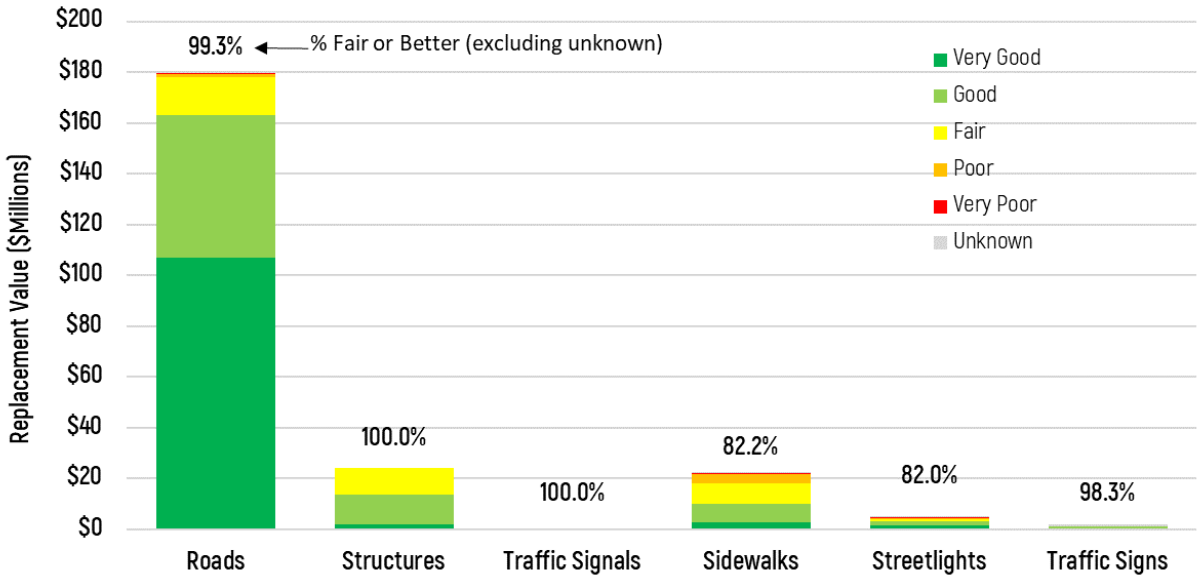


Table 2-7: Condition Overview by Replacement Value (Table Format) – Transportation ($M)

Asset Category	Very Good	Good	Fair	Poor	Very Poor	Unknown	Total
Roads	$106.8	$56.5	$15.0	$1.0	$0.2	$0.0	$179.4
Structures	$1.9	$11.6	$10.5	$0.0	$0.0	$0.0	$23.0
Traffic Signals	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.2
Sidewalks	$3.0	$7.1	$8.0	$3.8	$0.2	$0.1	$22.1
Streetlights	$1.6	$1.5	$0.8	$0.7	$0.1	$0.2	$4.9
Traffic Signs	$0.0	$1.0	$0.0	$0.0	$0.0	$0.7	$1.8
Total*	**$113.5**	**$77.8**	**$34.3**	**$5.6**	**$0.4**	**$1.0**	**$232.5**

*Totals may not add up due to rounding

2.3 Stormwater

Assets that support stormwater management include storm sewers, laterals, catchbasins, maintenance holes, oil grit separators, stormwater management ponds, and stormwater culverts. Table 2-8 shows the estimated replacement value of the Town's stormwater management system as $150.8 million, and includes a breakdown of the inventory by asset category. Most storm sewers are concrete with a median size of 375mm. Stormwater culverts consist of both driveway and cross culverts and are mainly corrugated steel pipe. The median size of stormwater culverts is 300mm, and for estimating replacement value, culverts with an unknown diameter are also assumed to be 300mm.

The physical infrastructure associated with stormwater ponds, separate from the initial excavation and site work, is covered by the other stormwater asset categories, such as sewers, catchbasins, and culverts. Therefore, as the remaining part of the pond is mainly the excavated area for the pond itself, similar to a natural area, it is assumed that the pond service life is infinite and will not require replacement. Therefore a replacement value and condition estimate are not determined separately for stormwater management ponds. Dredging for cleanout of wet ponds and the associated costs are considered as part of the lifecycle strategies in Section 5.

Table 2-8: Inventory of Stormwater Assets

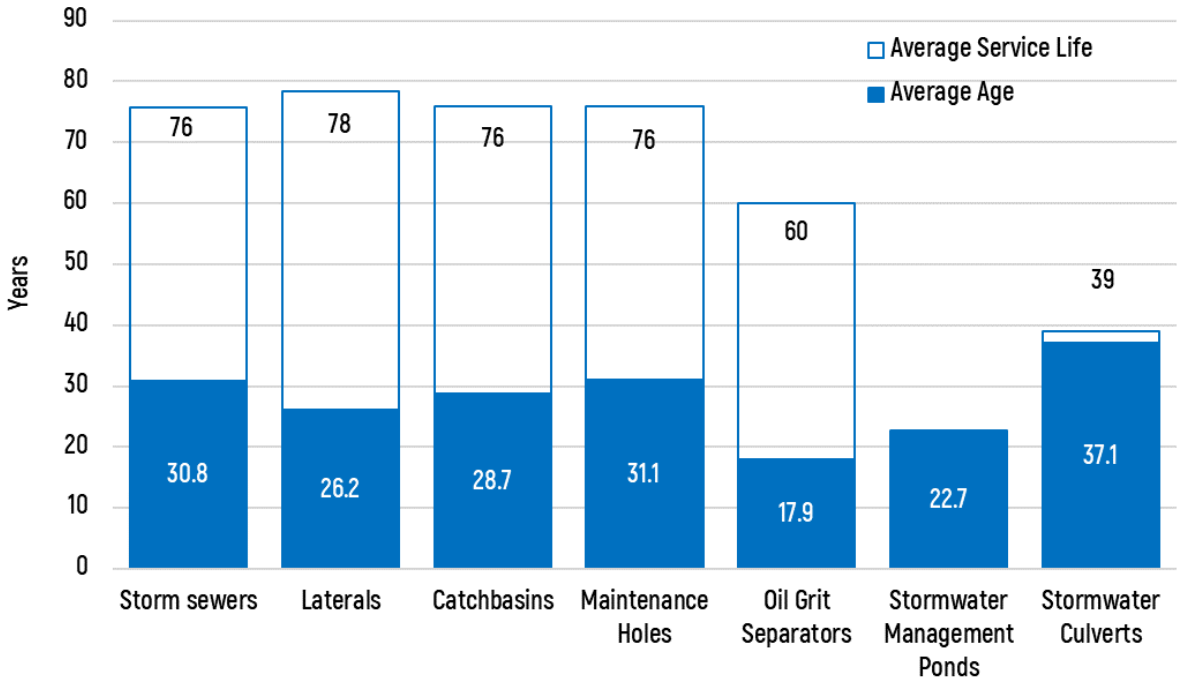
Asset Category	Quantity	Unit	Replacement Value
Storm Sewers	104.9	km	$106.2
Laterals	41.0	km	$16.9
Catchbasins	2218	asset	$6.7
Maintenance Holes	1248	asset	$12.5
Oil Grit Separators	18	asset	$1.3
Stormwater Management Ponds	9	asset	-
Stormwater Culverts	25.1	km	$7.3
Total*			**$150.8**

*Totals may not add up due to rounding

2.3.1 Age

The average age and estimated service life of the Town's stormwater assets, weighted by replacement value, is summarized in Figure 2-4. The estimated service life for storm sewers and laterals was averaged based on the various pipe materials. The similar service life values support the Town's strategy of replacing the laterals at the same time as the sewers. Catchbasins and maintenance holes are also expected to generally be replaced at the same time as the sewer, and their estimated service lives are assumed to be the same as that of the average sewer, rounded to the closest whole year (76 years). On average, the Town's storm sewers and appurtenances are at 33% to 40% of their estimated service life. Oil grit separators were installed starting in the 1990s and are generally newer assets. Stormwater culverts are on average near end-of-life, particularly the corrugated steel pipe culverts which are assumed to have an estimated service life of 30 years.

Figure 2-4: Average Age – Stormwater Assets



2.3.2 Condition

The condition for stormwater infrastructure is based on age and the estimated service lives of each asset. As shown in Figure 2-5, storm sewers are almost all in fair or better condition based on their age. For stormwater management ponds, the condition estimate for the physical components are mainly covered by the other asset categories. The Town also assesses the need for sediment removal of the ponds, and this lifecycle activity is discussed further in Section 5.2.2.2. Bathymetric surveys to determine sediment levels and determine dredging requirements assist the Town in meeting Environmental Compliance Approvals for the stormwater network.

Storm sewers are generally in good condition, with 96.9% in fair or better condition by replacement value. The accuracy of the age-based estimate will be improved as the Town expects to complete CCTV inspections for the storm sewer network over the next three years. Appurtenances such as maintenance holes, catchbasins, and laterals are generally installed and replaced at the same time as the associated sewer, and it is reasonable that these appurtenances have a similar condition profile to the storm sewers per Figure 2-5. Stormwater culverts are in poor condition as over half of the corrugated steel pipe culverts have reached end-of-life based on an estimated service life of 30 years, but are considered low criticality assets as discussed in the Risk Management Strategy in Section 4. To supplement Figure 2-5, the value of assets in each condition rating is provided in tabular format in Table 2-9.

Figure 2-5: Condition Distribution – Stormwater Assets

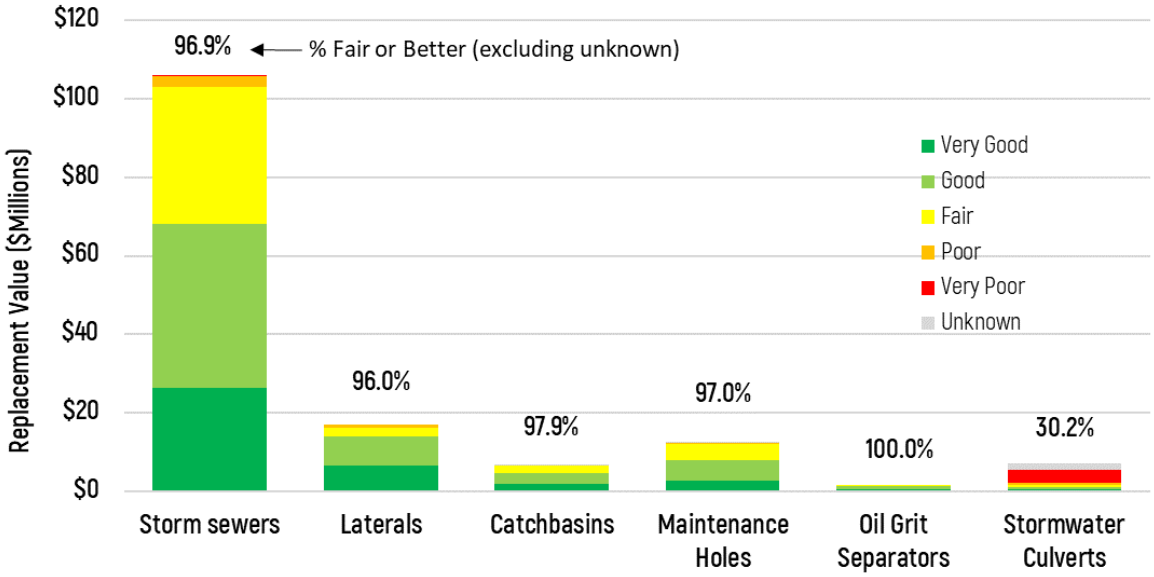


Table 2-9: Condition Overview by Replacement Value (Table Format) – Stormwater ($M)

Asset Category	Very Good	Good	Fair	Poor	Very Poor	Unknown	Total
Storm Mains	$26.4	$41.9	$34.7	$2.8	$0.4	$0.0	$106.2
Laterals	$6.7	$7.4	$2.2	$0.7	$0.0	$0.0	$16.9
Catchbasins	$1.8	$2.8	$1.9	$0.1	$0.0	$0.0	$6.7
Maintenance Holes	$2.7	$5.3	$4.1	$0.4	$0.0	$0.0	$12.5
Oil Grit Separators	$0.4	$0.8	$0.1	$0.0	$0.0	$0.0	$1.3
Stormwater Culverts	$0.5	$0.5	$0.5	$0.6	$3.1	$1.9	$7.3
Total*	**$38.5**	**$58.6**	**$43.6**	**$4.7**	**$3.6**	**$1.9**	**$150.8**

*Totals may not add up due to rounding

2.4 Wastewater

The wastewater network is supported by infrastructure to collect wastewater from residents and businesses. Assets include sanitary sewers, laterals, and maintenance holes. Table 2-10 shows the $193.8 million estimated replacement value of the Town's wastewater infrastructure and includes a breakdown of the inventory by asset category. 86% of sewers are 200 to 300mm in diameter and approximately half of the network is PVC material. There is also a significant percentage of sewers that are asbestos cement (24%) and vitrified clay (13%).

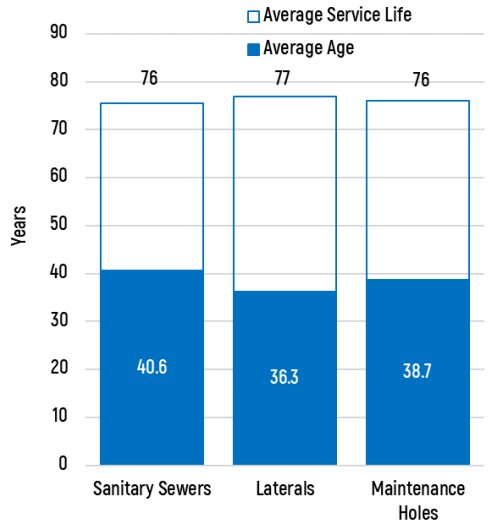
Table 2-10: Inventory of Wastewater Assets

Asset Category	Quantity	Unit	Replacement Value
Sanitary Sewers	112.5	km	$121.9
Laterals	79.9	km	$54.5
Maintenance Holes	1730	asset	$17.3
Total*			**$193.8**

*Totals may not add up due to rounding

2.4.1 Age

Figure 2-6: Average Age – Wastewater Assets



The average age and estimated service life of the Town's wastewater assets, weighted by replacement value, is summarized in Figure 2-6. Similar to the storm network, maintenance holes are generally expected to be replaced at the same time as the sewer, and their estimated service life is assumed to be the same as that of the average sewer, rounded to the closest whole year (76 years). On average, the Town's sanitary sewers are at approximately mid-life.

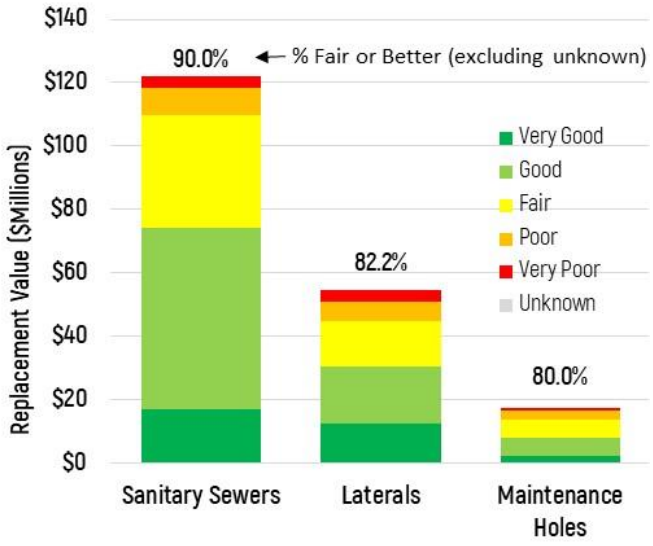
2.4.2 Condition

The condition for sanitary sewers is based on CCTV inspections. These assessments use video to identify problems such as cracks, breaks, sags, and obstructions. The inspection provides an overall inspection rating for each sewer on a 0 to 5 scale, which corresponds to the five-point rating scale summarized in Table 2-11. The Town is currently improving the accuracy of CCTV ratings of zero, which represent a pipe in very good condition but may also represent incomplete inspections. Further discussion on improvement recommendations is provided in Section 7. Where CCTV rating is not available or zero, condition is estimated based on age compared to the estimated service life according to the scale previously described in Table 2-3. The Town expects to complete CCTV inspections for the complete sanitary sewer network in 2022, and will determine an appropriate program and frequency of inspection going forward.

Table 2-11: Conversion Table for CCTV Structural Ratings

Condition Grade	CCTV Rating
Very Good	1
Good	2
Fair	3
Poor	4
Very Poor	5

Figure 2-7: Condition Distribution – Wastewater Assets



The condition for laterals and maintenance holes are estimated based on age compared to the expected service life. The condition distribution of the Town's wastewater assets is summarized in Figure 2-7. In general, the sanitary network is in good condition, with over 80% of assets estimated to be in fair or better condition across each asset category. To supplement Figure 2-7, the value of assets in each condition rating is provided in tabular format in Table 2-12.

Table 2-12: Condition Overview by Replacement Value (Table Format) – Wastewater ($M)

Asset Category	Very Good	Good	Fair	Poor	Very Poor	Unknown	Total
Sanitary Sewers	$17.1	$57.3	$35.4	$8.5	$3.6	$0.0	$121.9
Laterals	$12.6	$17.9	$14.3	$6.1	$3.6	$0.0	$54.5
Maintenance Holes	$2.5	$5.4	$5.9	$2.8	$0.7	$0.0	$17.3
Total*	**$32.3**	**$80.5**	**$55.6**	**$17.4**	**$7.9**	**$0.0**	**$193.8**

*Totals may not add up due to rounding

2.5 Water

The water network is supported by infrastructure to distribute water to residents and businesses through a 135.3 km network of pipes. Assets include watermains, laterals, hydrants, valve chambers, valves, pressure control valves, water meters, and a bulk water station. Table 2-13 shows the $191.3 million estimated replacement value of the Town's water infrastructure and includes a breakdown of the inventory by asset category. Watermains, excluding appurtenances, account for 67% ($127.5 million) of the Town's water asset portfolio. 76% of watermains are PVC material and almost all are between 150 and 300mm in diameter.

Table 2-13: Inventory of Water Assets

Asset Category	Quantity	Unit	Replacement Value
Watermains	135.3	km	$127.5
Laterals	82.1	km	$38.8
Hydrants	919	asset	$8.7
Valve Chambers	927	asset	$8.3
Valves	1259	asset	$3.1
Pressure Control valves	2	assets	$0.0
Water Meters	9578	asset	$4.7
Bulk Water Station	1	asset	$0.1
Total*			**$191.3**

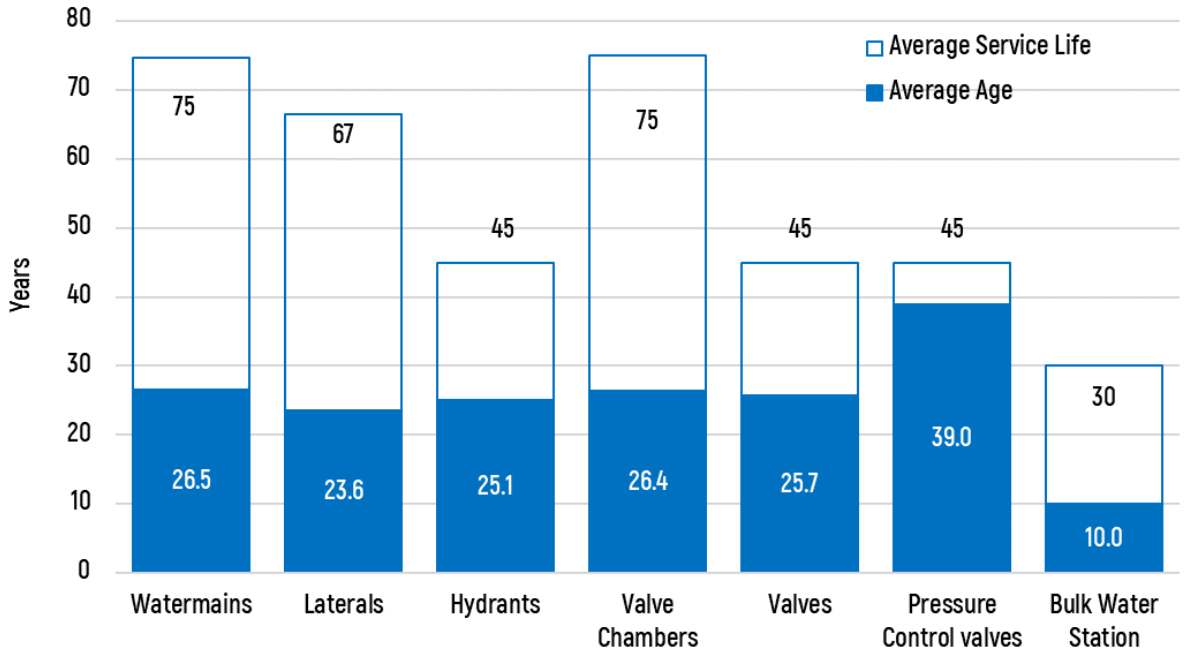
*Totals may not add up due to rounding

2.5.1 Age

The average age and estimated service life of the Town's water assets, weighted by replacement value, is summarized in Figure 2-8. On average, the Town's watermains and appurtenances were installed approximately 25 years ago. Similar to the wastewater and storm network, appurtenances such as valve chambers are expected to generally be replaced at the same time as the associated pipe, and their estimated service life is assumed to be the same that of the average watermain, rounded to the closest whole year (75 years). Hydrants and valves are typically also replaced during watermain construction, but have a shorter lifecycle of 45 years and will therefore require another replacement during the average lifecycle of a watermain. Lifecycle strategies are further discussed in Section 5.

39% (3725) of the Town's water meters were replaced in 2015 and are reaching mid-life of their 15-year estimated service life. The installation year for the remaining water meter portfolio is not tracked, and therefore an average age is not included for water meters in Figure 2-8.

Figure 2-8: Average Age – Water Assets



2.5.2 Condition

The Town maintains a database of watermain breaks recorded against the associated segment which enables a break per meter length to be determined for each segment that has a break history. The condition for watermains in this AM Plan is based on both break history (weighted 60% of condition score) and age compared to the estimated service life (weighted 40%). Where no breaks have been recorded against a watermain, the condition score is based solely on the estimated remaining service life by material. The five-point rating scale summarized in Table 2-11.

Table 2-14: Conversion Table for Watermain Break History and Remaining Service Life

Condition Grade	Watermain Break History (60% weighting)	% Remaining Service Life (40% weighting)
Very Good	Less than one break per 1000m	>75 – 100%
Good	One break per 501 to 1000m	>50 – 75%
Fair	One break per 201 to 500m	>25 – 50%
Poor	One break per 101 to 200m	>0 – 25%
Very Poor	One break or more per 100m	<= 0%

The condition distribution of the Town's water assets is summarized in Figure 2-9. 83.2% of watermains are estimated to be in fair or better condition. As noted in Section 2.5.1, installation year is not documented for meters that were not part of the 2015 replacement program and therefore, a condition estimate is not provided for those meters. The meters replaced in 2015 represent 100% of the meters ($1.6 million) with known installation dates and are considered to be in good condition, with the remaining meter inventory ($3.1 million) not assessed. As the condition profile for the smaller value asset categories is not easily visible in Figure 2-3, the value of assets for each condition rating is provided in tabular format in Table 2-15.

Figure 2-9: Condition Distribution – Water Assets

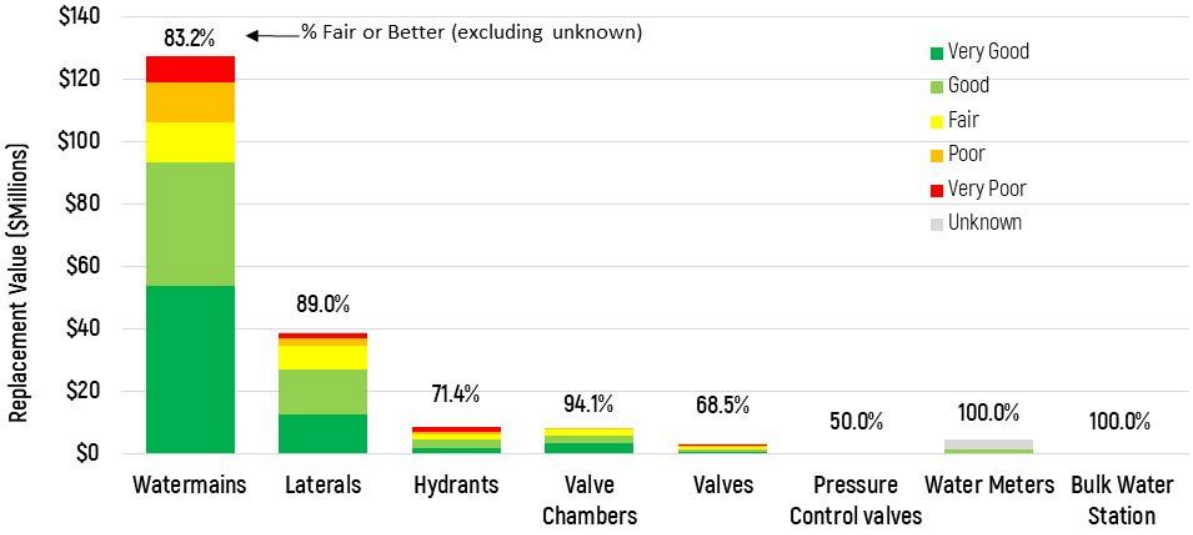


Table 2-15: Condition Overview by Replacement Value (Table Format) – Water ($M)

Asset Category	Very Good	Good	Fair	Poor	Very Poor	Unknown	Total
Watermains	$53.9	$39.8	$12.4	$13.2	$8.2	$0.0	$127.5
Laterals	$12.5	$14.6	$7.4	$2.7	$1.6	$0.0	$38.8
Hydrants	$2.1	$2.7	$1.5	$1.0	$1.5	$0.0	$8.7
Valve Chambers	$3.4	$2.7	$1.8	$0.5	$0.0	$0.0	$8.3
Valves	$0.7	$0.9	$0.5	$0.4	$0.6	$0.0	$3.1
Pressure Control Valves	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Water Meters	$0.0	$1.6	$0.0	$0.0	$0.0	$3.1	$4.7
Bulk Water Station	$0.0	$0.1	$0.0	$0.0	$0.0	$0.0	$0.1
Total*	**$72.6**	**$62.3**	**$23.7**	**$17.7**	**$11.9**	**$3.1**	**$191.3**

*Totals may not add up due to rounding

3 Levels of Service

3.1 Understanding Levels of Service

In the State of Infrastructure Section, the value, age, and condition of the Town's infrastructure assets were discussed. The Levels of Service (LOS) chapter builds on the State of Infrastructure by defining the performance the Town's assets are intended to deliver over their service lives. For example, the Town's network of roads is expected to be maintained such that residents can drive throughout the Town while experiencing an expected road smoothness or performance level.

LOS are statements that describe the outputs and objectives the Town intends to deliver to its residents, businesses, and other stakeholders.

In general, LOS are guided by a combination of customer expectations, legislative requirements, internal policies and procedures, and affordability. Effective asset management requires that LOS be formalized and supported through a framework of performance measures, performance levels, and timeframes to achieve performance levels, such that the costs to deliver the documented LOS can be understood.

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.

3.2 Line of Sight

Figure 3-1 shows the LOS framework and line of sight from high-level Corporate initiatives to detailed asset-specific Technical LOS. Corporate commitments, along with legislated LOS drive the definition of more specific Community LOS that describe the services that the assets need to deliver to the Town's residents and businesses. Community LOS can be categorized as relating to one of the following service attributes:

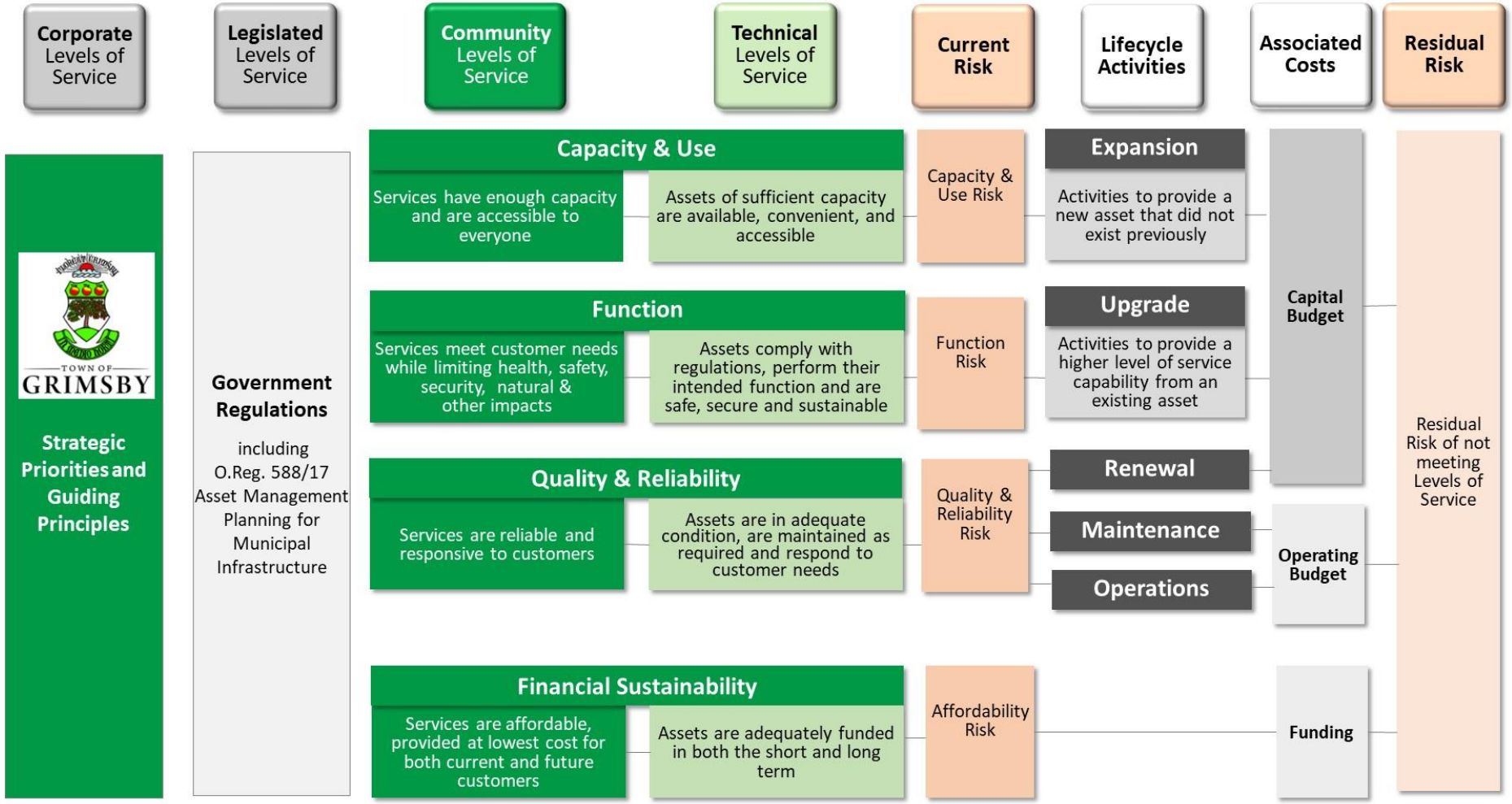
- Capacity & Use: Services have enough capacity and are accessible to the customers
- Function: Services meet customer needs while limiting health, safety, security, natural and heritage impacts
- Quality & Reliability: Services are reliable and responsive to customers
- Financial Sustainability: Services are affordable and provided at the lowest cost for both current and future customers

Community LOS are translated into Technical LOS that define asset performance levels, which in turn define asset needs and drive the required lifecycle activities and funding to mitigate risk. As shown in Figure 3-1:

- Capacity & Use LOS drive Growth needs
- Function LOS drive Upgrade needs
- Quality LOS drive Renewal, Operations and Maintenance needs
- Financial Sustainability LOS drive Funding needs

Lifecycle management activities balance the cost of service with the risk to meeting service levels. This Line of Sight establishes the connection of how the day-to-day management of Town assets contributes to the success of achieving corporate strategic priorities.

Figure 3-1: Levels of Service Framework



3.3 Corporate Levels of Service

The Corporate, or Strategic LOS establish service levels that describe the main vision or objective of service delivery at the Town. The Town of Grimsby Council developed four principles that have guided the Town's priorities and will continue to do so until the end of the current term in 2022.

The Town's strategic priorities are organized within seven themes to address what matters most to residents. This AM Plan supports elements of multiple strategic themes, but most identifies with the theme of Accountability and Transparency. The AM Plan demonstrates accountability and transparency by identifying priority needs and providing Council and staff with a framework for decision-making and fostering fiscal responsibility.

3.4 Legislated Levels of Service

Legislated requirements define the standards according to which the Town is legally obligated to provide services to the community, and these standards typically relate to asset safety and reliability. The Town's Drinking Water Quality Management System (DWQMS) Operational Plan sets out the required service levels related to the water system. The DWQMS is a legislated requirement under the Safe Drinking Water Act, 2002, S.O. 2002, c. 32.

For Transportation and Stormwater assets, the Town's Roads Quality Management System (RQMS) Operational Plan outlines these service levels. Although the RQMS itself is not legislated, it is designed to adhere to legislative requirements for the assets it covers, namely transportation, bridges and stormwater. Services levels for transportation assets (road surfaces, signage, sidewalks, etc.) are primarily derived from O.Reg. 239/02, minimum maintenance standards, which sets the minimum road maintenance service levels in Ontario. RQMS service levels for structures (bridges, structural culverts and retaining walls) follow the requirements of O.Reg. 104/97, standards for bridges.

For stormwater assets, the Ontario Ministry of the Environment, Conservation and Parks (MECP) issues Environmental Compliance Approval requirements for sewage works (including stormwater) under Section 53 of the Ontario Water Resources Act (OWRA). These approvals may specify requirements for ongoing monitoring and maintenance of stormwater management ponds. The MECP is implementing a new Consolidated Linear Infrastructure ECA (CLI ECA) for each municipality in 2022 which will establish a system-wide approval process for the Town's stormwater infrastructure and will replace most individual ECAs.

3.5 Community and Technical Levels of Service

The Community and Technical LOS discussed in this AM Plan are focused on those required by O.Reg. 588/17, as well as additional measures developed to support achievement of the Town's higher level strategic priorities. In addition to the measures identified in Sections 3.5.1 to 3.5.4, the Town will be developing measures related to how well the Town is completing operations and maintenance activities after it has implemented its Computerized Maintenance Management System and Enterprise Asset Management System.

3.5.1 Transportation

Table 3-1 summarizes Community and Technical LOS related to transportation assets. The Public Works Department established the Roads Quality Management System (RQMS) to provide safe roads for the residents of Grimsby. The Town is committed to serving its residents and visitors by providing and maintaining safe transportation infrastructure, through a network of 175.5km of roads (see Figure 3-2). Technical LOS are focused on condition-related Quality measures. Transportation assets are generally performing well, with most assets in fair or better condition. In the RQMS, the Town has established service levels based on the minimum maintenance standards specified in O.Reg. 239/02, as amended. The Town corrects deficiencies based on O.Reg. 239/02 requirements for repair and response times.

Table 3-1: Levels of Service – Transportation

Community Levels of Service	Technical Levels of Service		
	Description		2021 Performance
Capacity and Use LOS			
Description of the road network and its level of connectivity*: The Town owns and maintains all municipal roadways and sidewalks that serve a variety of purposes including local access and regional travel. The Town's system consists of a network of arterial, collector, and local roadways which range from Class 2 to 5 roads. Most of these roads are local and provide connections to and within neighbourhoods, commercial sites, and industrial lands. Refer to Figure 3-2 for a map of the road network.	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: 0.83 lane-km per sq.km. Collector: 0.58 lane-km per sq.km. Local: 3.57 lane-km per sq.km.
Description of the traffic that is supported by municipal bridges*: The Town's bridges and structural culverts have been designed in accordance with the Bridge Design Code current at the time of construction to carry motor vehicles, emergency vehicles, cyclists, and pedestrians, as shown in Figure 3-3.	Percentage of bridges in the municipality with loading or dimensional restrictions*		None
Quality LOS			
Description/images that illustrate the different levels of road class pavement condition*: Refer to Table 2-5 in Section 2.2.2.	For paved roads in the municipality, the average pavement condition index value*		80.2 (Very Good condition)
Description/images of the condition of bridges/culverts and how this would affect use of the bridges*: Refer to Table 2-6" in Section 2.2.2.	For bridges in the municipality, the average bridge condition index value*		69.6 (Good-Fair condition)
	For structural culverts in the municipality, the average bridge condition index value*		69.3 (Good-Fair condition)
Transportation assets are maintained in a state of good repair.	For retaining walls in the municipality, the average condition index		78.8 (Good condition)
	Percentage of assets in Fair or Better Condition	Roads	99.3%
		Structures	100.0%
		Traffic Signals	100.0%
		Sidewalks	82.2%
		Streetlights	82.0%
		Signs	98.3%

* O.Reg. 588/17 LOS reporting requirement.

Figure 3-2: Town of Grimsby Road Network

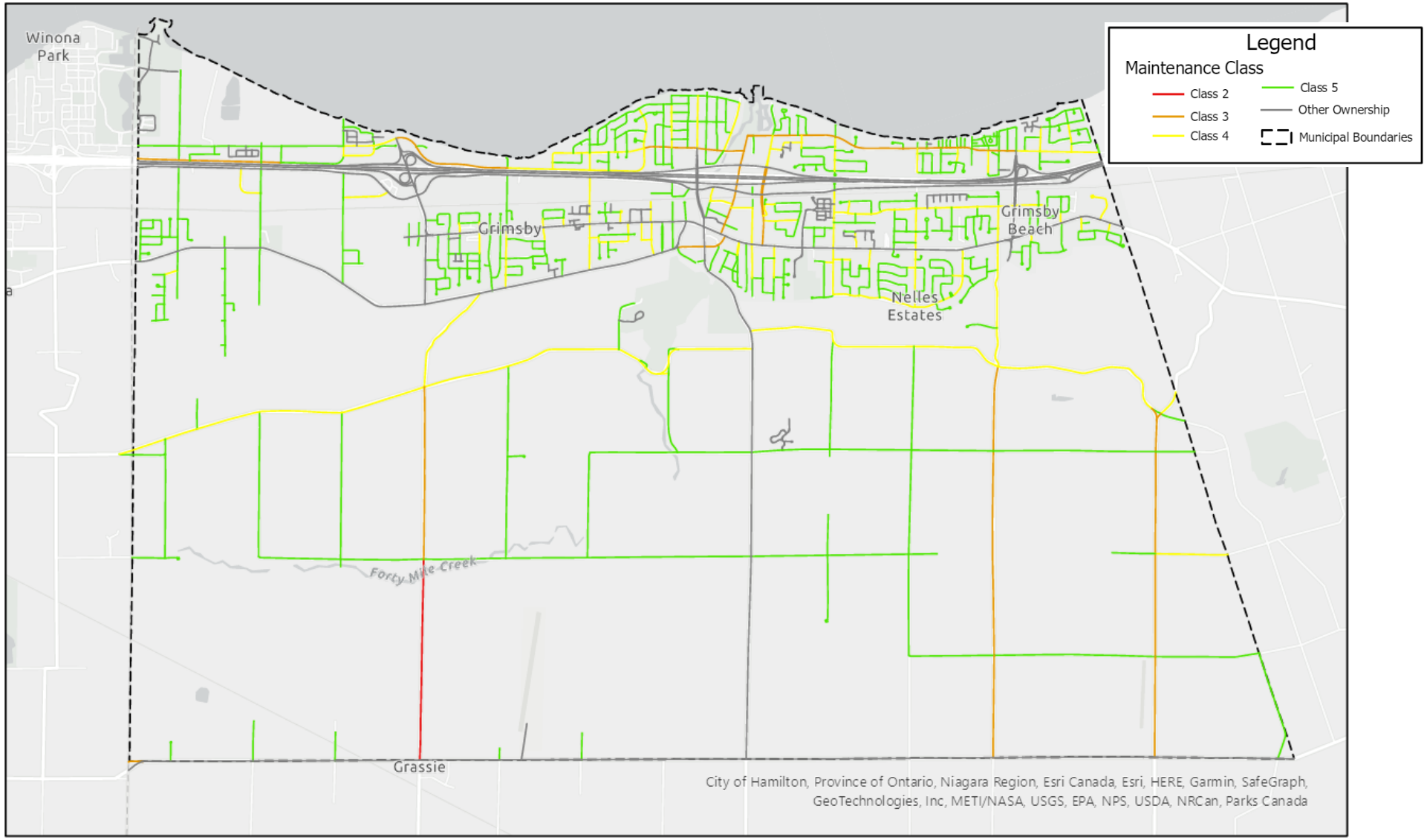
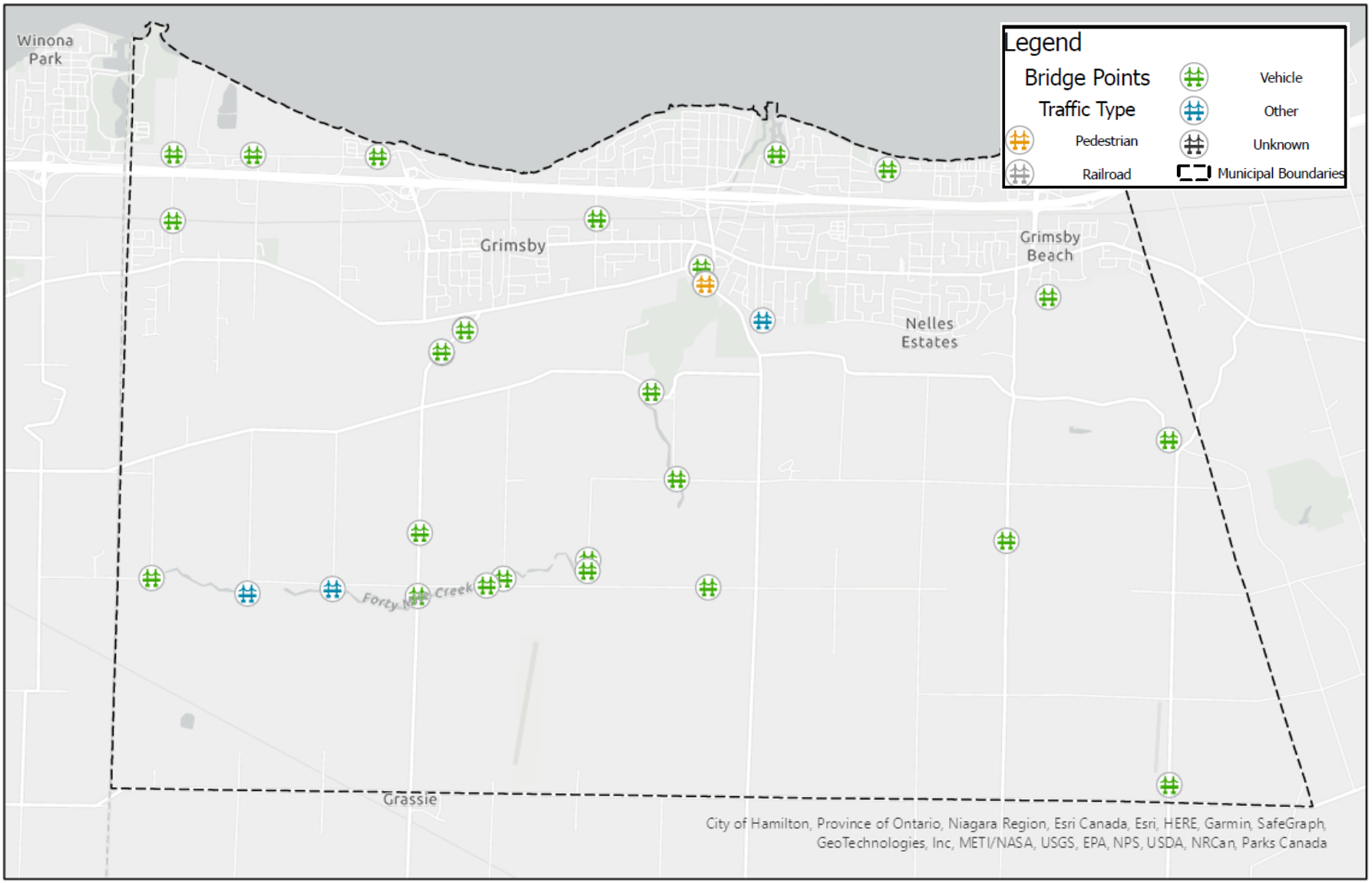


Figure 3-3: Town of Grimsby Structures Network



3.5.2 Stormwater Service

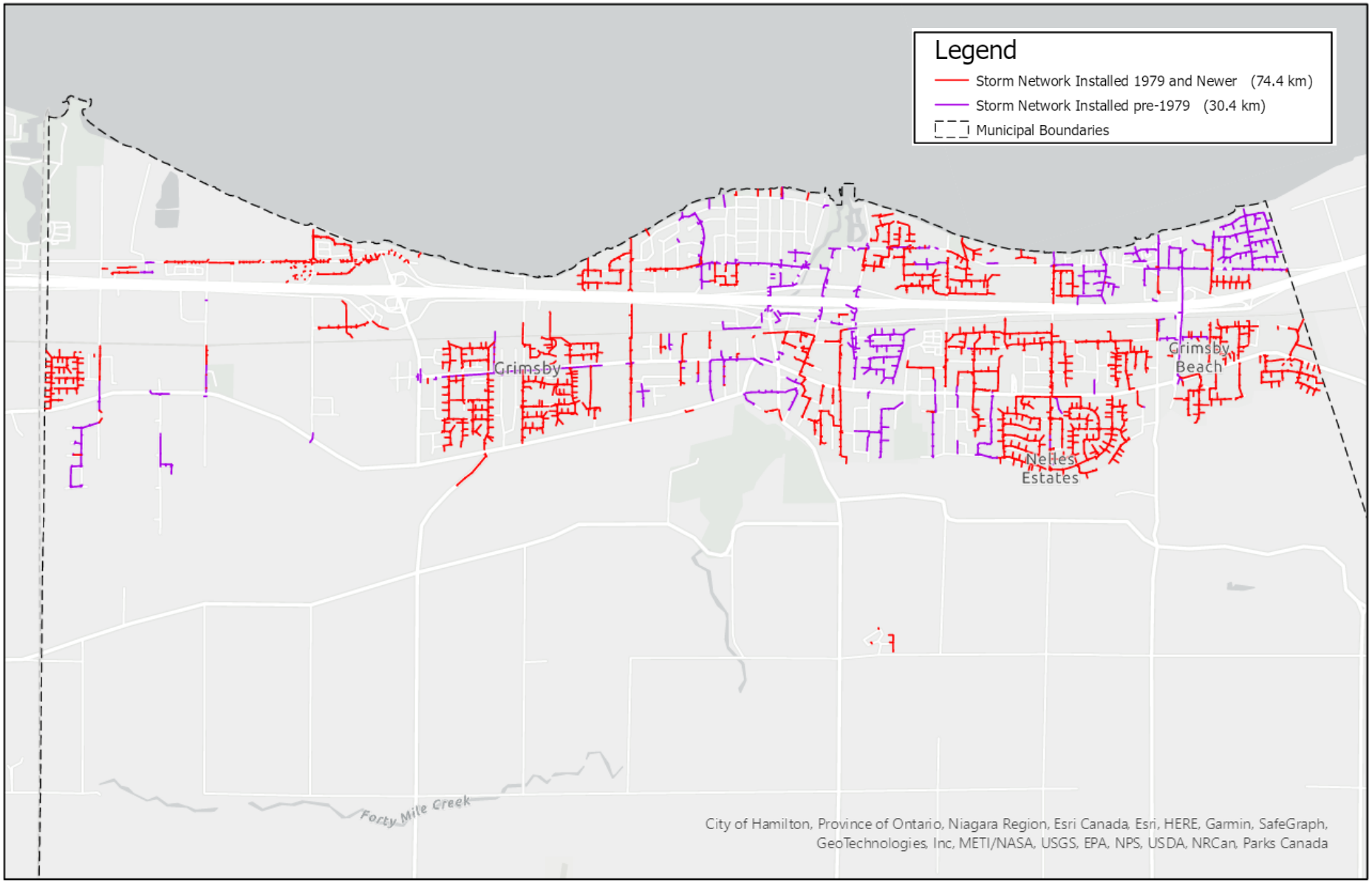
Table 3-2 summarizes Community and Technical LOS related to stormwater assets. The stormwater network of sewers and stormwater management ponds helps control stormwater runoff. O.Reg. 588/17 service measures are mainly focused on resiliency to flooding. In this AM Plan, the percentage of properties resilient to a 100-year storm is estimated based on the percentage of properties built in 1990 or later, as all development design objectives in the Town required a 100-year storm design since that time. Regarding the stormwater management system, the Town sewers were required to be designed to a 5-year storm starting from 1979, which represents 71% (74.4km) of the Town's storm sewer network by length, as shown in Table 3-2.

Table 3-2: Levels of Service – Stormwater

Community Levels of Service	Technical Levels of Service	
	Description	2021 Performance
Capacity and Use LOS		
Description of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater management system*: The Town owns and manages stormwater ponds, storm sewers, oil grit separators, stormwater culverts, and catchbasins to store, direct, and control stormwater runoff that can otherwise pose dangers to the natural and built environment. The stormwater system improves water quality of runoff into the local waterways and helps prevent flooding and erosion. The Town continues to work on understanding the increasing impacts of climate change and building its flood resiliency through improvements to its built infrastructure. Refer to Figure 3-4 for a map of the stormwater network.	Percentage of properties in municipality resilient to a 100-year storm*	Estimated 42.8% (properties built in 1990 or later) Note: 974 properties not assessed due to unknown age.
	Percentage of the municipal stormwater management system resilient to a 5-year storm*	Estimated 71% (sewers built in 1979 or later)
Quality LOS		
Assets are maintained in a state of good repair and condition	Percentage of sewers in Fair or Better Condition	96.9%
	% of SWM wet ponds that are within allowable sediment levels	50%
	% of SWM ponds inspected per target frequency per Environmental Compliance Approval	75%
	% of OGS inspected annually per Environmental Compliance Approval	100%
	% of OGS identified issues remediated annually	100%

* O.Reg. 588/17 LOS reporting requirement.

Figure 3-4: Town of Grimsby Stormwater Network



3.5.3 Wastewater Service

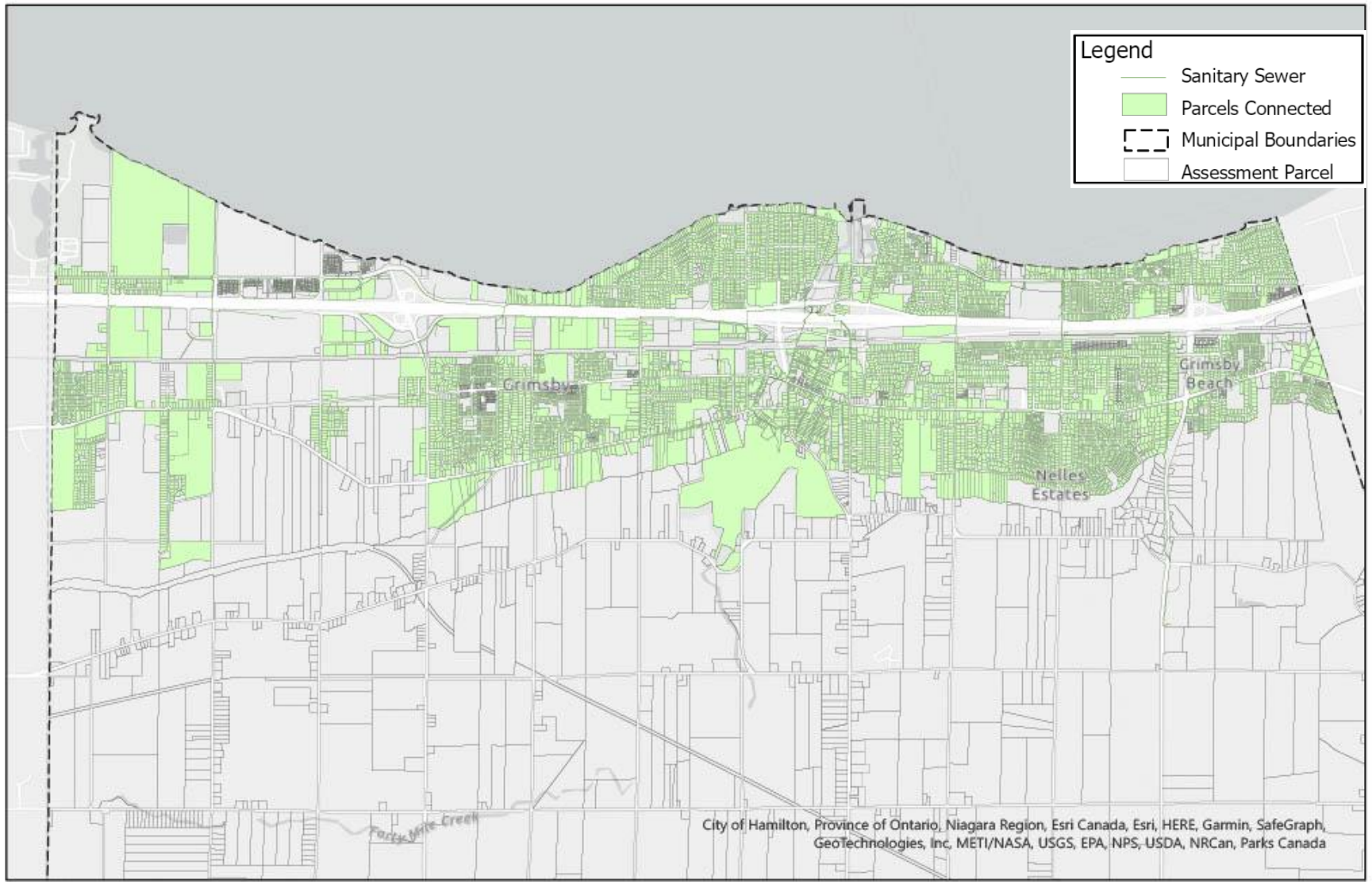
Table 3-3 summarizes Community and Technical LOS related to wastewater assets. Service levels are focused on minimizing backups and supporting a resilient network in the event of extreme weather events. For a map of the Town's sanitary sewers, refer to Figure 3-5. In 2021, there was one overflow event related to the backup of 18 properties. It is difficult to determine the exact source of the backups, as the overall system including the regional network was over-capacity during the extreme weather event. The Town is currently investigating the root cause and the review may result in resolving inflow and infiltration issues or the upsizing of some Town sewers. The Town does not have any combined sewers and therefore O.Reg. 588/17 measures related to combined sewers are not included in the AM Plan. Effluent violations are the responsibility of the Region and effluent-related measures are also not included in this AM Plan.

Table 3-3: Levels of Service – Wastewater

Community Levels of Service	Technical Levels of Service	
	Description	2021 Performance
Capacity and Use LOS		
Description of the user groups or areas of the municipality that are connected to the municipal wastewater system*: Almost all properties have their wastewater collected through the Town's 112.5 km network of sanitary sewers. The Lincoln and West Lincoln wastewater systems discharge into the Grimsby system, which then conveys the flow to the Baker Road Wastewater Treatment Plant (WWTP). Refer to Figure 3-5 for a map of the Town's wastewater network and connected parcels.	Percentage of properties connected to the municipal wastewater system*	83.6% (8729 of 10,440 properties)
Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes*: Surface water and groundwater can enter the sewage collection system and can cause surcharging, basement flooding, sewer bypasses, and reduced treatment efficiency at the plant. Inflow may occur through major defects in roof drains, foundation drains, manholes, and pipes. Infiltration occurs when the groundwater level rises above the elevation of the collection system, and can occur at damaged service connections, joints, and pipes.	The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system*	18 connection-days compared to 8729 connected properties (one connection-day per 485 properties)

Community Levels of Service	Technical Levels of Service	
	Description	2021 Performance
Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described above*: To reduce the potential for inflow and infiltration, the Town conducts CCTV inspections to identify defects and maintains its assets in a state of good repair through rehabilitation and repair work. To increase resiliency to sewage backups, the system is also designed with two overflow structures that allow sanitary overflow into an outlet pipe. Overflows are designed to reduce strain on the wastewater system during extreme weather conditions to prevent sewage from backing up into basements	# of locations with fat, oil, and grease (FOG) issues or prone to blockages	1
Quality LOS		
Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system*: The Water Pollution Control Plant is a pre-denitrification activated sludge facility with a design capacity of 17,500 m3/day. It is operated according to its Environmental Compliance Approval which specifies effluent objectives for various parameters including Total Suspended Solids, Total Phosphorous, Total Ammonia Nitrogen, Total Nitrogen, E.Coli, and pH.	Total volume of untreated wastewater discharged into the natural environment via sewer network overflows	1150 cubic metres
Assets are maintained in a state of good repair	Percentage of sewers in Fair or Better Condition	90.0%

Figure 3-5: Town of Grimsby Wastewater Network



3.5.4 Water Service

Table 3-4 summarizes Community and Technical LOS related to water assets. Per the Town's Drinking Water Quality Management System, the Town is committed to providing Town water customers with safe, clean drinking water and upholding all applicable legislative and regulatory requirements. Service disruptions due to watermain breaks are minimized by performing live repairs where possible. In 2021, though there were 5 breaks due to age and condition, only one repair required isolation affecting service to one customer. To ensure its watermains remain in overall good condition, the Town monitors its progress on replacing its unlined cast iron and ductile iron pipes with new PVC pipe.

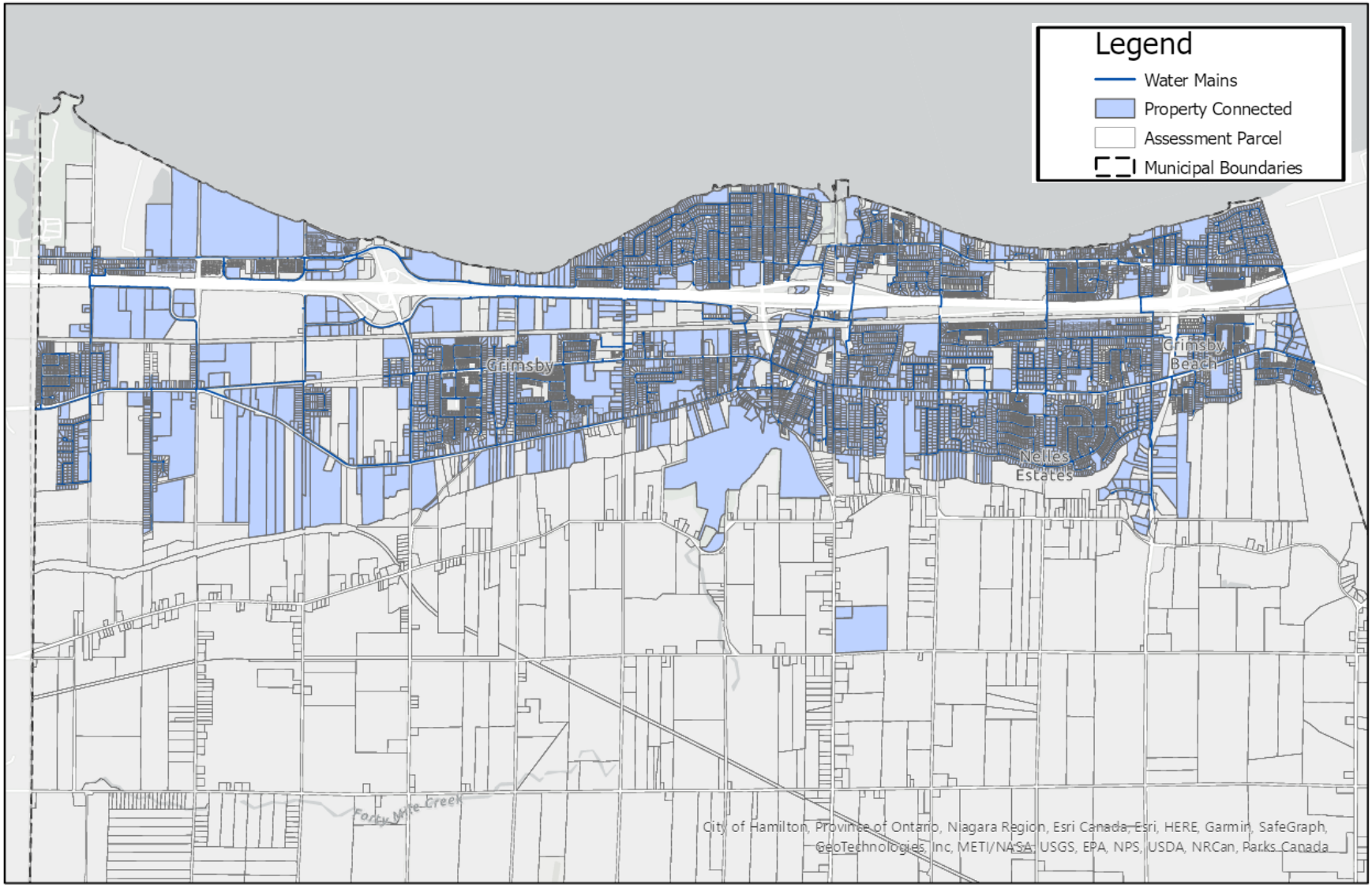
Table 3-4: Levels of Service – Water

Community Levels of Service	Technical Levels of Service	
	Description	2021 Performance
Capacity and Use LOS		
Description of the user groups or areas of the municipality that are connected to the municipal water system*: The Grimsby Water Distribution System is a stand-alone drinking water distribution system which receives 100% of its drinking water from the Grimsby Water Treatment Plant and through connections with the Region of Niagara's Grimsby Water System. The Town's watermain network distributes drinking water to Town customers and one downstream water system located in Winona (City of Hamilton). Refer to Figure 3-6 for a map of the water network.	Percentage of properties connected to the municipal water system*	85.8% (8956 of 10,440 connected properties)
Description of the user groups or areas of the municipality that have fire flow*: Fire hydrants are located throughout the community and provide the Grimsby Fire Department with access to water during fire emergencies. The Town has over 900 hydrants servicing both residential and non-residential areas. The majority of properties are within 90m of a fire hydrant and therefore have fire flow available.	Percentage of properties where fire flow is available*.	9295 (Based on properties intersecting within 90m of hydrant)
Quality LOS		
Description of boil water advisories and service interruptions*: The Town of Grimsby's Drinking Water Quality Management System formalizes an Operational Plan as part of its efforts to ensure that clean, safe and reliable drinking water is supplied to all customers served by the Town. The Town is	The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system*	Zero

Community Levels of Service	Technical Levels of Service	
	Description	2021 Performance
committed to establishing and maintaining open and effective communication with water customers regarding matters of drinking water quality. For emergencies related to water quality, per the Town's Water Operations Emergency Response Plan, the Town may issue a boil water advisory or other drinking water quality advisory it if believes that the water from the drinking water system is unsafe for human consumption. Other water service disruptions are typically caused by watermain breaks and are tracked by the Town and repaired while minimizing disruptions to the community.	The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system*	1 connection-day compared to 8956 connected properties
Assets are maintained in a state of good repair	Number of age-related watermain breaks	5 breaks
	Percentage of watermains in Fair or Better Condition	83.2%
	Percentage of watermains that are unlined Cast Iron or Ductile Iron	16.9% (22.9km)

* O.Reg. 588/17 LOS reporting requirement.

Figure 3-6: Town of Grimsby Water Network



3.6 Financial Sustainability Service Levels

Levels of Service related to financial sustainability are discussed in the Financing Strategy Section 6.3.4.

3.7 External Trends and Issues Affecting Levels of Service

The Town's ability to maintain current service levels may be impacted by external trends and factors. Future updates to the AMP will consider such factors as they occur and incorporate them into the reporting and setting of appropriate service levels.

- **Demographic Factors**: Population and employment changes can impact the intensity and frequency of infrastructure use, resulting in the need for additional infrastructure or more frequent asset renewal strategies.
- **Social and Economic Factors**: Increases in environmentally conscious behaviour and attitudes among residents and businesses can lead to infrastructure that lasts longer and is more efficient. From an economic perspective, higher costs due to increases to the cost of materials and energy can reduce the ability to maintain the same level of service.
- **Technological Factors**: Changes in technology or asset construction, operation, or maintenance methods may lead to the replacement of obsolete equipment or materials, helping to achieve higher quality service levels and better cost efficiencies over the asset lifecycle.
- **Regulatory Factors**: As a lower-tier municipality, the Town is subject to various policies, programs, and legislative decisions issued by other levels of government (i.e., federal, provincial, and regional), and such legislative changes can impact the Town's strategic direction and demand for services. Specific asset-related legislation such as Environmental Compliance Approvals can also impact the required performance levels of assets.
- **Environmental Factors**: In 2021, Council unanimously passed a resolution for the Town to join the Federation of Canadian Municipalities (FCM) and ICLEI Canada Partners for Climate Protection (PCP) program. Consequences attributed to the climate change crisis are already being seen in the Town such as record-setting high lake levels, shoreline erosion, and extreme weather events. Mitigation and adaptation strategies to climate change will continue to be developed and implemented by the Town as climate change impacts are better understood. Some sewer infrastructure upgrades are already being identified by the Town through the Baker Road WWTP Pollution Prevention and Control Plan and Master Servicing Plan. These initiatives are discussed further in the Lifecycle Strategy in Section 1.1.1.1.

4 Risk Management Strategy

4.1 Overview

A key asset management principle for the Town is to meet service levels and manage risk, while minimizing lifecycle costs. The relative importance of the assets to support service delivery, referred to as asset criticality, is a key driver in the selection of the most appropriate asset management strategy for each asset. Critical assets include assets that are key contributors to performance and have the highest consequences of failure to provide required service levels.

Risk events, such as an asset's failure in capacity, function, or reliability, are events that may compromise the delivery of the Town's strategic priorities. Lifecycle activities are used to manage the risk of failure by reducing the likelihood of asset failure to acceptable levels. The impact of asset failure on the Town's ability to meet its strategic priorities informs the type and timing of lifecycle activities.

The Town's preliminary risk strategy estimates the risk exposure of its assets to inform the prioritization of projects across asset classes and service areas. Risk exposure is the multiplication of two factors:

Risk Exposure = Consequence of Failure x Likelihood of Failure

The criticality or consequence of failure (CoF) is the direct and indirect impact on the Town if an asset failure were to occur, and the likelihood of failure (LoF) is the likelihood that an asset failure may occur.

4.2 Consequence of Failure

The focus in this section is on asset criticality or consequence of failure which reflects the importance of an asset to the Town's delivery of services. The following impacts of a potential asset failure are considered:

- Financial: damages to Town infrastructure or private property, loss of Town revenue, and fines.
- Health and Safety: the ability to meet health and safety related regulatory requirements, as well as the degree and extent of potential injury, ranging from negligible injuries to loss of life.
- Service Delivery: considers the extent of customers affected by service disruption, the type of service lost (essential versus non-essential), and length of service disruption.
- Reputational: consists of negative media, and or reduced trust / confidence in the Town.
- Environmental: acknowledges the length and extent of damages to the natural environment.

Table 4-1 summarizes the above listed impacts against an asset criticality rating scale from 1 to 5, with a higher score reflecting a higher consequence of failure. This rating scale will be refined as the Town incorporates assessment of non-core assets in future updates to this AM Plan. Improvements may include specifying values in terms of the number of people affected and amount of financial impact in dollars to improve the objectivity of the rating scale.

Table 4-1: Asset Criticality (Consequence of Failure) Rating Scale

Consequence Categories	1	2	3	4	5
	Insignificant	Minor	Moderate	Major	Extreme
Financial	Insignificant damages, losses, or fines. Absorbed in normal business operation.	Low damages, losses, or fines. Absorbed in normal business operation.	Moderate damages, losses, or fines. Notable change to operating budget.	Significant damages, losses, or fines requiring additional funding.	Significant damages, losses, and fines requiring additional current and future expenditures.
Health & Safety	No obvious potential for injury or affects to health.	Potential for minor injury or health affects of an individual. Full recovery is expected.	Potential for moderate or serious injury or affects to health. May affect many individuals.	Potential for serious injury or affects to health such as long-term disability. Emergency hospitalization required for one or more individuals.	Potential for death or multiple deaths; or Emergency and long-term hospitalization required for several individuals.
Service Delivery	Negligible service impact. Small number of customers impacted.	Localized service disruption. Typically up to one day loss of service.	Significant localized disruption. Typically up to one week loss of service.	Many areas disrupted or localized disruption for a long time; or loss of essential service for short period of time.	Town-wide service disruption, or loss of services for a very long period of time; or loss of essential service for moderate or long periods of time.
Reputational	No media exposure	Minor media exposure	Moderate local media exposure lasting several days	Intense local media exposure lasting several days and/or Town-wide exposure	Provincial (or Federal) exposure lasting several days or weeks
Environment	Negligible impact to natural environment.	Minor recoverable impact to natural environment.	Some environmental damage, with short term impacts.	Medium to long-term environmental damage requiring immediate intervention.	Significant environmental damages with long-term effects.

Understanding criticality enables risk to be incorporated into the development of the lifecycle management strategies. More critical assets are prioritized for expansion, inspection, cleaning, maintenance, and renewal, depending on their current and forecasted performance.

4.3 Risk to Levels of Service

Asset risk may be associated to one or more aspects of failure across the levels of service attributes discussed in Section 3.2:

- Capacity and Use: Asset may have failed to provide sufficient capacity in terms of availability, convenience, or accessibility
- Function: Asset may have failed to comply with regulations, perform its intended function, or is no longer considered sustainable due to factors such as obsolescence
- Quality/Reliability: Asset may have failed due to deteriorated physical condition.

4.3.1 Risk to Capacity LOS

As indicated in Section 1.3, over the past few years, the Town has experienced steady growth, and continues to plan for responsible growth and development through commencement of the official plan review and transportation master plan update. The Town mitigates capacity-related risks by assessing the need for additional infrastructure and planning for additional infrastructure assumed by the Town through development. Projects to address known capacity issues are currently scheduled in the Town's 5-year Capital Budget, such as the reconstruction of North Service Road in conjunction with Fifth Wheel development. These and other lifecycle activities that address capacity service levels are discussed further in Section 5.2.1.

4.3.2 Risk to Function LOS

The Town also plans for service improvements to functional service levels while balancing these risks against capacity and reliability-related needs. New services or service enhancements currently planned over the next 10 years include urbanization of Marlow Avenue from Park Road North to the west limit as part of Central Avenue and Park Road North reconstruction. A road urbanization project addresses multiple service levels as it upgrades the function of the road while also renewing the asset by addressing reliability service levels, discussed further in Section 4.3.3. Town upgrade projects that address risks to asset functional service levels are discussed further in Section 5.2.1.

4.3.3 Risk to Service Reliability

The Reliability Level of Service refers to maintaining Town assets in a state of good repair to reduce the incidence of unplanned service interruptions due to poor asset condition while minimizing lifecycle costs. Depending on the asset, unplanned failures can have wide-ranging consequences including service disruption, damage to surrounding infrastructure and property, risks to public safety, and environmental impacts. The Town has developed preliminary risk assessments through continuous improvement asset management initiatives over the past few years. This risk approach focuses on reliability risk and assesses both LoF and CoF for the Town's main assets through the Geographic Information System (GIS). The results from this automated risk assessment process were refined during development of this AM Plan, and additional assets such as structures and sidewalks were also assessed using the LoF and CoF framework described in this section. Assets for which a significant portion were not assessed for condition, such as water meters and traffic signs, are not included in the assessment.

LoF is estimated based on the condition of the asset from Section 2 (State of Infrastructure), as shown in Table 4-2. Observed condition is used where available, and percentage of remaining life based on age is used as a supporting factor or used when observed condition is not available.

Table 4-2: Likelihood of Failure Ratings for Reliability

LoF Rating	LoF Description	Asset Condition
1	Rare	Very Good
2	Unlikely	Good
3	Moderate	Fair
4	Probable	Poor
5	Very Likely	Very Poor

CoF is estimated based on the expected impact of an asset failure aligned with the rating scale provided in Table 4-1. As part of the Town's development of risk work, CoF ratings based on the 1 to 5 scale were assigned to each land use category. The GIS spatial analysis identifies land uses adjacent to a road, sidewalk, storm sewer, sanitary sewer, or watermain, and applies the associated CoF score to each asset. In general, land uses with lower criticality include rural and open spaces and higher criticality is assigned to downtown and more highly populated areas. The highest consequence rating of 5 is assigned for assets close to institutional properties such as schools and hospitals, as well as QEW and CN Rail crossings. The land use rating is factored with other currently available data such as road class and pipe diameter depending on the asset type, to determine an overall CoF score for each asset.

A summary of the CoF scoring approach is provided in Table 4-3. The weighting column specifies the contribution of the land use score for roads, sidewalks, storm sewers, sanitary sewers, and watermains. Pipe size (diameter) is not weighted as heavily for watermains compared to sewers as the water distribution system generally has redundancies within the network such that if a large watermain were to fail, its impact would not be significantly more than that of a smaller diameter main. Therefore, the land use weighting for watermains is 75% compared to 50% for sanitary and storm sewers. Diameter plays a more significant role in sewer failure, as the magnitude of potential backups and flooding is directly related to the volume of wastewater and stormwater in the pipes. Appurtenances such as laterals, catchbasins, maintenance holes, valves, and hydrants were determined to have a similar or lower criticality as the associated watermain or sewer and their risk exposure is grouped in with the value of the pipe. The CoF for structures is based on two criteria independent of land use (road class and size) and is summarized separately in Table 4-4.

Table 4-3: Consequence of failure Ratings for Reliability

Asset Category	Criteria		
	Criteria Description	CoF Score	Weighting
Transportation			
Roads	Road Class 5	1	75% Road Class + 25% Land Use
	Road Class 4	2	
	Road Class 3	3	
	Road Class 2	4	
	Road Class 1	5	
Structures	Refer to Table 4-4		-
Traffic Signals	All signals	3	-
Sidewalks	-	-	100% Land Use
Streetlights	All streetlights	2	-
Traffic Signs	All signs	1	-

Asset Category	Criteria		
	Criteria Description	CoF Score	Weighting
Stormwater			
Storm sewers (including appurtenances)	<450mm diameter	1.67	50% diameter + 50% land use
	>450 to 825 mm	3.33	
	>825 mm	5	
Oil Grit Separators	All separators	3	-
Stormwater Management Ponds	Wet Ponds	4	-
	Dry Ponds	1	-
Stormwater Culverts	Driveway culverts	1	-
	Cross culverts	2	-
Wastewater			
Sanitary Sewers (including appurtenances)	<450mm diameter	1.67	50% diameter + 50% land use
	>450 to 825 mm	3.33	
	>825 mm	5	
Water			
Watermains (including appurtenances)	<100mm diameter	1	75% diameter + 25% land use
	100 to <200 mm diameter	2	
	200 to <=300 mm diameter	3	
Pressure Control valves	All pressure control valves	3	-
Water Meters	Less than 3"	1	-
	3" and larger	2	-
Bulk Water Station	Bulk Water Station	2	-

Table 4-4: Consequence of failure Ratings for Reliability (Structures)

CoF Rating	Road Class	Size	Weighting
Bridges & Culverts			
1	-	-	50% Road Class + 50% Deck Area
2	Road Class 5	<200m2 deck area	
3	Road Class 4	200m2 <= deck area < 500m2	
4	Road Class 3	>= 500m2 deck area	
5	Road Class 2	-	
Retaining Walls			
1	-	<1 m height	50% Road Class + 50% Retaining Wall Height
2	Road Class 5	1m <= height < 3m	
3	Road Class 4	>=3m height	
4	Road Class 3	-	
5	Road Class 2	-	

The CoF rating methodology is based on the best available data and will be refined as new data and information becomes available. A future improvement is to consider assigning criticality to storm sewers based on catchment areas of each pipe rather than using pipe diameter as a proxy for volume. This initiative would require hydraulic

modelling of the storm system that accurately represents the volume of stormwater being collected by each sewer. Hydraulic modelling can also be applied to the water and wastewater networks to improve accuracy of COF ratings.

The risk results are plotted on a risk map (Figure 4-1) to show a visual representation of risk exposure across the Town's assets. Colours on the map denote various levels of risk and help to prioritize the Town's resources, time, and effort for renewal activities.

- **Very High** risks in the light red zone are significant to the Town and therefore should be actively managed and monitored in a more comprehensive and/or immediate manner than other risks (i.e., prioritized).
- **High and Medium** risks in the orange (high) or green (medium) zones should also be actively managed or identified for potential mitigation soon.
- **Low and Very Low** risks that appear in the light blue (low) or grey (very low) zones are acceptable without significant mitigation strategies being implemented, although monitoring may still be beneficial.

As shown in Figure 4-1, $4.3 million (0.6%) of the Town's assets are currently estimated to be in the Very High risk category. These assets consist of larger diameter sanitary sewers and watermains that are approaching or have reached their end-of-life and are adjacent to a land use that is of higher consequence, such as along Main Street, CN Rail crossings, or QEW crossings. A small portion of sidewalks ($0.2 million) are in high risk due to their age and also due to their proximity to a more critical land use. Mitigation of risks through lifecycle strategies are discussed further in Section 5.2.2. Actual observed condition improves the accuracy of the likelihood of failure assessment and therefore the Town's CCTV inspection program and break history records are useful strategies that provide confidence in the identification of potential failures before they occur.

Figure 4-1: Current Reliability Risk (by Replacement Value in $M)

LoF						
	5	$3.6	$14.7	$1.5	$1.4	$0.8
	4	$3.2	$30.5	$5.0	$1.9	$2.1
	3	$8.7	$91.9	$36.4	$12.2	$6.4
	2	$44.7	$161.9	$54.7	$18.6	$3.6
	1	$70.5	$142.3	$35.5	$6.3	$1.0
		1	2	3	4	5
		CoF				

Risk Category	Replacement Value ($M)	%
Very High	$4.3	0.6%
High	$9.8	1.3%
Medium	$35.4	4.6%
Low	$236.6	30.8%
Very Low	$473.1	61.6%
Not assessed	$9.2	1.2%
Total*	$768.4	100%

*Totals may not add up due to rounding

Figure 4-2 summarizes the risk profile by service area and indicates that watermains currently have the highest risk exposure, mainly due to the need to replace older cast iron and ductile iron pipes servicing critical customers.

Figure 4-2: Current Reliability Risk by Service Area (by Replacement Value in $M)

Risk Category	Transportation	Stormwater	Wastewater	Water	Total
Very High	$0.2	$0.0	$0.5	$3.6	$4.3
High	$1.1	$3.1	$3.1	$2.5	$9.8
Medium	$4.9	$11.4	$7.7	$11.4	$35.4
Low	$46.1	$73.9	$81.7	$34.8	$236.6
Very Low	$178.1	$60.3	$100.7	$133.9	$473.1
Not assessed	$2.1	$2.1	$0.0	$5.1	$9.2
Total*	**$232.5**	**$150.8**	**$193.8**	**$191.3**	**$768.4**

*Totals may not add up due to rounding

4.4 Climate Change Risk Considerations

Climate change risks pose an additional challenge to managing Town assets and maintaining service levels. Climate change events can play a role in increasing the likelihood of an asset failure, as well as increasing the consequence of failure in terms of financial impacts, service delivery, and damages to the natural environment due to the potential magnitude of an extreme weather event. Therefore, climate change considerations may increase the Town's risk exposure and the proportion of assets in the high and very high risk categories that will need to be addressed through various strategies. Examples of increased asset risk due to climate change is described below for each of the core service areas:

- **Transportation**: Erosion and embankment failures can damage roads and bridges, and roads may experience an increased frequency and severity of pavement cracking and rutting resulting in reduced reliability service levels.
- **Stormwater Service**: More intense and frequent storm events may lead to a higher probability of sewer capacity failure and therefore more frequent flooding events causing damages to Town infrastructure and private properties.
- **Water Service**: Source water quality may be reduced due to increased flooding events, affecting functional service levels related to drinking water quality.
- **Wastewater Service**: Extreme weather events can increase inflow and infiltration leading to a higher probability of sewer capacity failure, resulting in backups and damages due to flooding.

Lifecycle strategy considerations due to climate change are discussed in Section 5.3.

5 Lifecycle Management Strategy

5.1 Overview

To achieve its program objectives and maintain service levels, the Town builds new infrastructure assets to meet capacity needs, upgrades assets to meet functional needs, and manages existing assets to meet reliability needs – all with limited funds. Asset lifecycle management strategies are planned activities that enable assets to provide the service levels in a sustainable way, while managing risk at the lowest lifecycle cost. Asset lifecycle management strategies are typically organized into the categories listed in Table 5-1, and are driven by the levels of services defined in Section 3 and the associated risk discussed in Section 4.

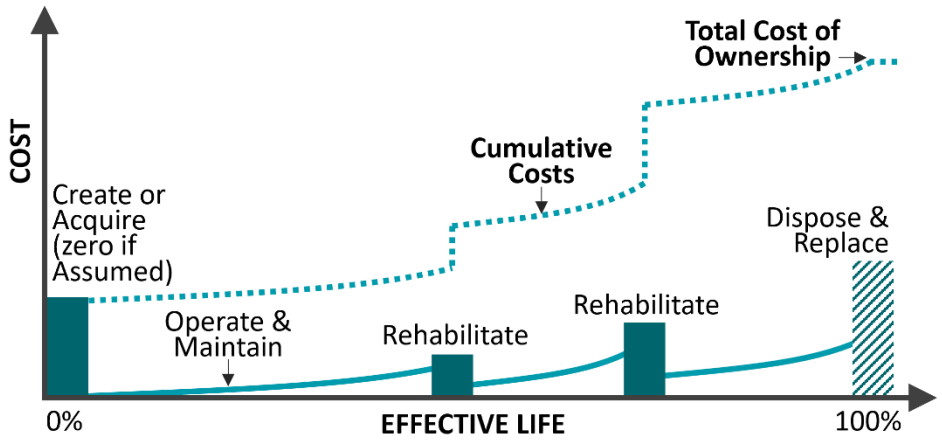
Table 5-1: Asset Lifecycle Management Categories

Lifecycle Management Category	Description	Examples of Associated Activities
Operate	Regular activities to provide services	inspections, cleaning, flushing
Maintain	Activities to retain asset condition to enable it to provide service for its planned life	repairs, component replacements
Renew	Activities that return the original service capability of an asset	minor or major rehabilitations such as road resurfacing, asset replacement
Upgrade	Activities to provide a higher level of service capability from an existing asset to achieve better fit for purpose or meet regulatory requirements	road urbanization
Expand/Grow	Activities to provide a new asset that did not exist previously or an expansion to an existing asset	new asset construction such as new sidewalks and expansion of existing asset such as road widenings

In addition to the above asset strategies, non-asset solutions are also considered which are actions or policies that can lower costs, lower demands, or also extend asset life. For example, integrated infrastructure planning between services enables cost savings by bundling road, watermain, and sewer work into one project.

The Town reviews the costs of potential lifecycle activities to determine the lowest lifecycle cost strategy while still meeting service levels. The total cost of ownership is the sum of lifecycle activity costs to sustain an asset over its lifecycle. (See Figure 5-1 for a conceptual lifecycle cost model). Sufficient investment of the right type of asset intervention at the right time minimizes the total cost of ownership for each asset and mitigates other potential risks such as interruption to service delivery or failure that causes damage to other nearby infrastructure. Operations, maintenance, and renewal activities are timed to reduce the risk of service failure from deterioration in asset condition and all contribute to the total cost of ownership.

Figure 5-1: Conceptual Lifecycle Cost Model



5.2 Lifecycle Management Needs

The Town uses its understanding of risks associated with different service levels to inform the timing and level of investments needed in infrastructure assets. This section of the AM Plan outlines the Town's expansion and upgrade strategies to support capacity and functional service levels, and the operations, maintenance, and renewal activities to support reliability service levels. The additional impacts due to climate change are discussed in Section 5.3.

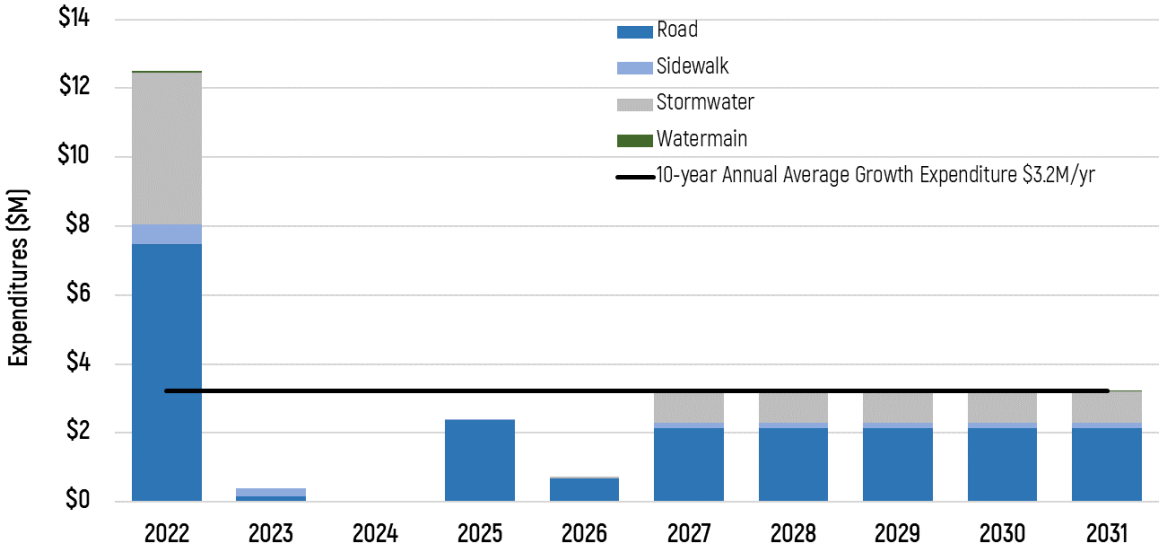
5.2.1 Capital Growth and Upgrade Needs

The Town carefully plans for growth and service improvements based on the community's growing and changing needs, and has key initiatives planned over the next 5 years. It is assumed that these growth expenditures will continue in years 6 to 10. The scope for years 6 to 10 will be supplemented with additional projects pending recommendations from upcoming studies such as the Transportation Master Plan. The growth and upgrade portion of planned projects in the 5-year Capital Budget is estimated to cost a total of $16 million, or $3.2 million averaged annually over the next 5 years and extended to 10 years, as shown in Figure 5-2.

66.7% ($10.7 million) of the projects to address known capacity and functional issues are related to road assets. As indicated in Section 4.3.1 and Section 4.3.2, these projects include the reconstruction of North Service Road in conjunction with Fifth Wheel development and urbanization of Marlow Avenue from Park Road North to the west limit as part of Central Avenue and Park Road North reconstruction. The Marlow Avenue road project addresses both upgrade and renewal service levels, with $600,000 estimated to be associated with growth or upgrade, and the remaining $200,000 associated with renewal. The $600,000 share, which is funded through development charges, is the growth or upgrade portion included in Figure 5-2. In 2022, the major road growth project is North Service Road reconstruction associated with Fifth Wheel development. There are also several areas throughout the Town for which new sidewalks are planned. This AM Plan does not forecast additional urbanization needs beyond what is currently planned in the Capital Budget, as the Town will need to gain a better understanding of which areas of the Town requires sidewalks and storm sewers and develop an appropriate policy and plan. As recommended in Section 7, updates to this forecast should include any additional road urbanization projects that may be planned based on a future policy. Additional sidewalk expenditures may also be needed in the future to address Accessibility for Ontarians Disability Act (AODA) requirements such as curb ramps in specific areas.

For stormwater, the Town has sewer improvements planned on Tomahawk Avenue and Arrowhead Park, as well as on Casablanca Boulevard as part of a Regional roadway reconstruction project. There are minimal capital expenditures expected for net new sewers and watermains over the next ten years. Assets assumed through development are not included in this section. These additional assets are estimated to add a nominal 2% annual growth to the asset portfolio and will impact the operating budget discussed in Section 1.1.1.1.

Figure 5-2: Growth & Upgrade Needs – 2022 to 2031



5.2.2 Capital Renewal Needs

Renewal efforts focus on rehabilitation and replacement activities to enable the Town to meet its service levels related to asset reliability. The renewal activities forecasted in this AM Plan maintain asset condition over the next 10 years. Over time, as the Town refines the asset management strategies through tracking of treatment activity timing and associated benefits and costs, the Town will improve its understanding of the deterioration rates and the lowest lifecycle cost for each asset type. Where appropriate, the Town considers coordinating multiple activities across asset types through project bundling to reduce total costs.

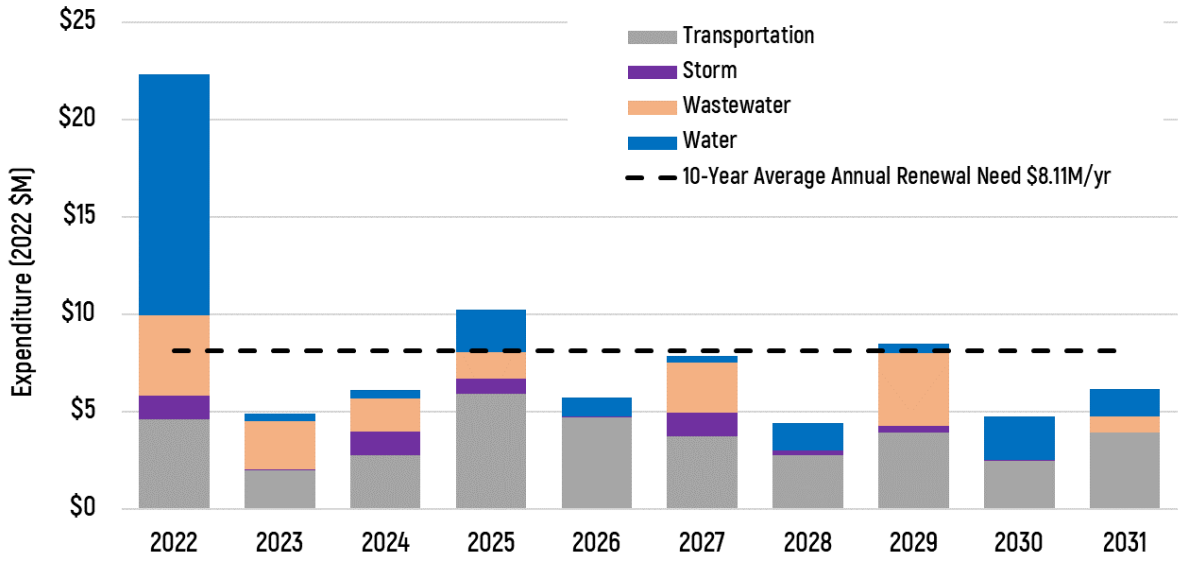
Rehabilitation activities extend the life of an asset and reduce its likelihood of failure. These activities and associated benefits are deemed more cost effective than allowing the asset to reach its end of life. An example of a rehabilitation activity is resurfacing of a road, which will improve the condition 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 planned rehabilitation and replacement activities, as well as the recommended strategies from the following specific studies:

- **2019 Road Needs Study Report** – This study provided recommended timing for road improvements, rehabilitation, reconstruction, and associated costs over the next 10 years. PCI scores and recommendations have been updated by Town staff to reflect work and updated information since the 2019 assessment.
- **2021 OSIM Inspection Reports** – Inspections on Town structures are completed every two years. In 2021, inspections were performed on road bridges, pedestrian bridges (not including those in parks), and culverts greater than or equal to 3 metres in span, as well as retaining walls. In addition to determining a BCI for each asset, the report provides timing for asset rehabilitations and replacements over the next 10 years. The recommendations have been updated to reflect work and updated information since the 2021 assessment, such as replacement of Gibson Street pedestrian bridge in May of 2022.

Figure 5-3 shows the renewal needs over the next 10 years for the Town's core assets. The average renewal need is estimated at $8.11 million per year for the period 2022-2031. The 2022 forecasted expenditure includes the backlog of assets that are past their estimated end-of-life, such as older cast iron and ductile iron watermains that are overdue for replacement.

Figure 5-3: 10-Year Capital Renewal Needs Forecast

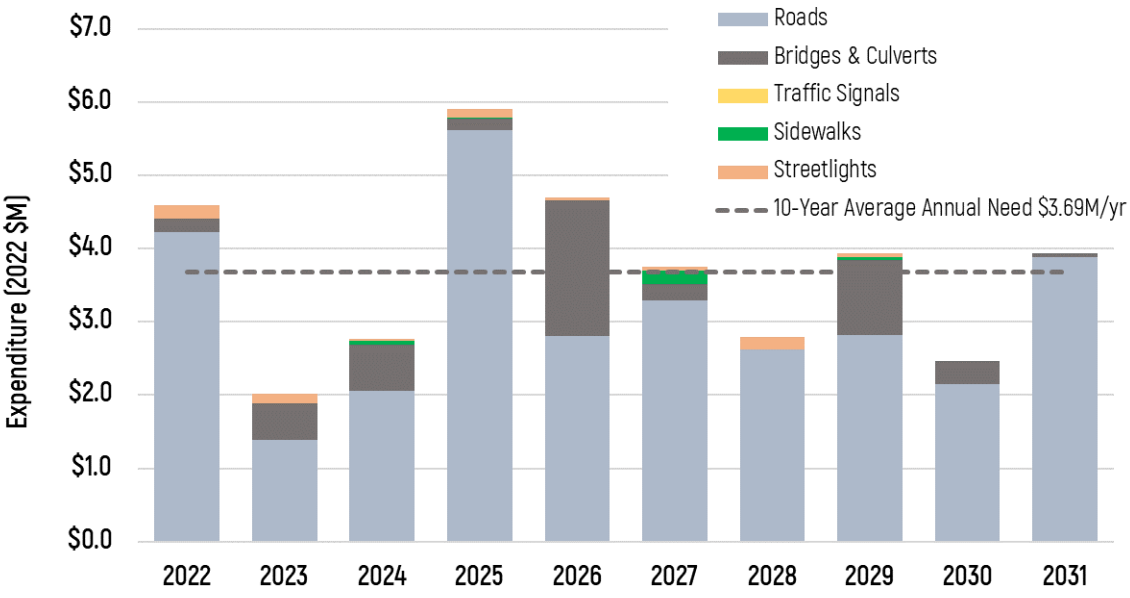


The renewal needs forecast is described in more detail by service area in the following subsections.

5.2.2.1 Transportation Capital Renewal Needs

The average annual renewal needs for transportation and stormwater assets is estimated at $3.69 million per year, as shown in Figure 5-4. Most of the forecasted needs is for road renewal, which is estimated to cost the Town an average of $3.1 million per year.

Figure 5-4: 10-Year Capital Renewal Needs Forecast – Transportation



The forecasted needs consist of various treatments reflecting a lowest lifecycle approach to managing the road network, with intermediate rehabilitations that extend asset life and delay the need for reconstruction. The typical lifecycle strategy for high class bituminous (HCB) surface roads is provided in Table 5-2.

Table 5-2: Typical Lifecycle Strategy - High Class Bituminous Surface Roads

Age (Years)	Treatment
15	Thin (50mm) Overlay
30	Thin (50mm) Overlay
45	Thick (90mm) Overlay + 30% Curb and Gutter + Subdrain
60	Thin (50mm) Overlay
75	Replace HCB in Full

The thick overlay is a more extensive resurfacing treatment which includes some curb and gutter replacement and base repairs, and has a more significant impact on the extension of the road's service life. With the intermediate resurfacing treatments, HCB roads are expected to last approximately 75 years. Table 5-2 represents a general lifecycle approach to managing HCB roads. The specific rehabilitation requirements for each pavement section should be established as a part of the routine condition inspection program and project level evaluation at the time of planning the rehabilitation treatment. Other techniques such as partial depth pulverization may also be considered depending on the condition of the pavement. For low class bituminous (LCB) surface roads, the typical lifecycle strategy is based on a chip seal treatment at 15 and 30 years, followed by replacement of the LCB surface at 40 years.

Sidewalks are typically maintained through activities such as grinding, patching, lifting, and individual panel replacements that are covered by the operating budget discussed in Section 5.2.3. Over the next 10 years, the main capital renewal requirements for sidewalks are expected to be driven by road reconstruction needs, as the Town would likely take advantage of cost savings and minimizing service disruption by bundling sidewalk replacement with road work. An independent forecast based on service life indicated that only a small percentage of the portfolio requires renewal based on age, and aligns with the age analysis in Section 2.2.1 which indicated that sidewalks are on average at mid-life (30.7 years out of the 60-year estimated service life). However, the risk map in Section 4.3.3, identified some sidewalks currently estimated as high risk. Based on the 60-year life, these segments are forecasted for replacement just beyond the next 10-year period and are higher criticality assets due to their proximity to land uses such as institutional properties and downtown areas. It is recommended that the Town monitor these areas as the assets continue to age and determine appropriate repair or rehabilitation strategies as required. Signals and streetlights are forecasted for replacement based on their age and estimated service life. Streetlight luminaries have all been replaced within the last 8 years and are not expected to require replacement in the next 10 years.

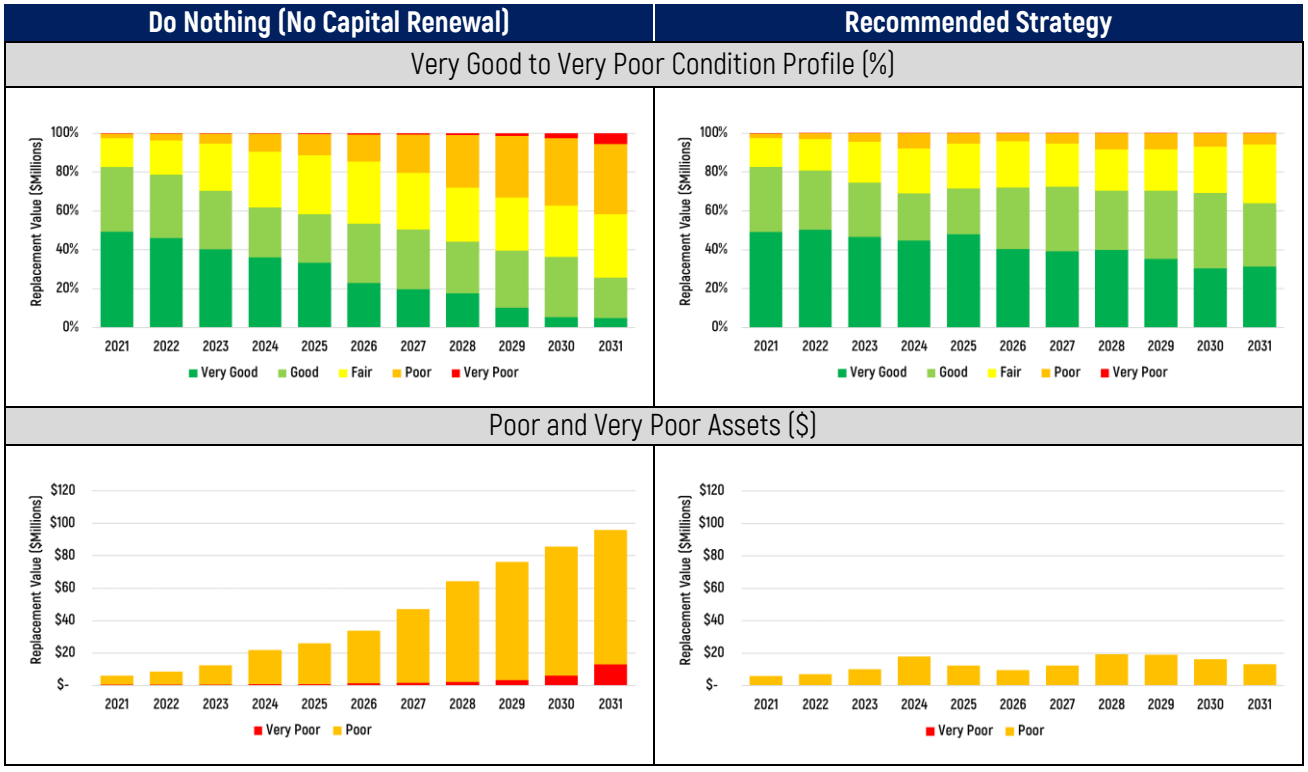
Summary of Recommended 10-Year Renewal Strategy:

- Maintains percentage of assets in fair or better above 90% over 10-year forecast
- Road renewal treatments are generally timed based on PCI triggers for thin overlay (60 to 75), thick overlay (<60 PCI), and reconstruction (<50 PCI)
- Sidewalk reconstruction needs are aligned with road reconstruction projects
- Signals and streetlights are replaced at end-of-life based on age
- Structure rehabilitations and renewals are based on 2021 OSIM inspection recommendations
- All assets follow a deterioration curve based on their estimated service life until they are renewed; intermediate treatments such as overlays renew assets back to Very Good condition; replacements return assets to new condition.

The forecasted needs for structures are based on the 2021 bridge, culvert and retaining wall structure inspections. These inspections provided renewal recommendations including minor and major rehabilitations, and full replacements depending on the condition of each structure.

The recommended strategy associated with the average $3.69 million per year forecast for transportation supports the Town's ability to achieve its service levels while balancing risk and minimizing lifecycle costs. If the Town does not invest in renewing its infrastructure, there will be a significant deterioration in asset condition over time, with the value of assets in poor or very poor condition increasing from $5.9 million to an estimated $95.9 million by 2031. The recommended strategy ensures that transportation assets are maintained and renewed in a state of good repair, as shown in Figure 5-5.

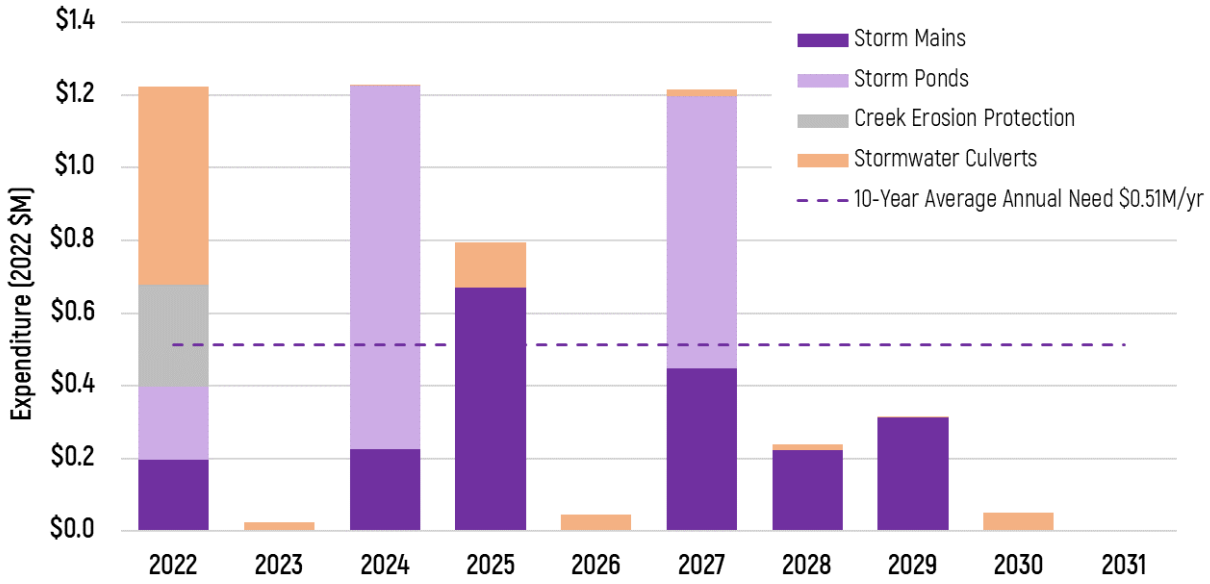
Figure 5-5: Condition Forecast - Do Nothing versus Recommended Strategy – Transportation



5.2.2.2 Stormwater Capital Renewal Needs

The average annual renewal needs for stormwater assets to maintain reliability service levels is estimated at $0.51 million per year, as shown in Figure 5-6.

Figure 5-6: 10-Year Capital Renewal Needs Forecast – Stormwater



Storm sewers, including appurtenances, are generally replaced with road reconstruction projects to take advantage of cost savings and minimize service disruptions by bundling associated works. The storm sewer forecast is aligned with urban road reconstruction needs from Section 5.2.2.1, which is mainly forecasted as a need in 2022. It is assumed that the majority of sewers (75%) that are less than 600mm can be lined, and the remaining 25% and all those over 600mm will require open cut full replacement. The relining strategy reduces the overall lifecycle cost as the lining is estimated to cost approximately 50% of a full replacement and is expected to extend the service life of the pipe an additional 50 years, if not longer. Storm sewers have an estimated service life of 75 years for asbestos cement and concrete pipes, and 80 years for PVC and other plastic pipes. CSP sewers are only expected to last 30 years, but represent less than 1% of the storm sewer inventory. An independent forecast based on service life indicated that only a small percentage of the portfolio requires renewal based on age, therefore supporting the approach that the major capital renewal requirements over the next 10 years will be driven by road reconstruction projects. As indicated in Section 2.3.2, the Town expects to complete CCTV inspections for the storm sewer network over the next three years which will enable a better of understanding of future capital needs and inform future updates to this forecast.

Road reconstruction work also drives the renewal need for driveway culverts in rural environments. Driveway culverts are low criticality assets based on the risk management strategy and would typically only be replaced as part of capital planning when part of a rural road reconstruction. They are otherwise typically replaced under the Operating Budget based on road patrol inspections or resident complaints. For cross culverts, which are higher criticality assets, the forecasted need is based on asset age and estimated service life by material type.

Three of the four wet stormwater management ponds are expected to require sediment removal over the next 10 years: Vineyard Valley, Civic Neighbourhood, and Sumner Pond. It is expected that ponds will typically need to be dredged every 15 years, though factors such as loading from the upstream environment and weather events will influence sediment accumulation. The Town also manages five dry ponds which have associated operations costs such as grass cutting, covered in the Operating budget discussed in Section 5.2.3. An erosion protection project for 40 Mile Creek in Coronation Park is required in 2022 and is considered as part of stormwater infrastructure renewal in this AM Plan.

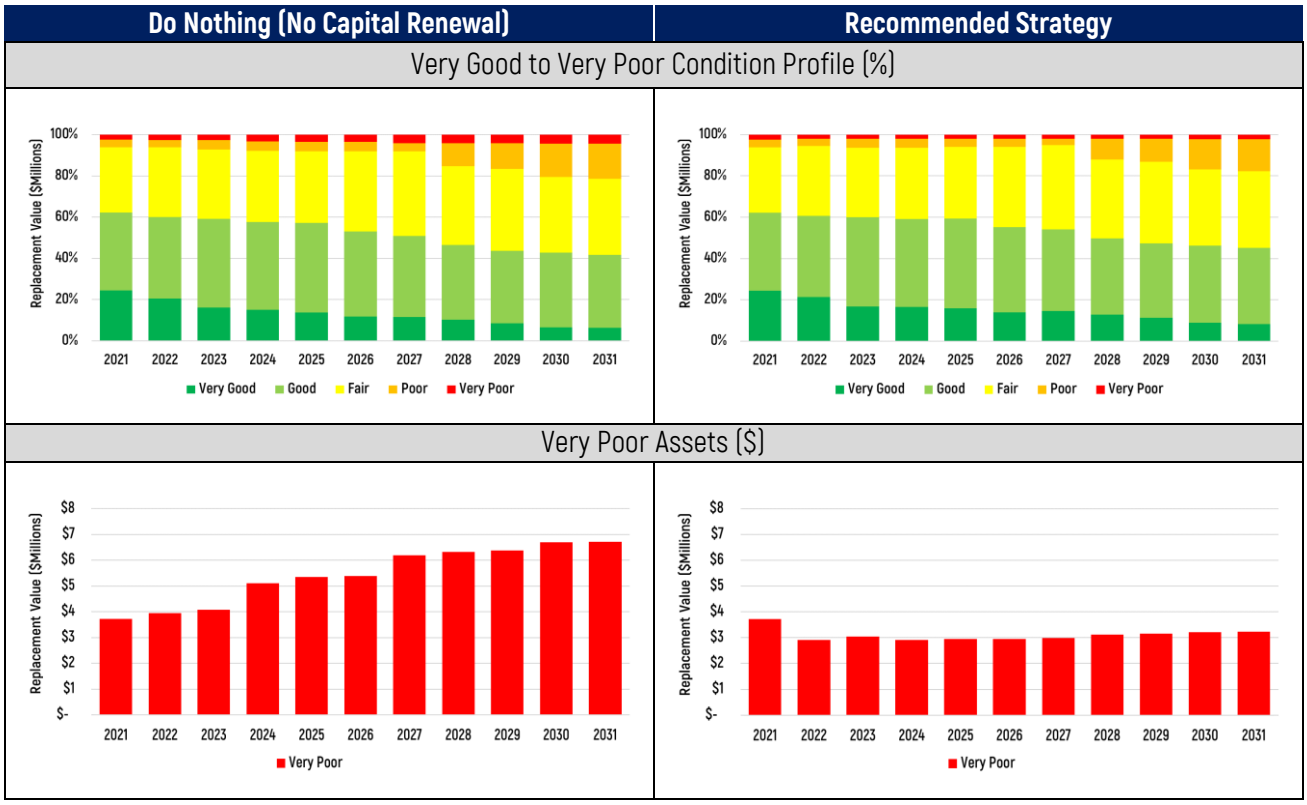
The recommended strategy associated with the average $0.51 million per year in stormwater renewal supports the Town's ability to achieve its service levels while balancing risk and minimizing lifecycle costs. Like the investment required in transportation assets, if the Town does not invest in renewing its stormwater infrastructure, there will be a significant deterioration in asset condition over time. The recommended strategy enables the Town to maintain current service levels, as shown in Figure 5-7. If no investment is provided, Very Poor assets increase to $6.7 million in 2031 compared to the recommended strategy where it is limited to $3.2 million.

The impact of the expenditures for sediment removal for stormwater ponds is included in Figure 5-7 by representing ponds that are due for cleanout in Very Poor condition. As discussed in Section 2.3, the excavated area for the pond is considered similar to a natural area with an infinite life and is not assessed for replacement value. Therefore, the value of ponds related to sediment accumulation in Figure 5-7 is represented by the estimated cost of the sediment removal activity.

Summary of Recommended 10-Year Renewal Strategy:

- Maintains Very Poor assets less than 2.5% of portfolio over 10-year forecast
- Storm sewer renewal needs, including appurtenances, are aligned with urban road reconstruction projects
- It is assumed that the majority of sewers below 600mm in diameter will be relined, reducing overall lifecycle costs
- Driveway culverts are aligned with rural road reconstruction projects
- Cross culverts are replaced based on their estimated service life
- Three wet ponds are dredged over the next 10 years
- All assets follow a deterioration curve based on their estimated service life (by material type for sewers) until they are renewed. Relinings and replacements return assets to new condition.

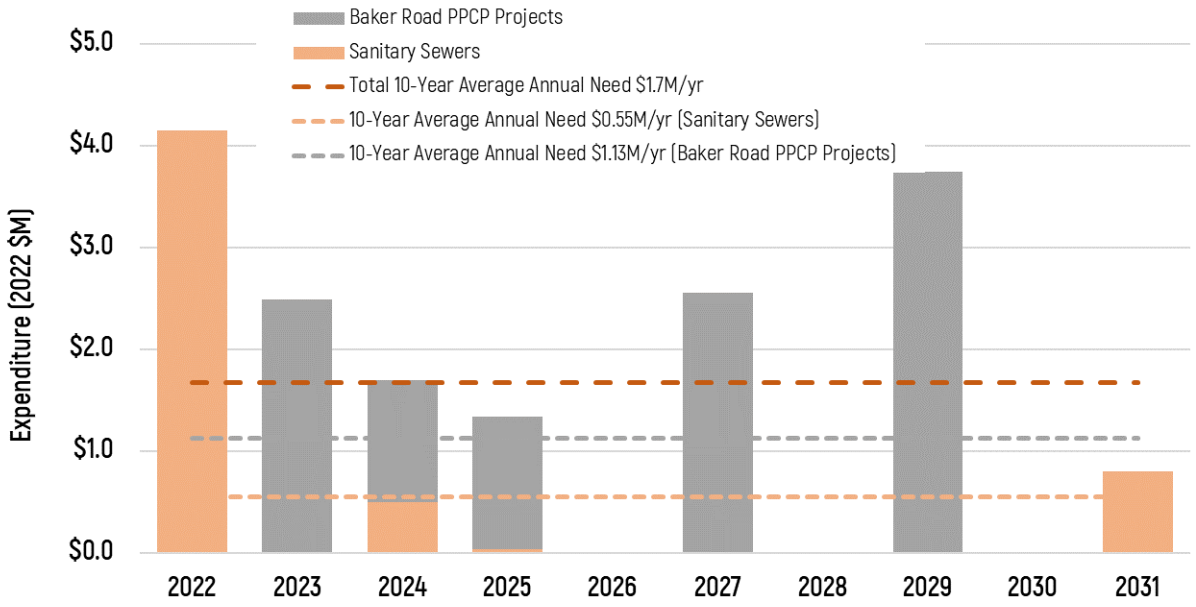
Figure 5-7: Condition Forecast – Do Nothing versus Recommended Strategy – Stormwater



5.2.2.3 Wastewater Capital Renewal Needs

The average annual renewal needs for wastewater assets to maintain reliability service levels is estimated at $1.7 million per year, as shown in Figure 5-8. This forecast consists of sanitary sewer renewal, as well as projects recommended by the Baker Road WWTP Pollution Prevention and Control Plan and Master Servicing Plan Update (Baker Road PPCP).

Figure 5-8: 10-Year Capital Renewal Needs Forecast –Wastewater



Sanitary sewers, including appurtenances, are forecasted for replacement based on their estimated service life: 75 years for asbestos cement and concrete pipes, 80 years for PVC and other plastic pipes, and 60 years for vitrified clay pipes. The remaining life to replacement is based on the current condition from the CCTV inspection rating, or age of the pipe if the rating was not available. Similar to storm sewers, as part of a lowest lifecycle cost approach, it is assumed that the majority of sanitary sewers (75%) under 600mm in diameter can be lined, while the remaining 25% and all pipes over 600mm are assumed to require open cut full replacement. The estimated average renewal need for sanitary sewers is $0.55 million per year, consisting mainly of a backlog of sewers currently estimated to be in very poor condition.

The Baker Road wastewater system services Grimsby, the communities of Beamsville, Campden, Jordan and Jordan Station, and Vineland in the Lincoln area, and the Smithville area in West Lincoln. The Town, other Local Area Municipalities (LAMs), and Niagara Region have joint responsibility for the management and operation of the Baker Road wastewater system. In 2021, the Baker Road WWTP Pollution Prevention and Control Plan and Master Servicing Plan Update (Baker Road PPCP) was completed to recommend system optimization, upgrades, or other infrastructure planning approaches to address growth and existing customer base capacity needs. For the Town, these recommendations included sewer upgrades to support the Grimsby GO Secondary Plan, and inflow and infiltration (I&I) reduction programs to manage peak flows in the following catchment areas:

- Biggar Lagoon Pump Station catchment
- Woodsview Sewage Pumping Station catchment
- Old Orchard Sewage Pumping Station catchment
- Lake Street Sewage Pumping Station catchment

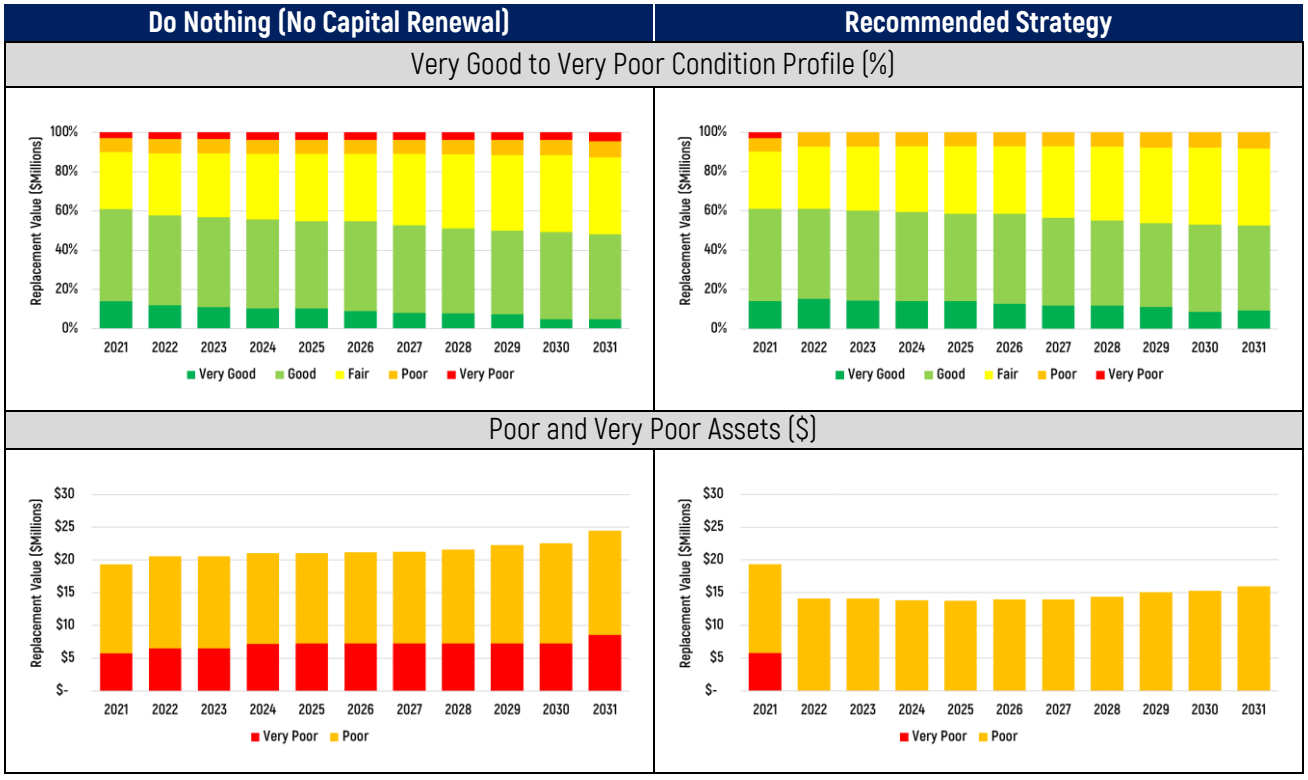
Over the next 10 years, it is estimated that these projects may cost the Town $11.3 million, or an average of $1.13 million per year. The costs are based on preliminary estimates and will be adjusted as the Town carries out additional I&I studies to confirm the full scope of the required infrastructure work.

The recommended strategy associated with the average $1.7 million per year in expenditures supports the Town's ability to achieve its service levels while balancing risk and minimizing lifecycle costs. If the Town does not invest in renewing its wastewater infrastructure, there will be a significant deterioration in asset condition over time. The recommended strategy ensures that wastewater assets are maintained and renewed to maintain current service levels. The impact of the recommended strategy on asset condition is shown in Figure 5-9, and is focused on the $0.54 million per year investment in sewers. It does not include the impact of the Baker Road PPCP recommendations, as the scope and sewers affected by those investments are still to be determined. The recommended strategy renews the sewers currently in very poor condition and limits the Poor and Very Poor assets to $16.0 million (8.2%) in year 2031. In the 'do nothing' approach, the Town would have increased risk exposure with over $24.5 million (12.6%) of poor and very poor sanitary sewers in 10 years.

Summary of Recommended 10-Year Renewal Strategy:

- Maintains percentage of assets in fair or better above 90% over 10-year forecast
- Sanitary sewer renewal needs, including appurtenances, are forecasted based on current condition (CCTV score) and estimated service life (by material)
- It is assumed that the majority of sewers below 600mm in diameter will be relined, reducing overall lifecycle costs
- Sanitary sewers follow a deterioration curve based on their estimated service life (by material type) until they are relined or replaced. Relinings and replacements return assets to new condition.
- Potential sewer upgrades based on projects from the Baker Road PPCP recommendations are preliminary estimates ($1.13 million annually)

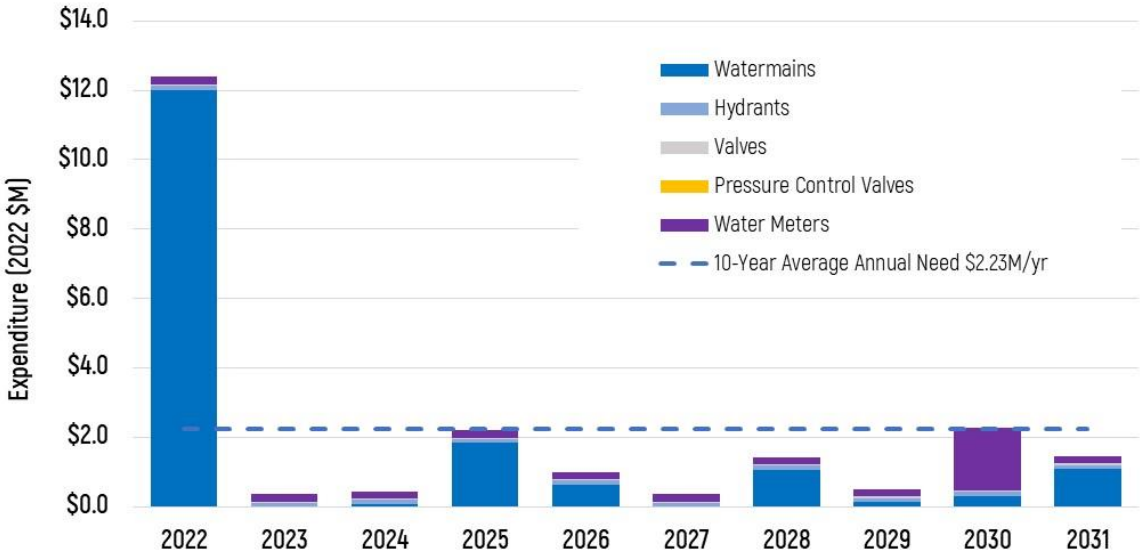
Figure 5-9: Condition Forecast – Do Nothing versus Recommended Strategy - Wastewater



5.2.2.4 Water Capital Renewal Needs

The average annual renewal needs for water assets to maintain reliability service levels is estimated at $2.23 million per year, as shown in Figure 5-10.

Figure 5-10: 10-Year Capital Renewal Needs Forecast – Water



For water assets, there is a backlog of watermains estimated to need replacement in 2022 based on their age and break history, consisting mainly of cast iron and ductile iron pipes that have a shorter estimated service life and have generally experienced a higher number of breaks. The estimated service life for watermains is 80 years for PVC and other plastic pipes, 75 years for asbestos cement, 60 years for ductile iron, and 45 years for cast iron. The watermains forecast includes appurtenances that would be typically replaced at the same time as the pipe replacement. Hydrants and valves, however, have a lower service life and are assumed to require another replacement during the life of the pipe, and that additional expenditure is shown in Figure 5-10.

As discussed in Section 2.5.1, 39% (3725) of the Town's water meters were replaced in 2015, and therefore another significant expenditure is forecasted for year 2030 at the end of their 15-year estimated service life. The bulk water station, with an estimated service life of 30 years, is not expected to require replacement within the next 10 years.

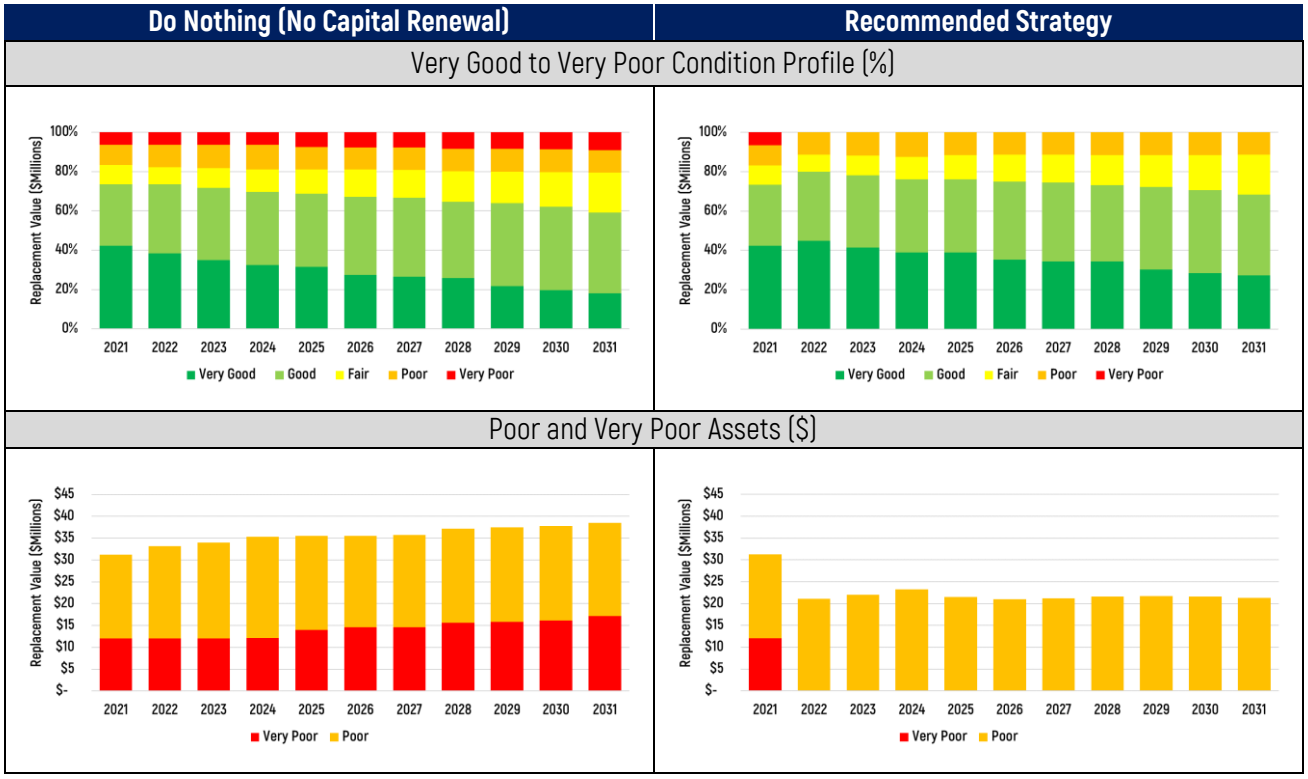
The recommended strategy associated with the average $2.23 million per year in expenditures supports the Town's ability to achieve its service levels while balancing risk and minimizing lifecycle costs. The recommended strategy ensures that water infrastructure is maintained and renewed to current service levels over the next 10 years as shown in Figure 5-11. The strategy reflects the Town's program to replace old cast iron and ductile iron watermains to

Summary of Recommended 10-Year Renewal Strategy:

- Maintains percentage of assets in fair or better above 85% over 10-year forecast
- Watermain replacement needs, including appurtenances, are forecasted based on current condition (age and break history) and estimated service life (by material), with most cast iron pipes replaced within the 10-year forecast
- Pressure control valves are replaced at end-of-life based on age
- Water meters are replaced at end-of-life based on age
- All assets follow a deterioration curve based on their estimated service life (by material type for watermains) until they are replaced; replacements return assets to new condition.

maintain the water infrastructure portfolio in a state of good repair. If no investment is provided, Poor and Very Poor assets increase to $38.5 million in 2031 compared to the recommended strategy where it is limited to $21.3 million.

Figure 5-11: Condition Forecast – Do Nothing versus Recommended Strategy – Water



5.2.3 Operations and Maintenance Needs

The Town also supports asset reliability service levels through operations and maintenance (O&M) work. The distinction between renewals (capital programs) and operations and maintenance (operating expenses) is defined by the Town's accounting policies and standard operating procedures. O&M activities ensure the asset continues to deliver defined levels of services, while renewal activities discussed in Section 5.2.2 extend the service life of the asset.

Renewals and O&M are integral activities that influence the overall lifecycle management of an asset. O&M strategies can be used to delay the need for renewals, and if renewals are deferred, O&M expenditures will often have to increase to ensure that assets are able to deliver the required services. Table 5-3 summarizes the Town's main asset-related O&M activities for core assets.

Table 5-3: Main Operations and Maintenance Activities

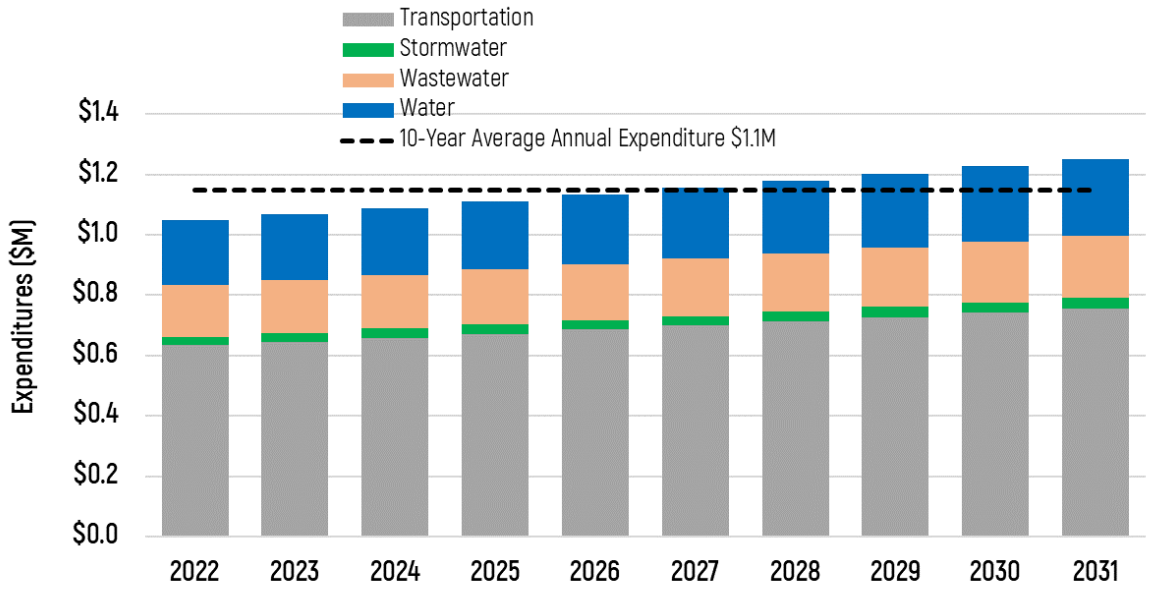
Asset Category	Operations & Maintenance
Transportation	
Roads	Winter Control per MMS Road Patrol per MMS Sweeping Condition assessment (Road Needs Study) Repair potholes Pavement markings Washout repairs

Asset Category	Operations & Maintenance
	Repairs to medians and shoulders Grass cutting Ditching and ditch maintenance
Structures	OSIM inspections every two years Cleaning Repairs based on OSIM inspections
Traffic Signals	Repairs or replacements of signal components as needed
Sidewalks	Inspections Winter control per MMS Repair panels, grinding, patching, lifting/jacking Remove and replace panels Trim vegetation
Streetlights	Replacements of lights, fixtures, and photocells as needed Pole repairs as needed Utilities (electricity)
Traffic Signs	Repairs and sign replacements as needed
Stormwater	
Storm Sewers and appurtenances	Sewer flushing Inlet/outlet structure inspections Catchbasin cleaning Street sweeping Spot repairs Catchbasin repairs CCTV inspections
Stormwater Culverts	Repairs and replacements as needed
Oil Grit Separators	Cleaning and repairs
Stormwater Ponds	Inspections Cleaning outfalls Removing vegetation overgrowth and debris Repairs to pond components
Water	
Watermains and appurtenances	Directional Flushing Hydrant flushing and maintenance Isolation Valve Exercising Water sampling Pressure control valve inspection and maintenance as required
Water Meters	Repairs and new installations as needed Calibration and maintenance on larger meters

Asset Category	Operations & Maintenance
Wastewater	
Sanitary Sewers and appurtenances	Sewer flushing CCTV inspections Spot repairs Maintenance hole repairs Sewer lateral maintenance

Figure 5-12 summarizes the forecasted operations and maintenance expenditures related to core asset activities for the period 2022-2031, at an annual average of $1.1 million. A nominal growth rate of 2% is forecasted over the 10 years reflecting increasing needs as the Town's asset portfolio grows through the capital expenditures in Section 5.2.1 and assumptions through development. In general, Figure 5-12 is focused on asset activity-related materials and contracted services, and does not include salaries, which would represent a significant additional expense to the $1.1 million as many of the O&M activities are carried out by internal staff. Other administrative expenses such as office supplies, training, and insurance are also not included. Potential pressures on asset activities covered by the operating budget are discussed further in Section 6.3.3.

Figure 5-12: Operations and Maintenance Needs Forecast ($M)



5.3 Climate Change Strategies

As indicated in Section 1.1, climate change can have significant implications on Town infrastructure that increase the overall risk exposure to the Town, resulting in the need for renewal strategies to mitigate more frequent asset failure events. For core assets, one of the Town's main initiatives for climate change adaptation is carrying out an inflow and infiltration study to fully develop the scope of the I&I reduction strategy recommendations from the Baker Road PPCP. The Baker Road PPCP developed these recommendations in consideration of system resiliency and network vulnerability to climate change related failures such as flooding.

The Town also has shoreline protection projects planned over the next 5 years in the Capital Budget to protect existing infrastructure from the impacts of extreme weather events. These projects are considered land development projects and will be discussed in the next AM Plan with other non-core assets.

6 Financial Strategy

6.1 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 financial strategy considers how the Town will fund the recommended asset management actions to maintain current service levels.

The key challenge to financial sustainability is aligning level of service decisions and fiscal capacity. Additional challenges include changes in the cost of infrastructure investments and unforeseen impacts to funding. In advance of the 2025 O.Reg. 588/17 requirements, this section of the AM Plan reviews the annual funding projected to be available and compares the funding to the needs forecasted in Section 5.2 to provide a preliminary funding shortfall estimate for capital renewal. Continuous improvements in data will refine forecasts and a more comprehensive outlook will be available when the Town includes non-core assets in the next AM Plan. Forecast and funding gap analysis limitations are discussed in Section 6.4.

6.2 Funding Sources

Through the Town's annual budget process, capital project and operating activity expenditure information is gathered from each service area, including investment needs, trends, and priorities, to enable preparation of the capital and annual operating budget plans. The investments are proposed with careful line-of-sight to financial sustainability and affordability for its residents and businesses. Once the expenditure plans are finalized, a financing plan is developed which includes several key sources of funding as outlined in the table below.

Table 6-1: Key Sources of Funding and Financing

Funding Source	Description
Property Tax	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
OCIF	Ontario Community Infrastructure Fund for small, rural and northern communities to develop and renew their infrastructure
Grants	Project specific grants / subsidies
User Fees	Funds collected for the use of Town services or infrastructure (e.g., water rates)
Development Charges	Fees collected from developers to help pay for the cost of infrastructure required to provide municipal services to new development

Effective November 1st, 2021, the Town implemented a Reserve and Reserve Fund Policy to provide guidelines with respect to the consistent and effective development, management, and use of Town reserves and reserve funds. These funds address long-term Town objectives and balance current and future financial requirements. Annual reserve contributions sustain reserve balances at appropriate levels to address future infrastructure renewal costs and inherent uncertainties in capital investment needs. The 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.

The Town establishes asset renewal reserves as well as contingency and stabilization reserves for operating emergencies, unplanned cost increases, or revenue reductions over multiple budget cycles.

6.3 Financial Sustainability

6.3.1 Financial Sustainability for Capital Growth and Upgrade

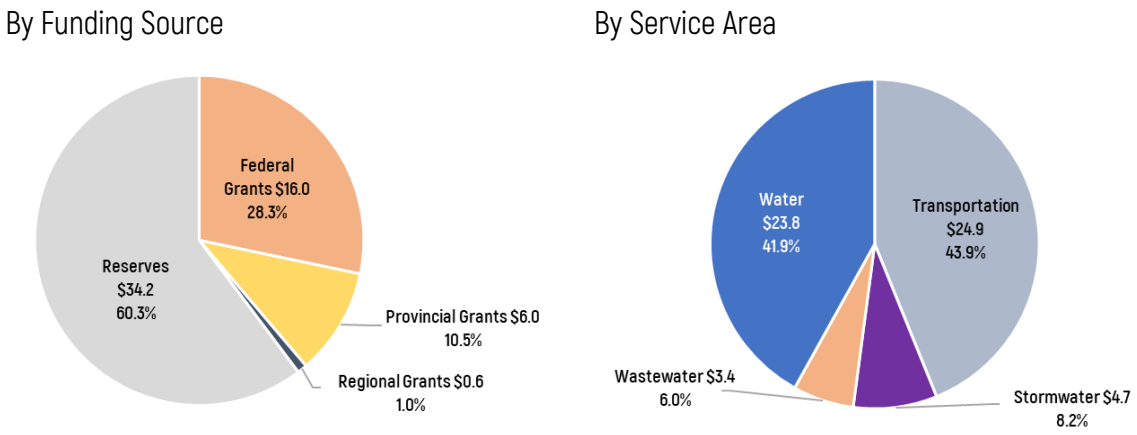
The Town's needs for capital growth and upgrades are estimated in Section 5.2.1 at $3.2 million over the 10 year period, based on the development charge portion of the Town's 10-Year Capital Budget. Therefore, there is no funding shortfall assuming these development charges cover the Town's growth needs over the next 10 years. The growth forecast should be updated as studies such as the Transportation Master Plan update are completed.

6.3.2 Financial Sustainability for Capital Renewal

This section compares the planned capital funding available for renewal (not development charges) in the Town's Capital Budget against the forecast needs for the recommended capital lifecycle activities (Section 5.2.2) to determine if there is a funding shortfall in the Capital Budget to maintain current service levels for core assets.

The estimated amount of funding available over the next 10 years is based on the 5-year Capital Budget, with years 6 to 10 assumed to continue at the same level of funding unless any special funding was not expected to be available again in the subsequent years. It is assumed that grants from the Ontario Community Infrastructure Fund (OCIF) will continue in years 6 to 10 and be allocated to core assets at the same levels as in years 1 to 5. The funding available **for renewal** is estimated to be $56.7 million over the next 10 years, as shown in Figure 6-1 by funding source and service area. This does not include potential funding from the Region's Combined Sewer Overflow (CSO) Control Program discussed in Section 6.3.2.3.

Figure 6-1: 10-Year Total Capital Renewal Funding Available ($M), 2022 to 2031

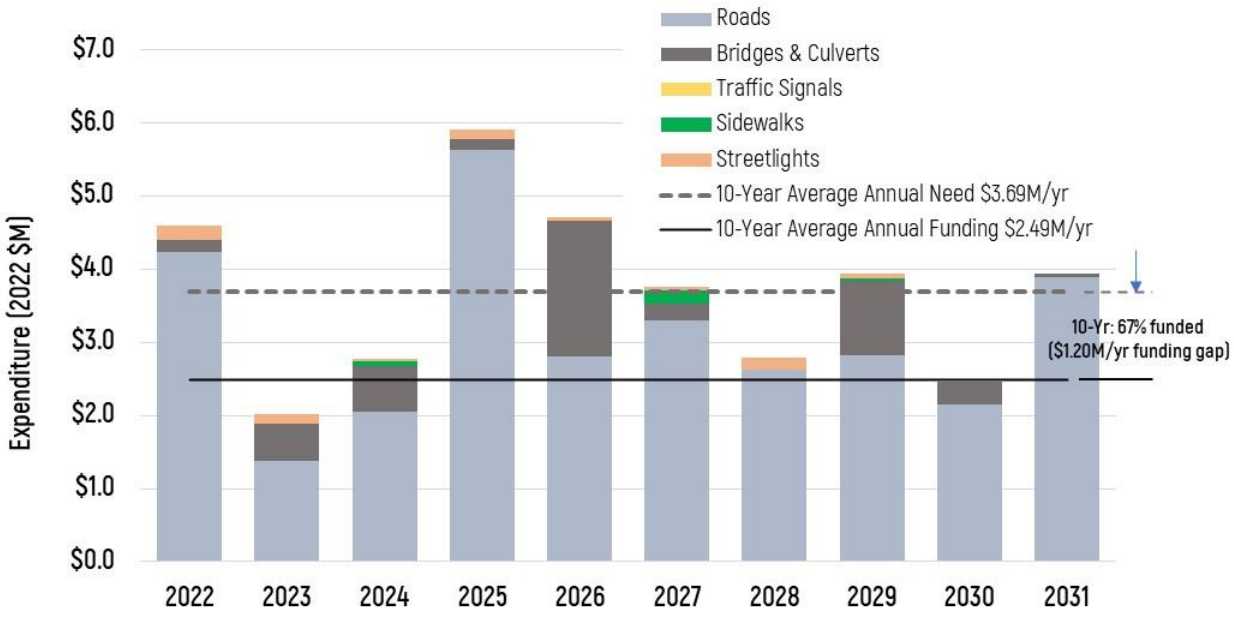


Reserves account for 60.2% of funding for capital renewal projects. For transportation, stormwater, and wastewater assets, reserves are primarily funded through annual contributions from property tax. For water, reserves are funded through water user rates.

6.3.2.1 Transportation

Figure 6-2 shows the forecasted average annual need over the next ten years of **$3.69 million per year** (dashed grey line) and the average annual funding of **$2.49 million per year** (black line). This results in an estimated average annual funding gap of **$1.20 million per year** over the next ten years and indicates that the asset portfolio for these assets is approximately **67% funded** based on currently available data.

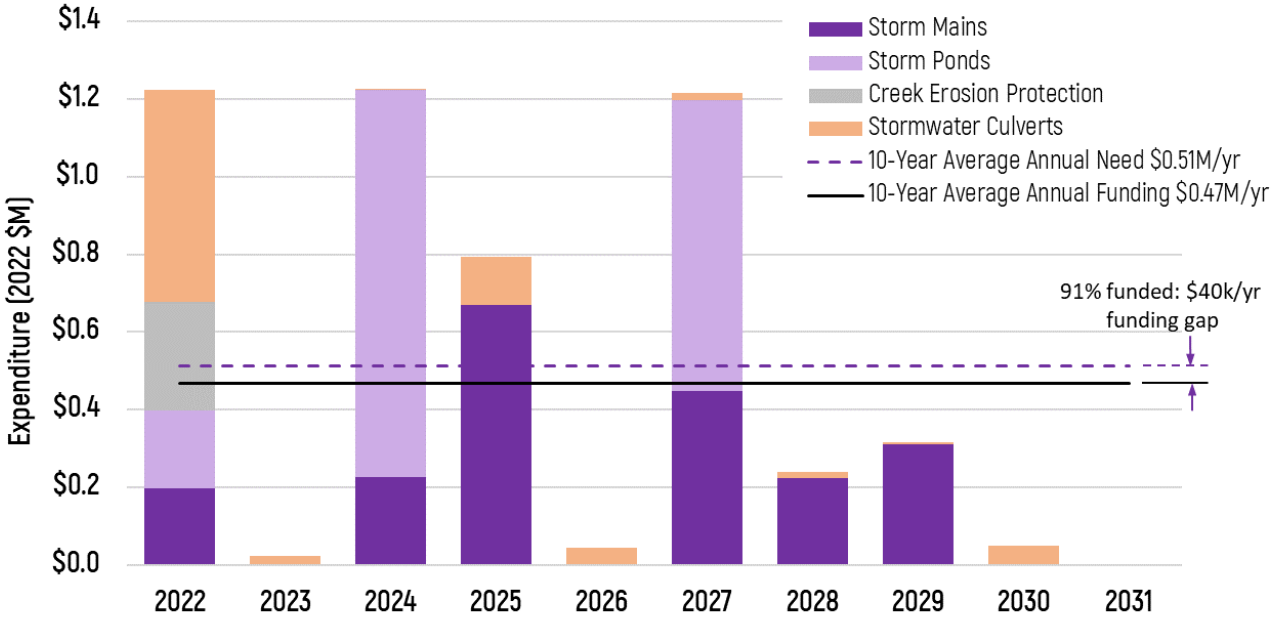
Figure 6-2: Capital Renewal Funding Gap – Transportation



6.3.2.2 Stormwater

Figure 6-3 shows the forecasted average annual need over the next ten years of **$0.51 million per year** (dashed purple line) and the average annual funding of **$0.47 million per year** (black line). This results in an estimated average annual funding gap of approximately **$40k per year** over the next ten years and indicates that the asset portfolio for these assets is approximately **91% funded** based on currently available data. As indicated in Section 2.3.2, CCTV inspections on storm sewers will better inform future updates to this forecast.

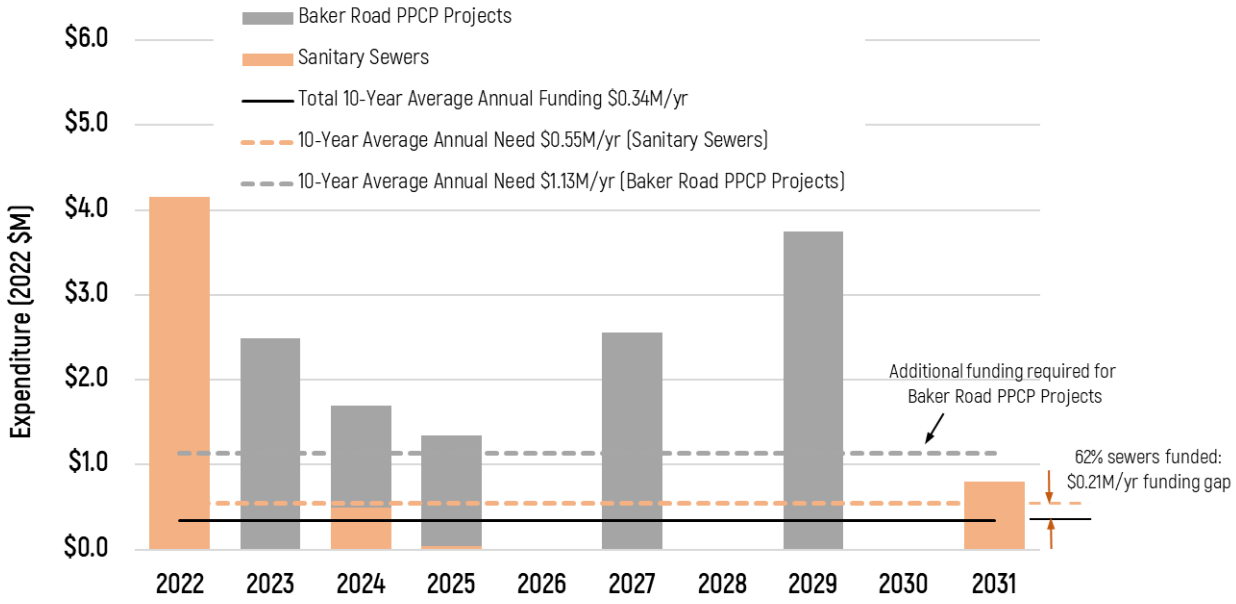
Figure 6-3: Capital Renewal Funding Gap – Stormwater



6.3.2.3 Wastewater

Figure 6-4 shows the forecasted average annual need over the next ten years of **$0.55 million per year** (dashed tan-coloured line) for sanitary sewer renewal and the average annual funding of **$0.34 million per year** (black line). This results in an estimated average annual funding gap of approximately **$0.21 million per year** over the next ten years and indicates that the asset portfolio for these assets is approximately 62% funded based on currently available data. This analysis does not include the additional estimated average $1.13 million per year potentially required for the Baker Road PPCP projects addressing I&I issues and sewer upgrades to support the Grimsby GO Secondary Plan. As indicated in Section 1.1.1.1, the costs are based on preliminary estimates and will be adjusted as the full scope of the required infrastructure work is confirmed. It is expected that the Town will be able to fund 50% of the Baker Road PPCP projects through the Region's Combined Sewer Overflow (CSO) Control Program.

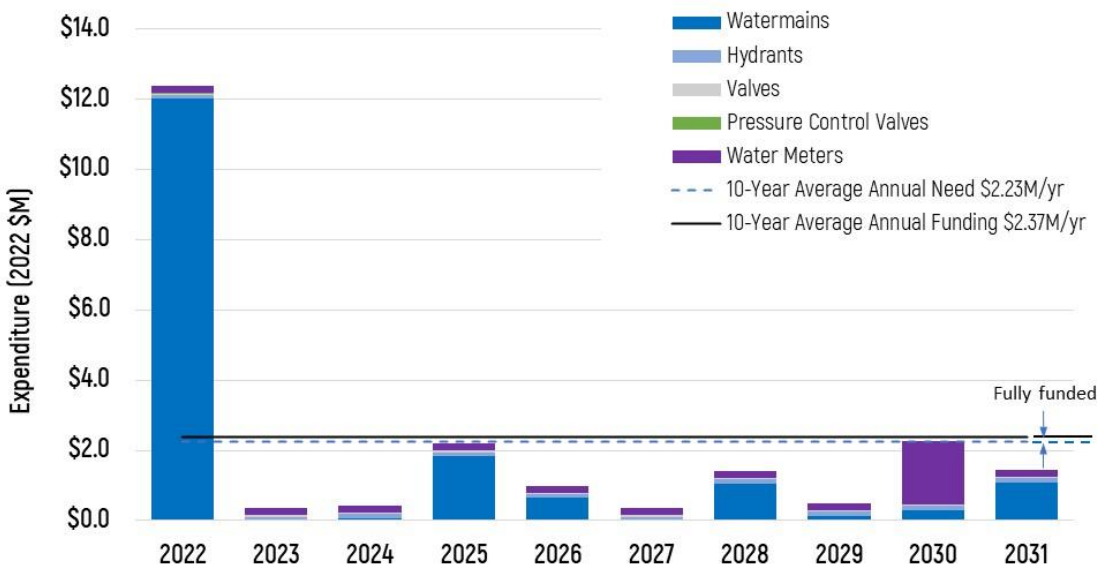
Figure 6-4: Capital Renewal Funding Gap – Wastewater



6.3.2.4 Water

Figure 6-5 shows the forecasted average annual need over the next ten years of **$2.23 million per year** (dashed blue line) for water asset renewal and the average annual funding of **$2.37 million per year** (black line). This indicates that the water asset portfolio is fully funded based on currently available data. This analysis includes the $1.96 million of Investing in Canada Infrastructure Program (ICIP) funding allocated to the downtown watermain project in 2023. It is assumed that this external funding will not be allocated again in years 6 to 10.

Figure 6-5: Capital Renewal Funding Gap – Water



6.3.3 Financial Sustainability for Operations and Maintenance

As indicated in Section 5.2.3, this AM Plan estimates an average spend of $1.1 million per year on asset-related operations and maintenance activities on core assets only, excluding salaries and other administrative expenses. The Town is experiencing some pressures on the operating budget in terms of having enough staff resources to complete all required O&M activities for transportation assets, as many activities are carried out by internal staff. For stormwater assets, funding may need to be designated for catchbasin and oil grit separator cleaning to ensure sufficient budget is provided for these activities in upcoming years.

6.3.4 Affordability and Strategies to Close Funding Gap

For capital renewal, water assets are estimated to be fully funded but there are significant funding shortfalls estimated for the Town's transportation assets to maintain service levels over the next 10 years, as shown in Table 6-2. The 'Percentage of Needs Funded' is summarized from the preceding sections and is an affordability service level which indicates the extent of the funding shortfall.

Table 6-2: Summary of Capital Renewal Estimated Funding Gaps ($M)**

Service	Average Annual Need	Average Annual Funding Available	Percentage of Needs Funded	Average Annual Gap
Transportation	$3.69	$2.49	67%	$1.20
Storm	$0.51	$0.47	91%	$0.04
Wastewater (Sewers only)	$0.55	$0.34	62%	$0.21
Wastewater (Baker Road PPCP Projects)	$1.13	$0.56*	50%*	$0.57*
Water	$2.23	$2.37	Fully Funded	-$0.14

*assumes 50% funded by Region's Combined Sewer Overflow Control Program
**Gap plus Funding Available may not total Annual Need due to rounding

Renewal of transportation assets is estimated to be 67% funded over the next 10 years ($2.49 million per year budget versus $3.69 million per year need), representing an average annual gap of $1.20 million per year.

For wastewater related assets, the main potential funding gap relates to the Baker Road PPCP recommendations, as 50% of the costs will need to be funded outside of the Region's Combined Sewer Overflow (CSO) Control Program. The magnitude of this funding gap is estimated at an average or $0.57 million per year over the next 10 years, but the true needs and associated shortfall will be better understood after the completion of inflow and infiltration studies.

The following strategies may be considered in closing the funding gaps and addressing pressures on the operating budget. The Town focuses on strategies that minimize the financial impacts on residents such as maximizing grants and other external revenue sources.

- **Increase available funding sources** though property tax increase, utilization of debt, leveraging third party grants, or drawing down on reserves.
- **Change the funding source** for wastewater from property taxes to a dedicated and stable wastewater user fee to recover the full cost of wastewater management. Consider user fee for stormwater management in the long-term.
- **Reduce near term renewal needs** by deferring capital renewal projects on lower risk assets, thereby reducing service levels. Note that this may increase overall lifecycle costs in the long-term.
- **Further extend asset life and reduce lifecycle costs** by considering additional rehabilitation strategies to defer more expensive renewals.

The Town's goals and objectives of transparent and responsible decision-making aligns with O.Reg. 588/17, which requires municipalities to demonstrate financial sustainability through the AM Plan. This AM Plan is proactive in setting the stage for meeting O.Reg. 588/17 requirements for year 2025 by identifying potential funding shortfalls. This proactive approach enables the Town to start the needed discussions on the affordability of current service levels such that it will be able to determine the appropriate service levels for the Town by year 2025 that effectively balances the associated costs and risks.

6.4 Forecast and Funding Gap Limitations

The forecasts and funding gap estimates in this AM Plan are based on currently available data. The Town has made significant achievements in building its GIS inventory and carrying out regular condition assessments and digitizing the data for assets such as road, structures, watermains, storm sewers, and sanitary sewers. As the Town continues to improve on data collection and implement additional condition assessment protocols, the confidence in forecasts and funding gap estimates will improve. The Town will also have a more holistic understanding of needs and the funding shortfall when non-core assets are included in the next AM Plan, such as fleet, information technology, facilities, and parks. The gap analysis in this AM Plan assumes that the level of funding from OCIF in years 1 to 5 will continue to be applied to core assets in years 6 to 10. If some of this funding is prioritized to other assets instead, the funding gap for core assets will be higher.

The values in this AM Plan are reflected in year 2022 dollars. During development of this AM Plan, construction costs have been continuing to increase through 2022 due to the uncertain economic and political environment. This AM Plan does not include potential cost increases occurring since the beginning of 2022. The Town will monitor price increases and adjust future forecasts as necessary depending on the extent and duration of these cost impacts.

7 AM Plan Monitoring & Improvement

7.1 Overview

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 recommends improvements to the Town's asset management practices.

Table 7-1: O.Reg. 588/17 Compliance Status and Other Opportunities

AM Plan Section	O.Reg. 588/17 Compliance (Current LOS)
State of Local Infrastructure	**Compliance**: 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, and the approach to assessing condition of assets. **General Improvements**: • Continue to improve knowledge of asset replacement costs and current condition of the assets. Target efforts on highest risk assets and assets with unknown condition. • Procurement and implementation of Computerized Maintenance Management and Enterprise Asset Management System to improve management and tracking of all Town-owned assets and enhance overall asset management capabilities. **Specific improvements**: • Improve data on road base construction year. • Confirm if there are storm sewers currently included in the Town inventory that are not owned by the Town (QEW crossings and CN rail locations). • Confirm inventory for pond components are captured within existing datasets and document missing assets that will require eventual renewal, with replacement value and installation date information. • Continue to perform bathymetric surveys to inform sediment removal requirements for stormwater management ponds, and record sediment removal dates. • For stormwater outfall structures, add detail in inventory regarding structure type, such as rip rap or wingwall to GIS inventory. Capture size and material data that enables unit costing for determining replacement values. • Improve accuracy of CCTV inspection data records with "0" ratings, which may currently be a valid zero defect score or an invalid null score. • Complete CCTV inspections of stormwater sewers. • Fill in remaining installation year data for stormwater culverts, with focus on the more critical cross culvert assets.
Levels of Service	**Compliance**: For each asset category, the AM Plan reports the current LOS performance. For core assets, the 2022 AM Plan provides the qualitative community descriptions and technical metrics as required by O.Reg. 588/17, and the current performance.

AM Plan Section	O.Reg. 588/17 Compliance (Current LOS)
	General Improvements: • For 2025 O.Reg. 588/17, develop Proposed LOS (target performance for each measure over each of the next 10 years). • Consider other measures such as those related to operations and maintenance based on tracking of activities enabled by Computerized Maintenance Management and Enterprise Asset Management System. **Specific improvements**: • Continue to work on understanding the increasing impacts of climate change and flood resiliency to gain further understanding of resiliency of properties and stormwater system to 100-year and 5-year storms, respectively, for O.Reg. 588/17 stormwater technical measures.
Risk and Lifecycle Management Strategies	**Compliance**: The AM Plan provides the population and employment forecasts as set out in Schedule 3 to the 2017 Growth Plan or the Region's Official Plan. For each asset category, the AM Plan provides the lifecycle activities that would need to be undertaken to maintain the current LOS for each of the next 10 years, based on risk and lowest lifecycle cost analyses. **General Improvements:** • Continue to optimize the lifecycle activities by searching out and testing various operations, maintenance and renewal activity and timing options, and then evaluating the benefits over time to determine the lowest lifecycle cost option. After implementation of Computerized Maintenance Management and Enterprise Asset Management System, utilize tracking of activities and costs to refine future forecasts. • Refine the CoF 1 to 5 rating framework (Table 4-1) to help in the process of standardizing scoring methodologies across different asset classes and service areas. This rating scale should be adjusted to align with Town scope/size (for example, the maximum number of people affected by service delivery disruption should consider the size of the Town population). **Specific improvements**: • Improve understanding of growth and upgrade needs by incorporating recommendations from future studies, such as the Transportation Master Plan. • Extend the capital budget forecast from 5 to 10 years. • Refine lifecycle strategies for assets as data on condition and renewal treatment timing is collected, particularly on long-lived assets and newer assets with less historical data such as oil grit separators. • Determine typical stormwater pond cleanout timing requirements for each pond, as the interval likely differs between ponds depending on many factors such as upstream conditions and sediment loading rates.

AM Plan Section	O.Reg. 588/17 Compliance (Current LOS)
	• Carry out I&I studies to determine full scope of work required per Baker Road PPCP recommendations, and incorporate needed projects into future updates of the AM Plan. • Develop a policy as required for road urbanization, including plan for where new sidewalks are to be constructed. Update forecast to include additional road urbanization needs based on policy. • Align LoF scoring in GIS geodatabase to match AM Plan recommendations • Continue to improve risk scoring methodologies, such as land use CoF ratings, weighting of CoF factors, and incorporation of additional factors not currently considered due to limited data. Consider hydraulic modeling for improving CoF ratings for stormwater, wastewater, and water networks.
Financial Strategy	**Compliance**: The AM Plan provides the estimated 10-year capital expenditures and significant operating costs required to maintain the current levels of service to accommodate projected increases in demand caused by growth as set out in Schedule 3 to the 2017 Growth Plan or the Region's Official Plan. 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. **General Improvements**: • Update Operating budget forecast as impact of on-going pressures, such as the increasing costs in the current economic and political environment are better understood. Also monitor the current stresses on the budget indicated in Section 6.3.3 and review need for additional funding as required. • Incorporate costs of additional projects into the needs forecast from studies such as the inflow and infiltration study once the recommendations and associated scope and costs are understood. • Develop a more comprehensive understanding of the funding shortfall in the next AM Plan with the inclusion of non-core assets. • Prepare 10-year operating and capital plans as required by O.Reg. 588/17 for AM Plans for Proposed LOS (due by July 1, 2025), and evaluate the funding shortfall to the Proposed LOS.

7.2 Monitoring and Review Procedures

The AM Plan will be updated at least every five years to ensure it reports an updated snapshot of the Town's asset portfolio and its associated value, age, and condition. It will ensure that the Town has an updated 10-year outlook including non-core assets by 2024 and proposed service levels by year 2025. Per O.Reg. 588/17, the Town will conduct an annual review of its asset management progress in implementing this AM Plan and will discuss strategies to address any factors impeding its implementation.