Halton Region

2025 Asset Management Plan






Halton REGION

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1. Executive Summary

The Region of Halton is a vibrant growing community in the Greater Toronto and Hamilton Area, known for its beautiful natural spaces, strong local economy, and commitment to providing high-quality public services. Halton Region (the Region) was established in 1974 and serves the four local municipalities of the City of Bulington, Town of Halton Hills, Town of Milton, and Town of Oakville. The Region is currently home to approximately 650,000 residents and is projected to experience continued growth with the population growing to over 1.1 million people by 2051.

From providing safe drinking water to reliable means of transportation to waste collection, the Region's infrastructure is fundamental in supporting the provision of these essential services that contribute to the well-being of its residents and the community. The following services areas at the Region manage infrastructure assets in delivering these services to the community:

- Transportation and Stormwater (that supports the road network)
- Water
- Wastewater
- Waste Management
- Halton Regional Police Service
- Halton Paramedic Services
- Corporate Fleet
- Corporate Facilities
- Long Term Care
- Halton Community Housing Corporation (HCHC)
- Digital and Information Services

Asset Management is how the Region plans for the long-term stewardship of this essential infrastructure. To accommodate the continued growth in Halton and support the ongoing investments to renew existing infrastructure, the Region has established comprehensive and evolving Asset Management Programs. Asset Management is the coordinated practice of planning for, operating, and investing in infrastructure to ensure it delivers value to the community over its full lifecycle. This work allows Halton Region to provide high-quality services today while preparing for the needs of tomorrow.

It also plays a vital role in supporting Halton's strategic goals and enabling the Region to meet its community needs by:

- Delivering consistent and sustainable services to its residents.
- Managing infrastructure risks and plan for future growth.

- Optimizing investments by focusing on long-term value and efficiency.
- Aligning infrastructure decisions with community needs and priorities.

This 2025 Asset Management Plan (AMP) supports these goals by providing a clear long-term approach for managing infrastructure responsibly and effectively while considering financial sustainability. It ensures Halton meets the requirements of *Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure* and reflects the Region's commitment to transparency and accountability in service delivery.

This 2025 AMP also supports infrastructure decision-making across the Region and includes:

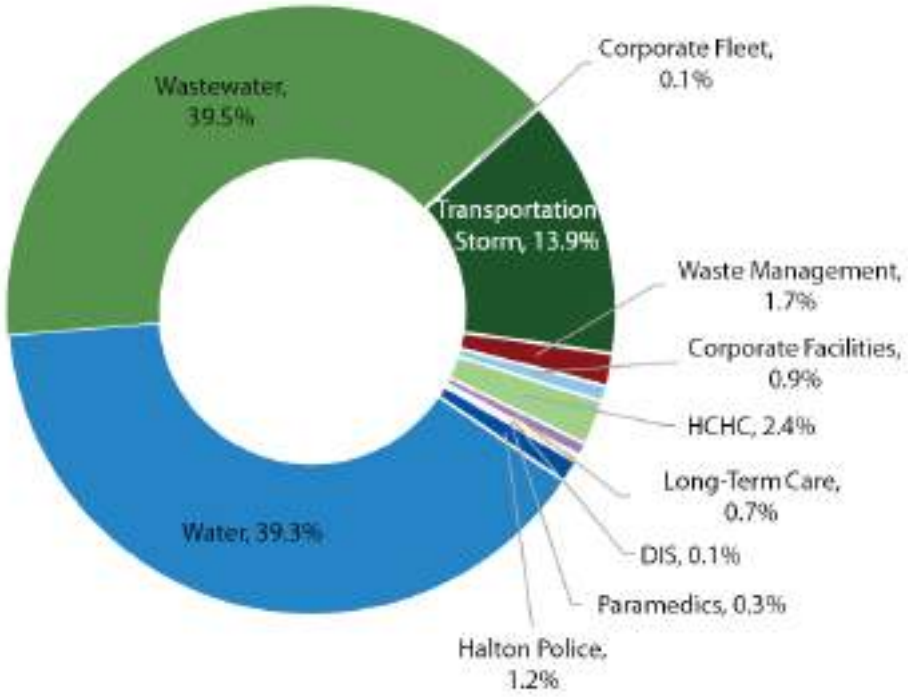
- Current state of Halton's diverse infrastructure portfolios.
- Current and proposed levels of service delivered to the community.
- Asset lifecycle strategies including asset maintenance, rehabilitation, and replacement.
- A preliminary estimate of average annual capital investment needs and potential infrastructure funding gap.
- Financial assessment that identifies potential considerations for the preliminary estimated infrastructure funding gap.
- Consideration of climate change impacts on infrastructure.
- Opportunities to improve asset management practices.
- Alignment with the Region's strategic goals.

1.1. State of Infrastructure

The State of the Local Infrastructure section provides a quantitative assessment of the integrated network of infrastructure owned, operated, and maintained by the Region. The primary objective is to provide an understanding of the inventory, replacement value, condition, and the average age of the assets owned by the Region, as per Ontario Regulation 588/17 (O. Reg. 588/17).

The Region currently owns and manages over $19.7 billion in infrastructure assets spanning 11 service areas. These include core assets identified under O. Reg. 588/17 such as water, wastewater, stormwater, and transportation systems. Non-core assets include corporate facilities, fleet, information technology, housing, police, long-term care, and paramedic assets. Figure 1-1 shows the distribution of total replacement value of Region's assets by service area.

Figure 1-1. Distribution of Total Replacement Value by Service Area (%)

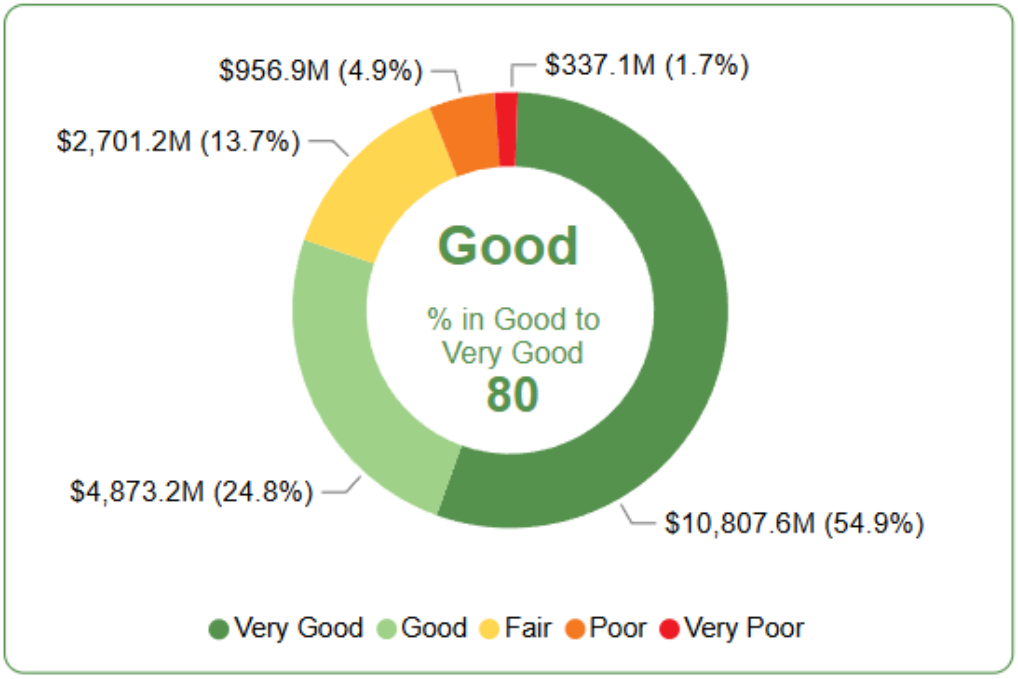


These assets vary in complexity, require different condition assessments and have diverse expected lifespans. The condition of assets in each category was evaluated using a range of methodologies with the results standardized into industry rating scales that are designated a 1 to 5 condition rating (Very Good to Very Poor respectively). Many asset categories have dedicated technical condition assessment programs in place. For those without a formal program, asset conditions were estimated based on the remaining expected service life.

Figure 1-2 provides an overview of the condition distribution of Halton Region's infrastructure assets. The Region has achieved a significant goal of keeping 80% of assets in good to very good condition as specified in the 2023-2026 Strategic Business Plan. This is reflective of the Region's robust asset management and capital budgeting approaches.

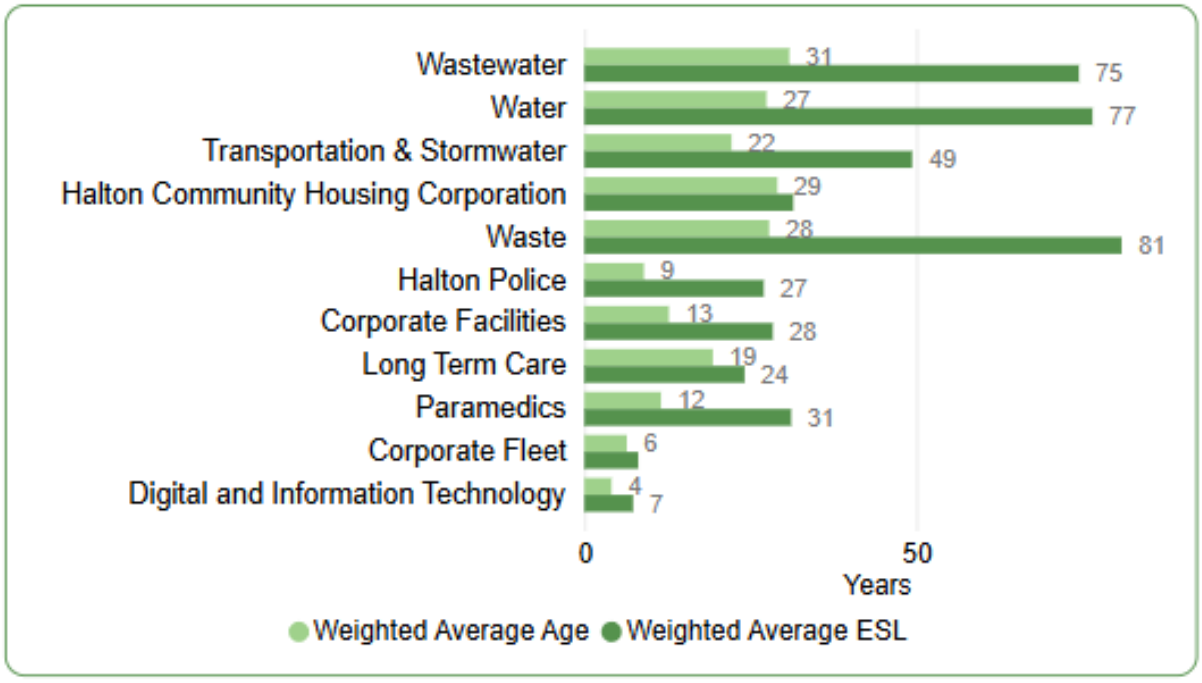
Although some assets are in Poor and Very Poor condition or beyond their estimated service life, it is important to highlight they are reliable and provide their expected operational functionality.

Figure 1-2. Region's Overall Asset Condition Distribution ($ Millions)



Based on the average age of the Region's assets, as noted in Figure 1-3, the Region's assets are relatively young in comparison to their expected service life, which can also be attributed to Halton's robust annual asset investments and growth.

Figure 1-3. Average Age and Estimated Service Life by Service Area (Years)



A summary of the state of Halton Region's infrastructure is highlighted in Table 1-1 below.

Table 1-1. Valuation, Average Condition, Age and Estimated Service Life by Service Area

Service Area	Replacement Cost ($ Millions)	Average Condition	Average Age / Estimated Service Life (Years)
Wastewater	$7,778M (39.5%)	Good	31 / 75
Water	$7,735M (39.3%)	Good	27 / 77
Transportation & Stormwater	$2,729M (13.9%)	Good	22 / 49
Halton Community Housing Corporation	$469M (2.4%)	Good	29 / 31
Waste Management	$337M (1.7%)	Very Good	28 / 81
Halton Police	$230M (1.2%)	Very Good	9 / 27
Corporate Facilities	$168M (0.9%)	Good	13 / 28
Long-Term Care	$133M (0.7%)	Good	19 / 24
Paramedics	$59M (0.3%)	Good	12 / 31
Corporate Fleet	$22M (0.1%)	Fair	6 / 8
Digital Information & Technology	$15M (0.1%)	Good	4 / 7

1.2. Levels of Service

Levels of Service (LOS) define the performance expectations for Halton Region's infrastructure, ensuring alignment with community needs, council priorities, and regulatory requirements. They help the Region set clear service standards, connect infrastructure to service outcomes, measure and benchmark performance, prioritize investments, and communicate transparently with residents.

The Region of Halton has established LOS metrics as well as Key Performance Indicators (KPIs) that can be reviewed on a recurring basis to continue to monitor the Region's progress in implementing the AMP.

The 2025 Asset Management Plan reports current levels of service and sets a target level of service that the Region wishes to provide through the proposed level of service (PLOS). LOS metrics for core assets follow Ontario Regulation 588/17, while additional metrics for non-core assets reflect Halton's strategic goals. These ensure compliance with the O. Reg. 588/17 LOS reporting requirements.

The percentage of assets rated good to very good (based on replacement value) has been selected as a preliminary corporate LOS metric that is applied to each service area and is the basis for the required capital investment forecasts that are reflected in this AMP. A preliminary PLOS has been set for this metric to 80% based on the Halton Region's 2023-2026 Strategic Business Plan.

As part of continuous improvement, establishing the appropriate and financially sustainable proposed levels of service based on service areas' business and community needs will be explored and developed further.

1.3. Lifecycle Management and Financial Assessment

The Lifecycle Management Strategy outlines Halton Region's ongoing actions to maintain its infrastructure to continue to deliver sustainable service levels while minimizing risk and lifecycle costs. This approach maximizes asset longevity, improves cost efficiency, proactively manages risk, and enhances resilience and sustainability in the face of evolving community and environmental needs.

This 2025 AMP documents all activities that are completed to operate and maintain assets throughout their life, and for their eventual replacement. It is important to understand the full cost of asset ownership, and to plan for these activities throughout the asset's life. Through this AMP, analysis has been completed to forecast the lifecycle activity costs for Halton's assets under various scenarios to understand the impacts of these scenarios on the condition of them.

These scenarios provide an understanding of the costs associated with asset ownership and provide analysis to determine if current investments are adequate for the next 10 years.

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

The analysis completed throughout the AMP is summarized in the following sections based on rate-supported and tax-supported assets.

1.3.1. Rate Supported Assets

Preliminary lifecycle investment requirements for the current LOS and PLOS scenarios were compared with planned lifecycle management activities in the next 10 years, to determine if there is an infrastructure gap for rate-supported assets: water and wastewater. Figure 1-4 provides the anticipated lifecycle management activities based on the Region's for rate-supported assets.

Figure 1-4. Anticipated Lifecycle Management Activities - Capital & Operating Budgets for Rate-Supported Assets

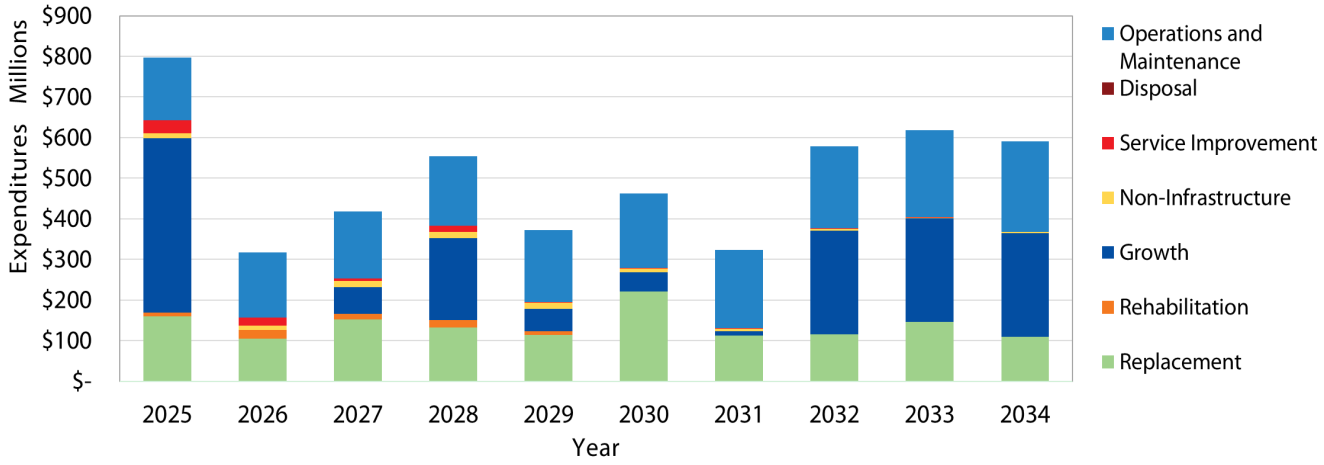


Table 1-2 shows the analysis determined that the Region currently does not have a gap to maintain rate-supported services at their current level of service, and a potential average annual estimated capital funding gap of $78.6M for PLOS. While this is a significant value it represents only 0.5% of the current replacement value of the rate-supported assets, respectively.

Table 1-2. Lifecycle Activities & Preliminary Estimated Average Annual Capital Funding Gap for Rate-Supported Assets ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0.2M	$0.2M	$0.2M
Growth	$164.8M	$164.8M	$164.8M
Non-Infrastructure	$12.3M	$12.3M	$12.3M
Rehabilitation & Replacement	$154.1M	$105.2M	$232.7M
Service Improvement	$19.7M	$19.7M	$19.7M
Capital Expenditures	$351.1M	$302.2M	$429.7M
Capital Infrastructure Gap		**No Gap**	**$78.6M (Gap)**
Operations & Maintenance	$159.6M	$159.6M	$159.6M
Total Expenditures	$510.7M	$461.8M	$589.3M
Gap as % of Replacement Value		**No Gap**	**0.5% (Gap)**

1.3.2. Tax-Supported Assets

Preliminary lifecycle investment requirements for the current LOS and PLOS scenarios were compared with planned lifecycle management activities in the next 10 years, to determine if there is an infrastructure gap for tax-supported services such as transportation and stormwater, facilities, police, paramedics, etc. Figure 1-5 provides the anticipated lifecycle management activities based on the Region's budget for tax-supported assets.

Figure 1-5. Anticipated Lifecycle Management Activities - Capital & Operating Budgets for Tax-Supported Assets

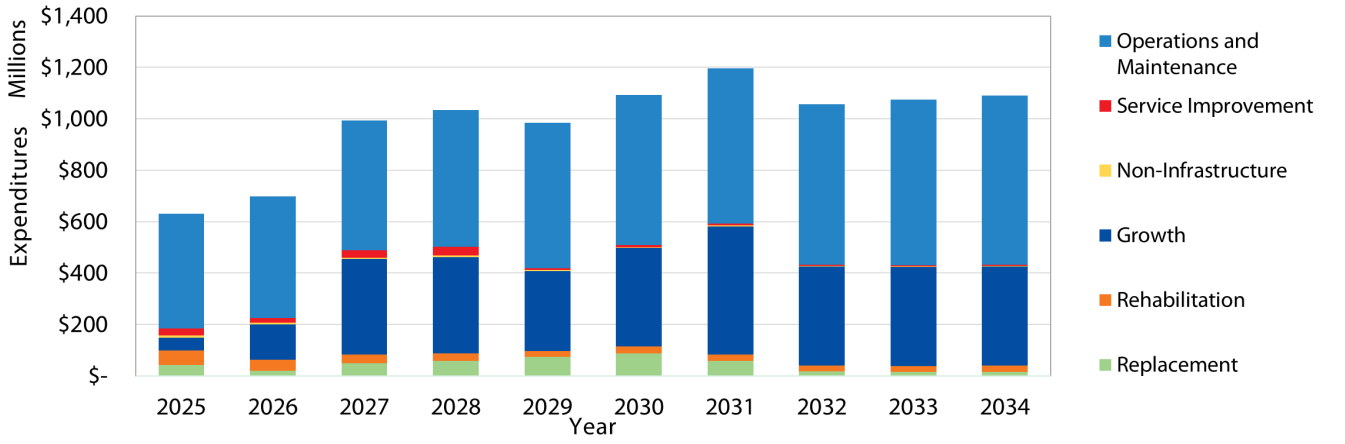


Table 1-3 shows the analysis estimated that the potential average annual capital funding gap to maintain current LOS is forecast at $24.3M, and $90.0M for PLOS. While these are significant values, they represent only 0.6% and 2.2% of the current replacement value of the tax-supported portfolios, respectively.

Table 1-3. Lifecycle Activities & Preliminary Estimated Average Annual Capital Funding Gap for Tax-Supported Assets ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$185.8M	$185.8M	$185.8M
Non-Infrastructure	$7.1M	$7.1M	$7.1M
Rehabilitation & Replacement	$82.1M	$106.4M	$172.1M
Service Improvement	$24.6M	$24.6M	$24.6M
Capital Expenditures	$299.6M	$323.9M	$389.6M
Capital Infrastructure Gap		**$24.3M (Gap)**	**$90.0M (Gap)**
Operations & Maintenance	$474.7M	$474.7M	$474.7M
Total Expenditures	$774.3M	$798.6M	$864.3M
Gap as % of Replacement Value		**0.6% (Gap)**	**2.2% (Gap)**

1.3.3. Financial Assessment

The Region's assets are functioning reliably and the analysis in the plan indicated that the existing expenditure levels in the approved 2025 Capital Budget and Forecast can generally maintain current levels of service. As such, there is no need to increase state of good repair investments above and beyond the approved funding levels in the 2025 Budget at this point. However, to ensure sustainable and resilient infrastructure for the future, it is critical for the Region to manage existing reserves to address any estimated capital expenditure shortfalls. As estimates are refined to more accurately reflect specific level of service requirements, appropriate actions will be identified and included in subsequent Capital Budgets and Forecasts.

This 2025 AMP will help inform and support Halton's capital budgets. By implementing a balanced combination of strategies holistically keeping in mind community services, the Region can work toward managing infrastructure expenditure needs, improving service delivery, and enhancing residents' quality of life while maintaining reserves, fiscal responsibility and long-term sustainability. Using a mix of tools helps manage finances effectively, ensuring the Region meets expected levels of service without overburdening tax and rate payers.

1.4. Accommodating Growth

Halton Region's 2025 budget, along with approval of Report No. CA-02-24/PW-04-24/FN-05-24 re: "Revised 2023 Allocation Program", ensures that the Region is well-positioned to accommodate growth and support the Province's objective of delivering 1.5 million new homes in Ontario by 2031 in alignment with Bill 23, *More Homes Built Faster Act, 2022*. The Allocation Program and future infrastructure staging will help local municipalities manage and support growth ensuring they are prepared for the anticipated increase in housing and population, in alignment with provincial goals and timelines.

Halton Region has a shared objective with the Province and Local Municipalities to advance housing supply and will play a role in providing infrastructure in support of Local Municipal housing pledges by proactively planning for, financing and delivering infrastructure. The housing pledges of 92,500 units by 2031 represent a significant acceleration of growth in the Region and is more than a 70% increase over the residential growth anticipated in the Region's Infrastructure Master Plans.

Halton Region is also in the process of updating an Integrated Master Plan (IMP), to complete the next region-wide Water, Wastewater, and Multi-Modal Transportation Master Plans. The outcome of this work will be a long-term integrated servicing strategy for Region's Infrastructure to accommodate future growth. Currently, the 2025 capital budget identifies a

total of $4.8 Billion in the next 10 years to meet growth requirements based on the planned projects funded through development charges or initiatives addressing the Region's growing population. This will be updated based on the recommendations from the updated IMP.

1.5. Climate Change Integration with Asset Management

Halton Region has a long-standing commitment to climate action. In 2023, the Region released a Corporate Climate Action Plan to respond to climate change and set a path toward a resilient, low-carbon future. This comprehensive plan focuses on reducing corporate greenhouse gas (GHG) emissions, increasing infrastructure and service resilience, and fostering collective action through partnerships with the community, stakeholders, and various levels of government.

The Corporate Climate Action Plan acts as a framework for the Region and is based around three overarching goals:

1. Achieve the Milestones of the Partners for Climate Protection Program
2. Reduce greenhouse gas emissions to achieve Net Zero by 2045
3. Increase climate resiliency and preparedness

Asset management will support climate change mitigation goals by exploring opportunities for greater operational efficiency of Region's assets to reduce energy usage and consider construction of new infrastructure or replacement of existing assets using green standards.

Asset management will also continue to support climate adaptation efforts by leveraging asset criticality and risk assessment to identify priority infrastructure investment needs for increasing resiliency and minimizing interruption of essential services resulting from extreme weather events. This approach will balance the cost of addressing climate change vulnerabilities with the associated risk and community benefits while ensuring fiscal sustainability.

1.6. Improvement & Monitoring

Effective asset management is a dynamic, evolving process that enhances asset performance, maximizes value, and strengthens long-term sustainability. Achieving this requires a commitment to refining strategies, practices and systems. Over the past decade, Halton Region has made significant strides in enhancing asset management practices, leading to strong capabilities in several service areas. There is a shared commitment across the organization to continue advancing asset management, with foundational initiatives already in progress.

This plan lays the groundwork for the next phase of Halton's asset management journey, reinforcing a transparent, consistent, and sustainable approach. As part of the 2025 AMP, an

asset management maturity assessment was conducted to document current asset management practices across the services and to identify opportunities for improvement.

Table 1-4 presents some of the key areas of improvements and opportunities found from the maturity assessment exercise.

Table 1-4. Asset Management Maturity Assessment - Improvement Opportunities

AM Capabilities	Improvement Opportunities
Levels of Service	• Improve identifying the appropriate proposed levels of service based on service area business needs. • Improve the integration of service level metrics and implications with budgeting and long-term financial planning.
Asset Knowledge, Technology and Tools (Information Systems)	• Enhance the use of technology and tools in asset management. • Develop a formal standardized data dictionary and an asset information strategy. • Implement a new centralized decision support system to facilitate and leverage data analytics. • Continuously update lifecycle costs to optimize decision making processes. • Develop a Governance Model to facilitate collaboration among stakeholders to support asset management improvements across the Region.
Capital and Maintenance Plans	• Develop an asset criticality framework. • Improve the integration of maintenance management strategies with capital programming. • Integrate asset criticality with lifecycle models and risk management to better inform future budgets and financial forecasting.
Climate Change Adaptation	• Integrate climate risks with risk management and aligning climate change adaptation efforts with asset lifecycle management activities.

2. Introduction

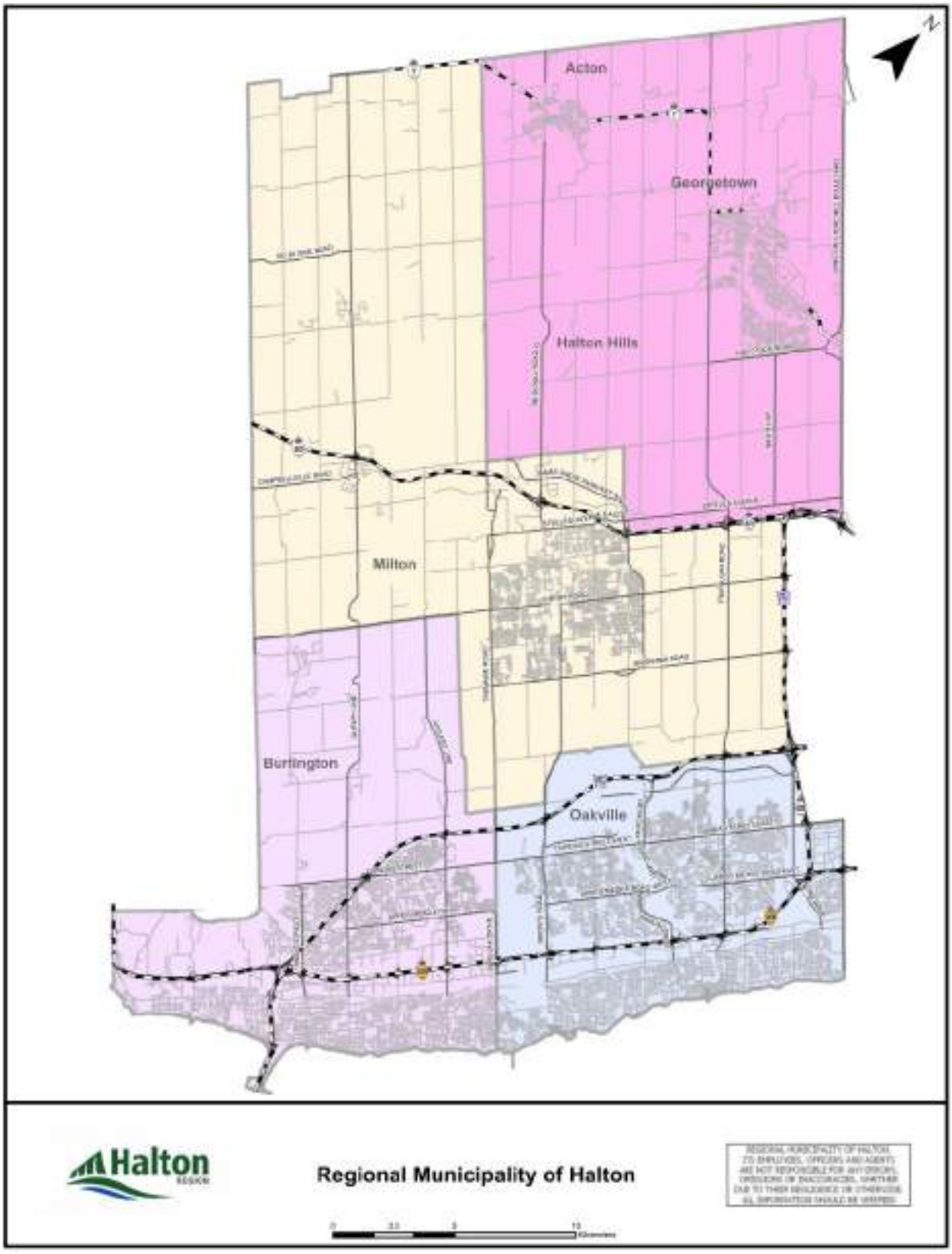
2.1. Overview of Halton Region and Services

The Regional Municipality of Halton is part of the Greater Toronto Area in Ontario and lies along the northern shore of Lake Ontario. As illustrated in Figure 2-1, Halton Region encompasses the four municipalities of the City of Burlington, Town of Halton Hills, Town of Milton, and Town of Oakville, and has a combined population of over 650,000. Halton's infrastructure plays a crucial role in serving its residents and supporting a wide array of municipal services that help individuals, businesses, and institutions thrive in the region.

Halton Region is responsible for delivering essential services that are crucial to the community, all of which depend on effectively managed infrastructure assets. These services include transportation, clean drinking water, wastewater collection and treatment, waste management, social housing, services for seniors, emergency services (e.g. paramedics and police), corporate municipal services, and digital and information services.

Provision of these services relies on a variety of infrastructure assets including linear, vertical and mobile systems that have unique physical characteristics, condition profiles, expected service lives, lifecycle costs, maintenance and capital investment requirements to keep them in a state of good repair. This asset management plan includes assessing this range of assets that support and align with the following service areas:

Figure 2-1. Map of Halton Region



2.2. Scope and Assets Included in the 2025 AMP

Table 2-1 outlines the different types of infrastructure assets owned and managed by the Region. Assets for the purpose of developing the Region's 2025 Asset Management Plan are defined by capitalization thresholds and other criteria identified in the Region's TCA policy.

Table 2-1. Scope of 2025 Asset Management Plan

Service Area	Assets Included
Transportation & Stormwater	Transportation assets include roads, bridges, major culverts, retaining walls, noisewalls, streetlights, signalized intersections and guiderails. Stormwater assets that support the Region's road network include storm mains, stormwater pumping stations, minor culverts, stormwater ponds, retention structures and oil grit separators.
Water	Water treatment plants, distribution mains, trunk mains, booster stations, bulk water stations and reservoirs.
Wastewater	Wastewater treatment plants, biosolids management centre, storage tank, pumping stations, forcemains and gravity mains.
Waste Management	Open and closed landfills owned and managed by the Region as well as the supporting facilities and equipment.
Corporate Facilities	Halton Regional Centre, operations centres, heritage centres and childcare centres.
Long-Term Care	Long-term care homes and equipment.
Halton Community Housing Corporation	Public housing and non-profit buildings.
Halton Police	Vehicles (patrol, mobile command, administrative and investigative), technology assets, facilities and equipment.
Paramedics	Vehicles (ambulances, logistics units and emergency response vehicles), Paramedic stations, Paramedic equipment and other equipment (communications, and training and station equipment).
Digital & Information Services	IT Infrastructure, end user devices, applications and software.
Corporate Fleet	Light, medium and heavy-duty vehicles, and user group equipment

Service Area	Assets Included
Natural Assets	Woodlands, wetlands, open country natural assets, aquatic natural assets, individual trees, street trees and other trees.

The scope of this 2025 Asset Management Plan includes an assessment of these assets on the following basis below, which are in alignment with Ontario Regulation 588/17 Asset Management Planning for Municipal Infrastructure:

- State of the Infrastructure (asset inventories, condition, replacement value, age, estimated service life)
- Levels of Service (current and proposed levels of service delivered to the community)
- Lifecycle Management (existing asset lifecycle strategies including asset maintenance, operations, rehabilitation, replacement disposal, etc.)
- Forecasting Lifecycle Costs and Investment Requirements (estimate intervention timing and preliminary costs using the Region's Lifecycle Model)
- Financial Assessment (a preliminary estimate of average annual capital investment needs and potential funding gaps)
- Risk Considerations (potential risks associated with not following the identified lifecycle management activities)
- Climate Change and Asset Management (climate change mitigation and adaptation initiatives at Halton Region)
- Growth (Region's approach to deliver infrastructure required to support housing growth and economic development in Halton's communities)
- Continuous Improvements (opportunities to improve asset management practices and enhance the Region's AM maturity)

2.3. Purpose of the 2025 Asset Management Plan

Asset Management refers to the coordinated efforts within the organization to optimize the value derived from these assets. The management practices, objectives, and documentation form the foundation of the Region's asset management framework, which includes the processes for developing asset management objectives, policy, strategies and the asset management plan (AMP).

Guided by the Region's Asset Management Policy, the 2025 AMP achieves compliance with the requirements of O. Reg. 588/17

The purpose of this 2025 Asset Management Plan is to:

- Support asset management infrastructure planning.
- Continue to enhance the Region's asset management by building upon the previous progress and advancements.
- Align with the Region's overarching strategic plans and studies and supports the Region's strategic priorities:
  - Halton Region's 2023 – 2026 Strategic Business Plan
  - Halton Region's Annual Budget and Business Plan
  - Halton Region's Corporate Climate Action Plan
  - Halton Region Departments' Master Plans
  - Halton Region's Water Financial Plans under the Safe Drinking Water Act, 2002
  - Halton Region's Development Charge Background Study under the Development Charges Act, 1997
  - Halton Region's Tangible Capital Assets (TCA) Policy

2.4. Complying with Asset Management Regulatory Requirements

In 2018 the Province of Ontario enacted Ontario Regulation 588/17 (O. Reg. 588/17) under the Infrastructure for Jobs and Prosperity Act to support improvements in municipal asset management. O. Reg. 588/17 has been a signification driver for municipalities to make continuous progress in Asset Management, and mandates municipalities to adopt a phased approach, beginning with the development of an Asset Management Policy followed by a phased development of asset management plans. A summary of O. Reg. 588/17 timelines and requirements is shown in Table 2-1.

Table 2-2. Ontario Regulation 588/17 Timelines and Requirements

Deadline	Requirements
July 1, 2019	A Corporate Asset Management Policy is required that articulates specific principles and commitments that will guide decisions around asset management planning
July 1, 2022	An Asset Management Plan is required that documents the state of infrastructure, lifecycle management and current Levels of Service being provided and the costs to sustain them for the Region of Halton's water, wastewater, stormwater, roads and bridges infrastructure systems (i.e., "core" assets per O. Reg. 588/17).
July 1, 2024	An Asset Management Plan is required that documents the state of infrastructure, lifecycle management and current Levels of Service being provided and the costs to sustain them for all infrastructure systems in Halton.
July 1, 2025	An Asset Management Plan is required that documents the state of infrastructure, lifecycle management, current Levels of Service being provided, the costs to sustain the current Levels of Service, the desired Levels of Service, the costs to achieve the desired Levels of Service, and the financial assessment to fund the expenditures necessary to achieve the desired Levels of Service for all infrastructure systems in the Region of Halton.

To meet the requirements of O. Reg. 588/17, the Region developed its AM Policy in 2019, which was later updated in 2025 to support the development of the 2025 AMP. This policy sets out guiding principles and provides strategic direction on achieving the following:

- Development of asset management plans that recommend evidence-based and informed infrastructure investment needs.
- Support annual capital budgeting process and development of budgets and business plans through an integrated approach.
- Align asset management programs with overarching strategic plans and strategies to support community investments, including climate change.
- Implement continuous improvements in asset management practices.
- Support opportunities for community input into the organization's asset management planning process.
- Integrating climate change and asset management planning.

The updated policy also prescribes the following guiding principles for making progress in asset management at the Region. These principles are based on best practices defined by the ISO 55000 family of standards for AM and the specific requirements of O. Reg. 588/17:

- Strategic Alignment
- Complying with Regulatory and Industry Best Practices
- Integration and Supporting Capital Budgeting
- Coordination of Infrastructure Planning with Local Municipalities
- Whole Asset Lifecyle Community Service Approach
- Integration of Climate Change Considerations
- Evidence Based and Transparent Infrastructure Investment Decisions
- Land Use Planning and Growth
- Continuous Improvement
- Public Input and Stakeholder Engagement

Furthermore, the Policy establishes a corporate asset management governance structure that identifies multi-disciplinary stakeholders involved in asset management and defines roles and responsibilities to facilitate coordination and active collaboration across the Region.

2.5. Alignment with the Region's Vision and Strategic Priorities

Halton Region's commitment to managing its assets aligns with the directions and objectives reflected in Halton's Budget and Business Plan and Strategic Business Plan among. The Region's asset management program is a key component in achieving Halton Region's mission, which includes to enhance the quality of life for all people of Halton today and into the future.

Halton's strategic planning process ensures a strong alignment between Council priorities, the Region's strategies and plans, and departmental business needs and processes. The Region's AM practices are aligned with the Region's Vision, Mission and Strategic Goals, ensuring a line of sight and interconnectivity as presented in Figure 2-2. The Strategic Business Plan 2023 – 2026 reflects what matters most to the Halton Community, setting the goals and specific actions that will help the Region to achieve the vision and mission while shaping the future of the Region.

Figure 2-2. Asset Management - Line of Sight

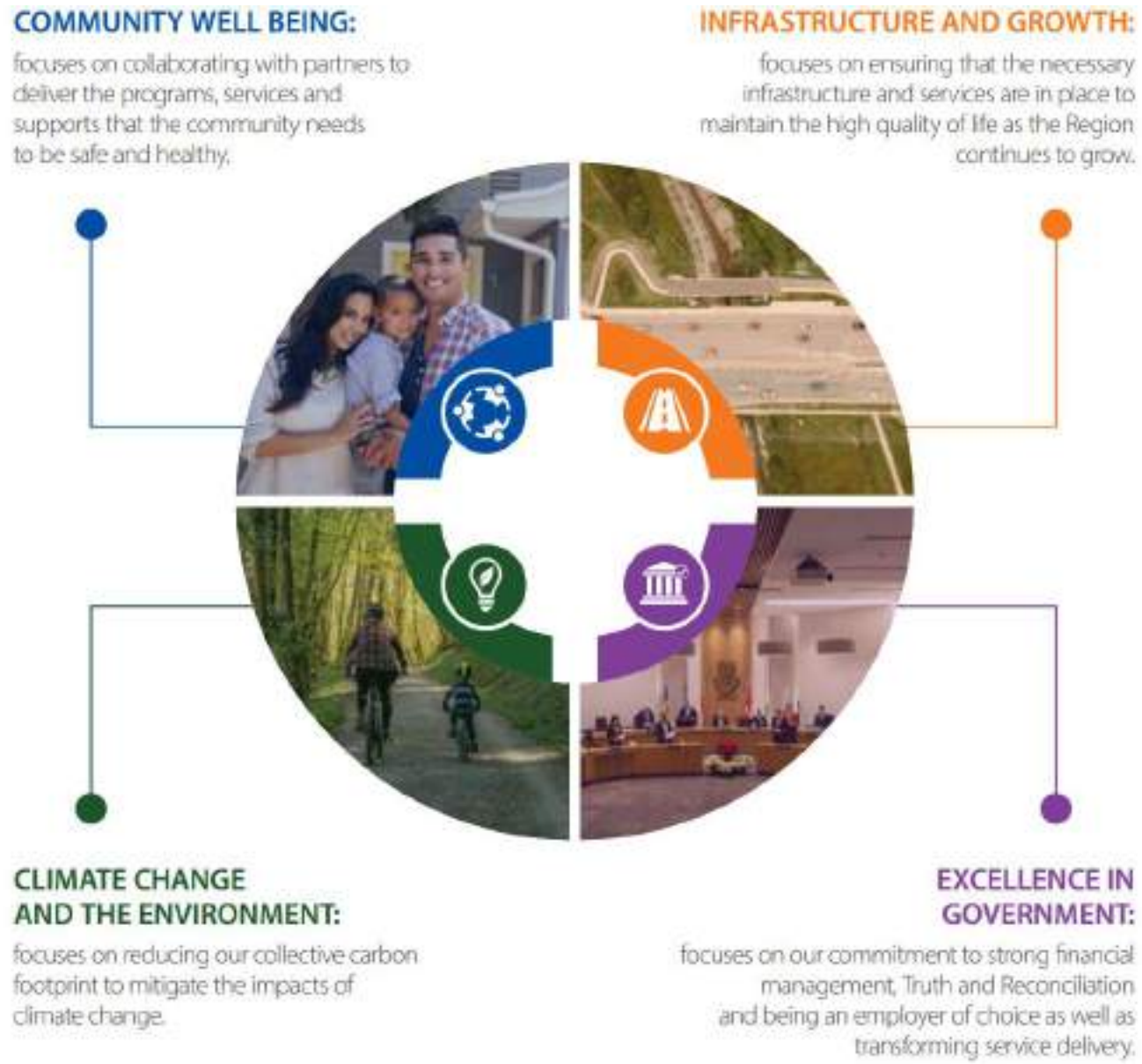
Vision: A welcoming and inclusive community that is sustainable, economically strong, equitable and safe.

To provide more context and direction, Figure 2-3 shows the four themes presented in the 2023 – 2026 Strategic Business Plan: Community Well Being, Infrastructure and Growth, Climate Change and the Environment, and Excellence in Government.

A key concept in asset management is ensuring line of sight between the organizational objectives, the asset management objectives, and asset management activities. As such, the strategic business plan forms one of the guiding pillars for this asset management plan and is paramount to achieving the Region's asset management goals and objectives.

One of the goals identified under the strategic theme of **Infrastructure and Growth** is to maintain the Region's infrastructure in a state of good repair by implementing the Region's asset management plan with its success measured by ensuring that 80% of all infrastructure assets are rated as in Good or Very Good condition as identified in the asset management plan. This is consistent with the purpose of developing the 2025 Asset Management Plan in addition to meeting the requirements of O. Reg. 588/17.

Figure 2-3. Themes in Halton Region's 2023 -2026 Strategic Business Plan



2.6. Enhancing Asset Management

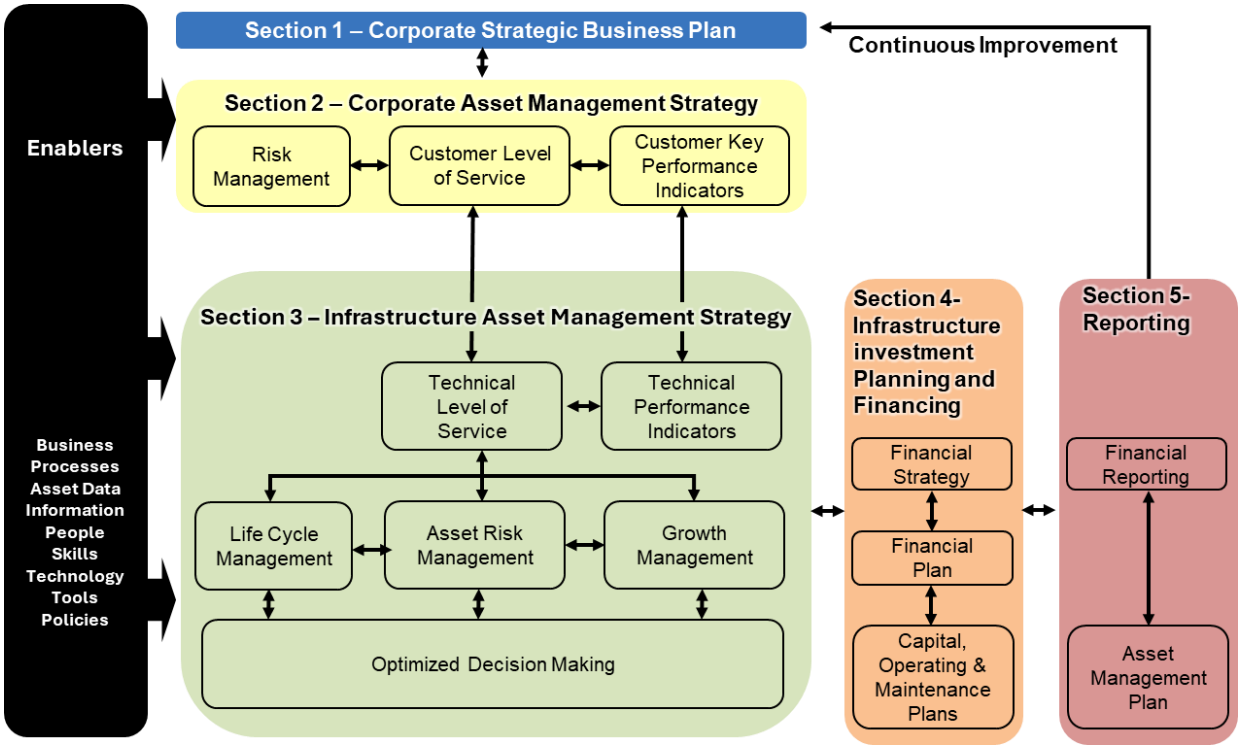
The objective of Asset Management is to outline and establish a set of planned actions, based on best practices that will enable the Region to provide sustainable levels of service, while managing risk efficiently and minimizing the total lifecycle costs. Since 2006, the Region has been advocating for asset management practices across the Region and continues to undertake various initiatives to improve the Region's asset management maturity. Building upon over 19 years of significant efforts from across the organization, this plan aims to set the foundation for the next steps in the Region's Asset Management journey. This approach will continue to enhance the Region's robust, transparent and consistent methodology while maintaining the Region's strong financial position and long-term sustainability.

2.6.1. Asset Management Framework

Halton Region's asset management programs are guided by the Council-approved asset management framework. The asset management framework provides a systematic approach to develop and continuously improve Halton Region's asset management plan.

Figure 2-4 presents the iterative process of integrating various asset management activities and their relative importance to update and report our asset management plan.

Figure 2-4. Halton Region's Asset Management Framework



The framework includes the following key sections:

- **Corporate Strategic Business Plan** establishes a vision to guide the way services are delivered in the Region.
- **Corporate Asset Management Strategy** reviews risks across program areas and establishes customer expectations of levels of service and how performance will be assessed from the customer's perspective.
- **Infrastructure Asset Management Strategy** establishes technical Levels of Service and key performance indicators and contains all the processes related to the day-to-day management and decision making of the assets in supporting the delivery of infrastructure services.
- **Infrastructure Investment Planning and Financing** contains the processes to establish capital and maintenance plans for infrastructure systems at the Region. This also includes processes to develop the financial plans and strategies to fund the infrastructure needs over their lifecycle.
- **Reporting** includes the activities related to preparing the Region's asset management plan and financial reports.

2.6.2. Progress Made – Recent and Ongoing Initiatives

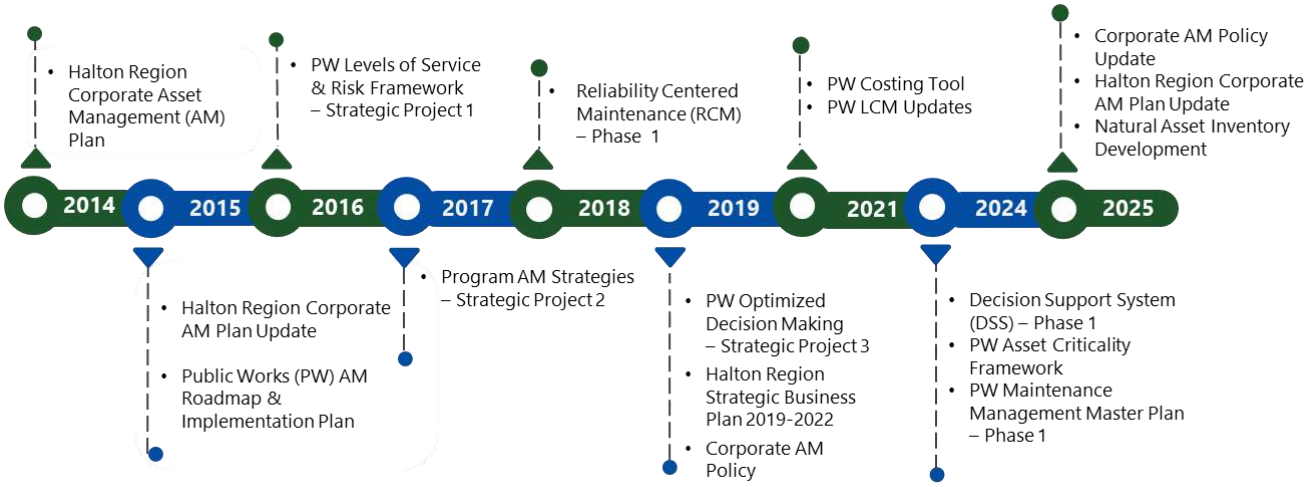
Since developing its first Asset Management Plan in 2014, Halton Region has implemented several initiatives to refine its asset management framework. In 2014, the Region developed an Asset Management Roadmap aligned with the Asset Management Plan and its corporate structure. This roadmap outlined the Region's asset management vision, strategic direction, corporate asset management strategy, program strategies, and processes for infrastructure investment planning and financing.

Since then, departments such as Public Works have implemented several initiatives to further enhance asset management practices. These initiatives led to defining the department's Service Objectives, as well as the framework for preparing the 10-year capital state-of-good repair budget. This framework formed the basis for the 2018 Capital Budget, highlighting the infrastructure needs required to maintain services for the community while mitigating risks in a fiscally sustainable manner.

Having articulated the need, the next step in the development of a modernized asset management plan was tools and procedures, which have been implemented in all subsequent capital budgets for the Public Works Department, that enable the formalized prioritization of projects to provide the highest benefit/cost solution, while mitigating risk and focusing on service delivery.

Halton Region has also initiated the development of a maintenance management strategy for core assets that considers opportunities to coordinate effort and to realize value from assets by balancing cost, risk and performance in a way that is aligned to the strategic plan. The collaborative implementation of innovative lifecycle management strategies to extend the life of constructed or acquired assets has improved Halton Region's environmental stewardship, fiscal responsibility and capacity to support evidence-based decision making. Figure 2-5 shows several key asset management initiatives the Region has undertaken in the last decade.

Figure 2-5. Asset Management (AM) Initiatives – Progress Made



Since the completion of the 2021 Asset Management Plan, the following initiatives and strategic projects are underway to advance the Region's AM maturity:

- **Decision Support System (DSS):** The first phase of this project was completed in 2024 that assessed Public Work's current state, proposed a future state as well as identified the required functionality and technical requirements of a DSS to support capital programming. The second phase of this project will focus on procuring and implementing a DSS that meets the specifications identified in Phase 1.
- **Maintenance Management Master Plan:** Public Work's is undertaking a two phased initiative to develop a standardized PW maintenance management master plan. The scope of phase 1 included the completion of a maturity assessment to better understand the current state of maintenance management practices while the second phase will focus on developing the master plan.
- **Asset Criticality Framework:** To further enhance the PW risk management approach to capital programming, an asset criticality framework was proposed and piloted across all service areas in PW. As part of on-going initiatives, the department is looking to standardize asset criticality to inform risk management and capital budgeting process.

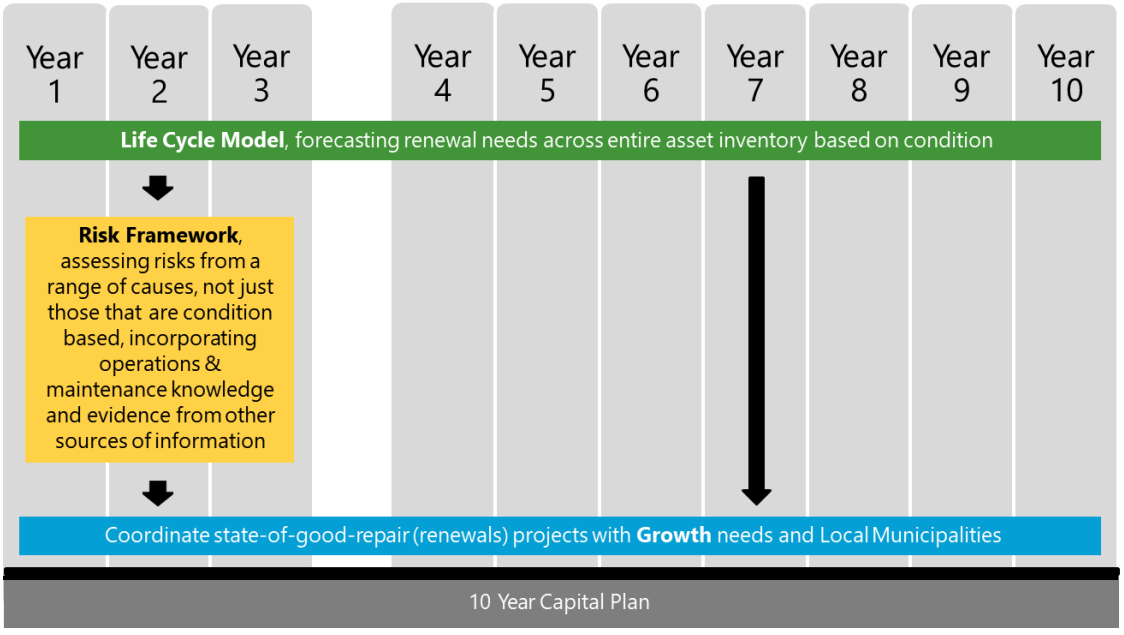
- **Development of Natural Assets Inventory:** A basic inventory of natural assets was developed in early 2025 with the Region committed to capturing additional data attributes over the next few years to fully integrate natural assets in asset management planning.

2.7. Supporting Asset Management Infrastructure Planning

Guided by the Region's asset management framework and ongoing initiatives, asset management continues to support and inform identifying capital investment priorities and developing the Region's infrastructure investment plans. An annual budget is prepared in accordance with the financial plans, annual targets and policies approved by the Regional Council to ensure the Region's assets are in a state of good repair.

For example, the Public Works department utilizes a detailed risk assessment and lifecycle management framework to support the Region's fiscal responsibility and commitment to sustainable service delivery. This is evident in the department's approach to annually prepare the Region's 10 Year Capital Plan, as outlined in Figure 2-6.

Figure 2-6. Asset Management Integration with Capital Programming



2.7.1. Risk Management

Risk management enables an evidence-based framework to assess the likelihood of asset failure and the associated consequences to determine short term capital investment needs and priorities (Years 1 to 3). Condition and performance data are a great starting point in

identifying the likelihood of asset failure and then, a risk-based approach dives deeper to leverage tacit knowledge from operational and maintenance staff working "first-hand" with the asset. This information is crucial in understanding potential failure modes and root causes, all of which assist in making better informed decisions.

To understand potential consequences, the Region uses a robust risk framework to evaluate any potential financial implications, health and safety concerns, availability and reliability of services, legislative context as well as potential impacts to environment. This comprehensive assessment allows the Region to score, prioritize and address the risks holistically across different asset types.

2.7.2. Lifecycle Management

While the Region's short term investment needs (Years 1 – 3) are guided by risk management, the long-term investment needs (Years 4 – 10) are based on the Region's lifecycle model (LCM). In general, LCM considers the inspected condition and age of the assets and applies different deterioration models developed for each asset type to determine the current condition and forecasts the future condition of assets to identify anticipated lifecycle activities such as rehabilitation or replacement based on established condition thresholds, and the cost of required intervention.

This long-term forecast enables the Region to forecast future capital expenditures needs, based on an asset's standard deterioration and lifecycle interventions, and plan accordingly.

Furthermore, the Region's incorporation of asset management in its budgeting process ensures:

- Assets are in a state of good repair as the Region's infrastructure continues to age and expand.
- Prioritization of critical infrastructure projects.
- Informed and evidence-based investment decisions in preparing the annual capital forecast.
- Optimization of capital budget through maintenance, when applicable.

3. Development of the 2025 Asset Management Plan

The AMP document is divided into individual chapters for each of the O. Reg. 588/17 requirements as well as for each of the service areas, which provides greater details. Each service area chapter outlines the state of the infrastructure, levels of service (current and proposed), lifecycle management strategy, forecasting lifecycle costs, impact on levels of service, potential risks, and estimated preliminary infrastructure gaps. The last two chapters are allocated to the financial assessment, and improvement and monitoring plan. The methodology and approaches presented in these chapters are described below.

3.1. Determining the State of Halton Region's Infrastructure

The State of the Infrastructure section provides a quantitative assessment of infrastructure assets owned and managed by the Region. The primary objective is to present a high-level inventory of the assets and provide insights about the overall age, condition, replacement value, and key performance metrics as per O. Reg. 588/17. The information is developed from the most recent and updated datasets and documents that were assessed for data confidence and discussed with Subject Matter Experts (SMEs). This section summarizes the inventory of assets, their replacement values, and details the age and condition of assets.

3.1.1. Asset Register

To develop this asset management plan, a consolidated asset register with standardized data attributes was developed by staff leveraging information from multiple sources of data to gather required information including:

- Unique Asset Identifier
- Asset Quantity and Unit of Measurement
- Age
- Estimated Service Life
- Current Replacement Value
- Current Condition and Condition Rating Criteria
- Asset Physical Characteristics

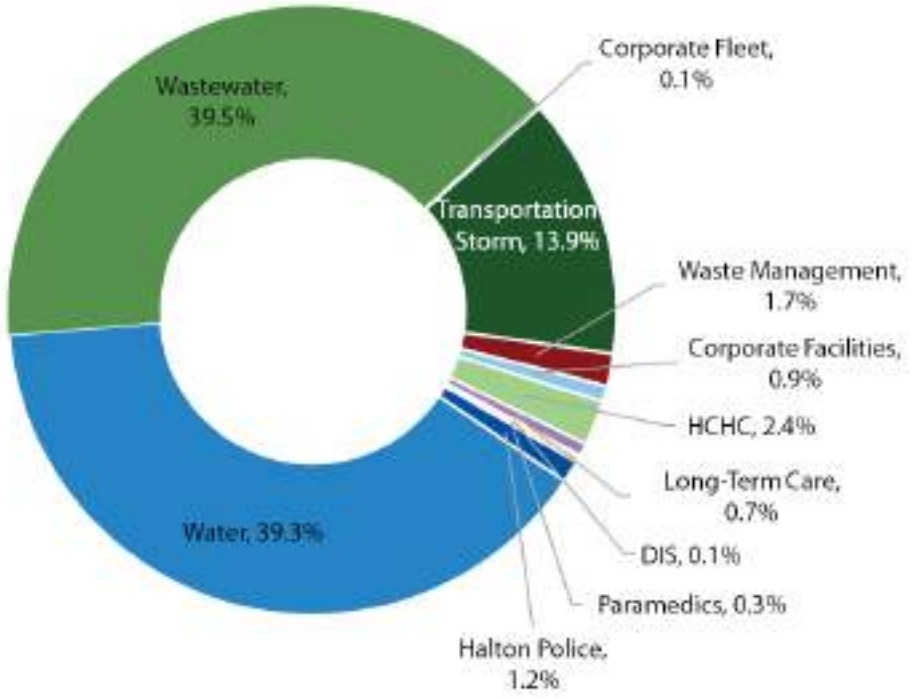
3.1.2. Current Replacement Values

The Current Replacement Value (CRV) of an asset represents the estimated cost required for a like-to-like replacement based on recent appraisals, condition needs assessments (CNAs), building condition assessments (BCAs), recent purchases, and recently completed construction

projects while factoring all related costs such as engineering design, project management, materials, and labor.

Staff have undertaken different strategies and approaches, such as reviewing recent project costs and conducting unit rate analysis to review, assess, and update the CRVs for all service areas assets included in this AMP. Using this approach, the Region currently owns and manages over $19.7 billion in infrastructure assets spanning 11 service areas as presented in Figure 3-1. These include core assets identified under Ontario Regulation 588/17 (O. Reg. 588/17), such as water, wastewater, stormwater, and transportation systems. Non-core assets include corporate facilities, fleet, information technology, housing, police, long-term care, and paramedic assets. Figure 3-1 shows the distribution of total replacement value of Region's assets by service area.

Figure 3-1. Distribution of Total Replacement Value by Service Area (%)



Updating CRVs is an ongoing process that will continue to improve asset management data and support development of capital budgets.

In interpreting this information, the following should be noted:

- CRVs used in this AMP represent the best available information and will continue to be evaluated and updated as required for future iterations of the AMP.

- Current market conditions have been reflected in this AMP where possible, and in some cases are significantly different than those provided in the previous AMP due to inflationary pressures.
- Except where noted, all CRVs are based on like-for-like replacements.
- Considerations for growth, changes in technology, green alternatives, rehabilitations, refurbishments or service enhancements are not captured in the reported CRVs, unless stated otherwise within an individual chapter.

3.1.3. Asset Condition

Asset condition is a useful indicator to understand the extent of asset deterioration. Asset condition information is required to support decisions on the timing of possible interventions to improve or maintain the levels of service at a desired standard and to avoid potential failures. Where applicable, industry standard rating condition scales were used to determine the condition of assets including:

- NASSCO's Pipeline Assessment Certification Program (PACP) Scores for sewers.
- Pavement quality index (PQI) and bridge condition index (BCI) for roads, bridges and structural culverts.
- Building Condition Assessments (BCA) for facilities.
- Capital Need Assessments (CNA) for treatment plants, booster stations, pumping stations, bulk water stations and reservoirs, biosolids management centre, and storage tanks.

For this AMP, condition scores for assets were converted to standardized condition rating categories of "Very Good" to "Very Poor" as outlined in Table 3-1. Condition rating scale consists of qualitative condition categories that represent the estimated condition of the assets. Wherever the inspection-based condition was not available, the condition of an asset was determined based on its remaining ESL and age-based deterioration models.

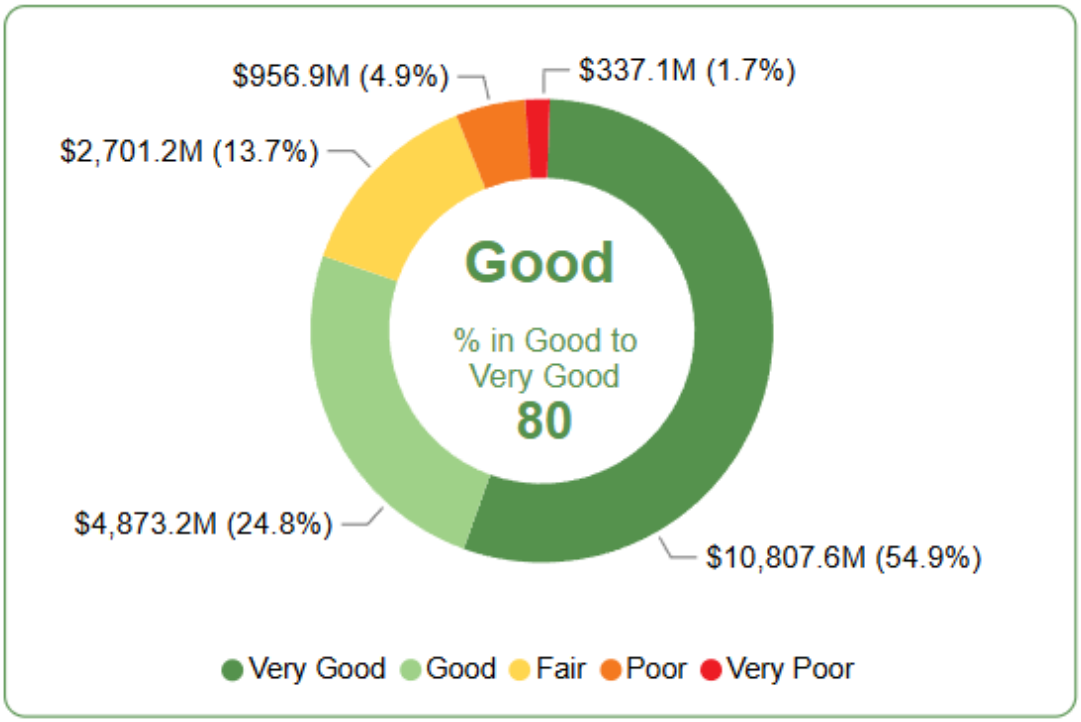
By using standardized scales, the condition of assets is rated consistently across all service areas. Asset condition distribution graphs presented within this AMP document are weighted by the replacement value of the assets for every asset type and asset class.

Table 3-1. Description of Condition Rating Categories

Condition Rating	Description
Very Good	The asset is fully functional and fit for the future. It is new or recently rehabilitated. There are insignificant or no defects or wear.
Good	The asset is fully functional and adequate for current use. There are very minor deficiencies. Ongoing regular maintenance is sufficient.
Fair	The asset is fully functional but showing some signs of deterioration. Additional maintenance may be required at times.
Poor	The asset is fully functional but approaching the end of service life and showing signs of deficiencies. Maintenance and other treatments are required.
Very Poor	The asset is past service life with deficiencies but still fit for service. Major capital treatments (e.g. replacement) are required.

The Region has achieved a significant goal of keeping 80% of assets in good to very good condition as specified in the 2023-2026 Strategic Business Plan. This is reflective of the Region's robust asset management and capital budgeting approaches and illustrated in Figure 3-2.

Figure 3-2. Region's Overall Asset Condition Distribution ($ Millions)



Assets that are reported in this AMP as in "Very Poor" condition are still operationally functional. Rather, these assets are generally at or past their useful life and are experiencing higher than average maintenance/repair costs and, when feasible, are prioritized for immediate replacement.

The Region is committed to balancing the costs associated with replacement of assets in Very Poor condition with higher maintenance or capital treatment costs to deliver the best value to our community.

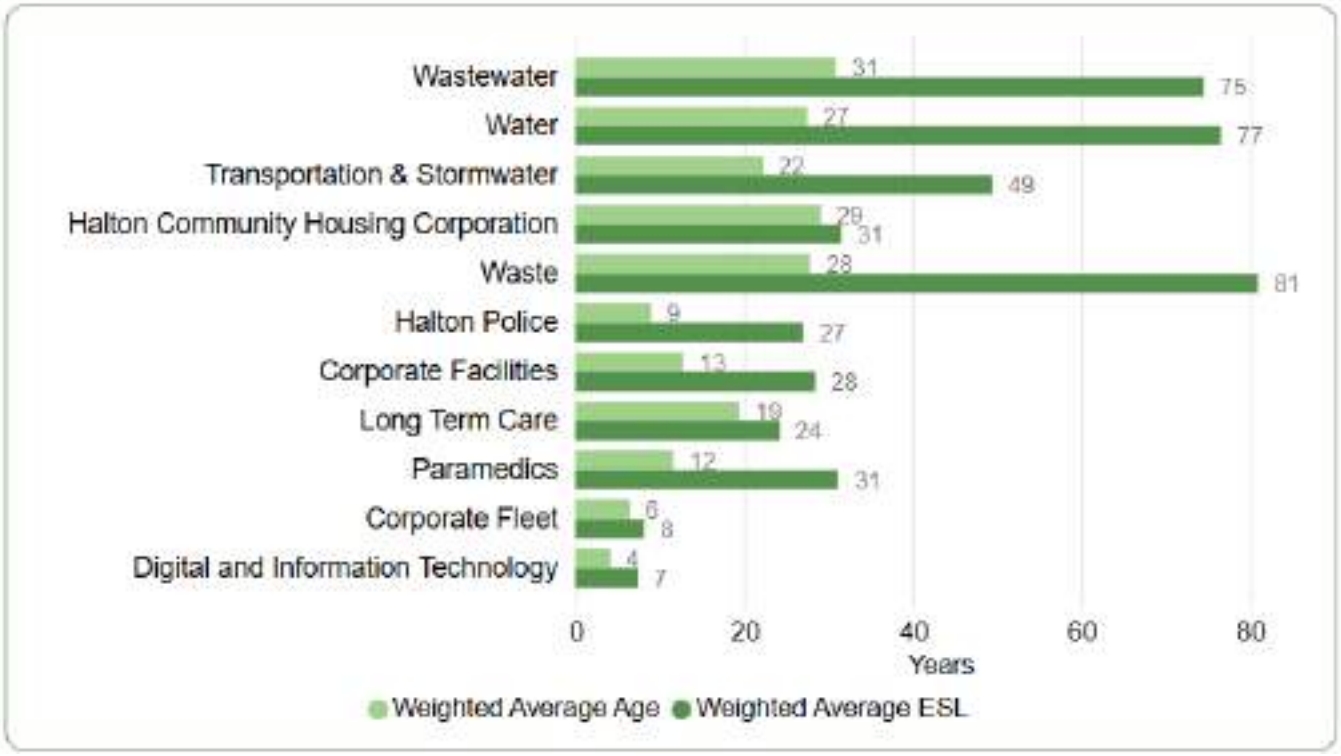
3.1.4. Age and Estimated Service Life

Estimated Service Life (ESL) refers to the expected time an asset will remain operational and perform its intended function. The age of the assets are the date (year) when that asset was purchased, came into service for the first time (newly constructed), replaced, and or fully reconstructed. The remaining estimated service life (Remaining ESL) is calculated by subtracting the age of an asset from its ESL. It is used to forecast future lifecycle activities such as repairs, maintenance, and replacements and to estimate long-term capital expenditure needs, and typically influenced by factors such as historical operations and maintenance practices and the operational environment.

For this AMP, ESLs are based on the Region's Tangle Capital Asset Policy consistent with annual financial reporting and were used in the analysis unless stated otherwise in the individual chapters. It is recommended that the Region review these values and update to ensure they are in line with appropriate estimated service lives to ensure accurate forecasting for asset management planning.

Based on assessing the age, useful life and remaining service life of the Region's assets, it is noted that the Region's assets are relatively younger and for the most part have a substantial amount of remaining service life as shown in Figure 3-3.

Figure 3-3. Average Age and Estimated Service Life by Service Area (Years)



3.2. Measuring Levels of Service (Current and Proposed)

Levels of Service (LOS) metrics provide key performance information about assets and are an indicator of the quality of services provided to the community. Proposed LOS describe the desired performance of the associated assets as the business drivers for asset management decisions.

In general, the Region's LOS framework provides the following information below. These metrics are aligned with the Region's strategic goals, financial reporting practices, fiscal capacity and the specific regulatory requirements prescribed in O. Reg. 588/17. Additional LOS are developed and reported in this AMP update to provide a comprehensive understanding of assets performance in each service area.

- **Community Level of Service Objective:** A general statement that describes the service provided from a community perspective.
- **Key Service Attributes:** Terms that describe the overall purpose of service being provided, e.g., scope, quality, reliability, etc. These descriptions cover different aspects of the service and are easy for the public to understand and recognize. Key service attributes that have been applied as part of the Region's LOS framework are shown in Table 3-2.

- **Levels of Service:** Statements or metrics that allow the Region to monitor the progress in implementing the AMP.
- **Current Performance:** The metric associated with the performance indicator in present day performance measured for LOS requirements.
- **Proposed Performance:** The proposed (target) performance of the current metrics. A target has been set based on the 2023-2026 Strategic Business Plan to reach a target of 80% of infrastructure assets in good to very good condition.

The LOS metrics are used for internal reporting purposes within the Region as well since they provide a way to track and monitor the performance of the infrastructure and services in terms of condition, availability, reliability, efficiency, cost effectiveness, and sustainability.

Based on the assessment of the levels of service, the Region's assets are performing as expected in providing reliable, effective and efficient services to the community.

Table 3-2. Region's Service Levels Framework

Corporate Strategic Priorities	Community LOS Attributes	Community LOS Statements
Community Well Being	• Scope • Safety • Availability • Suitability • Responsiveness	Services of sufficient capacity are convenient & accessible, that minimize healthy, safety, and security risks.
Infrastructure and Growth	• Quality • Reliability	Services are predictable, continuous, and suitable for intended function.
Climate Change and the Environment	• Sustainability	Services preserve and protect the natural and heritage environment.
Excellence in Government	• Cost Effectiveness • Efficiency	Services preserve and protect the natural and heritage environment.

3.3. Climate Change & Asset Management

Climate change is impacting the service levels associated with physical condition, estimated remaining service life and reliability of infrastructure assets in Ontario, marked by rising temperatures and an increase in extreme climate events. Climate hazards such as more frequent and intense extreme rainfall and extreme heat, and freeze-thaw cycles can adversely impacting sustainable service delivery and total cost of delivering regional services to the community in terms of increasing lifecycle costs, and reduced service levels due to:

- Increased service disruptions.
- Accelerated degradation of infrastructure leading to reduced service life.
- Increased operational, maintenance and capital requirements.
- Additional costs associated with climate change mitigation and adaptation with implications on total cost of delivering infrastructure services.

However, by proactively addressing climate change and adapting infrastructure to withstand future climate impact, municipalities can reduce the financial burden of reactive repairs, emergency responses, and disaster recoveries. Beyond direct savings, such investments ensure uninterrupted service delivery, safeguard economic activities, and mitigate cascading effects such as supply chain disruptions and productivity losses. Moreover, embedding climate change mitigation and adaptation into infrastructure planning enhances financial predictability, fosters public confidence, and positions communities to thrive in a changing climate.

3.3.1. Climate Change Mitigation & Adaptation Initiatives at Halton Region

Halton Region has a long-standing commitment to climate action. On September 11, 2019, Halton Regional Council declared a Climate Emergency, recognizing the urgency and importance of climate action. This declaration included a commitment to developing short and long-term climate change goals, progressing through the Partners for Climate Protection program and the development of corporate climate change policies. Halton Region participates in the Partners for Climate Protection Program, co-propelled by the Federation of Canadian Municipalities and Local Governments for Sustainability (ICLEI) to adopt a five-step milestone framework to support climate action. The five milestones are:

1) Creating a greenhouse gas emissions inventory
2) Setting the emissions reduction target
3) Developing the local action plan(s)
4) Implementing the plans(s)
5) Measuring progress – monitor, verify and report on greenhouse gas reductions

In 2023, the Region released a Corporate Climate Action Plan to respond to climate change and set a path toward a resilient, low-carbon future. This comprehensive plan focuses on reducing corporate greenhouse gas (GHG) emissions, increasing infrastructure and service resilience, and fostering collective action through partnerships with the community, stakeholders, and various levels of government.

The Corporate Climate Action Plan acts as a framework for the Region's corporate activities and is flexible to ensure it is responsive to technical advancements and shifting regulatory environments. It is based around three overarching goals:

- Achieve the Milestones of the Partners for Climate Protection Program.
- Reduce greenhouse gas emissions to achieve Net Zero by 2045.
- Increase climate resiliency and preparedness.

The Region has now successfully completed all milestones of the Partners for Climate Protection Program by advancing implementation of the Corporate Climate Action Plan. This Action Plan supports the integration of climate change considerations with asset management through the following actions presented in Table 3-3.

Table 3-3. Integration of Climate Change Considerations with Asset Management

Climate Change Considerations	Integration with Asset Management
 **Opportunities**	• Access climate financing opportunities including grants and funding programs.
 **Adaptation**	• Where possible, design and construct roads and storm system to be resilient to more severe and frequent extreme precipitation based on green standards. • Increase climate resiliency of corporate assets.
 **Mitigation**	• Measure, track, monitor, and mitigate greenhouse gas (GHG) emissions to ensure progress with reduction efforts. • Optimize building efficiencies to reduce energy usage across corporate facilities.

Climate Change Considerations	Integration with Asset Management
	• Develop an electric vehicles (EV) strategy to support the switch to electric vehicles (EV) for the Region's corporate fleet to reduce greenhouse gas (GHG) emissions.

In 2024, the Region updated its Conservation and Demand Management (CDM) Plan in compliance with O.Reg.25/23 to outline the Region's strategy for managing energy use to 2028 and reports on progress made between 2020-2024. Measures that have been implemented include lighting retrofits, HVAC upgrades, building automation systems, water heating improvements, window and building envelope upgrades, and various heat recovery and energy efficiency improvements.

Proactive asset management and strategic investments will not only protect critical systems and resources but also enhance the Region's capacity to provide safe and reliable services to its communities, even under evolving and challenging climatic conditions. The following examples demonstrate the progress the Region has recently made recently in climate change mitigation and adaptation as shown Table 3-4.

Table 3-4. Recent and Current Climate Change Initiatives by Service Area

Service Area	Recent and Current Climate Change Initiatives
HCHC	• In 2023, 100 tCO2e of GHG emissions were reduced through lighting, control, and mechanical retrofits at HCHC facilities.
Corporate Facilities	• Solar photovoltaic (PV) panels will be installed as part of scheduled roof replacements for nine facilities.
Corporate Fleet	• An RFP has been issued to advance a Green Fleet Implementation Strategy. • A green procurement policy is currently under review.
Natural Assets	• An update of the Region's 20-year Forest Management Plan is currently in progress. • A basic inventory of Region's natural assets has been developed as part of this AMP.

Service Area	Recent and Current Climate Change Initiatives
Waste Management	• Inclusion of requirements for alternative fuel sources in the next waste collection contract to reduce GHG emissions in contracted waste management vehicles. • Compactors and dozers used to bury waste at the landfill sites are replaced with new equipment that allows operators to use GPS technology to more efficiently utilize space at the landfill. • The implementation of the 2023-2030 Solid Waste Management Strategy will potentially increase the total diversion of waste generated to up to 70% by 2030, reduce GHG emissions by over 13,000 tonnes per year, and extend lifespan of landfill to 2054.
Water & Wastewater	• Advanced Metering Infrastructure (AMI) upgrades to the Region's water meter system have been initiated to enhance water usage tracking and leverage operational efficiencies. • Micro-hydro turbine at the Mid-Halton Wastewater Treatment Plant was upgraded resulting in GHG reductions of 19 tCO2e. • An Environmental Assessment is underway to determine the optimal location for a proposed facility that would process biosolids from the wastewater treatment plants into compost. • A study is underway to assess opportunities and make recommendations to support mitigation of nitrous oxide (NOx) emissions at the Region's wastewater treatment plants to help support future emission reduction strategies. • A study is underway to identify most effective renewable energy solution for wastewater treatment plants such as solar wall thermal systems, ground-mounted systems, and superstructures over wastewater tanks. • Use of solar photovoltaic (PV) systems and battery energy storage is being explored to reduce greenhouse gas (GHG) emissions from energy use at water and wastewater facilities.

Asset management will continue to support climate adaptation efforts through consideration of asset criticality and risk assessment to identify priority infrastructure investment needs for increasing resiliency and minimize interruption of essential services resulting from climate events. This approach will balance the cost of addressing climate change with the associated risk and community benefits while ensuring fiscal sustainability.

Additionally, to align climate change efforts with current and proposed service levels and relevant asset lifecycle management activities, the following performance measures have been captured in this asset management plan as shown in Table 3-5.

Table 3-5. Climate Change Service Level Metrics and Asset Lifecycle Management Activities

Service Area	Performance Measures	Current Performance	Proposed Performance	Relevant Asset Lifecycle Activities
Corporate Facilities	Total Energy Consumption (kWh per Square Feet)	10.38	Improve	Operations, Maintenance, Replacement
Corporate Facilities	Total Energy Consumption (ekWh per Square Feet)	24.12	Improve	Operations, Maintenance, Replacement
Corporate Facilities	Total Water Consumption (m^3 per Square Feet)	0.06	Maintain	Operations, Maintenance, Replacement
Long-Term Care	Total Energy Consumption (kWh per Square Feet)	13.24	Improve	Operations, Maintenance, Replacement
Long-Term Care	Total Energy Consumption (ekWh per Square Feet)	28.92	Improve	Operations, Maintenance, Replacement
Long-Term Care	Total Water Consumption (m^3 per Square Feet)	0.15	Maintain	Operations, Maintenance, Replacement
HCHC	Total Energy Consumption (kWh per Square Feet)	6.9	Improve	Operations, Maintenance, Replacement
HCHC	Total Energy Consumption (ekWh per Square Feet)	16.5	Improve	Operations, Maintenance, Replacement
HCHC	Total Water Consumption (m^3 per Square Feet)	0.13	Maintain	Operations, Maintenance, Replacement
Paramedics	Total fuel consumption (litres per year)	515,958	Improve	Operations, Maintenance, Replacement

Service Area	Performance Measures	Current Performance	Proposed Performance	Relevant Asset Lifecycle Activities
Corporate Fleet	Total fuel consumption of dyed/clear diesel (litres/year)	223,718.8	Improve	Operations, Maintenance, Replacement
Corporate Fleet	Total fuel consumption of regular gasoline (litres/year)	180,191.5	Improve	Operations, Maintenance, Replacement
Corporate Fleet	% Vehicles with non-fossil fuels	0%	Improve	Operations, Maintenance, Replacement
Corporate Fleet	GHG emissions for fleet in tonnes of carbon dioxide equivalent.	6,200	Improve	Operations, Maintenance, Replacement
Police	Annual average fuel consumption ($/Km driven)	$0.24	Maintain	Operations, Maintenance, Replacement
Police	Annual electricity use rate ($/square feet)	$2.51	Maintain	Operations, Maintenance, Replacement
Waste Management	Tonnes of residential solid waste disposed per capita (annual)	0.14	Maintain	Operations, Replacement
Transportation & Stormwater	Percentage of municipal stormwater management system resilient to a 5-year storm.	100%	Maintain	Operations, Maintenance, Replacement
Wastewater	Percentage of wastewater treated to secondary level or better	100%	99.7%	Operations, Maintenance, Rehabilitation, Replacement
Wastewater	# Connection-days per year due to wastewater backups compared to total number of properties connected to the municipal wastewater system	0.0000402	Improve	Operations, Maintenance

Service Area	Performance Measures	Current Performance	Proposed Performance	Relevant Asset Lifecycle Activities
Wastewater	# Effluent violations per year due to wastewater discharge compared to total number of properties connected to the municipal wastewater system	0.0027%	Improve	Operations, Maintenance, Rehabilitation, Replacement
Wastewater	# Downspouts disconnected annually	8	Maintain	Operations, Maintenance
Wastewater	# Weeping tiles disconnected annually	37	Maintain	Operations, Maintenance
Wastewater	# Bypasses at pumping stations	4	Improve	Operations, Maintenance, Refurbishment, Replacement
Wastewater	# Blocked sewers per 100 km (annual)	0.4	Maintain	Operations, Maintenance, Rehabilitation, Replacement
Wastewater	Availability of Backup Power for Wastewater Treatment Plants	100%	Maintain	Operations, Replacement
Wastewater	Biosolids land applied to biosolids produced	100%	Maintain	Operations
Water	# Connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0	Maintain	Operations, Maintenance, Replacement

Service Area	Performance Measures	Current Performance	Proposed Performance	Relevant Asset Lifecycle Activities
Water	# Connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system.	0.00079	Improve	Operations, Maintenance, Replacement
Water	# Watermain breaks per 100 km (annual)	4.3	Improve	Operations, Maintenance, Replacement

3.4. Lifecycle Management Strategy and Cost Modeling

The goal of a lifecycle management strategy is to achieve sustainable LOS while minimizing risk and the total lifecycle costs. Table 3-6 describes the lifecycle activities that are required to ensure the long-term functionality, reliability, and sustainability of the Region's assets. The lifecycle activities for each service area are detailed in the individual chapters.

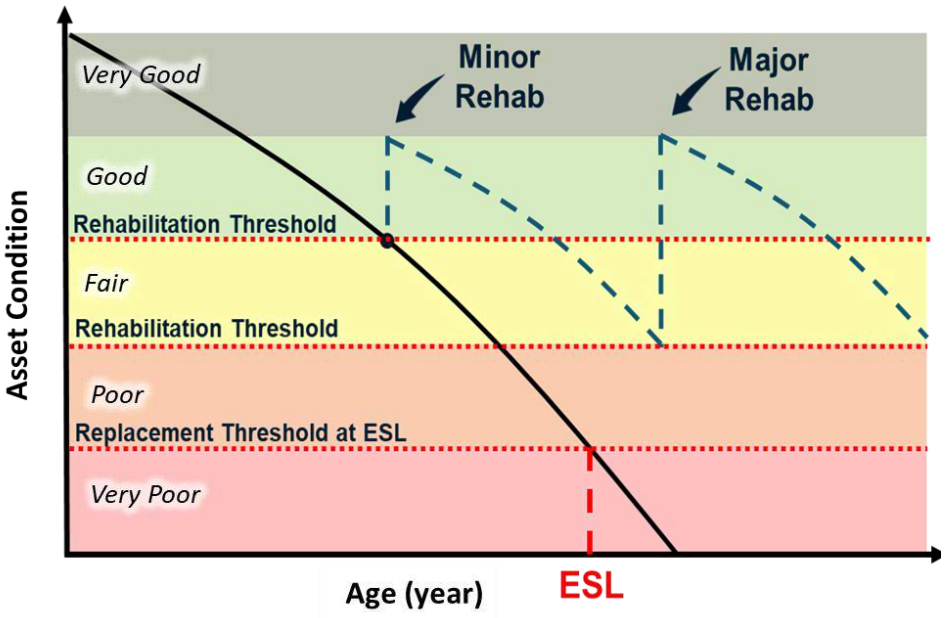
Table 3-6. Lifecycle Activities and Descriptions

Lifecycle Activity	Description
Disposal	Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.
Growth	Planned activities required to extend services to previously un-serviced areas - or expand services to meet growth demands.
Non-Infrastructure	Activities such as inspection and condition assessment of assets, development of asset management plans, programs, and policies to sustain assets functions and level of services.
Operations & Maintenance	Planned and unplanned maintenance or repair activities associated with operational activities.
Rehabilitation	Significant repairs to restore the asset condition and extend its service life.
Replacement	Replacement activities that are expected to occur once an asset has reached the end of its useful life.
Service Improvement	Activities to improve an asset's capacity, level of service, operational efficiency, or reliability that are not associated with growth.

3.4.1. Modeling Lifecycle Management Activities

Lifecycle Model (LCM) is utilized to model the future states of infrastructures and project their capital reinvestment needs accordingly. It analyzes the most recent inspection condition and performance data and employs varying deterioration curves, for different types of assets depending on its specific characteristics, such as material for example. The model then applies predefined sets of treatments to apply rehabilitation or replacement interventions on assets when they reach certain condition performance thresholds i.e., triggering condition score. After applying the intervention, the asset condition and its remaining useful life is adjusted. The example as shown in Figure 3-4 is for roads.

Figure 3-4. Example of a Road Lifecycle Model for Predicting Timing of Capital Interventions



The LCM employs established unit cost rates to calculate intervention costs and account for capital expenditures across specific asset categories in any planning year. Various asset management plan scenarios can be developed to assess the impact of different financial decisions on the future state of infrastructure.

3.4.2. Forecasting Lifecycle Costs

The goal of asset management is to analyze and prepare for the entire lifecycle cost of asset ownership. The lifecycle forecasts included in this AMP:

- Focuses on forecasting capital rehabilitation and replacement needs for infrastructure investments.
- Expenditures required for the remaining lifecycle activities (non-infrastructure, service improvements, operations and maintenance, and growth) are adequate to meet the needs of the Region, based on the Operating and Capital Budget. These activities have been captured to analyze the full lifecycle cost of asset ownership.

O. Reg. 588/17 requires a 10-year lifecycle forecast of costs that will maintain service levels as well as achieve proposed levels of service over that planning horizon. As part of the Lifecycle Management Strategy, an assessment is also completed to understand not only the costs associated with the lifecycle activities, but to also forecast the resultant impact on the performance (condition) of the Region's assets over the next 10 years. The following forecasting scenarios were developed for each service area:

Scenario 1: Approved Budget – Evaluates asset performance under the current funding level that the Region identified in its approved 2025 10-year capital budget. It is also used as a baseline scenario, which can be used to assess the other scenarios analyzed below.

Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point. Understanding the cost to maintain current performance levels is a requirement of O. Reg. 588/17. For the purposes of this AMP, the current performance (condition) of the assets is used to determine the current level of service.

Scenario 3: Proposed Level of Service – This scenario determines the required investment in assets for the 10-year period to achieve the proposed level of service of 80% of assets in good to very good condition, as per the Region's strategic priorities. Like the second scenario, the condition levels were held to a specific target LOS to improve and/or maintain the performance.

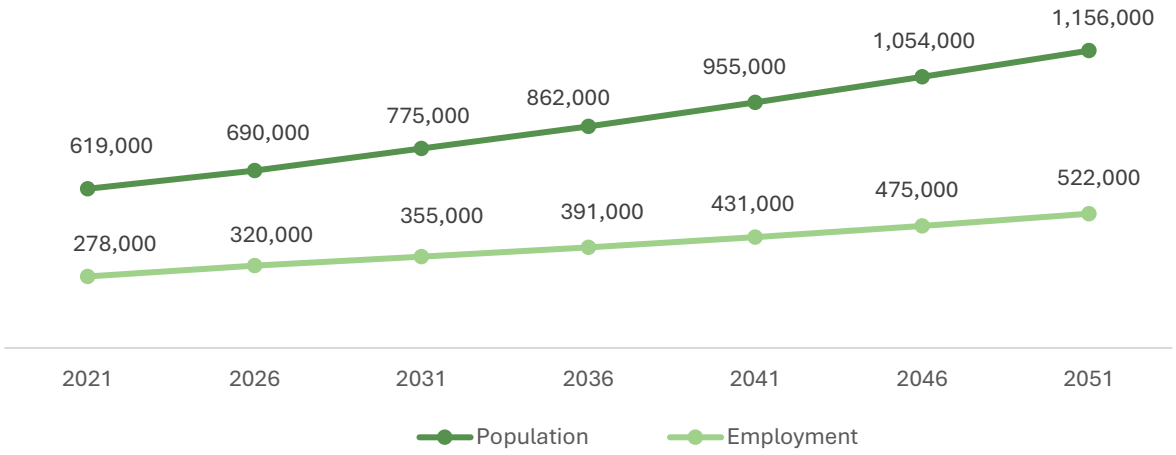
These scenarios were developed for each service area to assess the Region's forecasted expenditures to understand the full cost of maintaining service levels and proposed levels of service over the 10-year forecast period. Forecasts for expenditures (Scenario 2 and 3) were then compared to capital and operating budget forecasts (Scenario 1) to determine if an potential estimated infrastructure gap was present. The financial assessment identifies potential options on how the Region can consider addressing these estimated preliminary gaps.

In each of the service area chapters, there are detailed lifecycle strategies, forecasting of costs and impacts on levels of service associated with that service delivery.

3.5. Growth and Asset Management

Halton recognizes its strategic location within the Greater Toronto and Hamilton Area and the importance of population and employment growth to the social and economic life of its residents. Currently with a population of over 650,000 people and with 13,810 businesses in four local municipalities, Halton is expected to grow to over 1.1 million people and over 500,000 jobs by 2051. One of the strategic themes in Halton Region's 2023-2026 Strategic Business Plan is Infrastructure and Growth that focuses on ensuring that the necessary infrastructure and services are in place to maintain a high quality of life as the Region continues to grow. Figure 3-5 shows the population and employment forecast for Halton Region based on Ministry of Municipal Affairs and Housing's technical report on "Greater Golden Horseshoe: Growth Forecasts to 2051" as required by O. Reg. 588/17.

Figure 3-5. Halton Region's Population & Employment Forecast to 2051



The Region is committed to accommodating the population and employment growth by delivering infrastructure required to support housing growth and economic development in Halton's communities, maintaining the Region's infrastructure in a state-of-good-repair, and providing sustainable and affordable services. These priorities that are vital to Halton need to be advanced while managing the impacts of extended periods of high inflation that have had a significant impact on the cost of goods, services and construction.

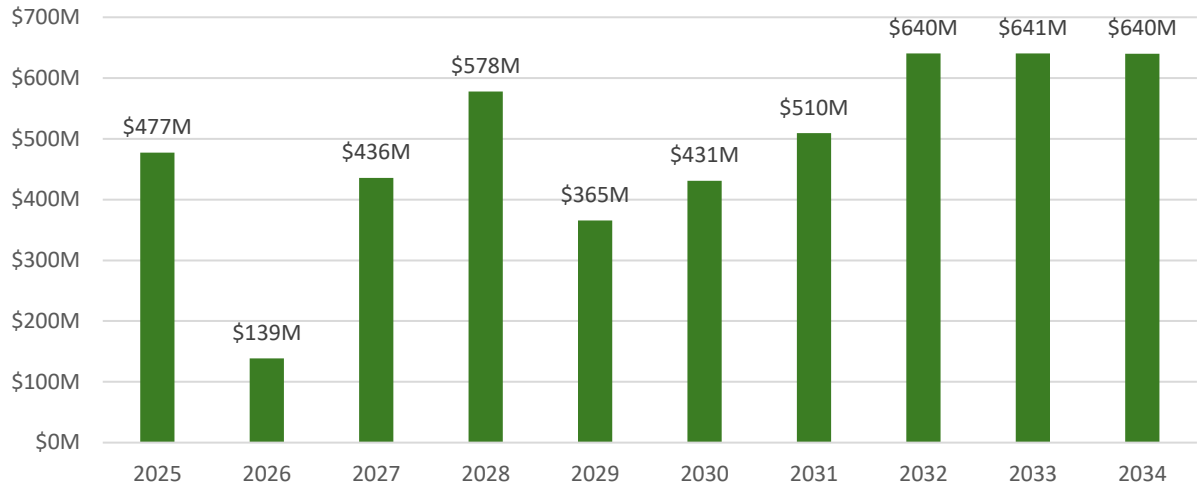
Halton Region's 2025 Budget and Business Plan, along with approval of Report No. CA-02-24/PW-04-24/FN-05-24 re: "Revised 2023 Allocation Program", ensures the Region is well-positioned to support the Province's objective of delivering 1.5 million new homes in Ontario by 2031 in alignment with Bill 23, *More Homes Built Faster Act, 2022*. The Allocation Program and future infrastructure staging will help local municipalities manage and support growth ensuring they are prepared for the anticipated increase in housing and population, in alignment with provincial goals and timelines.

The Region has a shared objective with the Province and Local Municipalities to advance housing supply and plays a role in providing infrastructure in support of Local Municipal housing pledges by proactively planning for, financing and delivering infrastructure. It represents a significant acceleration of growth in Halton Region adding 92,500 units by 2031 which is more than a 70% increase over the residential growth anticipated in the Region's Infrastructure Master Plans.

The 2025 Budget and Business Plan has been prepared based on current master plans and financing plans approved by Council. The 2025 capital budget identifies a total of $4.8 Billion in

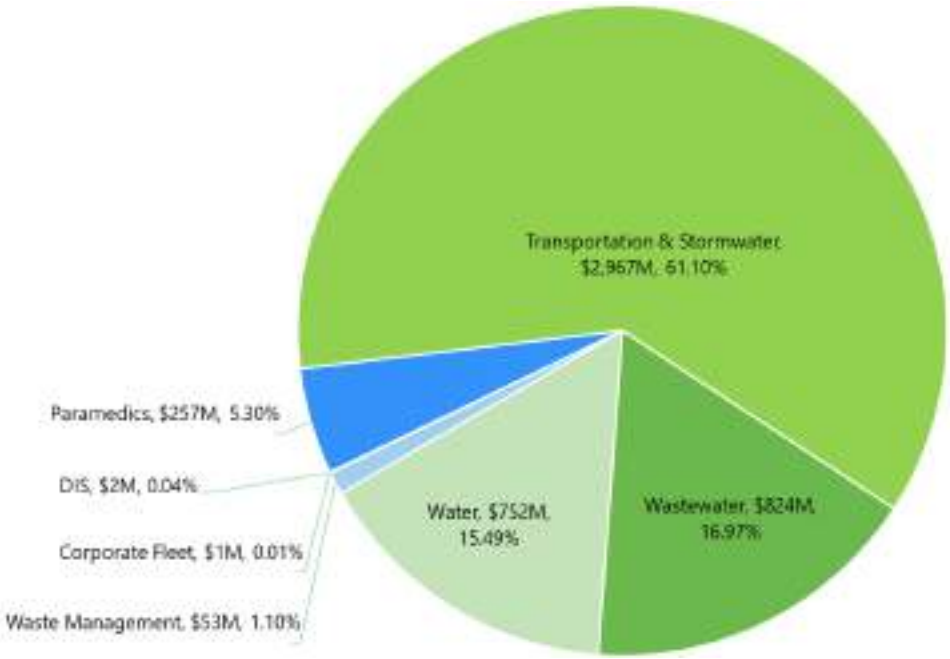
the next 10 years to meet growth requirements as shown in Figure 3-6. It is based on the planned capital projects funded through development charges or initiatives addressing the Region's growing population.

Figure 3-6. Projected Growth Expenditures from 2025 Budget ($ Millions)



Over 60% of the growth projects are related to transportation infrastructure followed by a combined 32% for water and wastewater infrastructure. Distribution of growth projects during 2025-2034 by service area is shown in Figure 3-7.

Figure 3-7. Distribution of Growth Projects During 2025-2034 by Service Area ($ Millions)



Halton Region is also in the process of developing and updating an Integrated Master Plan (IMP) for the next region-wide Water, Wastewater, and Multi-Modal Transportation Master Plans. The outcome of this work will be a long-term integrated servicing strategy for Region's Infrastructure to accommodate future growth. This integrated masterplan will take into consideration the accelerated growth till 2031 and will include expenditures to support growth to 2051. The Integrated Master Plan will:

- Guide the management and development of the Region's water, wastewater, and transportation systems.
- Maximize capacity, system flexibility and extend the life expectancy of Region's water, wastewater, and transportation infrastructure.
- Outline the strategies for maintaining and improving these critical systems to ensure the Region meet the needs of the community now and in the future.

The cost associated with the new growth will be incorporated into the budget once approved. It is anticipated the results from this updated integrated master plan will help inform the financial impact of future growth on asset lifecycle management activities such as operations and maintenance, and the associated long-term capital requirements for keeping future new assets, acquired due to growth, in a state of good repair.

3.6. Pressures, Drivers and Risk Management

The management of assets faces various pressures that can impact its operations, strategies, and overall success. Some of these pressures include:

- **Market Volatility:** Asset managers must navigate constantly changing market conditions, including fluctuations in prices and interest rates. Market volatility can make it challenging to appropriately plan for future asset needs.
- **Regulatory Changes:** Municipalities are often subject to a wide range of regulations that can vary by jurisdiction. Changes in regulations can require asset managers to adapt their processes and systems.
- **Budget Constraints & Funding Options:** Municipalities often operate within tight budget constraints, requiring the balancing of several competing priorities. Municipalities must explore various funding and financing options to support asset management initiatives, and other infrastructure needs. Identifying, securing and apportioning sustainable funding sources to multiple priorities can be challenging.
- **Population Growth and Urbanization:** Growing populations and urbanization place increased strain on municipal infrastructure and services. Municipalities must manage

the demands for housing, transportation, utilities, and public amenities while ensuring sustainable development, and balancing the current asset portfolios.

- **Aging Infrastructure:** Maintaining and upgrading infrastructure as they deteriorate over time requires significant investment, but these needs may exceed available funding to address all needs.
- **Environmental Regulations:** Municipalities must comply with varying types of regulations. Meeting these regulations often requires investment in infrastructure upgrades and environmental mitigation measures. There is also significant staff time required for data tracking and reporting to ensure compliance.
- **Climate Change:** Climate change poses challenges for municipal asset management, including increased risk of extreme weather events such as floods and storms. Municipalities must invest in resilience measures to protect infrastructure and communities from climate-related risks.
- **Limited Human Resources:** Municipalities may face challenges in recruiting and retaining qualified staff with expertise.
- **Data Management and Technology Adoption:** Effective asset management includes the reliance on accurate data collection, analysis, and decision-making. This requires reliable asset data and implementing systems and processes that leverage technology to optimize asset performance.

Overall, municipal asset management requires navigating a complex landscape of financial, regulatory, environmental, and service level pressures to effectively manage infrastructure and deliver services to residents. Within each service area chapter, there is a description of potential risks and the lifecycle strategies that mitigate those risks.

WATER

The Region is committed to providing safe, high quality drinking water with adequate pressure and flow in a reliable and cost-effective manner.

4. Water

Halton Region provides safe, high quality drinking water and fire protection to over 650,000 residents and businesses every day. Halton's drinking water supply comes from either Lake Ontario or groundwater sources. The water is treated to provincial water quality standards and then potable water is distributed to homes and businesses through underground water systems. Halton Region maintains and operates municipal drinking water systems that service residents of Burlington, Halton Hills, Milton and Oakville.

Halton Region has developed and implemented a Drinking Water Quality Management Standard (DWQMS) that applies a continuous improvement approach to the management of the water utility. The DWQMS is documented within the Halton Region Drinking Water Quality Management System Operational Plan and meets the requirements of the Ministry of the Environment, Conservation and Parks' Drinking Water Quality Management Standard under the Safe Drinking Water Act, 2002. Through the quality management system, the Region is committed to:

- Providing customers with safe drinking water and fire protection.
- Complying with applicable legislation and regulations.
- Maintaining and continually improving the Drinking Water Quality Management Standard.

4.1. State of the Infrastructure

The following sections summarize the portfolio of assets associated with the Region's Water services.

4.1.1. Asset Overview & Valuation

The water assets include transmission infrastructure such as watermains and booster stations that convey water from the water treatment plants to residences and businesses, and reservoirs and bulk water stations that provide water storage, capacity, and bulk water access. Overall, water infrastructure assets have a total replacement value of $7,735 million.

The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing recent construction projects and estimating current replacement values for these assets. Table 4-1 provides the inventory and current replacement value for the assets included in this AMP.

Table 4-1. Water Asset Inventory and Current Replacement Value ($ Millions)

Asset Class & Asset Type	Count	Unit	2024 Estimated Replacement Value
Transmission			
Distribution Mains (< 400mm)	2,050	Km	$5,402.3 M
Trunk Mains (>400mm)	380	Km	$817.6 M
Booster Stations, Reservoirs & Storage Facilities	32	Ea.	$603.8 M
Bulk Water Stations	6	Ea.	$4.2 M
Treatment			
Water Treatment Plants	12	Ea.	$907.5 M
Total Replacement Value			**$7,735.3M**

4.1.2. Asset Condition and Age

The condition of Water assets is determined using established condition rating criteria or an age-based approach depending on the asset type. Water assets are on average in Good condition with the average age of both transmission and treatment assets significantly less than their average estimated service lives as shown in Figure 4-1.

Figure 4-1. Water Assets Overall Condition (%), Age and Estimated Service Life (Years)

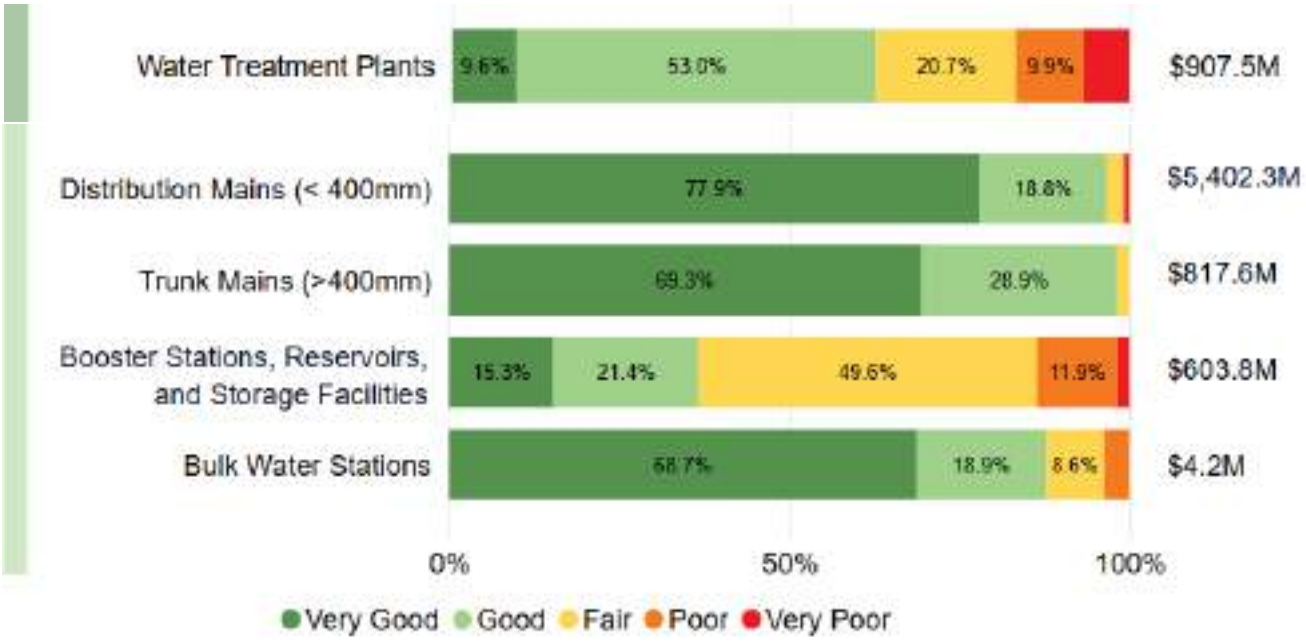
Table 4-2 provides how condition rating is assigned to the various types of water assets. Condition for watermains is determined using both estimated service life (ESL) as well as the break history. Capital needs assessments (CNA) are used to determine the condition of all water facilities. When inspection-based condition scores were not available, age and remaining estimated service life is used to determine condition.

Table 4-2. Water Condition Rating Criteria

Condition Rating	Watermains (# Breaks)	Watermains (Remaining ESL)	Facilities (CNA)	All Other Assets (Remaining ESL)
Very Good	0 – 1	80% – 100%	1	80% – 100%
Good	2	60% – 79%	2	60% – 79%
Fair	3	40% – 59%	3	40% – 59%
Poor	4	20% – 39%	4	20% – 39%
Very Poor	>4	0% – 19%	5	0% – 19%

The overall condition of Water assets, as a percentage of replacement values, can be viewed at the asset type level in Figure 4-2.

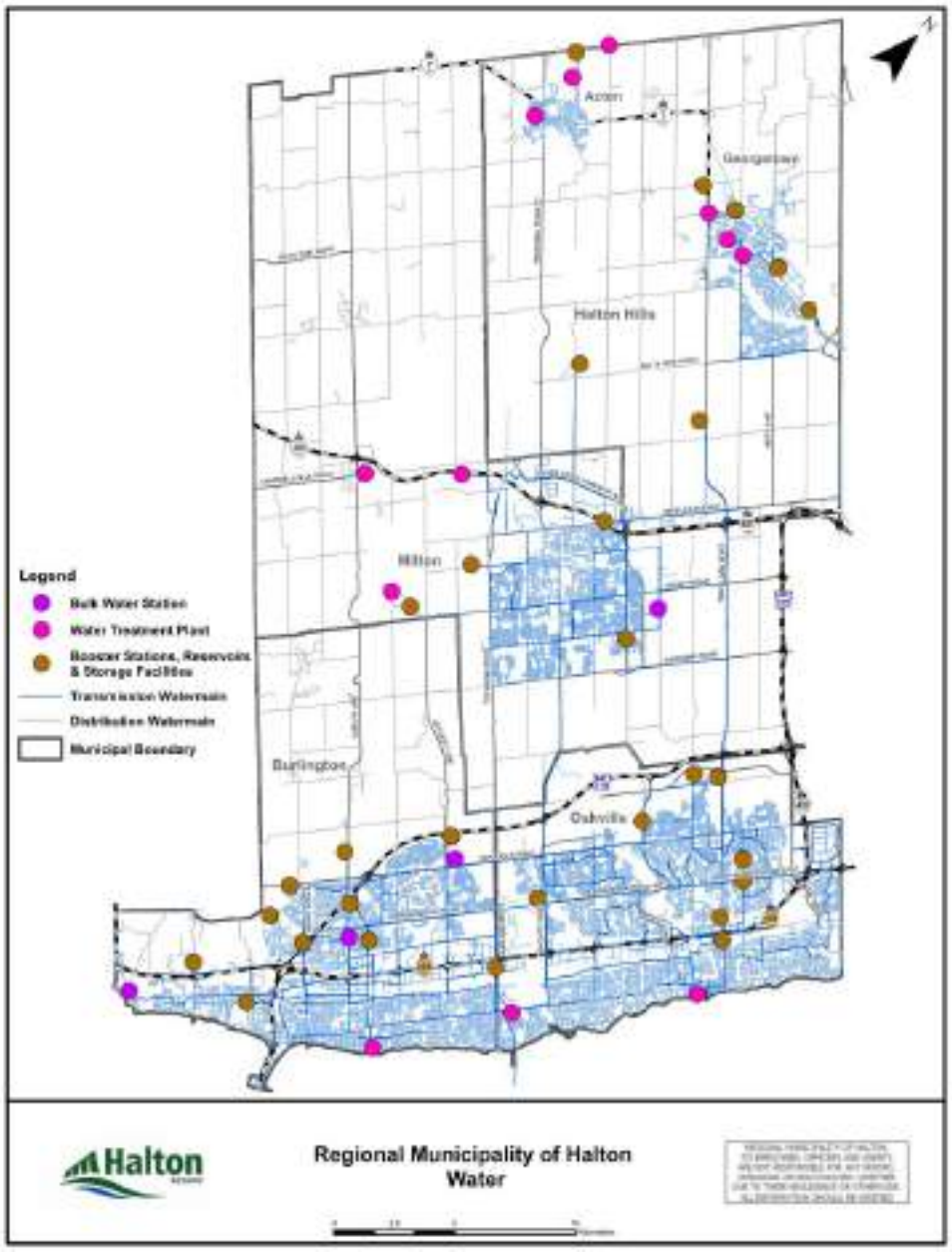
Figure 4-2. Water Condition Distribution by Asset Type (%)



4.2. Levels of Service

Community Level of Service Objective	The Region is committed to providing safe, high quality drinking water with adequate pressure and flow in a reliable and cost-effective manner.

Figure 4-3. Halton Region Water System



Halton's Water system includes water treatment plants, watermains and trunk mains, reservoirs, booster stations, and bulk water stations.

The water distribution system is an integral component of every neighborhood in the Region, with all urban and rural areas featuring various elements of the water network, from main pipelines to local service connections. The water service areas are depicted on the accompanying map.

This comprehensive system ensures the reliable delivery of clean water to protect public health and support community needs. In many instances, the Region's water distribution network interfaces with local water systems, creating an interconnected grid that enhances overall water security and service reliability.

Table 4-3. Water Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Description or images that illustrate the user groups or areas of the municipality that are connected to the Municipal water system [1]	Scope	See Figure 4-3	N/A
Percentage of properties connected to the municipal water system [1]	Scope	86%	Improve
% of properties where fire flow is available [1]	Scope	86%	Improve
Description or images that illustrate user groups or areas of the municipality that have fire flow[1]	Scope	All properties connected to Halton Region's municipal water system have access to fire flow with sufficient water pressure and volume, as per the Region's standards and fire flow policy.	N/A

[1] O. Reg 588/17 Required Level of Service Metrics

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Description of boil water advisories and service interruptions[1]	Reliability	Currently, the Region has no (0) boil water advisories. Should one occur, A Boil Water Advisory (BWA) is issued by Halton Region's Medical Officer of Health when bacteria or other microorganisms may be present in the municipal drinking water supply, making it unsafe to drink. During a BWA, residents are advised to boil their water before using it for drinking, washing or preparing food, and brushing teeth. Service interruptions are typically caused by watermain breaks.	N/A
The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system [1]	Reliability	0	Maintain

[1] O. Reg 588/17 Required Level of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
The number of connection-days per year with service interruptions due to water main breaks compared to the total number of properties connected to the municipal water system. [1]	Reliability	0.00079	Improve
Percentage of water infrastructure rated as Good and Very Good	Reliability	88.2%	80%
Treatment Assets - Maintenance Costs as a % of Replacement Asset Value	Efficiency	0.62%	0.65%
Key Performance Indicators			
Compliance to drinking water inspections	Reliability	100%	Maintain
Transmission Assets - Annual Number of Watermain Breaks per 100 km	Reliability	4.3	Improve
Treatment Assets- Plant Process Downtime Hours, 5 Year Rolling Average	Reliability	1413	1131.2
Treatment Assets - Percent adherence to planned work scheduled (All Work Types)	Efficiency	91%	95%

4.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. The Region manages various lifecycle activities for Water assets that include design, planning, acquisition or construction, commissioning, operating, repair and maintenance, refurbishment or rehabilitation, decommissioning and disposal, and eventual replacement of all assets.

The importance of lifecycle activities for Water assets ensures the long-term functionality, reliability, and sustainability of the critical infrastructure. The lifecycle activities listed in Table 4-4 that summarize the Region's current approaches ensure that these infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being.

Table 4-4. Water Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
Decommissioning and Disposal Activities		
• Decommissioning and disposal of water transmission, or treatment assets, and materials according to regulations and standards.	All	• Improper disposal may lead to environmental impacts and expenses.
• For replacement of equipment executed by the maintenance function, the P-Shell process ensures costs and master data records are accurately assigned separately to disposed and the replacement equipment.	Vertical - Treatment	• Inaccurate SAP equipment records prevent effective management of equipment during the operations and maintenance lifecycle stage.
Growth Activities		
• Capital projects and expansion needs are identified to accommodate growth as identified through the development of Master Plans. • Undertake environmental assessments for new developments.	All	• Growth activities are aligned with when actual development occurs.
Maintenance Activities		
• Implementation and optimization of Reliability Centered Maintenance program to ensure critical infrastructure is maintained, breakdowns are minimized, and the service life of the assets are maximized.	Vertical	• Potential for increased maintenance and other lifecycle costs. • Potential service implications.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
• Preventative maintenance (PM) and Predictive Maintenance (PdM) programs and activities for treatment assets including equipment, and water sample testing from wells and treatment plants. • Plan, schedule and execute proactive work to maintain assets in good and very good condition e.g. preventive maintenance and predictive maintenance tactics. • Diagnose and repair equipment, process and plant, and restore condition back to design standards. • Scheduled inspections are performed for pumps, electrical controls, and standby generators.	All	• As above.
• Reactive maintenance programs and systems to efficiently address unexpected issues. • Routine and preventative maintenance programs and activities for transmission assets including valves and hydrants, fire flow testing and watermain flushing program. • Watermain leak detection studies to locate and repair small leaks. • System performance monitoring.	All	• As above.
Non-Infrastructure		

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
• Perform condition assessments at regular intervals (i.e., 5-year cycles) on all facilities to inform maintenance and capital planning programs, avoiding reactive, unplanned maintenance or replacement costs. • Complete condition needs assessment at the assembly level and build rehabilitation plans to replace assets and improve condition grade. • Lifecycle models have been developed for water transmission and distribution assets which predict asset condition. • Development of water conservation programs, initiatives and outreach to promote efficient use of water. Programs and initiatives include Halton Region's Advanced Metering Infrastructure (AMI) meter installation, water meter replacement program, outdoor water conservation and indoor water efficiency. • Joint contracts with local municipalities to promote project synergies. • Project coordination bundling with other services such as transportation and wastewater to minimize construction impacts and costs. • Optimization program for linear assets and plants enhance facility performance and capability resulting in SCADA automation of equipment, operating cost savings and extending asset life.	All	• Potential for Increased risk of higher operating and maintenance costs. • Potential impacting service delivery to residents. • Lack of coordination with other service areas may increase overall lifecycle costs associated with providing all services for the Region. • Delay in infrastructure upgrades and increased demands on the water transmission system and treatment facilities.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
Condition Appraisal and Refurbishment Activities		
• Condition assessment of Mechanical, Electrical and Instrumentational equipment components, controls and power systems, to identify sources of deterioration and improvement strategies to extend life of assets and defer replacement through refurbishment and enhancement of maintenance strategies.	Vertical - Treatment	• Prematurely dispose of installed Equipment. • Increase consumption of capital expenditure and resources that design, plan and construct infrastructure. • Potential service implications. • Write off equipment before they are fully amortized/depreciated.
Repair Activities		
• Restore function of critical equipment, control and power systems to enable safe operation of plant, processes and systems.	Vertical - Treatment	• Potential impacting service delivery.
Rehabilitation Activities		
• Rehabilitation needs are identified through ongoing maintenance, inspections, and condition needs assessments. • Pipe relining.	All	• Potential for increased lifecycle costs.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
Replacement / Construction Activities		
• Replacement of watermains. • Replacement of equipment, SCADA, and facility assets. • Re-use, re-purpose equipment on demand. • Replace same for same equipment and update SAP Enterprise Asset Management records.	All	• Potential service implications. • Delay in replacement may result in higher overall lifecycle costs, and potential service impacts.
Service Improvement Activities		
• Water hydraulic modelling identifies areas that require system improvements such as fire flow or pressure. • Upgrades or operating changes to equipment to improve operational efficiencies. • Energy Management Strategy activities, including implementing advanced water meter infrastructure to automate meter reading and automated control of the lake-based water treatment facilities based on good energy conservation practices. • Continuous improvement efforts to enhance finished water quality and public health protection through process optimization.	All	• System is not able to accommodate water flow. • Missed opportunity to reduce energy consumption.

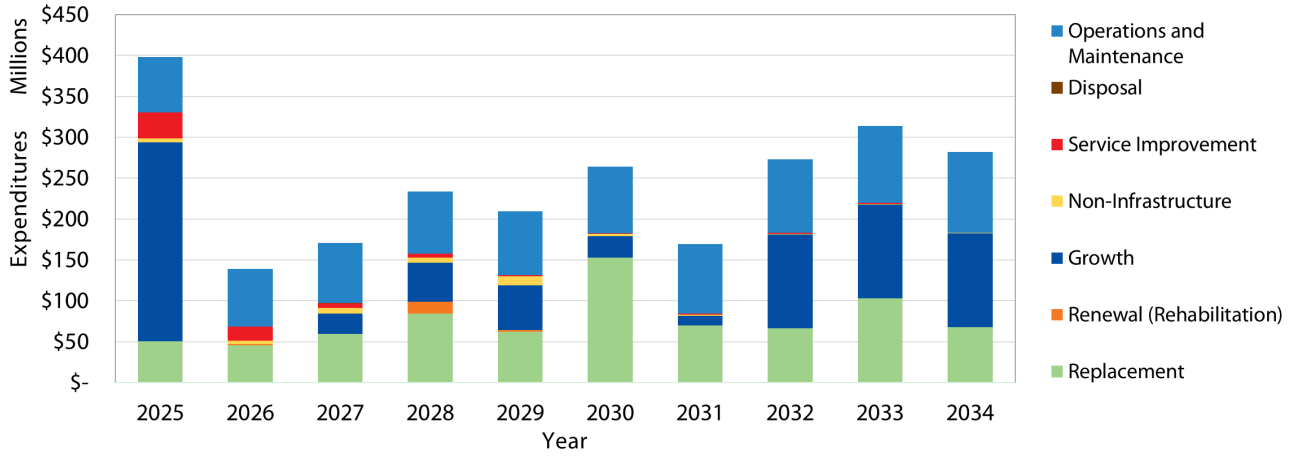
4.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outlined in Table 4-4 to plan work and assess future expenditure needs for Water assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Water assets, developed by leveraging staff expertise and are aligned with industry best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities that maintain infrastructure in a state of good repair and support continued service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy. For this AMP, these activities and their associated costs are assumed to be sufficient in meeting current needs and proposed service levels. Figure 4-4 shows the approved 2025 budget lifecycle activities for Water assets.

Figure 4-4. Water Anticipated Lifecycle Management Activities - Capital & Operating Budgets



The 2025 budget identifies a total of $0.76 Billion in the next 10 years to meet growth requirements based on the planned projects funded through development charges or initiatives addressing the Region's growing population. The 2025 operating budget's 10-year forecast is based on general inflation of 2.0%, customer growth ranging from 1.4% to 3.0%, and increase in plant maintenance ranging from 2.0% to 6.0% to reflect inflationary increases and new infrastructure to support growth.

In addition to changes through Bill 23, the demand for infrastructure has been accelerated to achieve the Provincial housing target to achieve 1.5 million homes by 2031. The Region of Halton is in the process of the development of an Integrated Master Plan (IMP), to complete the next region-wide Water, Wastewater, and Multi-Modal Transportation Master Plans. The outcome of this work will be a long-term integrated servicing strategy for Region's Infrastructure to accommodate future growth. It is anticipated the results of this study will impact the expenditure required for growth, and in turn O&M.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

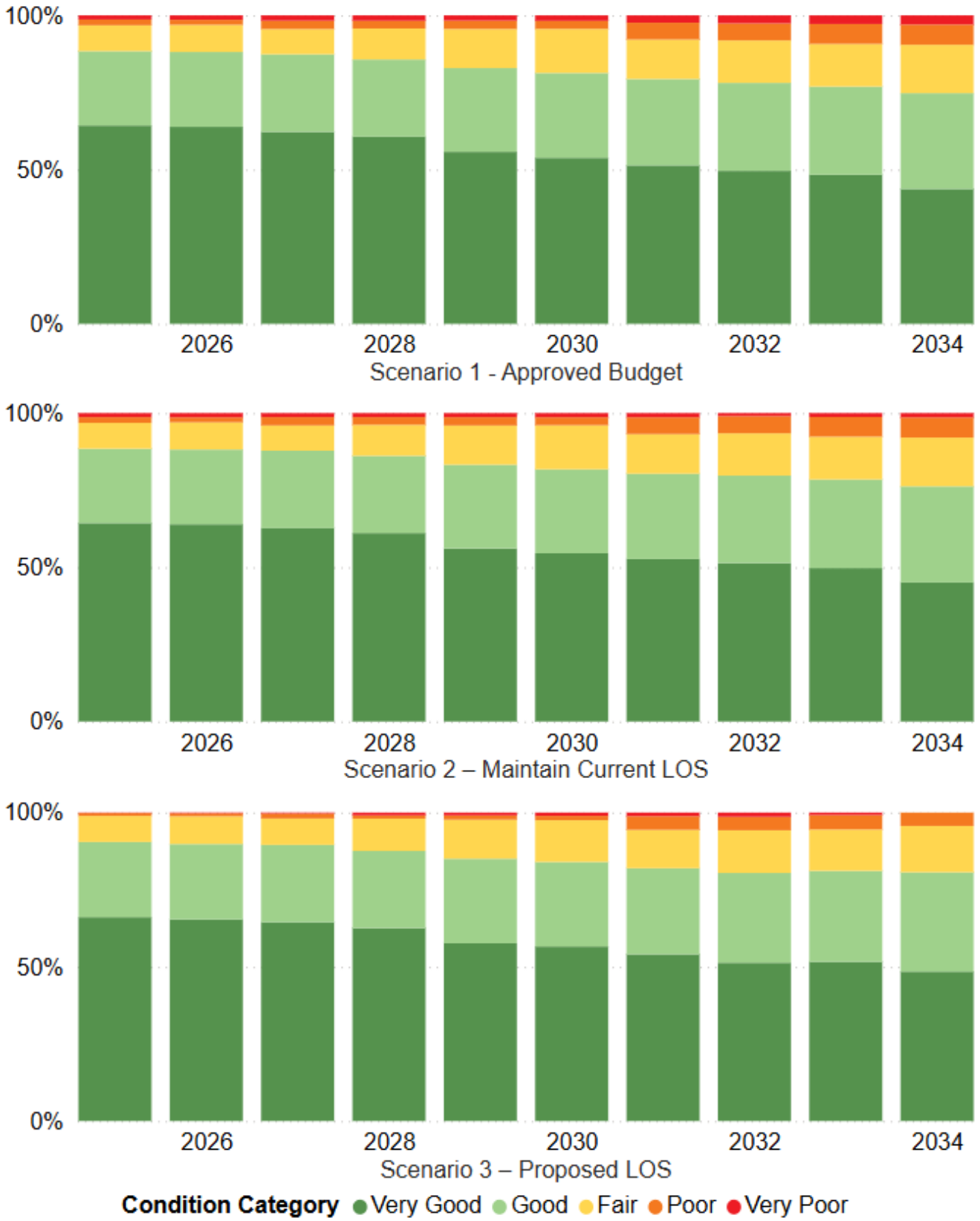
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

4.5. Impact on Current and Proposed Levels of Service

Figure 4-5 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 4-5. Water Condition Profile for Service Level Scenarios



In Scenario 1, condition of assets is deteriorating at a quicker rate when compared to Scenario 2 and Scenario 3. Furthermore, the assets in very poor condition increase from 1.4% to 3% over the 10-year forecast, which represents approximately $229M of assets.

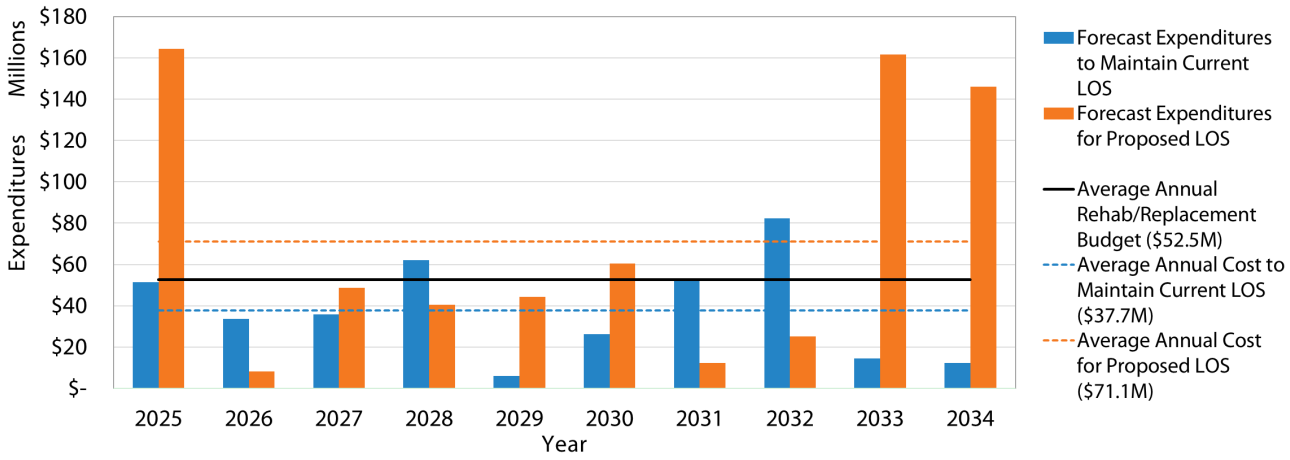
In Scenario 2, there is no increase of assets in very poor condition. The Region currently has sufficient funds to keep its assets in the same condition over the 10-year forecast.

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed service levels were set to achieve 80% of assets in good to very good condition. This would require an additional annual investment of $18.6M for rehabilitation and replacement activities for Water assets.

4.6. Estimated Preliminary Potential Infrastructure Gap

Figure 4-6 illustrates that rehabilitation and replacement expenditures of $37.7M and $71.1M are needed annually to sustain the current LOS and proposed LOS, compared to the average annual budget of $52.5M.

Figure 4-6. Water Rehabilitation & Replacement Expenditure Scenario Comparison



While there is no gap to maintain current service levels, there is a potential average annual estimated capital funding gap of $18.6M to achieve proposed service levels. While the additional annual capital funding requirement is substantial, it only accounts for 0.2% of the total replacement value as shown in Table 4-5.

The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values for construction of water assets. Continued periods of high inflation and cost escalations coupled with the increase in construction in the GTHA to support the housing targets will put additional pressure on future years' budgets. It is expected that it will take several years to recover from the high impacts of inflation experienced over the past several years.

Table 4-5. Water Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0.2M	$0.2M	$0.2M
Growth	$89.2M	$89.2M	$89.2M
Non-Infrastructure	$5.3M	$5.3M	$5.3M
Rehabilitation & Replacement	$52.5M	$37.7M	$71.1M
Service Improvement	$18.2M	$18.2M	$18.2M
Capital Expenditures	$165.4M	$150.5M	$184.0M
Capital Infrastructure Gap		**No Gap**	**$18.6M (Gap)**
Operations & Maintenance	$70.4M	$70.4M	$70.4M
Total Expenditures	$235.8M	$220.9M	$254.4M
Gap as % of Replacement Value		**No Gap**	**0.2% (Gap)**

WASTEWATER

The Region is committed to providing reliable and cost-effective wastewater services while protecting the environment and the community.

5. Wastewater

5.1. State of the Infrastructure

Halton Region wastewater system includes six treatment plants, collection systems and one biosolids facility. The Region's wastewater collection system spans over 2,000 km of gravity mains and forcemains, supported by 84 pumping stations. The existing wastewater treatment system consists of Lake Ontario based wastewater treatment plants servicing Oakville, Burlington and Milton and stream-based wastewater treatment plants that service Halton Hills (Georgetown and Acton). The following sections summarize the portfolio of assets associated with the Region's Wastewater services.

5.1.1. Asset Overview & Valuation

Halton Region's wastewater infrastructure assets have a total replacement value of $7,778 million. The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing recent construction projects and estimating current replacement values for these assets. Table 5-1 provides the inventory and current replacement value for the assets included in this AMP.

Table 5-1. Wastewater Asset Inventory and Current Replacement Value ($ Millions)

Asset Class & Asset Type	Count	Unit	2024 Estimated Replacement Value
Collection			
Gravity Mains	1,949.5	Km	$5,454.9 M
Forcemains	75.1	Km	$169.4 M
Wastewater Pumping Stations	84	Ea.	$296.3 M
Wastewater Storage Tank	1	Ea.	$20.4 M
Treatment			
Wastewater Treatment Plants	6	Ea.	$1,693.4 M
Biosolids Management Centre	1	Ea.	$143.6 M
Total Replacement Value			**$7,778.1 M**

5.1.2. Asset Condition and Age

The condition of wastewater assets is determined using established condition rating criteria or an age-based approach, depending on the asset type. Figure 5-1 shows that wastewater assets are on average in Good condition with the average age of both collection and treatment assets significantly less than their average estimated service lives.

Figure 5-1. Wastewater Assets Overall Condition (%), Age and Estimated Service Life (Years)

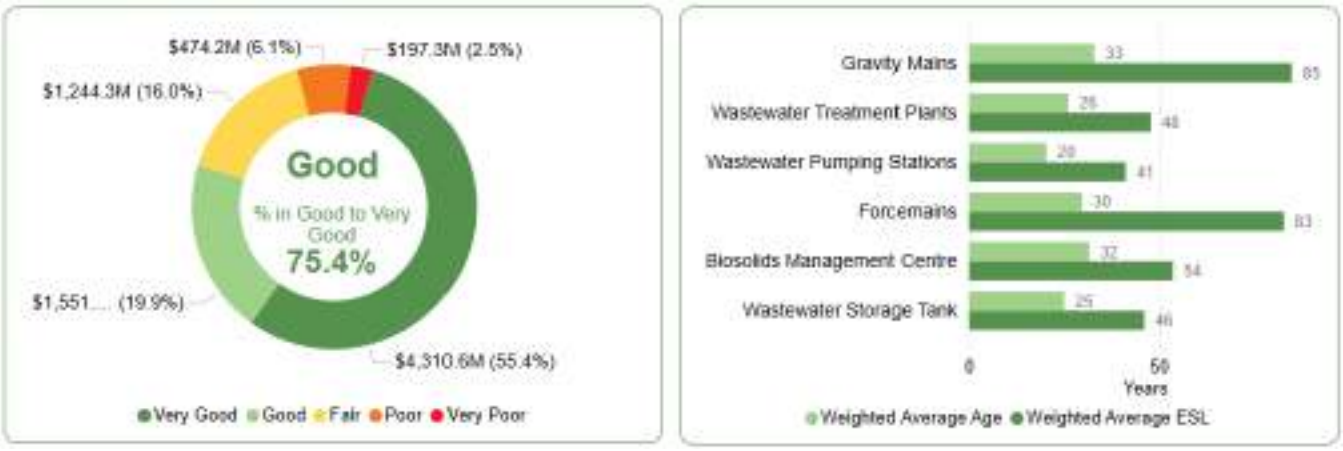


Table 5-2 provides how condition rating is assigned to the various types of wastewater assets. Industry standard condition rating scales such as NASSCO's Pipeline Assessment Certification Program (PACP) Scores are used to determine the condition of sewers based on closed circuit television (CCTV) inspections of them.

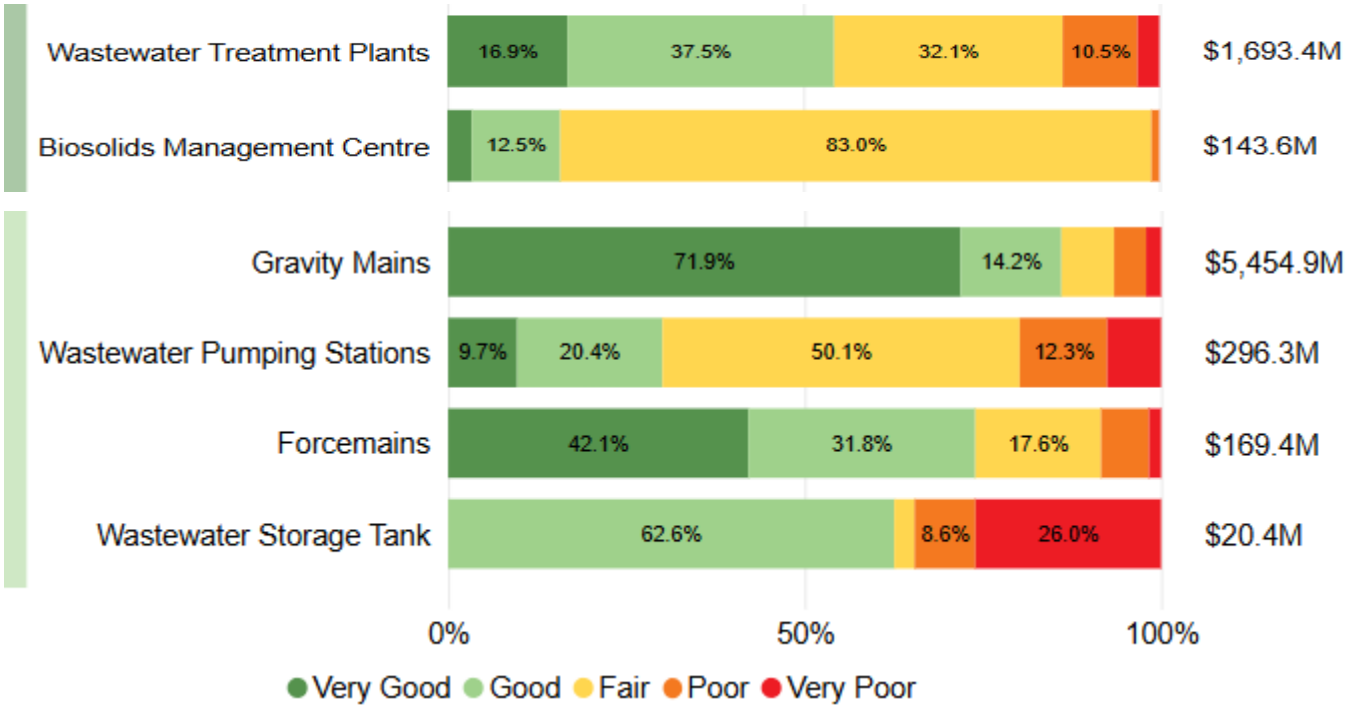
For wastewater facilities, capital needs assessment (CNA) data is utilized which provides a comprehensive evaluation of the individual facility components based on field observations and known defects or issues. These assessments help determine the current condition, identify capital expenditure requirements, and support the long-term capital planning. When inspection-based condition scores are not available, age and remaining estimated service life is used to determine condition.

Table 5-2. Wastewater Condition Rating Criteria

Condition Rating	Sewers (PACP)	Facilities (CNA Condition)	All Other Assets (Remaining ESL)
Very Good	0 or 1	1	80% – 100%
Good	2	2	60% – 79%
Fair	3	3	40% – 59%
Poor	4	4	20% – 39%
Very Poor	5	5	0% – 19%

The overall condition of Wastewater assets, as a percentage of replacement values, is shown at the asset type level in Figure 5-2. Gravity mains represents the largest proportion of the wastewater system replacement value with 86.1% of the assets being in good to very good condition. The treatment plants represent the next largest proportion of the replacement value, with 54.4% of the assets in good to very good condition.

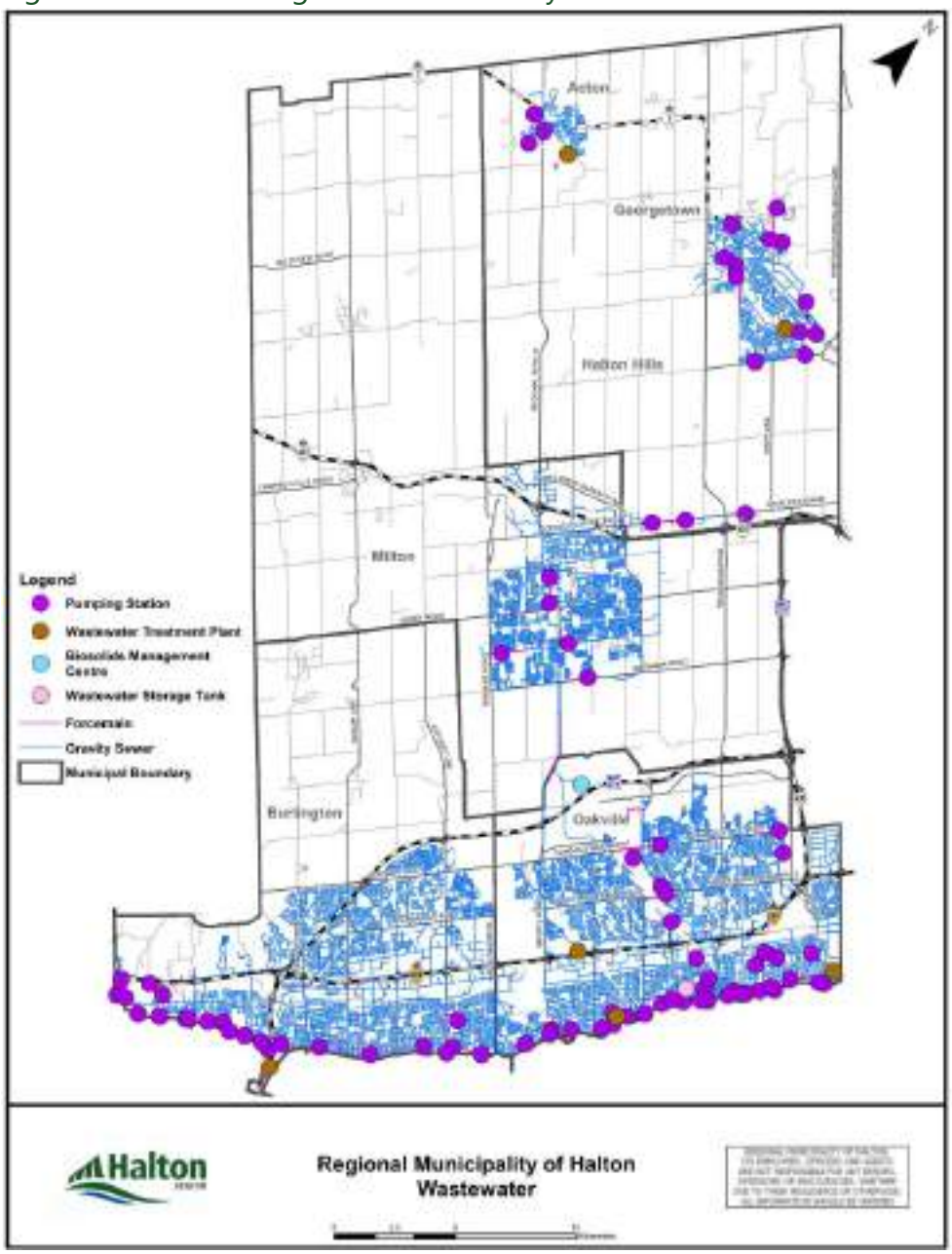
Figure 5-2. Wastewater Condition Distribution by Asset Type (%)



5.2. Levels of Service

Community Level of Service Objective	The Region is committed to providing reliable and cost-effective wastewater services while protecting the environment and the community.

Figure 5-3. Halton Region Wastewater System



Halton's wastewater system spans the entire region, with each area featuring various components of the wastewater collection infrastructure including gravity sewers, pumping stations and forcemains that convey wastewater to the treatment plants.

The service areas for this network are illustrated on the accompanying map. This comprehensive system ensures efficient collection and conveyance of wastewater and biosolids to protect public health and the environment.

Table 5-3. Wastewater Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Description which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system[1]	Scope	See Figure 5-3	N/A
Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes[1]	Reliability	The Region currently does not own any combined sewers.	N/A
Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches[1]	Reliability	The Region currently does not own any combined sewers.	N/A
Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes[1]	Reliability	Inflow includes entrance through direct connections, including those on private property. Infiltration includes entrance points through cracks and leaks in the sanitary pipes due to deterioration, loose joints, damage or root intrusion.	N/A

[1] O. Reg 588/17 Required Level of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Percentage of properties connected to the municipal wastewater system	Scope	86%	Improve
Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described in previous row[1]	Reliability	The Region has established a variety of programs such as the I&I Program that identifies problematic areas that are prone to inflow and infiltration, the Downspout Disconnection Program to disconnect any improper stormwater connections, and the Spot Repair Program in which any cracks or deficiencies are fixed.	N/A
Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater	Reliability	100% of the wastewater is treated to a secondary level or better	Maintain
Number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total numbers of properties connected to the municipal wastewater system	Reliability	The Region currently does not own any combined sewers.	N/A

[1] O. Reg 588/17 Required Level of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system [1]	Reliability	0.0000402	Improve
The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	Reliability	0.0027%	Improve
Percentage of wastewater infrastructure rated as Good and Very Good of Total	Reliability	75.4%	80%
Treatment Assets - Maintenance Costs as a % of Replacement Asset Value	Efficiency	0.47%	0.65%
Key Performance Indicators			
Percentage of unscheduled maintenance work orders compared to the total number of maintenance work orders for Pumping Stations	Reliability	43%	Improve
Collection Assets - Number of downspouts disconnected annually	Sustainability	8	Maintain
Collection Assets - Number of weeping tiles disconnected annually	Sustainability	37	Maintain
Collection Assets - Number of bypasses at pumping stations	Reliability	4	Improve

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Collection Assets - Number of blocked sewers per 100 km of sewer pipes	Reliability	0.4	Maintain
Treatment Assets - Plant Process Downtime Hours, 5 Year Rolling Average	Reliability	3,443	2,754.4
Treatment Assets - Plant Maintenance, All Planned Work	Efficiency	87%	95%
Treatment Assets - Availability of Backup Power for Wastewater Treatment Plants	Reliability	100%	100%
Treatment Assets - Biosolids land applied to biosolids produced	Sustainability	100%	100%

5.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. The Region manages a broad range of lifecycle activities for Wastewater assets that include design, planning, acquisition or construction, commissioning, operating, repair and maintenance, refurbishment or rehabilitation, decommissioning and disposal, and eventual replacement of all assets.

The importance of lifecycle activities for Wastewater assets ensures the long-term function, reliability, and sustainability of critical infrastructure. Proper lifecycle management helps municipalities manage costs, reduce risks, and improve service delivery performance. The lifecycle activities listed in Table 5-4 that summarize the Region's current approaches ensure that these infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being.

Table 5-4. Wastewater Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
Disposal Activities		
• Decommissioning and disposal of wastewater collection or treatment assets, and materials according to regulations and standards.	All	• Improper disposal may lead to environmental impacts and expenses.
• For replacement of equipment executed by the maintenance function, the P-Shell process ensures costs and master data records are accurately assigned separately to disposed and the replacement equipment.	Vertical – Treatment	• Inaccurate SAP equipment records prevent effective management of equipment during the operations and maintenance lifecycle stage.
Growth Activities		
• Capital projects and expansion needs are identified to accommodate growth as identified through the development of Master Plans. • Undertake environmental assessments for new developments.	All	• Growth activities are aligned with when actual development occurs.
Maintenance Activities		
• Implementation and optimization of Reliability Centered Maintenance program to ensure critical infrastructure is maintained, breakdowns are minimized, and the service life of the assets are maximized.	Vertical - Treatment	• Potential for increased maintenance and other life cycle costs. • Potential service implications.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
• Preventative maintenance (PM) and Predictive Maintenance (PdM) programs and activities for treatment assets including equipment, and water sample testing from wells and treatment plants. • Plan, schedule and execute proactive work to maintain assets in good and very good condition e.g. preventive maintenance and predictive maintenance tactics. • Diagnose and repair partial and fully functionally failed equipment, process and plant, and restore condition back to design standards.	Vertical	• Potential for increased maintenance and other life cycle costs. • Potential service implications.
• Reactive maintenance may arise during normal operation of assets or from inspections.	All	• Delayed maintenance activities due to lack of inspection data resulting in increased lifecycle costs.
• Routine and preventative maintenance programs for collection assets: spot repair, annual maintenance flushing, manhole inspection, preventative maintenance program, CCTV inspection. • Performance monitoring of the system.	Vertical - Collections	• Increased rate of asset deterioration and service implication leading to customer dissatisfaction.
Non-Infrastructure		

• Lifecycle models have been developed for wastewater services collection and treatment assets which predict asset condition. • Joint contracts with local municipalities to minimize customer disruption and promote project synergies. • Project coordination with other services such as transportation and water to minimize construction impacts and costs. • Perform condition assessments at regular intervals (i.e., 5-year cycles) on all facilities to inform maintenance and capital planning programs, avoiding reactive, unplanned maintenance or replacement costs. • Complete condition needs assessment at the assembly level, and build rehabilitation plans to replace assets and improve condition grade. • Optimization Program for linear and treatment assets enhances level of service, facility performance and capability resulting in SCADA automation of equipment, operating cost savings and extending asset life. • Annual maintenance flushing program, manhole inspection program, preventative maintenance program, and CCTV inspection programs to assess condition of linear assets. • Enforcement of By-law No. 2-03 to regulate and control discharges into the sanitary sewers & sanitary sewage works. • Downspout disconnection program to reduce stormwater flows in the sanitary system. • Development of biosolids management strategy through the development of the Biosolids Master Plan.	All	• Potential for increased risk of higher operating and maintenance costs. • Potential for impacting service delivery to residents. • Lack of coordination with other service areas may increase overall lifecycle costs associated with providing all services for the Region. • Potential risk of sewer backup.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
Condition Appraisal and Refurbishment Activities		
• Condition assessment of Mechanical, Electrical and Instrumentational equipment components, controls and power systems, to identify sources of deterioration and improvement strategies to extend life of assets and defer replacement through refurbishment and enhancement of maintenance strategies.	Vertical - Treatment	• Prematurely dispose of installed equipment. • Increase consumption of capital expenditure and resources that design, plan and construct infrastructure. • Potential service implications. • Write off equipment before they are fully amortized/depreciated.
Repair Activities		
• Restore the function of critical equipment, control and power systems to enable safe operation of plant, processes and systems.	Vertical - Treatment	• Potential for impacting service delivery.
Rehabilitation Activities		
• Rehabilitation needs are identified through ongoing maintenance, inspections, and condition assessments. • Manhole rehabilitation program to identify any deficiencies. • Lining and Spot Repair Program. • Enhanced Basement Flooding Prevention Subsidy Program for private sewer lateral lining and repair.	All	• Premature asset failure and increased lifecycle costs.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
Replacement / Construction Activities		
• Pipe replacement is based on condition, replacement methods include horizontal directional drilling, open-cut replacement, pipe bursting.	All	• Potential service implications. • Delay in replacement may result in higher overall lifecycle costs and potential service impacts.
• Replacement of equipment, SCADA, and facility assets based on condition and performance. • Replacement of Pumps, Valves, etc. • Re-use, re-purpose equipment on demand. • Replace like-for-like equipment and update SAP Enterprise Asset Management records.	Vertical	• As above.
Service Improvement Activities		
• Inflow & Infiltration program to identify areas and sources of inflow and infiltration. • Upgrades or operating changes to equipment to improve operational efficiencies. • Wastewater hydraulic modelling identifies areas that require system improvements such as treatment facility capacity upgrades. • Alignment with Energy Management Strategy, which includes potentially reducing the number of pump stations (see Wastewater Pumping Station Master Plan).	All	• Projects/activities are delayed, and lack of service improvement can result in unanticipated risks. • Missed opportunity to reduce energy consumption.

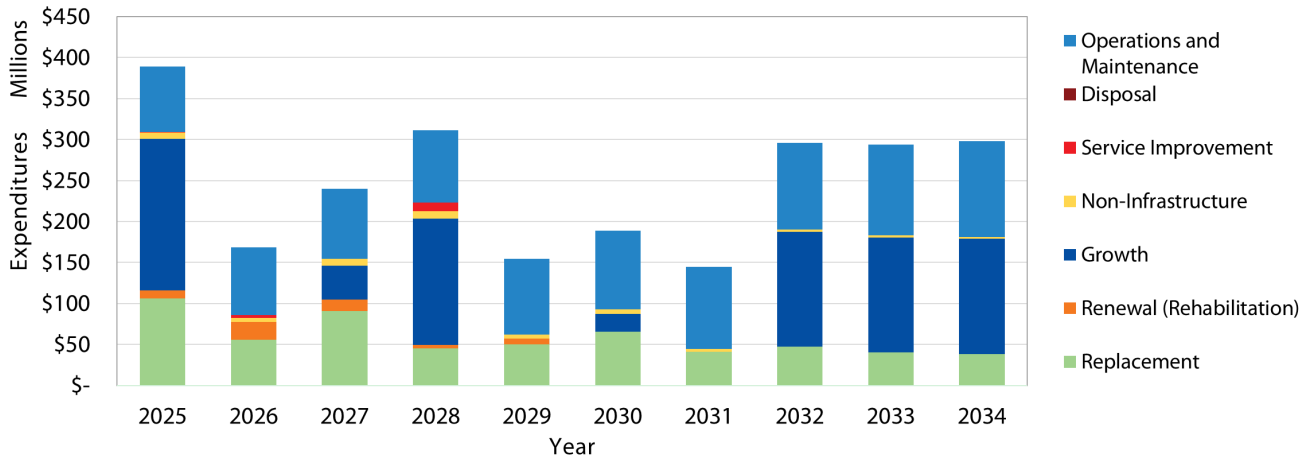
5.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outlined in Table 5-4 to plan work and assess future expenditure needs for Wastewater assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Wastewater assets, developed by leveraging staff expertise, and are aligned with industry's best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities-that maintain infrastructure in a state of good repair and support continued service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy. For this AMP, these activities and their associated costs, determined based on the analysis of the Region's Capital and Operating budgets, are assumed to be sufficient in meeting current needs. Figure 5-4 shows the approved 2025 budget lifecycle activities for Wastewater.

Figure 5-4. Wastewater Anticipated Lifecycle Management Activities - Capital & Operating Budgets



The 2025 budget identifies a total of $0.8 Billion for Wastewater assets in the next 10 years to meet growth requirements based on the planned projects funded through development charges or initiatives addressing the Region's growing population. The 2025 operating budget's 10-year forecast is based on general inflation of 2.0%, customer growth ranging from 1.4% to 3.0%, and an increase in plant maintenance ranging from 2.0% to 6.0% to reflect inflationary increases and new infrastructure to support growth.

In addition to changes through Bill 23, the demand for infrastructure has been accelerated to achieve the Provincial housing target to achieve 1.5 million homes by 2031. The Region of Halton is in the process of the development of an Integrated Master Plan (IMP), to complete the next region-wide Water, Wastewater, and Multi-Modal Transportation Master Plans. The outcome of this work will be a long-term integrated servicing strategy for Region's Infrastructure to accommodate future growth. It is anticipated the results of this study will impact the expenditure required for growth, and in turn O&M.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

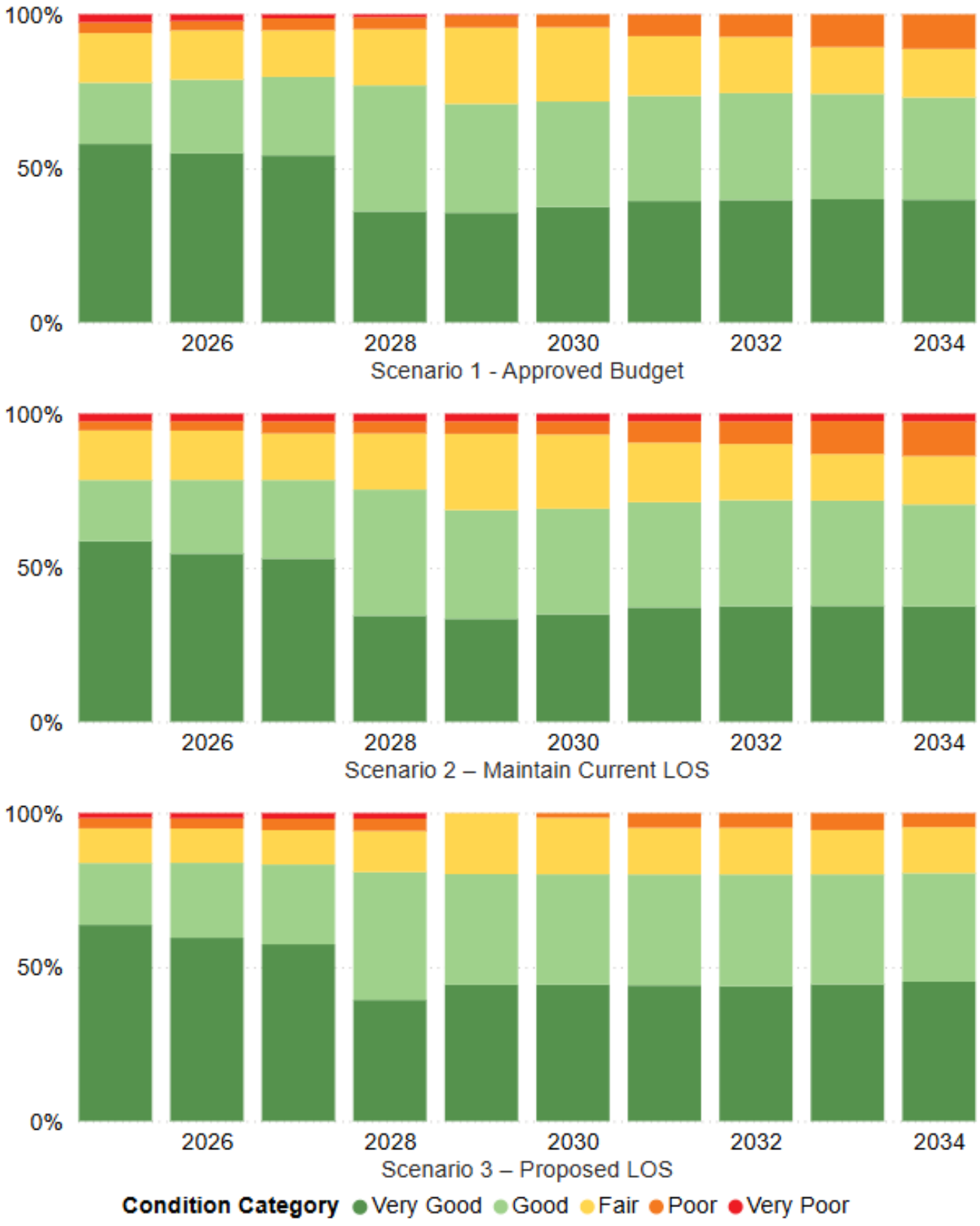
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the need to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

5.5. Impact on Current and Proposed Level of Service

Figure 5-5 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 5-5. Wastewater Condition Profile for Service Level Scenarios



Scenario 1 shows that following the approved 2025 budget improves overall asset condition and removes any assets in very poor condition.

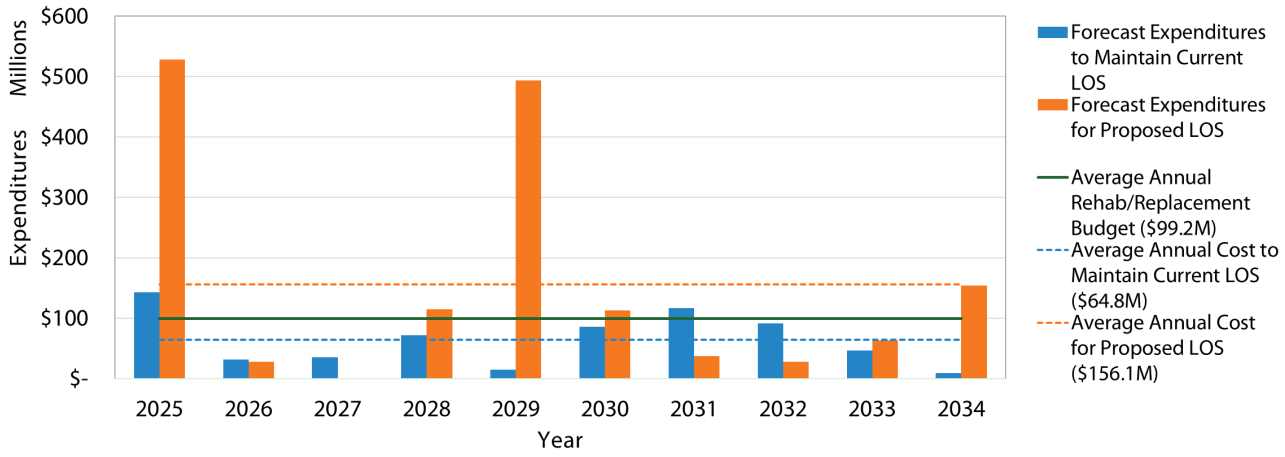
Scenario 2 keeps assets in approximately the same condition over the 10-year forecast period, with the focus on not allowing the number of assets in very poor condition to increase by the end of the forecast period. The Region currently has enough funding to keep assets in approximately the same condition over the 10-year forecast period, but this scenario does not meet the goals of the organization to improve asset condition.

Based on Halton Region's 2023-2026 Strategic Business Plan, the proposed LOS was set to achieving 80% of assets in good to very good condition. To achieve the proposed LOS, an additional annual investment of $56.9M for rehabilitation and replacement activities for Wastewater assets.

5.6. Estimated Preliminary Potential Infrastructure Gap

Figure 5-6 illustrates that rehabilitation and replacement expenditures of $64.8M and $156.1M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $99.2M.

Figure 5-6. Wastewater Rehabilitation & Replacement Expenditure Scenario Comparison



While there is no gap to maintain the current service level, there is a potential average annual estimated capital funding gap of $56.9M to achieve proposed service levels. While the additional annual capital funding requirement is substantial, it only accounts for 0.7% of the total replacement value of wastewater assets as shown in Table 5-5.

The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in construction and replacement values for wastewater assets. Continued periods of high inflation and cost escalations coupled with the increase in

construction in the GTHA to support the housing targets will put additional pressure on future years' budgets. It is expected that it will take several years to recover from the high impacts of inflation experienced over the past several years.

Table 5-5. Wastewater Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$75.6M	$75.6M	$75.6M
Non-Infrastructure	$7M	$7M	$7M
Rehabilitation & Replacement	$99.2M	$64.8M	$156.1M
Service Improvement	$1.5M	$1.5M	$1.5M
Capital Expenditures	$183.3M	$148.9M	$240.2M
Capital Infrastructure Gap		**No Gap**	**$56.9M (Gap)**
Operations & Maintenance	$82.5M	$82.5M	$82.5M
Total Expenditures	$265.8M	$231.4M	$322.7M
Gap as % of Replacement Value		**No Gap**	**0.7% (Gap)**

TRANSPORTATION & STORMWATER

The Region is committed to expanding transportation options throughout Halton while promoting safety, minimizing environmental impact, optimizing traffic flows, and keeping infrastructure in a state of good repair. The Region is also committed to providing reliable stormwater drainage for supporting the Region's transportation network

Replacement Value
$ 2,728.5 M

Average Age
22 Years

Average Estimated Service Life
49 Years

Average Condition
Good

% of Assets in Good to Very Good Condition
73%

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
$10.6M	**$22.5M**

6. Transportation & Stormwater

Halton Region's goal is to provide transportation services to residents and businesses that support a healthy and active lifestyle, contribute to the Region's economic vitality while balancing economic, social, and environmental goals, and keeping the infrastructure in a good state of repair. The transportation assets that support the service include roadways that support the movement of people and goods, bridges and culverts, and road right-of-way assets.

Halton Region is also specifically responsible for stormwater management along Region's roads, and currently maintain assets related to stormwater collection, pre-treatment and minor structures that support the Region's transportation network.

The Transportation and Stormwater assets have a combined total replacement value of over $2.7 billion. The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing recent construction projects and estimating current replacement values for these assets.

6.1. State of the Infrastructure (Transportation)

The following sections summarize the portfolio of assets associated with the Region's Transportation services.

6.1.1. Asset Overview & Valuation

Table 6-1 provides the inventory and current replacement value for the assets included in this AMP.

Table 6-1. Transportation Asset Inventory and Current Replacement Value ($ Millions)

Asset Class & Asset Type	Count	Unit	2024 Estimated Replacement Value
Transportation Structures			
Bridges	92	Ea.	$443.6 M
Culverts (≥3 m)	94	Ea.	$208.3 M
Culverts (<3 m)	152	Ea.	$115.9 M
Noisewalls	22.9	Km	$89.2 M
Retaining Walls	140	Ea.	$29.5 M
Roadway			
Urban Roads	703.3	Lane Km	$749.1 M
Sub-Urban Roads	58.4	Lane Km	$52.2 M
Rural Roads	409.2	Lane Km	$295.1 M
Road Right-of-Way			
Signalized Intersections	268	Ea.	$156.5 M
Streetlights	5,345	Ea.	$98.0 M
Guiderails	654	Ea.	$23.8 M
Total Replacement Value			**$2,261.1 M**

6.1.2. Asset Condition and Age

Transportation assets condition is determined using established condition rating criteria or an age-based approach depending on the asset type. Transportation assets are on average in Good condition with the average age of all assets less than their estimated service life as shown in Figure 6-1.

Figure 6-1. Transportation Assets Overall Condition (%), Age and Estimated Service Life (Years)

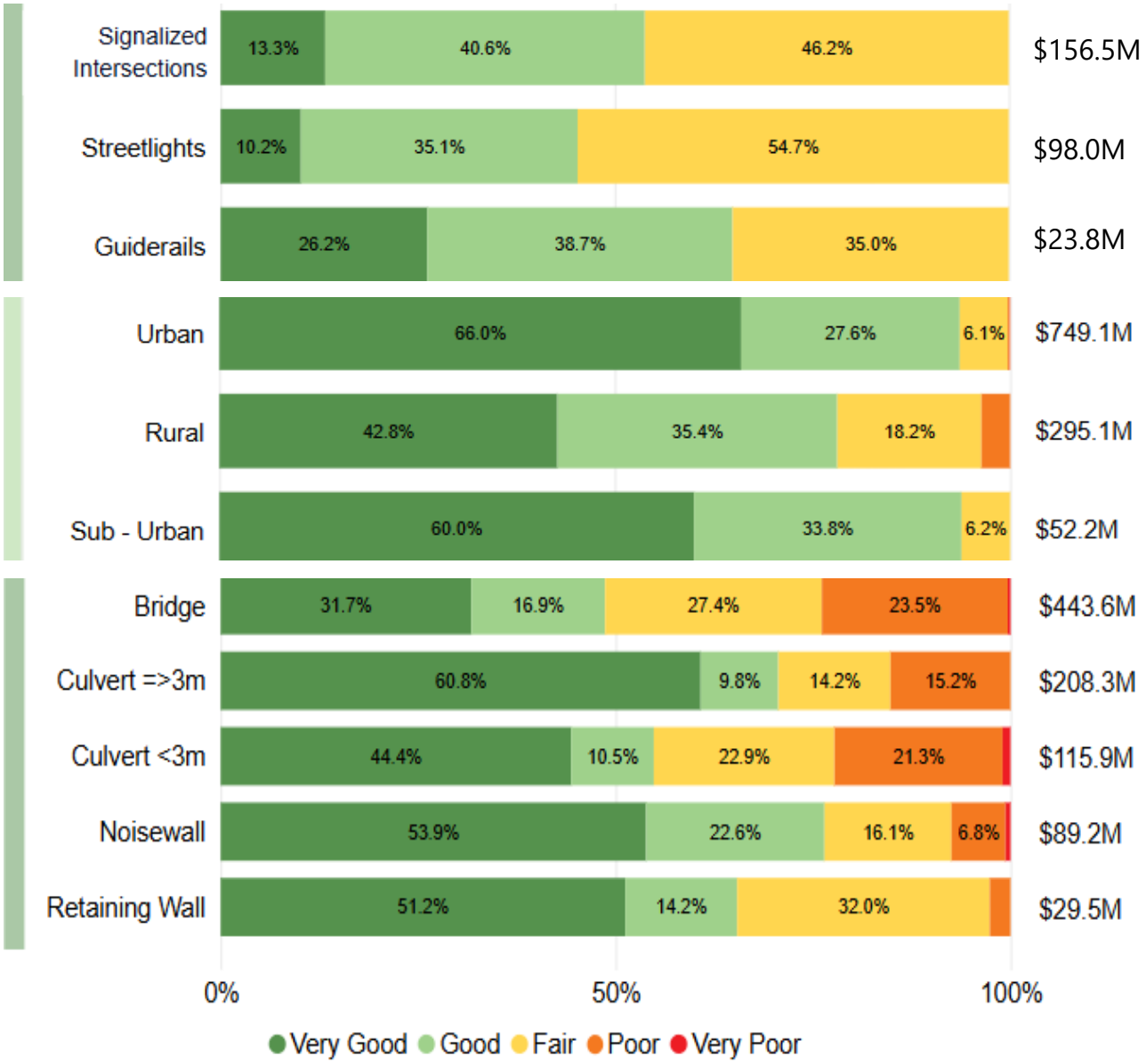
Table 6-2 provides how condition rating is assigned to the various types of transportation assets. Industry standard condition rating scales such as pavement quality index (PQI) and bridge condition index (BCI) are used to determine the condition of roads, bridges and structural culverts. Region's roads are inspected over a three-year cycle with the results from these pavement condition inspections monitored and assessed through Pavement Management Data Collection. The results from these are categorized into one of the five condition ratings. Bridges and culverts are inspected every two years in accordance with OSIM. BCI results for transportation structures, where available, are categorized into one of the five condition ratings. For road right-of-way assets, condition is assigned strictly based on age of the assets. For all other asset types, age and remaining estimated service life is used to determine condition.

Table 6-2. Transportation Condition Rating Criteria

Condition Rating	Roads (PQI)	Bridges/Culverts (BCI)	Road Right of Way Assets (Age in Years)	All Other Assets (Remaining ESL)
Very Good	80 – 100	80 – 100	< 5	80% – 100%
Good	60 – 79	70 – 79	> 5	60% – 79%
Fair	40 – 59	60 – 69	Guiderails > 15 Traffic Signals > 20 Streetlights > 25	40% – 59%
Poor	20 - 39	30 – 59	N/A	20% – 39%
Very Poor	0 – 19	0 – 29	N/A	0% – 19%

The overall condition of Transportation assets, as a percentage of replacement values, can be viewed at the asset type levels in Figure 6-2.

Figure 6-2. Transportation Condition Distribution by Asset Type (%)



6.2. State of the Infrastructure (Stormwater)

The following sections summarize the portfolio of Region's assets providing stormwater drainage on Region's roads.

6.2.1. Asset Overview & Valuation

Table 6-3. provides the inventory and current replacement value for the assets included in this AMP.

Table 6-3. Stormwater Asset Inventory and Current Replacement Value ($ Millions)

Asset Class & Asset Type	Count	Unit	2024 Estimated Replacement Value
Stormwater Collection			
Storm Mains	163.3	Km	$427.4 M
Stormwater Pumping Stations	4	Ea.	$4.2 M
Stormwater Structures			
Minor Culverts (Storm)	759	Ea.	$7.6 M
Retention Structure	33	Ea.	$6.7 M
Stormwater Pre-Treatment			
Oil Grit Separator (OGS)	115	Ea.	$13.5 M
Stormwater Ponds	9	Ea.	$8.1 M
Total Replacement Value			**$467.4 M**

6.2.2. Asset Condition and Age

Stormwater asset condition is determined using established condition rating criteria or an age-based approach, depending on the asset type. Stormwater assets are on average in Good condition with the average age of all assets less than their estimated service life as shown in Figure 6-3.

Figure 6-3. Stormwater Assets Overall Condition (%), Age and Estimated Service Life (Years)

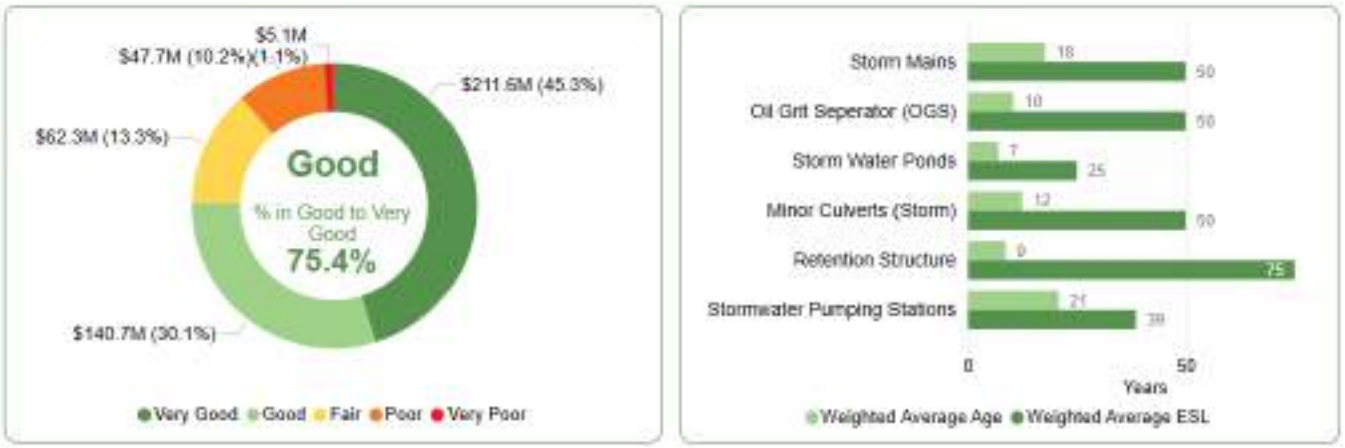


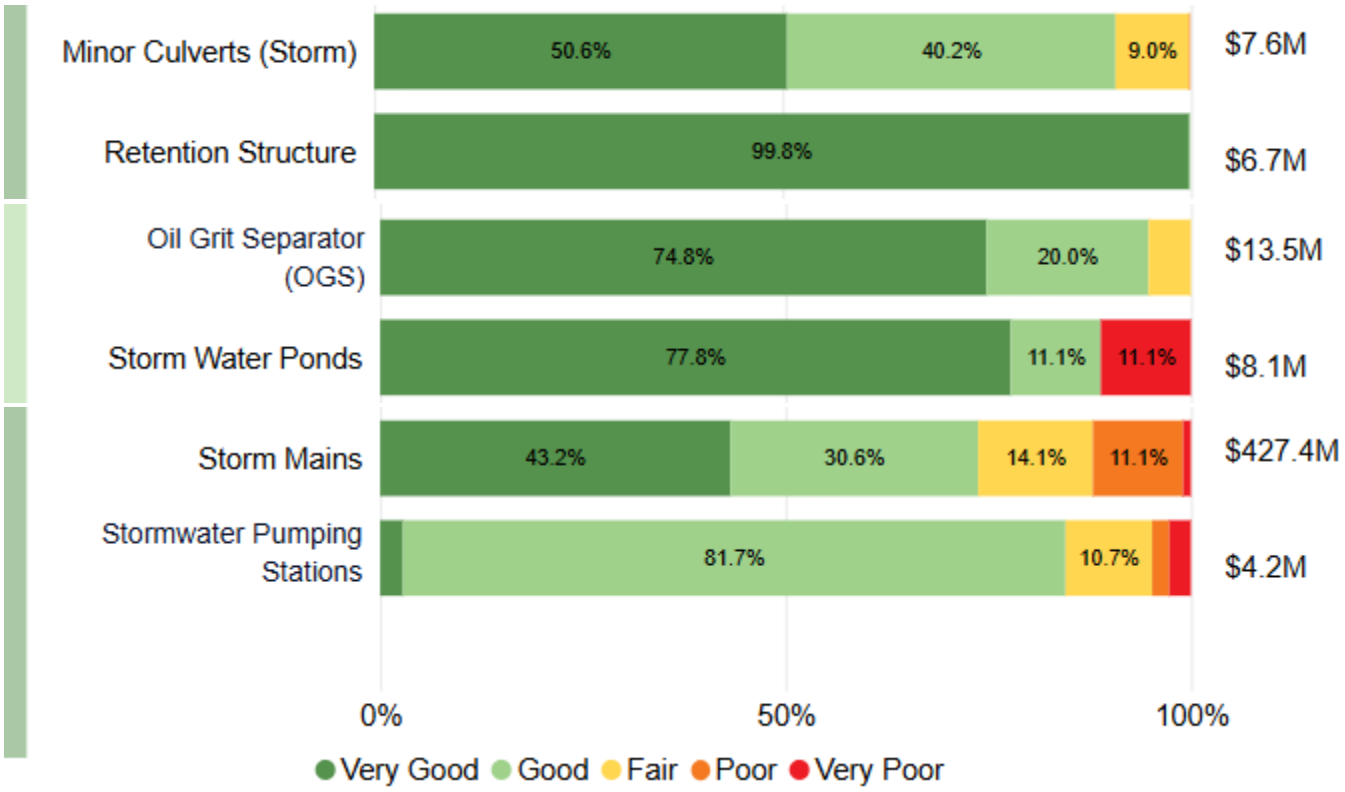
Table 6-4 provides how condition rating is assigned to the various types of stormwater assets. Capital needs assessments (CNA) are used to determine the condition of stormwater pumping stations. When inspection-based condition scores were not available, age and remaining estimated service life is used to determine condition.

Table 6-4. Stormwater Condition Rating Criteria

Condition Rating	Pumping Stations (CNA)	All Other Assets (Remaining ESL)
Very Good	1	80% – 100%
Good	2	60% – 79%
Fair	3	40% – 59%
Poor	4	20% – 39%
Very Poor	5	0% – 19%

The overall condition of Stormwater assets, as a percentage of replacement values, can be viewed at the asset type levels in Figure 6-4.

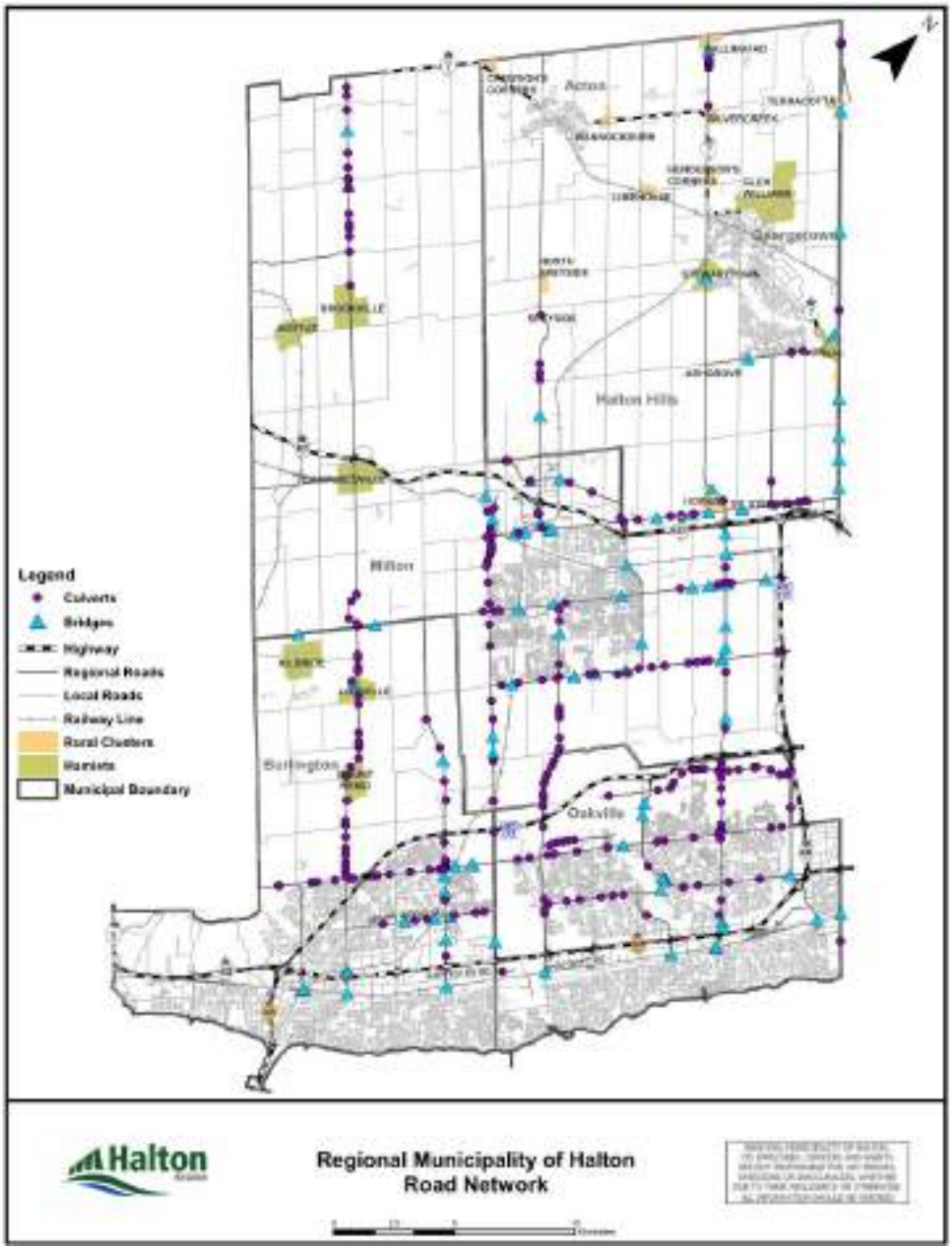
Figure 6-4. Stormwater Condition Distribution by Asset Type (%)



6.3. Levels of Service (Transportation)

Community Level of Service Objective	The Region is committed to expanding transportation options throughout Halton while promoting safety, minimizing environmental impact, optimizing traffic flows and keeping infrastructure in a state of good repair.

Figure 6-5. Halton Region Road Network (Transportation Assets)



Halton's transportation services provide a range of options for moving about in a safe and efficient manner. The importance of efficient transportation is essential to building a strong economy and improving the quality of life of all residents.
The service functions that are provided by the transportation assets include:

- Mobility & Economic Development
- Accessibility & Connectivity
- Safety
- Efficiency & Reliability

Table 6-5. Transportation Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Description or images that illustrate the different levels of road class pavement condition[1]	Quality	See Figure 6-6	N/A
Description or images of the condition of bridges and how this would affect use of bridges[1]	Quality	See Figure 6-6	N/A
Description or images of the condition of culverts and how this would affect use of culverts[1]	Quality	See Figure 6-6	N/A
Number of lane-kilometers of arterial roads as a proportion of square kilometers of land area[1]	Scope	1.21 lane km / km2	Maintain
Percentage of bridges in the municipality with loading or dimensional restrictions. [1]	Scope	2.17%	Maintain
Description of the traffic that is supported by municipal bridges[1]	Scope	Region's bridges support traffic over and under for rail, heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians and cyclists.	N/A

[1] O. Reg 588/17 Required Level of Service Metric

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Description, which may include maps, of the road network and its level of connectivity[1]	Scope	Halton Region's Road network, as shown in Figure 6-5, connects the rural and urban centres and provides connectivity to the provincial highway system. The primary east-west arterial roads include Dundas Street through Burlington and Oakville; and Derry Road, Britannia Road and Steeles Avenue through Milton and Halton Hills. The primary north-south arterial roads include Regional Road 25, Trafalgar Road and Guelph Line. These roadways provide connectivity to Highways 7, 401, 407 and the QEW/403.	Maintain
Average surface condition (e.g., Excellent, Good, Fair or Poor) for paved roads (PQI)[1]	Quality	78.04	Improve
For bridges in the municipality, average bridge condition index value (BCI) [1]	Quality	71.82	Improve
For structural culverts in the municipality, average bridge condition index value (BCI) [1]	Quality	82.22	Improve
Percent of Transportation assets rated Good to Very Good (based on replacement value)	Reliability	72.5%	80%

[1] O. Reg 588/17 Required Level of Service Metric

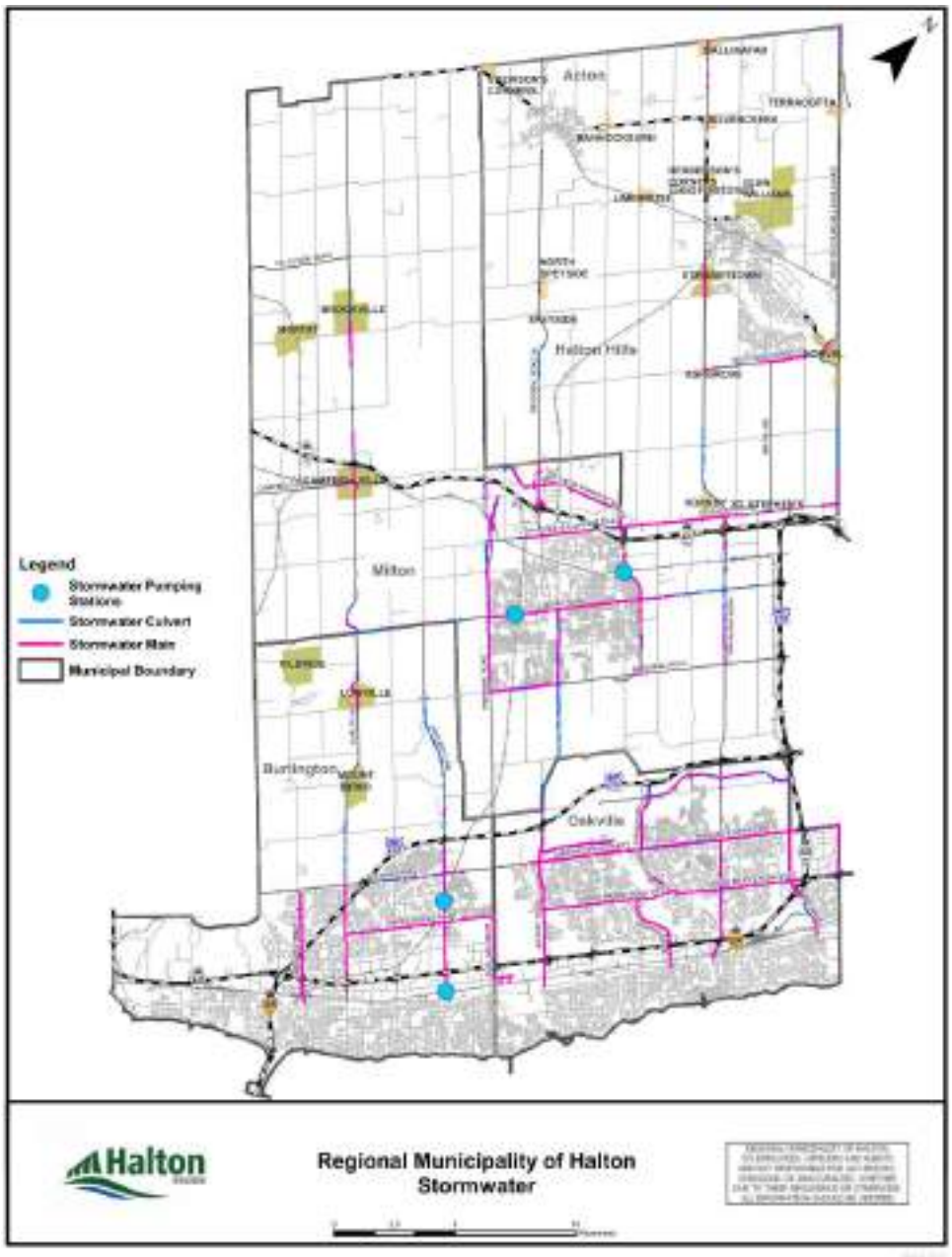
Figure 6-6. Description and Images of PQI and BCI Condition Rating

Condition Rating	Roads	Bridges	Culverts
Very Good | PQI & BCI: 80-100 Well maintained, good condition, new or recently rehabilitated. Fit for future use.			
Good | PQI: 60-79.99 & BCI: 70-79.99 Fully functional and in good condition for current use. Exhibiting normal rates of very minor deterioration. Ongoing regular maintenance is sufficient.			
Fair | PQI: 40-59.99 & BCI: 60-69.99 Acceptable and fully functional with some minor signs of deterioration. Additional maintenance may be required at times.			
Poor | PQI: 20-39 & BCI: 30-59.99 Fully functional and reliable but showing signs of deficiency. Maintenance and other treatments required.		No Image No structure >= 3m with this BCI range	
Very Poor | PQI: 0-19.99 & BCI: 0-29.99 Generally at end of the assets service life but still fit for service and is reliable. Capital treatments required.		No Image No structure >= 3m with this BCI range	

6.4. Levels of Service (Stormwater)

Community Level of Service Objective	The Region is committed to providing reliable stormwater drainage on Region's roads to support the transportation network

Figure 6-7. Halton Region Stormwater Network (Stormwater Assets)



Stormwater assets along the Halton Region's major arterial roads is comprised of the following assets: storm mains, laterals, catch basins, Oil and Grit Separators, pumping stations, ditches, culvert, channels, storm ponds and storm retention structures at a high level.

The stormwater system is part of every regional road section, each roadside environment (urban, semi-urban and rural road) has elements of the stormwater system from a storm main to a ditch to convey stormwater drainage. The regional road sections are illustrated on the attached map.

The stormwater system provides drainage of stormwater off the regional roadway to support the transportation network,

Table 6-6. Stormwater Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system. [1]	Scope	See Figure 6-7.	N/A
Percentage of properties in municipality resilient to a 100-year storm. [1]	Scope	Not Applicable - Halton Region's stormwater system only includes assets associated with its major arterial roads. Protection of properties from flooding is managed by surrounding local municipalities and Conservation Halton.	N/A
Percentage of the municipal stormwater management system resilient to a 5-year storm. [1]	Scope	100%	Maintain
Percentage of storm assets rated as Good to Very Good (based on replacement value)	Reliability	75.4%	80%

[1] O. Reg 588/17 Required Level of Service

6.5. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. The Region manages various lifecycle activities for Transportation & Stormwater assets that include design, planning, construction, maintenance, repair, rehabilitation, disposal, and eventual replacement of all assets.

The importance of lifecycle activities for transportation and stormwater assets ensures the long-term functionality, reliability, and sustainability of these critical infrastructure systems. The lifecycle activities listed in Table 6-7 and Table 6-8 summarize the Region's current approaches to ensure infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being.

6.5.1. Transportation Lifecycle Activities

Table 6-7. Transportation Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
Disposal Activities		
• Disposal activities include decommissioning the road by blocking off entry or removing the pavement and redirecting traffic. • Asphalt disposal according to regulations and standards.	Roadways	• Improper disposal may lead to environmental impacts and expenses.
• Disposal activities include closing the bridge, demolition, and disposal of materials according to regulations and standards.	Structures	• As above.
• Disposal of damaged guard rails, signage, traffic and streetlight poles.	Right-of-way Assets	• As above.
• Disposal of traffic signals and cabling when they are replaced.	Traffic Signal Network Assets	• As above.
Growth Activities		
• Capital projects include road widening, extension, and new construction projects to service new growth and intensification. • Road volume/capacity ratio analysis to determine strategies to accommodate travel demand growth. • Transportation master plans. (Integrated Master Plan).	All	• Growth activities are aligned with when actual development occurs.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
• Installation of right-of-way assets in areas with new road construction to service growth in previously unserved areas.	Right-of-way Assets	• Potential service implications.
Maintenance Activities		
• Reactive maintenance activities. • System deficiencies identified through weekly routine patrols and spring and fall night tours. • Minor deficiencies are repaired on the spot when possible.	All	• Potential for Increased lifecycle costs. • May contribute to increasing asset deterioration and potential service implications. • Customer dissatisfaction such as long traffic congestion and road closures. • Delayed maintenance activities may lead to more costly reactive repair activities such as road resurfacing.
• Pavement condition monitoring through the Pavement Management Data Collection and Review to determine appropriate pavement interventions/treatments. • Road maintenance in accordance with O. Reg. 239/02. • Localized spot repairs, resurfacing, crack sealing, and rehabilitation of pavement markings on an annual basis. • Spot repair and pothole repair. • Guiderail repair and acoustic fence repair. • Road salting and snow removal in the winter.	Roadways	• Higher maintenance and repair costs.
Non-Infrastructure		
• Lifecycle models have been developed for transportation assets which predict asset condition. • Condition inspections.	All	• Potential for higher operating and maintenance costs.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
• Biennial structure inspections in accordance with O. Reg. 104/97 to ensure all bridges and major structures are kept in a state of good repair. OSIMs for bridges, culverts, noise walls and Retaining walls completed biennially.	Structures	• Service implications.
• Road weather information systems (RWIS).	Roadway	• May contribute to service implications.
• Coordinating road construction projects with water and wastewater projects to reduce the impacts of construction on the community. • Extending pavement life on certain secondary roads by applying load restrictions where full truck loads can impact the pavement structure. • Travel demand management and active transportation initiatives encourage multimodal transportation.	Roadway and Structures	• Not planning for multimodal transportation may lead to unanticipated traffic congestion. • Lack of coordination with other service areas may increase overall lifecycle costs associated with providing all services for the Region. • Delayed assessment of roads may impact service delivery to residents.
• Annual speed and delay review of corridors. • Optimization of signal timing which includes the Annual Corridor Review Program. • Optimization of traffic by implementation of an Advanced Traffic Management Centre/System. • Update traffic signal timings when necessary.	Traffic Signal Network Assets	• Inefficient signal timing may lead to increased traffic congestion along road sections and at intersections.
Rehabilitation Activities		
• Minor and major rehabilitation activities based on condition and relevant work history. • Roadways: Scheduled rehabilitation activities such as road resurfacing and spot repairs.	All	• Increased lifecycle costs if rehabilitation activities are done improperly or not as scheduled.

Asset Management Practices	Asset Class	Risks Associated with Not Following the Strategy
• Asset repair is needed after complaints, inspections or weather events.	Right-of-way Assets	• Service implications
Replacement/ Construction Activities		
• Replacement or reconstruction based on asset condition and relevant work history.	All	• Delay in replacement may result in higher overall lifecycle costs, longer service impacts, and customer dissatisfaction.
• Light fixture, guide rails, streetlight, traffic signals and signage replacement.	Right-of-way and Traffic Signal Network Assets	• Traffic Signal Network Assets: Delayed traffic signal replacements will lead to increased traffic. congestion at intersections and further service disruption.
Service Improvement Activities		
• Installing new streetlights or signage in areas with high collision rates.	Right-of-way Assets	• Service implications due to lack of signage or improper lighting. • Missed opportunity to reduce energy consumption.

6.5.2. Stormwater Lifecycle Activities

Table 6-8. Stormwater Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Risks Associated with Not Following the Strategy
Non-Infrastructure	
• Lifecycle models have been developed for stormwater management assets which predict asset condition. • Project coordination with local municipalities and other service areas such as transportation to minimize construction impacts and costs. • Perform capital needs assessment at regular intervals on stormwater pumping stations to inform maintenance and capital planning programs, avoiding reactive, unplanned maintenance or replacement costs.	• Not meeting the increased demand and additional capacity requirement on the stormwater system. • Lack of coordination between local municipalities and other services may cause construction delays, increased service disruption, construction costs, and replacing assets before the end of estimated service life.
Maintenance Activities	
• Stormwater assets routine maintenance programs that include Spot Repair program, Annual Maintenance Flushing Program, Manhole Inspection Program, Preventative Maintenance Program, and CCTV Inspection Program. • Annual inspection of oil-grit separators (OGS). • Scheduled and reactive cleaning and maintenance of OGS. • Street sweeping to decrease amount of debris and litter entering the system. • Downspout disconnection program to reduce stormwater flows in the sanitary system. • Ditching and shouldering maintenance to allow for proper rural stormwater flow.	• Increase in overall lifecycle costs if maintenance is done improperly or not as scheduled. • May contribute to reactively restoring function and replacing assets prematurely. • May contribute to service disruptions and road closures and customer dissatisfaction.

Asset Management Practices	Risks Associated with Not Following the Strategy
Rehabilitation Activities	
• Rehabilitation needs are identified through ongoing maintenance, inspections, and condition assessments. • Manhole rehabilitation program to identify any deficiencies. • Pipe relining and grouting.	• Increased lifecycle costs due to improper and unplanned rehabilitation activities.
Replacement/ Construction Activities	
• Pipe replacement based on the current pipe condition and appropriateness of replacement methods such as open-cut replacement, horizontal directional drilling, and pipe bursting.	• Delay in construction projects may result in higher project costs, customer dissatisfaction and road closures.
Service Improvement Activities	
• Upgrades or operating changes to equipment to improve operational efficiencies. • Reducing the amount of inflow and infiltration (I&I) that can drive service improvement activities in the stormwater system, such as increasing the capacity at pumping stations. • Implementation of low impact development (LID) technologies.	• Lack of service improvement can result in higher operation and maintenance, and capital needs.

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Disposal activities include decommissioning stormwater pumping stations, or assets belonging to the facilities, and materials according to regulations and standards. • Assessment of material type to determine considerations of health and safety concerns. • Disposal of pipe when decommissioned.	• Improper disposal can lead to environmental impacts and expenses.
Growth Activities	
• Capital projects to upgrade and extend stormwater system to accommodate for population growth. • Undertake environmental assessments for new developments.	• Growth activities are delayed with future growth projections requiring realignment to meet capacity needs. • Inadequate system capacity can potentially lead to operational issues.

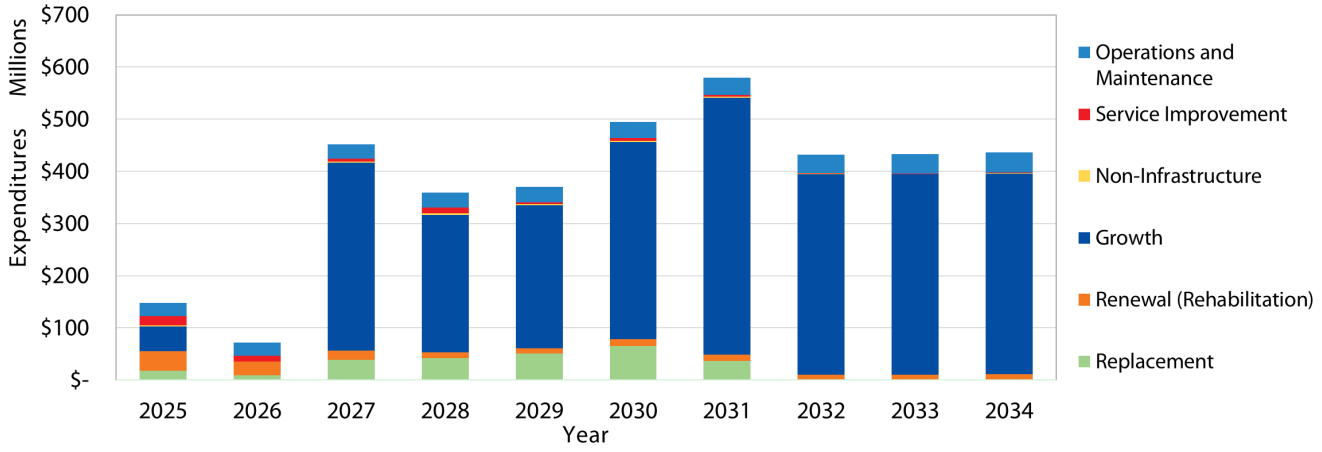
6.6. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outline in Table and Table to plan work and assess future expenditure needs for Transportation and Stormwater assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Transportation and Stormwater assets, developed by leveraging staff expertise and are aligned with the industry's best practices. The forecasted needs focus on the investment requirements associated with rehabilitation and replacement activities that maintain infrastructure in a state of good repair and support continue service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership, the scenario comparison also captures other lifecycle activities such as those related to disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements where applicable to understand the full cost of ownership. For this AMP, these activities and their associated costs are assumed to be sufficient in meeting current needs and proposed service levels. Figure 6-8 shows the approved 2025 budget lifecycle activities for Transportation and Stormwater.

Figure 6-8. Transportation & Stormwater Anticipated Lifecycle Management Activities - Capital & Operating Budgets



The 2025 capital budget identifies a total of $3 Billion in the next 10 years to meet growth requirements based on the planned projects funded through development charges or initiatives addressing the Region's growing population. The 2025 operating budget's 10-year forecast is based on general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year.

In addition to changes through Bill 23, the demand for infrastructure has been accelerated to achieve the Provincial housing target to achieve 1.5 million homes by 2031. The Region of Halton is in the process of the development of an Integrated Master Plan (IMP), to complete the next region-wide Water, Wastewater, and Multi-Modal Transportation Master Plans. The outcome of this work will be a long-term integrated servicing strategy for Regional Infrastructure to accommodate future growth. It is anticipated the results of this study will impact the expenditures required for growth, and in turn O&M.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

6.7. Impact on Current and Proposed Level of Service

Figure 6-9 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 6-9. Transportation & Stormwater Condition Profile for Service Level Scenarios

In Scenario 1, the condition of assets deteriorates more relative to the other scenarios over the 10-year forecast period, while there is an improvement in asset condition for Scenario 2 and 3.

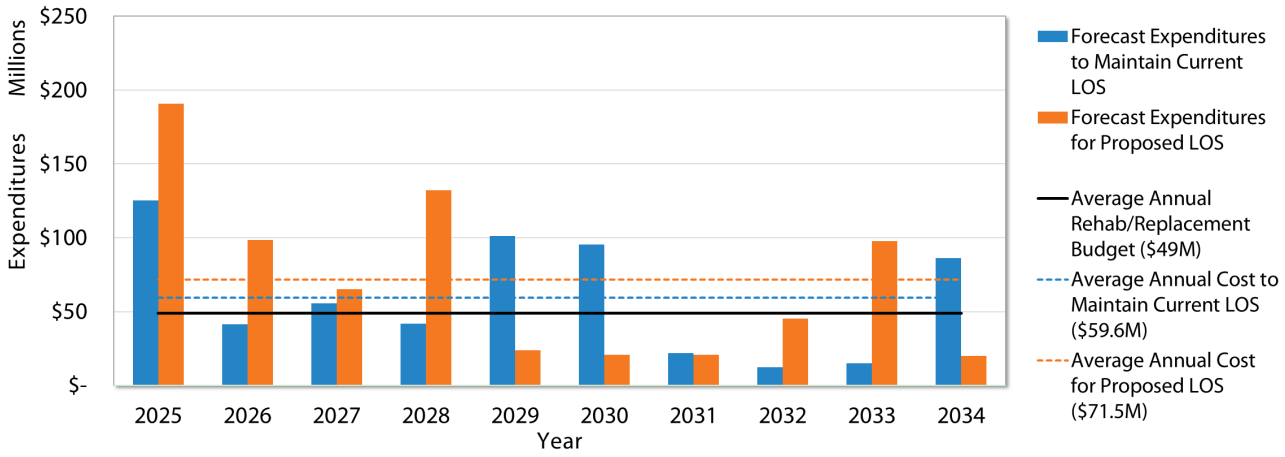
To achieve Scenario 2, the Region would require an additional annual investment of $10.6 M annually in rehabilitation and replacement, to keep assets in approximately the same condition to maintain existing service levels over the 10-year forecast.

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed service levels were set to achieve 80% of assets in good to very good condition. This would require an additional annual investment of $22.5M for rehabilitation and replacement activities for Transportation and Stormwater assets.

6.8. Estimated Preliminary Potential Infrastructure Gap

Figure 6-10. illustrates that rehabilitation and replacement expenditures of $59.6M and $71.5M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $49M.

Figure 6-10. Transportation & Stormwater Rehabilitation & Replacement Expenditure Scenario Comparison



This results in a potential average annual estimated capital infrastructure gap of $10.6M to maintain current service levels, and $22.5M to achieve proposed service levels. While these costs are substantial, they only account for 0.4% and 0.8% of the total replacement value as shown in Table 6-9.

The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values for transportation and stormwater assets. Continued periods of high inflation and cost escalations coupled with the increase in construction in the GTHA to support the housing targets will put additional pressure on future

years' budgets. It is expected that it will take several years to recover from the high impacts of inflation experienced over the past several years.

Table 6-9. Transportation & Stormwater Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$135.8M	$135.8M	$135.8M
Non-Infrastructure	$1.9M	$1.9M	$1.9M
Rehabilitation & Replacement	$49M	$59.6M	$71.5M
Service Improvement	$11.2M	$11.2M	$11.2M
Capital Expenditures	$197.9M	$208.5M	$220.4M
Capital Infrastructure Gap		**$10.6M (Gap)**	**$22.5M (Gap)**
Operations & Maintenance	$25.9M	$25.9M	$25.9M
Total Expenditures	$223.7M	$234.4M	$246.3M
Gap as % of Replacement Value		**0.4% (Gap)**	**0.8% (Gap)**

WASTE MANAGEMENT

Waste Management is responsible for an integrated and sustainable waste management system of collection, processing, and disposal of municipal solid waste for over 650,000 Halton residents, 2,200 commercial locations including 8 designated Business Improvement Areas (BIAs), as well as the operation and maintenance of the Halton Waste Management Site (HWMS) and 11 closed landfills. The Region is committed to providing a sustainable, equitable and responsible waste management system that efficiently serves our community, protects our environment and is responsive to change.

Replacement Value
$336.8 M

Average Age
28 Years

Average Estimated Service Life
81 Years

Average Condition
Good

% of Assets in Good to Very Good Condition
85%

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
$2.1M	**$1.2M**

7. Waste Management

Halton Region owns and operates the Halton Waste Management Site (HWMS), an integrated waste management facility that includes the only operating landfill in the Region. The HWMS opened in 1992 and is 126 hectares in size, 53 of which is the landfill with an approved total landfill capacity of 7.96 million cubic metres. The remainder of the state-of-the art facility includes a waste and recycling area, composting facility, household hazardous waste depot, reuse depot, bulk brush and rubble area, and a transfer station. Additional infrastructure at the HWMS includes a landfill gas collection system and leachate collection system. The Region is responsible for maintaining and monitoring a total of 11 closed landfills; 4 of these sites have active leachate collection systems. Of these 4, the Region owns and manages 3 closed landfills with active leachate collection systems located at Burlington North Service, Oakville 4th line and Georgetown Armstrong.

Halton Region's 2023-2030 Solid Waste Management Strategy provides the framework to increase the total diversion of waste generated to between 64% and 70% by the year 2030. In addition, the Strategy proposes to reduce greenhouse gas emissions by over 13,000 tonnes per year and extend the lifespan of the landfill out to 2050-2054 by decreasing the annual amount of garbage generated per person.

Halton residents' continued participation in waste diversion programs and services has been instrumental in diverting waste from landfill, and Halton Region continues to be a leader in waste diversion. The diversion rate is targeted at 60% in 2025, and in combination with the key initiatives identified in the Council approved Solid Waste Management Strategy, will continue to extend the landfill lifespan and defer the significant capital investment required to expand the landfill capacity.

7.1. State of the Infrastructure

The following sections summarize the portfolio of regional assets associated with Waste Management.

7.1.1. Asset Overview & Valuation

Halton Region's Waste Management assets have a total replacement value of $336.8 million. The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing recent construction projects and estimating current replacement values for these assets. Table 7-1 provides the inventory and current replacement value for the assets included in this AMP. The replacement value of assets at the Halton Waste Management Site is currently estimated at $316 million; however, the valuation

of replacing the landfill at end of life is closer to $750 million to $1 billion. Landfill capacity in Ontario is dwindling, and provincial approvals for new municipal and/or private landfill sites have stalled. As each year of landfilling waste progresses at the Halton Waste Management Site, the value of one cubic metre of space for garbage will increase significantly.

Table 7-1. Waste Management Asset Inventory and Current Replacement Value ($ Millions)

Asset Class (Waste Management Sites)	2024 Estimated Replacement Value
General - Halton Waste Management Site	$201.1 M
Open Landfill - Halton Waste Management Site	$115.0 M
Closed Landfill - Burlington North Service	$11.6 M
Closed Landfill - Oakville 4th Line	$7.0 M
Closed Landfill - Georgetown Armstrong	$2.0 M
Total Replacement Value	**$336.8 M**

7.1.2. Asset Condition and Age

The condition of waste management assets is determined using established condition rating criteria or an age-based approach, depending on the asset type. Condition for Waste Management buildings is determined based on recent Building Condition Assessments (BCA). For all other assets, an age-based approach is used to determine condition. The condition of all Waste Management assets is continually monitored and tracked by staff. Overall, Waste Management assets are in Good condition with the average age of all assets less than their estimated service life as shown in Figure 7-1.

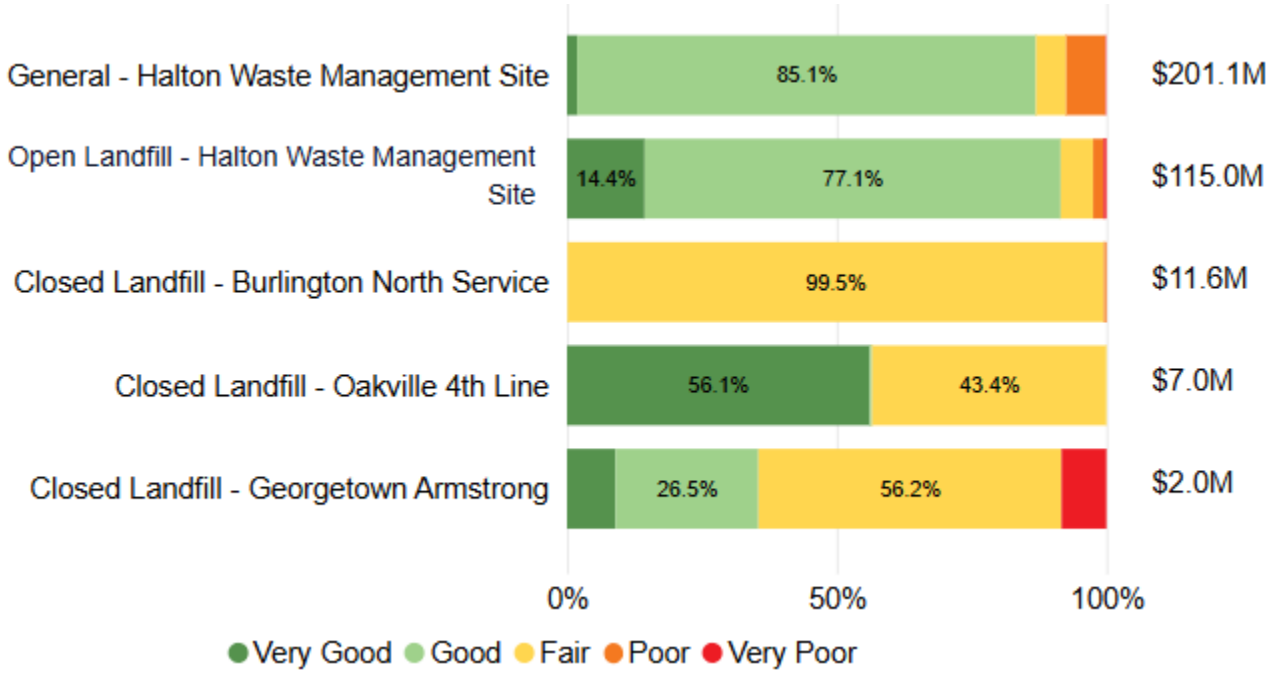
Figure 7-1. Waste Management Assets Overall Condition (%), Age and Estimated Service Life (Years)

Table 7-2 provides how condition rating is assigned to the various types of Waste Management assets. When inspection-based condition scores are not available, age and remaining estimated service life is used to determine condition. The overall condition of Waste Management assets, as a percentage of replacement values, can be viewed at the asset class level in Figure 7-2.

Table 7-2. Waste Management Condition Rating Criteria

Condition Rating	Facilities (CNA)	All Other Assets (Remaining ESL)
Very Good	1	80% – 100%
Good	2	60% – 79%
Fair	3	40% – 59%
Poor	4	20% – 39%
Very Poor	5	0% – 19%

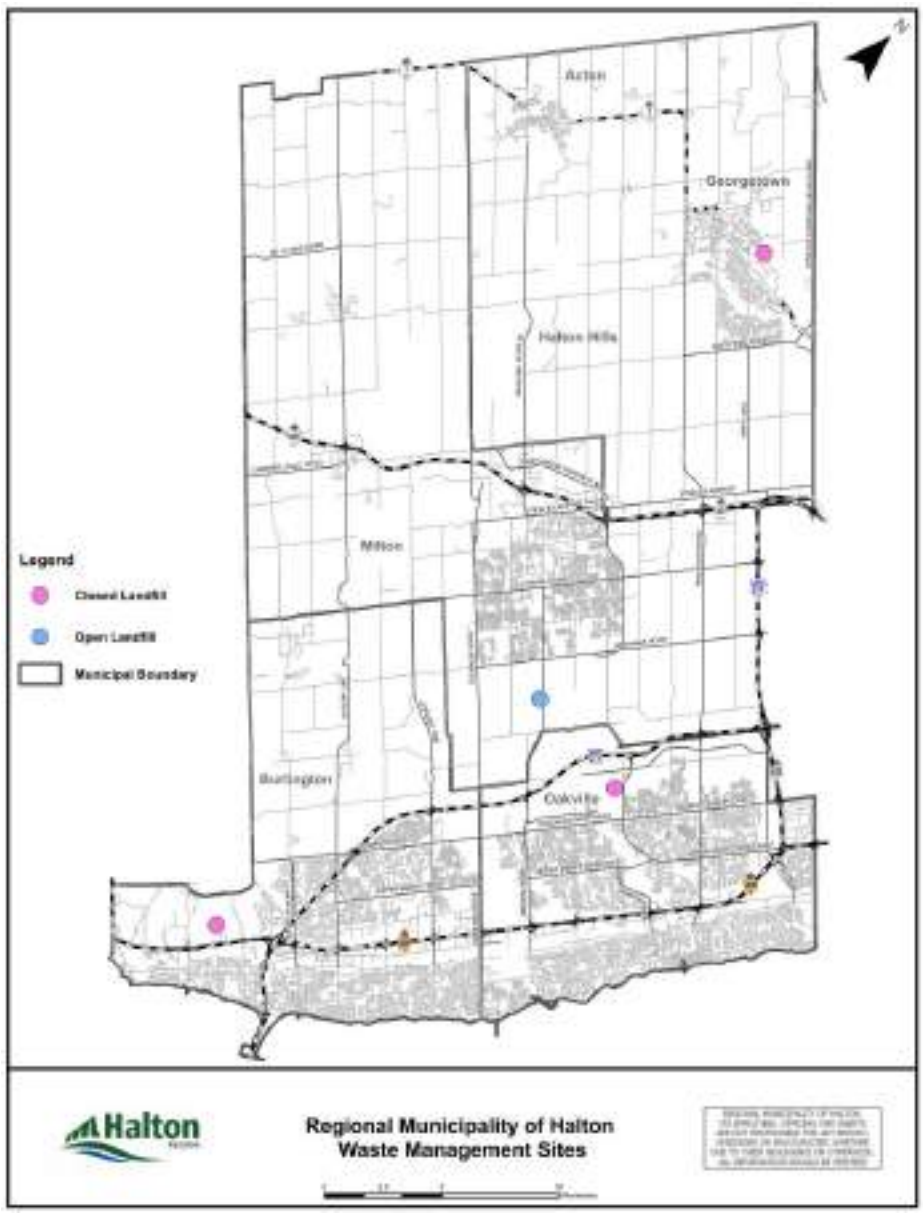
Figure 7-2. Waste Management Condition Distribution by Asset Type (%)



7.2. Levels of Service

Community Level of Service Objective	Building on the strengths of our Region, provide a sustainable, equitable and responsible waste management system that efficiently serves our community, protects our environment and is responsive to change

Figure 7-3. Halton Region's Waste Management Sites



The Waste Management division delivers programs and services to support the Halton community, including:

- Curbside collection of recycling, organics, yard waste, bulk waste, metal & appliances, Christmas trees and garbage on a weekly, bi-weekly or seasonal basis.
- Convenient public drop-off at the HWMS for all waste materials, including reusable goods, household hazardous waste, and electronics.
- Operation and maintenance of the Region's active landfill, the only remaining open landfill in the GTA.
- Composting of yard waste at the Halton Waste Management Site.
- Comprehensive environmental monitoring and management program of the 1 open landfill & 3 closed landfills with active leachate collection systems owned and managed by the Region.
- Community outreach and education programs and partnerships, rooted in environmental sustainability and waste diversion best practices.
- Various initiatives as identified in the 2023-2030 Solid Waste Management Strategy to extend the landfill lifespan, enhance diversion, reduce GHG and maintain an adaptive and sustainable waste management system to meet demands of the present and future growth.

Table 7-3. Waste Management Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Percentage of assets rated as Good to Very Good (based on replacement value)	Reliability	84.6%	80%
Indirect Level of Service			
Tonnes of Residential Solid Waste Disposed per Capita (annual)	Sustainability	0.14	Maintain
Total number of customers at the HWMS (annual)	Reliability	266,852	Maintain

7.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. The Region manages various lifecycle activities for Waste Management assets that include design, planning, construction, maintenance, repair, rehabilitation, disposal, and eventual replacement of all assets.

The importance of lifecycle activities for Waste Management assets ensures the long-term functionality, reliability, and sustainability of these critical infrastructure systems. Proper lifecycle management helps municipalities manage costs, reduce risks, and improve service delivery.

Asset lifecycle activities waste management include planning and design (site selection, environmental assessments, permitting), construction and commissioning (facility development, infrastructure installation), operations and maintenance (waste processing, equipment upkeep, environmental monitoring), rehabilitation, growth (facility upgrades, capacity expansion) and closure and post-closure care (site remediation, long-term monitoring, landfill gas management) for closed landfill sites.

The lifecycle activities listed in Table 7-4 summarize the Region's current approaches to ensure that these infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being.

Table 7-4. Waste Management Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Open and closed landfills exempt, all other assets disposed at the end of their useful life.	• Improper disposal may lead to environmental impacts and expenses.
Growth Activities	
• Capital projects and expansion needs are identified to accommodate growth as identified through the development of Master Plans. • Undertake environmental assessments for new developments.	• Growth activities are delayed with future growth projections requiring realignment to meet capacity needs.
Maintenance Activities	
• Routine and preventative maintenance programs. • Reactive maintenance may arise during normal operation of assets or from inspections. • Implementation and optimization of maintenance programs to ensure critical infrastructure is maintained, breakdowns are minimized, and the service life of the assets are maximized.	• Potential impacts to the environment. • Delayed maintenance activities due to lack of inspection data resulting in increased lifecycle costs. • Potential service disruptions leading to customer dissatisfaction.
Non-Infrastructure	
• Develop Solid Waste Management Strategy. • Lifecycle models have been developed for Waste Management assets which predict asset condition. • Perform condition assessments at regular intervals on all facilities to inform maintenance and capital planning programs, avoiding reactive, unplanned maintenance or replacement costs.	• Increased risk of higher operating and maintenance costs. • Inadequate capacity to leverage advancing technologies, industry trends and best practices.

Asset Management Practices	Risks Associated with Not Following the Strategy
Rehabilitation Activities	
• Rehabilitation needs are identified through ongoing maintenance, inspections, and condition assessments.	• Increased lifecycle costs due to improper and unplanned rehabilitation activities.
Replacement / Construction Activities	
• Replacement or reconstruction based on asset condition and previous rehabilitation activities performed.	• Lead to service disruptions. • Delay in replacement may result in higher overall lifecycle costs, longer service impacts, and customer dissatisfaction.
Service Improvement Activities	
• Upgrades or operating changes to equipment to improve operational efficiencies. • Ensure alignment with Halton Region's 2024-2028 Energy Conservation & Demand Management Plan.	• Lack of service improvement can result in higher operation and maintenance, and capital needs.

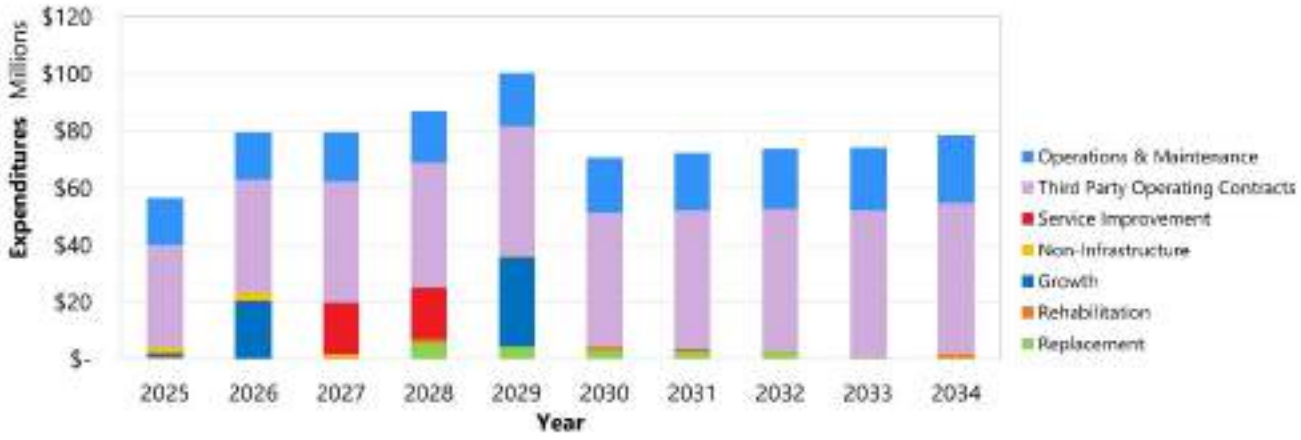
7.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outlined in Table 7-4 to plan work and assess future expenditure needs for Waste Management assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Waste Management assets, developed through staff consultations and aligned with industry's best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities- that maintain infrastructure in a state of good repair and support continued service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy. For this AMP, these activities and their associated costs were established based on the analysis of the Region's Capital and Operating budgets and are assumed to be sufficient in meeting current needs. Figure 7-4. shows the approved 2025 budget lifecycle activities for Waste Management assets.

Figure 7-4. Waste Management Anticipated Lifecycle Management Activities - Capital & Operating Budgets



The 2025 capital budget identifies a total of $53.4M for Waste Management in the next 10 years to meet growth requirements based on the planned projects such as incorporating a new or expanded household hazardous waste and reuse depot, compost pad expansion, construction of a transfer station, and construction of cell 4 to ensure the continuation of garbage disposal from residents and businesses. The 2025 operating budget's 10-year forecast

is based on general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year. This also includes $437M for third party operating contracts for waste collection in the next 10 years.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

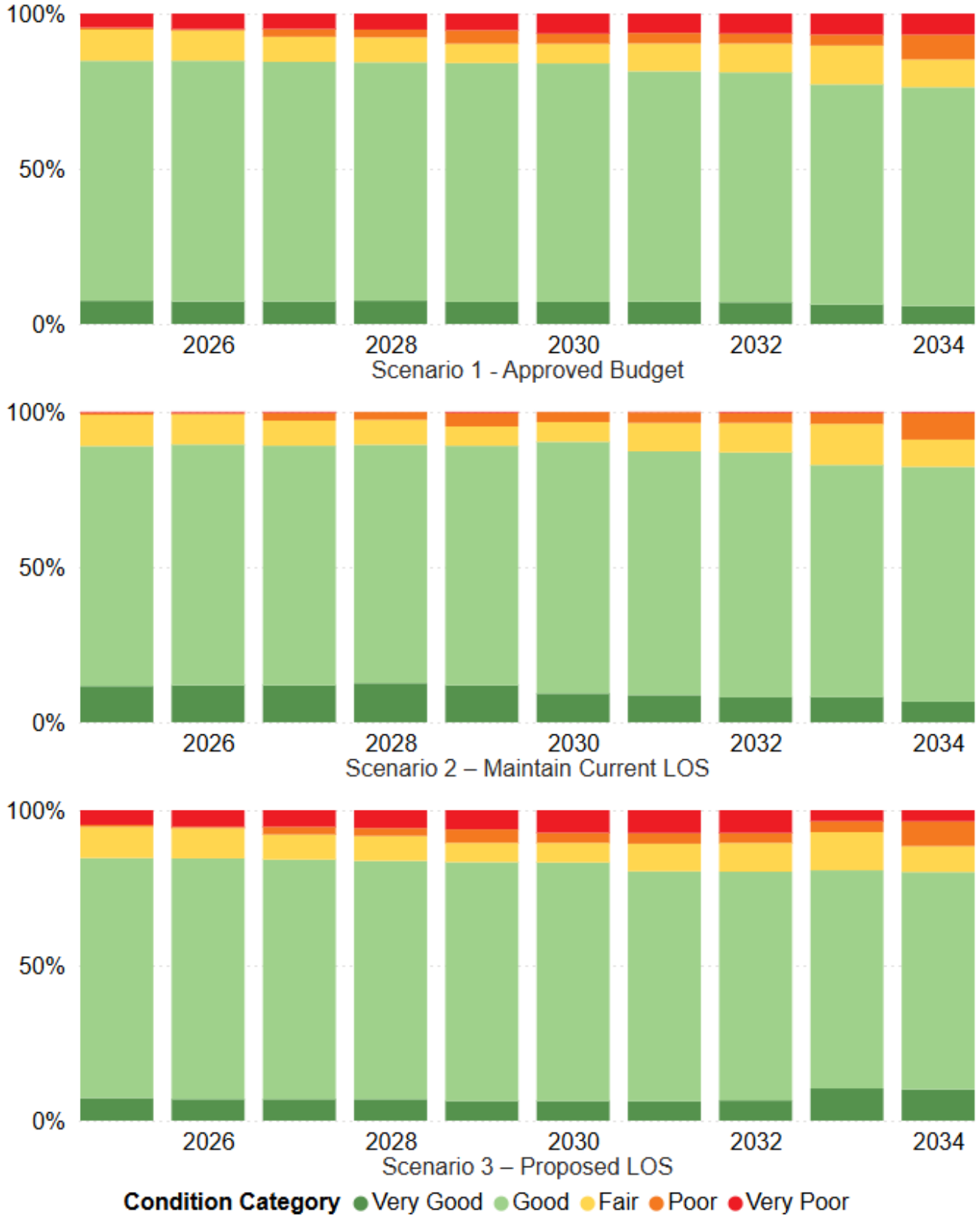
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

7.5. Impact on Current and Proposed Levels of Service

Figure 7-5 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS, and Proposed LOS forecast scenarios.

Figure 7-5. Waste Management Condition Profile for Service Level Scenarios



In Scenario 1, the asset condition worsens over the 10-year forecast period with assets in very poor condition growing from 4.5% to 6.8%, which is approximately $22.9M of assets.

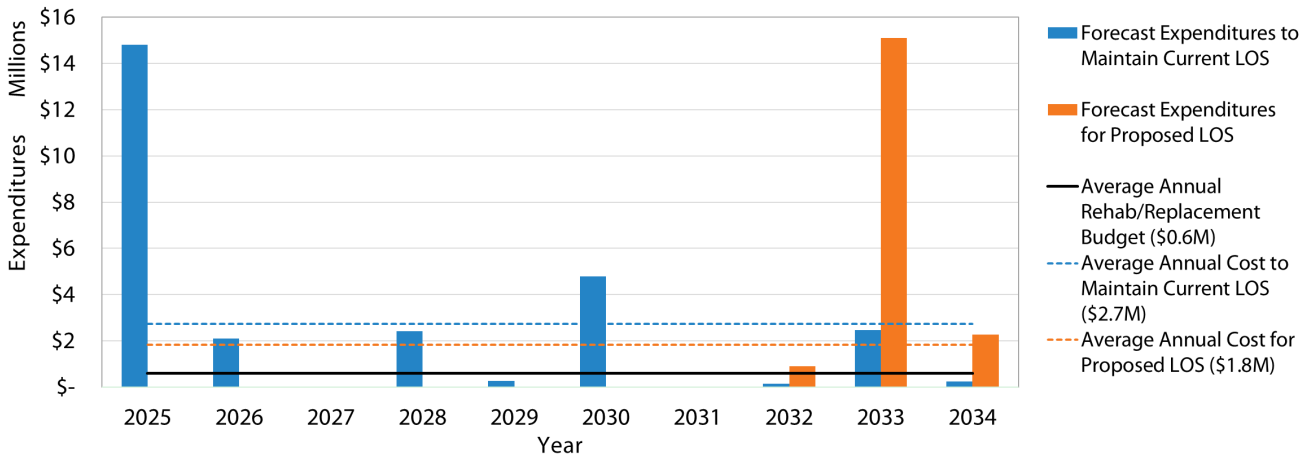
Scenario 2 would see no additional assets falling into very poor condition. The Region currently needs additional funding to keep assets in approximately the same condition over the 10-year forecast period (Scenario 2). This would require an additional investment of approximately $2.1M. As can be seen in the condition profile, the cost to maintain current LOS is more expensive than the proposed scenario as the forecast does not allow any more assets to get into very poor condition than they are currently.

Based on Halton Region's 2023-2026 Strategic Business Plan, the proposed LOS was set to 80% of assets in good to very good condition. This would require additional annual investment of $1.2M in replacement activities for Waste Management assets. Currently the Region's Waste assets are meeting the target of 80%, so this forecast scenario requires less expenditure than Scenario 2.

7.6. Estimated Preliminary Potential Infrastructure Gap

Figure 7.6 illustrates that rehabilitation and replacement expenditures of $2.7M and $1.8M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $0.6M.

Figure 7-6. Waste Management Rehabilitation & Replacement Expenditure Scenario Comparison



This results in a potential average annual estimated capital infrastructure gap of $2.1M to maintain current service levels, and $1.2M to achieve proposed service levels. While these costs are significant, they only account for 0.6% and 0.4% of the total replacement value as shown in Table 7-5.

The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values for Waste Management assets. Continued periods of high inflation and cost escalations coupled with the increase in construction in the GTHA to support the housing targets will put additional pressure on future years' budgets. It is expected that it will take several years to recover from the high impacts of inflation experienced over the past several years.

Table 7-5. Waste Management Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$7.2M	$7.2M	$7.2M
Non-Infrastructure	$2.2M	$2.2M	$2.2M
Rehabilitation & Replacement	$0.6M	$2.7M	$1.8M
Service Improvement	$6.0M	$6M	$6M
Capital Expenditures	$16.0M	$18.1M	$17.2M
Capital Infrastructure Gap		**$2.1M (Gap)**	**$1.2M (Gap)**
Operations & Maintenance	$55.8M	$55.8M	$55.8M
Total Expenditures	$71.8M	$73.9M	$73.0M
Gap as % of Replacement Value		**0.6% (Gap)**	**0.4% (Gap)**

CORPORATE FACILITIES

The Region is committed to providing reliable, safe, accessible and energy efficient facilities.

Replacement Value
$ 167.6 M

Average Age
13 Years

Average Estimated Service Life
28 Years

Average Condition
Good

% of Assets in Good to Very Good Condition
74%

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
$0.6M	**$2.9M**

8. Corporate Facilities

Halton Region is responsible for the planning, development, construction, and maintenance of Corporate Facilities including the Halton Regional Centre, Operations Centres, Child Care Centres, Heritage Buildings, and other miscellaneous facilities such as emergency shelters. These facilities provide staff with a safe and efficient space to carry out the day-to-day operations necessary for effective service delivery, while also providing a central location to support residents.

8.1. State of the Infrastructure

The following sections summarize the portfolio of Corporate Facilities owned and managed by Halton Region.

8.1.1. Asset Overview & Valuation

Corporate facilities are estimated to have a replacement value of $167.6M. The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing recent appraisals and building condition assessments. Table 8-1 provides the inventory and current replacement value for the assets included in this AMP.

Table 8-1. Corporate Facilities Asset Inventory and Current Replacement Value ($ Millions)

Asset Class	Count	Unit	2024 Estimated Replacement Value
Halton Regional Centre	1	Ea.	$129.0 M
Operations Centres	2	Ea.	$25.6 M
Heritage Buildings	2	Ea.	$5.4 M
Miscellaneous	2	Ea.	$5.2 M
Child Care Centres	3	Ea.	$2.5 M
Total Replacement Value			**$167.6 M**

8.1.2. Asset Condition and Age

Condition for Corporate Facilities is determined based on recent Building Condition Assessments (BCA). Corporate Facilities are on average in Good condition with the average age of most assets less than their estimated service life as noted in Figure 8-1.

The Halton Regional Centre underwent a major rehabilitation start in 2020, significantly improving the facility's overall condition to a very good state. This investment has also reduced

the facility's average effective age relative to its estimated useful life, ensuring its continued functionality and longevity.

Figure 8-1. Corporate Facilities Overall Condition (%), Age and Estimated Service Life (Years)

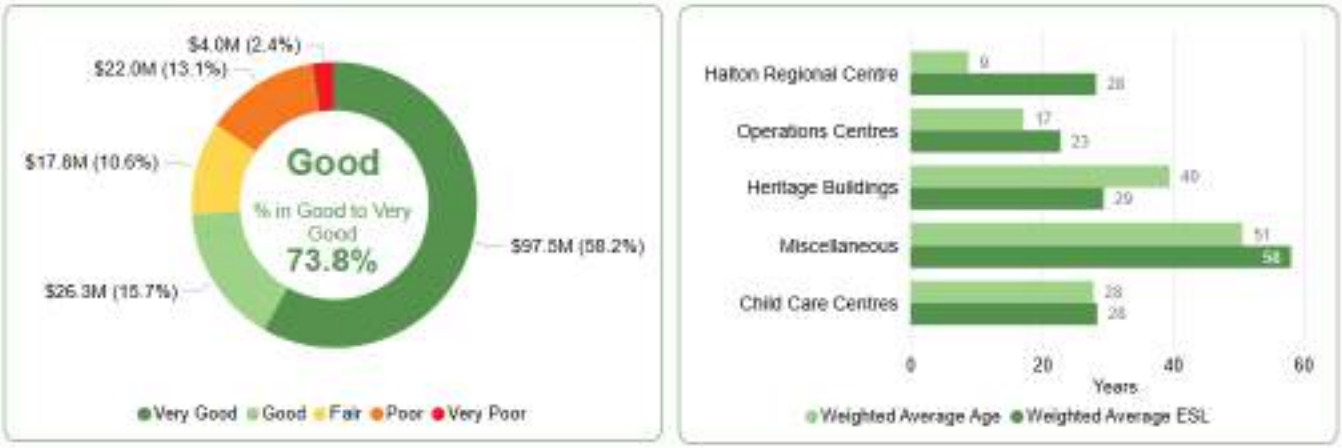


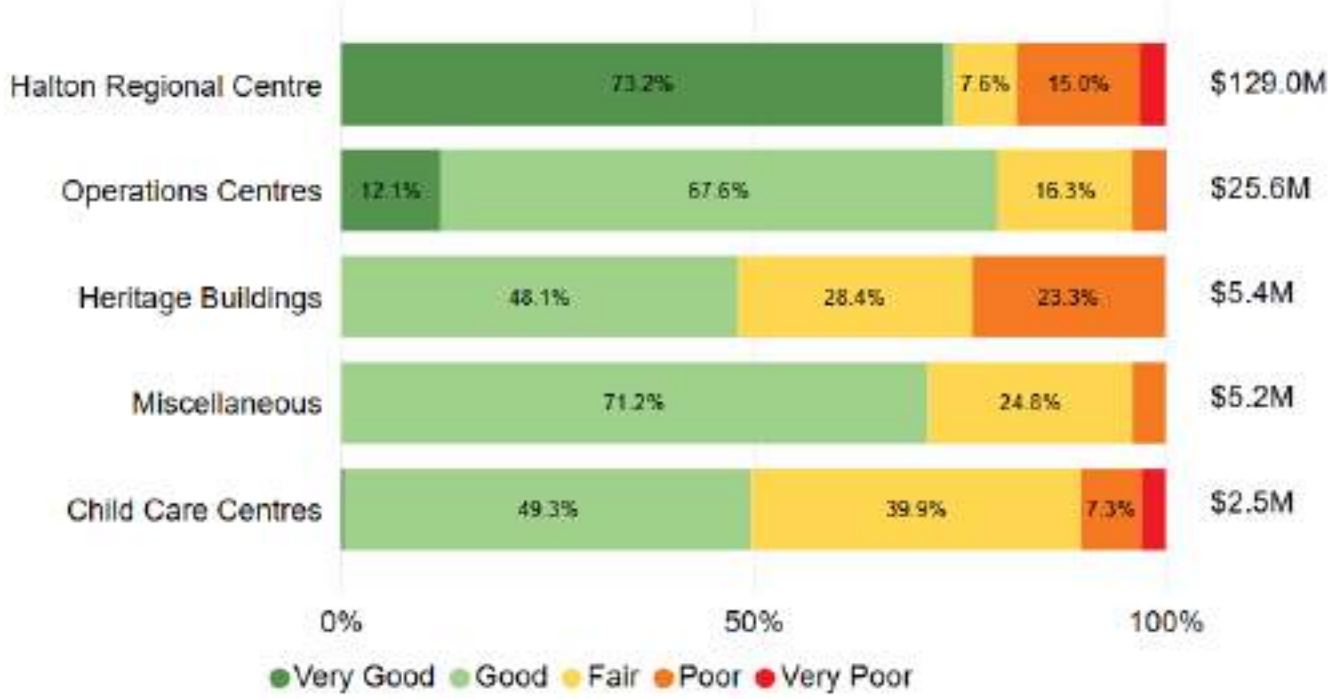
Table 8-2 provides how condition rating is assigned to the corporate facility assets. For facilities, capital needs assessment data from the recently completed BCAs were utilized which provides a comprehensive evaluation of the individual facility components. BCAs are completed for corporate facilities on a 5-year cycle with condition and performance of these assets continually monitored and tracked by staff between periodic assessments. These assessments help determine the current condition, identify capital expenditure requirements, and support the long-term capital planning for the assets.

Table 8-2. Corporate Facilities Condition Rating Criteria

Condition Rating	Building Condition Assessment (BCA)
Very Good	1
Good	2
Fair	3
Poor	4
Very Poor	5

The overall condition of Corporate Facilities, as a percentage of replacement values, can be viewed at the asset class level in Figure 8-2.

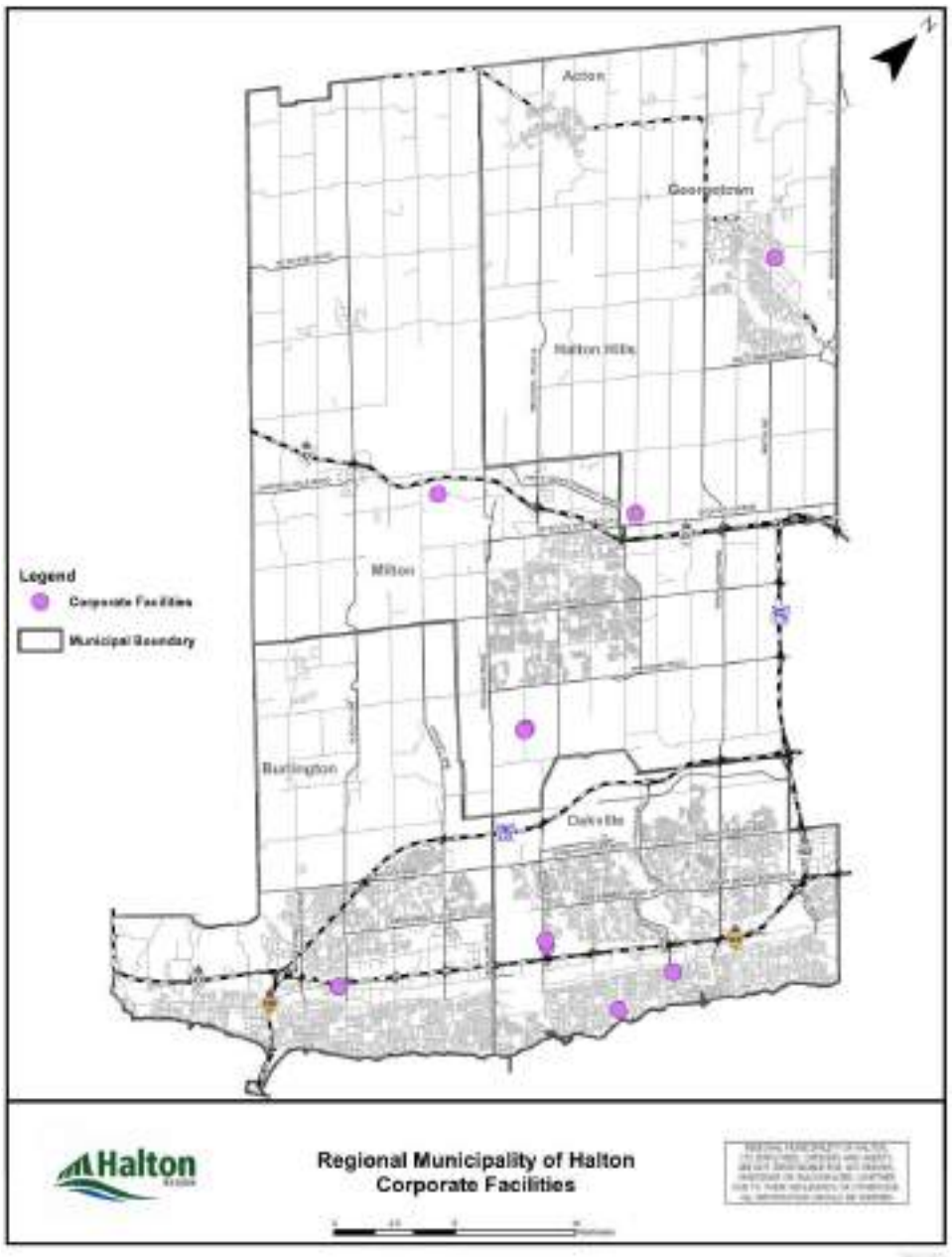
Figure 8-2. Corporate Facilities Asset Condition Distribution by Asset Type (%)



8.2. Levels of Service

Community Level of Service Objective	The Region is committed to providing reliable, safe, accessible and energy efficient facilities

Figure 8-3. Halton Region Corporate Facilities



Halton's Corporate Facilities serve a variety of essential functions for local communities by housing government operations, public services, and community resources. Some key functions include:

- Government Administration
- Public Services
- Child Care
- Community Spaces
- Infrastructure Support

These buildings play a critical role in supporting residents, businesses, and local governance while ensuring the delivery of essential services.

Table 8-3. Corporate Facilities Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Percentage of facilities in Good or Very Good condition (based on replacement value)	Reliability	73.8%	80%
Indirect Level of Service			
Total Building Service Area (Square Feet)	Availability	1,160,176	Improve
Demand work orders as a percentage of total work orders	Reliability	55%	Improve
Total Energy Consumption (kWh per Square Feet)	Sustainability	10.38	Improve
Total Energy Consumption (ekWh per Square Feet)	Sustainability	24.12	Improve
Total Water Consumption (m^3 per Square Feet)	Sustainability	0.06	Maintain

8.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. The Region manages various lifecycle activities for Corporate Facilities that include design, planning, construction, maintenance, repair, rehabilitation, disposal, and eventual replacement of all assets.

The importance of lifecycle activities for Corporate Facilities ensures the long-term functionality, reliability, and sustainability of these critical infrastructure systems. Proper lifecycle management helps municipalities manage costs, reduce risks, and improve service delivery. The lifecycle activities listed in Table 8-4 that summarize the Region's current approaches ensure that these infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being. The risks associated with not following these strategies have also been identified.

Table 8-4. Corporate Facilities Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Disposal of assets at the end of their useful life.	• Improper disposal may lead to environmental impacts and expenses.
Growth Activities	
• Capital projects to accommodate population growth in new and existing areas.	• Inadequate system capacity can potentially lead to operational issues and higher operating and maintenance costs. • Expansion of corporate facilities is aligned with growth in servicing requirements to accommodate community service needs.
Maintenance Activities	
• Routine and preventative maintenance programs • Reactive maintenance may arise during normal operation of assets or from inspections. • Implementation and optimization of maintenance programs to ensure critical infrastructure is maintained, breakdowns are minimized, and the service life of the assets are maximized.	• Potential for higher costs and operational inefficiency. • Failure to meet stakeholder expectations and potential impact to service delivery. • Increased downtime and operational disruptions causing inconsistent service levels. • May contribute to increased rate of asset deterioration.

Asset Management Practices	Risks Associated with Not Following the Strategy
Non-Infrastructure	
• Lifecycle models have been developed for Corporate Facilities assets which predict asset condition. • Perform building condition assessments at regular intervals on all facilities to inform maintenance and capital planning programs, avoiding reactive, unplanned maintenance or replacement costs.	• Increased risk of higher operating and maintenance costs. • Inability to prioritize critical assets' maintenance activities due to lack of inspection data, leading to delay and more costly maintenance activities.
Rehabilitation Activities	
• Rehabilitation needs are identified through ongoing maintenance, inspections, and condition assessments.	• Potential for increased lifecycle costs due to improper and unplanned rehabilitation activities. • Missed opportunity to reduce energy consumption. • Failure to meet stakeholder expectations, increased operational costs and potential impact to service delivery.

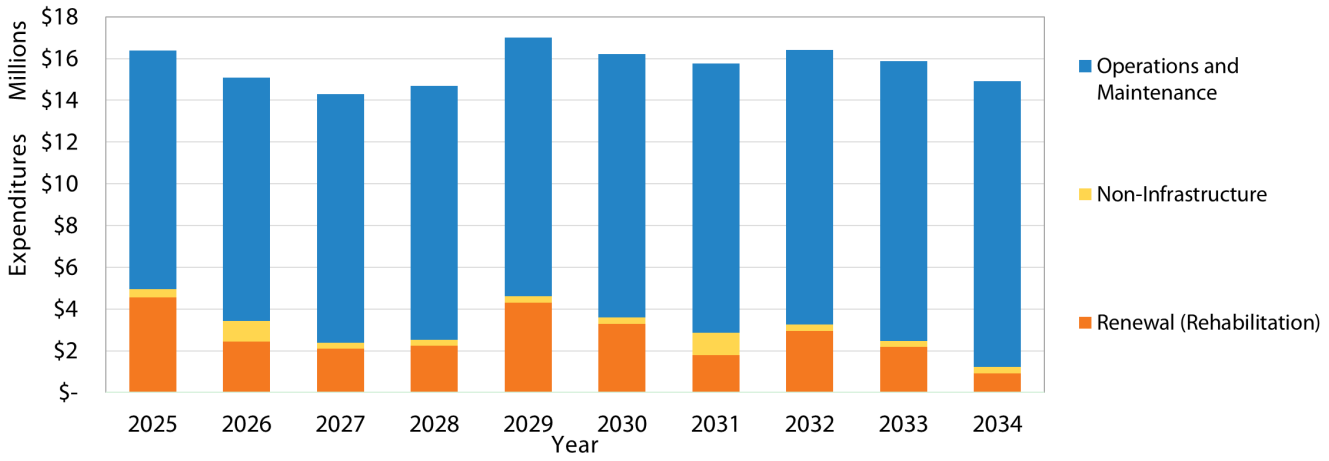
8.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outline in Table 8-4 to plan work and assess future expenditure needs for Corporate Facilities. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Corporate Facilities, developed by leveraging staff expertise and are aligned with industry's best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities that maintain infrastructure in a state of good repair and support continued service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy, where applicable. For this AMP, these activities and their associated costs were established based on the analysis of the Region's Capital and Operating budgets and are assumed to be sufficient in meeting current needs. Figure 8-4 shows the approved 2025 budget lifecycle activities for Corporate Facilities.

Figure 8-4. Corporate Facilities Anticipated Lifecycle Management Activities - Capital & Operating Budgets



In the 2025 capital budget, there are no growth-related expenditures for Corporate Facilities in the next 10 years. The 2025 operating budget identifies $11.4M in program recoveries for Corporate Facilities for the operations and maintenance (O&M) needs based on established O&M service levels, general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

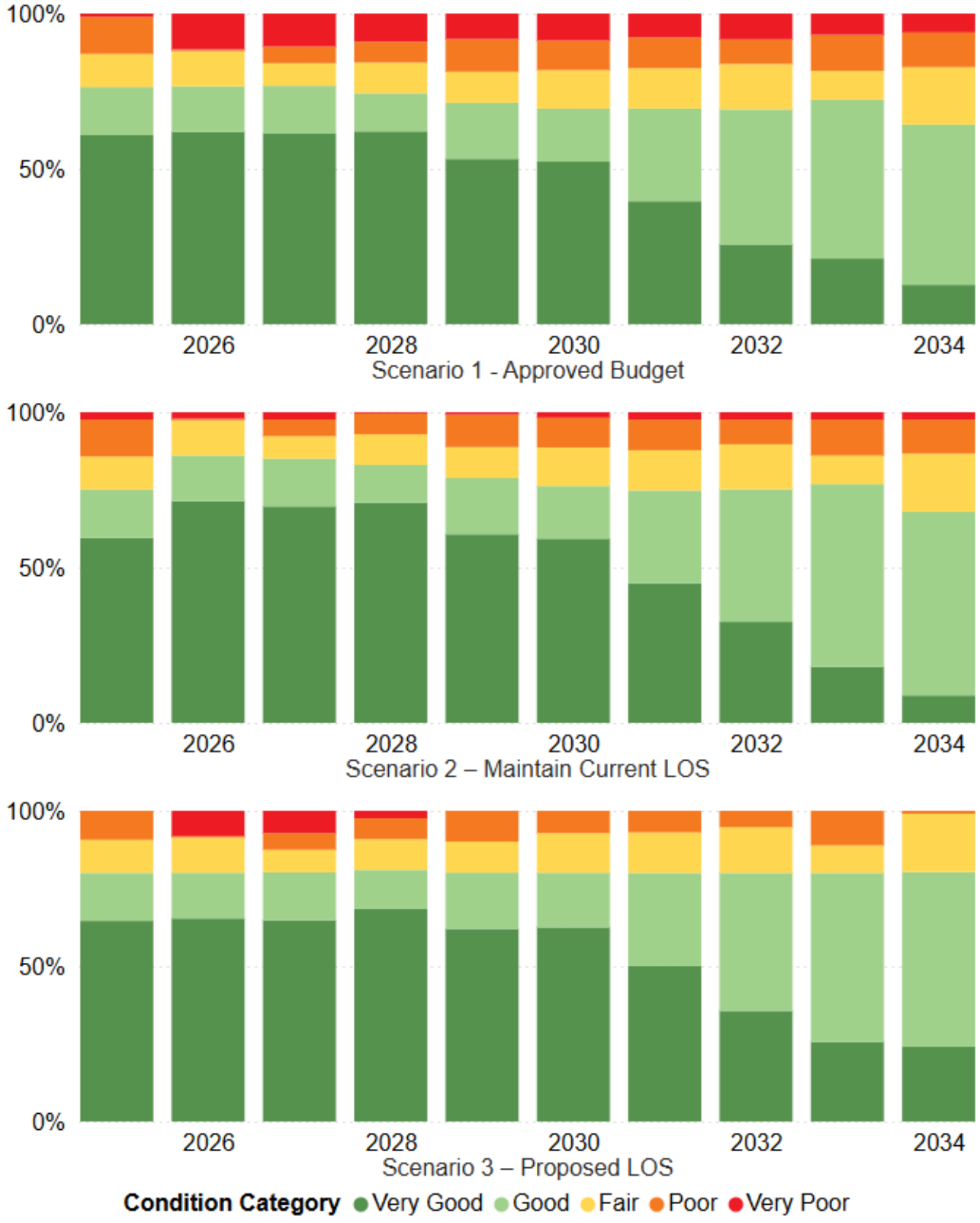
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

8.5. Impact on Current and Proposed Levels of Service

Figure 8-5 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 8-5. Corporate Facilities Condition Profile for Service Level Scenarios



In Scenario 1, the asset condition worsens over the 10-year forecast period with assets in very poor condition growing from 1.1% to 6.28%, which is approximately $10.5M of assets.

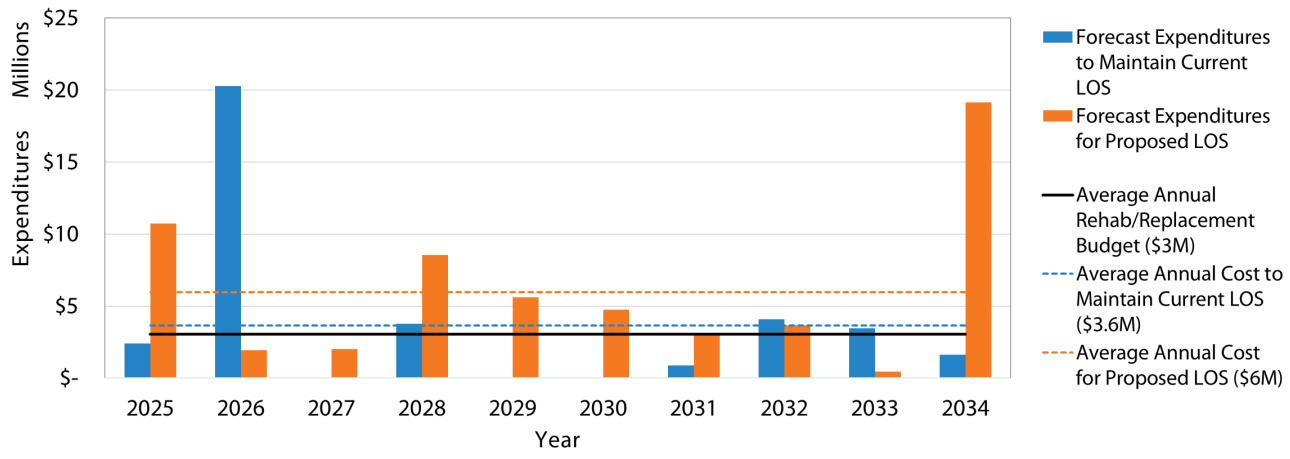
Scenario 2 would see no additional assets falling into very poor condition. The Region currently needs an additional $0.6M in annual funding to keep assets in the same condition over the 10-year forecast period (Scenario 2).

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed LOS was set to achieve 80% of assets in good to very good condition. This would require a significant investment for Corporate Facility Assets to achieve the proposed LOS of an additional $2.9M for rehabilitation and replacement activities annually.

8.6. Estimated Preliminary Potential Infrastructure Gap

Figure 8-6 illustrates that rehabilitation and replacement expenditures of $3.6M and $6.0M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $3.0M. This results in a potential average annual estimated capital infrastructure gap of $0.6M to maintain current service levels, and $2.9M to achieve proposed service levels.

Figure 8-6. Corporate Facilities Rehabilitation & Replacement Expenditure Scenario Comparison



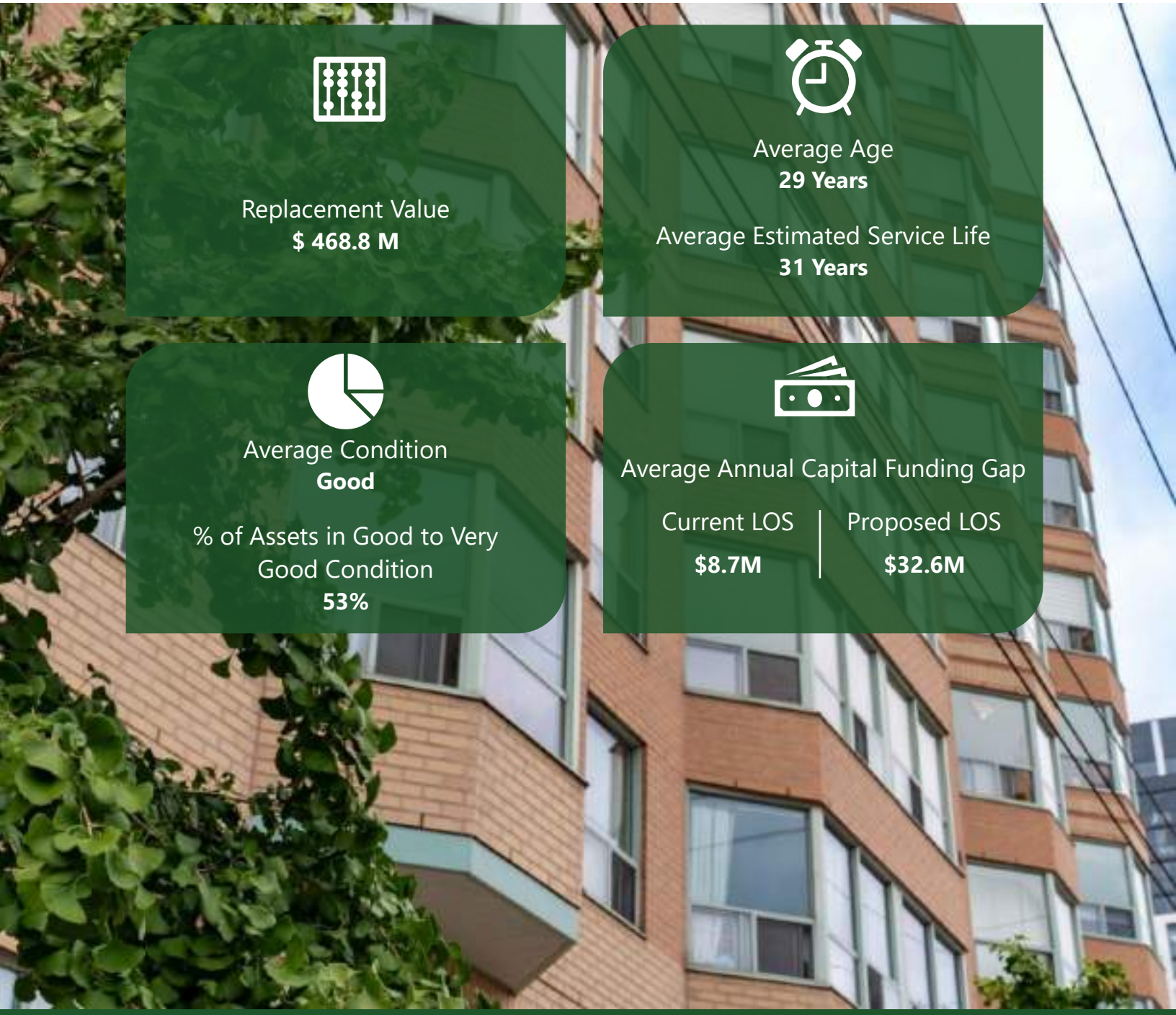
While these costs are substantial, they only account for 0.4% and 1.8% of the total replacement value as shown in Table 8-5. The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement value for Corporate Facilities. Continued periods of high inflation and cost escalations coupled with the increase in construction in the GTHA to support the housing targets will put additional pressure on future years' budgets. It is expected that it will take a number of years to recover from the high impacts of inflation experienced over the past several years.

Table 8-5. Corporate Facilities Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$0M	$0M	$0M
Non-Infrastructure	$0.6M	$0.6M	$0.6M
Rehabilitation & Replacement	$3.0M	$3.6M	$6.0M
Service Improvement	$0M	$0M	$0M
Capital Expenditures	$3.6M	$4.2M	$6.6M
Capital Infrastructure Gap		**$0.6M (Gap)**	**$2.9M (Gap)**
Operations & Maintenance	$11.7M	$11.7M	$11.7M
Total Expenditures	$15.3M	$15.9M	$18.2M
Gap as % of Replacement Value		**0.4% (Gap)**	**1.8% (Gap)**

HALTON COMMUNITY HOUSING CORPORATION

The Halton Community Housing Corporation provides property management and tenant support services to residents in its rent-geared-to-income (RGI), market rent, and condominium units. HCHC balances fiscal responsibility with keeping vulnerable populations housed, works with residents to support tenancies and promote community safety and well-being, and has a resident informed multi-year Community Development Strategy in place to guide these activities.



Replacement Value
$ 468.8 M

Average Age
29 Years

Average Estimated Service Life
31 Years

Average Condition
Good

% of Assets in Good to Very Good Condition
53%

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
$8.7M	**$32.6M**

9. Halton Community Housing Corporation

Halton Community Housing Corporation (HCHC) is a Regionally owned corporation that owns and manages community housing units in Halton Region. HCHC is committed to sustaining communities that are healthy, safe and enjoyable places to live while working towards the long-term outcomes identified in its 2023-2026 Community Development Strategy:

1. Well-built and well-maintained communities.
2. Safe and secure communities.
3. Residents are supported, where required.
4. Programming is reflective of residents' needs.
5. Effective communication with residents.

Actions taken by HCHC to achieve these outcomes include:

- Respond to maintenance requests in an effective and efficient manner while ensuring capital repairs and upgrades keep HCHC buildings in a state-of-good-repair.
- Complete security audits of all HCHC communities and make targeted investment in security cameras and access control systems.
- Build upon existing partnerships with local municipalities to expand program offerings and partnership opportunities.
- Improve the health and quality of life of residents, including supporting residents facing financial hardship and food insecurity.
- Apply equity, diversity and inclusion lens to HCHC programs and policy making.
- Operationalize digital signage across multi-residential sites to provide community notices and communicate with tenants in a timelier manner.

9.1. State of the Infrastructure

The following sections summarize the portfolio of Region's assets associated with HCHC.

9.1.1. Asset Overview & Valuation

HCHC manages 37 facilities on behalf of Halton Region with a total replacement value of around $469 million, estimated based on recent appraisals and building condition assessments. Table 9-1 provides the inventory and current replacement value for HCHC assets included in this AMP.

Table 9-1. HCHC Asset Inventory and Current Replacement Value ($ Millions)

Asset Class	Count	Unit	2024 Estimated Replacement Value
Non-Profit	17	Ea.	$268.8 M
Public Housing	20	Ea.	$200.0 M
Total Replacement Value			**$468.8 M**

9.1.2. Asset Condition and Age

Condition of HCHC assets is determined using an established condition rating criteria or age-based approach, depending on the asset type e.g., structural building components, interior and exterior components, electromechanical equipment, water and energy supply systems, plumbing system, heating, ventilation and air conditioning (HVAC) systems, etc. HCHC assets are on average in Good condition with the average age of non-profit assets less than their estimated service life as noted in Figure 9-1. The average age of Public Housing assets is close to the average estimated service life. While some of these assets are around their estimated service life, they still are in a state of good repair and provide expected operational functionality for the residents.

Figure 9-1. HCHC Overall Condition (%), Age and Estimated Service Life (Years)

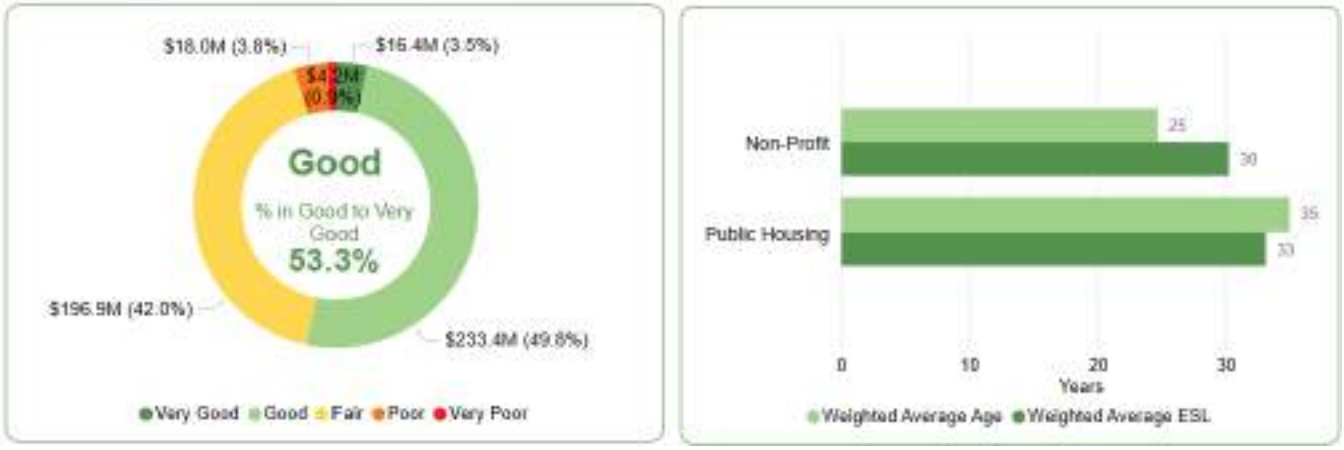


Table 9-2 highlights how condition rating is assigned to the various types of assets. For facilities, recent building condition assessment (BCA) data was utilized for almost all facilities which provides a comprehensive evaluation of the individual facility components. BCAs are completed for corporate facilities on a 5-year cycle with condition and performance of these assets continually monitored and tracked by staff between periodic assessments. These assessments help determine the current condition, identify capital expenditure requirements,

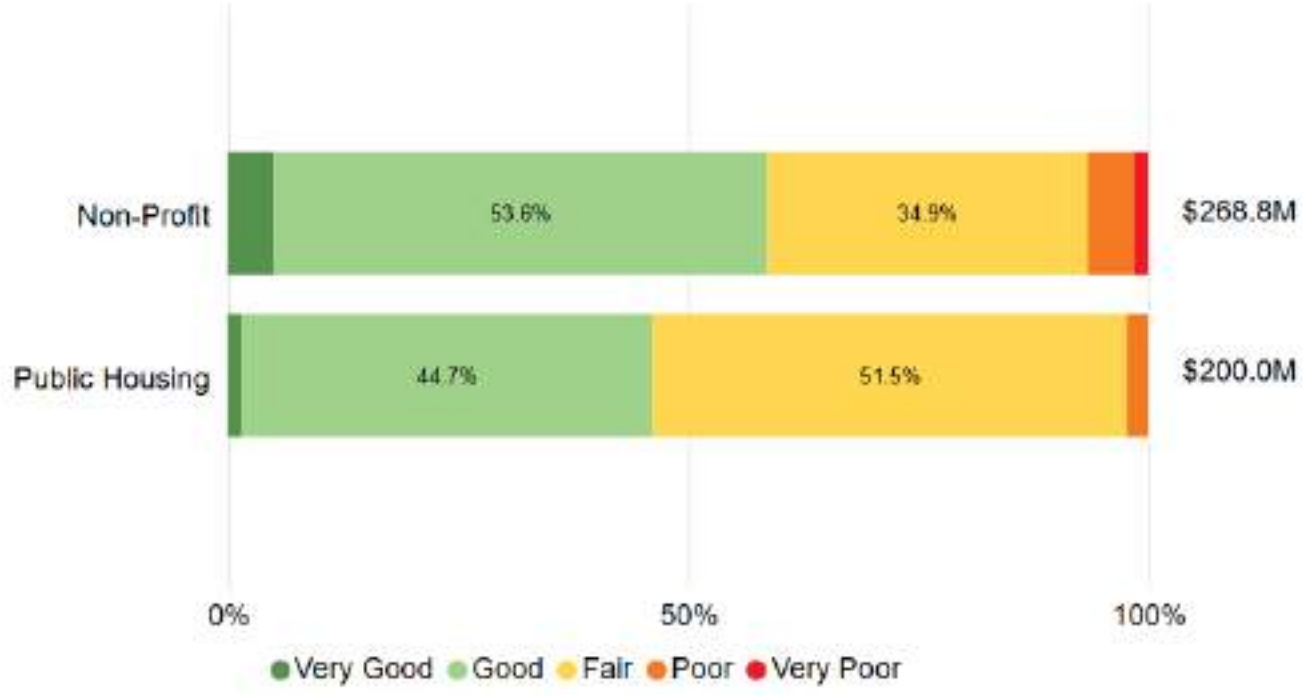
and support the long-term capital planning for the assets. Where BCA data is not available for a facility, age and remaining estimated service life is used to determine condition.

Table 9-2. HCHC Condition Rating Criteria

Condition Rating	Building Condition Assessment (BCA)	Remaining Estimated Service Life (%)
Very Good	1	80 – 100
Good	2	60 – 79
Fair	3	40 – 59
Poor	4	20 – 39
Very Poor	5	0 – 19

The overall condition of Halton Community Housing Corporation assets, as a percentage of replacement values, can be viewed at the asset class level in Figure 9-2.

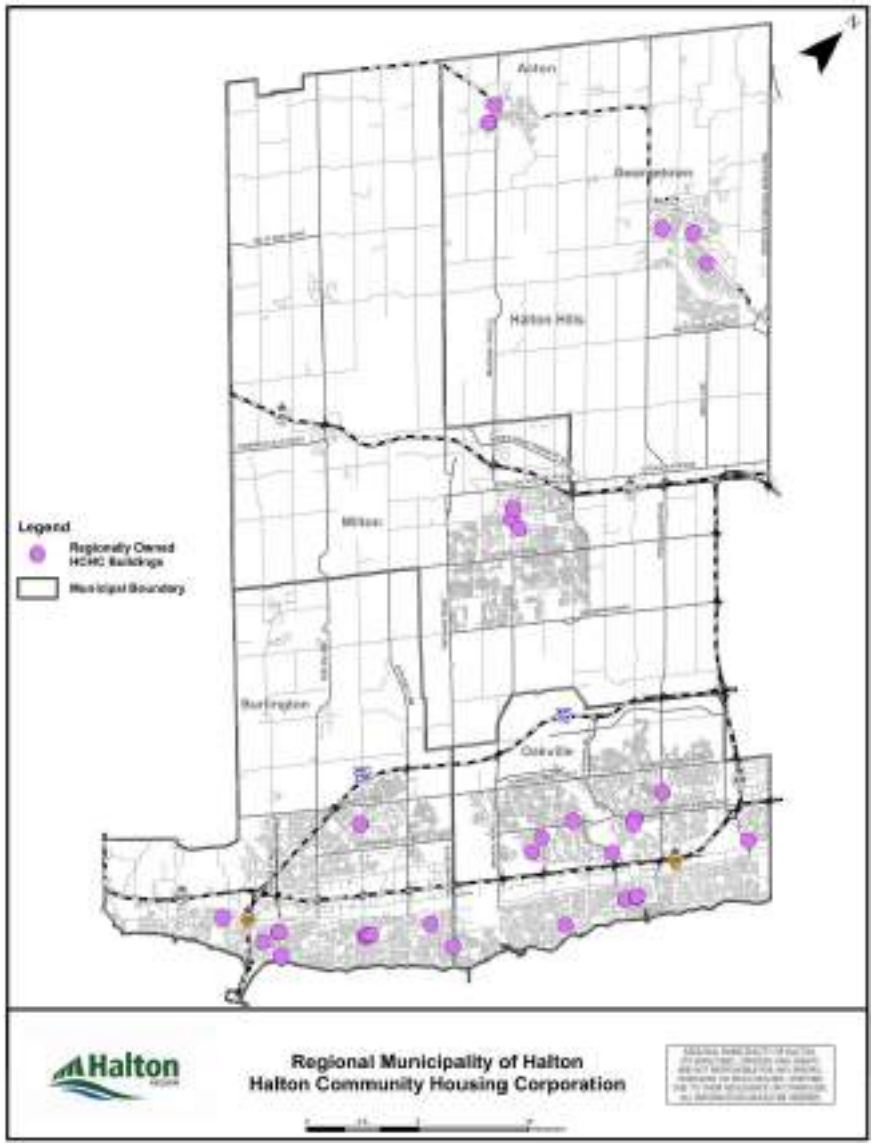
Figure 9-2. HCHC Asset Condition Distribution by Asset Type (%)



9.2. Levels of Service

Community Level of Service Objective	The Halton Community Housing Corporation (HCHC) provides property management and tenant support services to residents in its rent-geared-to-income (RGI), market rent, and condominium units. HCHC balances fiscal responsibility with keeping vulnerable populations housed, works with residents to support tenancies and promote community safety and well-being, and has a resident informed multi-year Community Development Strategy in place to guide these activities.

Figure 9-3. HCHC Buildings Owned by Halton Region



Halton is responsible for the funding, planning, delivery and administering of government assisted housing programs and services for Halton residents.

The Comprehensive Housing Strategy actions and targets are designed with the goal of:

- Creating a range and mix of new housing opportunities to meet the needs of our Halton community.
- Protecting existing rental housing so that it continues to be available to our residents.
- Providing coordinated services to residents who need support to obtain or maintain their housing.

Table 9-3. Halton Community Housing Corporation Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Percentage of assets that are rated as Good to Very Good (based on replacement value)	Reliability	53.9%	80%
Indirect Levels of Service			
Asset management state of good repair spending ($ Millions)	Cost Effectiveness	$4.7	Improve
Number of units in HCHC portfolio	Availability	2,280	Improve
Percentage of at-risk community housing units retained	Safety & Availability	100%	Maintain
Number of HCHC Building Condition Assessments and energy audits completed	Reliability & Sustainability	88%	95%
Percentage of Priority 1 & 2 BCAs completed for HCHC	Reliability	60%	80%
Total HCHC Energy Consumption (kWh per Square Feet)	Sustainability	6.9	Improve
Total HCHC Energy Consumption (ekWh per Square Feet)	Sustainability	16.5	Improve
Total HCHC Water Consumption (m^3 per Square Feet)	Sustainability	0.13	Maintain

9.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable Level of Service (LOS) while minimizing risk and achieving the lowest lifecycle cost. The Region manages various lifecycle activities for HCHC assets that include design, planning, construction, maintenance, repair, rehabilitation, disposal, and eventual replacement of all assets.

The importance of lifecycle activities for HCHC assets ensures the long-term functionality, reliability, and sustainability of these critical infrastructure systems. Proper lifecycle management helps municipalities manage costs, reduce risks, and improve service delivery. The lifecycle activities listed in Table 9-4 summarize the Region's current approaches ensure that these infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being.

Table 9-4. HCHC Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Disposal of assets at the end of their useful life.	• Improper disposal may lead to environmental impacts and expenses.
Growth Activities	
• Capital projects and expansion needs are identified to accommodate growth.	• Inadequate system capacity can potentially lead to operational issues and higher O&M costs.
Maintenance Activities	
• Routine and preventative maintenance programs • Reactive maintenance may arise during normal operation of assets or from inspections. • Implementation and optimization of the maintenance program to ensure critical infrastructure is maintained, breakdowns are minimized, and the service life of the assets are maximized.	• Potential for higher costs and operational inefficiency. • Failure to meet stakeholder expectations and potential impact to service delivery. • Increased downtime and operational disruptions causing inconsistent service levels. • May contribute to increased rate of asset deterioration.
Non-Infrastructure	
• Development of Comprehensive Housing Strategy Report Card (2025-2035). • Lifecycle models have been developed for HCHC assets which predict asset condition. • Perform condition assessments at regular intervals (i.e., 5-year cycles) on all facilities to inform	• Increased risk of higher operating and maintenance costs. • Inability to prioritize critical assets' maintenance activities due to lack of inspection data, leading to delay and more costly maintenance activities. • Housing shortages and inability to adapt to changing demographics and housing needs.

Asset Management Practices	Risks Associated with Not Following the Strategy
maintenance and capital planning programs, avoiding reactive, unplanned maintenance or replacement costs.	
Rehabilitation Activities	
• Rehabilitation needs are identified through ongoing maintenance, inspections, and condition assessments.	• Potential for increased lifecycle costs due to improper and unplanned rehabilitation activities. • Missed opportunity to reduce energy consumption. • Failure to meet stakeholder expectations, increased operational costs and potential impact to service delivery.

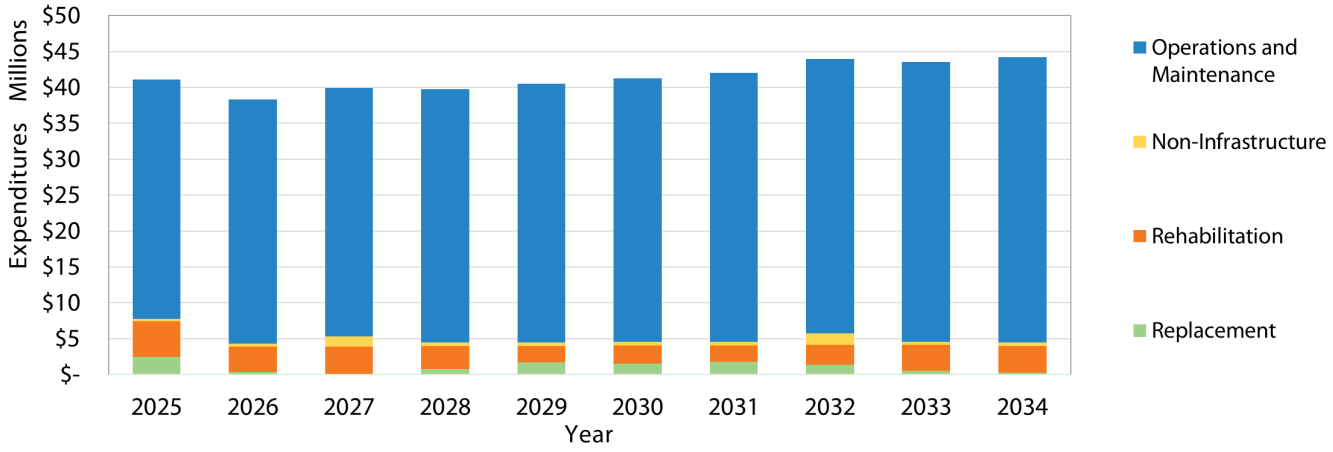
9.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outline in Table 9-4 to plan work and assess future expenditure needs for HCHC assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for HCHC assets, developed through staff consultations and aligned with industry's best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities that maintain infrastructure in a state of good repair and support continue service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy, where applicable. For this AMP, these activities and their associated costs were established based on the analysis of the Region's Capital and Operating budgets and are assumed to be sufficient in meeting current needs. Figure 9-4 shows the approved 2025 budget lifecycle activities for HCHC.

Figure 9-4. HCHC Anticipated Lifecycle Management Activities - Capital & Operating Budgets



The 2025 10-year Capital Plan forecast for HCHC owned housing assets is primarily based upon BCAs and energy audits completed in 2023. In the 2025 capital budget, there are no growth-related expenditures forecasted for HCHC assets in the next 10 years. The 2025 operating budget identifies $33.2M for HCHC for the operations and maintenance (O&M) needs based on established O&M service levels, general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year.

The Region will continue to closely monitor the annual capital funding requirements to ensure the housing stock is maintained in a state-of-good-repair.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

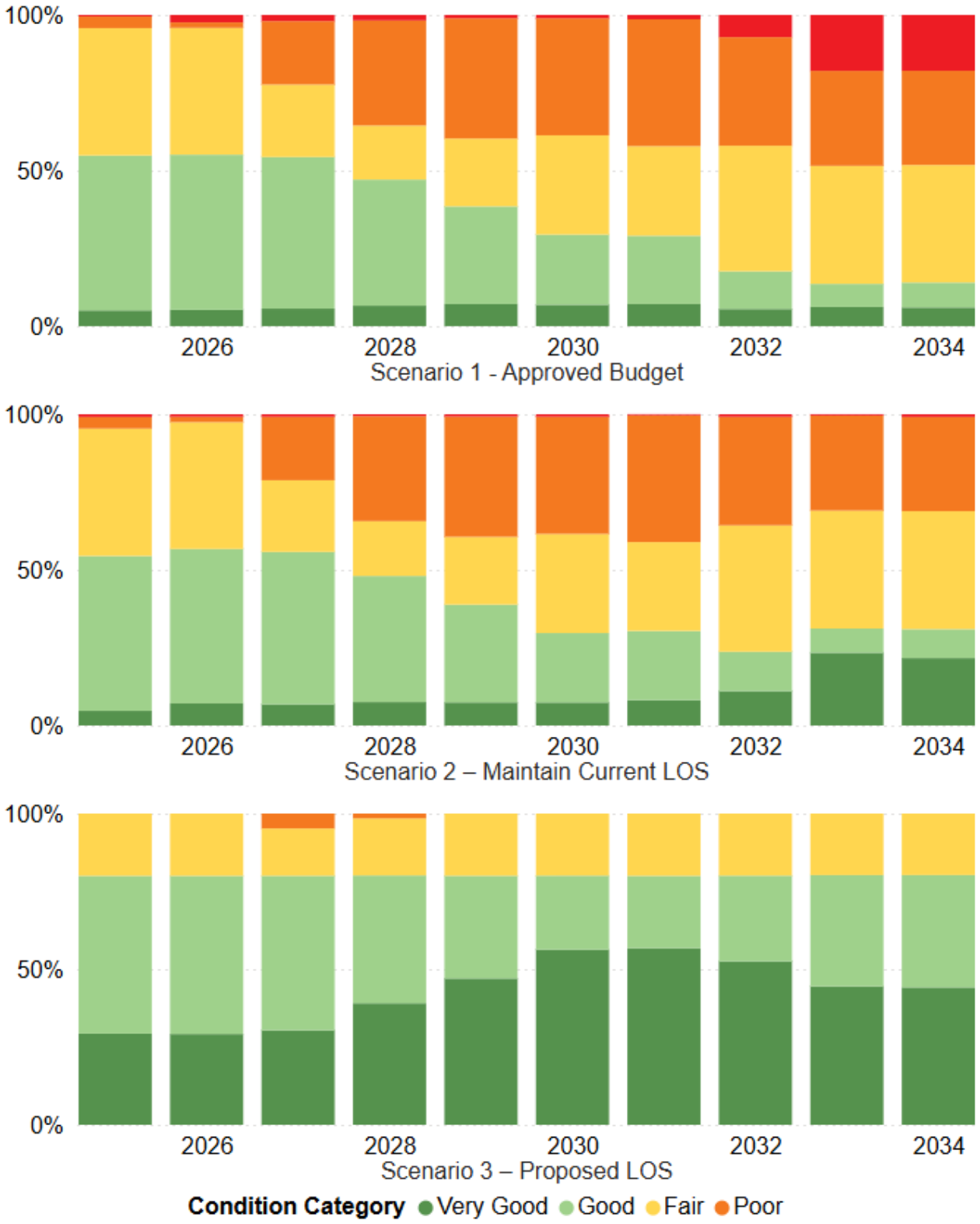
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

9.5. Impact on Current and Proposed Levels of Service

Figure 9-5 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 9-5. HCHC Condition Profile for Service Level Scenarios



In Scenario 1, the asset condition worsens over the 10-year forecast period with assets in very poor condition growing from 0.5% to 18%, which is approximately $84.1M of assets.

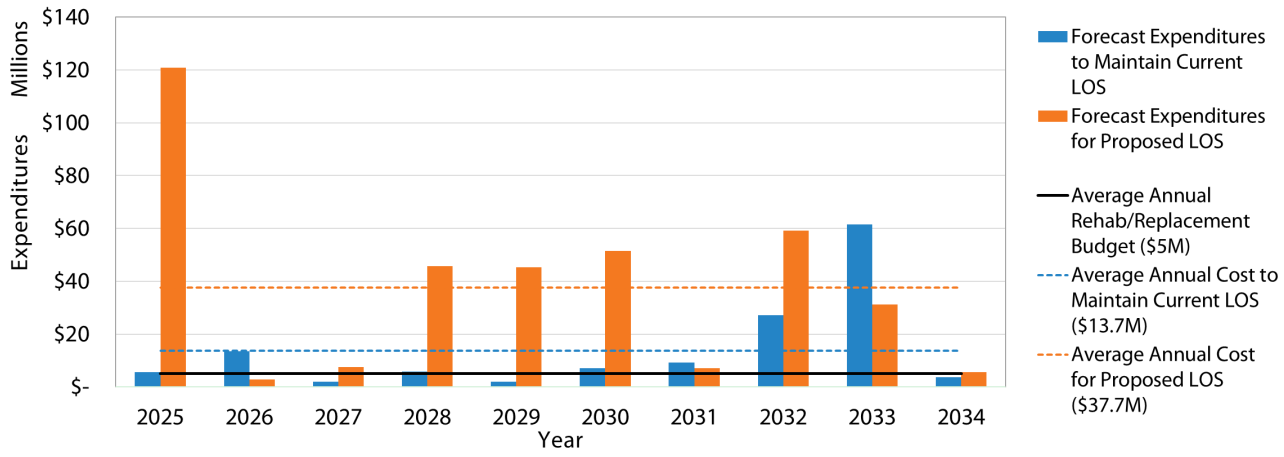
Scenario 2 would see no additional assets falling into very poor condition but still sees a significant amount of assets fall into Fair and Poor condition. To maintain the current condition, additional annual investment would be required.

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed LOS was set to achieve 80% of assets in good to very good condition. This would require a significant investment for HCHC assets. To achieve the proposed LOS, an additional $32.6M would be required for rehabilitation and replacement activities annually.

9.6. Estimated Preliminary Potential Infrastructure Gap

Figure 9-6 illustrates that rehabilitation and replacement expenditures of $13.7M and $37.7M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $5M.

Figure 9-6. HCHC Rehabilitation & Replacement Expenditure Scenario Comparison



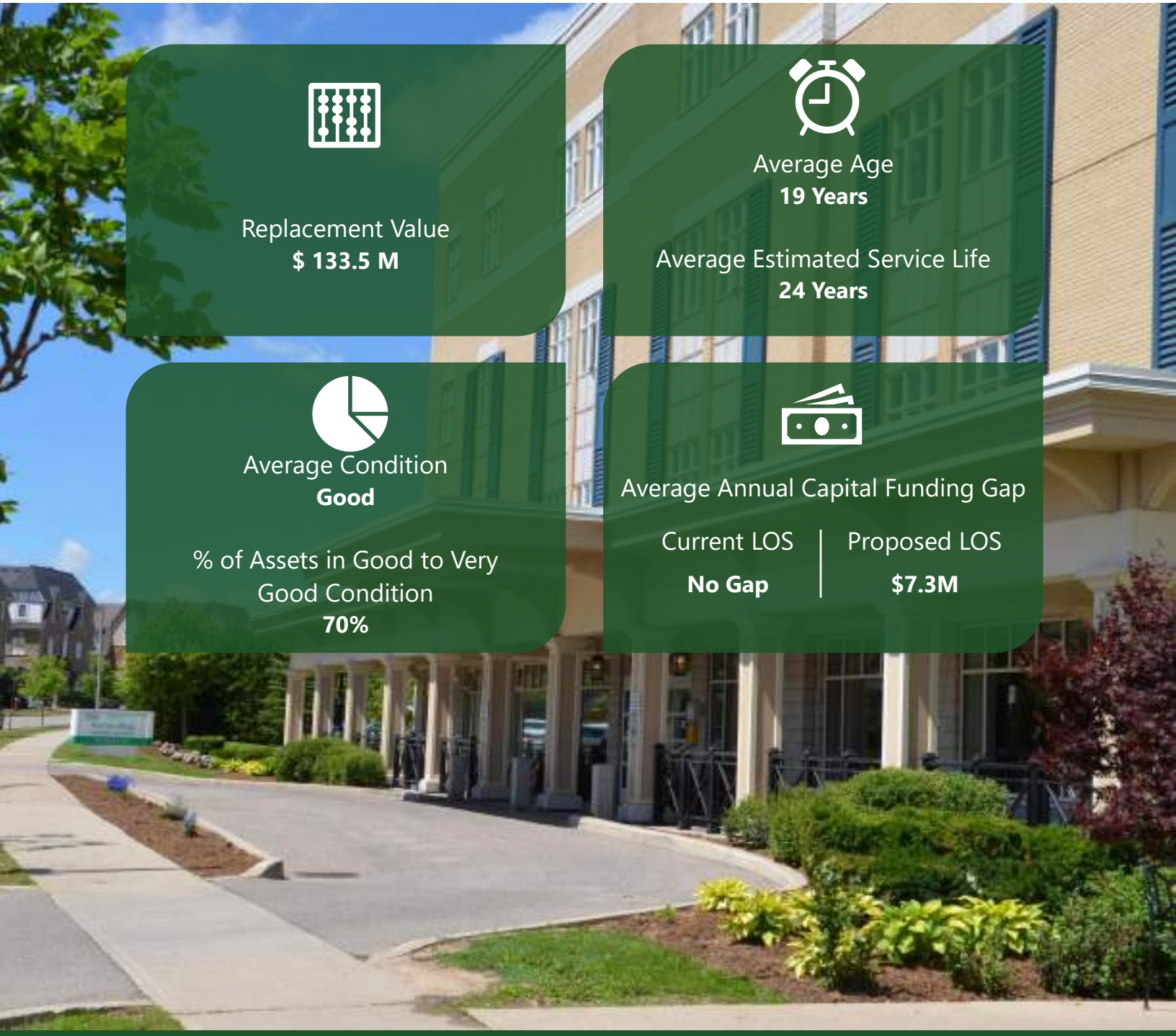
This results in a potential average annual estimated capital infrastructure gap of $8.7M to maintain current service levels, and $32.6M to achieve proposed service levels. While these costs are significant, they only account for 1.9% and 7% of the total replacement value as shown in Table 9-5. The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values for HCHC assets. Continued periods of high inflation and cost escalations coupled with the increase in construction in the GTHA to support the housing targets will put additional pressure on future years' budgets. It is expected that it will take several years to recover from the high impacts of inflation experienced over the past several years.

Table 9-5. HCHC Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$0M	$0M	$0M
Non-Infrastructure	$0.8M	$0.8M	$0.8M
Rehabilitation & Replacement	$5.0M	$13.7M	$37.7M
Service Improvement	$0M	$0M	$0M
Capital Expenditures	$5.8M	$14.5M	$38.5M
Capital Infrastructure Gap		**$8.7M (Gap)**	**$32.6M (Gap)**
Operations & Maintenance	$33.9M	$33.9M	$33.9M
Total Expenditures	$39.7M	$48.4M	$72.4M
Gap as % of Replacement Value		**1.9% (Gap)**	**7.0% (Gap)**

LONG TERM CARE

The Region is committed to providing long-term care services to residents that require medical, nursing, personal, therapeutic and social work services in a cost-effective way.



Replacement Value
$ 133.5 M

Average Age
19 Years

Average Estimated Service Life
24 Years

Average Condition
Good

% of Assets in Good to Very Good Condition
70%

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
No Gap	**$7.3M**

10. Long Term Care

Halton Region owns and operates three accredited, non-profit long-term care (LTC) homes: Allendale, Creek Way Village and Post Inn Village that provide high quality care and accommodation to older adults who are no longer able to live on their own. Currently, LTC homes provide skilled nursing care and supports for activities of daily living, allied health and psychosocial supports to 572 individuals.

LTC homes have increased infection prevention and control measures to minimize the transmission and spread of all infectious diseases throughout the home and operate in accordance with the regulatory requirements through the *Fixing Long-Term Care Act, 2021*. In the Act, Ontario has committed to providing an average of four hours of direct care per day by 2024-25 which has resulted in an increase in operations and maintenance (O&M) costs to support the front-line care needs of our residents. The Region will continue to respond to the regulatory and operational challenges facing the sector and is committed to responding to our growing, aging population by identifying priorities to support the safety, health and well-being of older adults.

10.1. State of the Infrastructure

The following sections summarize the portfolio of assets associated with the Region's Long Term Care homes.

10.1.1. Asset Overview & Valuation

Valuation of infrastructure assets associated with LTC have a total replacement value of $133.5M estimated based on appraisals and building condition assessments for LTC homes, and estimated market value of LTC equipment such as appliances, furniture, beds, and support devices. Table 10-1 provides the inventory and current replacement value for the assets included in this AMP.

Table 10-1. LTC Asset Inventory and Current Replacement Value ($ Millions)

Asset Class	Count	Unit	2024 Estimated Replacement Value
Long-Term Care Homes	3	Ea.	$124.9 M
Long-Term Care Equipment	216	Ea.	$8.6 M
Total Replacement Value			**$133.5 M**

10.1.2. Asset Condition and Age

Condition for LTC homes is determined based on recent Building Condition Assessments (BCA). For the LTC equipment, an age-based approach is used to determine condition. Condition of all LTC assets is continually monitored and tracked by staff. Overall, LTC assets are in Good condition with around 70% of the assets in Good to Very Good condition as noted in Figure 10-1. In the case of LTC homes, the average age is less than average estimated service life. For LTC equipment, the average age has slightly surpassed the average estimated service life.

Figure 10-1. LTC Assets Overall Condition (%), Age and Estimated Service Life (Years)

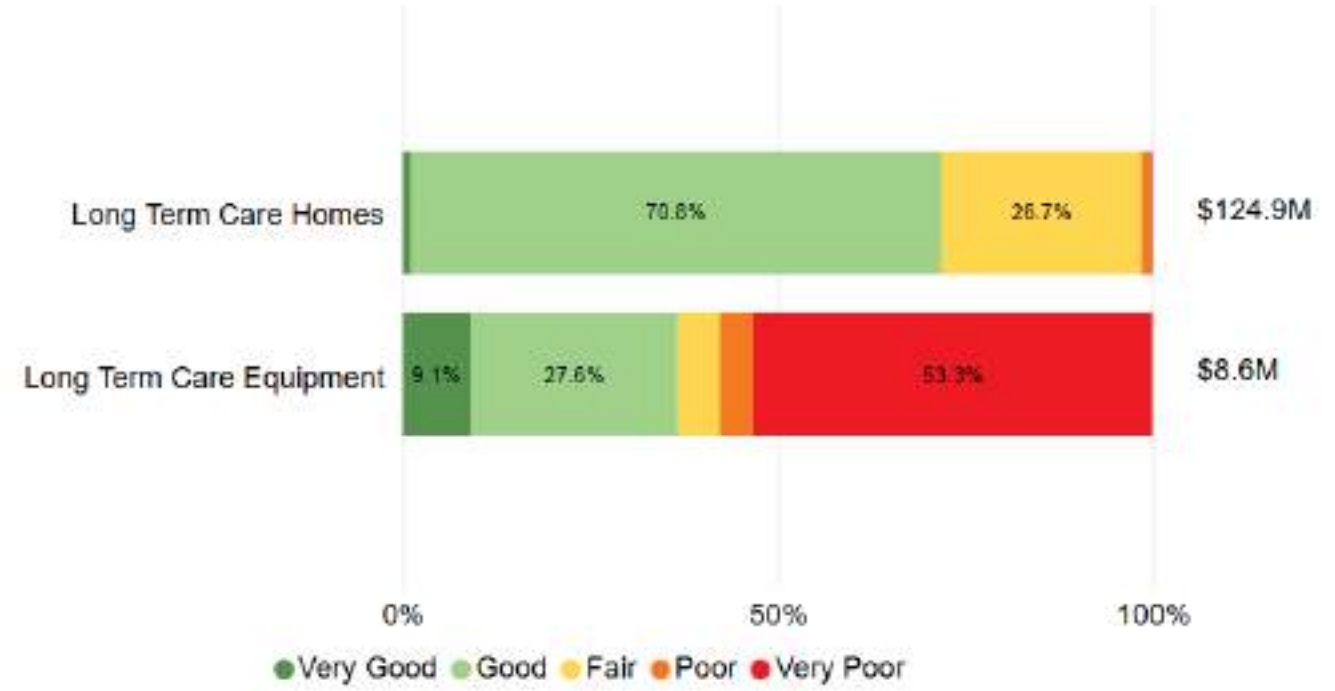
Table 10-2 highlights how condition rating is assigned to the various types of assets. For Long-Term Care homes, recent BCA data was utilized which provides a comprehensive evaluation of the individual facility components. BCAs are completed for LTC homes on a 5-year cycle. These assessments help determine the current condition, identify capital expenditure requirements, and support the long-term capital planning for the assets. For the equipment, age and remaining estimated service life is used to determine condition.

Table 10-2. LTC Condition Rating Criteria

Condition Rating	Long-Term Care Homes (BCA)	Long Term Care Equipment (Remaining ESL)
Very Good	1	80% – 100%
Good	2	60% – 79%
Fair	3	40% – 59%
Poor	4	20% – 39%
Very Poor	5	0% – 19%

The overall condition of LTC assets, as a percentage of replacement values, can be viewed at the asset class level in Figure 10-2. While 53.3% of equipment assets are in very poor condition, it is important to note its condition was solely based on age and these assets remain in a state of good repair and provide the expected operational functionality for residents.

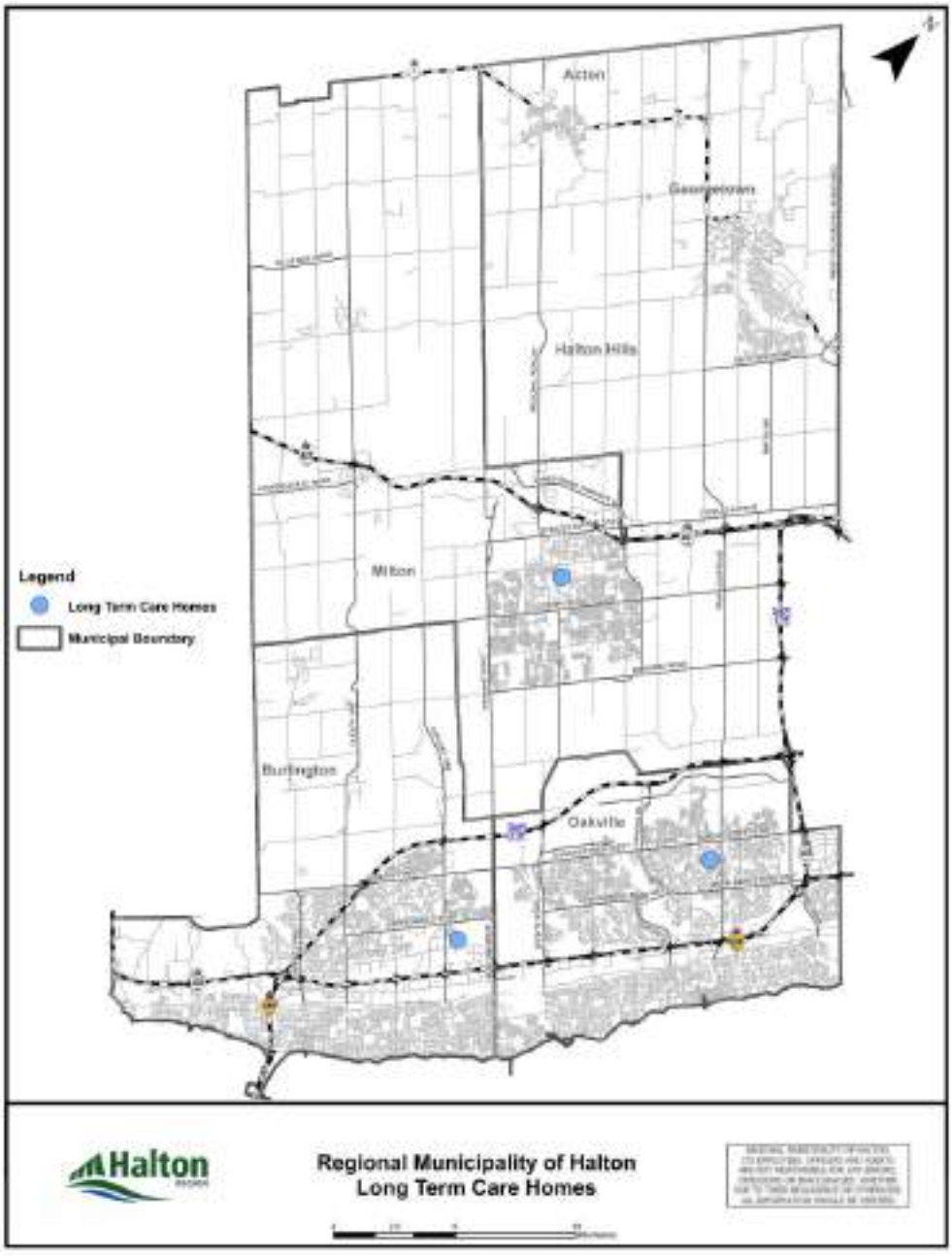
Figure 10-2. LTC Condition Distribution by Asset Type (%)



10.2. Levels of Service

Community Level of Service Objective	The Region is committed to providing long-term care services to residents that require medical, nursing, personal, therapeutic and social work services in a cost-effective way

Figure 10-3. Halton Region Long-Term Care Homes



Halton Region's Long-Term Care homes provide the following services:

- 24-hour nursing and medical care
- Social, recreational and therapeutic programs
- Spiritual support
- Nutritious and appetizing meals/snacks
- Live entertainment
- Specialized services i.e., dentist, foot care
- Hairdressing/barber services

Table 10-3. Long-Term Care Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Percentage of assets rated as Good to Very Good	Reliability	69.6%	80%
Indirect Levels of Service			
Gross operating cost of a bed per day in LTC Homes	Cost Effectiveness	$438	Maintain
Number of beds at LTC Homes	Availability	572	Maintain
Percentage of LTC beds per population over 75 years of age	Availability	1%	Maintain
Number of residents served at Regionally operated LTC Homes	Availability	572	Maintain
% of facilities that are wheelchair accessible	Suitability	100%	Maintain
Total LTC Homes Energy Consumption (kWh per Square Feet)	Sustainability	13.24	Improve
Total LTC Homes Energy Consumption (ekWh per Square Feet)	Sustainability	28.92	Improve
Total LTC Homes Water Consumption (m^3 per Square Feet)	Sustainability	0.15	Maintain
Demand work orders as a percentage of total work orders	Reliability	68%	Improve

10.3. Lifecycle Management Strategy and Potential Risk

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable Level of Service (LOS) while minimizing risk and achieving the lowest lifecycle cost. The Region manages various lifecycle activities for LTC assets that include design, planning, construction, maintenance, repair, rehabilitation, disposal, and eventual replacement of all assets.

The importance of lifecycle activities for LTC assets ensures the long-term functionality, reliability, and sustainability of these critical infrastructure systems. Proper lifecycle management helps municipalities manage costs, reduce risks, and improve service delivery. The lifecycle activities listed in Table 10-4 that summarize the Region's current approaches ensure that these infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being.

Table 10-4. LTC Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Disposal of assets at the end of their useful life.	• Improper disposal may lead to environmental impacts and expenses.
Growth Activities	
• Capital projects and expansion needs are identified to accommodate growth.	• Inadequate system capacity can potentially lead to operational issues and higher operating and maintenance costs.
Maintenance Activities	
• Routine and preventative maintenance programs. • Reactive maintenance may arise during normal operation of assets or from inspections. • Implementation and optimization of maintenance program to ensure critical infrastructure is maintained, breakdowns are minimized, and the service life of the assets are maximized.	• Potential for operational inefficiency, • Failure to meet stakeholder expectations and potential impact to service delivery/occupancy levels. • Increased downtime and operational disruptions causing inconsistent service levels. • May contribute to increased rate of asset deterioration.
Non-Infrastructure	
• Lifecycle models have been developed for LTC assets which predict asset condition. • Perform condition assessments (e.g. BCA for LTC homes) at regular intervals on all facilities to inform maintenance and capital planning programs.	• Potential for Increased risk of higher operating and maintenance costs. • Inability to prioritize assets' maintenance activities due to lack of inspection data, leading to delay and more costly maintenance activities.

Asset Management Practices	Risks Associated with Not Following the Strategy
Rehabilitation Activities	
• Rehabilitation needs are identified through ongoing maintenance, inspections, and building condition assessments.	• Increased lifecycle costs due to unplanned rehabilitation activities. • Missed opportunity to reduce energy consumption. • Failure to meet stakeholder expectations, increased operational costs and potential impact to service delivery.

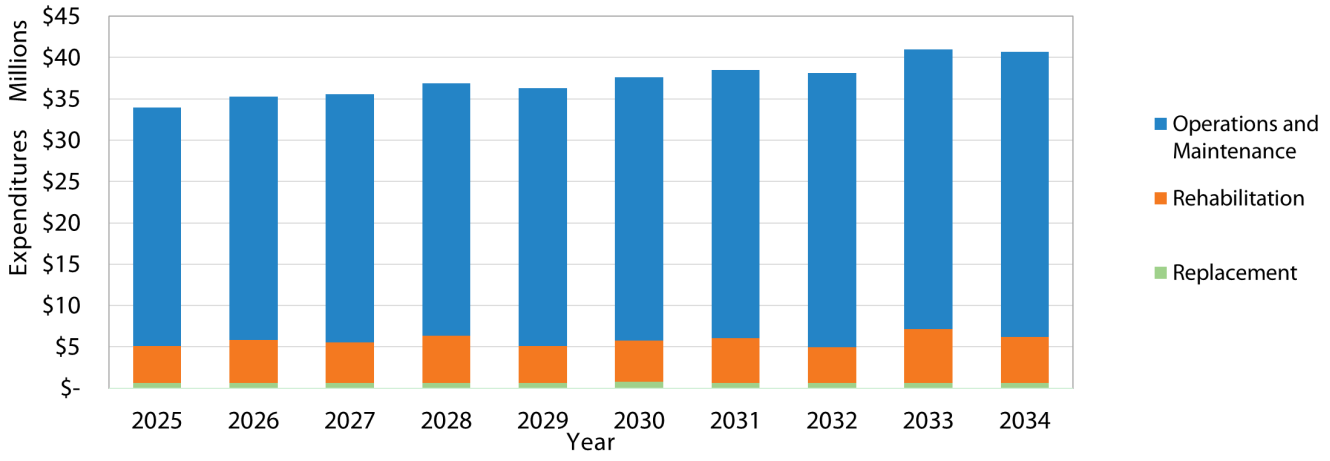
10.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outline in Table 10-4 to plan work and assess future expenditure needs for LTC assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for LTC assets, developed through staff consultations and aligned with industry's best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities that maintain infrastructure in a state of good repair and support continue service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy, where applicable. For this AMP, these activities and their associated costs were established based on the analysis of the Region's Capital and Operating budgets and are assumed to be sufficient in meeting current needs. Figure 10-4 shows the approved 2025 budget lifecycle activities for Long-Term Care.

Figure 10-4. LTC Anticipated Lifecycle Management Activities - Capital & Operating Budgets



In the 2025 Capital Budget, there are no growth-related expenditures for LTC assets. The 2025 Operating Budget identifies $28.8M for LTC for O&M needs based on established O&M service

levels. The 2025 10-year operating forecast is based on general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

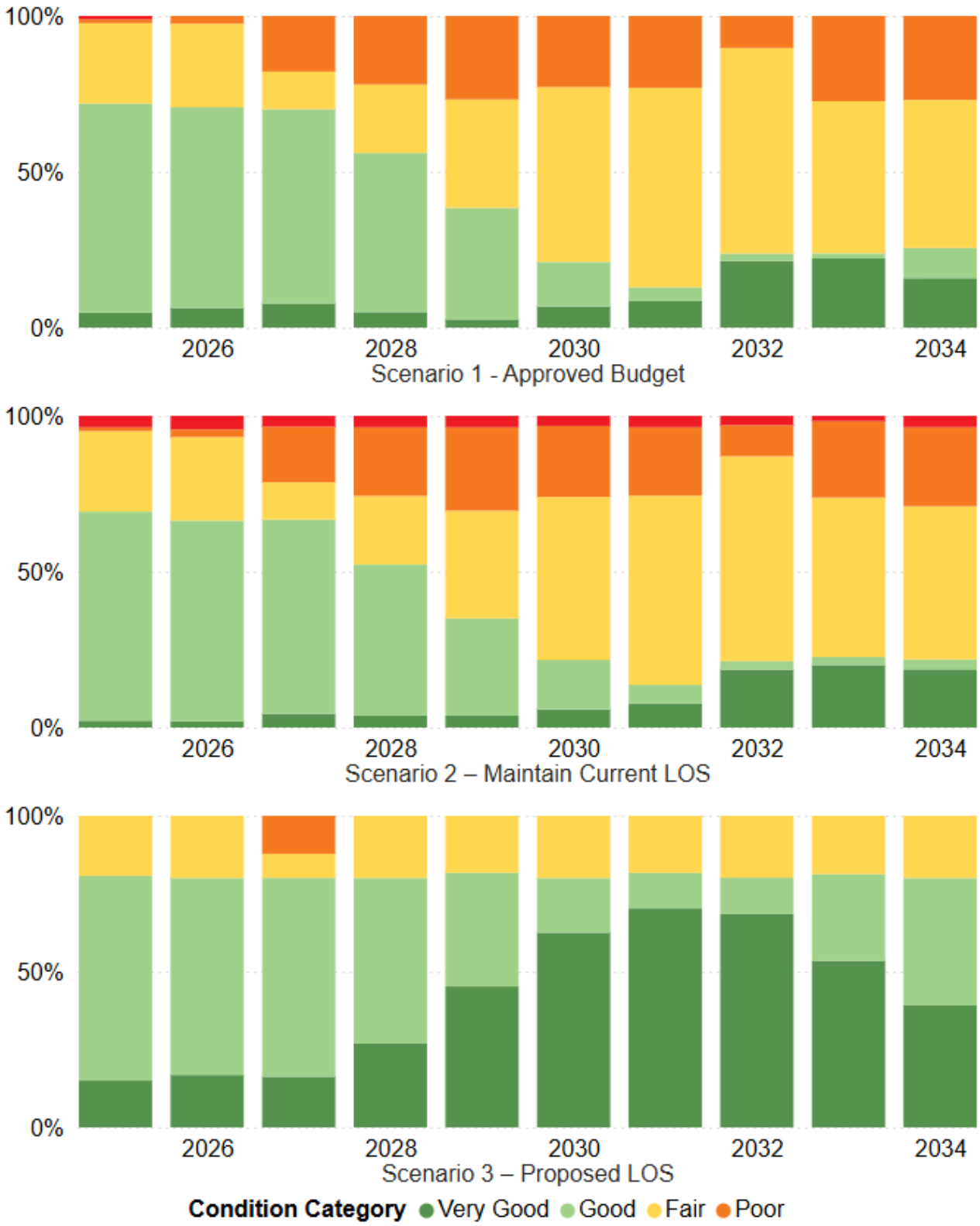
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

10.5. Impact on Current and Proposed Levels of Service

Figure 10-5 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 10-5. LTC Condition Profile for Service Level Scenarios



In Scenario 1, the condition for LTC assets worsens over the 10-year forecast period with assets in poor condition growing from 2.3% to 27%, which is approximately $1.4M of assets.

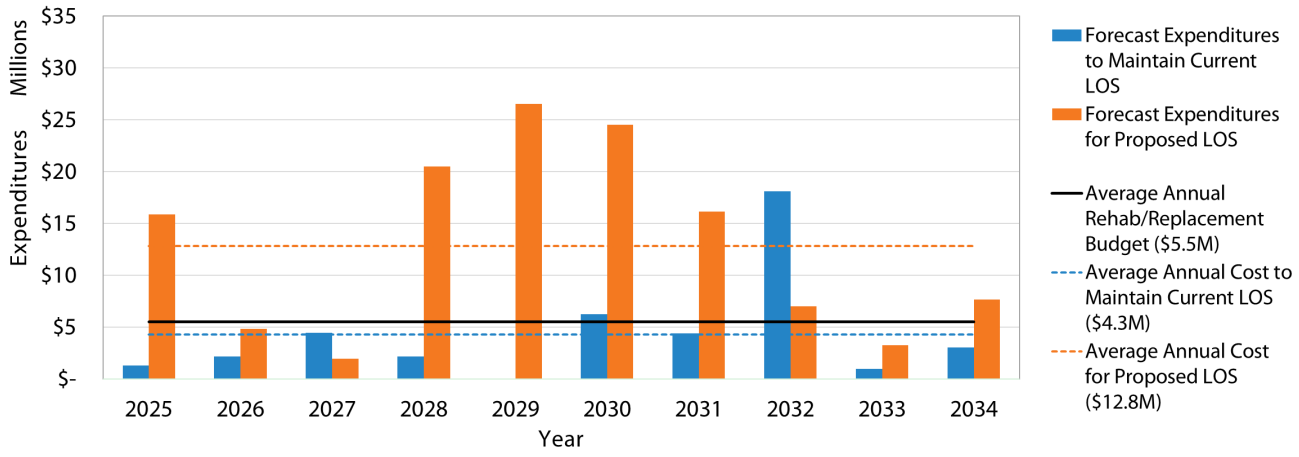
In Scenario 2, the portion of assets in very poor condition remain the same over the 10-year forecast. The Region currently has sufficient funding (no gap) to keep assets currently in good to very good condition in approximately fair or better condition over the 10-year forecast.

Scenario 3 forecasts the needs based on achieving the level of service identified the Region's 2023-2026 Strategic Business Plan (80% of assets are in good to very good condition). Based on this scenario, an additional $7.3M is required annually for replacement activities.

10.6. Estimated Preliminary Potential Infrastructure Gap

Figure 10-6 illustrates that rehabilitation and replacement expenditures of $4.3M and $12.8M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $5.5M. This results in a potential average annual estimated capital infrastructure gap of $7.3M to achieve proposed service levels and no gap to maintain current levels of service.

Figure 10-6. LTC Rehabilitation & Replacement Expenditure Scenario Comparison



While the annual funding gap is substantial, it only accounts for 5.5% of the total replacement value of LTC assets as shown in Table 10-5. The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values for LTC assets. Continued periods of high inflation and cost escalations coupled with the increase in construction in the GTHA to support the housing targets will put additional pressure on future years' budgets. It is expected that it will take several years to recover from the high impacts of inflation experienced over the past several years.

Table 10-5. LTC Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$0M	$0M	$0M
Non-Infrastructure	$0M	$0M	$0M
Rehabilitation & Replacement	$5.5M	$4.3M	$12.8M
Service Improvement	$0M	$0M	$0M
Capital Expenditures	$5.5M	$4.3M	$12.8M
Capital Infrastructure Gap		**No Gap**	**$7.3M (Gap)**
Operations & Maintenance	$29.4M	$29.4M	$29.4M
Total Expenditures	$34.9M	$33.7M	$42.2M
Gap as % of Replacement Value		**No Gap**	**5.5% (Gap)**

HALTON POLICE

The Halton Regional Police Service aims to be a world-class leader in community safety, equitable service and policing excellence by providing effective, efficient, and inclusive community-based policing for all, as exemplified through collaboration and coordination with the community.

Replacement Value
$ 230.3 M

Average Age
9 Years

Average Estimated Service Life
27 Years

Average Condition
Good

% of Assets in Good to Very Good Condition
86%

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
$2.7M	**$16.5M**

11. Halton Police

Halton Region has consistently been deemed one of the safest communities in Canada. The Halton Regional Police Service (HRPS) serves its residents under the guiding vision to be the leader in community safety and policing excellence, and with the mission to provide effective and efficient community-based policing in alignment with its 2024-2027 Strategic Plan.

11.1. State of the Infrastructure

The following sections summarize the portfolio of assets associated with HRPS.

11.1.1. Asset Overview & Valuation

HRPS assets are estimated to have a replacement value of $230.3M. The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing recent purchases and construction projects for like-to-like assets to estimate current replacement values for assets such as facilities, equipment, technology and fleet. Table 11-1 provides the inventory and current replacement value for HRPS assets included in this AMP.

Table 11-1. Halton Police Asset Inventory and Current Replacement Value ($ Millions)

Asset Class	Count	Unit	2024 Estimated Replacement Value
Facilities	6	Ea.	$134.9 M
Technology Assets	212	Ea.	$48.9 M
Equipment	25	Ea.	$14.6 M
Patrol Vehicles	172	Ea.	$13.8 M
Admin. & Investigative Vehicles	195	Ea.	$13.0 M
Specialized Vehicles	16	Ea.	$1.8 M
Mobile Command Units	6	Ea.	$1.7 M
Vessels	4	Ea.	$1.1 M
Motorcycles	6	Ea.	$0.2 M
Trailers	7	Ea.	$0.1 M
Total Replacement Value			**$230.3 M**

11.1.2. Asset Condition and Age

HRPS assets are on average in Good condition; assessed using an age-based approach as shown in Figure 11-1. Overall, the age of most assets is less than their average estimated service life. The condition of all assets is continually monitored and tracked by staff. It is important to highlight that even though some of these equipment assets are beyond their estimated service life, they still are reliable and provide expected operational functionality.

Figure 11-1. Halton Police Assets - Overall Condition (%), Age and Estimated Service Life (Years)

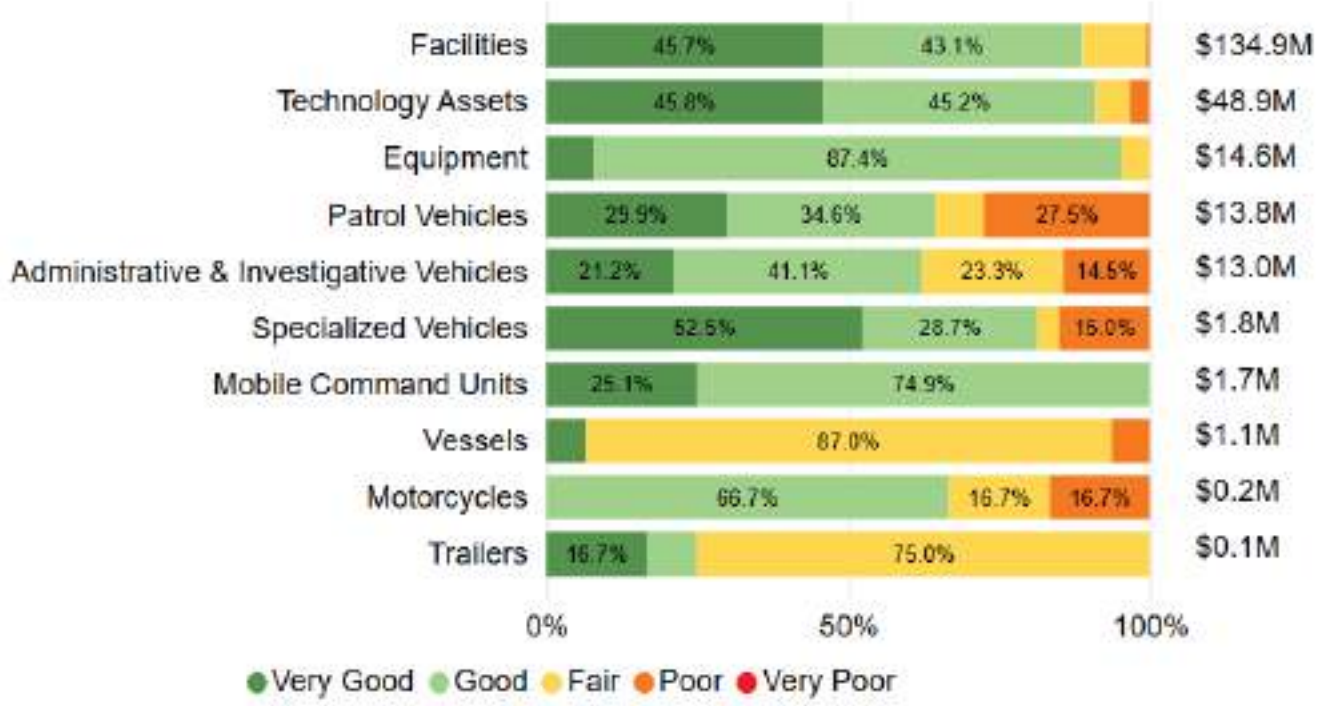
Table 11-2 provides how condition rating is assigned to the various types of assets within each service area. Age and remaining estimated service life (ESL) is used to determine condition of all Police assets including facilities in the absence of building condition assessments.

Table 11-2. Halton Police Asset Condition Rating Criteria

Condition Rating	Fleet & Equipment (Remaining ESL)	Facilities (Remaining ESL)
Very Good	67% – 100%	80% – 100%
Good	34% – 66%	60% – 79%
Fair	0% – 33%	40% – 59%
Poor	-25% – 0%	20% – 39%
Very Poor	< -25%	0% – 19%

The overall condition of Halton Police assets, as a percentage of replacement values, can be viewed at the asset class level in Figure 11-2.

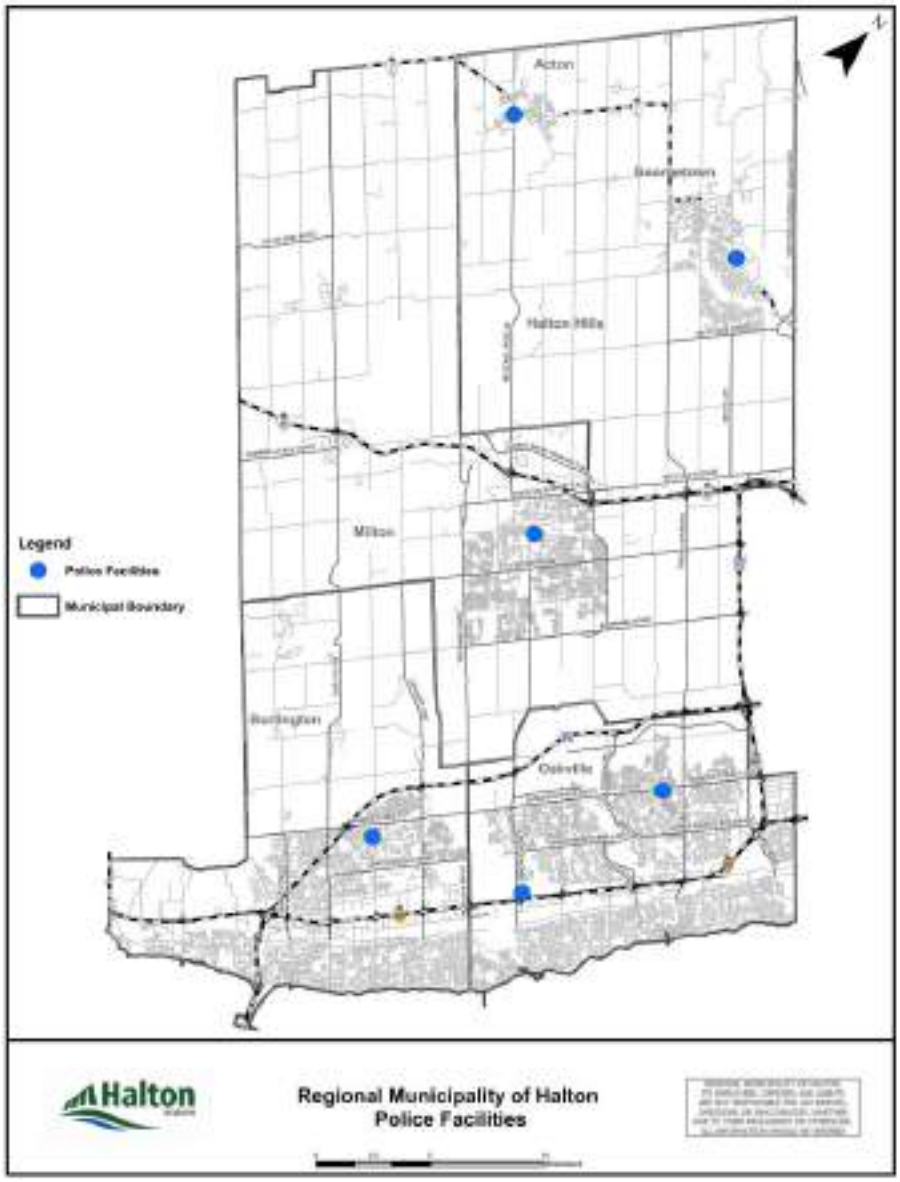
Figure 11-2. Halton Police Asset Condition Distribution by Asset Type (%)



11.2. Level of Service

Community Level of Service Objective	The Region aims to be a world-class leader in community safety, equitable service, and policing excellence by providing effective, efficient, and inclusive community-based policing for all, as exemplified through collaboration and coordination with the community.

Figure 11-3. Halton Police Facilities



Halton Police four priorities of focus include mental health and addictions, priority populations, traffic safety, and crime.

The Halton Regional Police Service has built on its policing philosophy by including proactive measures of intervention, known as the four pillars of community safety and well-being, which include:

- Incident Response
- Risk Intervention
- Prevention
- Social Development

Table 11-3. Levels of Service (Halton Police)

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Percentage of assets rated as Good to Very Good (based on replacement value)	Reliability	86.4%	80%
Indirect Level of Service			
Cost to provide service ($/capita)	Cost Effectiveness	$288	Maintain
Officers per 100,000 population	Cost Effectiveness	123	Maintain
Weighted Crime Clearance Rate	Cost Effectiveness	41.3%	Improve
Community satisfaction with service	Quality	89%	Maintain 80%
Percentage of time tactical/emergency response vehicles were available for service	Availability	98%	Maintain
Annual Average fuel consumption ($/Km driven)	Sustainability	$0.24	Maintain
Annual electricity use rate ($/square feet)	Sustainability	$2.51	Maintain
Average end-user IT asset (computers/phones/radios) rehabilitation rate (/years)	Reliability	5	Maintain
Average facility asset rehabilitation rate (/years)	Reliability	35	Maintain
Average fleet asset rehabilitation rate (/years)	Reliability	5-10	Maintain

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Average Backend IT Infrastructure (servers/storage/networking/security) asset rehabilitation rate (/years)	Reliability	5-10	Maintain
Percentage of police facilities in Poor or Very Poor condition	Reliability	9%	Maintain
Percentage of police fleet in Poor or Very Poor condition	Reliability	19%	Maintain
Percentage of police IT assets in Poor or Very Poor condition	Reliability	9%	Maintain
Percentage of patrol vehicles with in-car camera systems installed	Suitability	90%	Improve
Percentage of PSBN network availability	Responsiveness	99.5%	Maintain
Percentage of overall HRPS network availability	Responsiveness	99.5%	Maintain

11.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. HRPS manages various lifecycle activities for its assets that include design, planning, construction, maintenance, repair, rehabilitation, disposal, and eventual replacement of all assets.

The importance of lifecycle activities for Halton Police assets ensures the long-term functionality, reliability, and sustainability of these critical infrastructure systems. Proper lifecycle management helps municipalities manage costs, reduce risks, and improve service delivery. The lifecycle activities listed in Table 11-4 that summarize the Region's current approaches ensure that these infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being. The risks associated with not following these strategies have also been identified.

Table 11-4. Lifecycle Activities with Asset Management Practices and Risks (Halton Police)

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Subcontract disposals to companies which utilize environmentally safe disposal methods and provide a disposal certificate to verify the safe disposal.	• Improper disposal may lead to environmental impacts and expenses.
Growth Activities	
• Capital projects and expansion needs are identified to accommodate growth as identified through the development of strategic plans.	• Growth activities are delayed with future growth projections requiring realignment to meet capacity needs. • Resourcing priorities are realigned to support staff in delivering services.
Maintenance Activities	
• Routine and preventative maintenance programs. • Reactive maintenance may arise during normal operation of assets or from inspections. • Implementation and optimization of maintenance program to ensure critical infrastructure is maintained, breakdowns are minimized, and the service life of the assets are maximized.	• Increased lifecycle costs due to delayed maintenance. • May contribute to increasing of asset deterioration and potential risk of asset failure, leading to service disruptions.

Asset Management Practices	Risks Associated with Not Following the Strategy
Non-Infrastructure	
• Lifecycle models have been developed for HRPS assets which predict asset condition. • Perform ongoing assessments on facilities to inform maintenance and capital planning programs, avoiding reactive, unplanned maintenance or replacement costs. • Development of HRPS strategic plans & facility plans.	• Potential for Insufficient capital funds for programs and initiatives.
Rehabilitation Activities	
• Rehabilitation needs are identified through ongoing maintenance, inspections, and condition assessments.	• Potential for increased lifecycle costs due to improper and unplanned rehabilitation activities.
Replacement & Construction Activities	
• Replacement of equipment related to site function.	• Delay in replacement may result in higher overall lifecycle costs, longer service impacts, and customer dissatisfaction.

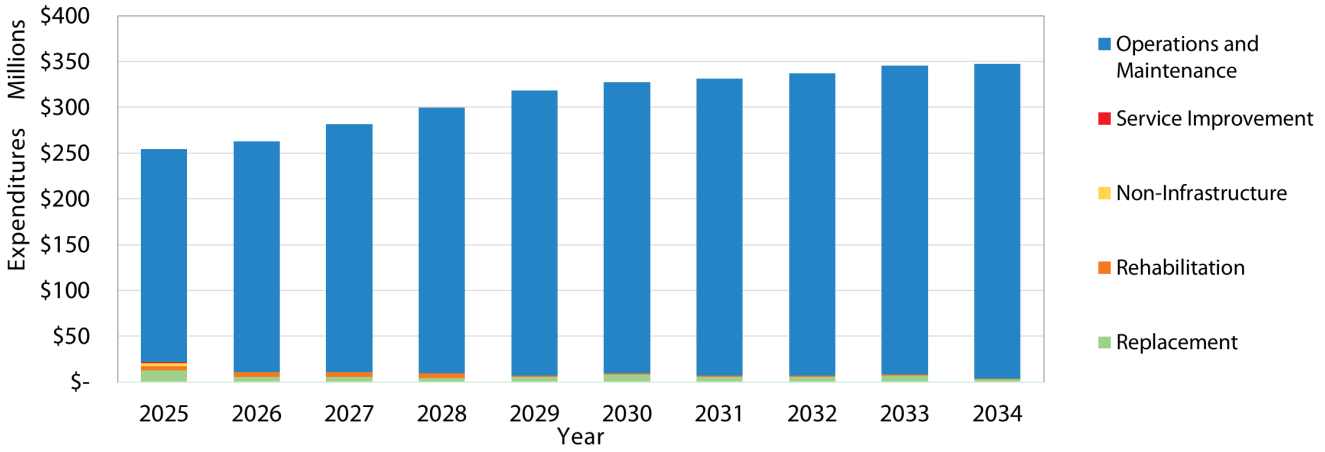
11.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outline in Table 11-4 to plan work and assess future expenditure needs for Halton Police assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Halton Police assets, developed through staff consultations and aligned with industry's best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities-that maintain infrastructure in a state of good repair and support continue service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy, where applicable. For this AMP, these activities and their associated costs were established based on the analysis of the Region's Capital and Operating budgets and are assumed to be sufficient in meeting current needs. Figure 11-4 shows the approved 2025 budget lifecycle activities for Halton Police.

Figure 11-4. Halton Police Anticipated Lifecycle Management Activities - Capital & Operating Budgets



Currently there are no growth-related expenditures for Halton Police assets. The 2025 budget identifies an annual average of $271.7M for Halton Police in the next 5 years for the operations and maintenance (O&M) needs based on established O&M service levels. The 2025 10-year operating forecast is prepared based on general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

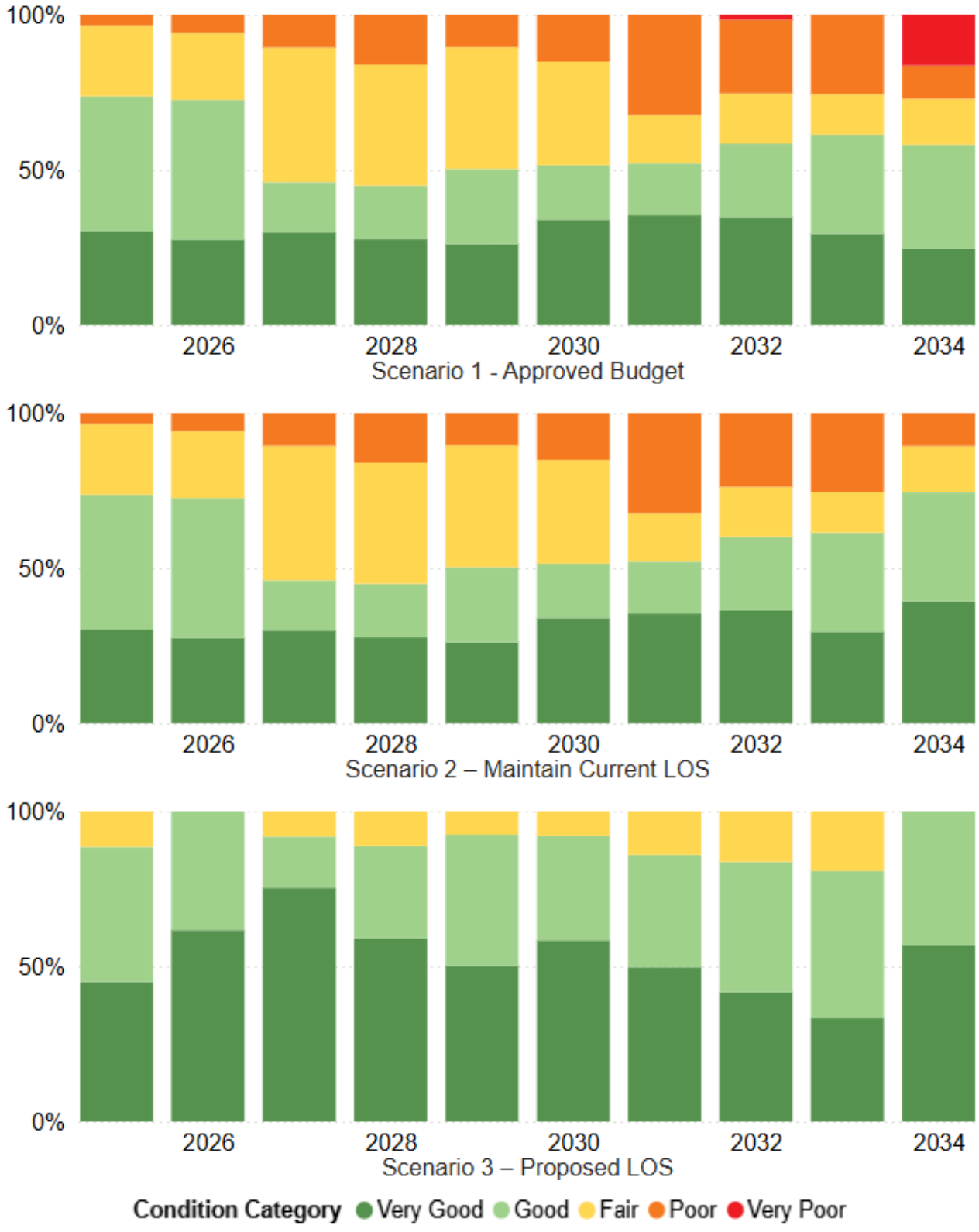
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

11.5. Impact on Current and Proposed Levels of Service

Figure 11-5 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 11-5. Halton Police Assets Condition Profile for Service Level Scenarios



In Scenario 1, the asset condition worsens over the 10-year forecast period with assets in poor and very poor condition growing from 1.9% to 26%, which is approximately $59.4M of assets.

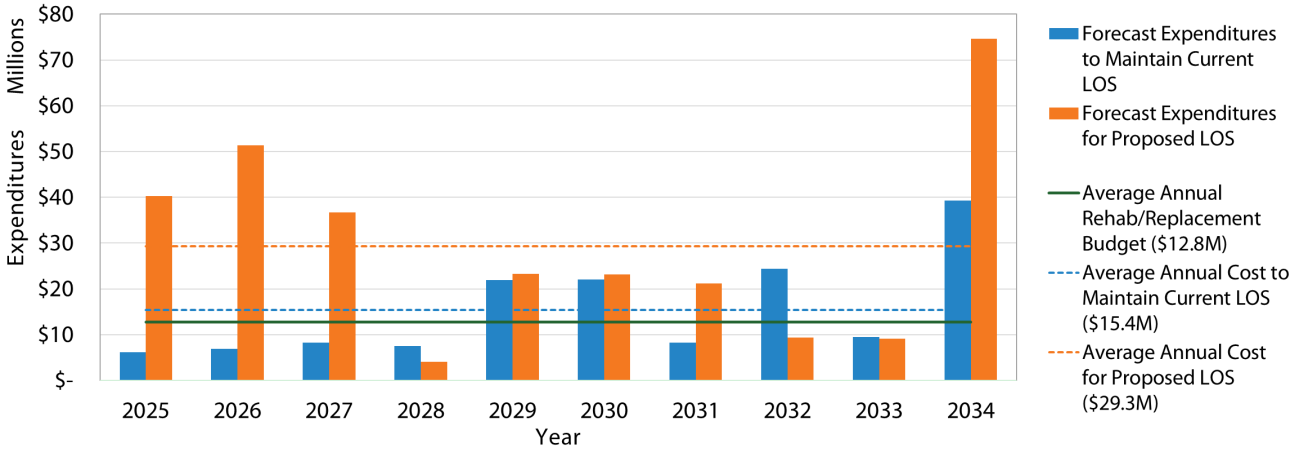
In Scenario 2, there is no increase of assets in very poor condition. The Region currently needs an additional annual investment of $2.6M to keep assets in the same condition over the 10-year forecast.

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed LOS was set to achieve 80% of assets in good to very good condition. This would require a significant investment for Halton Police Assets. To achieve the proposed LOS, an additional $16.5M would be required for rehabilitation and replacement activities annually.

11.6. Estimated Preliminary Potential Infrastructure Gap

Figure 11-6 illustrates that rehabilitation and replacement expenditures of $15.4M and $29.3M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $12.8M. This results in potential average annual estimated capital infrastructure gap of $2.7 to maintain current service levels, and $16.5M to achieve proposed service levels.

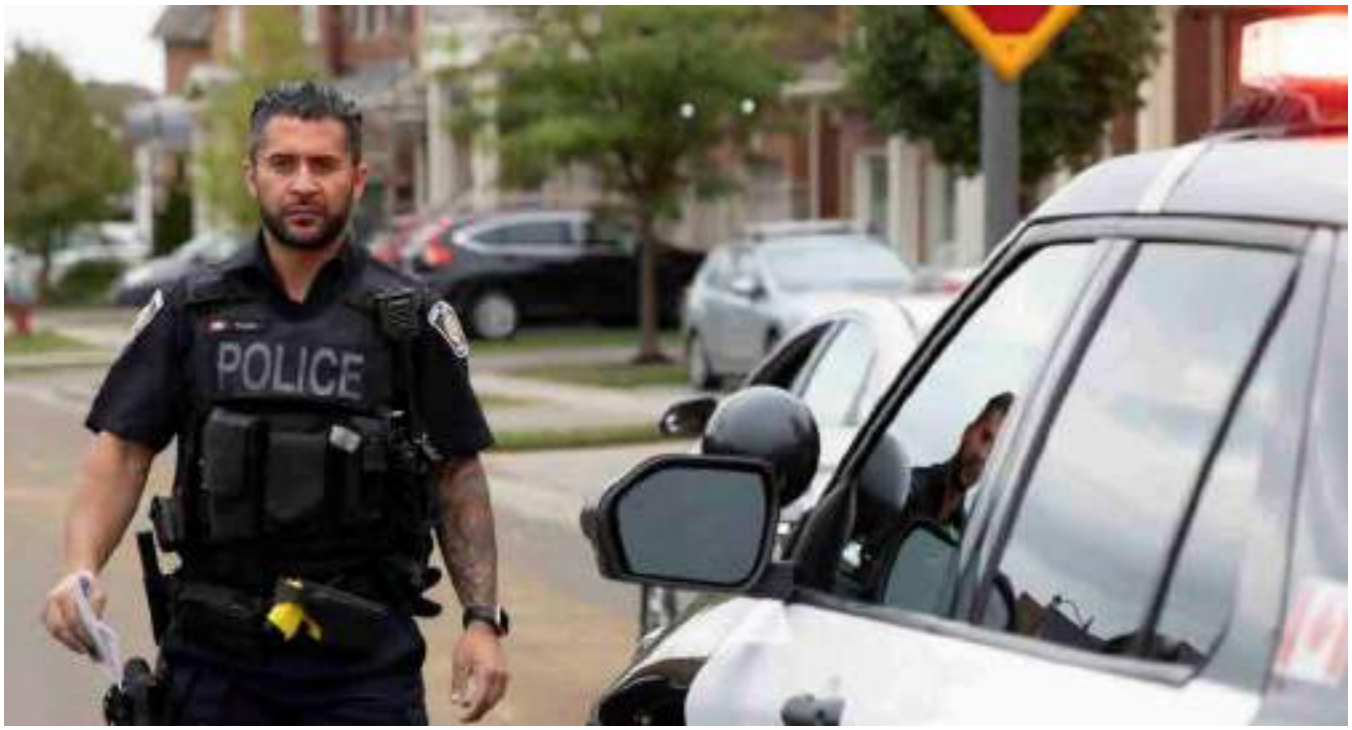
Figure 11-6. Halton Police Rehabilitation & Replacement Expenditure Scenario Comparison



While these costs are significant, they only account for 1.2% and 7.2% of the total replacement value as shown in Table 11-5. The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values for Halton Police assets. It is recommended that the Region continue to monitor and update replacement values to ensure accurate forecasting, as inflation and supply chain challenges continue to affect this service area. While the full impact is not yet clear, tariffs are expected to influence costs, likely affecting asset replacement values.

Table 11-5. Halton Police Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$0M	$0M	$0M
Non-Infrastructure	$1.1M	$1.1M	$1.1M
Rehabilitation & Replacement	$12.8M	$15.4M	$29.3M
Service Improvement	$0.4M	$0.4M	$0.4M
Capital Expenditures	$14.3M	$16.9M	$30.8M
Capital Infrastructure Gap		**$2.7M (Gap)**	**$16.5M (Gap)**
Operations & Maintenance	$252.1M	$252.1M	$252.1M
Total Expenditures	$266.4M	$269.0M	$282.9M
Gap as % of Replacement Value		**1.1% (Gap)**	**7.2% (Gap)**



PARAMEDICS

Halton Region Paramedic Services provides advanced pre-hospital care and community paramedicine programs, delivers public awareness programs, including CPR, public access defibrillation, and injury prevention. Paramedic Services continue to implement new models of care for select patients, enabling paramedics to treat and discharge relevant patients, avoiding transportation to hospital.

Replacement Value
$59.2 M

Average Age
12 Years

Average Estimated Service Life
31 Years

Average Condition
Good

% of Assets in Good to Very Good Condition

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
$1.4M	**$5.7M**

12. Paramedics

Halton's Paramedics are highly skilled medical professionals with an unmatched dedication to serving the community and saving lives. They work 24 hours a day, seven days a week, to provide life-saving emergency care to residents in Burlington, Halton Hills, Milton and Oakville. Every year, Halton Paramedics respond to more than 50,000 calls and transport over 30,000 patients. Paramedics treat patients on scene and continue life-saving treatment on the way to the hospital. Their training, medical expertise and collaboration with hospital emergency rooms ensure that those in life-threatening situations receive the best possible care.

The demand for paramedic services in Halton is estimated to rise by 4.7 per cent each year between now and 2034. As the Region's population ages and grows, to maintain existing level of service, the 10-year Paramedic Services Master Plan identifies additional infrastructure investment and operational needs such as:

- New Headquarters and hub in Oakville strategically positioned near the QEW.
- New hub in Halton Hills to support future growth in South Georgetown and East Milton.
- By 2034, add 1400 additional hours of ambulance staffing each week and 32 support staff to help keep stations and ambulances stocked with supplies and equipment.
- Community Paramedics to support programs including the Community Paramedicine Program in partnership with other health agencies.
- Additionally, Paramedics provide Public Access Defibrillation (PAD) and Cardiopulmonary Resuscitation (CPR) training across Halton.

12.1. State of the Infrastructure

The following sections summarize the portfolio of Region's assets associated with Paramedic Services.

12.1.1. Asset Overview & Valuation

Paramedic assets are estimated to have a replacement value of $59.2M. The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing appraisals and building condition assessments for paramedic stations, and recent purchases for like-to-like assets to estimate current replacement values for paramedic fleet and equipment. Table 12-1 provides the inventory and current replacement value for Paramedic assets included in this AMP.

Table 12-1. Paramedic Services Asset Inventory and Current Replacement Value ($ Millions)

Asset Class	Count	Unit	2024 Estimated Replacement Value
Paramedic Stations	12	Ea.	$39.6 M
Ambulances	40	Ea.	$10.6 M
Paramedic Equipment	159	Ea.	$5.7 M
Emergency Response Vehicles	21	Ea.	$2.9 M
Logistic Units	4	Ea.	$0.3 M
Communications Equipment	9	Ea.	$0.07 M
Training & Station Equipment	5	Ea.	$0.07 M
Total Replacement Value			**$59.2 M**

12.1.2. Asset Condition and Age

Condition of assets managed by Paramedic Services is determined using established condition rating criteria or age-based approach, depending on the asset type. Condition for paramedic stations is determined based on recent Building Condition Assessments (BCA). For paramedic fleet and equipment, an age-based approach is used to determine condition. The condition of all assets is continually monitored and tracked by staff. Paramedics assets are on average in Good condition with the average age of all assets less than their estimated service life as noted in Figure 12-1.

Figure 12-1. Paramedic Services Overall Condition (%), Age and Estimated Service Life (Years)

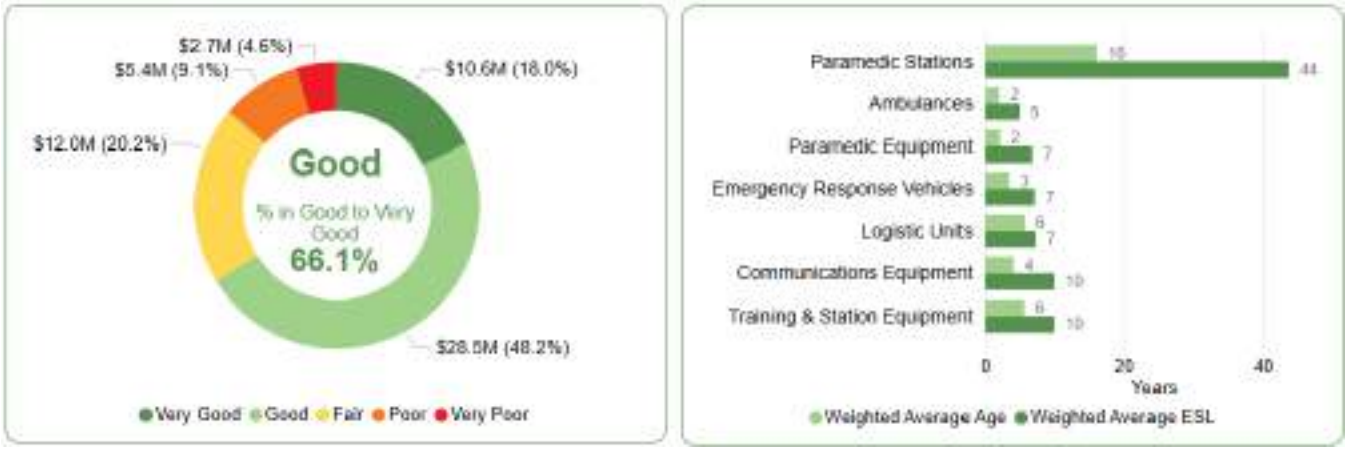


Table 12-2 provides how condition rating is assigned to the various types of assets within each service area. For Paramedic Stations, Building Condition Assessment (BCA) data is utilized which provides a comprehensive evaluation of the individual facility components. BCAs are

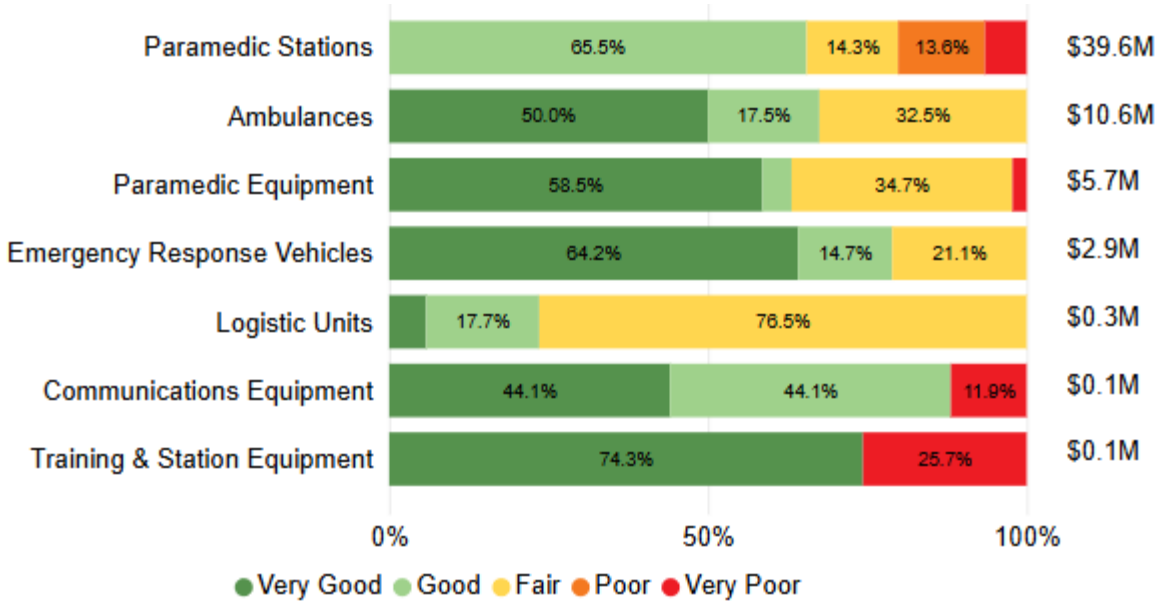
completed for paramedic stations on a 5-year cycle. These assessments help determine the current condition, identify capital expenditure requirements, and support the long-term capital planning for the assets. Where BCA data is not available, age and remaining estimated service life is used to determine condition. It is important to highlight that while some Paramedic assets are beyond their estimated service life, they still are reliable and provide expected operational functionality.

Table 12-2. Paramedics Services Asset Condition Rating Criteria

Condition Rating	Paramedic Stations (BCA)	Fleet & Equipment (Remaining ESL)
Very Good	1	67% – 100%
Good	2	34% – 66%
Fair	3	0% – 33%
Poor	4	-25% – 0%
Very Poor	5	< -25%

The overall condition of Paramedics assets, as a percentage of replacement values, can be viewed at the asset class level in Figure 12-2.

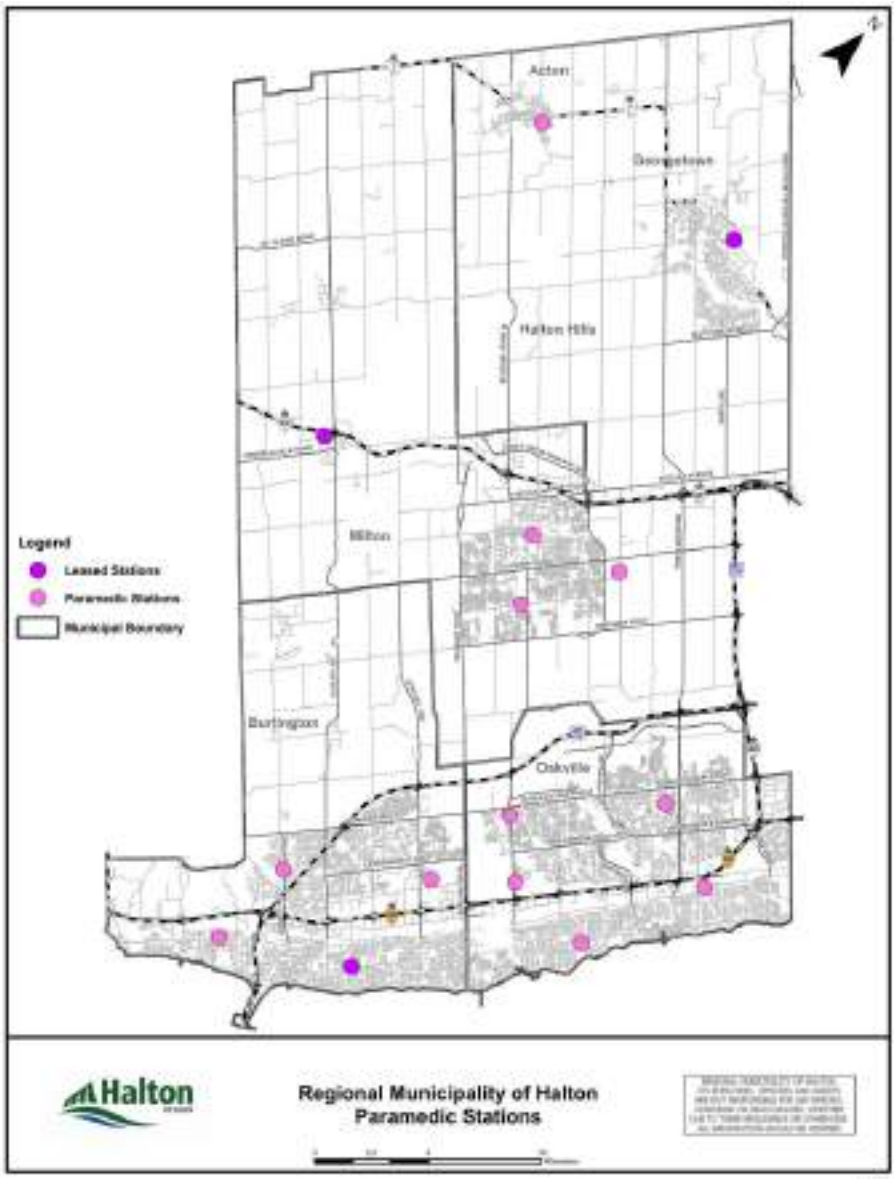
Figure 12-2. Paramedic Services Asset Condition Distribution by Asset Type (%)



12.2. Levels of Service

Community Level of Service Objective	Halton Region Paramedic Services provides advanced pre-hospital care and community paramedicine programs, and delivers public awareness programs, including CPR, public access defibrillation, and injury prevention. Paramedic Services continues to implement new models of care for select patients, enabling paramedics to treat and discharge relevant patients, avoiding transportation to hospital.

Figure 12-3. Halton Region Paramedic Stations



Every year, Halton Paramedics respond to more than 50,000 calls and transport over 30,000 patients.

Paramedics treat patients on scene and life-saving treatment continues on the way to the hospital. Their training, medical expertise and collaboration with hospital emergency rooms ensure that those in life-threatening situations receive the best possible care.

Table 12-3. Halton Paramedic Services - Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Percentage of assets that are rated as Good to Very Good (based on replacement value)	Reliability	66.1%	80%
Indirect Levels of Service			
Average condition	Reliability	Good	Maintain
Percentage of paramedic vehicles uptime	Reliability	99%	Improve
Total paramedics fuel consumption (litres /year)	Sustainability	515,958	Improve
Percentage of paramedic vehicles beyond estimated useful life	Reliability	0%	Maintain

12.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. The Region manages various lifecycle activities for Paramedic assets that include design, planning, construction, maintenance, repair, rehabilitation, disposal, and eventual replacement of all assets.

The importance of lifecycle activities for Paramedics assets ensures the long-term functionality, reliability, and sustainability of these critical infrastructure systems. Proper lifecycle management helps municipalities manage costs, reduce risks, and improve service delivery. The lifecycle activities listed in Table 12-4 that summarizes the Region's current approaches ensure that these infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being.

Table 12-4. Paramedic Services Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Disposal of assets at the end of their useful life.	• Improper disposal may lead to environmental impacts and expenses.
Growth Activities	
• Capital projects and expansion needs are identified to accommodate growth as identified in the 10-year Paramedic Services Master Plan.	• Growth activities are aligned to meet future growth projections • Resourcing priorities are realigned to support staff in delivering services.
Maintenance Activities	
• Routine and preventative maintenance programs. • Reactive maintenance may arise during normal operation of assets or from inspections. • Implementation and optimization of maintenance programs to ensure critical infrastructure is maintained, breakdowns are minimized, and the service life of the assets are maximized.	• Increased lifecycle costs due to delayed maintenance. • May contribute to increasing asset deterioration and potential risk to service disruptions.
Non-Infrastructure	
• Lifecycle models have been developed for paramedic's assets which predict asset condition. • Perform condition assessments (BCAs) at regular intervals on all facilities to inform maintenance and capital planning programs.	• Increased risk of higher operating and maintenance costs. • Inability to prioritize assets' maintenance activities due to lack of inspection data, leading to delay and more costly maintenance activities

Asset Management Practices	Risks Associated with Not Following the Strategy
• Development of Master Plans for Halton Region Paramedic Services.	
Rehabilitation Activities	
• Rehabilitation needs are identified through ongoing maintenance, inspections, and condition assessments.	• Potential for increased lifecycle costs due to improper and unplanned rehabilitation activities. • Failure to meet stakeholder expectations, increased operational costs and potential impact to service delivery.
Replacement / Construction Activities	
• Replacement of equipment or reconstruction of new facilities based on asset condition and identified needs.	• Delay in construction projects or replacement may result in higher overall life cycle costs, longer service impacts, and customer dissatisfaction.
Service Improvement Activities	
• Upgrades or operating changes to equipment to improve operational efficiencies.	• Lack of service improvement can result in higher operation and maintenance, and capital needs.

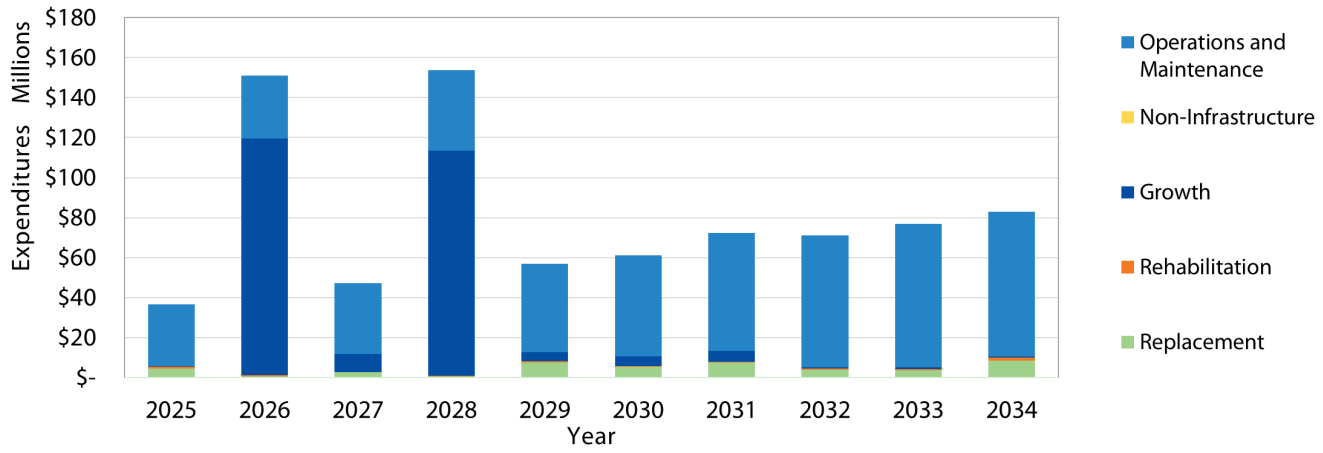
12.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outline in Table 12-4 to plan work and assess future expenditure needs for Paramedics assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Paramedic Services assets, developed by leveraging staff expertise and are aligned with industry's best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities that maintain infrastructure in a state of good repair and support continued service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy, where applicable. For this AMP, these activities and their associated costs were established based on the analysis of the Region's Capital and Operating budgets and are assumed to be sufficient in meeting current needs. Figure 12-4 shows the approved 2025 budget lifecycle activities for Paramedics.

Figure 12-4. Paramedic Services Anticipated Lifecycle Management Activities - Capital & Operating Budgets



Based on the 10-year Paramedic Services Master Plan, the demand for paramedic services in Halton is estimated to rise by 4.7% each year between now and 2034. A new headquarters and hub in Oakville and a new hub in Halton Hills are planned to support future growth in South Georgetown and East Milton. By 2034, an additional 1400 additional hours of ambulance staffing each week and 32 support staff to help keep stations and vehicles stocked with supplies is also expected.

The 2025 capital budget identifies a total of $257.4M for Paramedics in the next 10 years to meet growth requirements based on the planned projects funded through development charges or initiatives addressing the Region's growing population. The 2025 10-year operating forecast is based on general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

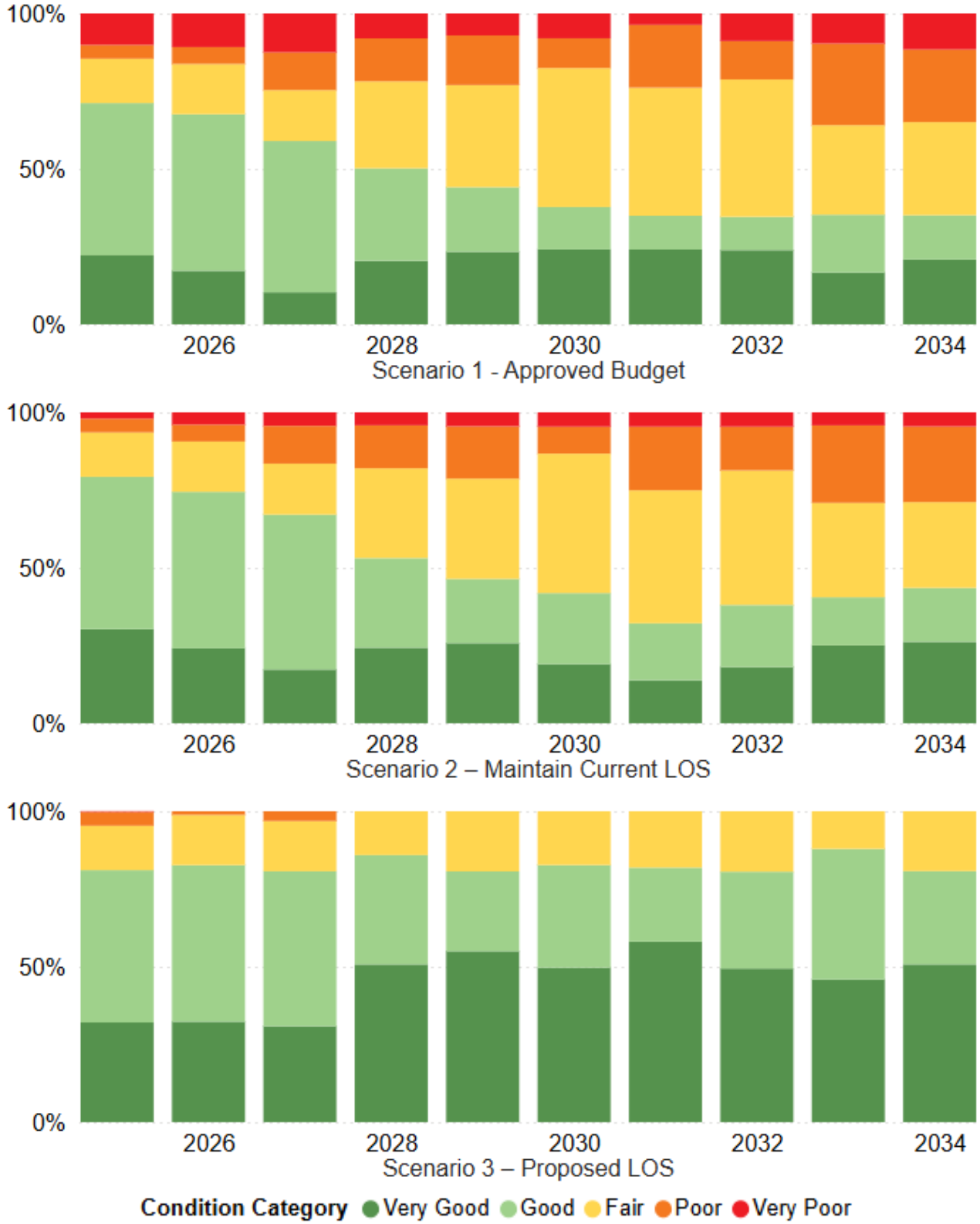
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

12.5. Impact on Current and Proposed Levels of Service

Figure 12-5 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 12-5. Paramedic Services Condition Profile for Service Level Scenarios



In Scenario 1, the asset condition marginally worsens over the 10-year forecast period with assets in very poor condition fluctuating from 10.1% to 11.6%, which is approximately $6.9M of assets.

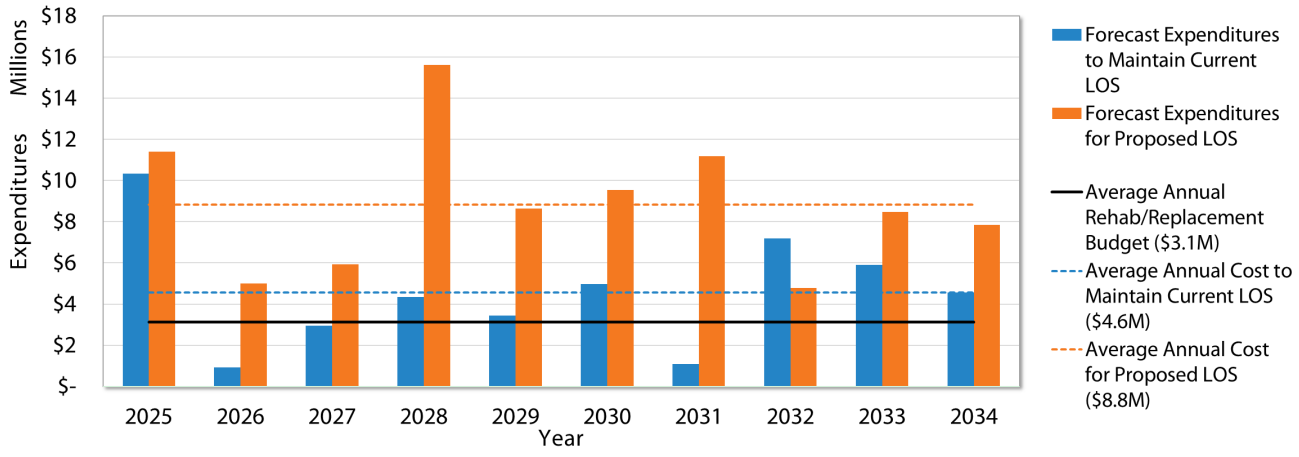
Scenario 2 The Region currently needs an additional $1.4M in annual funding to keep assets in approximately the same condition over the 10-year forecast period (Scenario 2).

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed LOS was set to achieve 80% of assets in good to very good condition. This would require a significant investment for Paramedic Assets. To achieve the proposed LOS, an additional $5.7M would be required for rehabilitation and replacement activities annually.

12.6. Estimated Preliminary Potential Infrastructure Gap

Figure 12-6 illustrates that rehabilitation and replacement expenditures of $4.6M and $8.8M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $3.1M.

Figure 12-6. Paramedic Services Rehabilitation & Replacement Expenditure Scenario Comparison



This results in a potential average annual estimated capital infrastructure gap of $1.4M to maintain current service levels, and $5.7M to achieve proposed service levels. These costs account for 2.4% and 9.6% of the total replacement value as shown in Table 12-5.

The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values for Paramedics Services assets. It is recommended that the Region continue to monitor and update replacement values to ensure accurate forecasting, as inflation and supply chain challenges continue to affect this service

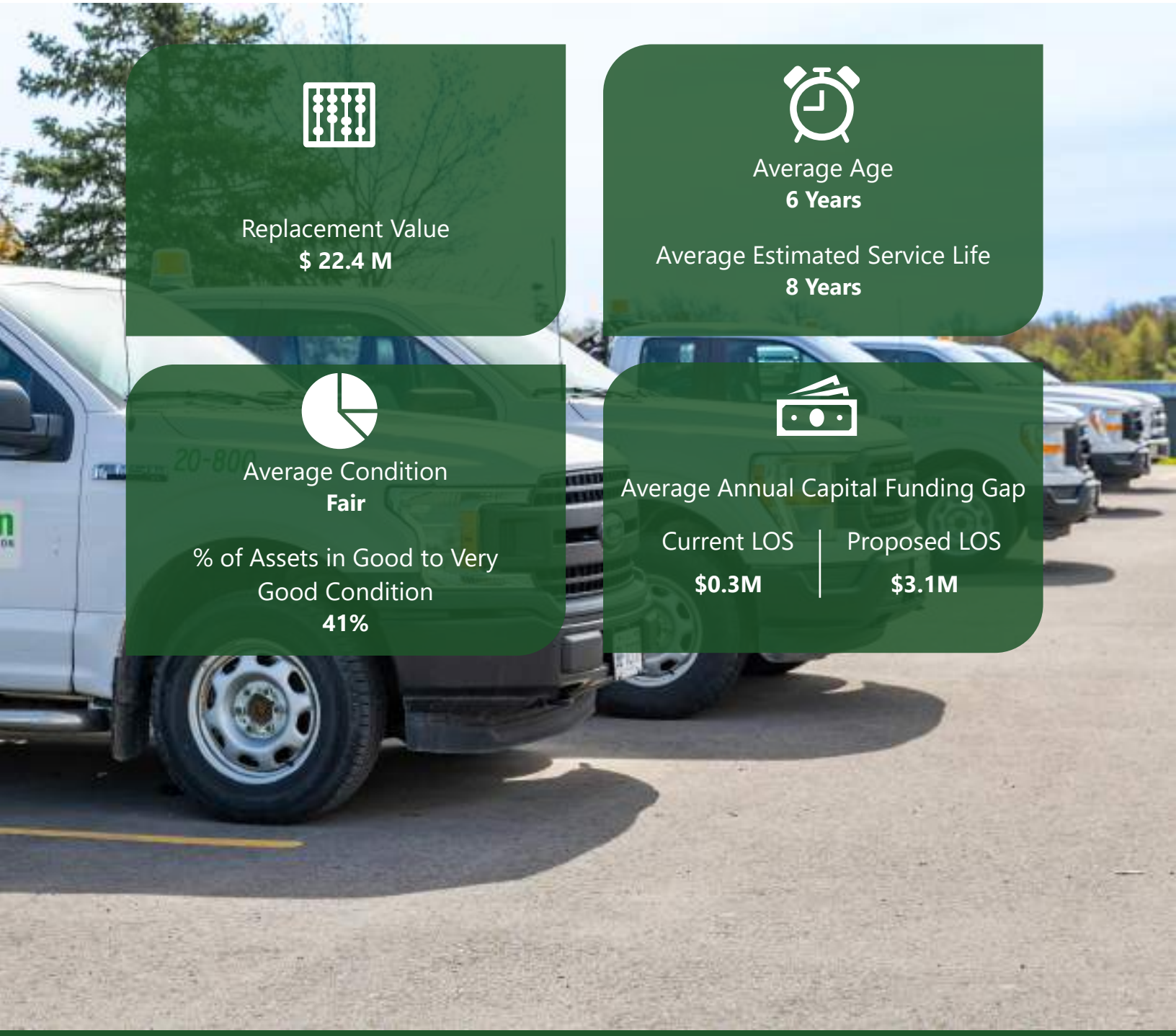
area. While the full impact is not yet clear, tarrifs are expected to influence costs, likely affecting asset replacement values.

Table 12-5. Paramedics Services Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$42.6M	$42.6M	$42.6M
Non-Infrastructure	$0M	$0M	$0M
Rehabilitation & Replacement	$3.1M	$4.6M	$8.8M
Service Improvement	$0M	$0M	$0M
Capital Expenditures	$45.7M	$47.2M	$51.4M
Capital Infrastructure Gap		**$1.4M (Gap)**	**$5.7M (Gap)**
Operations & Maintenance	$32.7M	$32.7M	$32.7M
Total Expenditures	$78.4M	$79.8M	$84.1M
Gap as % of Replacement Value		**2.5% (Gap)**	**9.6% (Gap)**

CORPORATE FLEET

The Region provides high-quality and cost-effective fleet services, manages fleet and ancillary equipment, provides operational support and customer service excellence by responding to service requests in a timely manner. Corporate Fleet delivers a comprehensive preventative maintenance program, conforming to codes and regulations, and adopting accepted industry standards and best practices.



Replacement Value
$ 22.4 M

Average Age
6 Years

Average Estimated Service Life
8 Years

Average Condition
Fair

% of Assets in Good to Very Good Condition
41%

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
$0.3M	**$3.1M**

13. Corporate Fleet

13.1. State of the Infrastructure

Corporate Fleet assets primarily support Region's departments by providing functional, reliable and well-maintained fleet and equipment to help deliver essential services and support municipal operations.

The following sections summarize the portfolio of assets associated with the Region's Corporate Fleet.

13.1.1. Asset Overview & Valuation

Halton Region's Corporate Fleet assets have a total replacement value of $22.4 million. The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing recent purchases as well as estimating current replacement values for these assets. Table 13-1 provides the inventory and current replacement value for the assets included in this AMP. It should be noted that the Corporate Fleet category excludes fleet assets captured under Halton Police and Paramedic Services.

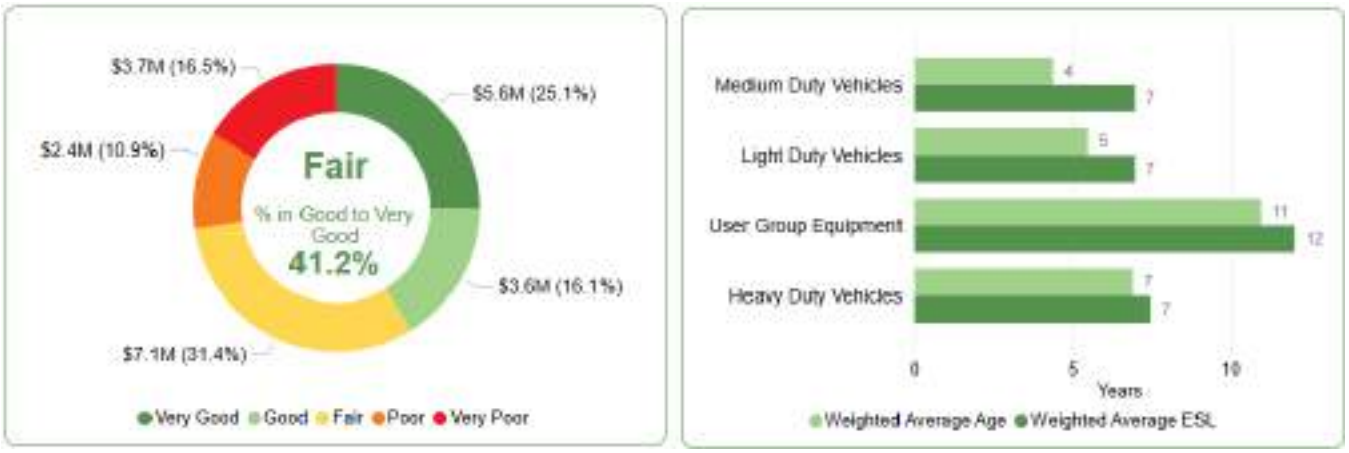
Table 13-1. Corporate Fleet Asset Inventory and Current Replacement Value ($ Millions)

Asset Class	Count	Unit	2024 Estimated Replacement Value
Heavy Duty Vehicles	21	Ea.	$3.4 M
Light Duty Vehicles	88	Ea.	$5.2 M
Medium Duty Vehicles	115	Ea.	$9.1 M
User Group Equipment	52	Ea.	$4.7 M
Total			**$22.4 M**

13.1.2. Asset Condition and Age

Corporate Fleet assets are on average in Fair condition with the average age of all asset categories less than their estimated service life as shown in Figure 13-1.

Figure 13-1. Corporate Fleet Assets Overall Condition (%), Age and Estimated Service Life (Years)



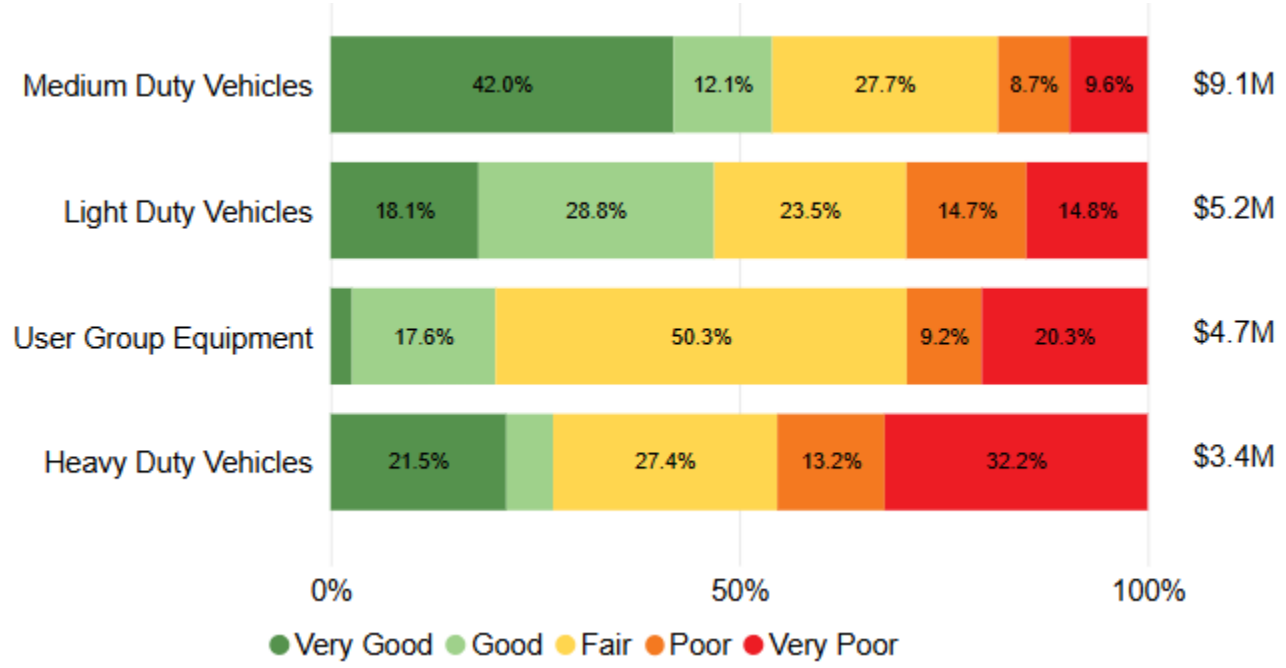
Corporate Fleet condition is assessed using an age-based approach. It should be noted that fleet and equipment assets are assessed as they come due for replacement and a decision is made if the asset should be replaced based on its condition. Table 13-2 provides how age and the assets remaining estimated service life determine the asset's condition rating for this category.

Table 13-2. Corporate Fleet Condition Rating Criteria

Condition Rating	Remaining Estimated Service Life
Very Good	67% – 100%
Good	34% – 66%
Fair	0% – 33%
Poor	-25% – 0%
Very Poor	< -25%

The overall condition of Corporate Fleet assets, as a percentage of replacement values, is shown at the asset class level in Figure 13-2. These assets are continuously monitored to ensure they are maintained throughout their lifecycle, and to prolong their service life. Although some assets are in Very Poor condition, it is important to highlight that even though these assets are beyond their estimated service life, they still are reliable and provide expected operational functionality.

Figure 13-2. Corporate Fleet Condition Distribution by Asset Type (%)



13.2. Levels of Service

Community Level of Service Objective	The Region provides high-quality and cost-effective fleet services by managing fleet and ancillary equipment, providing operational support and customer service excellence by responding to service requests in a timely manner. Corporate Fleet also delivers a comprehensive preventative maintenance program, conforming to codes and regulations, and adopting accepted industry standards and best practices.

Table 13-3. Corporate Fleet Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Percent of Fleet assets rated as Good to Very Good (based on replacement value)	Reliability	41.2%	80%
Indirect Level of Service			
Percentage of regulated MTO maintenance inspections completed	Reliability	100%	Maintain
Percentage of uptime	Reliability	98.30%	Improve
Total fuel consumption of dyed/clear diesel per year (litres/year)	Sustainability	223,718.8	Improve
Total fuel consumption of regular gasoline per year (litres/year)	Sustainability	180,191.5	Improve
Percentage of vehicles with non-fossil fuels	Sustainability	0%	Improve
GHG emissions for fleet in tonnes of carbon dioxide equivalent. (2023)	Sustainability	6,200	Improve
Percentage of external maintenance cost (sublet)	Reliability	37%	Maintain
Internal Repair Hours Available Annually	Reliability	13,200	Maintain

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. The Region manages lifecycle activities for Corporate Fleet assets that include asset acquisition, maintenance, repair, replacement and disposal.

13.3. Lifecycle Management Strategy and Potential Risks

Market shifts highlight the critical need for effective asset management practices and a proactive approach to asset management. This ensures Corporate Fleet assets remain reliable and perform as expected. A key strategy to achieve this is to adhere to planned lifecycle activities, which enhance efficiency and support service delivery at the required level while minimizing overall lifecycle costs. Table 13-4 provides an overview of the lifecycle activities for Corporate Fleet assets.

Table 13-4. Corporate Fleet Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Reassigned interdepartmental (moving vehicles between service area groups based on request). • Auction/Disposal/Salvage.	• Environmental and service implications as well as potential inefficiency.
Growth Activities	
• New Vehicles and related equipment. • Commissioning of Vehicle.	• Growth activities are delayed with future growth projections requiring realignment to meet capacity needs. • Resourcing priorities are realigned to support staff in delivering services.
Maintenance Activities	
• MTO inspections. • PM schedule by class of vehicle. • Reactive maintenance (damage, accidents, breakdowns. etc.) • Daily inspections (completed by assigned operator). • H&S inspections (completed by assigned operator). • Compressor inspections. • Hoist inspections. • Seasonal inspections on seasonal equipment. • Preventative maintenance (compressors).	• Increase in overall lifecycle costs if maintenance is done improperly or not as scheduled. • May contribute to reactively restoring function and replacing assets prematurely. • Postponed inspections may lead to delayed maintenance activities. • Misallocation of resources and operational inefficiency. • Increased downtime, higher maintenance and repair costs.

Asset Management Practices	Risks Associated with Not Following the Strategy
Non-Infrastructure	
• Condition assessment and inspections (based on age and/or vehicle profile). • Feasibility studies (new requests, leasing programs vs capital acquisitions).	• Increased risk of higher operating and maintenance costs.
Replacement Activities	
• Replacement (equipment, other assets). • Commissioning of Vehicle.	• Delay in replacement may result in higher overall lifecycle costs, longer service impacts, and customer dissatisfaction.
Service Improvement Activities	
• Vehicle Upgrade. • New technology. • New assets (user group request). • Fleet upgrade requiring new equipment (user group request).	• Failure to meet stakeholder expectations, increased operational costs and potential impacts to service delivery. • Projects are delayed with potential impact on service improvement.

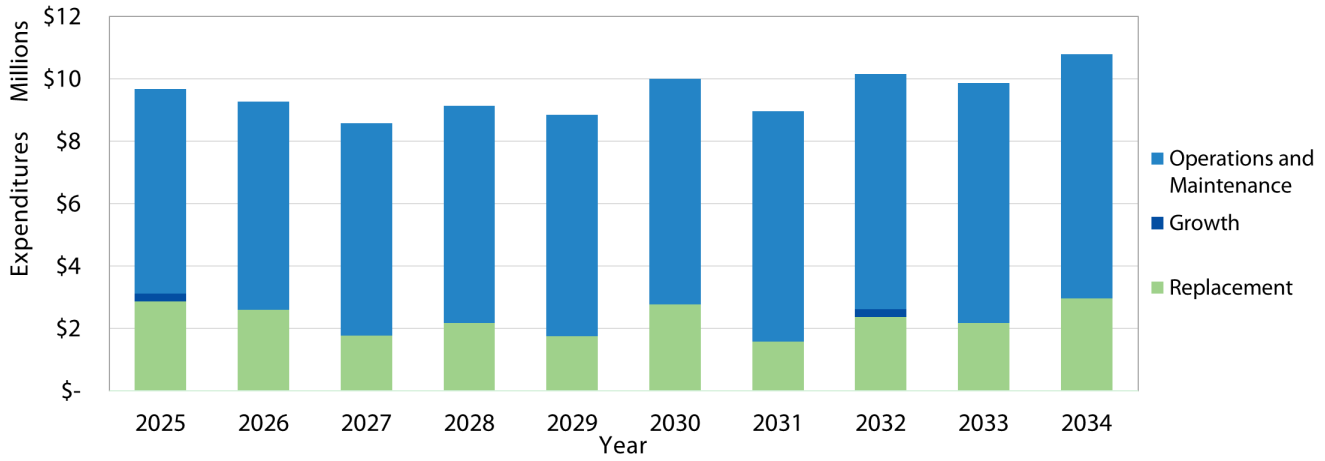
13.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outlined in Table 13-4 to plan work and assess future expenditure needs for Corporate Fleet assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Corporate Fleet assets developed by leveraging staff expertise and are aligned with industry's best practices. The forecasted needs focus on the investment requirements associated with rehabilitation and replacement activities that maintain infrastructure in a state of good repair and support continued service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership, the scenario comparison also captures other lifecycle activities such as non-infrastructure solutions, operations and maintenance, service improvements, growth and disposal where applicable. Figure 13-3 shows the anticipated lifecycle management expenditures for Corporate Fleet.

Figure 13-3. Corporate Fleet Anticipated Lifecycle Management Activities - Capital & Operating Budgets



The 2025 capital budget identifies a total of $0.5M for Corporate Fleet in the next 10 years to meet growth requirements based on the planned projects funded through development charges or initiatives addressing the Region's growing population. The 2025 10-year operating forecast is prepared based on general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year. The extended period of high inflation and continuing global inflationary trends has had a significant impact on the cost of goods, services and construction, and continues to be a significant driver of the increases in the 2025 capital and operating budgets to maintain core

services. It is expected that it will take several years to recover from the high impacts of inflation experienced over the past several years.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

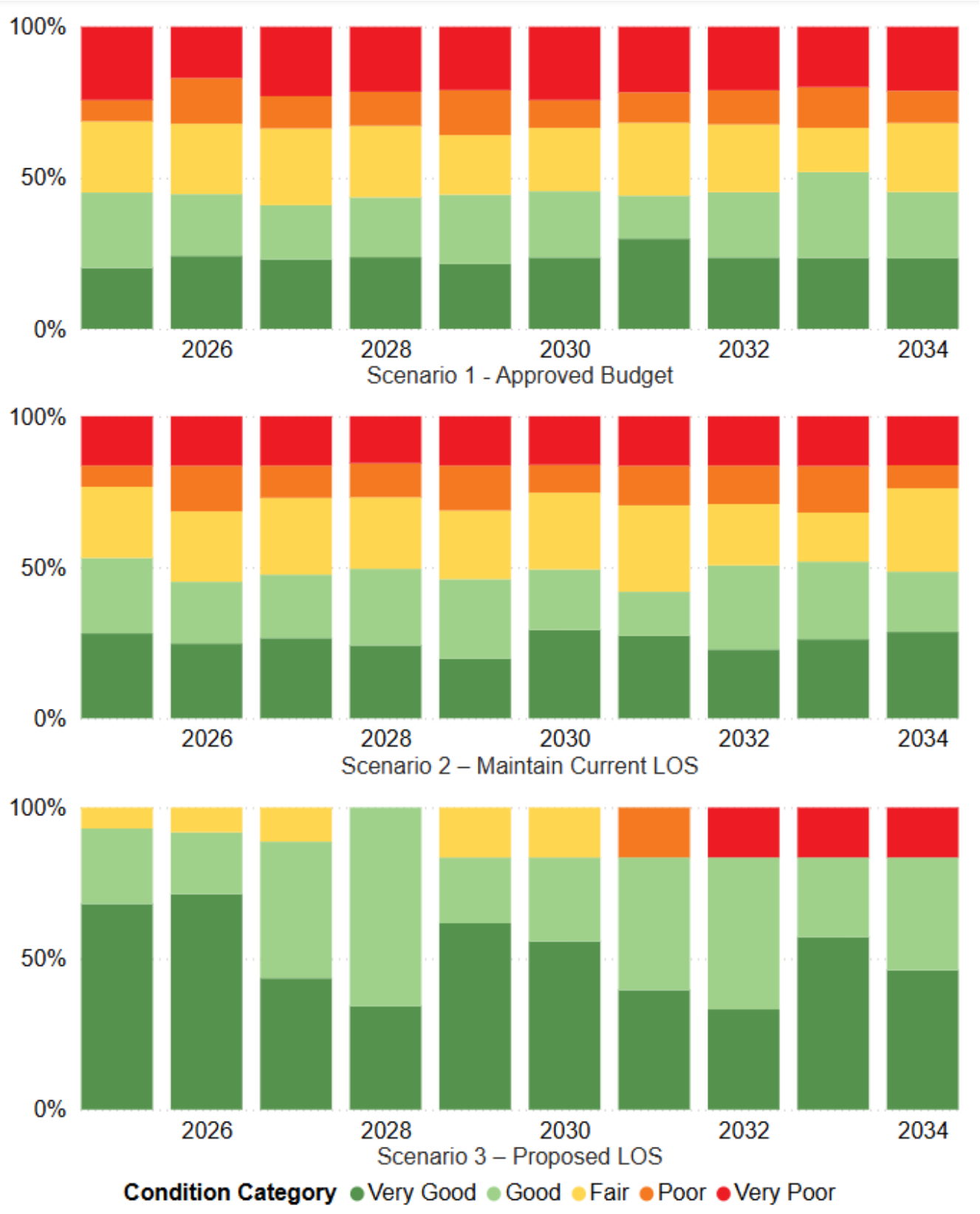
Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

13.5. Impact on Current and Proposed Levels of Service

Figure 13-4 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 13-4. Corporate Fleet Condition Profile for Service Level Scenarios

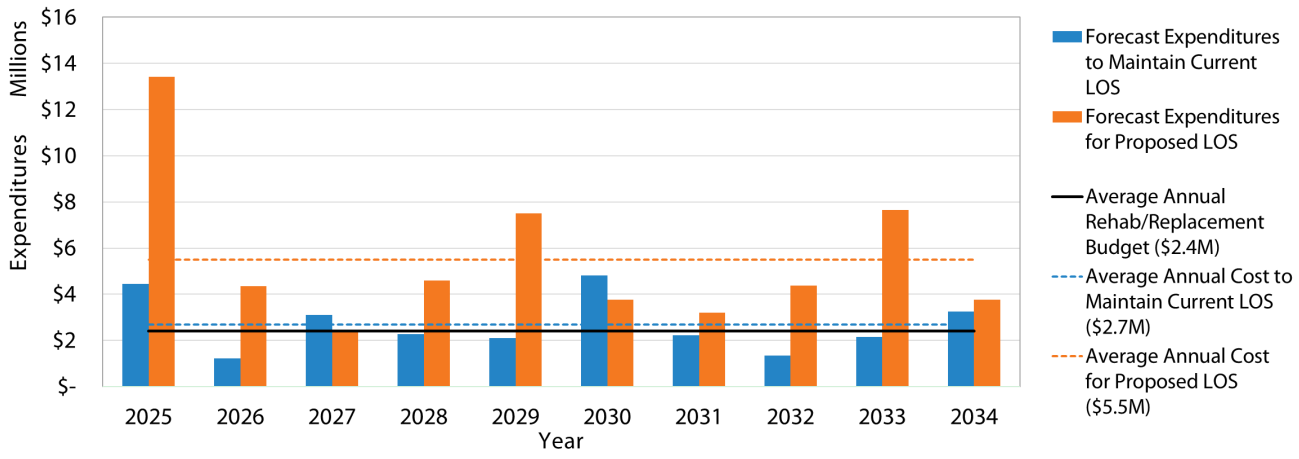


Scenario 1 and Scenario 2 keep assets in approximately the same condition over the 10-year forecast period, and there is not a significant increase in the overall condition of the Corporate Fleet assets. Based on Halton Region's 2023-2026 Strategic Business Plan, the proposed LOS was set to achieving 80% of assets in good to very good condition. This would require additional annual investment of $3M in replacement activities for Corporate Fleet assets.

13.6. Estimated Preliminary Potential Infrastructure Gap

Figure 13-5 illustrates that rehabilitation and replacement expenditures of $2.7M and $5.5M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $2.4M. This results in a potential average annual estimated capital funding gap of $0.3M to maintain current service levels, and $3.1M to achieve proposed service levels.

Figure 13-5. Corporate Fleet Rehabilitation & Replacement Expenditure Scenario Comparison



While these costs are significant, they only account for 1.3% and 13.8% of the total replacement value as shown in Table 13-5. The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values of Corporate Fleet. It is recommended that the Region continue to monitor and update replacement values to ensure accurate forecasting, as inflation and supply chain challenges continue to affect this service area. While the full impact is not yet clear, tariffs are expected to influence costs, likely affecting both asset replacement values and fuel expenses.

Table 13-5. Corporate Fleet Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$0.1M	$0.1M	$0.1M
Non-Infrastructure	$0M	$0M	$0M
Rehabilitation & Replacement	$2.4M	$2.7M	$5.5M
Service Improvement	$0M	$0M	$0M
Capital Expenditures	$2.5M	$2.8M	$5.6M
Capital Infrastructure Gap		**$0.3M (Gap)**	**$3.1M (Gap)**
Operations & Maintenance	$6.7M	$6.8M	$6.8M
Total Expenditures	$9.2M	$9.6M	$12.4M
Gap as % of Replacement Value		**1.7% (Gap)**	**14.2% (Gap)**

DIGITAL & INFORMATION SERVICES

The Region is committed to providing secure Digital and Information Services at an appropriate service level in an efficient and cost-effective manner.

Replacement Value
$ 15.3M

Average Age
4 Years

Average Estimated Service Life
7 Years

Average Condition
Good

% of Assets in Good to Very Good Condition
63%

Average Annual Capital Funding Gap

Current LOS	Proposed LOS
No Gap	**$1.1M**

14. Digital & Information Services

Digital and Information Services (DIS) assets are integral in supporting all service areas at the Region. Well-functioning and properly managed DIS assets ensure efficient delivery of services and support municipal operations across all the Region. The Digital & Information Services department's primary focus is delivering the Region's Digital Strategy and maintaining sustainable operating models for the Region's core platforms, strategic and legacy applications. The Region's objective of becoming a "digital first", data-driven organization is enabled through enhancing the Region's resident-facing and internal technology services. The department guides the Region's transition to a self-serve, digitally-powered service model that leverages data to support continuous improvement.

Operating Technology initiatives such as automatic meter reading (AMI), advanced traffic management (ATMS) and the continued investment in the Region's automation technology (SCADA) require integration with traditional Information Technology and increased cybersecurity focus. Additional priorities include providing ongoing services to program areas, business process enhancements, the introduction of smart technologies, and other key initiatives.

14.1. State of the Infrastructure

The following sections summarize the portfolio of assets associated with the Region's Digital & Information Services.

14.1.1. Asset Overview & Valuation

Halton Region's DIS assets have a total estimated replacement value of $15.3 million. The Region ensures the replacement value accurately reflects current market conditions and specific characteristics of its assets by reviewing recent purchases for like-to-like assets as well as estimating current replacement values for physical assets such as end user devices (cellphones, monitors, phones, printers, workstations) and IT infrastructure (network, servers).

Compared to the physical DIS assets, determining replacement cost for software and application is more complex. The true replacement value extends beyond software licensing fees to include implementation costs, which can vary greatly based on the system's size and complexity. The transition from on-premise software to a Software-as-a-Service (SaaS) model has shifted how the Region conducts business. SaaS solutions typically have lower upfront capital costs for licensing but require ongoing annual fees covered through operating expenses. Additionally, such assets are not replaced based on a fixed interval like typical

infrastructure assets. The replacement of such assets is continuously evaluated and determined when the exiting software/application does not support the Region's services.

For applications and software, the Region is actively working on improving the valuation and financial projections through the Digital Strategy (2021-2025), and various other strategies to move the Region to a digital first organization.

Table 14-1 provides the inventory and current replacement value for DIS assets included in this AMP. It should be noted that DIS assets exclude technology assets captured under Halton Police and Paramedics.

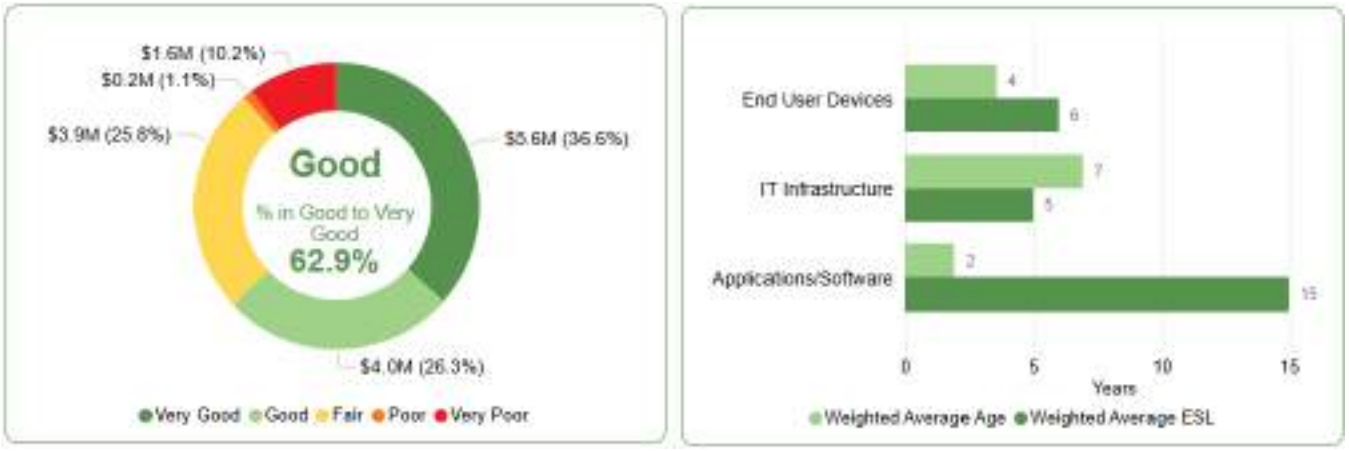
Table 14-1. DIS Asset Inventory and Current Replacement Value ($ Millions)

Asset Class	Count	Unit	2024 Estimated Replacement Value
End User Devices	10,204	Ea.	$8.8 M
IT Infrastructure	626	Ea.	$3.7 M
Applications/Software	350+	Ea.	$2.7 M
Total Replacement Value			**$15.3M**

14.1.2. Asset Condition and Age

DIS assets are on average in Good condition based on using an age-based approach as shown in Figure 14-1. Similar to the replacement value of applications and software, the age and estimated service life of these assets were determined based on accounting data. However, this does not accurately reflect how these assets are managed. Estimating a service life for software is challenging and constantly evolving due to factors such as software support and availability, changing end-user needs, and system functionality. Each application is unique and must be evaluated based on multiple factors to determine necessary updates or system redundancy or replacement. Assessing these factors helps establish the application's true condition and estimated service life, ensuring it continues to meet operational needs effectively.

Figure 14-1. DIS Assets Overall Condition (%), Age and Estimated Service Life (Years)



The average age for IT infrastructure assets exceeds its estimated service life and hence some of the IT assets are estimated to be in Very Poor condition. It is important to highlight that even though these assets are beyond their estimated service life, they still are reliable and provide expected operational functionality. These assets are continuously monitored to ensure they are maintained throughout their lifecycle, and to prolong their service life.

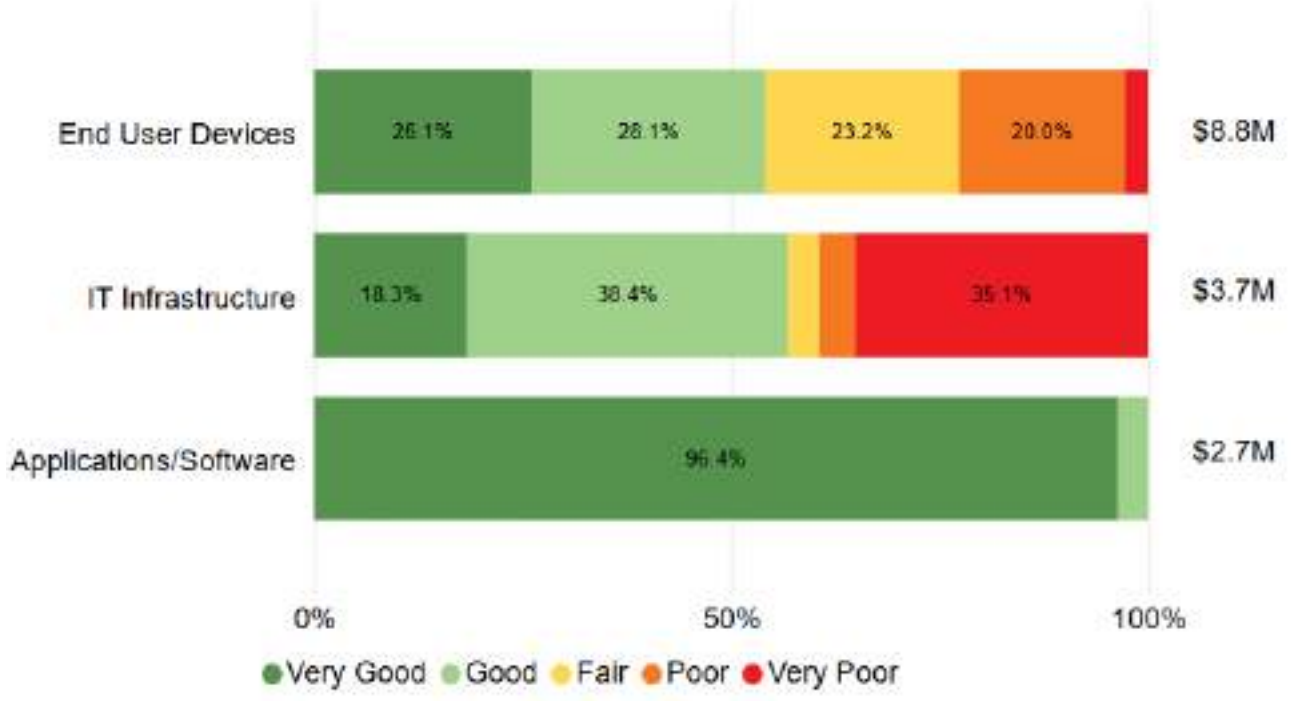
Table 14-2 provides how the assets remaining useful life determine the asset's condition category for this category.

Table 14-2. DIS Condition Rating Criteria

Condition Rating	Remaining Estimated Service Life
Very Good	67% – 100%
Good	34% – 66%
Fair	0% – 33%
Poor	-25% – 0%
Very Poor	< -25%

The overall condition of Digital & Information Services assets, as a percentage of replacement values, can be viewed at the asset class level in Figure 14-2. IT infrastructure currently has 35% of its assets in very poor condition and should continue to be evaluated for needs.

Figure 14-2. DIS Condition Distribution by Asset Type (%)



14.2. Levels of Service

Community Level of Service Objective	The Region is committed to providing secure Digital and Information Services at an appropriate service level in an efficient and cost-effective manner.

Table 14-3. Digital & Information Services Levels of Service

Performance Measure	Key Service Attribute	Current Performance	Proposed Performance
Levels of Service			
Percentage of DIS assets rated as Good to Very Good	Reliability	63.2%	80%
Indirect Level of Service			
Percentage of assets within their estimated service life	Reliability	89%	Improve
Percentage of DIS Devices Supported	Availability	100%	Maintain
Number of Digital Transactions	Availability	1,503,400	Improve
Number of Services that can be accessed Online.	Availability	109	Improve
Percentage of DIS user end equipment disposed of in an environmentally friendly manner, where feasible	Sustainability	100%	Maintain

14.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by the Region's current practices as well as by best industry practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. The Region manages various lifecycle activities for DIS assets that include design, planning, construction, maintenance, repair, rehabilitation, disposal, and eventual replacement of all assets.

The importance of lifecycle activities for Digital & Information Services assets ensures long-term functionality, reliability, and sustainability of these critical infrastructure systems. Proper lifecycle management helps municipalities manage costs, reduce risks, and improve service delivery. The lifecycle activities listed in Table 14-4 summarize the Region's current approaches that ensure infrastructure systems remain functional, efficient, and resilient, while minimizing risks and costs and enhancing community well-being.

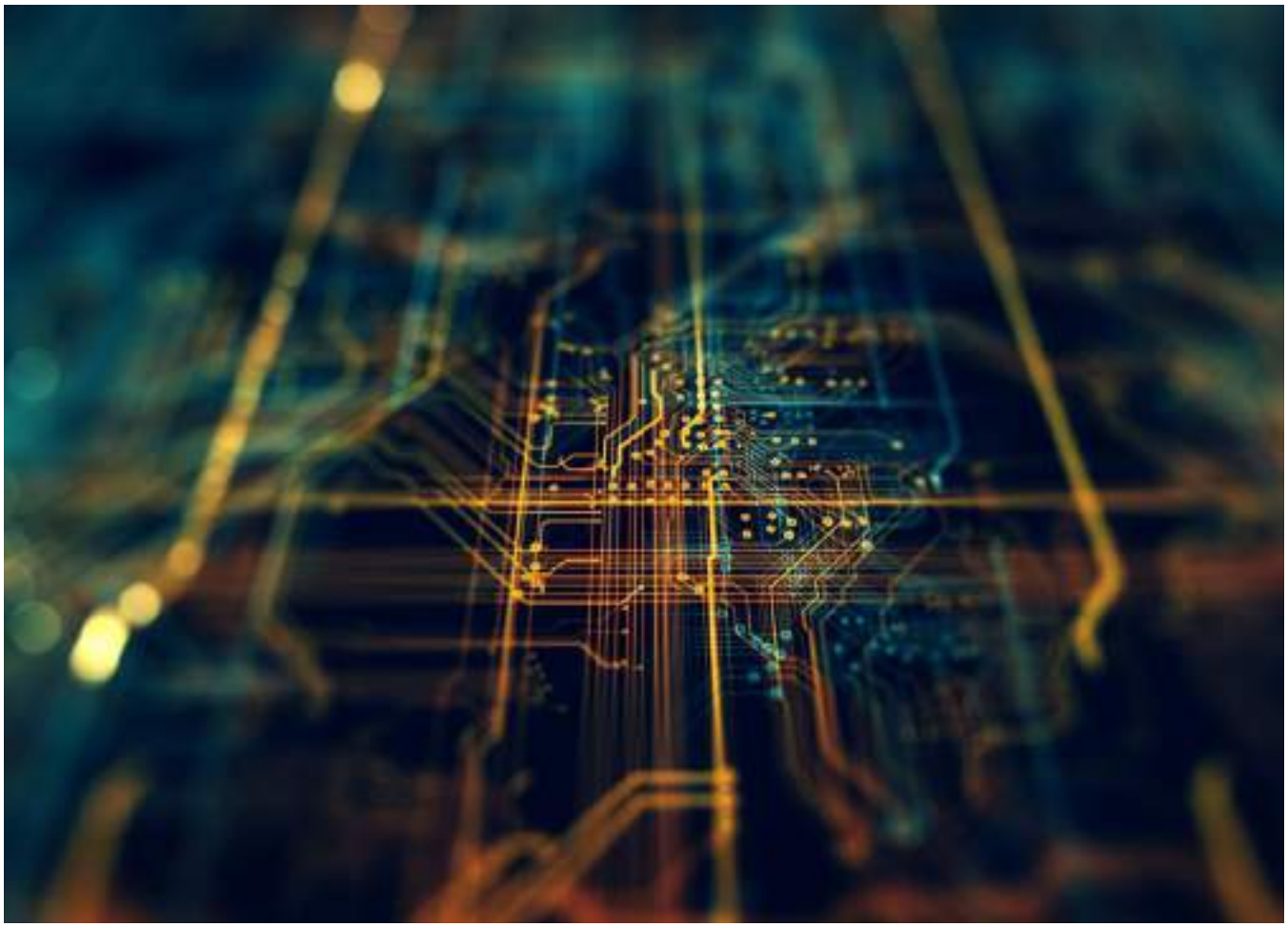


Table 14-4. Digital & Information Services Lifecycle Activities with Asset Management Practices and Risks

Asset Management Practices	Risks Associated with Not Following the Strategy
Disposal Activities	
• Standard disposal, recycling or storage for spares.	• Improper disposal can lead to environmental impacts and expenses.
Growth Activities	
• Expansion of services or users (internally). • DIS asset master planning or growth forecasts.	• Resourcing priorities are realigned to support staff in delivering services.
Maintenance Activities	
• Proactive maintenance, updates or repairs. • Reactive repairs occurring due to asset failure or defects.	• Delayed maintenance activities due to lack of inspection data resulting in increased lifecycle costs. • May contribute to premature asset failure, service disruptions.
Non-Infrastructure	
• Lifecycle models have been developed for DIS assets which predict condition based on age.	• Increased risk of higher operating and maintenance costs.
Replacement Activities	
• Replacement needs are identified through standard asset lifecycles or based on identified need.	• Risk of technological or functional obsolescence.
Service Improvement Activities	
• Depending on Contract Length and Type, rehabilitation and replacement is to be considered in consultation with Purchasing By-Law timing requirements. • Upgrades or changes in operating environment to improve operational efficiencies.	• Failure to meet stakeholder expectations, increased operational costs and potential impacts to service delivery. • Projects are delayed with potential impact on service improvement.

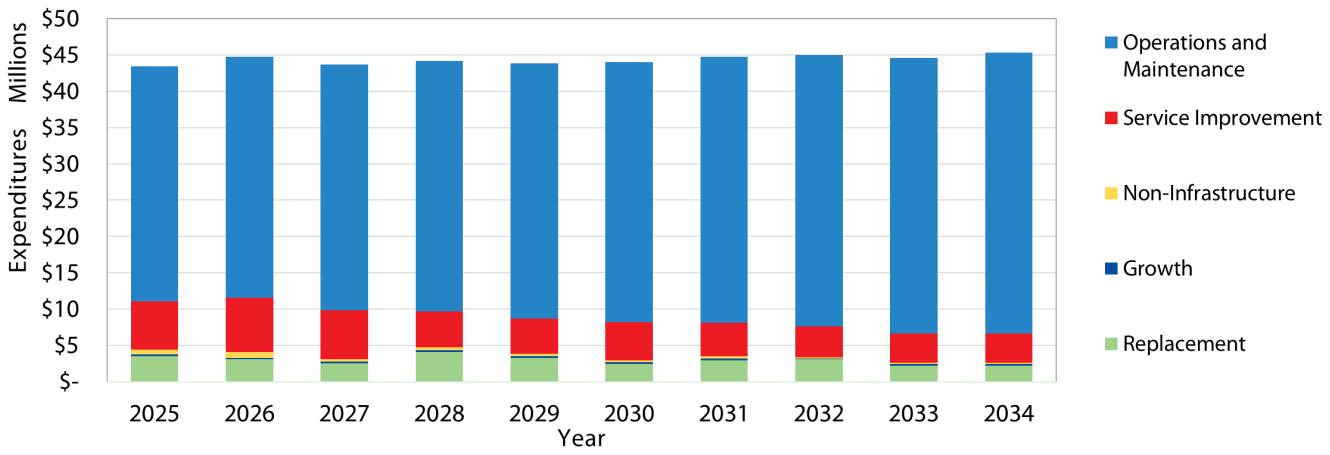
14.4. Forecasting Lifecycle Costs

The Region utilizes the lifecycle strategies outline in Table 14-4 to plan work and assess future expenditure needs for Digital & Information Services assets. These strategies, along with the scenarios detailed below, establish a comprehensive framework for managing assets, ensuring the Region can sustain current services and maintain existing infrastructure.

The scenarios are based on lifecycle strategies for Digital & Information Services assets, developed by leveraging staff expertise and are aligned with industry best practices. The forecasted needs focus on investment requirements associated with rehabilitation and replacement activities that maintain infrastructure in a state of good repair and support continued service delivery.

To provide a more complete financial picture and to determine the full cost of asset ownership expenditures associated with disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements have been included in the lifecycle strategy, where applicable. For this AMP, these activities and their associated costs were established based on the analysis of the Region's Capital and Operating budgets and are assumed to be sufficient in meeting current needs. Figure 14-3 shows the approved 2025 budget lifecycle activities for Digital & Information Services.

Figure 14-3. DIS Anticipated Lifecycle Management Activities - Capital & Operating Budget



The 2025 budget identifies a total of $1.87M for Digital & Information Services in the next 10 years to meet growth requirements based on the planned projects funded through development charges or initiatives addressing the Region's growing needs. The 2025 10-year operating forecast is based on general inflation of 2.0% and assessment growth of 1.9% to 3.0% per year.

An overview of the scenarios that were evaluated for the purposes of this AMP include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the Capital and Operating Budget.

Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets consistent over the forecast period, using the current asset register and condition profile as the starting point, without the current funding constraint.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, without the current funding constraint.

14.5. Impact on Current and Proposed Levels of Service

Figure 14-4 shows the impact to the condition of the assets based on the Approved Budget, Maintain Current LOS and Proposed LOS forecast scenarios.

Figure 14-4. DIS Condition Profile for Service Level Scenarios

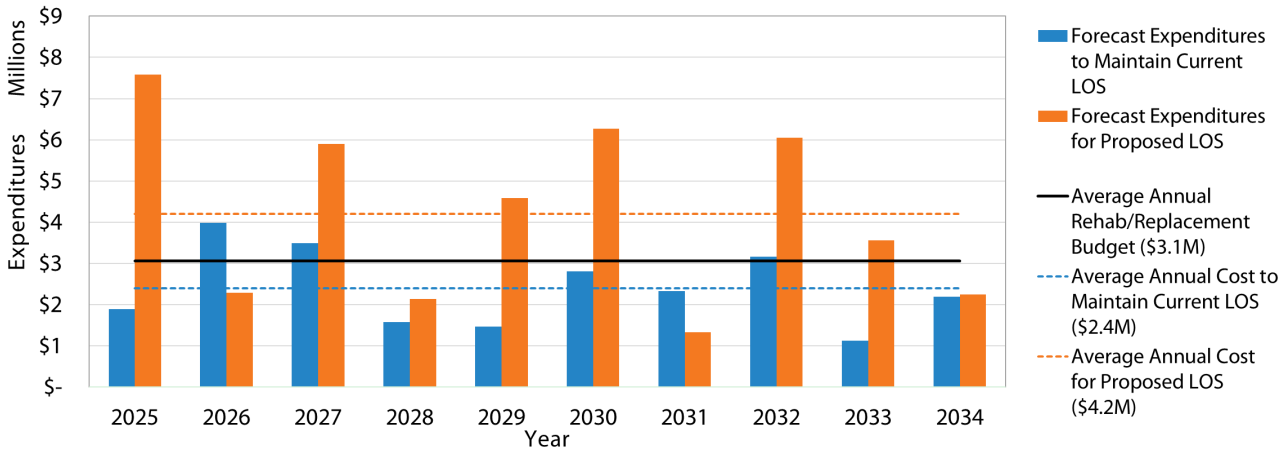
Scenario 1 and Scenario 2 generally maintains the condition of DIS assets over the forecast period. The replacement expenditures for this scenario are lower than the Approved Budget scenario, indicating that the amount of funding identified in the 10 year capital budget is sufficient to maintain asset conditions.

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed LOS was set to achieving 80% of assets in good to very good condition. This would require additional annual investment of $1.1M investment in replacement activities for Digital and Information Services Assets.

14.6. Estimated Preliminary Potential Infrastructure Gap

Figure 14-5 illustrates that replacement expenditures of $2.4M and $4.2M are needed annually to sustain the current LOS and proposed LOS compared to the average annual budget of $3.1M.

Figure 14-5. DIS Rehabilitation & Replacement Expenditure Scenario Comparison



This results in a potential average annual estimated capital infrastructure gap of $1.1M to achieve proposed service levels, while maintaining current LOS is sufficient with the current capital budget. While these costs are not significant, they do account for 7.2% of the total replacement value as shown in Table 14-5.

The forecasts and related infrastructure gap are based on the best available information and account for the significant increase in replacement values for Digital & Information Services assets. It is recommended that the Region continue to monitor and update replacement values to ensure accurate forecasting, as inflation and supply chain challenges continue to affect this service area. While the full impact is not yet clear, tarrifs are expected to influence costs, likely affecting asset replacement values.

Table 14-5. DIS Lifecycle Activities & Preliminary Estimated Average Annual Capital Infrastructure Gap ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$0.2M	$0.2M	$0.2M
Non-Infrastructure	$0.6M	$0.6M	$0.6M
Rehabilitation & Replacement	$3.1M	$2.4M	$4.2M
Service Improvement	$7.0M	$7.0M	$7.0M
Capital Expenditures	$10.9M	$10.2M	$12.0M
Capital Infrastructure Gap		**No Gap**	**$1.1M (Gap)**
Operations & Maintenance	$33.2M	$33.2M	$33.2M
Total Expenditures	$44.1M	$43.4M	$45.2M
Gap as % of Replacement Value		**No Gap**	**7.2% (Gap)**

NATURAL ASSETS

The Region is committed to efficiently protecting and providing wetlands, forestry and parks that support a livable community.

15. Natural Assets

Natural assets (woodland communities, plantations, wetland communities and open country communities), and enhanced assets (individual trees on the Regional Right-of-Way and properties) provide a range of community and ecosystem services. The functional management of these assets can contribute to better delivering of infrastructure services, such as improving the stormwater management system, protecting drinking water resources, reducing urban heat island effect, and supporting health and recreation related services.

Natural assets and enhanced assets are unique for applying asset management lens. For instance, while most assets depreciate over time, the financial valuation of natural assets generally increases with their age (e.g. the value of trees increases over time).

Additionally, natural assets support a wide range of ecosystem services providing indirect benefits that cannot be simply valued in financial terms. These benefits include phosphorous removal and water quality improvement, erosion control and flooding protection, and the enhancement of biodiversity through improved ecological connectivity.

15.1. State of the Infrastructure

15.1.1. Assets Overview

In preparation for this AMP, the Region acquired consulting services to develop a report on basic inventory of the natural assets owned by the Region. This project was completed in January 2025 and set the basis in preparing a consolidated inventory of natural assets for asset management strategies, budgeting purposes and managing service delivery.

A total of 625 natural assets were mapped, spanning an area of 912 hectares and 62.2% of Regional Properties (1,466 ha); the remaining 37.8% of Region's properties is represented by other communities (e.g., manicured lawns, impervious cover, hedgerows not captured in other natural assets, and disturbed areas).

The asset counts and area of natural and enhanced assets are summarized and presented in Table 15-1.

Table 15-1. Halton Region's Natural Assets Inventory

Asset Class & Asset Type	Count	Unit	Area Cover (ha)
Woodland Communities	263	Each	653.1
Natural Woodland Communities	182	Each	480.3
Plantations	81	Each	172.8
Wetland Communities	128	Each	153.5
Non-treed Wetland Communities (Marshes)	40	Each	79.7
Treed Wetland Communities (Swamps)	83	Each	70.5
Thicket Wetland Communities	5	Each	3.4
Open Country Communities (Cultural Meadow, Cultural Thicket, Hedgerow, Shrub Talus, & Bluff)	194	Each	97.7
Aquatic Communities (Lake, Open Water, Natural Ponds, Constructed Ponds, and Rivers)	40	Each	8.0
Linear Water Courses	26,313	Meters	N/A
Shoreline	2,644	Meters	N/A
Trees	40,073	Each	N/A
Individual Trees on Region's Properties	17,287	Each	N/A
Street Trees on Region's Roads	12,244	Each	N/A
Trees (Other)	10,542	Each	N/A

The replacement cost of a specific natural or enhanced asset is generally considered to be the estimated cost to restore an asset in a highly degraded state or recreate a lost asset. A condition assessment can be undertaken by completing a site-specific field-based assessment, landscape level desktop assessment, or relying on qualitative local expert and knowledge. Halton Region's future improvement initiatives would include estimation of replacement value and condition of these assets.

A detailed analysis of recent restoration projects within Halton Region along with other relevant restoration information will provide insights on estimating replacement costs for the various identified natural asset types and enhanced asset types. A high-level valuation of the replacement cost of key municipal services is also recommended for a greater appreciation of the importance of the Region's natural assets and enhanced assets.

15.2. Level of Service

Community Level of Service Objective	The Region is committed to protect natural and enhanced assets and improve their functions in supporting a viable community and sustainable developments.

Natural assets provide a wide array of ecosystem services to a community, such as air quality, biodiversity, habitat, pollination, carbon storage, cooling, shading, temperature regulation, and water quality. Trees provide cleaner air, cooler building and street level temperatures, shade, stormwater absorption and mitigation, and add beauty to Region's properties and roadways. Figure 15-1 and Figure 15-2 shows the map of natural and enhanced assets in Halton Region.

The natural asset and enhanced asset inventory report recommends establishing clear criteria for assessing the condition of natural assets, such as soil health, water quality, biodiversity, vegetation cover, habitat connectivity, and ecosystem functionality. These criteria should reflect the specific needs of the Region and align with the Region’s environmental, sustainability, and infrastructure strategic goals. It is recommended to supplement site-specific field-based assessment with landscape level desktop assessment and qualitative local expert and knowledge, where available to obtain comprehensive results.

Future phases of the integration of natural assets into the asset management plan will consider risk management opportunities and challenges associated with maintaining and enhancing existing natural assets or acquiring and creating new natural assets. A risk assessment for these asset types should consider both the risk mitigation they offer in terms of climate adaptation and resilience and potential risks to their longevity (e.g. contamination, feature degradation due to severe weather, etc.).

Figure 15-1. Region of Halton Natural Assets

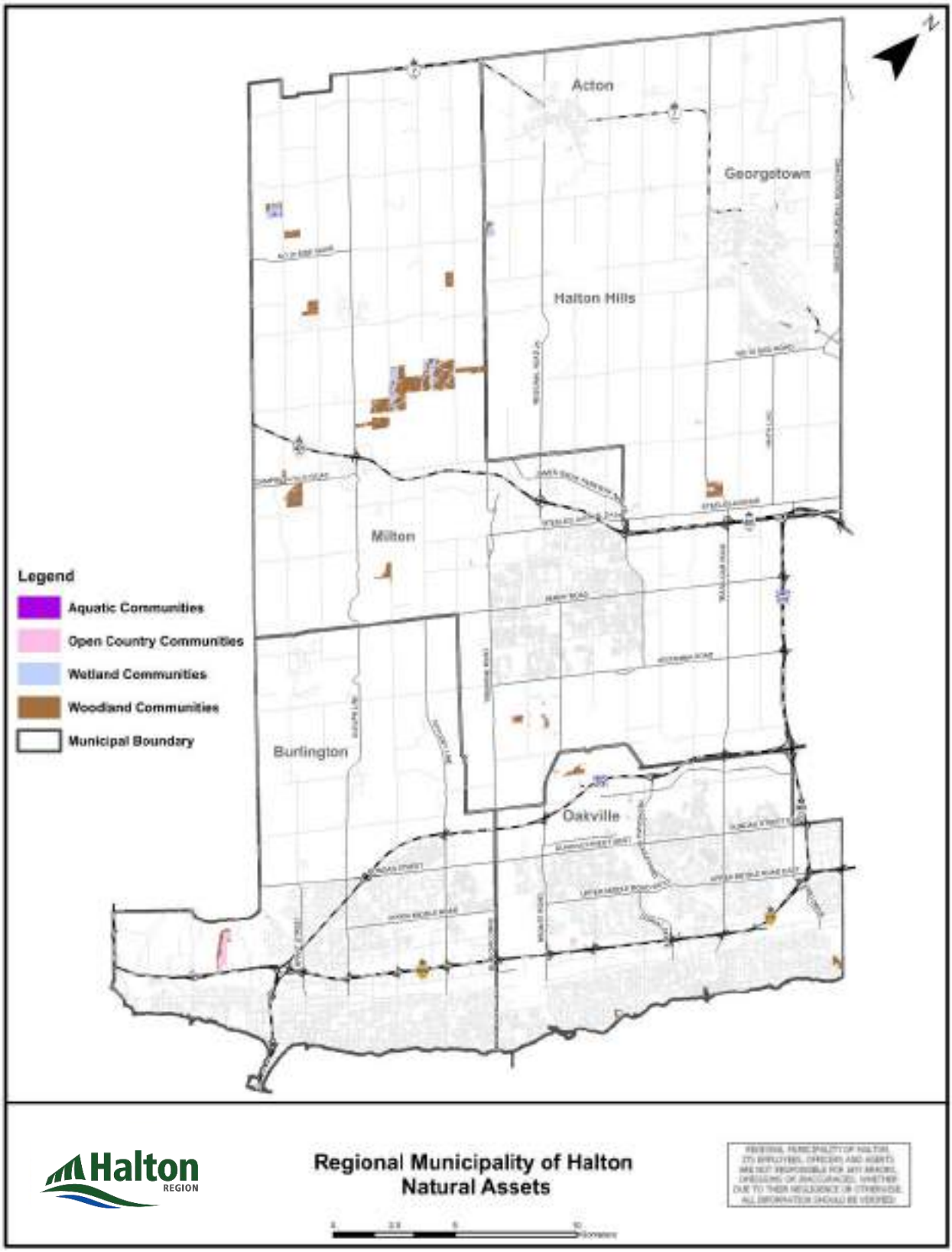
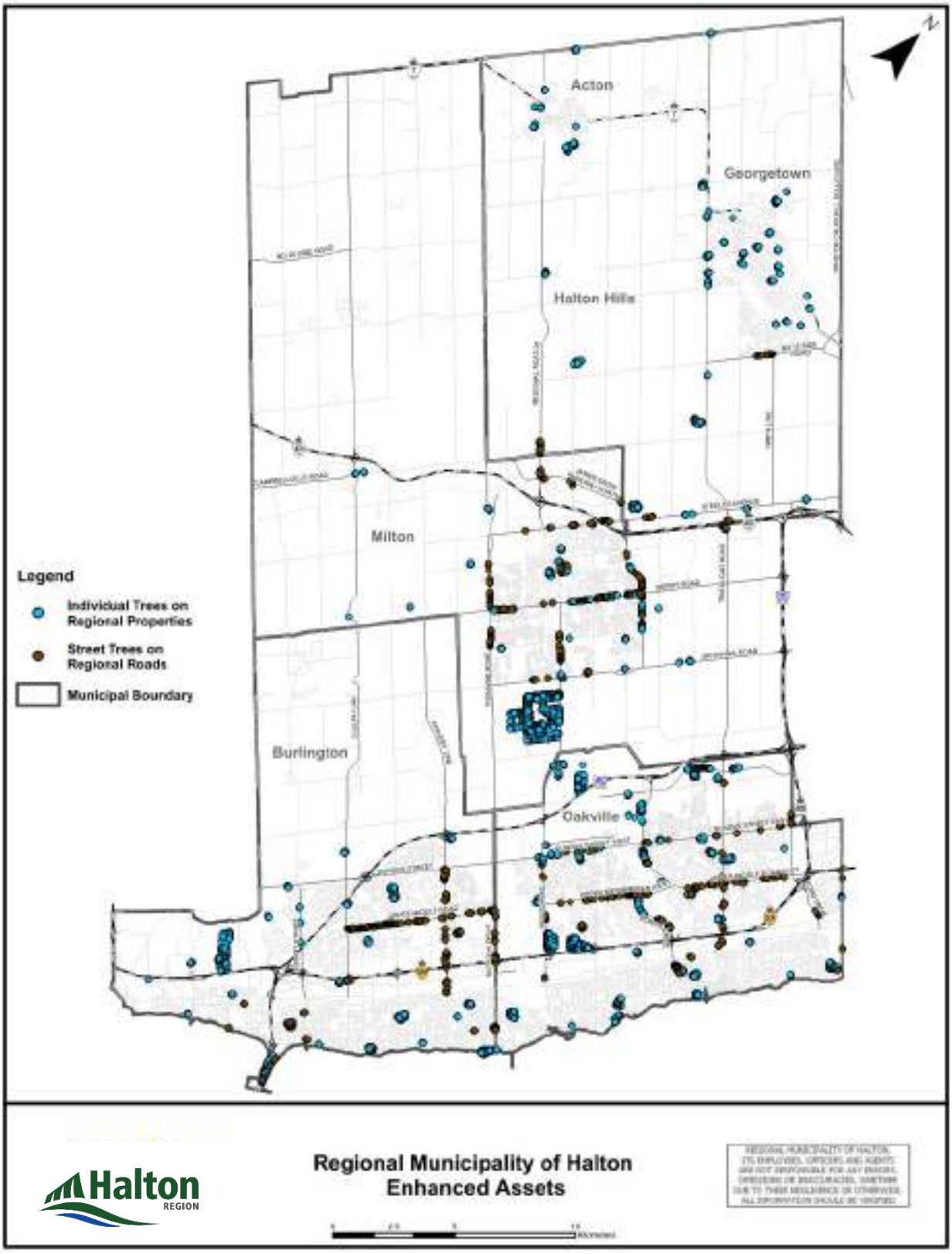


Figure 15-2. Region of Halton Enhanced Assets



15.3. Lifecycle Management Strategy and Potential Risks

The goal of the Lifecycle Management Strategy is to define a set of planned actions, guided by best practices, to ensure a sustainable LOS while minimizing risk and achieving the lowest lifecycle cost. Lifecycle management for natural assets is cyclical. Maintenance and monitoring are focused on preserving the existing condition and functionality, whereas restoration involves significant repair to extend the life and enhance the performance of existing assets.

Maintenance of assets intends to ensure continued function and resilience through activities such as pruning, invasive species management, and human use management. Monitoring for key indicators of hydrologic and ecological functions can be used to inform and update condition assessments. Restoration activities can be proactive to improve condition and resilience or reactive in response to a hazardous situation.

The natural asset and enhanced asset inventory report recommends securing stable, long-term funding and ensuring that the ongoing inventory efforts remain up-to-date and support the management and restoration of the natural and enhanced assets to achieve the desired level of service.

It is recommended to prepare an adaptive maintenance, monitoring, and restoration plan specifically designed for the Region's natural assets and enhanced assets. Identifying goals, objectives, targets, and indicators is essential to assess the success of lifecycle management for natural assets and enhanced assets over time. This plan will specify details such as frequency, duration/level of effort, seasonality, qualifications, data collection methods, data compilation and analysis, and criteria for management recommendations.

The Forest Management Plan (2005) provides a foundation for long-term vegetation management, restoration efforts, and alignment with capital planning and level of service (LOS) targets. The lifecycle activities in Table 15-2 have been informed by these documents.

Table 15-2. Natural Assets Lifecycle Activities

Asset Management Practices
Disposal Activities
• Planning and scheduling for the removal of trees, including thinning.
Maintenance Activities
• Implementing regular maintenance activities to ensure the health and vitality of the assets. Including vegetation management, invasive species control, erosion control, and monitoring.
Non-Infrastructure Solutions
• Conducting a comprehensive inventory and assessment of natural assets to understand their current condition, location, and ecological significance. • Developing long-term plans and designs that integrate natural assets into urban development and infrastructure projects. • Engaging the community in stewardship activities and educations programs to raise awareness about the value of natural assets and promote sustainable behavior. • Implementing adaptive management strategies to respond to changing environmental conditions, emerging threats, and community needs.
Restoration Activities
• Restoration and Enhancement – implementing restoration and enhancement projects to improve the ecological function and resilience of natural assets.
Replacement Activities
• Replacement and construction needs are identified through standard asset lifecycles or based on identified need.
Service Improvement Activities
• New assets to service new developments, as well as forest diversification and expansion.

16. Financial Assessment

Effective asset management requires a financial assessment to identify and consider approaches for addressing potential infrastructure funding gaps identified through the asset management planning process to ensure the continued provision of financially sustainable community services. The purpose of the financial assessment in this 2025 Asset Management Plan is to comply with the requirements of the O. Reg. 588/17 by highlighting the estimated funding necessary to maintain as well as to improve the condition of Region's assets based on proposed LOS, and to identify potential approaches to address funding gaps.

16.1. Approach

The approach of this financial assessment is to provide an overview of the average annual funding available based on the Region's approved 2025 Budget and Business Plan, and compare with expenditures required to maintain existing LOS and achieve proposed LOS in alignment with the Region's 2023-2026 Strategic Business Plan. In alignment with the O. Reg. 588/17 requirements, this AMP includes an assessment of the following:

- An identification of the lifecycle activities that would need to be undertaken to maintain current and proposed levels of service, which includes:
    - The full lifecycle of the assets.
    - The options for which lifecycle activities could potentially be undertaken to maintain and achieve the proposed LOS.
    - The risks associated with the options discussed.
    - The lifecycle activities that can be undertaken at the lowest cost to achieve the proposed LOS.
- An estimate of the annual costs for each of the 10 years of undertaking the lifecycle activities, including major capital and operating costs.
- An identification of the annual funding projected to be available to undertake the lifecycle activities.
- An explanation of the risk mitigation strategies associated with not reaching the proposed LOS lifecycle activities if a funding shortfall has been identified to meet proposed LOS.

This chapter also offers considerations of both financial and non-financial solutions that can be explored to help address the preliminary estimated infrastructure gap. The Region will take these considerations into account to advance its asset management practices and support the

development of future budgets and business plans through making necessary financial and budgetary adjustments guided by Council approval.

16.2. Overview of the 2025 Budget and Financing Sources

The Region's budgets are developed to allocate financial resources to sustain service delivery, maintain existing infrastructure, and invest in new assets due to replacement and/or growth requirements. The budget process is designed to balance required expenditures with available revenues, ensuring fiscal responsibility while meeting service objectives. The Region's budget is categorized into two primary components:

- **Operating Budget:** Supports the day-to-day activities required to provide municipal services. It includes expenditures such as staff salaries, equipment maintenance, materials, utilities, and facility operations. These costs are typically expensed within the fiscal year and are necessary to ensure continued service delivery.
- **Capital Budget:** Focuses on capital expenditures associated with the rehabilitation, replacement and acquisition of infrastructure assets. Capital budget planning spans a ten-year horizon, incorporating long-term investment proposals and future cash flow projections. The budget considers funding allocations for projects that sustain and enhance infrastructure, ensuring alignment with long-term asset management strategies.

The 2025 Gross Operating Budget is $1.4B while the 2025 Gross Capital Budget is $1.6B for all Regional Services including Police. The 2025 capital budget also includes $781.6M from the Region's Allocation Program which is a financing tool to support proactive planning and delivery of growth-related infrastructure such as water, wastewater and transportation infrastructure to support housing pledges by local municipalities for building 92,000 new units across the Region by 2031. The Allocation Program ensures that "growth pays for growth" to the greatest extent possible.

The Regions 2025 Budget is primarily funded by these major sources of financing:

- **Property Taxes:** This is the primary source of municipal revenue supporting Halton's services and infrastructure. Property tax revenue funds approximately 28.4% of gross expenditures for Regional Services excluding Police. The 2025 Budget reflected a tax increase of 2.3% for Regional Services based on adjusted program financing plans, assessment growth and provincial funding announcements. This aligns with the Regional Council's priority of tax rate increases at or below the rate of inflation.
- **Water & Wastewater Rate:** These are the user rate-based charges for services such as the treatment and distribution of water and collection and treatment of wastewater.

Water and wastewater revenue funds approximately 22.7% of gross expenditures for Regional Services excluding Police. The 2025 Budget reflected a rate increase of 5.5% based on existing program financing plans derived from asset management programs, lifecycle models, and program-specific assumptions with respect to inflation and growth factors including support for local municipal housing pledges. The increases in the water and wastewater rates are largely driven by requirements to support the state of good repair capital program, with increases to support operations and maintenance costs at or below the rate of inflation.

- **Federal and Provincial Funding:** This includes grants and subsidies provided to support specific capital projects and infrastructure programs. Provincial funding is primarily used to fund cost-shared programs in Health and Social & Community Services. Federal funding primarily consists of the Canada Community Building Fund (formerly the Federal Gas Tax Fund), which is used by the Region to finance infrastructure including water and wastewater capital projects.
- **Reserves and Reserve Funds:** This represents a dedicated fund set aside for future infrastructure rehabilitation and major capital investments, and mitigating financial risks associated with unexpected expenditures.
- **Development Charges:** These are the fees levied on new developments to finance growth-related infrastructure that are governed by the Development Charges Act.
- **Debt Financing:** This involves borrowing financing when deemed appropriate and feasible. It is used strategically to fund large-scale infrastructure projects, ensuring financial sustainability while managing fiscal constraints.

As part of the annual budget development process, the Region ensures continued financial sustainability through effective financial planning and risk management, which has resulted in maintaining a AAA/Aaa credit rating and tax and rate increases at or below the rate of inflation.

The development of the 2025 Budget was based on the following budget principles:

- The annual budget is prepared in accordance with the financial plans, annual targets and policies approved by the Regional Council.
- 10-year Operating and Capital Budget forecasts are prepared.
- The annual budget includes investment in the state of good repair of the Region's assets to maintain a good overall condition of the assets as it continues to age, deteriorate and expand.
- Reserves are maintained at levels to ensure financial sustainability to support the state of good repair of the Region's assets, tax and rate stabilization reserve targets, and to fund specific program requirements.

- Regional programs are funded from sustainable revenues to ensure ongoing expenditures are not funded from temporary or one-time revenues.
- All growth-related capital costs that can be recovered under the Development Charges Act (DCA) will be recovered from growth in the Annual Budget.
- In order to proceed with growth in the Region, an acceptable financing plan must be approved by Council prior to development proceeding.
- Strategic investments in additional staff or other resources resulting from growth, program enhancements or additional Federal and Provincial funding require a business case to be considered by Council as part of the annual budget process.
- Halton's own debt limits are not exceeded throughout the 10-year forecasts.
- Halton's strong financial position and financial planning principles will be upheld to ensure the Region's AAA/Aaa credit rating is maintained.

For the purposes of this financial assessment in the 2025 AMP, the 2025 Capital and Operating budgets for both rate and tax supported assets were analyzed for expenditures related to the assets identified in this plan, and were split into the following lifecycle categories:

- Operations & Maintenance
- Rehabilitation
- Replacement
- Service Improvements
- Growth
- Disposal
- Non-Infrastructure Activities

16.3. Projected Lifecycle Costs for Rate and Tax Funded Assets

The 2025 AMP aims to estimate the lifecycle costs and financial requirements to keep the Region's existing assets in a state of good repair to maintain current service levels (current LOS) and achieve proposed service levels (proposed LOS) across all service areas. This assessment used the following approach:

- **Lifecycle Cost Considerations**: Projected lifecycle costs, including disposals, growth, non-infrastructure, operations and maintenance, rehabilitation, replacement and service improvements were determined based on the Region's 10-year capital and operating budgets from the approved 2025 Budget and Business Plan. This provided the baseline for understanding the approved lifecycle costs.
- **Lifecycle Forecasts:** Forecasts for future capital rehabilitation and replacement activities associated with maintaining current LOS and achieving proposed LOS were calculated

from the established consultant lifecycle models. These models predict the deterioration of assets and the capital interventions required in the next 10 years for the following two scenarios: Maintain Current LOS and Achieve Proposed LOS.

- **Prioritization of Investments:** The consultant's lifecycle model determines capital investments priorities based on asset condition assessments and service level impacts.

The three scenarios evaluated in this AMP to align with the O. Reg. 588/17 requirements include:

Scenario 1: Approved Budget – This scenario forecasts the condition of the assets over the 10-year forecast period, should the Region continue to fund the asset portfolio as planned in the approved 2025 Capital and Operating Budget.

Scenario 2: Maintain Current Level of Service – This scenario aims to maintain the condition of assets over the 10-year forecast period, using the current asset register and condition profile as the starting point.

Scenario 3: Proposed Level of Service – This scenario forecasts the needs to reach the Region's desired level of service of 80% of assets in good to very good condition, as identified in the Region's 2023 – 2026 Strategic Business Plan.

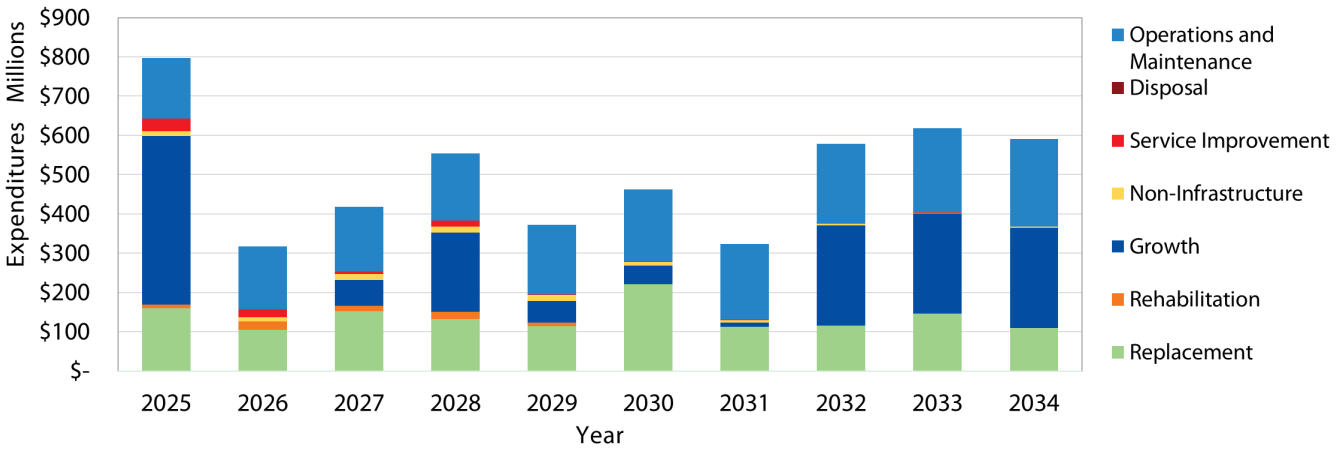
To provide a more complete financial picture and to determine the full cost of asset ownership expenditures, asset disposals, growth, non-infrastructure activities, operations and maintenance, and service improvements costs have all been captured in the lifecycle costs and strategy.

The analysis related to each service area is detailed in their respective individual service area chapter in this 2025 AMP. The following sections below summarize this level of analysis for rate funded assets and tax supported assets.

16.3.1. Projected Lifecycle Costs for Rate-Supported Assets

Water and wastewater services are fully funded by water and wastewater user rates, and as such, the analysis related to these funding sources are provided separately for this chapter. Rate supported assets include Water, Wastewater and Corporate Fleet assets. The anticipated lifecycle management activities over the next 10 years based on Halton Region's approved 2025 Budget and Business Plan are shown in Figure 16-1.

Figure 16-1. Preliminary Lifecycle Management Activities for Rate-Supported Assets

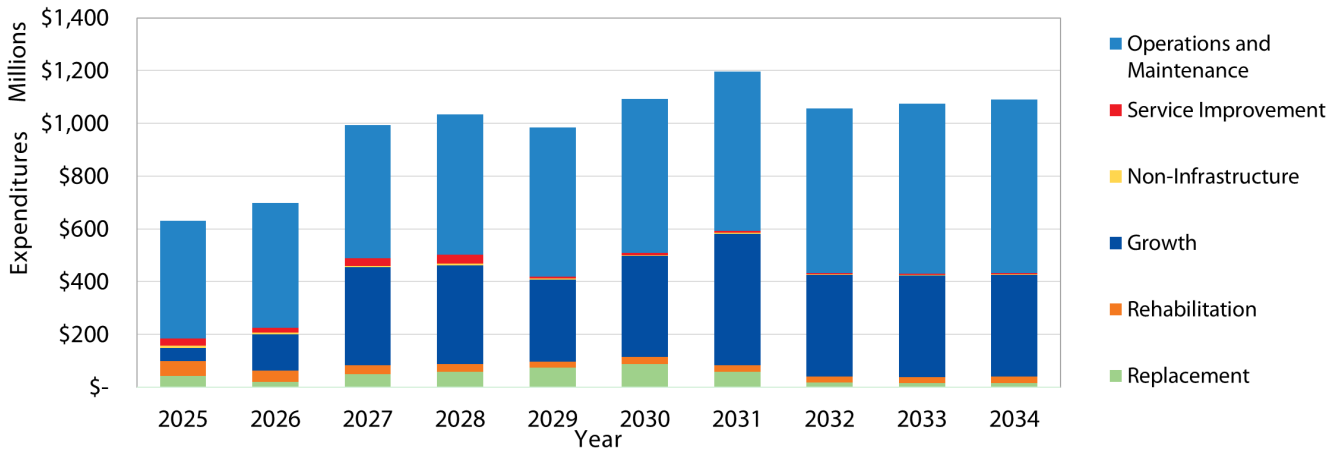


It is important to note that the 2025 Budget identifies a total of $1.6B for Rate-Supported assets in the next 10 years to meet growth requirements. The Region of Halton is also in the process of developing an Integrated Master Plan (IMP) to complete the next region-wide Water, Wastewater, and Multi-Modal Transportation Master Plans. The outcome of this work will be a long-term integrated servicing strategy for Regional Infrastructure to accommodate future growth. It is anticipated the results of this study will help inform the financial impact of growth on the state of good repair budget and asset lifecycle management activities such as operations and maintenance.

16.3.2. Projected Lifecycle Costs for Tax-Supported Assets

Property taxes fund the Region's programs and services including Transportation & Stormwater, Waste Management, Corporate Facilities, Long-Term Care, Halton Community Housing Corporation, Halton Police, Paramedics, and Digital & Information Services. The anticipated lifecycle management activities over the next 10 years based on the approved 2025 Budget and Business Plan are shown in Figure 16-2. The 2025 budget identifies a total of $3.3B for Tax-Supported assets in the next 10 years to meet growth requirements.

Figure 16-2. Preliminary Lifecycle Management Activities for Tax-Supported Assets



16.4. Potential Infrastructure Gaps for Rate and Tax Funded Assets

16.4.1. Potential Infrastructure Gap for Rate Funded Assets

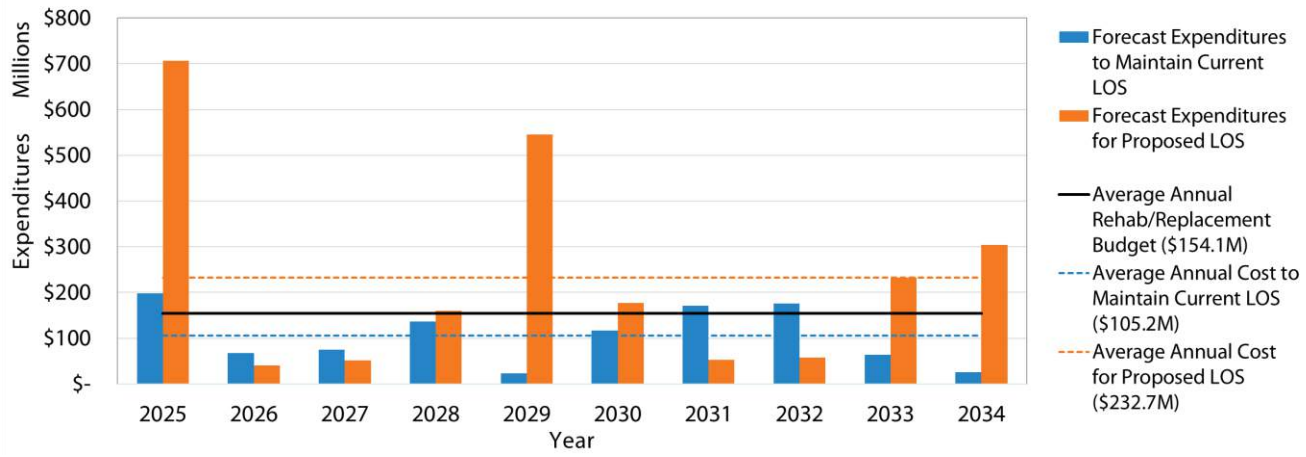
The summary and comparison of all the lifecycle scenarios for rate-supported assets are shown in Table 16-1.

Table 16-1. Preliminary Lifecycle Activities & Estimated Potential Capital Funding Gap for Rate-Supported Assets ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0.2M	$0.2M	$0.2M
Growth	$164.8M	$164.8M	$164.8M
Non-Infrastructure	$12.3M	$12.3M	$12.3M
Rehabilitation & Replacement	$154.1M	$105.2M	$232.7M
Service Improvement	$19.7M	$19.7M	$19.7M
Capital Expenditures	$351.2M	$302.3M	$429.7M
Capital Infrastructure Gap		**No Gap**	**$78.6M (Gap)**
Operations & Maintenance	$159.6M	$159.6M	$159.6M
Total Expenditures	$510.8M	$461.9M	$589.4M
Gap as % of Replacement Value		**No Gap**	**0.5% (Gap)**

Figure 16-3 illustrates that total rehabilitation and replacement expenditures of $105.2M and $232.7M are needed to maintain the current LOS and achieve proposed LOS respectively, compared to the average annual budget of 154.1M. While there is no gap to maintain current service levels, there is an annual capital infrastructure gap of $78.6M to achieve proposed service levels. While this cost is substantial, it only accounts for 0.5% of the total replacement value of rate-supported assets.

Figure 16-3. Scenario-Based Rehabilitation & Replacement Expenditures for Rate-Supported Assets



The estimated preliminary potential average annual capital funding gap for rate-supported assets categorized by service area can be found in Figure 16-4.

Figure 16-4. Distribution of Projected Capital Funding Gap for Rate-Supported Assets ($ Millions)

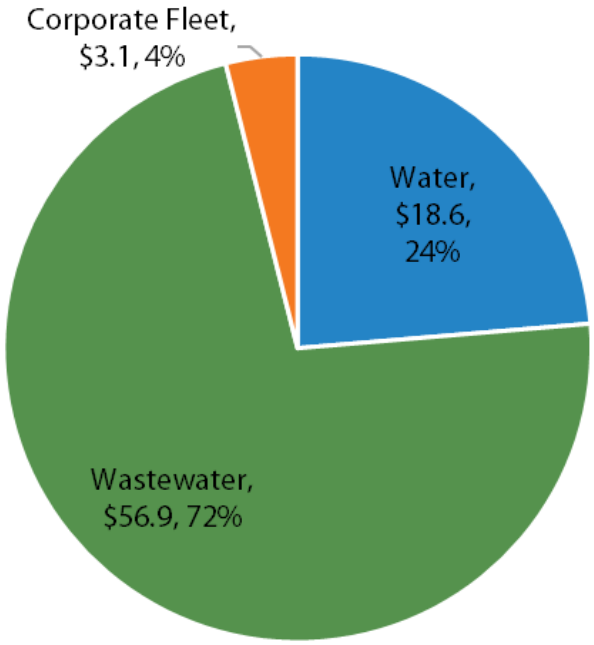
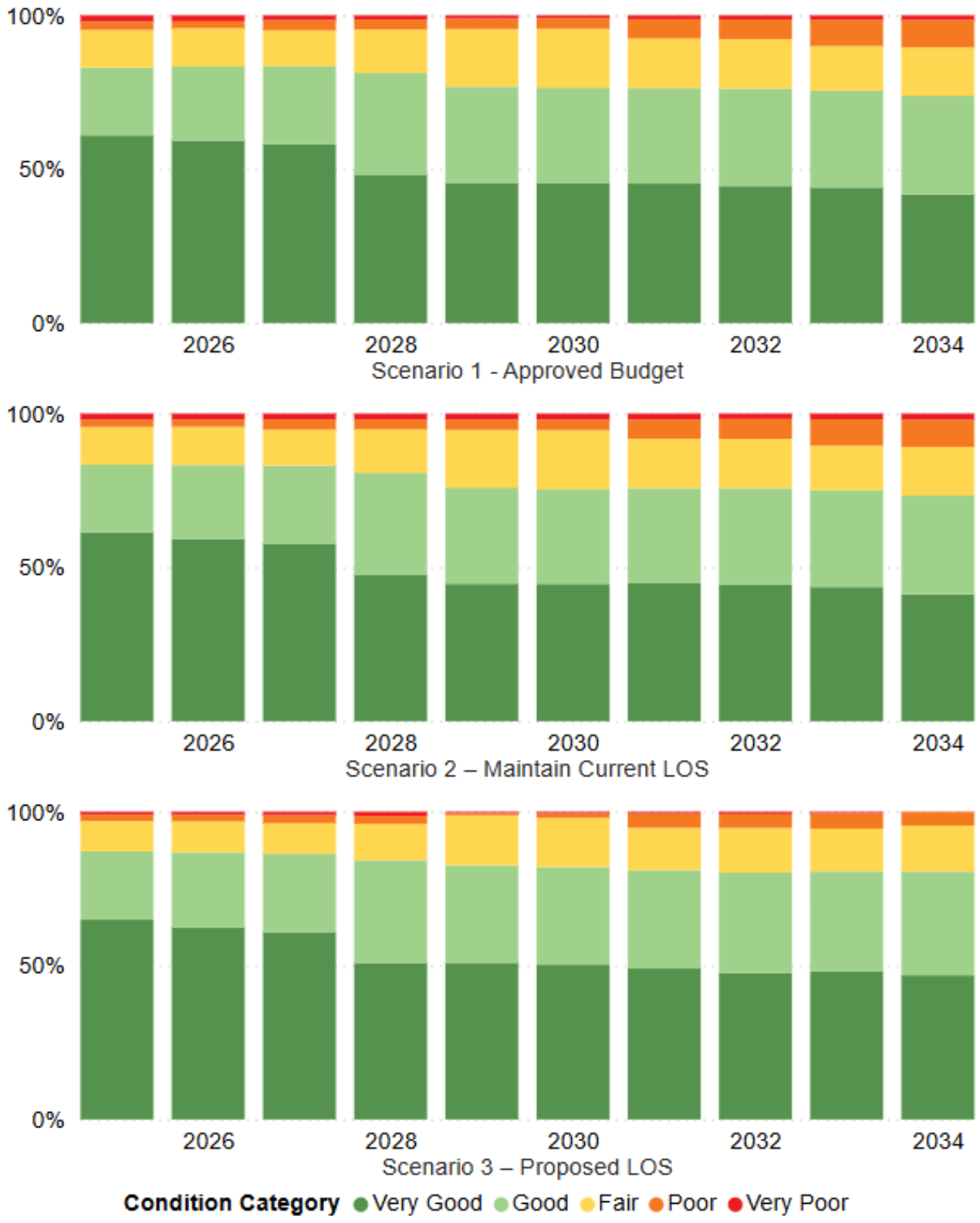


Figure 16-5 shows the impact to the condition of the assets based on the three scenarios of Approved Budget, Maintain Current LOS and Achieve Proposed LOS. The AMP analysis confirms that the Region has remained committed to continually investing in infrastructure to ensure it remains in good condition overall and provides reliable community services.

Figure 16-5. Scenario-Based Condition Profile for Rate-Supported Assets



In Scenario 1 and Scenario 2, the Region currently has sufficient funds to keep assets in approximately the same condition over the 10-year forecast period.

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed LOS was set to achieving 80% of assets in good to very good condition. To achieve the proposed LOS, a preliminary estimate of an additional $78.6M would be required for rehabilitation and replacement activities annually. There are potential options that the Region can explore to address the estimated preliminary infrastructure gap summarized in Section 16.5 *Consideration of Potential Options*. The Region is also actively improving their asset management maturity, and particularly the accuracy of lifecycle cost forecasting, which can improve the forecasting available for AMPs and budgets and business plans.

16.4.2. Potential Infrastructure Gap for Tax Funded Assets

The summary and comparison of all the lifecycle scenarios for tax-supported assets are shown in Table 16-2.

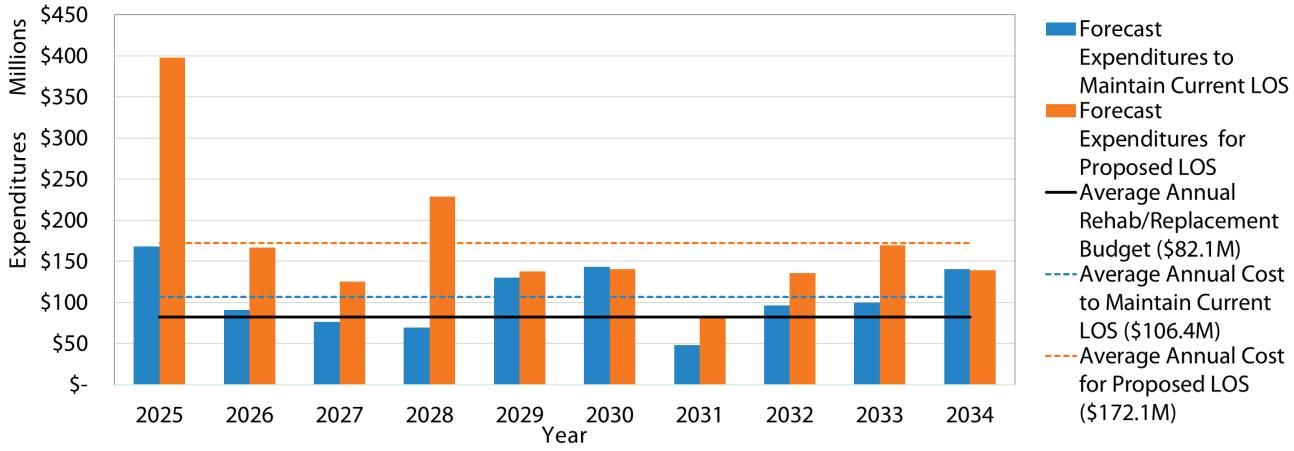
Table 16-2. Preliminary Lifecycle Activities & Projected Capital Funding Gap for Tax-Supported Assets ($ Millions)

Lifecycle Activity	Average Annual Budget	Average Annual Maintain LOS (Current Condition %)	Average Annual O. Reg. Proposed LOS (All Condition 80%)
Disposal	$0M	$0M	$0M
Growth	$185.8M	$185.8M	$185.8M
Non-Infrastructure	$7.1M	$7.1M	$7.1M
Rehabilitation & Replacement	$82.1M	$106.4M	$172.1M
Service Improvement	$24.6M	$24.6M	$24.6M
Capital Expenditures	$299.6M	$323.9M	$389.6M
Capital Infrastructure Gap		**$24.3M (Gap)**	**$90.0M (Gap)**
Operations & Maintenance	$474.7M	$474.7M	$474.7M
Total Expenditures	$774.3M	$798.6M	$864.3M
Gap as % of Replacement Value		**0.6% (Gap)**	**2.2% (Gap)**

Figure 16-6 illustrates that total rehabilitation and replacement expenditures of $106.4M and $172.1M are needed to sustain the current LOS and proposed LOS respectively, compared to the average annual budget of $82.1M. The Region faces an estimated preliminary potential

annual capital infrastructure gap of $24.2M to maintain current LOS and $78.6M to achieve proposed service levels. While this cost is substantial, it only accounts for 2.2% of the total replacement value.

Figure 16-6. Rehabilitation & Replacement Expenditure Scenario Comparison for Tax-Supported Assets



The estimated preliminary potential average annual capital funding gap for tax-supported assets categorized by asset category can be found in Figure 16-7. The Halton Community Housing Corporation and Transportation & Stormwater make up the biggest portion of the average annual capital funding gap.

Figure 16-7. Distribution of Projected Capital Funding Gap for Tax-Supported Assets ($ Millions)

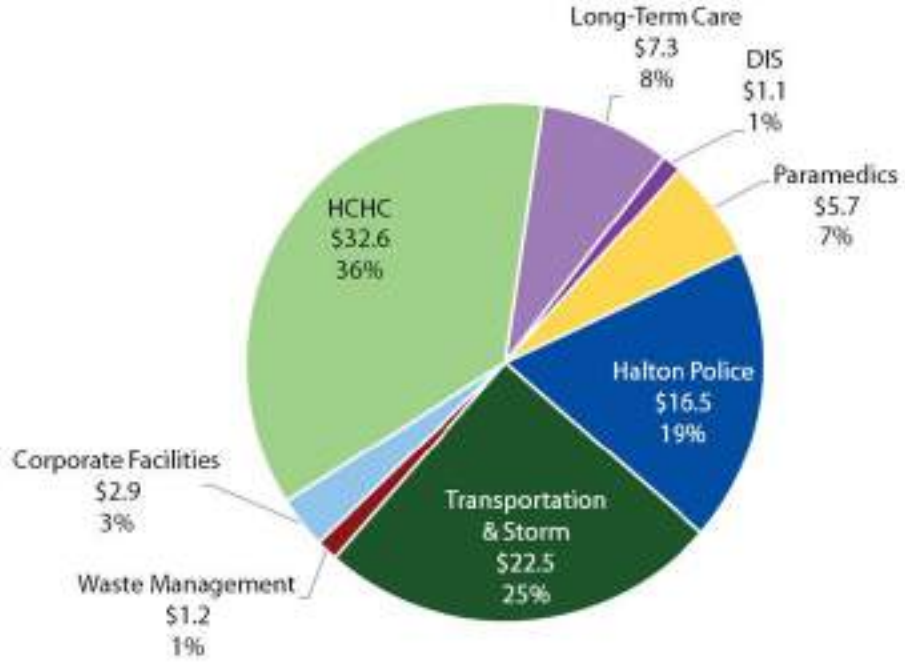
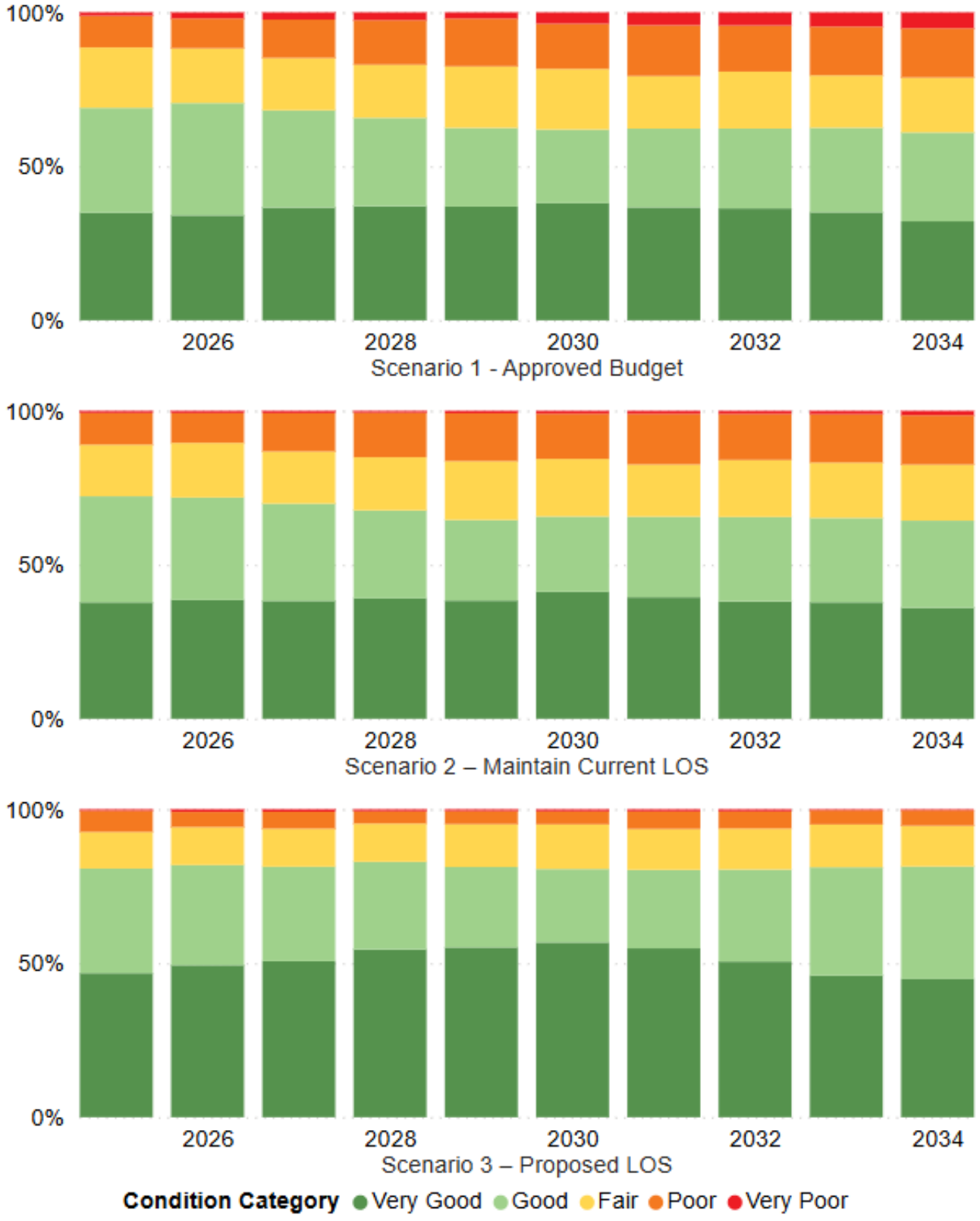


Figure 16-8 shows the impact to the condition of the assets based on three scenarios of Approved Budget, Maintain Current LOS and Achieve Proposed LOS. The AMP analysis confirms that the Region has remained committed to continually investing in infrastructure to ensure it remains in good condition overall and provides reliable community services.

Figure 16-8. Scenario-Based Condition Profile for Tax-Supported Assets



In Scenario 1, based on the current approved budget, Tax-Supported assets see an overall deterioration in condition. There is an increase in the amount of assets in very poor condition from 1.1% to 5.17%, and the amount of assets in good to very good condition decreases from 69% to 61%.

In Scenario 2, tax supported assets would require an addition $24.2M annually in rehabilitation and replacement activities over the next 10 years to maintain current LOS.

Based on the Halton Region's 2023-2026 Strategic Business Plan, proposed LOS was set to achieving 80% of assets in good to very good condition. To achieve the proposed LOS, an additional $90M would be required for rehabilitation and replacement activities annually. There are potential options that the Region can explore to address the infrastructure gap summarized in Section 16.5 *Consideration of Potential Options*. The Region is also actively improving their asset management maturity and in particular, the accuracy of lifecycle cost forecasting which can improve the forecasting available for AMPs and budgets and business plans.

16.4.3. Overall Potential Infrastructure Gap for All Assets

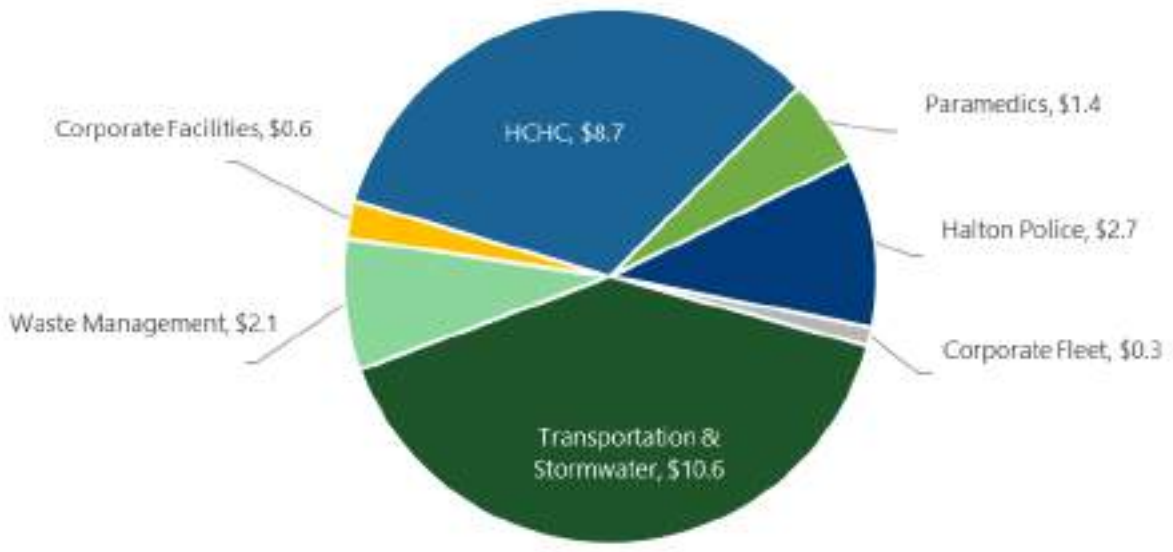
The potential estimated funding gaps for the different service areas are determined by comparing the forecasted rehabilitation and replacement expenditures under each scenario against the average annual 2025 Budget and Business Plan amounts allocated for keeping assets in a state of good repair.

The preliminary estimated infrastructure funding shortfall represents the average annual difference between the capital needs based on maintaining current LOS and proposed LOS, and the 2025 capital budget forecast. The overall preliminary average annual capital funding gap for all assets is:

- $26M to maintain current service levels accounting for only 0.1% of the total estimated current replacement value of all Region's assets.
- $169M for achieving proposed levels of service accounting for 0.9% of the total estimated current replacement value of all Region's assets.

Figure 16-9 and Figure 16-10 shows the distribution of the preliminary capital funding gap by service area for maintaining current service levels and achieving proposed service levels.

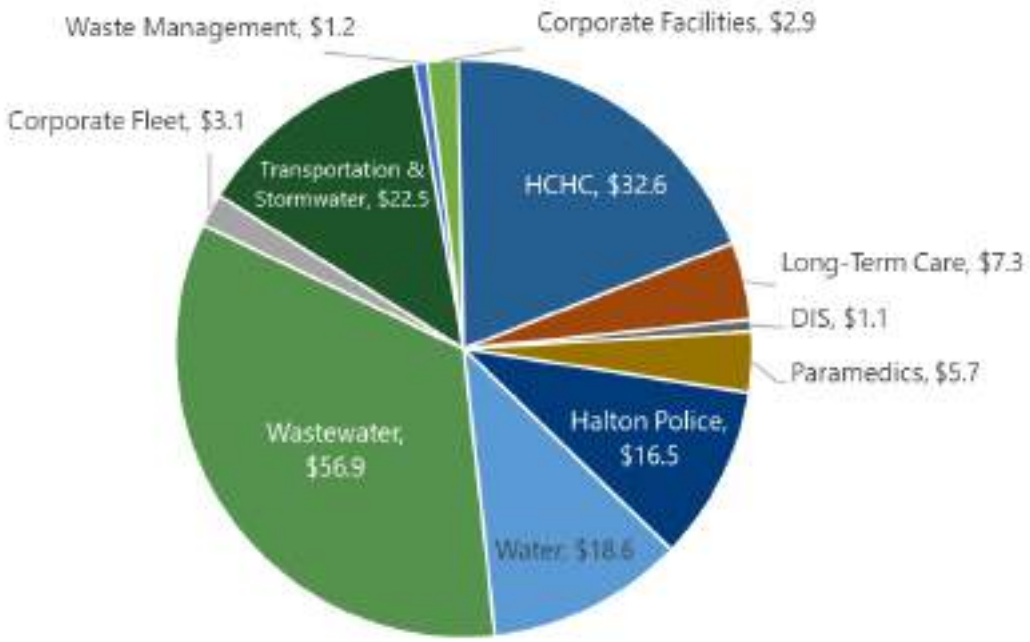
Figure 16-9. Projected Capital Funding Gap to Maintain Current LOS by Service Area ($ Millions)



For the annual average annual capital funding gap to maintain current LOS, services areas that have contributed the most are Transportation and Stormwater ($10.6M) followed by HCHC

($8.7M). While the overall additional annual capital funding requirement is substantial, it only accounts for only 0.1% of the total estimated replacement value of assets.

Figure 16-10. Projected Capital Funding Gap to Achieve Proposed LOS by Service Area ($ Millions)



For the annual average annual capital funding gap to achieve proposed LOS, services areas that have contributed the most are Wastewater ($56.9M), HCHC ($32.6M), and Transportation & Stormwater ($22.5M). While the overall additional annual capital funding requirement is substantial, it only accounts for 0.9% of the total estimated replacement value of assets.

The total estimated preliminary investment needs for all rate and tax funded assets are summarized in Table 16-3 for all service areas illustrating the distribution of average annual capital funding gap for maintaining current LOS as well as for achieving proposed service levels as a percentage of replacement value by service area.

Table 16-3. Projected Capital Funding Gaps as Percentage of Replacement Value by Service Area ($ Millions)

Service Area	Estimated Current Replacement Value (CRV)	Average Annual Capital Funding Gap (Maintain LOS)	Gap as Percentage of CRV (Maintain LOS)	Average Annual Capital Funding Gap (Proposed LOS)	Gap as Percentage of CRV (Proposed LOS)
Water	$7,735.3M	No Gap	0%	$18.6M	0.2%
Wastewater	$7,778.1M	No Gap	0%	$56.9M	0.7%
Corporate Fleet	$22.4M	$0.3M	1.3%	$3.1M	13.8%
Transportation & Stormwater	$2,728.5M	$10.6M	0.4%	$22.5M	0.8%
Waste Management	$336.8M	$2.1M	0.6%	$1.2M	0.4%
Corporate Facilities	$167.6M	$0.6M	0.4%	$2.9M	1.8%
HCHC	$468.8M	$8.7M	1.9%	$32.6M	7.0%
Long-Term Care	$133.5M	No Gap	0%	$7.3M	5.5%
DIS	$15.3M	No Gap	0%	$1.1M	7.2%
Paramedics	$59.2M	$1.4M	2.4%	$5.7M	9.6%
Halton Police	$230.3M	$2.7M	1.2%	$16.5M	7.2%
Overall	**$19,676.1M**	**$26.4M**	**0.1%**	**$168.6M**	**0.9%**

16.5. Consideration of Potential Options

As outlined in the previous sections, there is a potential for an infrastructure gap between the Region's project infrastructure needs and current funding levels. To address this gap, the Region should explore options. Bridging the infrastructure gap will require a strategic approach that incorporates both financial and non-financial solutions.

16.5.1. Non-Financial Options

Non-financial strategies involve practices that do not require increasing funding but can help reduce financial demands through alternative measures. Below are strategies for the Region to explore as part of its ongoing efforts to implement and consider additional approaches.

Levels of Service (LOS) Targets

O. Reg. 588/17 mandates that municipalities provide an annual update on their progress in implementing the asset management plan. To support this requirement, the adopted levels of service (LOS) metrics be reviewed and updated annually.

This will allow the Region to assess its progress toward achieving the proposed LOS targets outlined in this plan. Adjustments can be made as needed to ensure that targets remain both achievable and financially sustainable while also managing the infrastructure gap.

In alignment with Halton Region's 2023-2026 Strategic Business Plan, the proposed LOS target is to maintain 80% of all assets in good to very good condition across all asset categories. While some service areas have already met this benchmark, others remain below target, contributing to the preliminary estimated potential infrastructure gap. Overall, the Region has achieved 80% of assets in good to very good condition, with the water and wastewater playing a significant role in this achievement.

These assets, which account for approximately $15.5 billion of the Region's total $19.7 billion current replacement value, are 82% in good to very good condition. All other asset categories, valued at approximately $4.2 billion, have 72% of assets in good to very good condition.

This presents an opportunity for improvement by adjusting financially sustainable LOS targets for different service areas. A tailored approach, considering service areas specific and unique business needs, priorities, and risks could help reduce the funding shortfall while maintaining essential service levels.

Asset Prioritization and Asset Management Practices

As the Region continues to mature their asset management program, asset prioritization based on criticality assessment will play a crucial role in addressing any potential infrastructure gaps

by ensuring financial resources are allocated effectively to where they are needed the most that provide the most benefit. This can be done through optimizing investment decisions based on criticality, risk and condition to prevent resources from being spent on low-priority assets while high-risk assets deteriorate.

Proactive asset management, including preventative maintenance and rehabilitation, will assist in minimizing total lifecycle costs and reduce the need for costly reactive investments.

Asset Management Systems and Technology to Improve Lifecycle and Infrastructure Investment Forecasting

The Region is currently undertaking an asset management systems review to develop a roadmap for enhancing asset management systems and processes, aligning with the objectives of the Digital Strategy. While the Region possesses a wealth of data, improvements are needed to ensure this data is effectively leveraged for decision-making and remains easily accessible to staff. Additionally, the Region is in the process of acquiring a Decision Support System for Public Works assets, which will enhance forecasting capabilities for asset management and capital planning.

Enhancing asset data collection, analysis, and reporting tools and technology will strengthen evidence-based decision-making by providing accurate, timely, and comprehensive asset information. Improved data quality and analytics capabilities will enable the Region to better assess asset conditions, predict future infrastructure needs, and optimize maintenance and investment strategies.

16.5.2. Potential Financial Considerations

Reserves & Reserve Funds

Reviewing annual contributions to reserves is essential for building financial sustainability to manage years with large infrastructure expenditures. These reserves are typically funded through taxes, user fees, and grants. The Region currently utilizes reserves to support the state-of-good-repair (non-growth) infrastructure program. To maintain sufficient reserves the 2025 Budget increased operating contributions for the Water and Wastewater and Transportation State-of-Good-Repair capital programs. This allowed for greater use of capital reserves to finance the expanding State-of-Good-Repair capital program on a pay-as-you-go basis.

As stated in the 2025 Budget and Business Plan Budget Report, the Region's Reserves, which are funded by operating contributions, Canada Community-Building Fund revenue and investment earnings, are a primary funding source to sustain ongoing/recurring capital programs and in particularly the Region's state of good repair capital program. In addition,

reserves are also used to fund unanticipated or one-time expenditure requirements to allow the Region to minimize the fluctuation of property taxes and water and wastewater rates caused by temporary or cyclical conditions.

The Region's reserve continuity schedule is shown in Table 16-4.

Table 16-4. Reserve Continuity Forecast – 2025 Budget ($ Thousands)

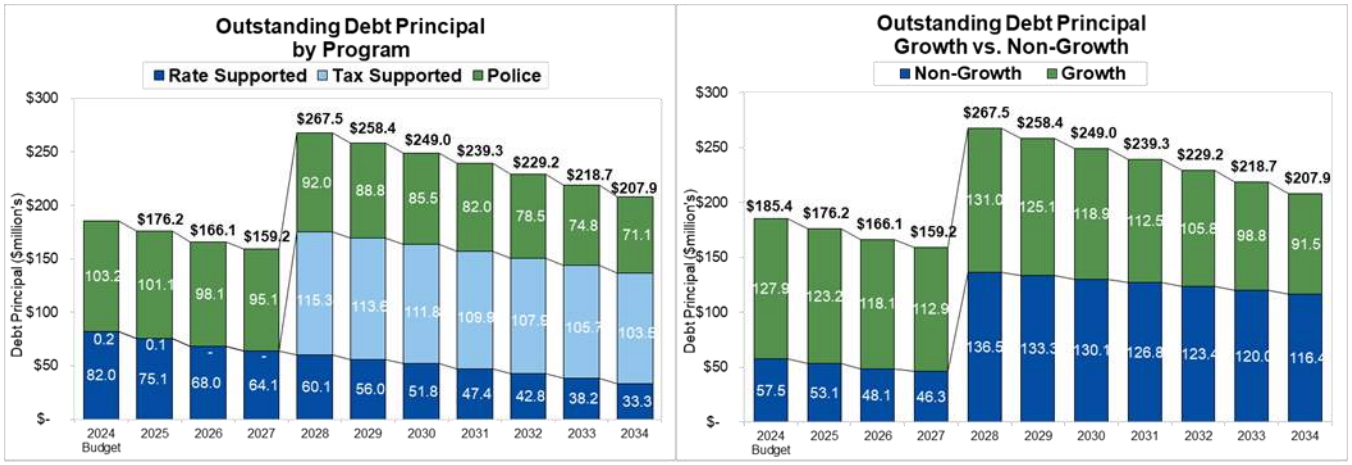
2025 Budget and Forecast Reserve Continuity ($000s)	2023 Ending	2024 Projected Ending*	2025 Transfers						2025 Projected Ending
			Transfers From/(To) Operating	Transfers From/(To) Capital	Intra Reserve Transfers	Projected DC/(Ovsl. Cntrbtn	Projected Interest Allocation	Total	
Reserves									
Tax Stabilization	$ 79,103	$ 79,916	$ 514	$ (1,319)	$ -	$ -	$ -	$ (805)	$ 79,111
Rate Stabilization	33,392	33,392	-	-	-	-	-	-	33,392
Program Specific	94,787	94,062	12,439	(796)	-	-	-	11,643	105,705
Vehicle & Equipment	93,092	83,633	24,101	(27,688)	(243)	-	2,452	(1,379)	82,254
Tax Capital	400,871	346,809	76,977	(202,673)	37,449	-	14,389	(73,858)	272,950
Rate Capital	301,103	248,958	137,631	(212,507)	-	-	21,523	(53,353)	195,605
Capital Invst Rvlvg Fund	112,019	109,799	7,366	(68,611)	31,081	-	3,955	(26,209)	83,590
Sub-Total	**1,114,368**	**996,569**	**259,027**	**(513,595)**	**68,286**	**-**	**42,320**	**(143,962)**	**852,607**
Reserve Funds									
Corporate	192,912	197,560	19,957	(19,540)	-	-	5,089	5,506	203,066
Development Charges	5,207	1,528	(6,364)	(223,933)	(68,286)	290,208	208	(8,167)	(6,639)
Sub-Total	**198,119**	**199,088**	**13,593**	**(243,473)**	**(68,286)**	**290,208**	**5,297**	**(2,661)**	**196,427**
Gross	**$ 1,312,487**	**$ 1,195,656**	**$ 272,620**	**$ (757,067)**	**$ -**	**$ 290,208**	**$ 47,617**	**$ (146,623)**	**$ 1,049,034**

* Balances include the projected year-end surpluses. Schedule may not add due to rounding.

Debt Financing

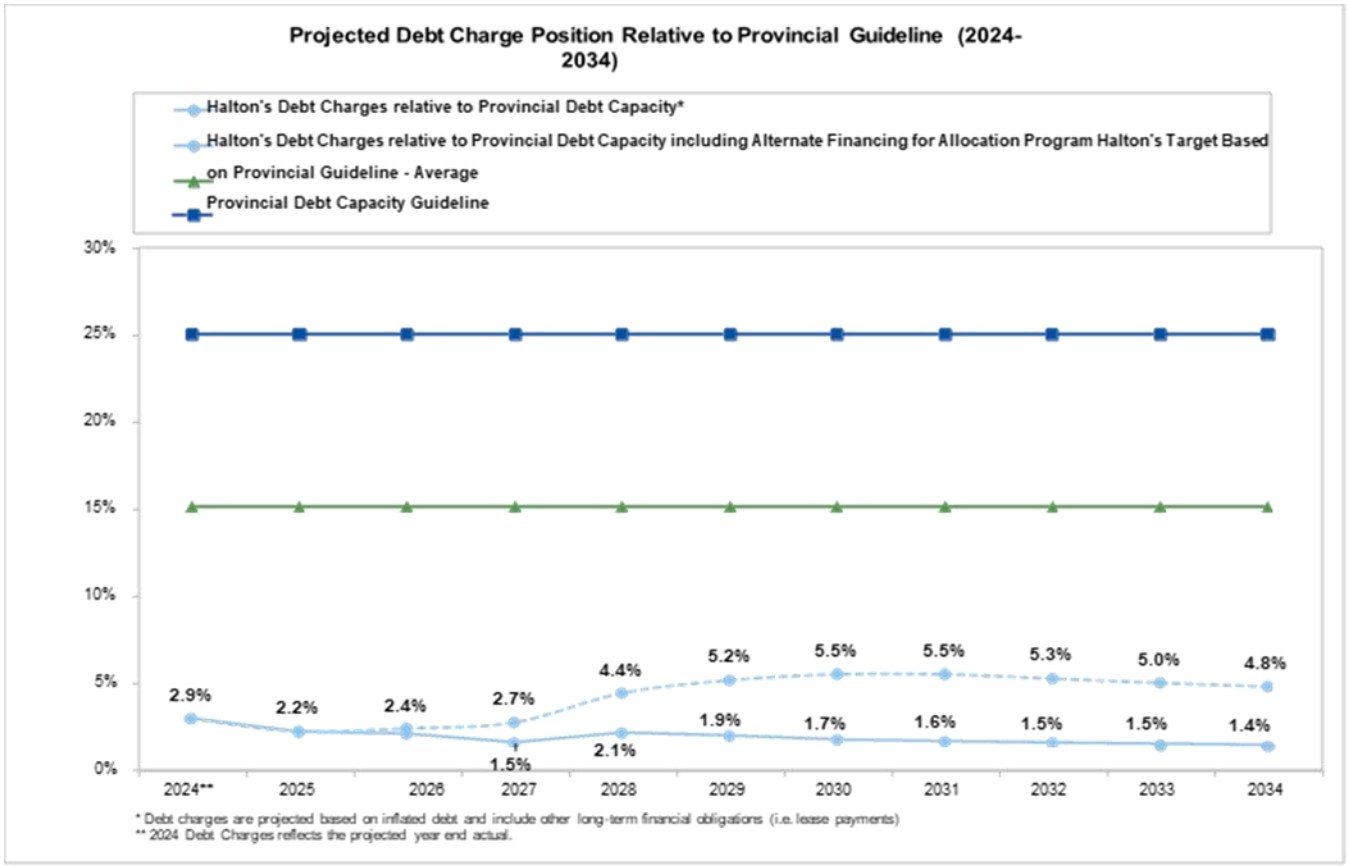
The Region leverages its long history of maintaining a AAA/Aaa credit rating to obtain the most competitive rates available in the market (typically over a 10-year term if debt is being considered). Leveraging debt allows the Region to maintain financial flexibility in the face of significant or changing funding requirements. Figure 16-11 illustrates the projected debt levels over the next 10 years, where debt levels are expected to peak at $267.5 M in 2028, mainly driven by the funding required for the North Operations Paramedic Centre.

Figure 16-11. Annual Projected Debt Levels – 2025 Budget ($ Millions)



As reflected in the 2025 Budget and Business Plan Budget Report and Figure 16-12, the projected levels are affordable in the context of the Region's total financial plan and relative to Halton's substantial asset base.

Figure 16-12. Projected Debt Charge Position Relative to Provincial Guideline – 2025 Budget



Grant Funding

It is recommended that the Region continue to actively seek and apply for available grant opportunities. Although these grants are challenging to estimate and forecast, and should not be relied upon as a consistent future funding source, the Region can still leverage them to address expenditures and alleviate financial pressures.

Incremental Revenue Increases & Infrastructure Levy

Incremental tax and rate increases can help close the infrastructure gap by gradually providing additional revenue to fund the long-term maintenance, renewal, and improvement of the Region's infrastructure. An infrastructure levy for instance, can play a role in providing this additional revenue through an incremental increase and provide consistent funding for infrastructure projects, support long-term asset management, ultimately spreading the financial impact over multiple years making it more manageable and enhancing fiscal sustainability.

An incremental increase in the form of an infrastructure levy, can provide a reliable and sustainable source of funding, enabling the Region to prioritize and address infrastructure needs over time without overburdening tax and rate payers or relying heavily on uncertain grants and external sources.

16.6. Potential Risks and Mitigation Approaches

Following the lifecycle strategies and activities outlined in this Asset Management Plan (AMP) is the most effective way for the Region to mitigate risk. Ignoring the infrastructure gap and failing to implement these strategies can lead to a range of immediate and long-term consequences, including:

- **Accelerated Infrastructure Deterioration:** Without adequate investment in renewal, rehabilitation, and replacement, infrastructure assets will degrade over time, leading to potential impacts to service delivery.
- **Reduced Operational Efficiency:** Poor lifecycle management can result in inefficient infrastructure, causing increased downtime, delays, and decreased productivity.
- **Rising Costs:** Deferring maintenance and rehabilitation may lead to higher overall lifecycle costs. Reactive repairs and premature asset replacements are significantly more costly than proactive maintenance and timely upgrades.
- **Inaccurate Forecasting:** Non-infrastructure activities, such as asset management planning, provide critical insights into infrastructure needs. Without these, funding and capacity requirements may be miscalculated, leading to resource shortfalls.

- **Potential Service Disruptions:** Asset deterioration often results in unplanned service interruptions, affecting the community's access to essential services.
- **Environmental & Regulatory Consequences:** Aging and inefficient infrastructure can increase emissions, cause leaks, and have potentially regulatory implications.
- **Economic Impacts:** Inadequate infrastructure can hinder economic growth by reducing the reliability and efficiency of services for residents and businesses.

Addressing infrastructure needs require proactive planning, investment, and ongoing maintenance to ensure long-term resilience, efficiency, and reliability of community services while mitigating these risks. O. Reg. 588/17 requires that the Region identify how the risks of not undertaking the lifecycle strategies to meet the proposed LOS will be managed. As discussed in the previous section and in the individual service area chapters, risks associated with not completing lifecycle activities according to the strategies are discussed. The Region actively manages these potential risks in the following ways:

- **Maintenance Activities and Prioritization:** The region continually maintains assets to attempt to prolong asset life and ensure reliability and functionality. Many assets are maintained to keep them in working order until such time that replacements are required.
- **Prioritizing Assets Based on Risk & Criticality:** Resources available are strategically assigned to higher risk and more critical assets, ensuring limited budgets are used effectively to mitigate high risks. For instance, the Region's PW groups adhere to the department's risk framework in identifying, assigning, scoring and prioritizing risks. The Region is in the process of improving their capital forecasting in consideration of documented risk metrics, which will assist in the annual budget and capital planning process.
- **Technology & Data:** The Region is continuing to implement their Digital Strategy, and in the process of the development of an asset management systems road map, to better understand how technology and data can be leveraged to improve asset management practices for the Region.
- **Asset Management Practices:** The Region, based on the maturity assessment, and the recommendations from this AMP, continues to develop their asset management program and practices to enhance decision-making and provide valuable input into where funding dollars should be spent.
- **Regulatory and Compliance with Standards:** The Region ensures compliance with all regulatory and safety standards to avoid risk.

The Region is committed to providing the level of service expected by the community, while managing risk, and in consideration of fiscal responsibility. While the Region considers options

to address the funding gap, these strategies will continue to be implemented and enhanced to mitigate the risks associated with not meeting the proposed LOS.

17. Improvement and Monitoring

Effective asset management is a dynamic evolving process that requires ongoing assessment to identify and implement enhancements, strategies, practices and asset management systems. Continuous improvement and monitoring will further refine the Region's asset management programs to increase the value provided by the Region's assets and maximize data utilization to track trends, determine strategic investment needs, mitigate risks, and support sustainable service delivery.

As part of the development of this 2025 Asset Management Plan, an asset management maturity assessment was conducted during the Fall of 2024 across the service areas to gather insights into their current level of maturity and identify future opportunities for improvement. This assessment along with the lessons learned from the development of this AMP provided the basis for the recommendations in this chapter.

17.1. Asset Management Maturity Assessment of Current State

The AM Maturity Assessment focused on all service areas and was conducted by engaging different staff involved directly or indirectly in lifecycle management of the Region's assets. It compared the Region's current AM processes with industry's best practices advocated by the Institute of Asset Management (IAM) and the ISO 55001 international standard specifying the criteria for establishing, implementing, maintaining and improving an asset management system.

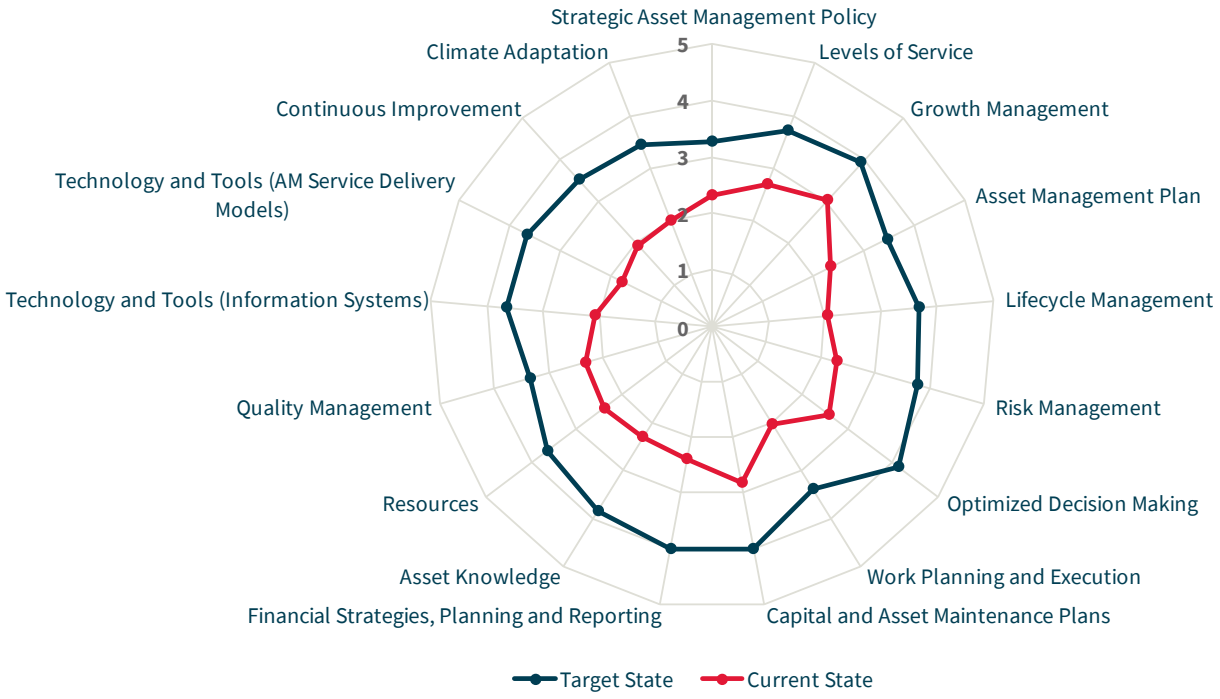
Internal stakeholders from all service areas provided input on their current and future target state in the following capabilities:

- Strategic Asset Management Policy
- Levels of Service
- Growth Management
- Asset Management Plan
- Asset Lifecycle Management
- Risk Management
- Optimized Decision Making
- Work Planning and Execution
- Capital and Asset Maintenance Plans
- Financial Strategy, Planning and Reporting
- Asset Knowledge
- Resources

- Quality Management
- Technology and Tools (Information Systems)
- Technology and Tools (Asset Management Service Delivery Models)
- Continuous Improvement
- Climate Adaptation

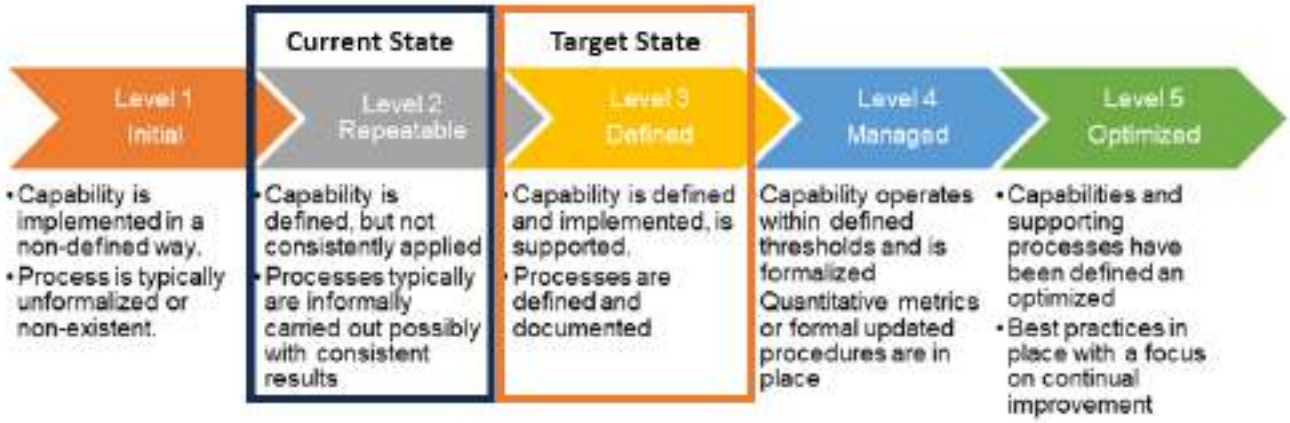
Figure 17-1 shows the assessment results, where the red line notes the current state, and the blue line notes the target. On average, the Region is currently at Level 2, where the asset management capabilities and processes are defined, but applied to varying degrees across the different service areas. The target identified by service areas intends to be above Level 3 by 2028.

Figure 17-1. 2024 AM Maturity Assessment Results



The maturity level scales and criteria that are used to assess the Region's asset management practices are illustrated in Figure 17-2.

Figure 17-2. Halton Region AM Maturity Rating



The following is a summary of the key findings based on the results of AM maturity assessment to enhance asset management capabilities:

Strategic Asset Management Policy

The Region has the required processes, tools, and staff resources to adopt an integrated and aligned asset management approach:

- The strategic asset management policy was updated in 2025, which captures the Region's updated and enhanced asset management guiding principles, approaches and practices.
- Review and develop a Governance Model to support asset management improvements across the organization working collaboratively among all stakeholders.

Levels of Service

AM service level metrics are defined, and the Region is committed to:

- Improve identifying the appropriate proposed levels of service based on service area needs.
- Improve the integration of service level metrics with budgeting and long-term financial planning.

Asset Knowledge, Technology and Tools (Information Systems)

The Region intends to leverage benefits of developing centralized asset information systems for facilitating asset assessments and is committed to:

- Enhance the use of technology and tools in asset management.
- Assessing the current state and roadmap of how the Region's asset management systems store and track information.

- Develop a standardized data dictionary and an asset information strategy.
- Implement a new centralized decision support system to facilitate and leverage data analytics.
- Review and continually update lifecycle treatments and costs to optimize/prioritize decision making process.
- Improve the accuracy and timeliness of asset condition data information and performance data to inform assessment of risks.
- Enhance asset risk assessment, particularly integrate asset criticality into asset management planning and capital programming.

Capital Forecasting, Maintenance Plans and Criticality Assessment

The Region is committed to improving the accuracy of forecasting infrastructure lifecycle investment needs including O&M needs over a 10-year planning horizon to inform operating and capital budgets. In addition, asset criticality is important to inform the capital planning process and standardize identification of investment priorities. The Region is committed to:

- Develop an asset criticality framework.
- Develop maintenance management strategies based on asset criticality.
- Integrate asset criticality with lifecycle models and risk management to inform future budgets.

Climate Adaptation

Climate change adaptation strategies and objectives are well defined. The Region is committed to integrate climate change considerations with asset management by:

- Continuing to implement its Corporate Climate Action Plan.
- Exploring opportunities for greater energy efficiency of facilities, treatment plants, landfill sites, and fleet assets to reduce energy usage and the construction of new infrastructure and replacement of existing equipment considers green standards.
- Integrating climate risks with risk management and aligning climate change adaptation efforts with asset lifecycle management activities to make the Region's infrastructure more resilient to the effects of climate change.

17.2. Future Initiatives for Continuous Improvements

Based on the improvement opportunities identified in the previous section, the Region is undertaking the following specific actions and initiatives to enhance its asset management program:

1) Implementing a Decision Support System (DSS)

The Region maintains multiple asset inventories and datasets across various systems, each designed to serve a particular function. Supporting alignment and connectivity between these systems will ensure all asset data is being leveraged and accessible in the decision-making process. To achieve this while enhancing the Region's capability in "Technology and Tools (Information Systems)", the Region will be implementing a Decision Support System (DSS).

A DSS is a secure, robust, and advanced software system that can consolidate various sources of information and complete varying degrees of advanced data analysis to assist in the decision-making process. It will also reduce manual efforts and traditional reliance on spreadsheets and stand-alone analyses.

This initiative will be undertaken by the Public Work's department and primarily focused on the department's Capital Budgeting Process. Below are the objectives set out by this DSS Initiative:

- **Digital Strategy Alignment** – Align the DSS with the Region's broader Digital Strategy to improve overall technological capabilities.
- **Improved Decision-Making** – Provide reliable, data-driven insights to support strategic decision-making for capital and maintenance budget programming.
- **Streamlined Processes** – Replace outdated, unreliable processes with a unified, automated system to increase efficiency and accuracy in programming and budgeting.
- **Enhanced Risk Management** – Consolidate risk management data to better assess and prioritize asset risks, improving asset lifecycle management.
- **Lifecycle Optimization** – Facilitate lifecycle planning and optimization of infrastructure projects for better long-term sustainability and cost efficiency.
- **Project Coordination** – Enable better coordination and bundling of capital projects to maximize resource allocation and minimize disruptions.
- **Data Security and Stability** – Provide a secure, stable environment for all data related to asset management, ensuring data integrity and protecting sensitive information.

2) Using Asset Criticality to Inform Risk Assessment and Maintenance Management

Assessing criticality and risk is essential for prioritization of asset expenditures, ensuring that high-risk assets receive priority attention. This ranking process helps inform the allocation of resources efficiently when there are budgetary constraints. This analysis will also help minimize service disruptions, enhanced decision-making, and optimized long-term planning. The key objectives of this initiative are to:

- Develop a risk criticality framework and incorporate it into the existing risk assessment framework to establish a unified approach and standard methodology for criticality scoring of assets across all asset hierarchy levels.
- Build consensus among different PW service area groups regarding the application of the new criticality assessment framework for prioritizing their capital work projects and budgeting processes.
- Integrate the established criticality assessment framework and validate the resulting scores from this project in the new Decision Support System (DSS).
- Integrate the established criticality assessment framework with the Maintenance Management Master Plan for PW assets.

3) Integrating Climate Change into Asset Management Planning

Integrating climate considerations into asset management planning is essential to ensuring long-term service reliability, financial sustainability, and infrastructure resilience. Climate change can accelerate asset deterioration, increase maintenance and replacement costs, and introduce new risks that must be proactively managed.

By integrating climate change into asset management planning, the Region can make informed investment decisions that protect assets, services, and communities from the impacts of climate change and extreme weather events. The Region is committed to:

- **Assess Climate Risks to Infrastructure** – Identify climate hazards such as extreme weather, flooding, heat stress and freeze-thaw events that could impact asset performance and service levels.
- **Improve Climate Data Integration** – Incorporate climate projections into asset lifecycle planning and decision-making processes.
- **Enhance infrastructure investment Planning for Climate Resilience** – Use risk-based infrastructure investment strategies to estimate the short and long-term costs of climate change adaptation and mitigation.
- **Update Master Plans and Policies** – Ensure alignment between existing asset management plans, climate action strategies, and other municipal planning documents to support a cohesive adaptation and mitigation approach.
- **Implement Climate Responsive Asset Management Practices** – Adjust lifecycle strategies, levels of service, and capital planning to incorporate climate change considerations and resilience measures.

Acronyms

Acronym	Definition
AAA/Aaa	Credit rating
AM	Asset Management
AMI	Advanced Metering Infrastructure
AMP	Asset Management Plan
ATMS	Advanced Traffic Management System
BCA	Building Condition Assessment
BCI	Bridge Condition Index
BWA	Boil Water Advisory
CCTV	Closed Circuit Television
CDM	Conservation and Demand Management
CMMS	Computerized Maintenance Management System
CNA	Condition Needs Assessment
CPR	Cardiopulmonary Resuscitation
CRV	Current Replacement Value
DC	Development Charges
DCA	Development Charges Act
DIS	Digital & Information Services (Service Area)
DSS	Decision Support System
DWQMS	Drinking Water Quality Management Standard
EAM	Enterprise Asset Management
ESL	Estimated Service Life

Acronym	Definition
EV	Electric Vehicle
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning System
GTA	Greater Toronto Area
GTHA	Greater Toronto and Hamilton Area
HCHC	Halton Community Housing Corporation
HRPS	Halton Regional Police Service
HVAC	Heating, Ventilation and Air Conditioning
HWMS	Hazardous Waste Management Site
I&I	Inflow and Infiltration
IAM	Institute of Asset Management
ICLEI	International Council for Local Environmental Initiatives
ICT	Information and Communication Technology
IMP	Integrated Master Plan
ISO	International Organization for Standardization
IT	Information Technology
LCM	Life Cycle Management
LID	Low Impact Development
LOS	Levels of Service
LTC	Long-Term Care
MTO	Ontario Ministry of Transportation

Acronym	Definition
OGS	Oil and Grit Separator
O. Reg.	Ontario Regulation
OSIM	Ontario Structure Inspection Manual
PACP	Pipeline Assessment and Certification Program
PAD	Public Access Defibrillator
PC	Personal Computer
PdM	Predictive Maintenance
PLOS	Proposed Level of Service
PM	Preventive Maintenance
PQI	Pavement Quality Index
PSBN	Public Safety Broadband Network
PV	Present Value
PW	Public Works
QEW	Queen Elizabeth Way
RCM	Reliability Centered Maintenance
RFP	Request for Proposal
RGI	Rent-Geared-to-Income
RWIS	Road Weather Information System
SaaS	Software as a Service
SAP	Systems, Applications, and Products in Data Processing (Company Name)
SCADA	Supervisory Control and Data Acquisition
TCA	Tangible Capital Asset

Definitions

Term	Definition
Asset Management Plan	Documented information that specifies the activities, resources and timescales required for an individual asset, or a grouping of assets, to achieve the organization's asset management objectives.
Asset Management System	Management system for asset management whose function is to establish asset management policies, objectives and processes to achieve those objectives.
Asset Portfolio	Assets that are within the scope of the asset management system.
Asset Type	Grouping of assets having common characteristics that distinguish those assets as a group or class (for example, physical assets, information assets, intangible assets, critical assets, enabling assets, linear assets, information, and communications technology (ICT) assets, infrastructure assets, moveable assets).
Capability	Measure of capacity and the ability of an entity (system, person, or organization) to achieve its objectives. Asset management capabilities include processes, resources, competences, and technologies to enable the effective and efficient development and delivery of asset management plans and asset life activities, and their continual improvement.
Computerized Maintenance Management System	A software system that keeps, records, and tracks all maintenance activities (e.g., maintenance work orders, preventative maintenance (PM) schedules, PM masters, material parts, work plans and asset history). Usually, it is integrated with support systems such as inventory control, purchasing, accounting, and manufacturing, and controls maintenance and warehouse activities.
Continual Improvement	Recurring activity to enhance performance.

Term	Definition
Enterprise Asset Management	Coordinated activity of an organization to realize value from assets using an enterprise or organization-wide approach.
Enterprise Asset Management System	An information system that integrates all asset related applications for an entire enterprise. An Enterprise Asset Management (EAM) system includes an asset registry (inventory of assets and their attributes) combined with a computerized maintenance management system (CMMS) and other modules (such as inventory or materials management). Assets that are geographically distributed, interconnected or networked, are often also represented through the use of geographic information systems (GIS).
Levels of Service	Parameters, or combination of parameters, which reflect social, political, environmental, and economic outcomes that the organization delivers. The parameters can include safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost, and availability.
Lifecycle	Stages involved in the management of an asset. The naming and number of the stages and the activities under each stage usually vary in different industry sectors and are determined by the organization.

Term	Definition
Objective	Result to be achieved. An objective can be strategic, tactical, or operational. Objectives can relate to different disciplines (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product, and process). An objective can be expressed in other ways, e.g., as an intended outcome, a purpose, an operational criterion, an asset management objective or by using other words with similar meaning (e.g., aim, goal, or target). In the context of asset management systems, asset management objectives are set by the organization, consistent with the organizational objectives and asset management policy, to achieve specific measurable results.
Organization	Person or group of people that has its own functions with responsibilities, authorities, and relationships to achieve its objectives. The concept of organization includes, but is not limited to, sole-trader, company, corporation, firm, enterprise, authority, partnership, charity or institution, or part or combination thereof, whether incorporated or not, public, or private.
Organizational Objective	Overarching objective that sets the context and direction for an organization's activities. Organizational objectives are established through the strategic level planning activities of the organization.
Performance	Measurable result. Performance can relate either to quantitative or qualitative findings. Performance can relate to the management of activities, processes, products (including services), systems or organizations. For the purposes of asset management, performance can relate to assets in their ability to fulfil requirements or objectives.

Term	Definition
Policy	Intentions and direction of an organization as formally expressed by its top management.
Preventative Action	Action to eliminate the cause of a potential nonconformity or other undesirable potential situation. Preventive action is taken to prevent occurrence and to preserve an asset's function, whereas corrective action is taken to prevent recurrence. Preventative action is normally carried out while the asset is functionally available and operable or prior to the initiation of functional failure.
Process	Set of interrelated or interacting activities which transforms inputs into outputs.
Requirement	Need or expectation that is stated, generally implied or obligatory. "Generally implied" means that it is custom or common practice for the organization and stakeholders that the need or expectation under consideration is implied. A specified requirement is one that is stated, for example in documented information.

Term	Definition
Risk	Effect of uncertainty on objectives. An effect is a deviation from the expected — positive and/or negative. Objectives can relate to different disciplines (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product, and process). Risk is often characterized by reference to potential "events" and "consequences," or a combination of these. Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated "likelihood" of occurrence. Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood.
Stakeholder	Person or organization that can affect, be affected by, or perceive themselves to be affected by a decision or activity. A "stakeholder" can also be referred to as an "interested party."