Region of Waterloo

ASSET MANAGEMENT PLAN

2025

Land Acknowledgement

We acknowledge that the lands on which infrastructure assets are managed in the Region of Waterloo are situated on the traditional territories of the Anishinaabe, Chonnonton and Haudenosaunee peoples. This territory is within the land protected by the Dish with One Spoon Wampum. These lands are part of the Haldimand Tract, land promised to the Six Nations that includes six miles on each side of the Grand River.

We recognize the deep historical and ongoing connection that Indigenous Peoples have to this land and the importance of honouring the treaties and responsibilities that guide our shared stewardship. We acknowledge the contributions of Indigenous communities past and present, and we commit to engaging with Indigenous rights holders and knowledge keepers in the spirit of truth, reconciliation and collaboration.

As we plan, maintain, and build infrastructure assets across the Region of Waterloo, we commit to thoughtful, inclusive, and respectful asset management practices that reflect our responsibility to future generations and the environment.

McDOUGALL COTTAGE
REGION OF WATERLOO

Executive Summary

Introduction

The Region of Waterloo (the Region) owns and manages physical assets such as roads, traffic signals, buses, water and wastewater treatment plants and pumping stations, groundwater wells, water storage facilities, watermains and sewers, waste management facilities, an airport, administrative and cultural buildings, community housing, and a fleet of vehicles that together total over **$11.31 billion** in value.

The Region relies on these assets to deliver services, in partnership with seven local municipalities, to over 674,000 residents (2023), including university students. Properly managing its assets helps to ensure the Region can deliver services safely and reliably, and provide value for money and long term financial sustainability. The purpose of this Asset Management Plan (AM Plan) is to support the Region's stewardship of its assets and to meet the requirements for proposed levels of service as outlined in Ontario Regulation 588/17 AM Planning for Municipal Infrastructure (O.Reg. 588/17).

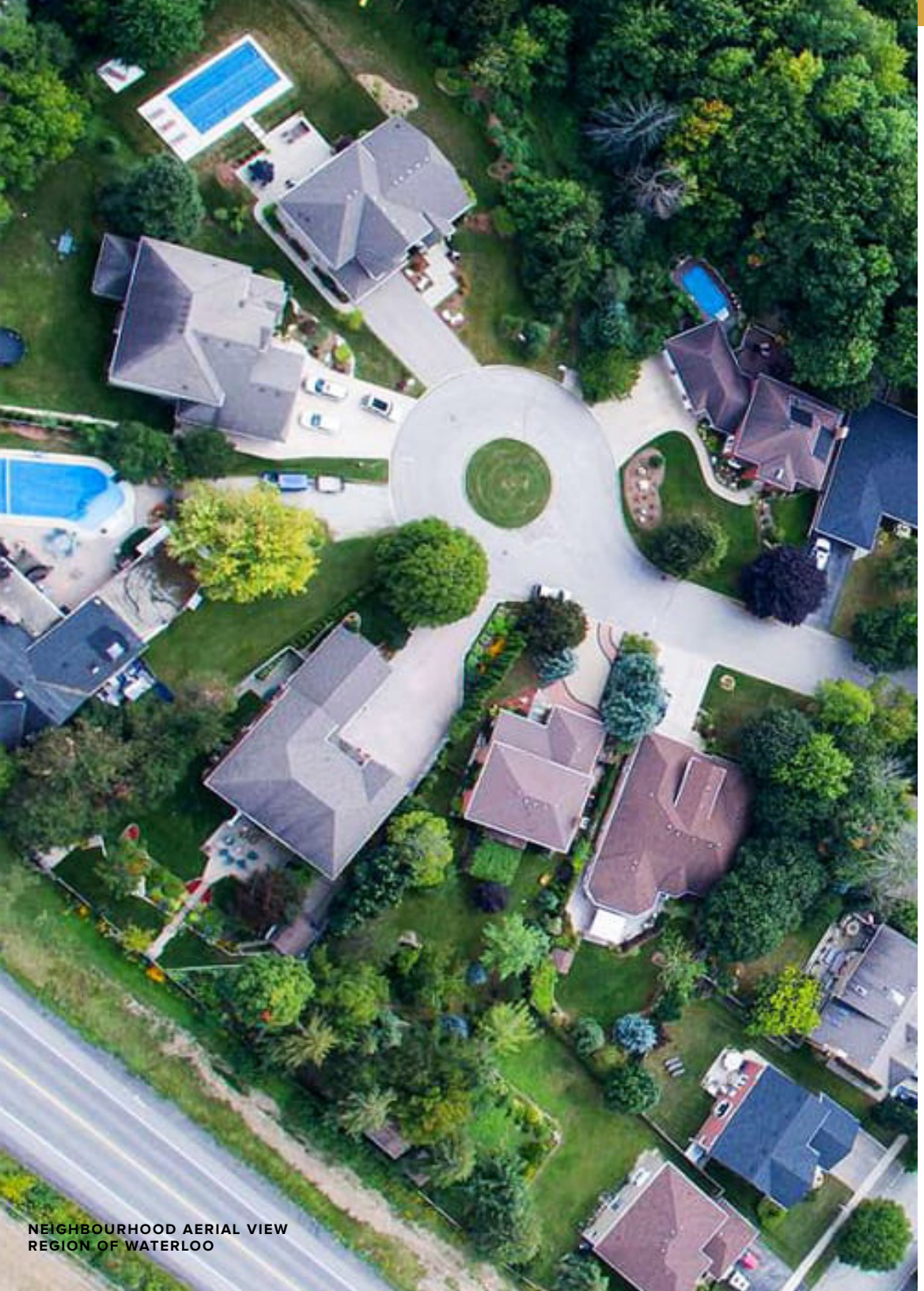
BRIDGE
REGION OF WATERLOO

Asset management involves balancing levels of service, associated cost, and risk. The goal is to deliver proposed levels of service at the best possible cost over an asset's lifecycle within an acceptable level of risk. The need to achieve this balance informed the updated corporate Strategic Asset Management Policy, which was reviewed and approved by Regional Council in 2023 and appears on the Region's web site. The policy supports and guides the organization to develop a coordinated approach to the management of municipal assets by establishing good stewardship practices.

This AM Plan summarizes:

- The assets the Region relies on to support service delivery to the community
- The levels of service proposed to be provided by these assets
- The assets that will be needed in the future to continue to deliver services safely and reliably
- The activities needed to sustain assets throughout their lifecycles at the best possible cost and an acceptable level of risk
- The funds needed for these activities and how they might be raised
- The steps to improve future versions of this AM Plan.

This AM Plan was created through workshops and input on assets and their performance, with participation of staff from across the organization.



NEIGHBOURHOOD AERIAL VIEW
REGION OF WATERLOO

Expected growth drives the scale of Regional services and, in turn, the assets needed to support them. Until the Provincial Planning Statement (PPS), 2024 came into effect on October 20, 2024, the Region planned for growth based on the Provincial Policy Statement, 2020 and A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019.

The PPS, 2024 is a consolidated statement of the government's policies on land use planning. It gives provincial policy direction on key land use planning issues that affect communities.

Updates to forecasts and master plan strategies to incorporate lands added to the urban area through the pre-January 1st 2025 approval of the Regional Official Plan are currently in progress.

Different departments and divisions within the Region of Waterloo are responsible for delivering specific services and managing the assets used to deliver them, as the following table shows.

Table ES-1 Regional Service and Program Areas

Service Areas	Engineering and Environmental Services	Transportation Services	Planning, Development & Legislative Services	Community Services	Public Health & Paramedic Services	Waterloo Regional Police Service
Program Areas	• Water & Wastewater Services • Waste Management • Facilities & Fleet Management	• Transportation • Transit Services	• Regional Airport • Cultural Services • Library*	• Housing Services • Seniors' Services • Children's Services	• Paramedic Services	• Police**

* Library reports to the Library Service Board

** Waterloo Regional Police Service (WRPS) reports to the Police Services Board which is operated under the provisions of the Ontario Police Services Act.

WATERLOO COUNTY GAOL AND GOVERNOR'S HOUSE

State of Local Infrastructure

The AM Plan describes the replacement value and physical condition of the Region's asset portfolio. This information helps to predict when renewals will likely be needed to keep assets working properly and reduce the risk of service disruption. It is especially helpful in identifying previously unknown risks to asset performance in the near term.

The Region owns assets with a total replacement value of approximately **$11.31 billion** (up $4 billion from the 2020 AM Plan). The AM Plan identifies that the Region's assets are generally in **GOOD** to **FAIR** condition, with over **84 percent** of the Region's assets in fair or better condition, which is referred to as a "**state of good repair**" (down from 90 percent in the 2020 AM Plan). The chart below illustrates the distribution of assets, by condition and by asset value.

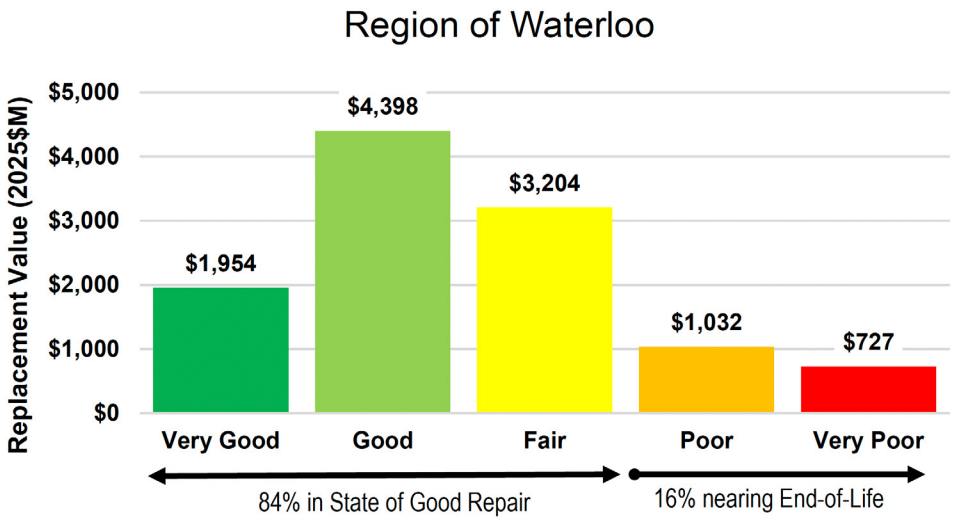
$11.31 BILLION

Total Asset Valuation (2025$)

GOOD/FAIR

Average Asset Condition (2024)

Figure ES-1 Asset Condition Distribution[1]



The AM Plan identifies 16 percent or $1.8 billion in Regional assets that are nearing End of Life (up from $0.7 billion in the 2020 AM Plan). Following best practice and to minimize lifecycle costs while appropriately mitigating risks, many non-critical assets are planned for replacement on failure or once assessed to be in poor condition. As an example, equipment that can be quickly and easily replaced or that has redundancy is planned to be "run to failure". The assets that are currently in poor or very poor condition are typically those that are included in 10-year capital renewal programs and budget forecasts.

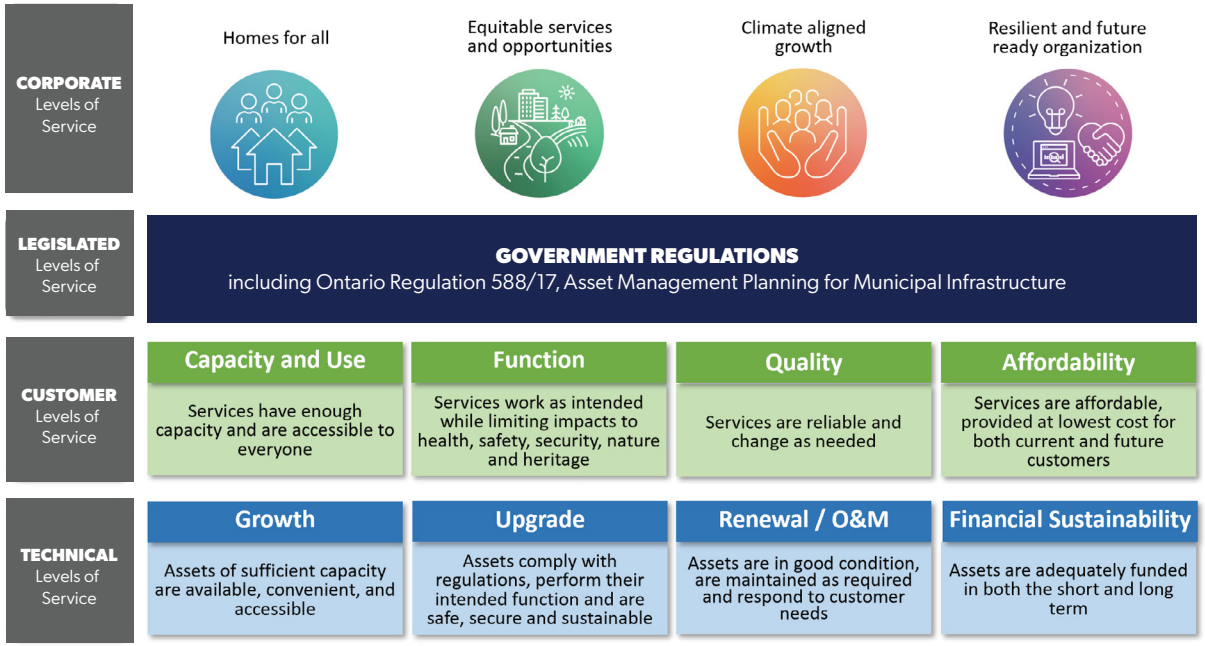
[1] Not included in the above condition distribution is approximately $46.9 million in assets with unknown condition, the majority of which are bus shelters.

Levels of Service

Levels of service statements describe the quality of services the Region is striving to provide in each service area. Performance indicators and targets are used to quantify the service levels that customers expect to receive and the cost to provide the services. Levels of service commonly relate to service attributes such as capacity, function, reliability, quality and affordability. Performance gaps – the differences between proposed and current performance – are key business drivers that influence asset management decisions related to asset expansion or growth, upgrade, renewal and maintenance, as well as financial sustainability.

An overview of corporate, legislated, customer and technical performance objectives is shown in the following figure.

Figure ES-2 Levels of Service Objectives Hierarchy



The AM Plan identifies the corporate, legislated, customer and technical performance objectives. The performance measures included in this AM Plan, against which current performance is documented, meet the requirements of O.Reg. 588/17 Proposed Levels of Service.

Asset Management Strategy

The Region's ability to deliver the levels of service outlined in this AM Plan is impacted in large part by:

- additional infrastructure to serve population growth
- upgraded infrastructure to serve changing functional, legislative and sustainability needs
- aging infrastructure and the associated need for operations, maintenance and renewal investments to sustain it

The relative importance of the assets to support service delivery, referred to as the asset criticality, is a key driver in selection of the most appropriate asset management strategy for each asset. More critical assets are prioritized for expansion, inspection, maintenance and renewal, depending on their performance. Industry standard asset management strategies are applied to minimize the risk of service disruption at the lowest cost.

The current strategies that are being applied include:

- **Non-asset solutions** such as education and conservation programs, sharing of assets and coordinating work between internal service areas and local municipalities.
- **Expansion (growth) and upgrade** of the assets identified through comprehensive service area master planning for all asset types.
- **Renewal** of the assets identified through comprehensive asset inventories and condition inspections which are used to estimate remaining life and develop short, medium and long term capital renewal plans, based on the understanding of asset criticality.
- **Maintenance and operations** activities which are assessed and prioritized based on criticality and reliability.

By applying these strategies, the Region is currently meeting identified legislated and customer levels of service. All necessary work is being completed, although not always in the year originally scheduled due to lack of funding or circumstances unanticipated or within the control of the Region. Deferring renewal and maintenance work can result in earlier deterioration of assets, resulting in increased lifecycle costs due to higher operating and maintenance costs and the need for earlier replacement.

Expenditure Forecasts and Financing Plan

To be effective, asset management practices need to be integrated with financial planning and budgeting. Financial management principles for asset intensive organizations include recognizing the consumption of asset service potential, categorizing expenditure by lifecycle activity, allocating costs to assets as far as practical, preparing long term forecasts, cost-effective financing, and effective reporting of financial performance.

The Region plans to invest, on average, approximately **$294.1 million** per year over the next 10 years to support growth and upgrade of the asset portfolio. Based on this growth and upgrade, the value of the Region's asset portfolio is estimated to increase from **$11.3 billion** in 2024 to approximately **$14.2 billion** by 2034.

In 2025, the Region will expend approximately **$1.8 billion** in operations, in order to meet current service levels. This expenditure is expected to increase to **$2.3 billion** by 2034 to accommodate the above growth and upgrade.
Optimal renewal investment needs refer to the amount of funding required to replace or rehabilitate infrastructure assets at the most cost-effective point in their lifecycle—before significant deterioration occurs but after the asset has delivered its intended service.

Currently, the level of investment in asset renewal in the ten-year capital program of **$226.0 million** annually falls short of the optimal level of investment needs identified in this AM Plan of **$308.8 million** annually, and represents a renewal funding shortfall of **$82.8 million** annually.

Lifecycle activities will not be undertaken at the optimal time resulting in failure to minimize total cost of asset ownership and risks to service delivery.

EXPENDITURE FORECASTS
Average Annual Investments

Growth & Upgrade	**$294.1M**
Operating	**$1,833.0M**
Optimal renewal	**$308.8M**

FINANCING PLAN
Average Annual Renewal Funding

Optimal funding needs	**$308.8M**
Available funding	**$226.0M**
Renewal funding shortfall	**$82.8M**

Current levels of funding through the capital program are insufficient to maintain our current performance.

Options available to the Region in the mid to long term include adjustments to the balance of levels of service and associated costs and risks:

- Reduce levels of service
- Increase funding
- Take on more risk.

Minimizing the amount of growth and complexity of services and assets will reduce both operating and renewal needs and associated costs.

WATER TREATMENT FACILITY
REGION OF WATERLOO

Ongoing Balancing of LOS, Costs and Risks

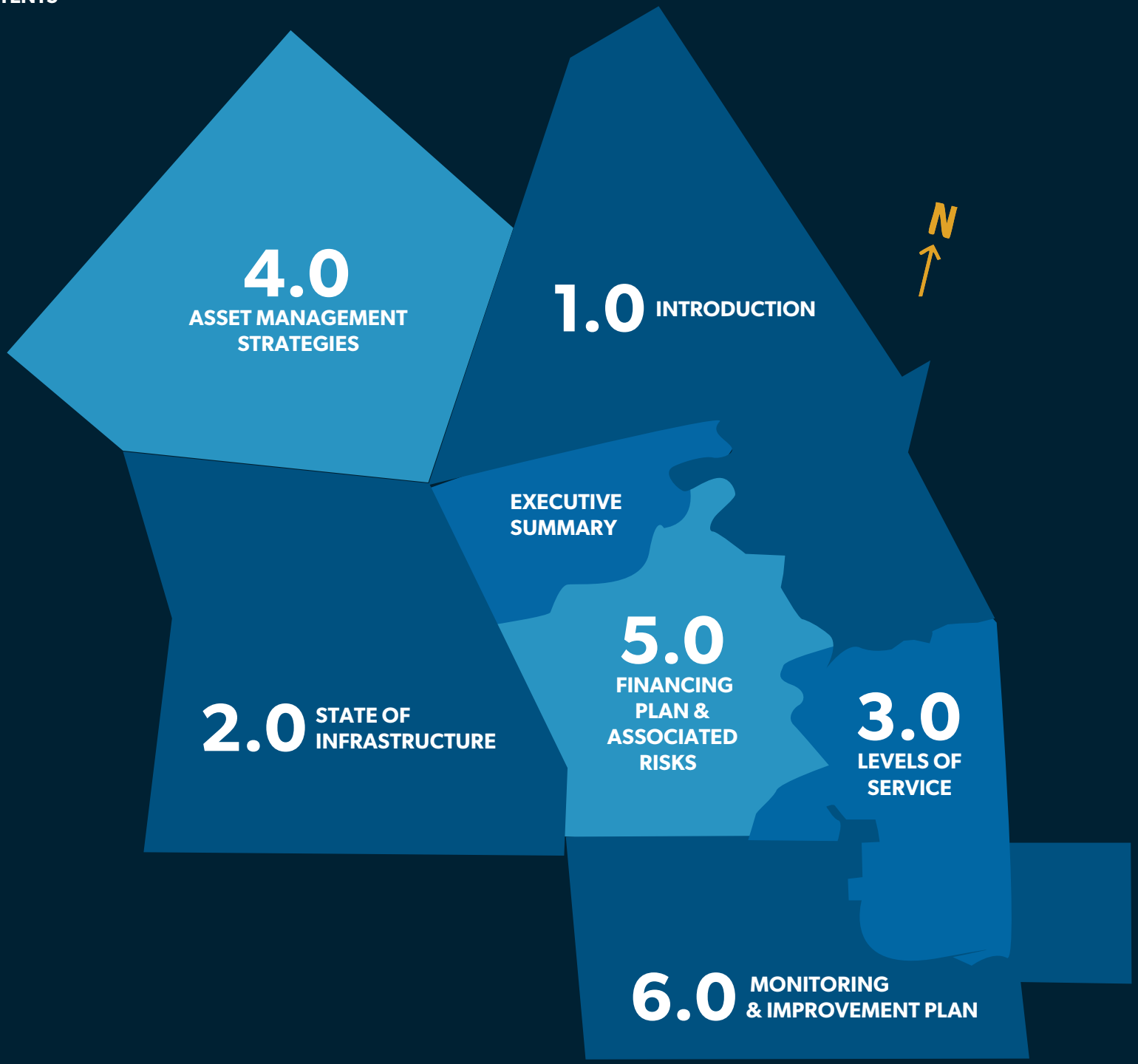
O.Reg. 588/17 mandates annual reporting to Council and senior leadership on progress toward meeting LOS measures and targets, and associated costs and risks. These reports will highlight investment needs, track infrastructure performance, and provide updates on any emerging funding shortfalls.
By continuously refining LOS measures through data-driven assessments and best-practice asset management approaches, the Region will adapt to evolving service demands and make informed funding decisions.

Monitoring and Improvement Plan

This AM Plan complies with Ontario Regulation 588/17 Asset Management Planning for Municipal Infrastructure, Current Levels of Service. The following improvement activities are planned to enable the Region to comply with the regulations:

- State of Infrastructure: Continue to improve knowledge of current condition based on asset criticality
- Levels of Service: Continue to assess current and proposed performance (over next 10 years)
- Asset Management Strategy: Continue to refine asset lifecycle strategies to manage risks and deliver lowest lifecycle cost services
- Financing Strategy: Continue to assess the financial sustainability of service delivery for both current and future generations.

INTERACTIVE TABLE OF CONTENTS
MAIN SECTIONS



INTERACTIVE TABLE OF CONTENTS
SECTION CONTENT

Glossary of Key Terms

Term	Definition
Asset Condition	An evaluation of an asset's physical state, often measured using a standardized grading system (e.g., Very Good to Very Poor) to inform renewal needs and timing.
Asset Criticality	A measure of the importance of an asset to service delivery, based on the consequence of its failure in terms of service, financial impact, and safety.
Asset Lifecycle	The stages an asset goes through from planning, acquisition, operation and maintenance, rehabilitation or renewal, and eventual disposal.
Asset Management (AM)	A coordinated activity of an organization to realize value from assets, typically involving a balance between performance, cost, and risk over the asset's lifecycle (as defined by ISO 55000).
Average Annual Renewal Amount (AARA)	The average annual investment needed to renew or rehabilitate assets over their useful lives to maintain desired service levels.
Customer Levels of Service (LOS)	Measures that describe the quality, reliability, and accessibility of services from the customer's perspective (e.g., availability, safety, affordability).

Term	Definition
Infrastructure Funding Gap	The difference between the available funding and the amount needed to perform optimal lifecycle activities, including renewals and operations.
Levels of Service (LOS)	Statements that describe the quality and performance targets for services provided by infrastructure, typically categorized into customer and technical LOS.
Lifecycle Activities	The set of actions taken throughout the life of an asset, including maintenance, renewal, upgrades, expansion, and disposal, to ensure it meets required LOS.
Lifecycle Cost	The total cost of owning, operating, maintaining, and disposing of an asset over its entire life.
Non-Asset Solutions	Actions that help deliver services without relying on physical infrastructure (e.g., education, demand management, partnerships).
O.Reg. 588/17	Ontario Regulation 588/17 under the Infrastructure for Jobs and Prosperity Act, which mandates asset management planning and reporting for municipalities.
Operations and Maintenance (O&M)	Ongoing activities to operate infrastructure systems and preserve their function and condition.
Optimal Renewal Strategy	A scenario in which all asset renewal activities are undertaken at the most cost-effective point in time to minimize total lifecycle cost.

Term	Definition
Renewal Funding Shortfall	The specific portion of the funding gap related to rehabilitation and replacement (renewal) investments that are not currently funded.
Risk Exposure Matrix	A tool that combines the probability of asset failure with its consequences to prioritize mitigation actions and capital investments.
Risk Management	The process of identifying, assessing, and prioritizing risks to service delivery and implementing measures to minimize their impact.
State of Infrastructure (SOI)	A snapshot of the inventory, condition, valuation, and remaining useful life of assets used to deliver services.
Tangible Capital Assets (TCA)	Physical infrastructure or assets with value that the municipality owns and accounts for in its financial records.
Technical Levels of Service	Internal performance measures that relate to how assets are managed and maintained to support the delivery of customer LOS.
Trade-Off Decision Making	Balancing between service levels, cost, and risk in planning and managing infrastructure investments.

1.0 Introduction

WEST MONTROSE COVERED BRIDGE
WOOLWICH, ONTARIO

1.0 Introduction

1.1 The 2025 Proposed Levels of Service AM Plan

The Region of Waterloo (the Region) is located in Southwestern Ontario, approximately 90 km west of Toronto. The Region includes a number of urban and rural local municipalities including the Cities of Cambridge, Kitchener and Waterloo, and the Townships of North Dumfries, Wellesley, Wilmot and Woolwich. Together, the Region, Cities and Townships serve a population of over 674,000 people (estimated to year end 2023) – making the Region of Waterloo one of the larger urban areas in Ontario and Canada.

The Region exists to provide services. To enable the Region to achieve its service objectives, it builds new infrastructure to meet growth needs and manages existing assets to meet reliability needs – all with limited funds. Assets include potable water treatment and distribution systems, wastewater collection and treatment facilities, transportation and stormwater drainage systems, green infrastructure, transit buses and facilities, airport airside and groundside systems, waste management siteworks and environmental controls, and supporting facilities, fleet and

WINTER SNOWSTORM
REGION OF WATERLOO

equipment for corporate, housing, seniors, cultural, police and paramedic services. Over time, the Region operates and maintains and chooses to add or expand, enhance and renew these assets to enable it to provide defined levels of service, at the lowest lifecycle cost, while managing risk.

The International Standard, ISO 55000 Asset Management, defines asset management as: "**the coordinated activity of an organization to realize value from assets, which normally involves balancing benefits and performance, costs, and risks.**"

Ontario Regulation 588/17 (O.Reg. 588/17), Asset Management Planning for Municipal Infrastructure, requires that each municipality prepare a **2025 Proposed Levels of Service Asset Management Plan** (this AM Plan document) that includes the following information for each asset category:

- The levels of service that the Region proposes to provide for each of the next 10 years
- The lifecycle activities and associated costs to provide the proposed levels of service
- The annual funding projected to be available to undertake the lifecycle activities
- For any funding shortfalls, how the Region will manage the risks associated with not undertaking all of the lifecycle activities.

Decisions related to balancing levels of service, cost of service and risk involve trade-offs. A higher level of service typically costs more. If sufficient funding is not available, lifecycle activities cannot be undertaken at the optimal time resulting in failure to minimize total cost of asset ownership and a risk of not delivering the proposed levels of service.

The Region's master planning process undertakes trade-off decision-making related to growth and upgrade activities and associated costs. For renewal activities, for each asset category, this Asset Management Plan (AM Plan) outlines combinations of levels of service, costs of service and risks and, through an iterative process, analyzes the proposed levels of service deemed suitable by the Region.

Three renewal scenarios are considered and analyzed over the next 10 year period (2025 to 2034):

- **Scenario 1: Maintain Current Performance**: Renewal activities are undertaken such that the current performance is maintained over the next 10 years.
- **Scenario 2: Available Funding**: Renewal activities are undertaken such that the associated costs are equal to the available funding anticipated over the next 10 years.
- **Scenario 3: Optimal Renewal Strategy**: All renewal activities are undertaken over the next 10 years at the optimal time to minimize total cost of asset ownership including clearing any backlog of renewal activities on assets that have already reached end-of-life.

In addition, the analysis shows the average annual amount to renew the assets over their entire lifetimes (i.e., beyond the 10 year analysis period required by O.Reg. 588/17). The **Average Annual Renewal Amount (AARA)** is the replacement cost of the asset plus the sum of any rehabilitation activities, divided by the estimated useful life of the asset.

In compliance with O.Reg. 588/17, this AM Plan is publicly available on the Region's website alongside supplementary documents, including condition assessments and other relevant background information.

1.2 AM Planning in the Organizational Context

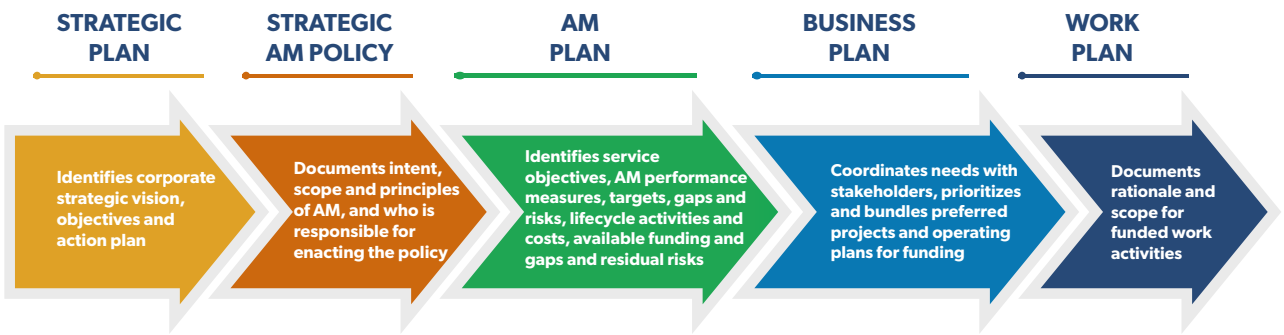
Asset management planning is a medium to long-term planning activity that relies on input from strategic planning activities and informs shorter-term decision making. The AM Plan provides a framework to validate the Region's budgeting processes and assist in prioritizing work activities, including capital projects, based on risk. It also discusses LOS that support goals in the Region's Strategic Plan and lifecycle management strategies intended to reduce the overall cost of asset ownership. The AM Plan is intended to be read with other Region policies and planning documents, including master plans which focus largely on service growth and upgrade.

An AM System aims to achieve a line of sight between and strategic alignment with the overall goals of an organization. These include corporate strategic goals outlined in the strategic plan and master plans, as well as operational plans, policies and procedures, as illustrated in Figure 1-1. The Strategic AM Policy, reviewed and updated in 2023, provides guidance to the AM System by documenting the intent, scope and principles of asset

management at the Region, and who is responsible for enacting the Strategic AM Policy. The objectives of the Strategic AM Policy are to:

- Provide a consistent framework for implementing asset management throughout the organization.
- Provide transparency and accountability and to demonstrate to stakeholders the legitimacy of decision-making processes which combine strategic plans, budgets, service levels and risks.

Figure 1-1 Strategic Plan Line-of-Sight to Work Plan



Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 1-1 below.

Table 1-1 Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Region of Waterloo Elected Council	Approves asset management policies and asset funding allocation through the annual corporate budget process. An overarching expectation of a standard of care is required by Council to ensure commitment to effective asset management practices.
Corporate Leadership Team (CLT)	Provides corporate oversight to the program to ensure that the goal and directions of the Corporate Asset Management program are maintained, and the program remains consistent with the overall Strategic Plan.
Finance	Reviews the Strategic Asset Management Policy and Asset Management Plan. Makes recommendations to Council and provides recommendations to Region staff on strategy, policy, and procedural development surrounding asset management. Works with EMT to coordinate the update of the Asset Management Plan.
AM Working Group	Provides leadership and strategic direction for supporting systems/processes specific to the delivery of asset/work management information for the Region of Waterloo. Further, in support of the Region-wide asset management strategies, the group provides leadership and governance to the Asset Management Policy statement through the provision of information necessary for the long-range forecasts of asset investment needs, services levels, risks, costs and other performance measures.
Corporate Services	Finance provides historic Tangible Capital Asset (TCA) amounts, and historic and current capital and operating budgets. Further, provides coordination on input data and development of the AM Plan from each of the service and program areas.
Departments	Provide input data, forecasts and text for the AM Plan relative their service and program area or area of functional expertise.
Service Boards	Provide input data, forecasts and text for the AM Plan relative their service and program area or area of functional expertise. The Service Boards incorporated in this AM Plan include the Waterloo Police Service Board and the Library Service Board.

1.3 Organization of Document

The contents of this AM Plan follow the recommended elements of a detailed AM Plan:

- **Introduction**: Outlines scope, background information, relationship to other Municipal documents and plans, and applicable legislation
- **State of Infrastructure**: Summarizes the inventory, valuation, condition and remaining life of the assets in the inventory by service and asset category
- **Levels of Service**: Defines organizational and asset category levels of service through performance indicators, and outlines current and proposed performance
- **Lifecycle Management Strategy**: Defines the framework for identifying critical assets and quantifying risk to enable prioritization of lifecycle activities, and summarizes the asset management strategies (i.e., planned actions) that will enable the assets to provide the required levels of service at the lowest lifecycle cost, while managing risk
- **Funding Plan and Associated Risks**: Estimates the predicted funding available to asset management activities as well as the funding required to maintain current asset performance. Summarizes the infrastructure funding gap based on these determined infrastructure needs and associated budgets, and associated risks and mitigation strategies. Recommends strategy for closing the infrastructure funding gap.
- **AM Plan Improvement and Monitoring**: Summarizes the next steps including improving future iterations of the AM Plan and annual monitoring of AM Plan implementation progress (an O.Reg. 588/17 requirement).

2.0 State of Infrastructure

TRANSIT INFRASTRUCTURE
REGION OF WATERLOO

2.0 State of Infrastructure

The State of Infrastructure section of the AM Plan describes the Region's asset inventory, and provides a snapshot in time of the valuation, age and condition of its assets. Recommendations for the sustainment of data collection and reporting are provided in the AM Plan Improvement and Monitoring section.

2.1 Asset Hierarchy and Inventory

Understanding the assets owned by the Region that are used to support each major service area is important to enable their effective and efficient management. In this AM Plan, the Region's asset inventory has been organized around the major service groups and program areas shown in Table 2-1 in the following sub-section.

Most infrastructure assets owned by the Region are included and organized into linear networks, facilities, fleet, equipment, information technology, and natural assets. Assets not included are land, leasehold improvements in facilities not owned by the Region, equipment, information systems, and data and information. Assets as part of the Region's Light Rail Transit (LRT) initiative will be produced in a separate AM Plan and on a different schedule.

MAINTENANCE WORKER
REGION OF WATERLOO

2.2 Asset Valuation

Financial accounting valuation uses historical costs and depreciation assumptions to determine the book value of capital assets in accordance with the Public Sector Accounting Board (PSAB). Policies and procedures relating to the development of net book values for accounting purposes have been developed by the Region to comply with PSAB 3150 Tangible Capital Assets (TCA) reporting.

While financial accounting valuations are based on historical costs, managerial accounting valuations are based on replacement costs. For some asset categories, the replacement cost values were calculated using historical costs indexed to December 31, 2024 and reported as 2025 dollars using the Building Construction Price Index or Consumer Price Index (CPI), as appropriate for the asset category. For the most part, replacement costs are benchmark values calculated from current and previous construction year contracts. The replacement cost valuation represents the estimated cost to replace assets today and is presented in current (2025) dollars. It does not account for future technology improvements but does account for increased regulatory requirements and technology improvements to date.

The estimated current replacement value of Region assets is **$11.3 billion** presented in current (2025) dollars, as outlined in the following table. For a detailed summary of the assets covered in this AM Plan refer to Section 7 Service and Program Area Details.

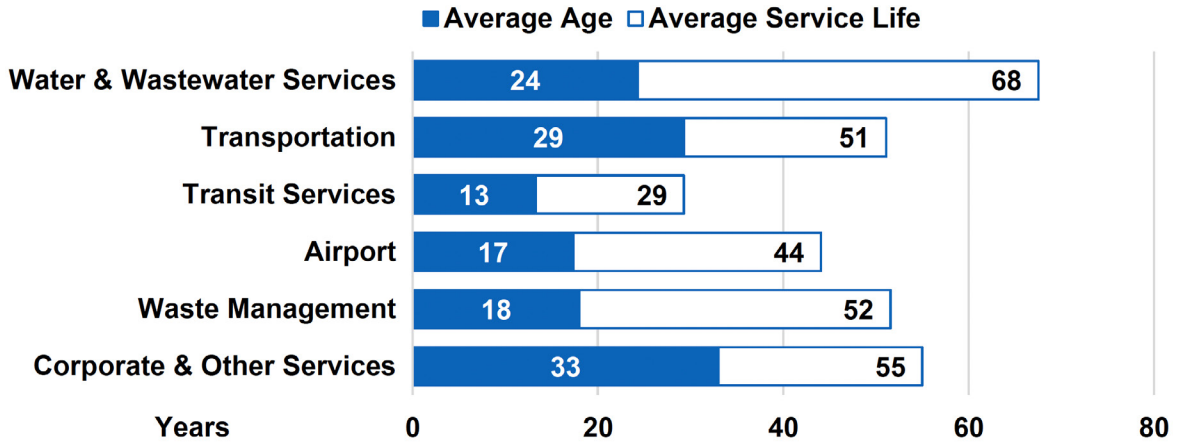
Table 2-1 Assets covered by this AM Plan

Service Area	Program Area	Assets	Replacement Value	
			2025$M	%
Water and Wastewater Services	Water	Watermains, Water Pumping Stations, Elevated Water Storage Tanks, Ground Water Supply Systems, Surface Water Supply Systems, Water Monitoring Wells, Other Water Infrastructure, Water Fleet	$2,371.9	21.0%
	Wastewater	Wastewater Collection Systems, Wastewater Forcemains, Wastewater Treatment Plants, Wastewater Pumping Stations, Wastewater Residual Management	$2,314.5	20.5%
Transportation	Roads	Urban Cross Section, Rural Cross Section, Off Road Cycling, Paved Trails	$1,964.4	17.3%
	Structures	Bridges, Structural Culverts, Safety Devices, Noise Walls, Retaining Walls	$1,048.0	9.3%
	Traffic	Illumination Street Lights, Traffic Signals, Cameras, Signs, Markings, Medians	$134.6	1.2%
	Stormwater	Stormwater Ponds, Culverts, Mains, Leads, Manholes, Cathbasins, Interceptors	$368.2	3.3%
	Green Infrastructure	Landscaped Areas, Grassy Areas, Trees	$30.5	0.3%
	Fleet & Facilities	Vehicles and equipment, buildings	$58.9	0.5%
Transit Services		Supervisor and Service Vehicles, Conventional Low Floor Buses, MobilityPlus Buses, Maintenance and Equipment, Passenger Amenities, Technology & Systems, Facilities	$770.2	6.7%
Airport		Airside Systems, Groundside Systems, Common Utilities & Equipment, Facilities, Fleet	$278.4	2.5%
Waste Management Services		Environmental Controls (Groundwater Monitoring and Remedial System, Landfill Gas Collection System, Leachate Collection System, Stormwater Collection System), Disposal Assets, Diversion Assets, Operations (Roads, Servicing), Facilities, Fleet	$268.8	2.4%
Corporate & Other Services	Police	Facilities, Fleet	$165.5	1.5%
	Paramedic Services	Facilities, Fleet	$65.5	0.6%
	Housing Services	Facilities	$784.6	6.8%
	Cultural Services	Facilities, Fleet	$98.9	0.9%
	Seniors Services	Facilities, Fleet	$128.8	1.1%
	Other Services	Library Facilities, Design and Construction Fleet, Corporately Shared Facilities and Fleet	$462.9	4.1%
Total			$11,314.6	100%

2.3 Asset Age and Remaining Life

Understanding the estimated life of an asset and the proportion of life that remains provides an insight into potential risk of asset failure and potential renewal need. The following graph shows, for each service area, the average age of the assets against the average estimated useful life, in years. Averages are "weighted" by replacement cost to give more importance to asset categories with more value. Although some of the Region's assets are relatively new due to recent growth to meet population and economic growth demands, many others are reaching the middle stages of their useful lives and will require rehabilitation or replacement in the upcoming years.

Figure 2-1 Asset Life Consumed Profile, By Service Area



2.4 Asset Condition

In the AM Plan, the term "condition" refers to the degree of physical deterioration of an asset. "Performance" is a more general term that typically describes an asset's ability to achieve levels of service through measures such as capacity, function and operational quality.

Condition assessment programs evaluate current physical condition, determine rate of deterioration over time, enable forecasts of future condition, and inform the most beneficial type and timing of treatment. Condition assessment methods and rating systems have become relatively standard for some assets but vary depending on the type of asset. The Region conducts inspections more frequently on more critical assets such as bridges. Some Region assets have no reported physical condition. These include assets which the Region is in the process of collecting the data, assets where the renewal decision is not based on condition (e.g. age or mileage), and lower risk assets that are run-to-failure.

For those assets with no condition data, age-based condition is estimated as the percentage of age to service life. Using age data as a surrogate for condition data is common in municipal organizations, but it can be misleading as age does not always directly reflect condition or remaining service life.

To enable comparison of condition and condition trends over time between different asset types, a generic condition grading scale is often used to translate detailed engineering data about assets into information that can be compared across asset groups. For this purpose, the Region uses a five-point condition grading system, summarized in the table below, which is consistent with the general condition grading system included in the International Infrastructure Management Manual (IIMM).

Table 2-2 Five-Point Condition Grading System

Grade	Description	Condition Criteria	Criteria Description
VG	Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated
G	Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life
F	Fair	Requires attention	Signs of deterioration, some elements exhibit deficiencies
P	Poor	Increasing potential of affecting service	Approaching end of service life, below standard, significant deterioration
VP	Very Poor	Unfit for sustained service	Near or past service life, advanced deterioration, assets may be unusable

Details relating to the condition of each asset are currently maintained in various databases and spreadsheets. The Region converts industry standard condition rating systems and age-based assets to the above condition grading system as provided in the table below.

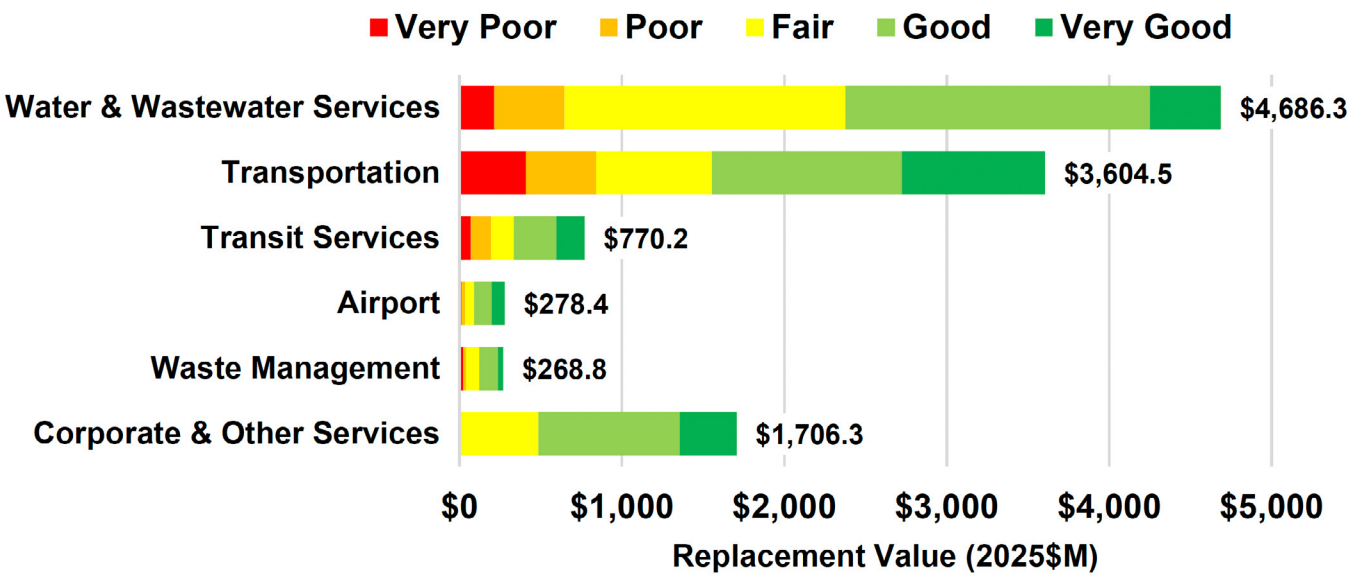
Table 2-3 Conversion of Industry Condition to Five-Point Condition Grade

Condition Grade	Transportation Pavement Condition Index	Bridge Condition Index (BCI)	Airport Surface Condition Rating (SCR)	Age	Age (Fleet only)
Very Good (1)	90 to 100	85 to 100	8 to 10	0 to 12.5%	0 to 25%
Good (2)	80 to <90	70 to <85	6 to <8	>12.5 to 37.5%	>25 to 75%
Fair (3)	65 to <80	60 to <70	4 to <6	>37.5 to 62.5%	>75 to 125%
Poor (4)	55 to <65	50 to <60	2 to <4	>62.5 to 87.5%	>125 to 175%
Very Poor (5)	0 to <55	0 to <50	0 to <2	>87.5%	>175%

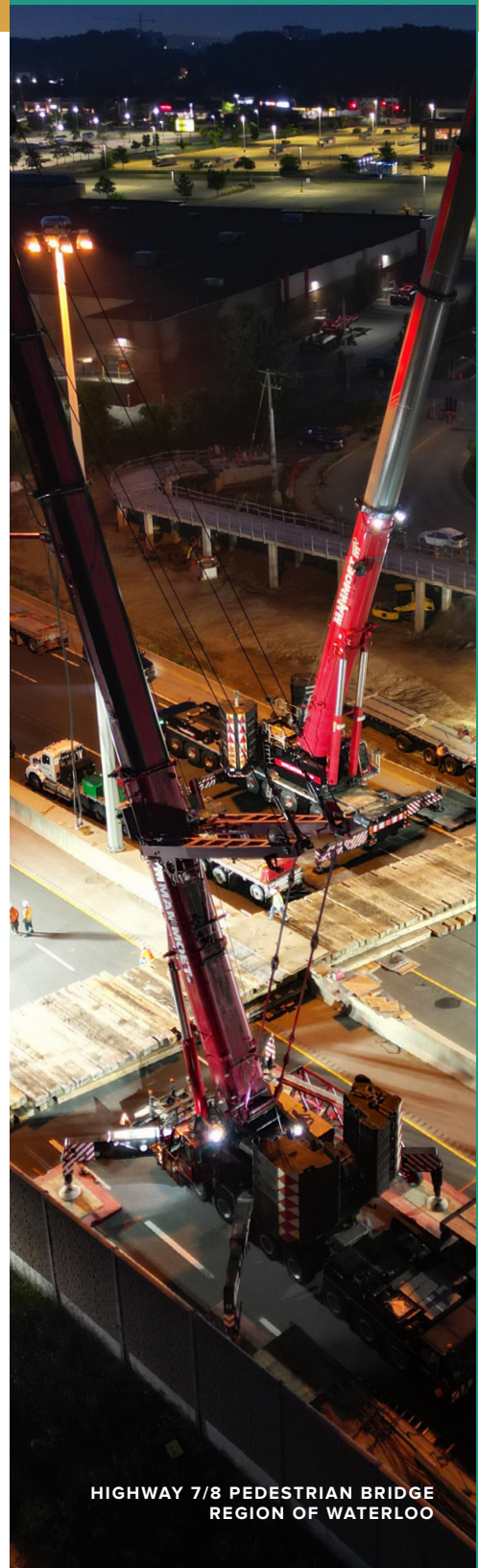
BIKE LANES
REGION OF WATERLOO

The following graph depicts, by colour, the value of assets that fall within each of the condition grades (very good or new, good, fair, poor, very poor or end-of-life, unknown), organized by program area. The total replacement value of assets within each service area is shown to the right of the condition grade bar.

Figure 2-2 Asset Condition Grade Profile, By Program Area



To adequately meet service levels and manage risk while minimizing lifecycle costs, most assets should generally be preserved in fair or better condition. The above figures show that the majority of the Region's assets – in fact 84% – are in fair or better condition based on weighted value. Assets in poor or very poor condition require increased attention and renewal investment (i.e., funding and staff resources) to avoid increased maintenance costs and/or unexpected failure. The assets that are currently in poor or very poor condition are typically those that are included in 10-year capital renewal programs and budget forecasts. It is important to note that based on criticality, the Region may elect to adopt a "run to failure" strategy for some asset classes.



HIGHWAY 7/8 PEDESTRIAN BRIDGE
REGION OF WATERLOO

3.0 Levels of Service

WALTER BEAN GRAND RIVER TRAIL
REGION OF WATERLOO

3.0 Levels of Service

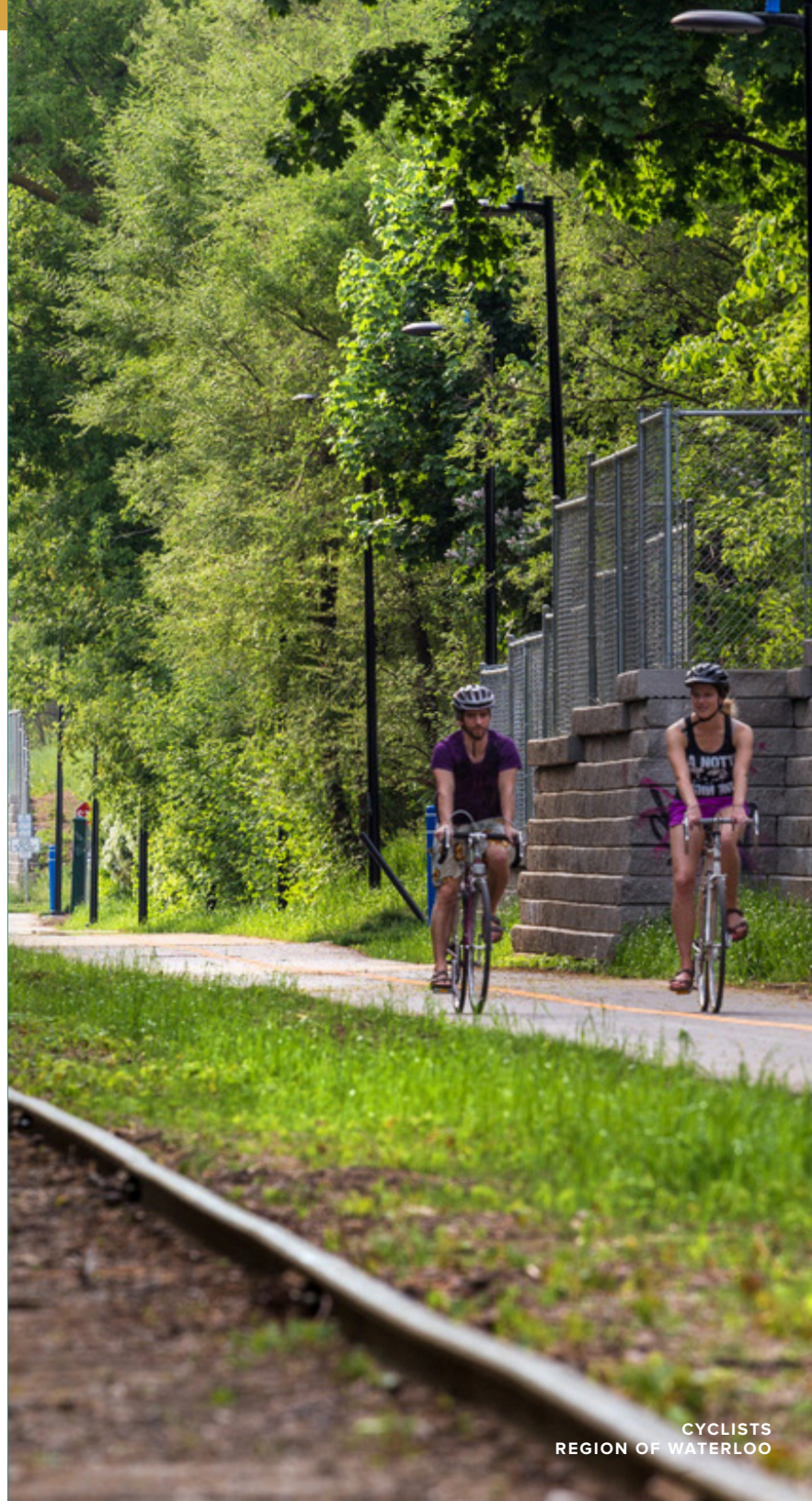
3.1 Overview

One of the basic principles of sound asset management practice is to describe the levels of service the current and future community want and are prepared to pay for, and the associated lowest cost to deliver those levels of service. Performance management is the systematic and cyclical process of identifying objectives, collating information regarding the achievement of those objectives, reporting the information in a meaningful way, and using the information to improve delivery of services to the community.

Monitoring the Region's performance against defined levels of service helps to improve the Region's service delivery by focusing program activities and assets on priorities and identifying under-performance so that it can be addressed. Performance measures or indicators are used for this purpose and are intended to align with the Region's corporate strategy.

GOOD PERFORMANCE MANAGEMENT
Helps the Region to

- **IMPROVE SERVICE DELIVERY**
- **DEMONSTRATE AFFORDABILITY**
- **PROVIDE ACCOUNTABILITY TO THE COMMUNITY**



CYCLISTS
REGION OF WATERLOO

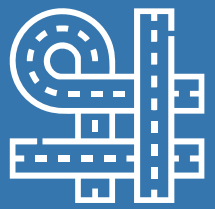
3.2 Current Services and Programs

The Region provides the following scope of services to the community included in this AM Plan:

WATER & WASTEWATER

Water & Wastewater Services is responsible for drinking water supply and wastewater treatment. Drinking water is supplied from over 100 groundwater wells and one surface water treatment plant, with the source from the Grand River. Water & Wastewater Services operate trunk and dual watermains, elevated storage tanks, water reservoirs, booster systems, and flow chambers. Distribution services are provided to North Dumfries and Wellesley.

For wastewater services, the Region operates and maintains 13 wastewater treatment facilities, a biosolids processing facility, seven (7) pumping stations, and two (2) collection systems in North Dumfries and Wellesley, all of which are operated by the Ontario Clean Water Agency (OCWA).



TRANSPORTATION

Transportation Services is responsible for roads, traffic control, bridges, a stormwater control network, and green infrastructure. Road functions include arterial, commercial residential and commercial industrial. In addition to roadways, the Region is also responsible for roadside and traffic control assets including traffic signals, noise walls, retaining walls, guiderails and cables on Regional roads. The stormwater network includes storm sewers, management ponds, oil / grit separators, catch basins, and culverts.

TRANSIT SERVICES

Grand River Transit (GRT) connects the three cities of Kitchener, Waterloo and Cambridge and provides service to Woolwich and Wilmot. GRT is responsible for managing a number of assets including conventional low floor buses, MobilityPlus vehicles, bus shelters and other supporting assets which enable the Region to provide transit services.

AIRPORT

The Region of Waterloo International Airport (YKF) is a full-service facility which supports commercial, corporate and general aviation. The Airport is responsible for managing Airport assets including pavement (runways, taxiways, aprons, access roads, parking lots and sidewalks), visual aids, the glycol de-icing system, fencing, security, and utilities and services (i.e., water, wastewater, power, gas, data/telephone).

WASTE MANAGEMENT

Waste Management is responsible for all solid waste disposal facilities, as well as region-wide garbage collection and waste reduction/diversion programs. This includes the operation of the Waterloo Waste Management Centre, the bulk waste transfer station and composting operations at the Cambridge Waste Management Centre, and the oversight of five closed landfill sites. The Region is also responsible for maintaining and expanding infrastructure to protect public health and the natural environment from the impacts of waste management operations.

CORPORATE

Under Corporate & Other Services, this AM Plan covers facilities and fleet assets that support general government or service areas not described above, including Housing, Seniors, Cultural, Police, and Paramedic Services. Facilities and fleet assets that support delivery of specific service areas are included under those service areas, as described above, even though the management of some or all of these assets is undertaken by other "internal" service providers.

OTHER SERVICES

Facilities Management is responsible for managing the planning, construction, maintenance, operations, asset upgrade and renewal management and protective services for owned or leased Regional buildings, including community housing stock.

Fleet Management is responsible for fleet planning, maintenance and support services for vehicles and moving equipment in the Region's corporate fleet, including ambulances and police vehicles.

REGION OF WATERLOO INTERNATIONAL AIRPORT

3.3 Strategic and Corporate Goals

The Region's 2023 to 2027 Strategic Plan, "**Growing with Care**", outlines the vision, mission and corporate operating principles, and strategic themes.

- **Vision**: Waterloo Region is a compassionate community that cares for all people, stewards the land for future generations and where everyone has the opportunity to live a good life.
- **Mission**: To provide essential services that support quality of life for each and every person in Waterloo Region.
- **Core Value**: Care for people and the land we share.

The Strategic Plan's four key priority areas and their strategic objectives are in the table 3-1.

Table 3-1 Corporate Strategic Themes

Priority Area	Definition	Objectives
 Homes for all	We will invest in affordable homes and economic opportunity for all that are part of inclusive and environmentally sustainable communities.	• Move quickly to create affordable, accessible, and equitable housing • Eliminate chronic homelessness and reliance on traditional shelter models • Invest in upstream solutions to reduce housing and economic precarity • Unlock Region-owned land that supports community growth
 Equitable services and opportunities	Through collaboration and innovative design, we will provide equitable, accessible services across Waterloo Region that support the social determinants of health, safety and complete communities as we grow.	• Ensure services are inclusive, accessible, culturally safe and appropriate • Design equitable Regional services that meet local community needs • Explore new models of service through community collaboration and partnerships
 Climate aligned growth	As we grow, we will support a healthy environment where communities can thrive. Through intentional collaboration and creativity, we will support sustainable community growth.	• Use a climate adaptation lens to re-imagine infrastructure, land and services for growth • Foster car alternative options through complete streets and extended alternative transportation networks • Steward our natural environment and shared resources as we grow
 Resilient and future ready organization	The Region of Waterloo is a great place to work, where everyone is valued, feels they belong and where they have the supports and tools they need to do a great job. We will be prepared for the future by providing a safe space for bold ideas and experimentation, based on data and other ways of knowing.	• Foster an empowered, people-centred culture • Reconcile past injustices to advance our future together • Explore new service models and partnerships to achieve fiscal resilience and better service

3.4 Customer and Technical Levels of Service

Customer levels of service (LOS) measure how the customer receives the service and whether value is provided to the customer. Figure 3-1 shows that Corporate LOS commitments and the legislated LOS referenced by them drive the definition of more specific Customer (also known as Community) LOS, which can be categorized as relating to one of the following service attributes:

- **Capacity**: Measures that reflect whether the service and supporting assets are of sufficient capacity to meet user demand both now and in the future.
  - **Does the Region need more or less of these services and assets?**
- **Function**: Measures that reflect the suitability of the services, operations and assets for the user or other stakeholder.
  - **Do they meet the needs of the community?**
  - **Do they meet regulatory requirements including those for health and safety, environmental protection and barrier free access?**
  - **Do they support the Region's strategic priorities?**
- **Reliability and Quality**: Measures that reflect whether services and supporting assets are reliable, available when needed, and responsive to customers.
  - **Are assets maintained and renewed to ensure a state of good repair (i.e., condition)?**
  - **Are services continuous?**
  - **Is the community involved in planning, treated respectfully and responded to promptly?**
- **Affordability**: Measures that reflect whether services and supporting assets are adequately funded in both the short and long term.

Technical LOS measures support the Customer LOS. They relate to the allocation of resources to service activities to best achieve the desired customer outcomes and demonstrate effective performance.

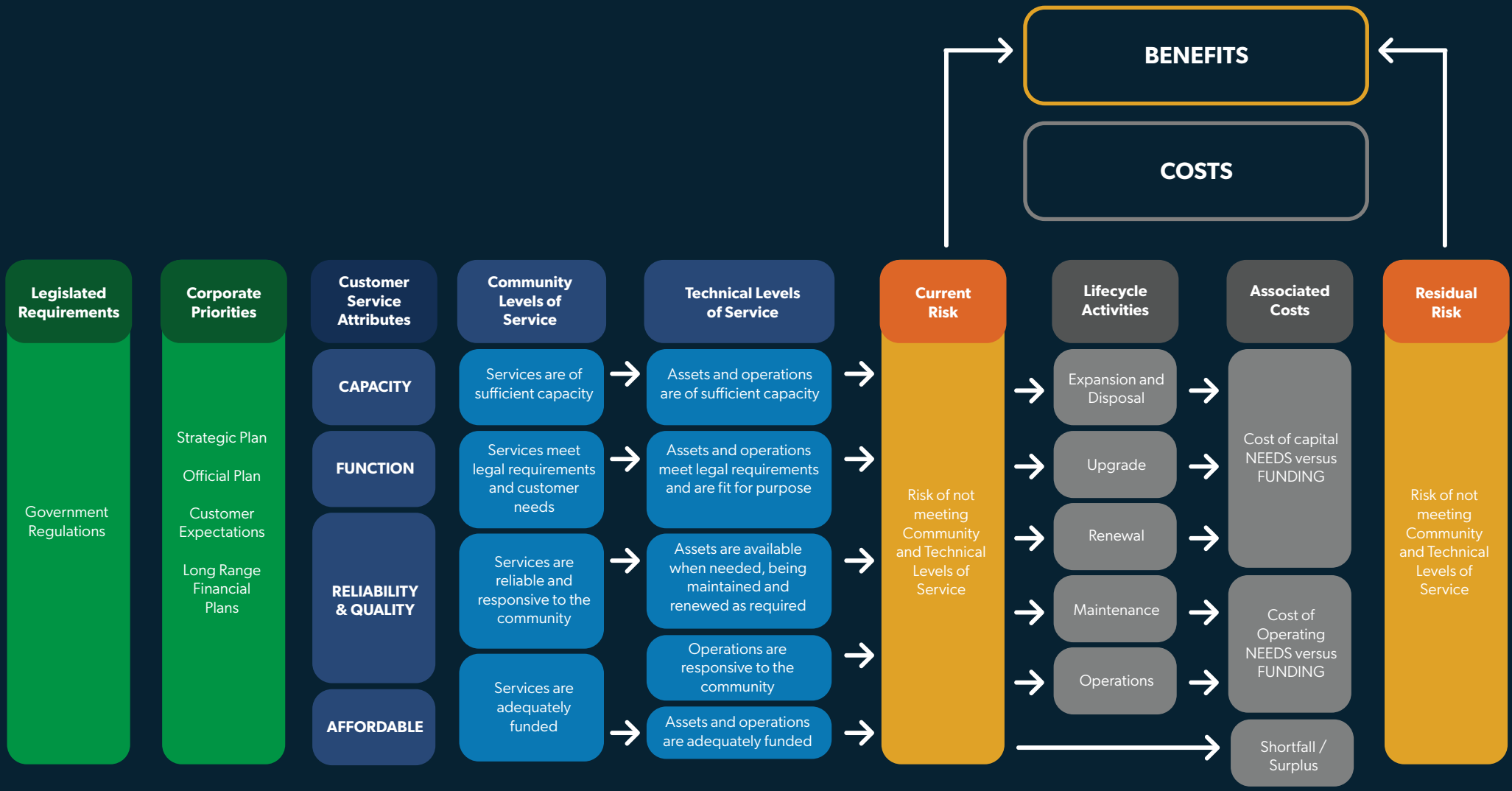
Customer LOS are translated into Technical LOS, where:

- **Capacity** LOS drive assessment of expansion needs
- **Function** LOS drive assessment of upgrade needs
- **Reliability and Quality** LOS drive assessment of renewal, maintenance and operations (and programming) needs
- **Affordability** LOS drive assessment of financial sustainability of asset ownership relative to the asset needs and projected funding adequacy.

The risks of failing to achieve the defined Customer and Technical LOS are assessed, and lifecycle activities are prioritized to address those risks. Lifecycle activities may include expansion, upgrade, renewal, maintenance or operational activities, depending on the category of LOS to be addressed. In some cases, lifecycle activities address several Customer and Technical LOS. For example, a project at a wastewater treatment plant may simultaneously increase capacity, make upgrades to meet regulatory requirements, and renew existing equipment. The nature of the lifecycle activity determines whether it should be funded through capital or operating budgets, as well as eligible funding sources. As shown in the figure below, even after the lifecycle intervention, some residual risk may remain.

POND
REGION OF WATERLOO

Figure 3-1 Levels of Service Framework



3.5 Customer Research and Expectations

Resident, business and other stakeholder input is sought during the update of the Region's Strategic Plan, Official Plan, Master Plans and annual budgets. This includes public opinion and stakeholder group surveys that collect information related to user service patterns, behaviours and preferences today and potentially in the future. This customer research provides insight into citizens' and other stakeholders' needs and perceptions related to areas of improvement.

3.6 Current and Proposed Performance

O.Reg. 588/17 requires that the Region provide specific measures for "core" municipal infrastructure assets (namely water, wastewater, stormwater management, roads, bridges and major culverts), and provide measures established by the municipality for all other assets.

This AM Plan summarizes performance on both the current and proposed measures for 2024, unless otherwise noted. For community and technical LOS specific to each Service Area, refer to each individual service area summary in the Appendices.
To inform the renewal trade-off analysis between levels of service, cost of service and risk, this AM Plan considers the costs associated with two key reliability measures:

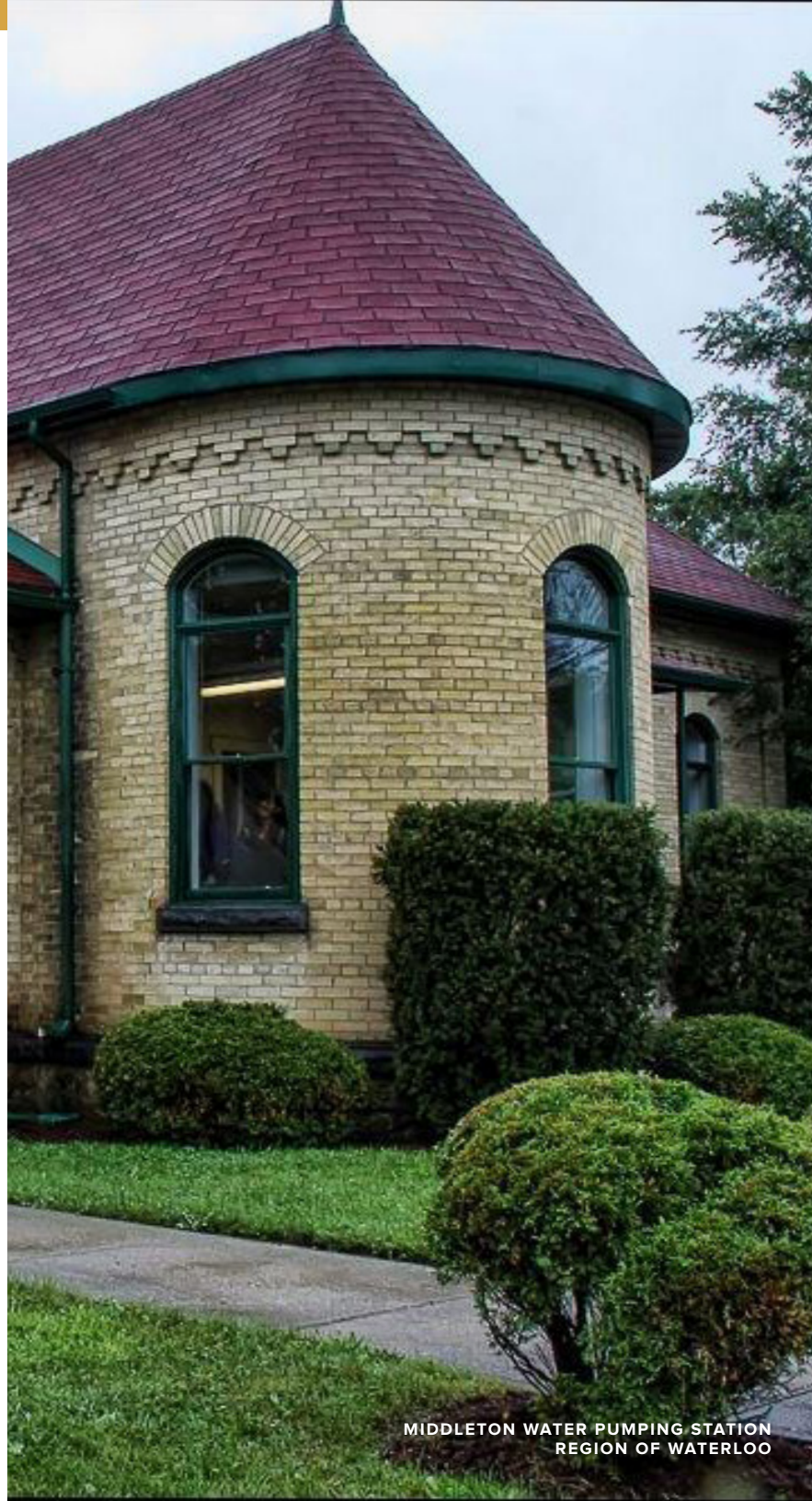
- The percentage of assets rated as poor or very poor condition
- The percentage of high criticality assets rated as poor or very poor condition.

3.7 Factors Impacting Levels of Service Performance

External trends and issues affecting expected levels of services or the Region's ability to meet the defined levels of services include the following:

- Population and employment changes (e.g. growth, demographics), which will impact infrastructure use.
- Changes in expectations for programs or patterns of use from the public, which will impact infrastructure use and revenue for services.
- Potential changes in technology or methods, which may replace obsolete equipment, provide longer asset life, and/or achieve higher quality and greater efficiencies.

- Potential changes to the cost of input variables (e.g. cost of power, fuel), which will impact costs to deliver the services.
- Infrastructure failing prematurely due to environmental factors and/or construction practices requiring renewal much earlier than the expected life of the asset.
- Availability of external funding (e.g. federal and provincial infrastructure programs), which may affect the infrastructure improvement activities that can be undertaken.
- Unexpected downloading of services by more senior levels of government.
- Sustainability initiatives (e.g. LEED, electrification, and GHG reduction).
- Climate change, including changing storm events and patterns (e.g., higher frequency and intensity of storms), which will impact the infrastructure.
- Potential changes in Federal or Provincial legislation.



MIDDLETON WATER PUMPING STATION
REGION OF WATERLOO

4.0 Asset Management Strategies

MARKET TRAIL
REGION OF WATERLOO

4.0 Asset Management Strategies

4.1 Overview

This section provides an overview on expected future growth in population and the associated need for additional infrastructure, the renewal needs and associated investments, and the risks to the Region's ability to deliver the proposed LOS. This section also provides the Region's operations, maintenance and renewal strategies to minimize those risks for each of the service areas. This AM Plan sets a baseline for potential future strategy changes or to help inform or justify service level changes that may be needed to reflect changing demands and available funding. Current strategies include non-asset solutions and investment such as education and demand reduction and balancing use; identifying expansion needs as identified in detailed master plans; prioritization of asset renewal requirements based on condition assessment programs; and prioritizing maintenance and operations needs and investment.

The costs to carry out these lifecycle activities are provided in this section, with the sources of available funding, funding constraints and the associated risks of any funding shortfalls discussed in Section 5 Funding Plan and Associated Risks.

NORTHFIELD TRANSIT MAINTENANCE FACILITY
REGION OF WATERLOO

4.2 Criticality Assessment to Inform Lifecycle Strategies

The Region's key asset management principle is to meet service levels and to manage risk, while minimizing lifecycle costs. Risk events, such as an asset failure, are events that may compromise the delivery of the Region's strategic objectives. The Region's asset risk assessment takes into account potential losses to services, financial loss, and potential safety hazards (see Table 4-1 below). All assets are scored according to the impact of asset failure against these criteria and the likelihood of that failure occurring based on asset performance and condition (or age if condition is not available).

Asset criticality reflects the importance of an asset to the Region's delivery of services or, in technical terms, the potential consequences of the asset failing (and therefore failing to provide the required LOS). Asset consequence of failure is determined based on the degree to which the failure of the asset would impact the following "triple bottom line" considerations:

- Service delivery considerations such as the lack of sufficient service capacity to meet demand or loss of existing service, expressed as degree and duration of impact from minimal localized short-term disruption of non-essential service to widespread and long-term disruption of essential service.
- Financial impact considerations such as damages to Regional or private property and infrastructure, loss of revenue, and fines.
- Safety impact considerations such as ability to meet health and safety related regulatory requirements and degree and extent of injury, from negligible injuries and multiple loss of life.

The higher the criticality or consequence of failure associated with an asset, the lower the Region's tolerance for probability of failure for that asset. Conversely, the Region will tolerate greater probability of failure in relation to less critical assets. The Region manages the probability of failure of each group of assets based on the criticality or consequence of failure. Most low criticality assets are run to failure and then replaced.

The Region has defined five criticality grades, from Very High to Very Low, that reflect its tolerance for risk of asset failure. The following table outlines the "triple bottom line" impacts and typical asset LOS for corresponding to each criticality grade.

Table 4-1 Asset Criticality Grades

Impacts	1 Very Low	2 Low	3 Moderate	4 High	5 Very High
Service	Service not affected or minimal impact	Localized disruption of non-essential service	Localized disruption of essential service	Widespread short-term disruption or localized long-term disruption of essential service	Widespread and long-term disruption of essential service
Financial	Damages, losses or fines <$10,000	Damages, losses or fines $10,000 to $200,000	Damages, losses or fines $200,000 to $2,000,000	Damages, losses or fines $2,000,000 to $10,000,000	Damages, losses or fines >$10,000,000
Safety	Negligible injuries	Minor injuries, medical attention required	Serious Injuries, multiple minor injuries	Multiple serious injuries, Loss of life	Multiple loss of life

Inherent in the assignment of criticality grades is redundancy or other mitigation strategies currently in place. The presence of 100% redundancy can reduce the criticality grade by as much as 50%.

WATER & WASTEWATER FACILITY
REGION OF WATERLOO

Criticality profiles enable risk to be incorporated into operations, maintenance and renewals strategies, as summarized in Section 4.4 in the following mitigating ways:

- by providing redundant or backup assets in case of failure of assets required to meet demand
- by setting maintenance service levels, including response times, to address identified asset defects and issues, based on risk tolerance
- by setting a condition-based LOS (the renewals intervention points) and monitoring condition, with frequency based on the tolerance for risk for each asset
- by setting the time to address assets that are considered Very High and High criticality assets that are in worse condition than their nominated intervention point.

These factors in turn influence the lifecycle options analysis and recommended strategies, as set out in the following two sections.

The following figure provides a risk map showing the total replacement value of assets for various risk exposures. Risk Exposure is derived from the multiplication of the probability of failure (PoF), which is the likelihood or chance that an asset failure may occur, and the consequence of failure (CoF), which is the direct and indirect impact on the Region if such an asset failure were to occur. In this AM Plan, the PoF for reliability is determined based on an asset's current physical condition, and the CoF is determined as outlined above. The risk maps show the replacement value and percentage of assets at Very High (red), High (yellow), Moderate (green) and Low (blue) business risk exposure. The assets falling in the Very High and High categories will generally be those assets that are in poorest condition, as illustrated in the condition graphs.

- Assets that appear in the red zone are significant to the Region and therefore need to be actively managed and monitored in a more comprehensive manner than other risks.
- Assets that appear in the yellow will also be actively managed depending on their nature
- Assets that appear in the green or blue zones are generally acceptable without significant mitigation strategies being implemented, although monitoring may still occur in some form.

The risk map has enabled the identification and prioritization of Very High risk assets that need renewal or replacement. A risk map showing both replacement value and percentage of assets by replacement value for all assets are shown below.

Figure 4-1 Risk Exposure Matrix: Region Total (in $M & %)

	LOF	*Risk exposure in year 2025 $, millions*				
5	**Certain**	$43.0	$357.9	$258.5	$195.1	$27.7
4	**Likely**	$32.7	$303.2	$424.8	$275.7	$82.7
3	**Possible**	$168.4	$1,182.1	$802.7	$348.4	$167.0
2	**Unlikely**	$365.7	$2,063.0	$966.2	$719.4	$614.5
1	**Rare**	$234.4	$592.4	$338.0	$551.7	$199.4
		Insignificant	**Minor**	**Moderate**	**Major**	**Catastrophic**
		1	*2*	*3*	*4*	*5*

Risk Exposure Ratings		
Very High	**$305.4**	3%
High	**$1,474.4**	13%
Moderate	**$5,188.2**	46%
Low	**$3,153.8**	28%
Very Low	**$1,192.7**	11%
Total	**$11,314.6**	100%

The majority of the Very High risk category assets are Water and Wastewater Services, Transportation, Airport and Waste Management assets. The Region's risk mitigation plans for the assets identified as Very High risk are addressed by prioritizing their renewal strategies.

4.3 Asset Management Strategies

Asset management strategies are planned actions that enable assets to provide the desired levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost (e.g. through preventative action). Allocating costs between various lifecycle activities such as expansion (also known as growth), upgrade (e.g. due to legislated requirements or availability of new technologies), renewal (rehabilitation or replacement), and maintenance is not simple due to complexities of the infrastructure needs and multi-purpose solutions to meet those needs.

The following sections summarize the Region's general approach and overall costs for managing assets. The appendices provide details for each of the service areas.

4.3.1 Non-Asset Solutions

The Region invests in the following non-asset solutions:

- Continuing to manage demand through education and demand reduction and other demand management programs.
- Balancing use (e.g. kilometres, hours, waste disposal cell volume) by shifting assets from higher use to lower use.
- Energy conservation and demand management initiatives such as process optimization and education.
- Creation of shared assets to reduce the asset portfolio size.
- Asset rationalization, reviewing the overall asset portfolio and objectives to optimize overall lifecycle costs.
- Integrating the planning of infrastructure renewal across asset classes (e.g. scheduling road and buried infrastructure replacements at the same time) and with local municipalities and other agencies.
- Working with the cities and townships to optimize infrastructure management (e.g. data sharing agreements, and coordinated capital projects).
- Continuously improving an integrated set of asset management best practices including implementing a Corporate Work Management System and Decision Support System.

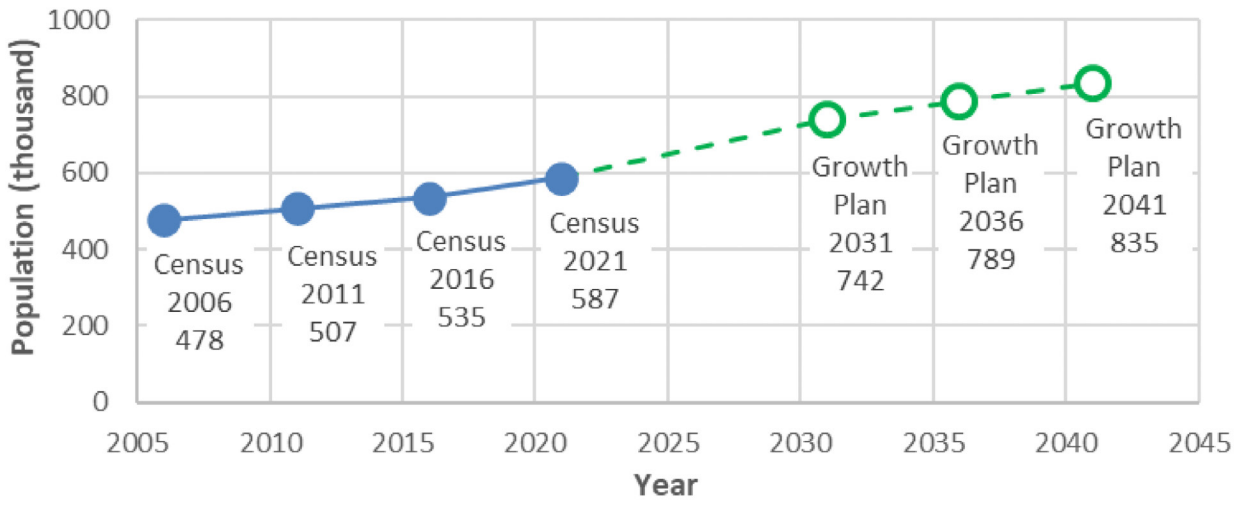
4.3.2 Expansion (Growth) and Upgrade Needs

The total population of the Region is estimated at 673,910 people (estimated to year end 2023), including university students.

Expected growth drives the scale of Regional services and, in turn, the assets needed to support them. Until the Provincial Planning Statement (PPS), 2024 came into effect on October 20, 2024, the Region planned for growth based on the Provincial Policy Statement, 2020 and A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019.

The level of growth based on the Provincial Policy Statement, 2020 and A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019 is shown in Figure 4-2 and will place significant pressure on the capacity of existing infrastructure and create demand for new infrastructure.

Figure 4-2 Region Population Growth Forecast (1000's)



AERIAL VIEW
REGION OF WATERLOO

The Provincial Planning Statement (PPS), 2024 is a consolidated statement of the government's policies on land use planning. It gives provincial policy direction on key land use planning issues that affect communities, such as:

- building more housing where it's needed
- making land available for development
- creating opportunities for economic development and job creation
- planning for the appropriate transportation, water, sewer and other infrastructure necessary to accommodate current and future needs
- protecting the environment and important resources including farmland, water, archaeology, cultural heritage, mineral aggregates and petroleum
- engaging with Indigenous communities to facilitate knowledge-sharing, inform decision-making in land use planning and protect Aboriginal and treaty rights
- protecting people, property and community resources by directing development away from natural or human-made hazards, such as flood prone areas.

The Region has yet to update its strategies and planning forecasts to accommodate the impacts of PPS, 2024.

Expansion works are those works that create a new asset that did not previously exist or increase the capacity of an existing asset. Upgrade works improve an existing asset beyond its existing function and may result from legislative, social or environmental needs. Assets may also be acquired at no cost.

The Region determines its recommended expansion (growth) and upgrade program through the master planning process which develops needs based on an assessment of demand against capacity and future trends in regulatory requirements, customer expectations, desired levels of service, other business drivers, and availability of enabling technologies. The Region updates master plans periodically, typically every five to eight years, and incorporates the results into renewal, operations and maintenance planning, and the 10-year Capital Program.

The following master plans and key related documents are complete, underway or planned for the near future:

- Transportation Integrated Mobility Master Plan
- Active Transportation Master Plan
- Water Supply Strategy Update
- Water Resource Protection Master Plan
- Wastewater Treatment Strategy Update
- Biosolids Strategy
- Wellesley Water and Wastewater Master Plan
- Baden and New Hamburg Water and Wastewater System Servicing Review
- Water Supply/Distribution Master Plan
- Airport Master Plan
- GRT Business Plan
- Paramedic Services Master Plan
- Police Services Facilities Master Plan
- Corporate Accommodation Master Plan
- Community Safety and Wellbeing Plan (under development)
- Waterloo Region Housing Master Plan
- Fleet Capital Replacement Plan
- Corporate Energy Plan
- SCADA Corporate Strategy
- Stand-by Power Master Plan
- Corporate Climate Change Adaptation Infrastructure Master Plan

Growth and expansion of infrastructure may be constructed by the Region or contributed by Developers in the case of roads, stormwater management, water distribution and wastewater collection assets.

Corporate Climate Change Action Plan

The Region has developed a five year Corporate Climate Change Action plan, outlining the path to achieve net zero emissions from energy sources by 2050. This plan, which will be updated every five years, include actions to advance the Region's commitment to decarbonizing corporate operations, and support broader community climate change commitments. This plan is organized into five goal areas:

- Buildings: Achieve net zero emissions in Regional buildings by 2050
- Water, Waste and Wastewater: Optimize process to decrease fugitive methane and adopt innovative approaches to reduce operational emissions
- Fleet and Transportation: Procure only low carbon fleet and transit vehicles by 2050, and invest in infrastructure, programs and services to support sustainable transportation choices
- Capacity Building: Climate change is built into the decision-making fabric of the Region of Waterloo

To achieve a corporate-scale climate and energy transition, the Region is aiming to achieve the following by 2050:

- Eliminate fossil fuel use in corporate operations
- Optimize local energy
- Enable a modal shift to active transportation
- Minimize fugitive methane emissions
- Increase resilience of essential programs and services
- Reduce risks to infrastructure through asset management

Mitigation actions include:

- **Implementing TransformWR**, which outlines our community's pathway to achieve an emissions reduction of 80% (of below 2010 levels) by 2050. In 2021, the Region of Waterloo and all seven lower-tier municipalities endorsed TransformWR, demonstrating a shared commitment to an equitable, prosperous, resilient, low carbon community.

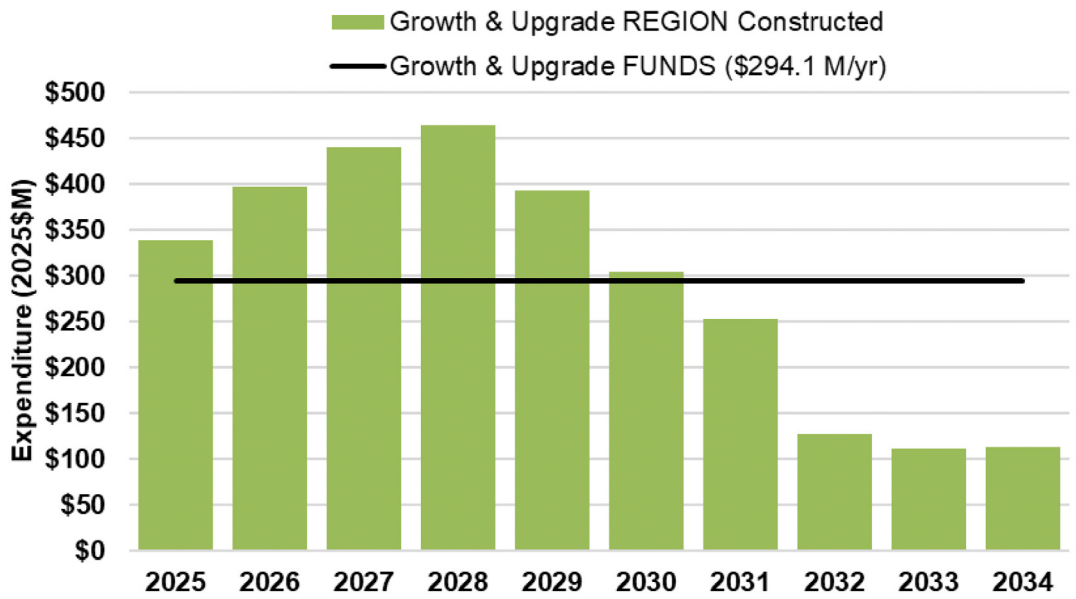
- **Monitoring corporate and community GHG emissions.** The Region conducts an annual corporate GHG emissions inventory to inform our decarbonization efforts, and directly supports a community-wide inventory as a member of ClimateActionWR.
- **Increasing energy efficiency** by retrofitting existing Regional facilities aligned with the Corporate Energy Plan.
- **Exploring a Carbon Budget**: Staff are building a decision making support tool that considers greenhouse gas emissions considerations as part of the project planning and asset management processes.
- **Switching to clean energy sources** in Regionally owned facilities and in corporate fleet and public transit vehicles, with proven technology.
- **Encouraging compact and complete communities** that facilitate sustainable and active transportation choices supported through Transportation's Integrated Mobility Strategic Plan.
- **Pursuing local renewable energy opportunities** (i.e. district energy systems). The Region's new biogas co-generation facilities, which make use of methane captured to offset energy used for wastewater treatment.
- **Reducing methane emissions** from landfills. The Region is actively exploring opportunities to maximize capture and minimize fugitive methane emissions from waste management sites, based on available and proven technology options and landfill waste diversion policies, as well as exploring potential future renewable natural gas opportunities.
- **Supporting our community partners** and encouraging cross-sector collaboration. The Region supports the work of WR Community Energy, REEP Green Solutions, and SustainableWR, who are all playing key roles in advancing deep energy retrofits in the residential and ICI sectors, and the community's overall energy transition to more renewable and sustainable energy sources and infrastructure.

Adaptation actions include:

- **Working with our partners** to implement the Community Climate Action Plan, which outlines the actions our community can take to become more resilient to the impacts of climate change.
- **Decreasing risks to infrastructure** through informed and strategic asset management that considers the impacts of future climate conditions. The Region's Strategic Initiatives and Asset Management Department is leading the development of a Corporate Climate Change Adaption Infrastructure Master Plan (forthcoming), which will identify the actions required to increase the resilience of our infrastructure assets. Through this work, the Region will consider changes to operational protocols and identify investments needed for adaptation retrofits and enhancements, while also noting opportunities for decarbonization and emissions reduction concurrent with addressing vulnerabilities.
- **Understanding local health risks** identified through a Climate Change and Health Vulnerability Assessment that informs adaptation planning in an effort to reduce health risks for vulnerable populations.
- **Reviewing services and operations** to understand and reduce climate risk. The Region's Water & Wastewater Services as well as Transportation has recently conducted risk assessments to identify and respond to the potential impacts of climate change on water and wastewater, transportation facilitates.

Figure 4-3 shows the projected asset growth and upgrade needs based on the Region's master planning. These growth and upgrade investments total **$2.9 billion** over the next 10 years. The figure also shows the average annual funding required to support this growth and upgrade over the next ten years. Based on this growth and upgrade, the value of the Region's asset portfolio is estimated to increase from **$11.3 billion** in 2024 to approximately **$14.2 billion** by 2034.

Figure 4-3 10-year Projected Growth and Upgrade Needs ($M)



4.3.3 Renewal Needs

Renewal is major rehabilitation and replacement work that does not increase the asset's design capacity or function but is intended to improve reliability of meeting desired levels of service. The primary performance measures for reliability are asset physical condition and associated risk.

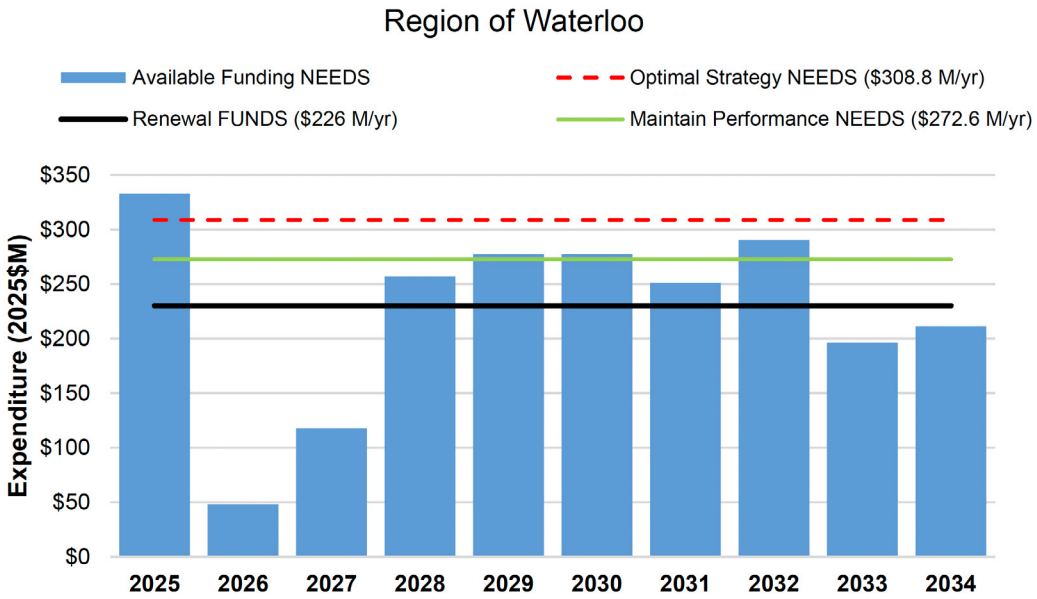
Based on the asset condition and risk information outlined in the preceding sections, three renewal needs scenarios are considered and analyzed over the next 10 year period (2025 to 2034), as required by O.Reg. 588/17:

- **Scenario 1: Maintain Current Performance**: Renewal activities are undertaken such that the current performance is maintained over the next 10 years. For example, this includes resurfacing or rehabilitating sections of the road network at the right time to maintain the average pavement condition rating across the network over the 10-year period.
- **Scenario 2: Available Budget**: Renewal activities are undertaken such that the associated costs are equal to the anticipated funding available over the next 10 years. For example, if the renewal budget for a service area is $1 million per year, the planned projects would be prioritized to ensure total annual spending does not exceed that amount.
- **Scenario 3: Optimal Renewal Strategy**: All renewal activities are undertaken over the next 10 years at the optimal time to minimize total cost of asset ownership, including clearing any backlog of renewal activities on assets that have already reached end-of-life.

SCHNEIDER HAUS NATIONAL HISTORIC SITE
REGION OF WATERLOO

Figure 4-4 shows the projected renewal needs for Scenario 2, based on the available funding needs for each of the next 10 years (blue bars), and the 10-year average available funding (solid black line). The figure also shows the funding required to maintain current performance (Scenario 1 as the solid green line) and to undertake the optimal renewal strategy (Scenario 3 as the dashed red line).

Figure 4-4 10-year Projected Renewal Needs ($M)

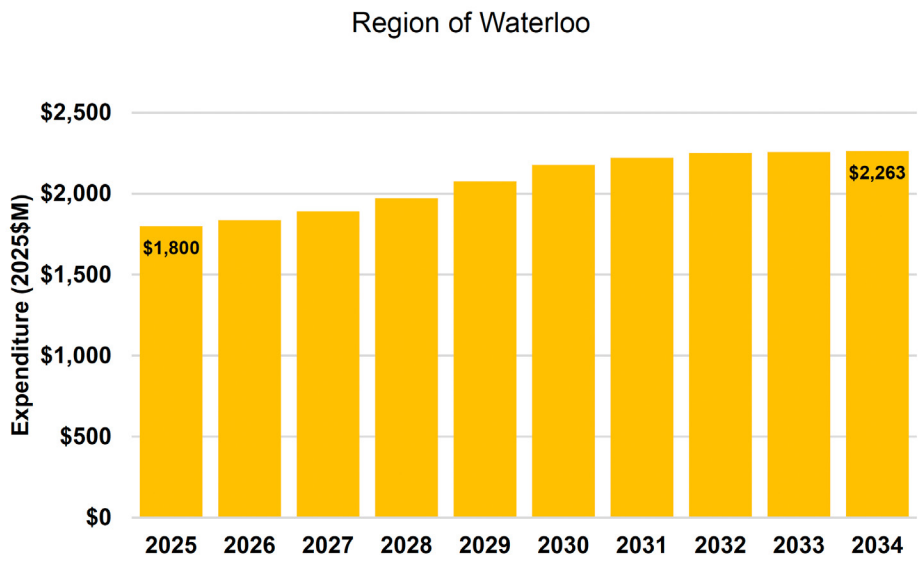


4.3.4 Operations and Maintenance Needs

To deliver services, the Region undertakes operations and maintenance activities which are funded through the operating budget. When new assets are added, additional operating funds are required for the operations and maintenance of these assets. For most assets, a good estimate of the consequential operating expenditure required to operate and maintain the new assets is simply the existing operations and maintenance cost multiplied by the growth factor.

Renewals and maintenance are strongly linked - maintenance strategies can hasten or delay the need for renewals. Similarly, if renewals are deferred, this can increase maintenance needs placing increased demands on resources such as budget and staff. Both maintenance and renewal, in combination, help to ensure assets continue to deliver the intended LOS.
Figure 4-5 shows the projected operating needs over the next 10 years to accommodate growth.

Figure 4-5 10-year Projected Operations and Maintenance Needs ($M)



Asset O&M requirements and required resources are assessed and prioritized based on:

- Carrying out legislated operations and maintenance activities to ensure safety and environmental sustainability in accordance with the appropriate regulations.
- Conducting routine and preventative maintenance activities to ensure preservation of existing assets.
- Assessing consequential O&M requirements of significant new infrastructure planned to be added to the asset portfolio.
- Analysis of current O&M contracts and known historical costs of the established LOS to forecast future O&M costs. For example, in some cases O&M costs increase at the rate of inflation, and in other cases such as energy, chemicals required for water and wastewater treatment, and oil for pavement, costs have increased significantly more over time than the overall rate of inflation.

5.0 Financing Plan & Associated Risks

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5.0 Financing Plan & Associated Risks

5.1 Overview

Financial management in asset-intensive organizations is characterized by high asset values relative to the total organization value. Financial management principles for asset intensive organizations include recognizing the consumption of asset service potential, categorizing expenditure by lifecycle activity, allocating costs to assets as far as practical, preparing long term forecasts, cost-effective financing, and effective reporting of financial performance.

This section integrates asset management planning with financial planning and budgeting. Allocating costs between lifecycle activities is not simple due to complexities of the infrastructure needs and multi-purpose solutions to meet those needs.

ELECTRIC BUS
REGION OF WATERLOO

5.2 Funding Plan

Capital Funding & Financing

Through the annual budget process, capital project information is gathered from service areas, including investment needs, trends and priorities. The ten-year capital program is then prepared which includes the current year budget and a nine-year forecast. Once the expenditure plan for the ten-year capital program is finalized, a funding plan for the proposed expenditure is developed. The plan includes several key sources of funding and financing as outlined in the table below:

Table 5-1 Key Sources of Funding and Financing

Funding Source	Financing Method
Property taxes	• Reserves (from current and prior years' taxes) • Long term borrowing, to be paid for by future taxpayers
User Rates	• Reserves (from current and prior years' user rates) • Long term borrowing, to be paid for by future rate payers
Development Charges	• Reserves (from current and prior years' RDC collections) • Long term borrowing, to be paid for by future development
Grants and subsidies	• Project specific Provincial, Federal grants/subsidies

As the above table illustrates there are four major sources of funding for capital: property taxes, user rates, development charges, and grants and subsidies. Within the first three sources, there are two financing options: reserves and long term borrowing.

Capital reserves are established as a source of pay-as-you-go funding for the Region's capital program. Funding for these reserves is obtained annually through contributions from property tax supported and user rate budgets. The annual reserve contributions are based on forecasted financing requirements and provisions required to sustain reserve balances at appropriate levels to address infrastructure replacement costs in the future and inherent uncertainties in capital funding needs. Reserve contributions are evaluated annually to ensure adequate funds are raised to meet future capital requirements and to smooth out the impact on the annual operating budget.

Grants from the Province or the Federal government are also used to finance the capital program. However, many grants are a result of stimulus or other one-time funding that may be more difficult to forecast. Most grants are included in the budget forecast when confirmed.

Development Charges (DCs) are collected by the Region from developers under the Region's DC Bylaw. DCs are held in designated DC reserve funds and used to fund a portion of growth-related infrastructure as prescribed by the Region's DC Bylaw. Projections relating to DC revenues are based on DC rates and the projected growth in residential and non-residential development.

In the absence of sufficient levels of pay-as-you-go funding, the Region will require debt financing for asset renewal work which, as a financing strategy, is more costly in the long term due to additional interest costs that must be incurred. In addition, debt financing of asset renewal work consumes regional debt capacity which should be preserved for significant asset expansions and additions.

Operating Revenues

The four main sources of funding for the Region's operating budget include:

- user rates
- property taxes
- user fees
- subsidies

User rates to support Wholesale Water and Wastewater infrastructure are collected from the seven area municipal water distribution and wastewater collection systems based on the volume of water consumed and wastewater treated. Additionally, the Region operates the Retail Water Distribution and Wastewater Collection systems in Wellesley and North Dumfries and utility rates are billed directly to the customer based on water consumption. Usage fee projections, future capital requirements, desired rate increases and historical trends are used to prepare revenue forecasts.

All other Regional programs are supported by a combination of subsidies, user fees and property taxes. During budget development, estimates are made with respect to program expenditure requirements, which are then offset by anticipated federal/provincial subsidies and user fee revenues. The remaining amount represents the property tax levy requirement. Property assessment changes and assessment growth, both residential and non-residential, will impact the amount of property taxes that each property owner will pay.

5.3 Lifecycle Expenditure Needs and Funding Plans

Growth and Upgrade

Figure 4-3 in Section 4 shows the projected asset growth and upgrade needs based on the Region's master planning. The Region plans to invest, on average, approximately **$294.1 million** per year over the next 10 years to support growth and upgrade of the asset portfolio. Based on this growth and upgrade, the value of the Region's asset portfolio is estimated to increase from **$11.3 billion** in 2024 to approximately **$14.2 billion** by 2034. The level of investment required to support the planned growth is significant and will require long term borrowing, to be paid for by future taxpayers.

Operations and Maintenance

Figure 4-6 in Section 4 shows the projected operating needs over the next 10 years to accommodate growth. In 2025, the Region will expend approximately **$1.8 billion** in operations, in order to meet current service levels. This expenditure is expected to increase to **$2.3 billion** by 2034 to accommodate the above projected growth and upgrade.

The level of investment required to support the planned operations and maintenance is significant and will require increases in property taxes or user rates.

Renewal

Figure 4-3 in Section 4 shows the projected renewal costs for the next 10 years for a) the LOS that the Region proposes to provide, b) required to maintain current performance, c) to undertake the optimal renewal strategy, and d) the available funding. Currently, the level of investment in asset renewal in the ten-year capital program of **$226.0 million** annually falls short of the optimal level of investment needs identified in this AM Plan of **$308.8 million** annually, and represents a renewal funding shortfall of **$82.8 million** annually.

Lifecycle activities will not be undertaken at the optimal time which will result in failure to minimize total cost of asset ownership and risks to service delivery. In the short term, the Region will mitigate the impact of these risks by prioritizing renewal activities on the higher risk assets while deferring lower risk renewal activities.

Current levels of funding through the capital program are insufficient to maintain our current performance.

Options available to the Region in the mid to long term include adjustments to the balance of reliability levels of service and associated costs and risks:

- Reduce levels of service
- Increase funding
- Take on more risk.

Minimizing the amount of growth and complexity of services and assets will reduce both operating and renewal needs and associated costs.

5.4 Ongoing Balancing of LOS, Costs and Risks

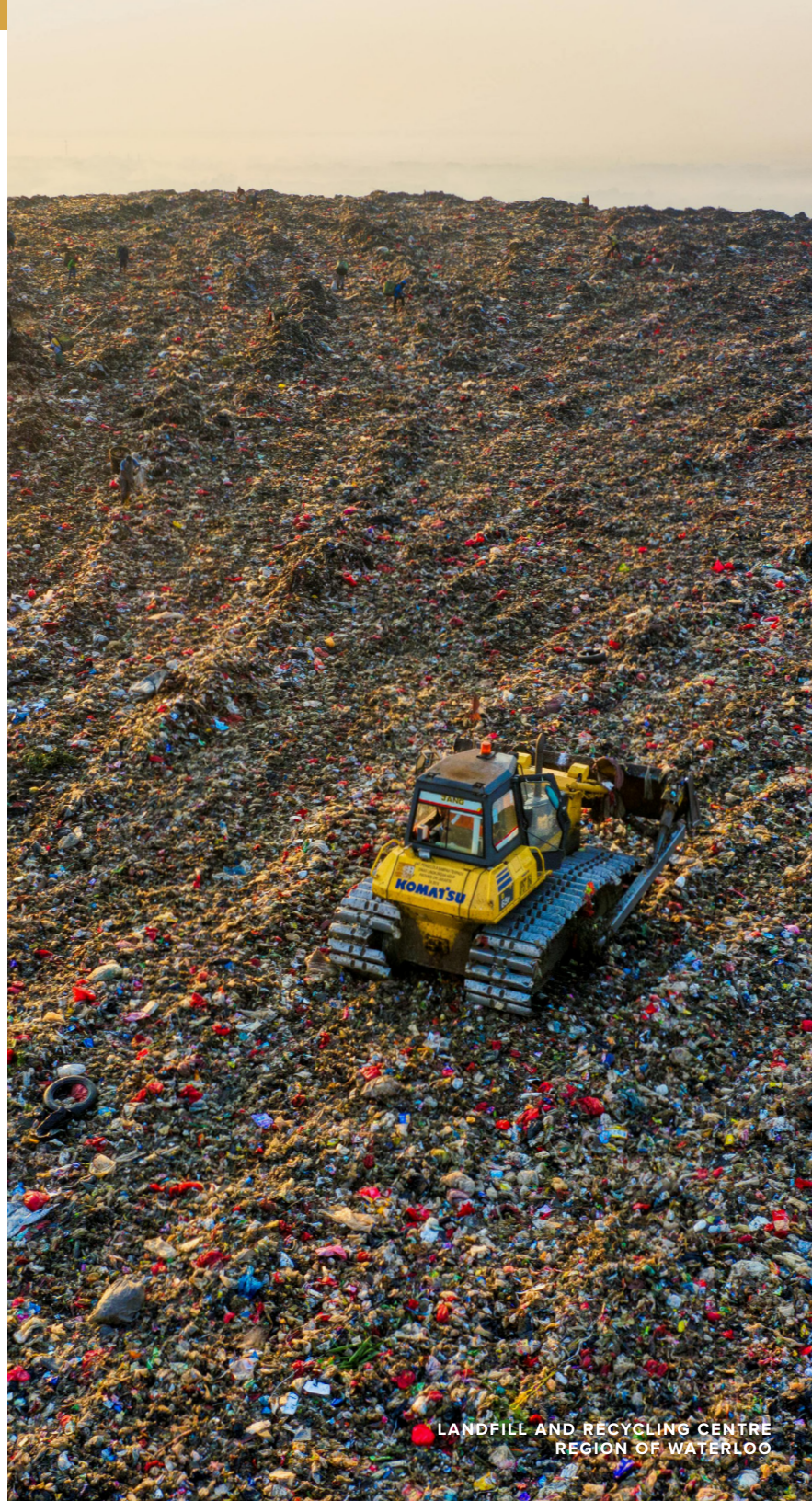
O.Reg. 588/17 mandates annual reporting to Council and senior leadership on progress toward meeting LOS measures and targets, and associated costs and risks. These reports will highlight investment needs, track infrastructure performance, and provide updates on any emerging funding shortfalls. By continuously refining LOS measures through data-driven assessments and best-practice asset management approaches, the Region will adapt to evolving service demands and make informed funding decisions.

To advance this work, the following steps will be undertaken:

- **Review Proposed LOS Measures**: Council will confirm alignment with regional objectives.
- **Incorporate Feedback and Finalize LOS Measures**: Adjustments will be made based on received input before integration into asset management planning.
- **Continue to Develop Performance Targets**: Once LOS measures are finalized, performance targets will be established to benchmark service levels and guide future investment.

- **Assess Lifecycle and Funding Needs**: LOS measures will be used to define asset maintenance, renewal strategies, and long-term investment priorities.
- **Develop Annual Reporting Framework**: Establish a structured approach for tracking and reporting progress toward LOS measures and targets.

These steps will strengthen the Region's ability to manage infrastructure assets effectively while aligning service expectations with available resources. Feedback from leadership and council is essential to refining these service level measures and shaping long-term infrastructure planning.



LANDFILL AND RECYCLING CENTRE
REGION OF WATERLOO

6.0 Monitoring & Improvement Plan

6.0 Monitoring & Improvement Plan

6.1 Introduction

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

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

DOON HERITAGE VILLAGE
REGION OF WATERLOO

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

As per Ontario Regulation 588/17, municipalities shall consider climate change mitigation (i.e. reduction of GHG emissions) and adaptation (i.e. preparing for extreme weather) through asset management planning. The following forthcoming initiatives will enable the Region to align with the regulation:

- The Infrastructure Climate Adaptation Action Plan will identify the vulnerabilities of Regional infrastructure to extreme weather and outline the strategies and costs to reduce to address these vulnerabilities.
- The Corporate Climate Action Plan will outline a climate accountability framework and calls for the development of supporting tools to identify and integrate emissions reduction investments into end-of-life replacements as part of the Region's asset management planning process.

6.2 Monitoring and Review Procedures

This AM Plan will be reviewed during annual budget planning processes and amended to show any material changes in service levels and/or resources available to provide those services as a result of budget decisions.

While O. Reg. 588/17 requires that asset management plans be updated at least every five years, the Region can elect to update its AM Plan at a shorter cadence is preferred. This approach helps ensure the Plan remains current with respect to service levels, asset values, and projected expenditures for operations, maintenance, renewal, upgrades, and disposals, and that these are accurately reflected in the long-term financial plan.

6.3 Performance Measures

The effectiveness of the AM Plan can be measured in the following ways:

- The degree to which the required projected expenditures identified in this AM Plan are incorporated into the long term financial plan
- The degree to which 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the AM Plan
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks and residual risks are incorporated into the Strategic Plan and associated plans
- The Asset Renewal Funding Ratio achieving the target of 1.0.

Region of Waterloo

2025 ASSET MANAGEMENT PLAN