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The Regional Municipality of Durham Report

To:	Committee of the Whole
From:	Commissioner of Finance and Commissioner of Works
Report:	#2024-COW-29
Date:	June 12, 2024

Subject:

2024 Asset Management Plan

Recommendation:

That the Committee of the Whole recommends to Regional Council:

A) That the 2024 Regional Municipality of Durham Asset Management Plan be endorsed; and

B) That the 2024 Regional Municipality of Durham Asset Management Plan be posted on the Region's website and the Ministry of Municipal Affairs and Housing be advised.

Report:

1. Purpose

1.1 The 2024 Asset Management Plan details the state of the Region's infrastructure, service levels, asset performance, lifecycle costs, and climate change risks, adaptation and mitigation initiatives to protect the Region's assets.

1.2 The Region's Asset Management Plan is a collaborative cross-departmental effort produced from year-round asset management processes to maintain assets and identify investment needs to meet target service levels. The process is guided by the Region's Corporate Strategic Asset Management Policy.

1.3 Aligned with best practices, the Asset Management Plan informs the Region's long-term planning and the annual business plans, budgets and nine-year capital forecast.

1.4 This report maintains the Region's compliance with provincial and federal regulatory requirements and meets the requirements for many senior government funding programs. In addition, with Regional Council's adoption of the 2024 Regional Municipality of Durham Asset Management Plan, the Region has met the new asset management requirements under Ontario Regulation 588/17 that are due by July 1, 2024.

2. Previous Reports and Decisions

2.1 On June 26, 2019, Region Council approved the Region's 2019 Asset Management Plan and the Region's Corporate Strategic Asset Management Policy (Report #2019-COW-16).

2.2 On September 30, 2020, Regional Council approved the Region's 2020 Corporate Asset Management Update Report (Report #2020-COW-24). This report provided an update to the Region's full 2019 Asset Management Plan.

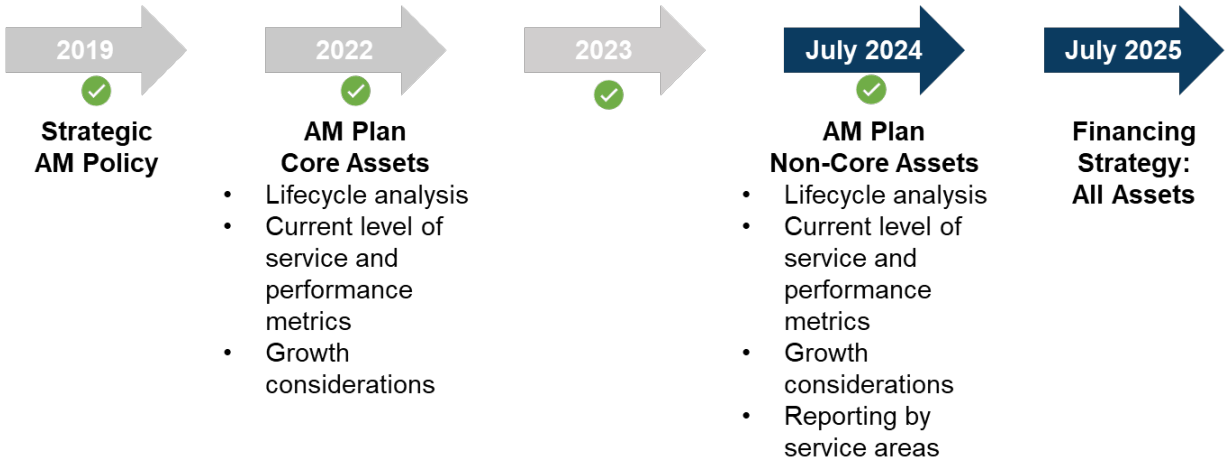
2.3 On June 29, 2022 Regional Council approved the Region's 2022 Asset Management Plan (Report #2022-COW-14). This report presented the Region's asset management goals, approach and policies, and advised Council on the state of the Region's infrastructure, service levels, performance, lifecycle considerations and risk and climate change adaptation and mitigation initiatives.

2.4 This report is aligned with and is informed by the 2024 Business Plans and Budget for Property Tax Purposes (Report #2024-F-3), the 2024 Business Plans and Budget for the Consolidated Water Supply and Sanitary Sewerage Systems (Report #2023-F-36), the Transit Service and Financing Strategy (2023 – 2032) (Report #2023-F-5) and the 2023 – 2032 Region of Durham Paramedic Services Service and Financing Strategy (Report #2023-COW-7).

3. Complying with Ontario Regulation 588/17

3.1 On January 1, 2018, Ontario Regulation 588/17, Asset Management Planning for Municipal Infrastructure, under the Ontario Infrastructure for Jobs and Prosperity Act 2015, came into effect with a full implementation deadline of 2024. Due to the pandemic, the regulation was amended to provide a one-year extension to the implementation timelines. The regulation requires municipal asset management plans to include the following components by specific deadlines as outlined in Figure 1.

Figure 1: Ontario Regulation 588/17 Key Changes and Timeline



3.2 Compliance with Ontario Regulation 588/17 is required for senior government capital funding programs like the Canada Community-Building Fund (CCBF), formerly the Federal Gas Tax Fund.

3.3 The Region's 2024 Asset Management Plan achieves the new requirements outlined in Ontario Regulation 588/17 for all assets (core and non-core assets) reported by service area by July 1, 2024 including:

- Inventory with asset condition, replacement value and remaining useful life;
- Current level of service and performance metrics;
- Growth considerations; and
- Lifecycle analysis including operating and capital investments.

3.4 Lifecycle analysis considers all operating and capital costs required for an asset to deliver its targeted service level over its useful life; from initial acquisition, repairs and maintenance, rehabilitation and eventual decommissioning costs. Ontario Regulation 588/17 requires the lifecycle analysis for a ten-year forecast period.

3.5 Regional staff will continue to refine lifecycle data processes and cost analysis aligned with the continual improvement practices enshrined in both the regulation and the Region's Corporate Strategic Asset Management Policy.

3.6 In addition to Ontario Regulation 588/17, the Region's Asset Management Plan ensures compliance and alignment with the following:

- The Development Charges Act and the provincial housing targets;
- The Smart Growth for Our Communities Act;
- Requirements under A Place to Grow: Growth Plan for the Greater Golden Horseshoe to support the next Municipal Comprehensive Review (Regional Official Plan Amendment);
- The Region's Tangible Capital Assets (TCA) Policy;
- PSAB requirements for the recording of Tangible Capital Assets; and

- Requirements for federal and provincial funding programs including the Canada Community-Building Fund Agreement.

3.7 Additionally, the Region is well positioned to meet additional reporting requirements in 2025 including the development of a financing strategy.

4. Financial Implications of Bill 23, More Homes Built Faster Act, 2022, Bill 134, Affordable Homes and Good Jobs Act, 2023 and related Legislation

4.1 Bill 23, *More Homes Built Faster Act, 2022*, Bill 134, *Affordable Homes and Good Jobs Act, 2023* and related legislation have brought a number of changes impacting municipalities including:

- The province, in support of a goal to build 1.5 million new homes by 2031, has established specific housing targets for large and fast-growing single and lower-tier municipalities, including Durham's five lakeshore municipalities who have formally committed to housing pledges. While housing targets are on a local municipal level, meeting them requires advancing the construction of Regional infrastructure earlier than previously planned. This creates additional financial burden on the Region both from having to advance funding for large infrastructure projects, as well as for additional staff resource requirements to support and deliver a much larger, technical and complex ten-year capital program.
- Changes to the Development Charges Act, 1997 that require municipalities to phase-in new development charge rates, allow developers to 'lock-in' their development charge rates at time of development application and provide development charge exemptions and discounts to select development categories. In addition, municipalities can no longer fund certain services (social housing and certain types of studies) through development charges. The implication is a smaller share of the Region's growth capital costs will be recoverable from development charges as the Region is required, under provincial legislation, to fund the impact of these provisions from nondevelopment charge sources. In the absence of provincial funding, regional property taxes and water and sanitary sewer user rate revenues will be required to fund these shortfalls.
- The Region is actively monitoring the status of Bill 185, *Cutting Red Tape to Build More Homes Act, 2024* which, at the time this report was written, is before the Legislative Assembly of Ontario. If approved, some of the changes introduced through Bill 23 will be reversed. If approved, the Region will no longer be required to phase-in new development charge rates over five-years and growth-related studies will again be eligible for Development Charge financing. Any impacts resulting from this and other legislation will be incorporated into future updates of the Asset Management Plan.

5. Asset Management Planning Process

5.1 Formal asset management has been in place at the Region since 2004. The Region's Corporate Strategic Asset Management Policy articulated asset management goals, objectives, guiding principles as well as an asset management framework. In accordance with Ontario Regulation 588/17, the Region's Corporate Strategic Asset Management Policy must be reviewed and updated at least once every five years with the next update anticipated in 2025.

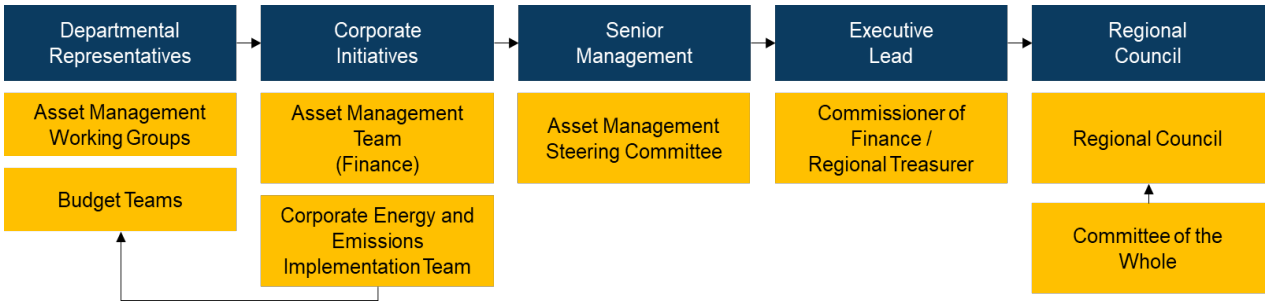
5.2 Asset management planning is a cross-departmental continuous year-round process that supports the development of Regional business and financial plans as illustrated in Figure 2. The asset management planning process is a cornerstone of the Region's annual business planning cycle.

Figure 2: Region's Asset Management Planning Process

5.3 The Asset Management Plan considers asset condition, remaining useful life and service needs and identifies operating and capital requirements including maintenance, repair, rehabilitation, and replacement over a ten-year period. Asset management investment needs and financing strategies are addressed through the annual business plans, budget and nine-year capital forecast.

5.4 Development of the Asset Management Plan is led by the Finance Department and overseen by a Director-level Steering Committee. Figure 3 illustrates the governance structure of asset management at the Region.

Figure 3: Regional Asset Management Governance Structure



5.5 Asset Management working groups, coordinated by the Finance Department collaboratively gather, analyze and report on the various asset management components detailed in Figure 4:

Figure 4: Asset Management Analysis Components

State of Infrastructure	Asset inventory, valuation, condition, age and remaining useful life
Service Level Targets	Desired asset service targets set by the Region and through legislation
Asset Performance	Metrics to assess how well an asset is meeting service level targets
Lifecycle Analysis	The capital and operating costs associated with an asset meeting service standards during its entire life (from initial acquisition to eventual disposal)
Climate Change	Greenhouse gas reduction and climate mitigation strategies for assets
Financial Planning	Expenditure forecast and financing strategies including maintenance, rehabilitation, replacement, disposal activities and non-infrastructure solutions
Risk Analysis	Summary of asset-related risks and mitigation strategies

6. Replacement Value of Regional Assets

6.1 The Region's infrastructure assets have a total replacement value of approximately $22.82 billion (as of December 31, 2023), of which $14.88 billion are utility-rate supported and $7.94 billion are property tax supported. Attachment #1 provides an overview of the Region's asset inventory, replacement value and condition.

$14.88 billion in utility-rate supported replacement value

$7.94 billion in property tax supported replacement value

6.2 Replacement values are impacted by both growth (additional infrastructure) and inflationary cost increases. The December 31, 2023 replacement value of the Region's assets has increased by $1.94 billion (9.3 per cent) from December 31, 2022.

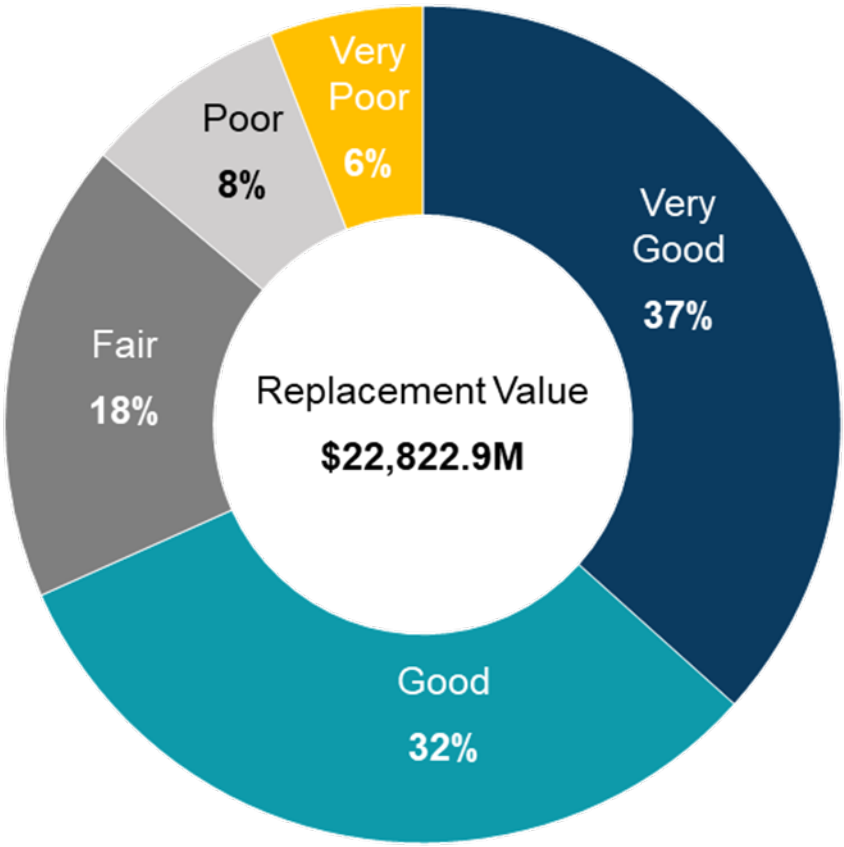
6.3 For 2023, approximately $90,506 per Durham household would be required to replace the Region's entire asset inventory. This is a representation of the community's investment in Regional infrastructure.

$90,506
Investment per Household to Replace all Assets

7. The Condition of the Region's Infrastructure

7.1 Asset condition helps to inform the Region's prioritization of maintenance, repair and replacement investments. The average condition across all Regional assets is Good and is consistent with the average condition in 2022. Across all assets, most are rated in Fair to Very Good condition (87 per cent based on proportion of total replacement value). Figure 5 below displays the total replacement values and condition ratings of the Region's service areas.

Figure 5: Condition and Replacement Values for Regional Assets*



* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include condition for equipment assets as these are pooled assets.

7.2 An asset assessed as Poor or Very Poor condition does not represent a health or safety risk. Rather, these are assets that may not be performing as intended, may be experiencing higher than average rehabilitation and/or maintenance costs due to condition, or may be deemed to be at or near the end of its useful life. When warranted, Very Poor assets are considered for current year replacement or significant rehabilitation. Staff balance replacement and repair work with the impact of the asset's poor performance to ensure assets are not prematurely replaced and deliver best value to user rate and property taxpayers.

7.3 Table 1 outlines the approaches the Region's asset management staff employ to assess the condition of each asset class:

Table 1: Asset Condition Assessment Methods

Asset Class	Assessment Methods
Linear Water and Sewer (e.g., buried pipes)	Pipe material, break rates, inspections, remaining service life and operational concerns
Vertical Water and Sewer (e.g., plants and pumping stations)	Site-specific inspections
Roads and Traffic Infrastructure	Inspections and consideration of age-based condition rating where appropriate
Bridges and Culverts (greater than a three metre span)	Biennial visual inspections
Facilities	Building Condition Assessment (BCA) and age (where a BCA has not yet been completed)
Fleet	Estimated service life and inspection

7.4 The assets currently rated in Poor to Very Poor condition will continue to undergo assessment for investment through the 2025 Business Planning and Budget process.

8. Service Levels

8.1 Assets are instrumental in the Region delivering services at its desired service levels. Desired service levels are set both by regulatory compliance and Regional priorities. Regional plans, studies, policies, by-laws influencing all assets' service levels include:

- Durham Region Strategic Plan: 2020 – 2024;
- The Regional Official Plan;
- Durham Region Corporate Climate Change Action Plan;
- Energy Conservation and Demand Management Plan (CDM);
- The 2022 Durham Accessibility and Inclusivity Standards;
- Light Duty Fleet Electrification Plan;
- The Durham Standard;
- Transit Service and Financing Strategy; and
- Region of Durham Paramedic Services Service and Financing Strategy.

8.2 Additionally, service levels are also influenced by:

- Departmental reports and plans;
- Best engineering and industry practices;
- Regulatory guidelines and/or requirements; and
- Other performance expectations as defined through multiple reports as approved by Regional Council.

8.3 Desired service levels influence asset management planning and subsequent investment decisions. Attachments #2 through #9 outline the desired service levels for each service areas as well as performance measures to track progress.

8.4 Ontario Regulation 588/17 sets out specific technical metrics and qualitative descriptions that must be included in service level reporting for core assets (water, wastewater, roads, bridges, culverts, traffic systems).

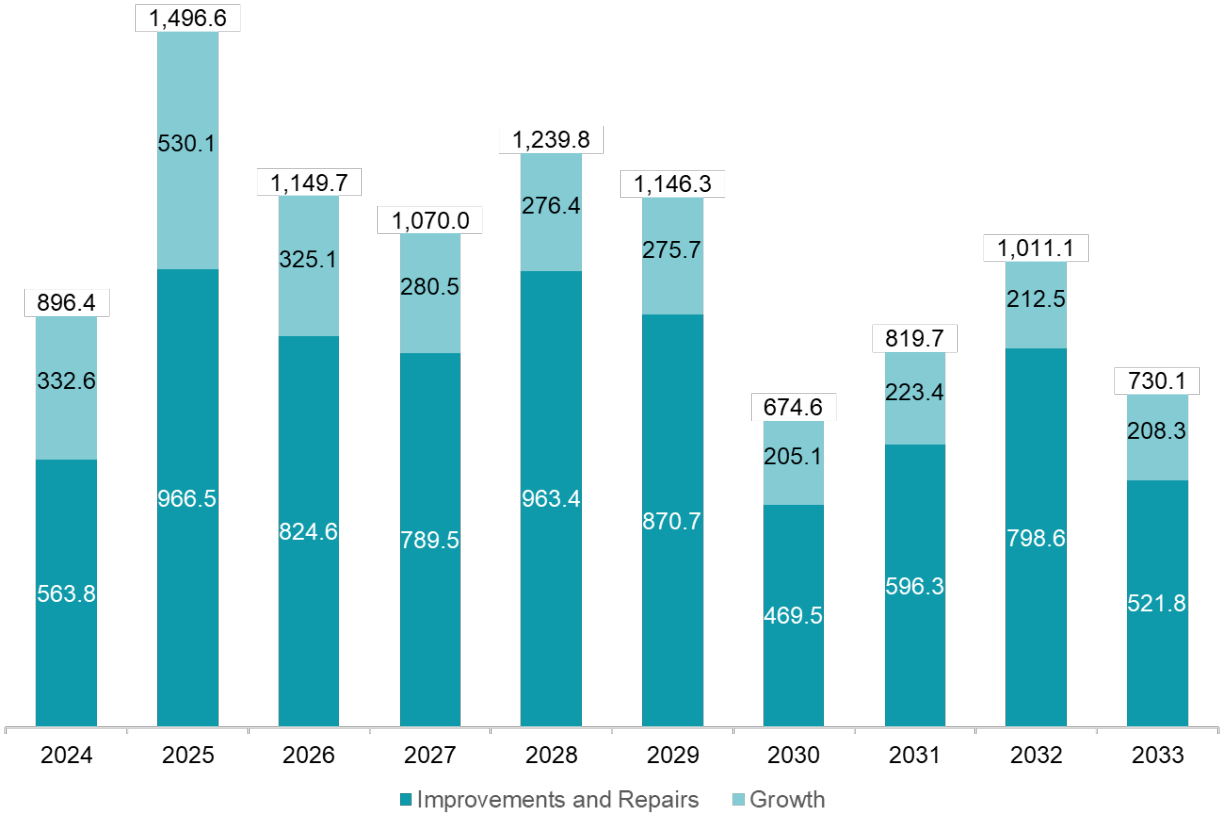
9. Capital Forecast for Core and Non-Core Assets

9.1 The Region's 2024 Business Plans and Budget identified major capital investments for core and non-core assets of $10,234.5 million from 2024 to 2033. As illustrated in Figure 6, approximately $7,364.7 million of this investment is growth related and is primarily funded from development charges with any development charge shortfalls being funded from user rates, property taxes, reserves, reserve funds and debenture financing.

9.2 The balance of $2,869.8 million for non-growth related infrastructure will to be funded primarily from property taxes, water and sewer user rates and Regional reserves and reserve funds.

9.3 Ten-year capital forecasts for each of the Region's Service areas is included in Attachments #2 through #9.

Figure 6: Ten-Year Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to the Total due to rounding.

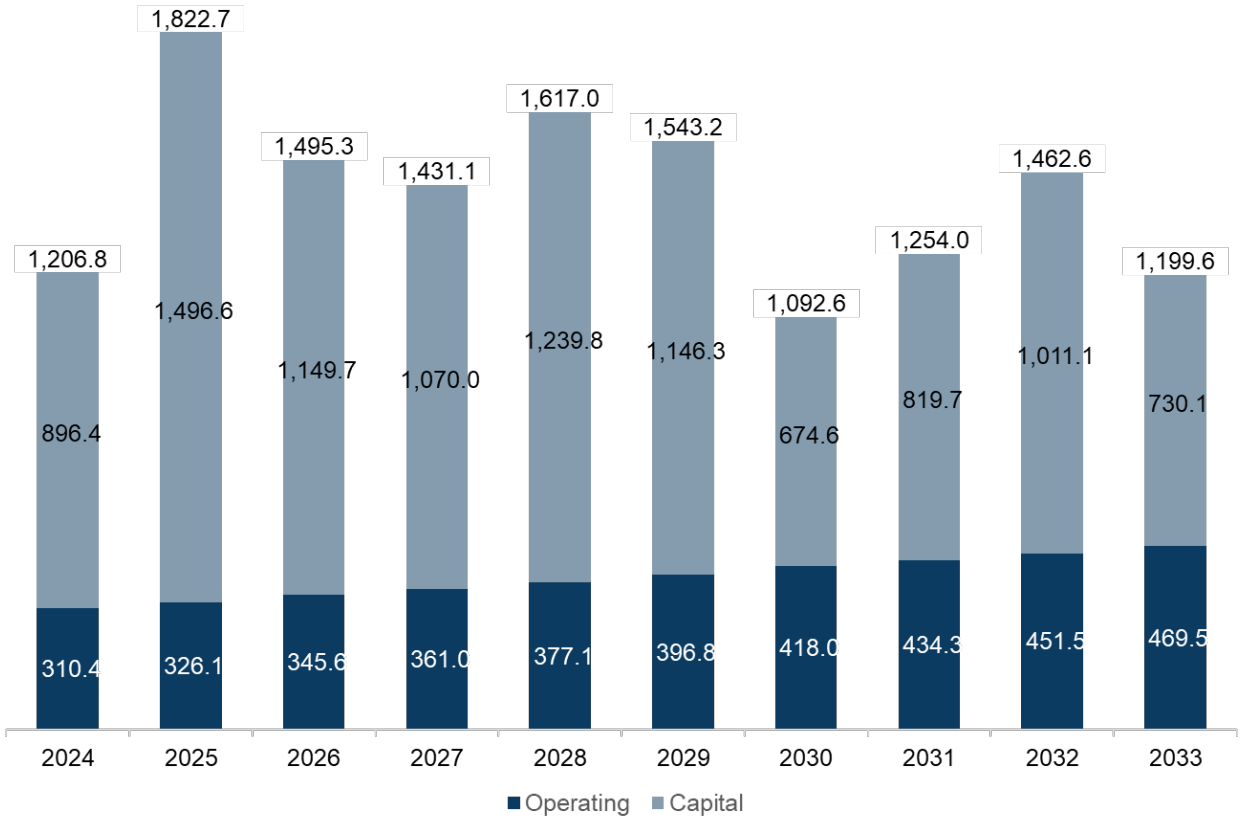
10. Lifecycle Considerations

10.1 Lifecycle analysis considers the costs for all capital and operating activities undertaken during the life of an asset to ensure it meets its desired service levels and target performance measures at the best value to user rate and property taxpayers. Lifecycle costs begin before an asset is even acquired including planning activities to determine needs, through to eventual asset disposal and possible site remediation activities.

10.2 Ontario Regulation 588/17 requires lifecycle analysis for core and non-core assets be included in the Region's Asset Management Plan by July 1, 2024.

10.3 As illustrated in Figure 7, the 2024 gross lifecycle costs (operating and capital) for regional assets is $1,206.8 million. Over the nine-year forecast period, total planned lifecycle expenditures for regional assets total $12,918.0 million. Detailed lifecycle costing by service area are included in Attachments #2 through #9.

Figure 7: Ten-Year Lifecycle Costs ($ millions)*

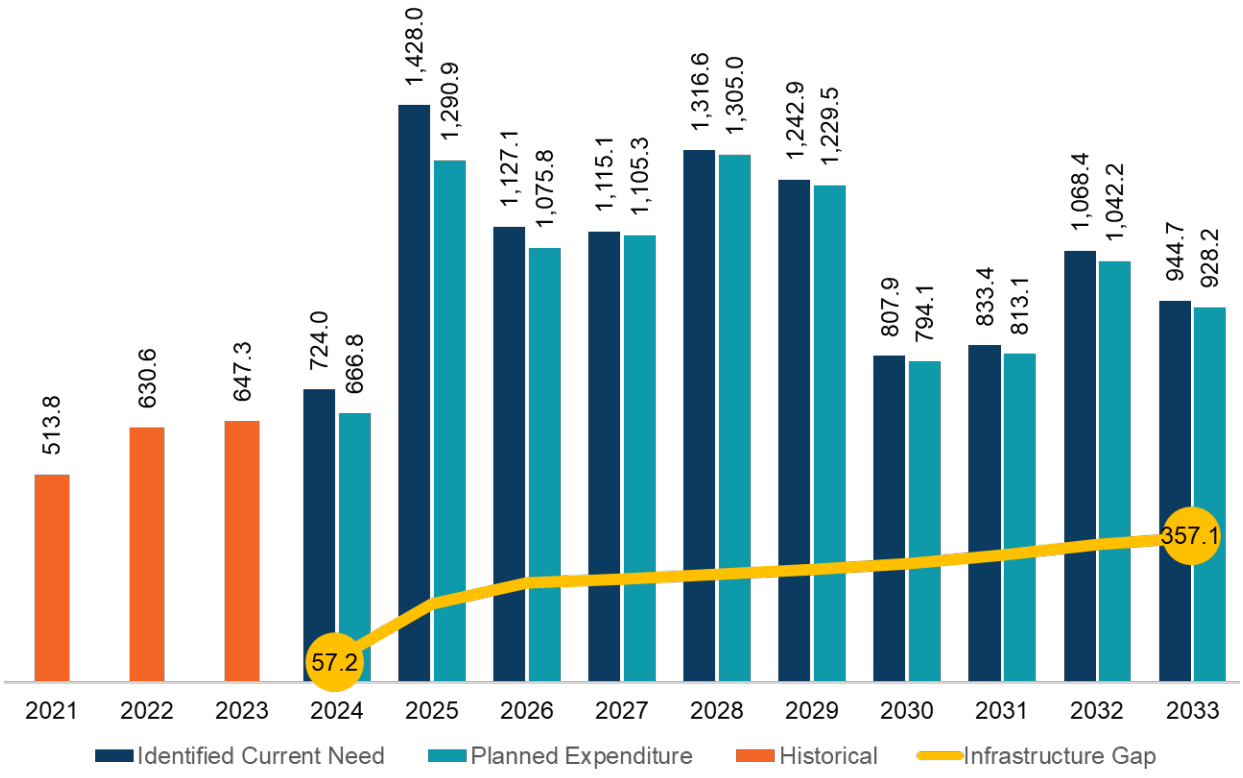


*Operating and Capital may not add to Total due to rounding.

11. Infrastructure Gap or Core Assets

11.1 As part of the lifecycle costing analysis for core assets, staff analysed the current planned funding against expected funding needs (both operating and capital) to meet service levels. Through this analysis, an infrastructure funding gap of $57.2 million in 2024 was identified, increasing to $357.1 million by 2033 based on planned investments (Figure 7).

Figure 8: Infrastructure Gap Analysis for Core Assets ($ millions)



11.2 Forecasted infrastructure needs will be reviewed, updated, and refined during the 2025 business planning and budget and long-term financial planning processes. Funding needs, gaps and strategies to address these infrastructure needs will also be refined through ongoing long-term capital planning exercises and future business plans and budgets.

11.3 The Region faces significant financial challenges, similar to those faced by other Ontario municipalities, related to capital cost escalations over the forecast period. Statistics Canada's Building Construction Price Index for non-residential buildings in the Toronto Census Metropolitan Area, for the period March 31, 2022, to March 31, 2023, identified an inflationary increase of 12.3 per cent. The increase in the index is reflective of the current inflationary environment, skilled labour and materials shortages, and increased cost of materials. The Region will continue to strategically

contribute to our capital replacement funds to ensure our forecasted infrastructure needs continue to support Regional programs and services.

12. Climate Change Mitigation and Adaptation Measures

12.1 The Durham Region Corporate Climate Action Plan has set targets to achieve net-zero corporate GHG emissions by 2045. The 2024 Business Plans and Budget includes a number of investments to reduce corporate GHG emissions from the Region's assets including the purchase of low carbon vehicles, the advancement of Durham Region Transit's zero emission fleet, facility initiatives, the usage of the Durham Standard, the use of recycled materials in construction projects, the completion of various deep energy retrofits of a number Regional facilities, and the undertaking of comprehensive building condition assessments and level 3 energy audits to document the baseline and inform the development of a greenhouse gas emissions reduction plan and pathway for the balance of the Region's facilities. Further details of these and other initiatives can be found in the Annual Climate Change Progress Report the latest of which was Report #2024-COW-12. The Region of Durham's 2024 to 2029 Energy Conservation and Demand Management Plan (Report #2024-COW-30) provides an overview of the Region's planned future energy conservation and demand management measures.

12.2 Staff employ strategies to prepare for the impacts of a changing climate as part of ongoing asset management best practices and in accordance with Ontario Regulation 588/17 requirements. Asset design, including material types, technical specifications and location, is all impacted by consideration of climate adaptation.

12.3 The asset class attachments (Attachments #2 through #9) provide further details on the specific measures being employed to adapt assets to a changing climate and highlight the ways in which investments in assets are aligned with the Region's corporate GHG inventory reduction targets.

13. Risk

13.1 Regional staff proactively analyze potential risks to assets on an ongoing basis considering risk likelihood and impact. Identified risk mitigation strategies include coordinated responses to potential risk events, measures to ensure business continuity, and systems to address service interruption.

13.2 Attachments #2 through #9 details by service area of the risks specific to each asset class as well as mitigation measures.

14. Relationship to Strategic Plan

14.1 This report aligns with and addresses the following Durham Region Strategic Plan goal and priorities.

- Goal 5 Service Excellence – to provide exceptional value to Durham user rate and property taxpayers through responsive, effective and fiscally sustainable service delivery. By responsibly managing the Region's assets, the proposed 2024 Asset Management Plan looks to optimize resources to deliver critical infrastructure and servicing for current and future generations.

15. Next Steps

15.1 Infrastructure needs identified in this report will inform the 2025 business planning and budget process, including the 2025 Budget Guideline Report, capital planning, and departmental 2025 to 2034 business plans and budgets.

15.2 Asset management staff will continue to work collaboratively to meet the remaining asset management regulatory requirements due by July 1, 2025. The specific next steps include:

- Continue aligning asset management practices with additional regulatory requirements including the development and presentation of a financing strategy;
- Refining data collection processes and analysis to improve asset management planning capabilities and lifecycle costing, to inform future business plans, budgets, capital forecasts, and long-term financial planning strategies;
- Refining the Region's non-core asset inventory;
- Continuing to work with the Office of the CAO to seek alignment between corporate climate initiatives and asset management processes; and
- Continuing to assess risk, business continuity, asset criticality, and asset reliability.

16. Conclusion

16.1 The Asset Management process is a critical element in the Region's business planning, budget and long-term financial planning processes. The Asset Management Plan details the current condition of the Region's assets and forecasts future investment needs for repair, maintenance, and replacements.

16.2 The Region's 2024 Asset Management Plan complies the additional reporting requirements for core and non-core assets required under Ontario Regulation 588/17.

16.3 The overall replacement value of the Region's assets is increasing due to growth demands for additional infrastructure and inflationary pressures which were higher in 2023 than in recent years. The asset class attachments (Attachments #2 through #9) provide additional details on the change in replacement values for each asset class.

16.4 The condition of the Region's assets remained relatively stable year-over-year as a result of preventative maintenance, rehabilitation and timely repairs and replacements with strategic investments planned that will address many assets currently in Very Poor condition.

16.5 As part of continual improvement, the asset management planning processes of data collection, asset assessment and asset and lifecycle analysis will continue to be refined and improved.

16.6 Regional staff will continue to work collaboratively to refine and enhance our lifecycle costing and the development of financing strategies for core and non-core assets. The Region is well positioned to meet these additional Ontario Regulation 588/17 requirements due in 2025.

Attachments:

Detailed 2024 Regional Municipality of Durham Corporate Asset Management Plan

Attachment #1: Regional Asset Inventory, Replacement Value and Condition

Attachment #2: Water Supply Asset Class Report

Attachment #3: Sanitary Sewerage Asset Class Report

Attachment #4: Transportation Asset Class Report

Attachment #5: Durham Region Transit Asset Class Report

Attachment #6: Social Services Department Asset Class Report

Attachment #7: Solid Waste Asset Class Report

Attachment #8: Health Department Asset Class Report

Attachment #9: Durham Regional Police Service Asset Class Report

Respectfully submitted,

Original Signed By

Nancy Taylor
Commissioner of Finance

Original Signed By

Ramesh Jagannathan
Commissioner of Works

Recommended for Presentation to Committee

Original Signed By

Elaine C. Baxter-Trahair
Chief Administrative Officer

DURHAM REGION

2024

Asset Management Plan

Contents

Attachments

Attachment #1: Regional Asset Inventory, Replacement Value and Condition

Attachment #2: Water Supply Asset Class Report

Attachment #3: Sanitary Sewerage Asset Class Report

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Attachment #6: Social Services Department Asset Class Report

Attachment #7: Solid Waste Asset Class Report

Attachment #8: Health Department Asset Class Report

Attachment #9: Durham Regional Police Service Asset Class Report

1. Overview of Asset Management Processes

1.1 Formal asset management has been in place at the Region of Durham since 2004. In 2019, Council approved the Region's first Corporate Strategic Asset Management Policy. The policy articulated asset management goals, objectives, guiding principles as well as an asset management framework. In accordance with Ontario Regulation 588/17 this policy must be reviewed and updated once every five years.

1.2 Year-round asset management planning processes are undertaken as part of the Region's best business practices of long-term financial planning as well as to ensure compliance with senior government grant programs.

1.3 Asset investment priorities are identified over a multi-year planning horizon based on lifecycle analysis, asset condition, and risks assessment with the objective of delivering approved service levels that are aligned with corporate goals and comply with regulatory requirements.

1.4 Financing to fund identified asset investment priorities is sought through the Region's annual business planning and budget process. Investment decisions balance asset condition and service needs with ensuring assets are not prematurely replaced to ensure best value for water and sewer customers, property taxpayers and the community.

1.5 The 2024 Asset Management Plan – in compliance with Ontario Regulation 588/17 – includes analysis of the following:

- Current asset status (inventory, replacement value, condition, average age, and remaining useful life);
- Reporting by service areas;
- Service levels and asset performance based on Regionally-defined objectives, best practice and regulatory requirements;
- Lifecycle analysis on operating and capital investment to maintain current levels of service over a ten-year period;
- Climate mitigation and climate adaptation initiatives including linkages to the Corporate Climate Change Action Plan; and,
- Infrastructure investment needs and financial planning strategies.

1.6 Development of the Asset Management Plan is a multi-departmental, collaborative process led by the Finance Department and overseen by a Steering Committee.

1.7 The Region's Asset Management Plan and supporting asset management processes are compliant with Ontario Regulation 588/17, the regulation governing municipal asset management plans. Ontario Regulation 588/17 was passed in 2018 with a phased implementation that must be fully implemented by municipalities by July 1, 2025 (as amended in 2021 due to the pandemic).

1.8 The Region's aggregated asset information (inventory, condition and replacement value) is provided in Attachment #1 and Attachments #2 through #9 provide details by service area.

2. The State of the Region's Infrastructure

2.1 Under the coordination of the Corporate Asset Management Team in Finance, year-round tracking, assessment and analysis of all Regional assets by departmental asset working teams determine inventory, valuations, conditions, average ages and remaining useful life.

Table 1: Key Components of the State of Infrastructure

Component	Description
Inventory	Asset inventories are tracked by asset class including consideration of new assets acquired and decommissioned assets. Year-over-year changes are identified and analyzed.
Replacement Costs	Asset replacement costs are updated annually using the most up to date information, with significant year-over-year changes analyzed.
Condition Assessment Ratings	Asset condition ratings from Very Good to Very Poor are assigned using the most appropriate assessment method and the best data available. Year-over-year changes in the rating are analyzed.
Remaining Useful Life	The average age and useful lives are updated and assigned relative to the asset lifespan.

Asset Inventory

2.2 Table 2 provides a summary of the Region's infrastructure assets as of December 31, 2023. Further details can be found in Attachment #1.

Table 2: Regional Infrastructure Summary

Asset Class	Assets Inventory
Water Supply System	2,693.4 km Watermains 29,249 Control and Specialty Valves 17,254 Hydrants 186,997 Service Connections 2,070 Fire Lines 185,362 Meters 14 Water Supply Plants and Well Systems 11 Pumping Stations 14 Water Storage Facilities 8 Combined Pumping Station/Storage
Sanitary Sewerage System	11 Water Pollution Control Plants 52 Pumping Stations 3 Other Wastewater Facilities 2,262 km Gravity Sewers 66 km Forcemains 32,981 Maintenance Holes 183,152 Service Connections
Transportation System	2,450 lane km Road Network 247 Bridges and Culverts 12,008 Storm Appurtenances 367 km Storm Mains and Culverts 16 Traffic Management Systems 26,461 Traffic Control Signs and Signals 338 km Traffic Communication Infrastructure 104 km Roadside Protection 127 CCTV

Asset Class	Assets Inventory
Durham Region Transit (DRT)	161 Conventional Buses 5 Specialized Buses 16 Supervisory Fleet 2 Maintenance, Administrative and Bus Storage Facilities 2,638 Bus Pads and Shelters
Social Services	27 Housing Facilities 4 Childcare Centers 4 Long-Term Care Facilities 10 Fleet Vehicles
Solid Waste	7 Facilities 6 Fleet Vehicles
Health	9 Paramedic Stations 82 Ambulances and other Paramedic Service Vehicles Shared Public Health Facility
Durham Regional Police Service	8 Facilities 378 Fleet Vehicles

Replacement Value of Regional Assets

2.3 As of December 31, 2023, the Region's infrastructure assets had an estimated replacement value of approximately $22.82 billion representing an increase of 9.3 per cent from December 31, 2022.

2.4 Replacement values assist with long-term financial planning through informing cost estimates for eventual asset replacement at end of useful life. Regional staff consider the following information when assigning replacement values:

- Annual increases in benchmark construction costs (Statistic Canada's Non-Residential Building Construction Price Index) and other inflationary asset replacement cost pressures;
- Updated market information including recent vendor quotes; and
- Inclusion of new assets into the Region's inventory to accommodate growth.

The Condition of the Region's Assets

2.5 Asset condition assessment, coupled with service level targets, play an important role in replacement and maintenance decisions. Table 3 highlights the most common asset condition assessment approaches undertaken at the Region.

Table 3: Asset Condition Assessment Methods

Asset Class	Assessment Methods
Linear Water and Sewer (e.g., pipeline)	Pipe material, break rates, inspections, remaining service life and operational concerns.
Vertical Water and Sewer	Site specific inspections.
Roads and Traffic Infrastructure	Inspections and consideration of age-based condition rating where appropriate.
Bridges and Culverts >3m	Biennial visual inspections.
Facilities	Building Condition Assessment (BCA) and age (where BCA not yet complete)

2.6 Using the above-mentioned approaches, Regional assets are assigned one of five condition ratings described in Table 4.

Table 4: Condition Rating Categories and Description

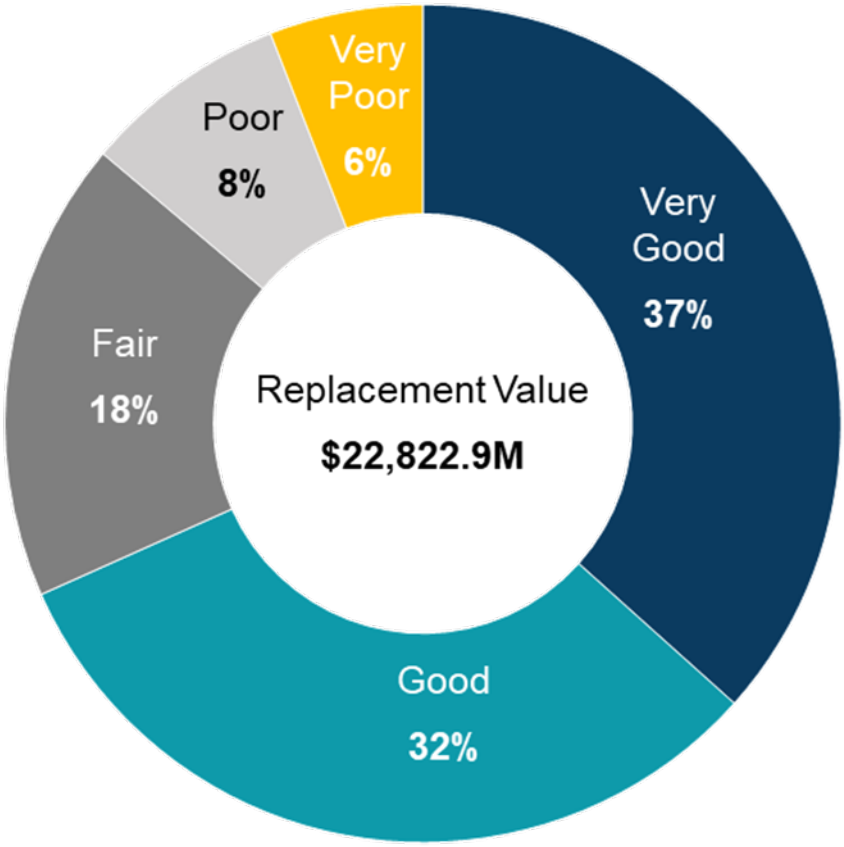
Rating	Description
Very Good	Asset is sound and functioning as intended. Typically, asset would be new.
Good	Asset is sound and functioning as intended. Typically, asset would be within mid-range of useful life.
Fair	Asset is starting to show signs of deterioration and functioning lower than intended. Typically, asset could be approaching later stages of useful life.
Poor	Asset is showing significant signs of deterioration and functioning much lower than intended. Typically, asset could be approaching the end of useful life.
Very Poor	Asset is not performing as intended. Typically, asset would be at the end of useful life.

2.7 An asset which has been classified as Poor or Very Poor does not represent a health or safety risk. Rather, these are assets that may not be performing as intended, may be experiencing higher than average rehabilitation and/or maintenance costs due to condition, or may be deemed to be at the end of their useful life. When warranted, Very Poor assets are considered for current year replacement or significant rehabilitation. Staff balance replacement and repair work with the impact of asset poor performance to ensure assets are not prematurely replaced and deliver best value to water and sewer ratepayers and property taxpayers.

2.8 The asset management working groups continue to refine, advance, and improve condition-based assessments including the planned completion of Facility BCAs for all Regional facilities.

2.9 Figure 1 illustrates the condition and replacement values for the Region's assets as of December 31, 2023. More detailed information on the asset inventory, replacement value and condition is included in Attachment #1.

Figure 1: Condition and Replacement Values for Regional Assets*



* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include condition for equipment assets as these are pooled assets.

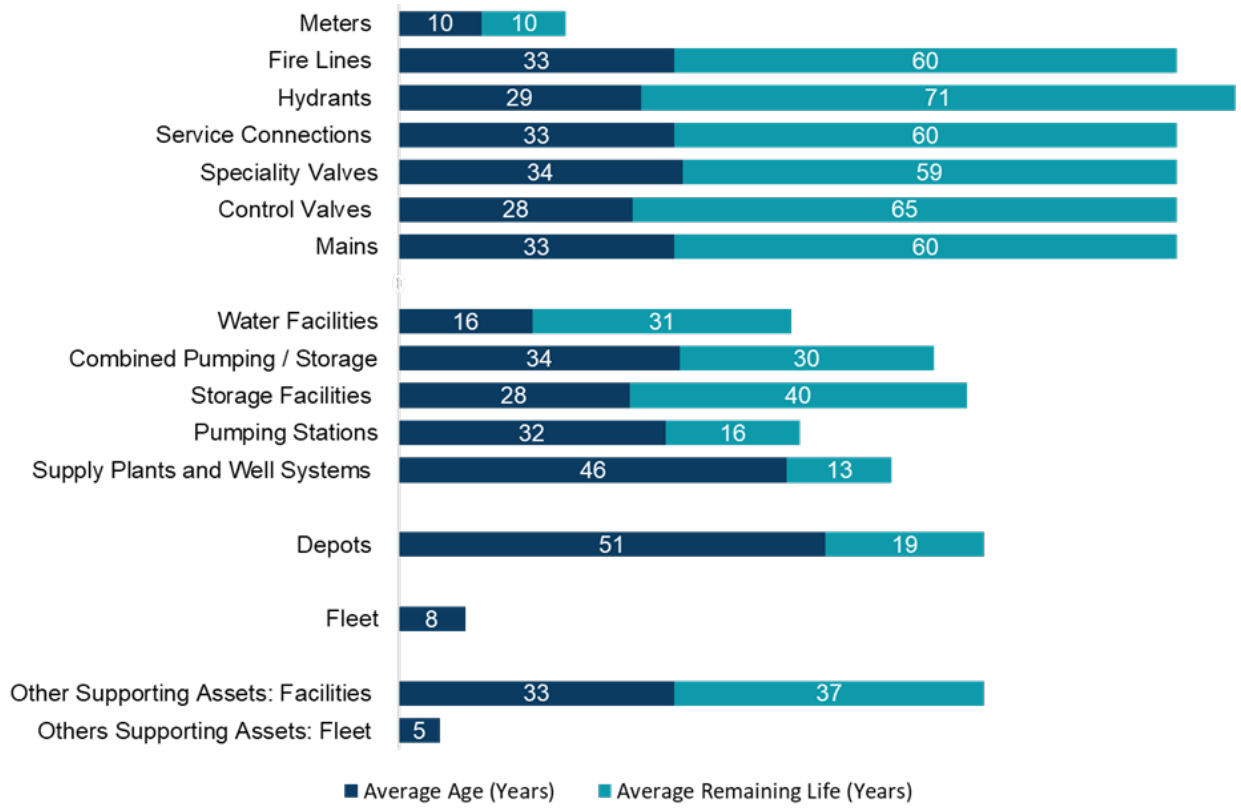
2.10 The assets currently rated in Poor to Very Poor condition will continue to undergo assessment through the 2025 Business Planning and Budget cycle for continued investment. Ongoing maintenance and repair investments for assets in Fair to Very Good condition will continue through annual business planning and budget processes.

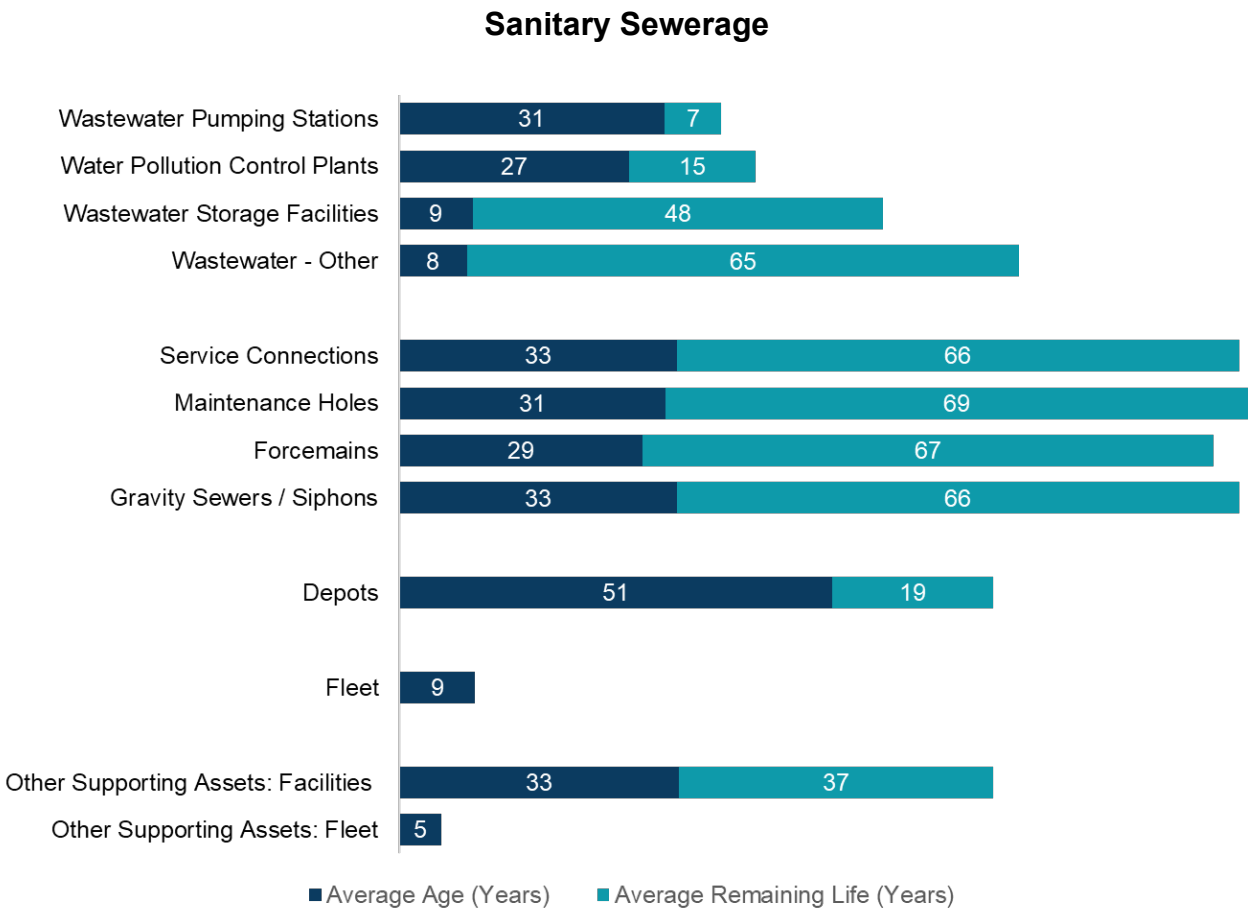
Average Age and Remaining Life of Regional Assets

2.11 Figure 2 summarizes the average age and estimated remaining life by asset class as of December 31, 2023.

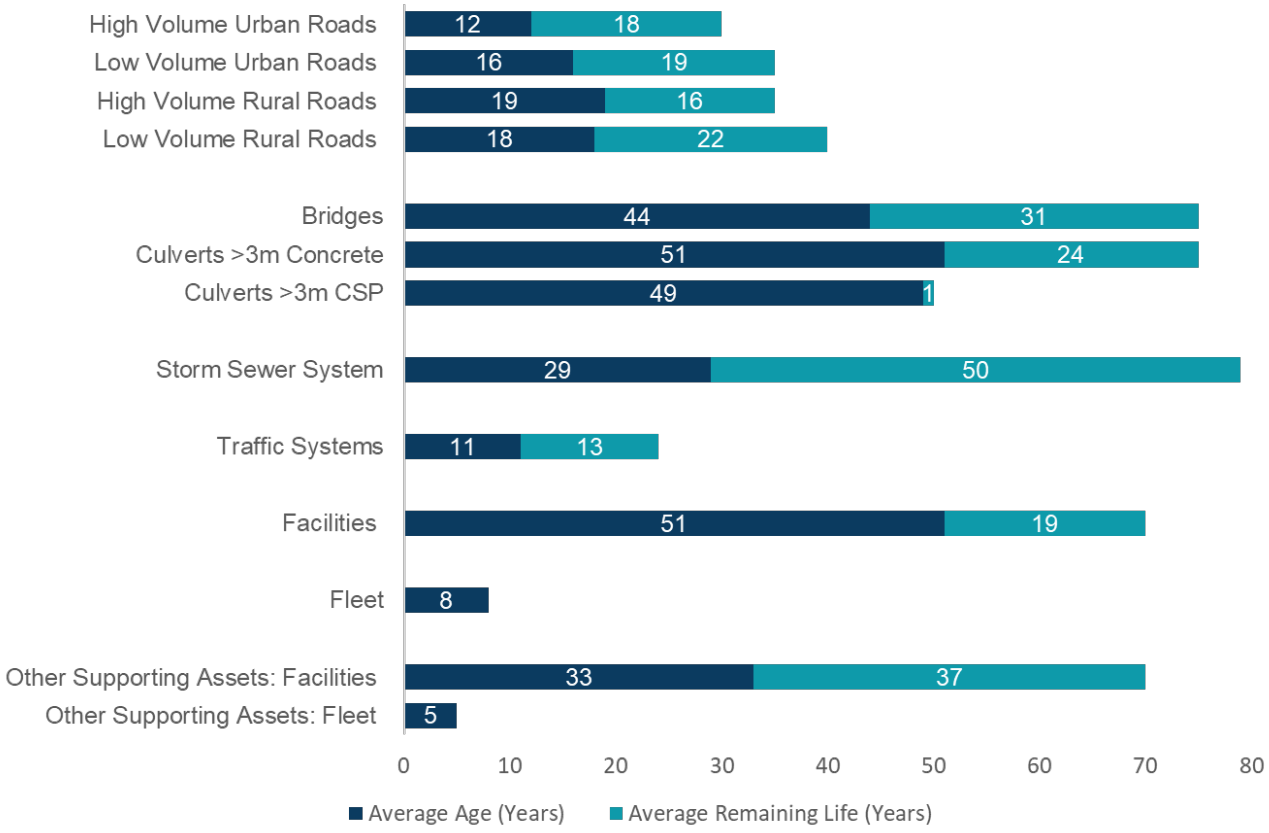
Figure 2: Average Age and Remaining Useful Life

Water Supply

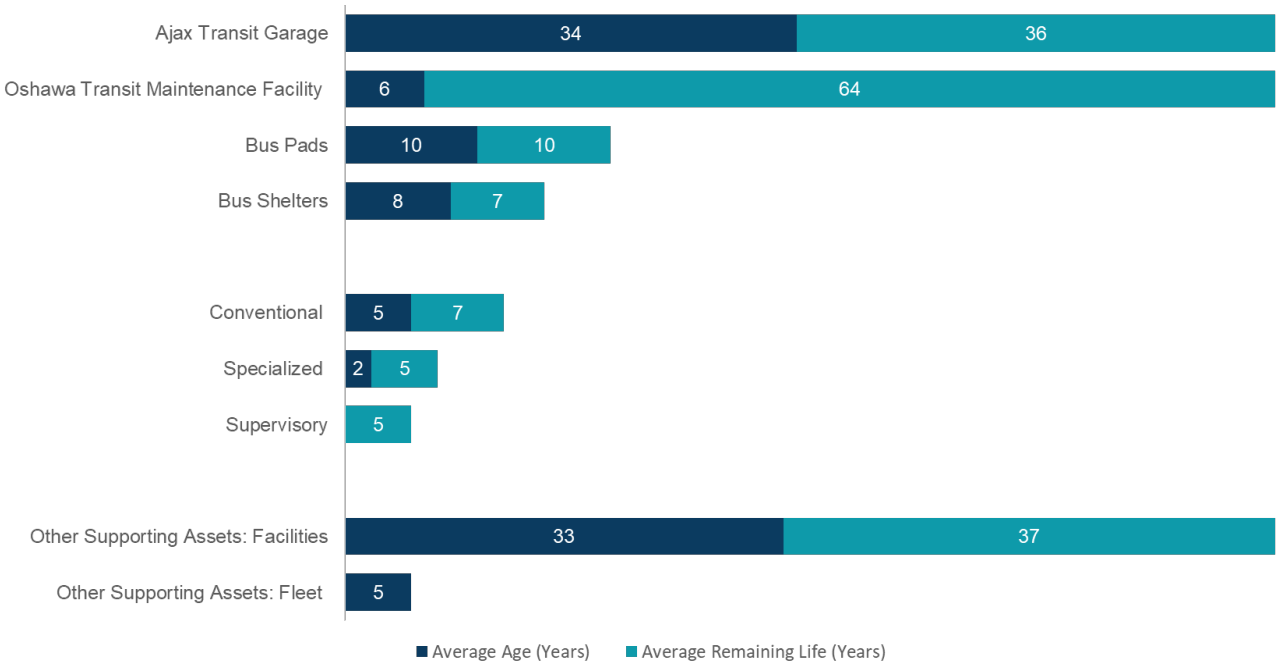



Sanitary Sewerage
Wastewater Pumping Stations
Water Pollution Control Plants
Wastewater Storage Facilities
Wastewater - Other
Service Connections
Maintenance Holes
Forcemains
Gravity Sewers / Siphons
Depots
Fleet
Other Supporting Assets: Facilities
Other Supporting Assets: Fleet
31
7
27
15
9
48
8
65
33
66
31
69
29
67
33
66
51
19
9
33
37
5
Average Age (Years)
Average Remaining Life (Years)

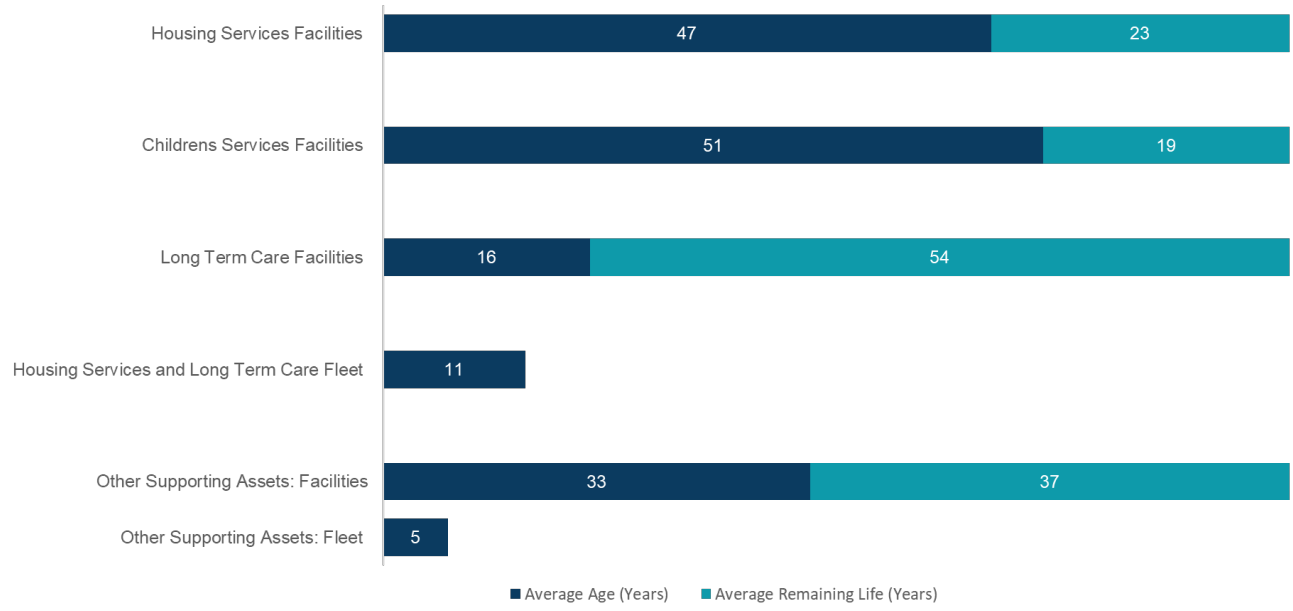
Transportation System



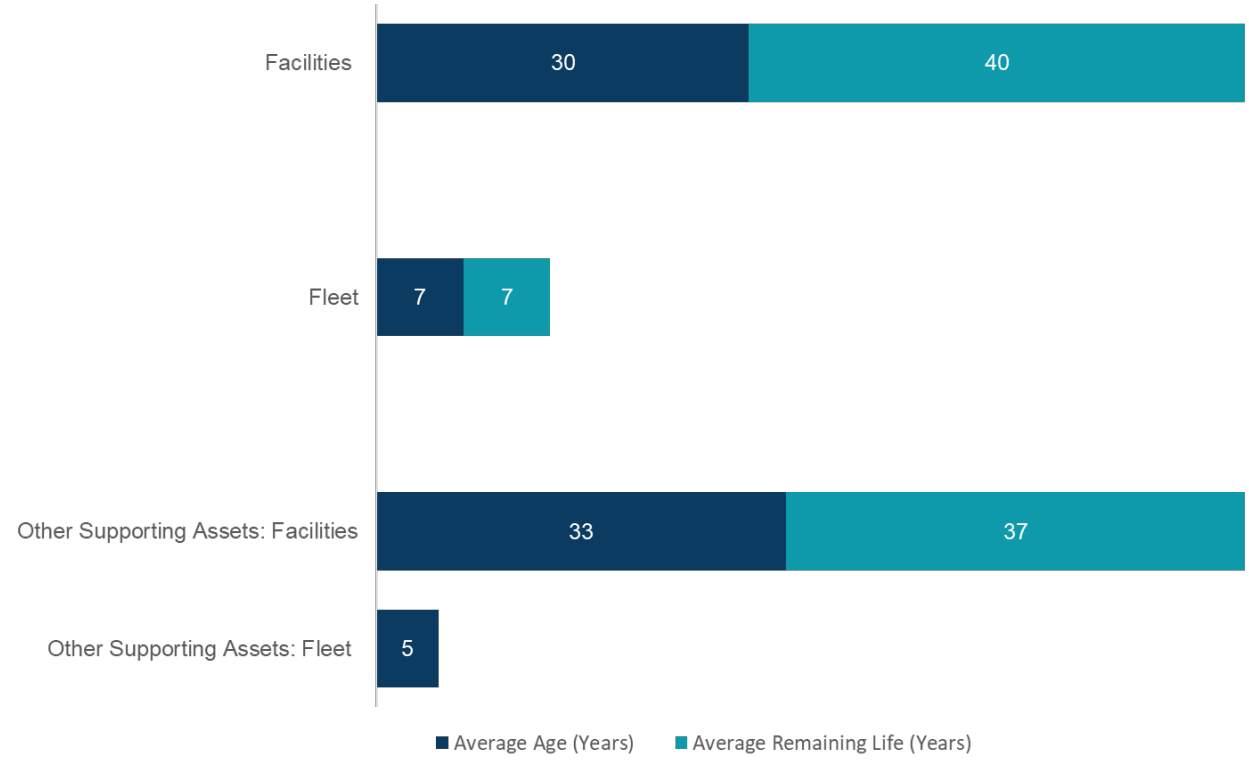
Durham Region Transit



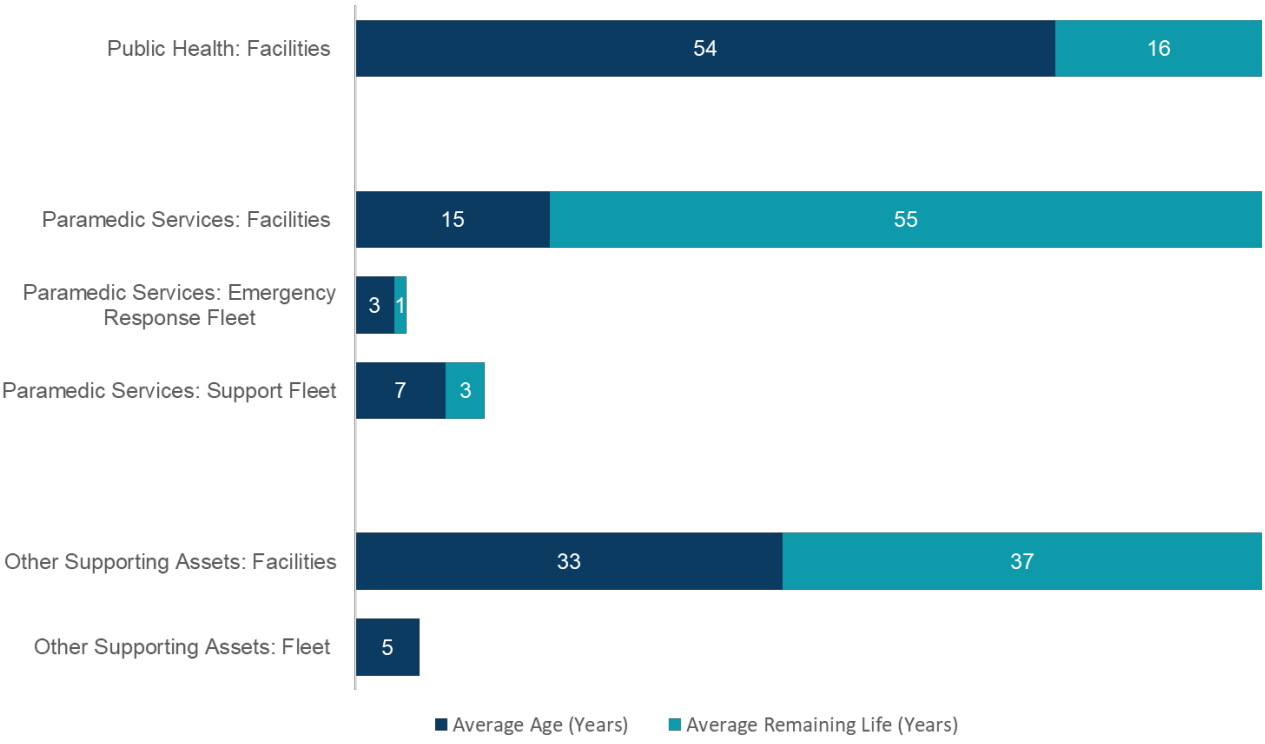
Social Services

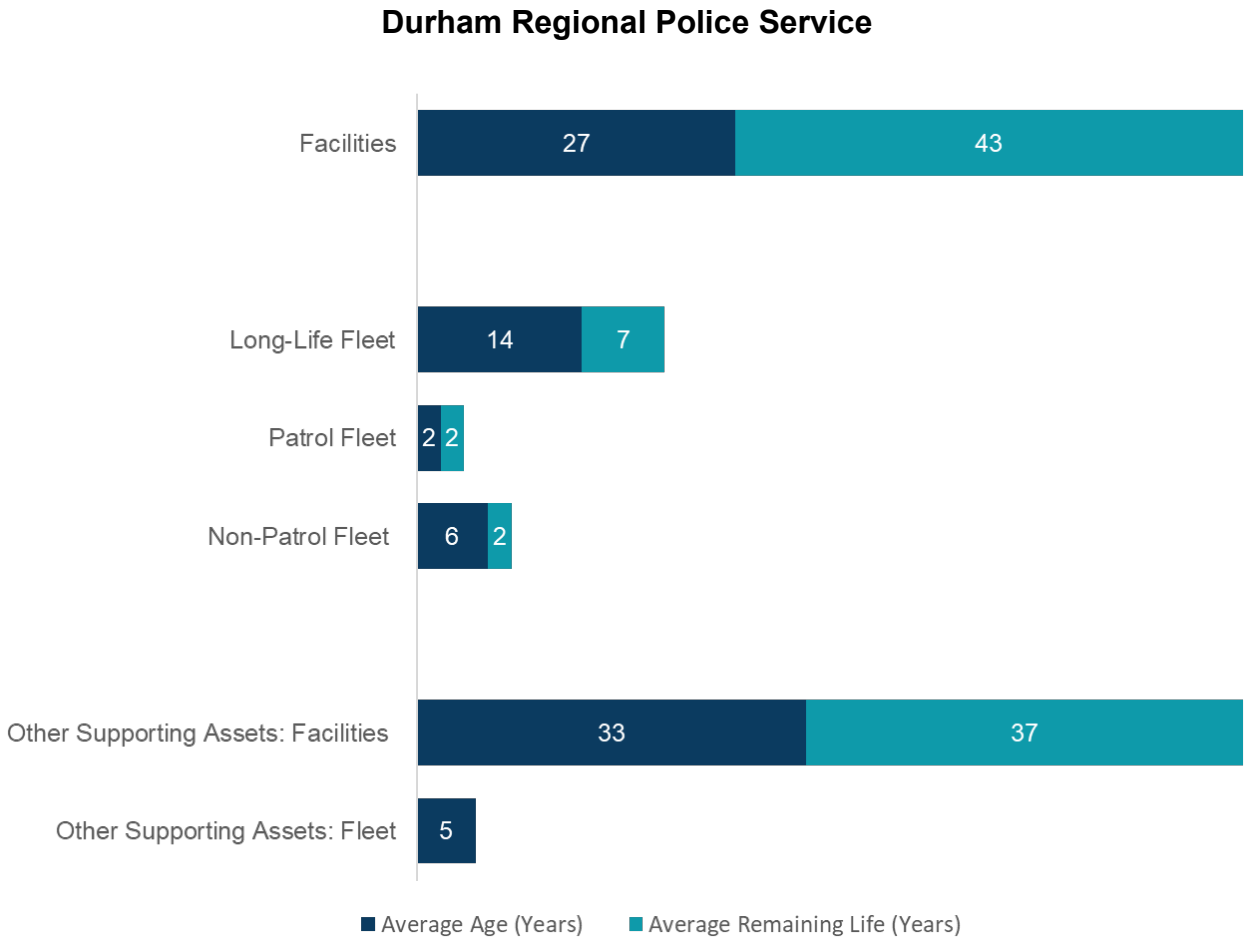


Solid Waste



Health





2.12 Asset useful life considers when an asset came into service, how it has been performing, expected lifespan of the asset and any rehabilitation work undertaken to extend its life.

2.13 Asset useful life can play a role in informing long-term financial planning for asset replacement. Generally, assets that have reached the end of their useful life may experience additional repair and maintenance costs and may be prioritized for replacement or rehabilitation to extend their useful life.

2.14 It is also important to assess which assets are considered as operating “Beyond Useful Life” but are still functioning as designed and may be assigned favourable condition ratings of Fair to Very Good. Regional staff monitor the performance and condition of assets operating beyond expected useful life as part of ongoing asset management processes.

3. Asset Management Service Levels and Performance Measurement

3.1 Level of service is a key consideration that influences asset management planning and investment decisions. Assets must be maintained, through ongoing maintenance activities as well as timely repairs, rehabilitation and/or eventual replacement to ensure service levels can be provided.

3.2 Asset management related service levels are defined through the following:

- Approved Regional strategic and master plans, related service standards, supporting plans, policies and by-laws;
- Regulatory compliance requirements; and,
- Other performance expectations as defined through best practice and Regional Council direction.

3.3 Ontario Regulation 588/17 requires municipalities to include both community service levels which provide qualitative descriptions on asset reliability and asset management practices as well as technical service levels which focus on service delivery and reliability in their Asset Management Plans.

3.4 Details on the Region's community and technical service levels for each of the Region's assets, by service area, are provided in Attachments #2 through #9 as required under Ontario Regulation 588/17.

3.5 Moving forward, existing service levels will continue to be refined to reflect Regional Council approved goals, plans, policies, strategies as well as best engineering practices.

4. Durham Region's Corporate Goals and Objectives

Durham Region Strategic Plan

4.1 The Durham Region Strategic Plan 2020-2024, translates the Region's vision of, "a healthy, prosperous community for all" into concrete goals for Durham's communities. Strategic Plan goals inform asset investment decisions and operating and maintenance activities.

4.2 Regional assets and corporate asset management processes support the Region in meeting its Strategic Plan goals. Figure 3 outlines which Strategic Plan goals can be directly linked to asset management.

Figure 3: Strategic Plan Goals Linkages to Asset Management

4.3 The Strategic Plan goals can be further directly linked to the targeted levels of service of an individual asset class as these targets reflect both legislated standards and corporate goals and objectives. Detailed tables linking each service-level target to Strategic Plan goals and other corporative priorities can be found in each asset class attachment (Attachments #2 through #9).

4.4 The Region is developing a new Strategic Plan for presentation to Regional Council in late 2024. The 2025 Asset Management Plan will reflect and integrate the new Strategic Plan goals.

Corporate Strategic Asset Management Policy Goals

4.5 The Corporate Strategic Asset Management Policy approved by Council in 2019 has been reviewed and remains aligned with best practices for asset management and various Regional priorities and plans. The following are the Policy's seven objectives:

1) The Region will maintain its assets in a safe condition throughout their lifecycles with tolerable risks mitigated through effective strategies, to deliver Regional services at approved levels in a financially prudent and sustainable manner;
2) The Region will maximize the value of its assets by undertaking the most appropriate and cost-effective maintenance, repair, rehabilitation, and/or replacement activities at the most optimal time, to achieve the lowest possible lifecycle cost as feasible;
3) The Region will demonstrate leadership in sustainable asset management, including investments in assets to mitigate (reduce energy use and emissions) and adapt to climate change (to build resiliency), as part of asset management planning;
4) The Region will proactively monitor, identify, and implement asset related risk mitigation measures to ensure the continuity of asset related services, as part of asset management planning;
5) The Region will strive for continuous improvements and innovation in asset management planning, including data analysis, technologies, processes, practices, strategies, and coordination with its lower tier municipalities, neighboring municipalities and senior governments;
6) The Region's asset management planning and reporting process will be transparent and accountable through the development and approval of an Asset Management Plan by Regional Council (which reports performance as well as ensures compliance with all senior government legislative, regulatory, and grant funding reporting requirements); and
7) Infrastructure capital needs identified through asset management planning, as well as risk and climate adaptation and mitigation measures, will be addressed based on funding allocated through the Region's Business Planning and Budget process.

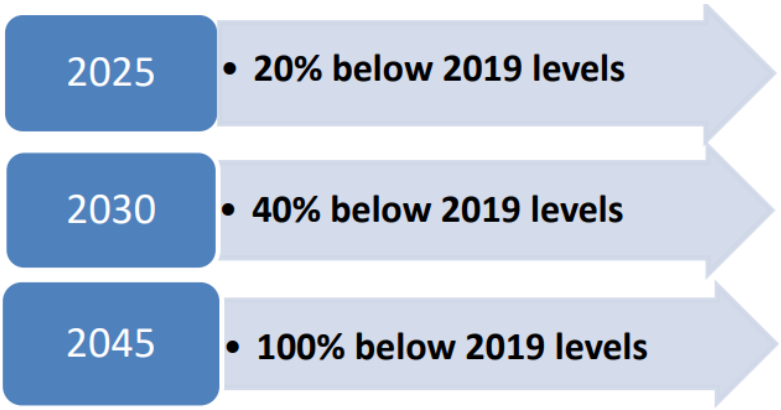
Climate Change Adaptation and Mitigation

4.6 Addressing climate change is a critical priority for the Region that is reflected in the Durham Region Strategic Plan 2020 – 2024, the 2020 Council declaration of a climate emergency and the Region's 2021 Corporate Climate Action Plan (CCAP) that positions the Region as a leader in the community-wide effort.

4.7 In 2019, the Region introduced a Corporate Strategic Asset Management Policy that specifies that leadership in sustainable asset management, including investments in assets to mitigate (reduce greenhouse gas emissions) and adapt to climate change (to build resiliency), be a key part of asset management planning.

4.8 The Region's 2021 Corporate Climate Action Plan (CCAP) establishes corporate GHG emission reduction targets and a carbon budgeting framework. As shown in Figure 4, the Region is moving towards a target of 100 per cent reduction in corporate GHG emissions from the 2019 baseline by 2045.

Figure 4: Corporate GHG Reduction Targets



4.9 The clear establishment of corporate performance targets provides guidance for corporate facility operations and helped inform the Region's 2024 to 2029 Energy Conservation and Demand Management Plan, included on the June 12, 2024 Committee of the Whole agenda (Report #2024-COW-30).

4.10 Corporate climate change considerations and related initiatives continue to be integrated into the Region's asset management planning processes and reporting requirements. Within each asset class attachment, specific climate resiliency and mitigation risks and actions are identified and linked to target service levels as appropriate. Key asset-related climate change initiatives include:

- Build on flood risk and vulnerability assessment work completed with the Conservation Authorities in 2021 – 2023 to incorporate flood risk data into corporate decision-making that informs capital planning and asset management for critical infrastructure by expanding flood risk assessment work into areas of the Region where significant development is planned over the coming decades.

- Advance the implementation of the Region's Light Duty Fleet Electrification Strategy with the replacement of a number of vehicles with electric and hybrid electric vehicles in both Durham Regional Police Services and the Region's Work's fleet.
- Implement Durham Region Transit's fleet electrification plan, including the purchase of 34 battery electric buses in 2024 (delivery in 2026) and related charging equipment at Durham Region Transit's Raleigh Depot in Oshawa, Westney Depot in Ajax and a new facility in North Oshawa (pending approval of federal grant funding).
- Delivery of electrical vehicle charging infrastructure funded in part through Natural Resources Canada's (NRCan) Zero Emission Vehicle Infrastructure Program (ZEVIP).
- Apply the Durham Standard to the development of new and major rehabilitation of existing Regional facilities. The Durham Standard provides a green development standard of net zero facilities for new construction and major facility retrofits for Region-owned facilities (and leased facilities where appropriate).
- Complete Greenhouse Gas Reduction Pathway Feasibility Studies for up to 55 Regional sites allowing for improved pursuit of funding opportunities and incorporation into budget forecasting.
- Complete deep energy building retrofits of Durham Regional Local Housing Corporation's senior's housing portfolio to reduce energy consumption and carbon emissions under the Federation of Canadian Municipalities' Sustainable Affordable Housing Program.
- Completion and implementation of the Water and Wastewater GHG Emission Management Strategy that charts a path to decarbonize water supply and wastewater treatment operations over the next 20 years.
- Continue utilization of recycled materials for road construction.

4.11 The 2024 Asset Management Plan's assessment of climate-related risks and climate adaptation and mitigation initiatives complies with the requirement of Ontario's asset management planning regulation (Ontario Regulation 588/17) to consider vulnerabilities that may be caused by climate change as part of asset management planning.

4.12 GHG emission impacts (with a view towards reduction targets) and climate resiliency will continue to be integrated into asset planning and supporting lifecycle analysis, where possible.

Barrier Free Infrastructure

4.13 Ensuring inclusive and accessible environments is a key corporate value for Durham Region and new facility and retrofit projects, whether owned or leased by the Region, are guided by the Durham Standard and provincial requirements.

4.14 Provincial requirements include those related to the Ontario Building Code Act, Accessibility for Ontarians with Disabilities Act, 2005 (AODA), The Ontarians with Disabilities Act, (ODA), Ontario Regulation 191/11 Integrated Accessibility Standards Regulation (IASR): the Provincial Policy Statement, and the Human Rights Code.

4.15 The Accessibility Advisory Committee (AAC) and/or the AAC Site Plan review sub-committee continue to be consulted by staff for their review and input on projects.

4.16 The following are ongoing asset-related accessibility initiatives:

- New public facilities are designed and built for full accessibility;
- Existing facility upgrades include removing trip hazards and implementing accessibility features (e.g., depressed curbs, ramps, smooth sidewalks, tactile plates, automatic doors and accessible reception areas, parking, entrances and washrooms etc.);
- Effective facility and transportation enhancements including accessible signage, bus stops/shelters, traffic signals, pedestrian poles and signals, sidewalks, curbs and reduced crossing distances at cross walks; and,
- Increased maintenance activities to enhance accessibility through enhanced snow clearing and de-icing.

Coordination of Planning and Partnerships with Other Governments

4.17 Successful coordination and partnerships with other governments related to asset management include:

- Partnership with the City of Oshawa and Town of Whitby to deliver an integrated solid waste management system. Oshawa and Whitby collect garbage and organic waste in their municipalities, while the Region collects these in the other six area municipalities as well as Blue Box material collections (until transition to extended producer responsibility) across all eight municipalities;
- The Durham York Energy Centre (DYEC) in the Municipality of Clarington is co-owned by the Region of Durham (78.6 per cent) and York Region (21.4 per cent) and is operated by the private sector through a design-build-operate public-private-partnership (P3) model under a 20-year Project Agreement to 2036;
- The Next Generation Interoperable Communications Platform (NextGen) allows Durham Regional Police Service, Regional Departments, fire services and public works staff from the area municipalities, and Ontario Power Generation (OPG) to jointly use the communication platform to improve service efficiency and achieve cost efficiencies;

- DRT and Metrolinx coordination and partnerships include:
  - DRT continued participation in the Metrolinx-led Joint Transit Procurement Initiative (TPI) for the procurement of vehicles, equipment, technology, supplies and services to increase buying power, assist in standardization of equipment and leverage industry expertise.
  - DRT continues to use the PRESTO fare collection system under agreement with Metrolinx.
  - DRT continues to leverage Metrolinx Radio service under agreement with Metrolinx.
- DRT, Works, Federal and Provincial Government coordination and partnerships include the ongoing implementation of Investing in Canada Infrastructure Program (ICIP) Transit Stream projects, including vehicle replacements, facility construction and bus rapid transit implementation;
- The Regions of York and Durham work in partnership to operate, maintain and expand the Duffin Creek Water Pollution Control Plant (WPCP) and related sanitary sewerage infrastructure;
- The Region works with the five conservation authorities to ensure environmental objectives are met related to watershed planning, environmental conservation and protection, as well as contracting with the Lake Simcoe Region Conservation Authority for the management of the Durham Regional Forest on behalf of the Region;
- The Region in partnership with the Region of York, Region of Peel, City of Toronto and nine Conservation Authorities have developed the Oak Ridges Moraine Groundwater Program which provides a collaborative approach to collecting, analyzing and disseminating water resource data and information as a basis for effective stewardship and management of water resources; and
- Co-ordination of planning and timing for infrastructure construction with the local area municipalities (e.g., Roads Capital Budget and Water and Sewer Capital Budget, Area Municipal Road Program, MTO and GO Transit Projects).

4.18 The Region's best business practice for coordination complies with Ontario Regulation 588/17 to coordinate where possible connected and/or interrelated assets with other municipalities and delivers on the Region's commitment to continuous improvement. This is also consistent with the Region's Corporate Strategic Asset Management Policy.

5. Lifecycle Overview

5.1 Lifecycle costing is a comprehensive consideration of the capital and operating activities (Table 5) that must be taken during the life of an asset to ensure it meets the desired service levels and target performance measures. Lifecycle costs can begin before an asset is even acquired through planning activities to determine needs (e.g., master plans) and continue through to eventual asset disposal and possible site remediation activities.

5.2 The focus of capital lifecycle activities includes ongoing regular inspections and timely preventative repair and maintenance and applying the most appropriate treatment at the optimal time. The goal of capital lifecycle activities is to maximize asset lifespan at the lowest possible cost and risk.

5.3 Operating lifecycle activities considers direct (e.g., fuel costs for fleet) and indirect activities (e.g., tree trimming programs along Regional Roads) required to ensure the asset can meet its service goals.

5.4 Ontario Regulation 588/17 requires lifecycle costing analysis for a ten-year period for core assets and non-core assets. The analysis must include:

- Full lifecycle costing of assets; all maintenance, repair, replacement and related-operating activities required over the life of an asset (from acquisition to disposal).
- Options for which lifecycle activities could be undertaken to meet desired service levels including risks associated with any options and which represent the lowest cost to deliver on service levels.

5.5 The Region is in compliance with Ontario Regulation 588/17. Additional details of this analysis can be found in each asset class attachment (Attachments #2 through #9).

Table 5: Key Concepts: Asset Lifecycle Activities

Activity Type	Description
Operating	All operating activities required to ensure the asset can meet service level delivery (e.g., snow plowing roads)
Maintenance	Regular scheduled inspections and preventative maintenance, or repair activities associated with unexpected events
Renewal and Rehabilitation	Major repairs designed to extend asset life, restore level of service and/or defer the need for replacement

Activity Type	Description
Replacement	Replacement occurs when the asset has reached the end of its useful life and/or renewal and rehabilitation activities are no longer considered appropriate
Disposal	Activities associated with the decommissioning of an asset including sale or disposal
Expansion	Planned activities to expand services either to enhance service levels or meet growth demands

6. Capital Forecast and Financing Options

6.1 Growth-related infrastructure requirements are forecasted as part of the Region's business and capital planning process and as part of development charge (DC) background studies.

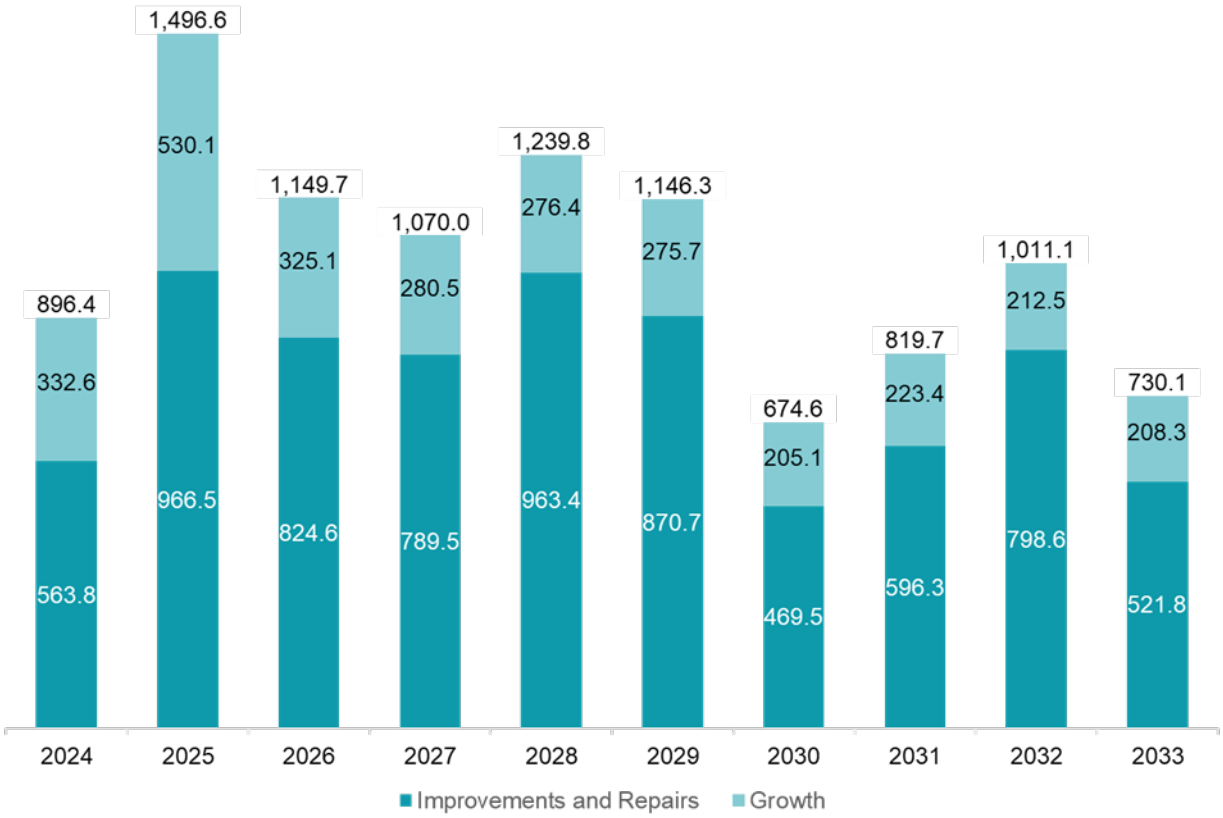
6.2 Bill 23, *More Homes Built Faster Act, 2022*, Bill 134, *Affordable Homes and Good Jobs Act, 2023* and related legislation have brought a number of changes impacting municipalities including:

- The province, in support of a goal to build 1.5 million new homes by 2031, has established specific housing targets for large and fast-growing single and lower-tier municipalities, including Durham's five lakeshore municipalities who have formally committed to housing pledges. While housing targets are on a local municipal level, meeting them requires advancing the construction of Regional infrastructure earlier than previously planned. This creates additional financial burden on the Region both from having to advance funding for large infrastructure projects, as well as for additional staff resource requirements to support and deliver a much larger, technical and complex ten-year capital program.
- Changes to the Development Charges Act, 1997 that require municipalities to phase-in new development charge rates, allow developers to 'lock-in' their development charge rates at time of development application and provide development charge exemptions and discounts to select development categories. In addition, municipalities can no longer fund certain services (social housing and certain types of studies) through development charges. The implication is a smaller share of the Region's growth capital costs will be recoverable from development charges as the Region is required, under provincial legislation, to fund the impact of these provisions from nondevelopment charge sources. In the absence of provincial funding, regional property taxes and water and sanitary sewer user rate revenues will be required to fund these shortfalls.

- The Region is actively monitoring the status of Bill 185, Cutting Red Tape to Build More Homes Act, 2024 which, at the time this report was written, is before the Legislative Assembly of Ontario. If approved, some of the changes introduced through Bill 23 will be reversed. If approved, the Region will no longer be required to phase-in new development charge rates over five-years and growth-related studies will again be eligible for Development Charge financing. Any impacts resulting from this and other legislation will be incorporated into future updates of the Asset Management Plan.

6.3 Capital growth requirements were considered as part of the 2024 Budget and nine-year forecast.

Figure 5: Ten-Year Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to Total due to rounding.

6.4 Forecasted infrastructure needs will be updated, refined and reprioritized during the 2025 business planning and budget process and long-term capital planning. Funding needs, gaps and strategies to address these infrastructure needs will also be refined through business planning, budgets and long-term financial planning.

7. Lifecycle Analysis

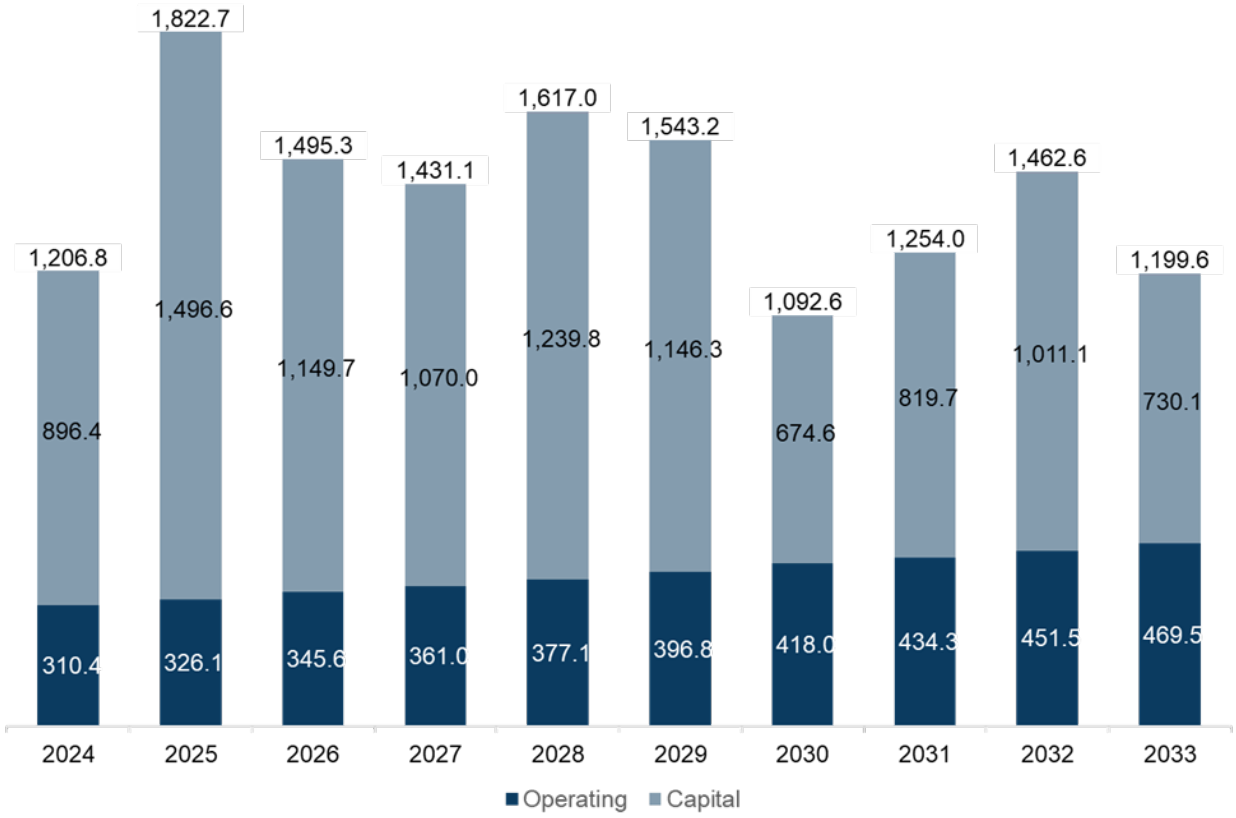
7.1 Lifecycle analysis considers the costs for all capital and operating activities undertaken during the life of an asset to ensure it meets its desired service levels and target performance measures at the best value to user rate and property taxpayers. Lifecycle costs begin before an asset is even acquired including planning activities to determine needs, through to eventual asset disposal and possible site remediation activities.

7.2 Regional staff undertook lifecycle costing analysis to determine historical and planned capital and operating lifecycle activities. Asset management practices such as condition assessments and expected useful life analysis inform capital and operating lifecycle activities. To assess capital lifecycle costs, staff considered rehabilitation and replacement activities that extend the useful life of assets and/or meet service delivery targets. In addition to repair and maintenance activities, staff considered other ongoing operating expenditures required for assets to meet target service levels. Some examples include overhead costs (e.g., office/depot space, training, software, etc.), gas and fuel, utilities and fleet rentals.

7.3 Ontario Regulation 588/17 requires lifecycle analysis for core and non-core assets be included in the Region's Asset Management Plan by July 1, 2024.

7.4 As illustrated in Figure 6, the 2024 gross lifecycle costs (operating and capital) for regional assets is $1,206.8 million. Over the nine-year forecast period, total planned lifecycle expenditures for regional assets total $12,918.0 million. Detailed lifecycle costing by service area are included in Attachments #2 through #9.

Figure 6: Ten-Year Lifecycle Costs ($ millions)*

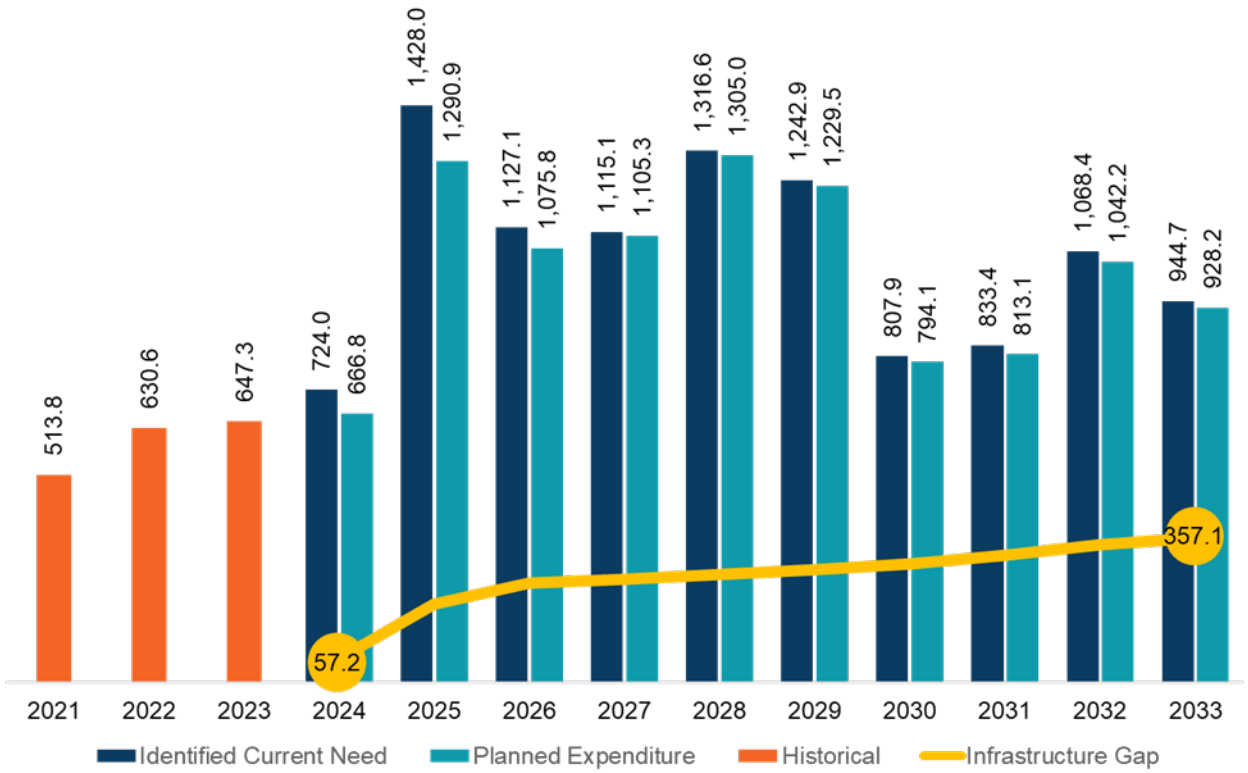


*Operating and Capital may not add to Total due to rounding.

Infrastructure Gap Analysis

7.5 As part of the lifecycle costing analysis for core assets, staff analysed the current planned funding against expected funding needs (both operating and capital) to meet service levels. Through this analysis, an infrastructure funding gap of $57.2 million in 2024 was identified, increasing to $357.1 million by 2033 based on planned investments (Figure 7).

Figure 7: Infrastructure Gap Analysis Core Assets ($ millions)



7.6 Year-over-year variability in planned capital spending is primarily a result of major water supply and sanitary sewerage plant renewal and expansion projects over the forecast period. The Region continues to utilize flexible financing sources such as the Asset Management Reserves, Development Charge funding, Water Rate Stabilization Reserve Fund, Sewer Rate Stabilization Reserve Fund and the strategic use of debt financing to ensure predictable, stable and gradual changes to user rates. Further details on Regional financing strategies can be found in Table 6. Reserve funds will play a critical role in the forecast years.

7.7 The identified current need reflects accelerating project timelines for some non-urgent projects. Not accelerating these projects may result in increased repair and maintenance work or not meeting service level targets which is balanced with cost savings to property taxpayers and utility ratepayers and ensuring full value is extracted from assets by avoiding premature replacement. Further details on lifecycle costing and infrastructure gap analysis for core assets can be found in Attachments #2 through #4.

7.8 Forecasted infrastructure needs will be reviewed, updated, and refined during the 2025 business planning and budget and long-term financial planning processes. Funding needs, gaps and strategies to address these infrastructure needs will also be refined through ongoing long-term capital planning exercises and future business plans and budgets.

7.9 The Region faces significant financial challenges, similar to those faced by other Ontario municipalities, related to capital cost escalations over the forecast period. Statistics Canada's Building Construction Price Index for non-residential buildings in the Toronto Census Metropolitan Area, for the period March 31, 2022, to March 31, 2023, identified an inflationary increase of 12.3 per cent. The increase in the index is reflective of the current inflationary environment, skilled labour and materials shortages, and increased cost of materials. The Region will continue to strategically contribute to our capital replacement funds to ensure our forecasted infrastructure needs continue to support Regional programs and services.

7.10 Moving forward, Regional staff will be further refining lifecycle costing analysis and data collection.

8. Funding Options

8.1 The Region's financing approach for assets is guided by the Long-Term Financial Planning Framework and the Corporate Asset Management Policy's goal to deliver Regional services at approved levels in a financially prudent and sustainable manner. Asset management planning and the annual budget planning exercises inform investment needs.

8.2 The annual property tax levy, water supply and sanitary sewerage user rates, reserves, reserve funds, development charges, Canada Community-Building Funds, provincial gas tax revenue and the strategic and sustainable use of debt are important financing tools to maintain and expand Regional assets.

8.3 Table 6 provides a summary of the Region's key infrastructure financing options. Further details of planned capital investments in 2024 and during the nine-year forecast can be found in the asset class attachments.

Table 6: Key Regional Financing Sources

Funding Source	Purpose
Regional Roads Rehabilitation Reserve Fund	Provides funding to address the rehabilitation needs of the road network.
Regional Roads Reserve - Growth	Provides property tax funding for the property tax portion of growth-related projects.
Vision Zero Initiatives Reserve Fund	Supports projects to meet Regional Council Vision Zero targets.
Regional Bridge Rehabilitation Reserve Fund	Addresses bridge rehabilitation and replacement needs.

Funding Source	Purpose
Water Rate Stabilization Reserve Fund and Sewer Rate Stabilization Reserve Fund	In addition to providing funding to stabilize water and sewer user rates, funds are used for major water and sanitary sewer capital projects and asset management needs.
Water Supply and Sanitary Sewerage Asset Management Reserve Funds	Funds high priority capital initiatives related to repair, rehabilitation and replacement of existing water supply and sanitary sewer assets.
General Levy Asset Management Reserve Fund	Funds high priority capital initiatives related to repair, rehabilitation and replacement of existing assets (i.e., general purpose needs, such as facilities).
Equipment Replacement Reserve	Funding for regional works equipment and fleet replacements.
Various Service Area Reserve Funds	Funds rehabilitation, replacement and growth needs for DRT, RDPS and Social Housing.
Capital Impact Stabilization Reserve Fund and Capital Project Reserve	Enables contributions towards capital project financing to mitigate impacts on tax levy from major projects, provides capital funding for Regional priorities and ongoing business continuity.
Development Charges	Funding to pay for infrastructure growth needs. The Region charges development charges for all eligible asset classes to maximize recoveries related to growth infrastructure per the principle that 'growth pays for growth' as permitted under the Development Charges Act (DCA) legislation.
Canada Community-Building Fund (formally Federal Gas Tax) and Provincial Gas Tax	Provincial Gas Tax funds: expanding and improving public transit. Canada Community-Building Funds: source of funding for eligible Regional infrastructure projects.
User Rates	A portion of annual water and sanitary sewer user rate revenues are dedicated to the highest priority needs.
Property Taxes	A portion of annual property tax revenues are utilized to finance upgrades, rehabilitation and the replacement of infrastructure assets for Regional roads, transit and other tax-supported programs.

Funding Source	Purpose
Debt Financing	For large-scale capital projects which may require significant up-front financing over a shorter time horizon, debt financing options provide the ability to distribute the costs over a longer time horizon to current and future users who will benefit from the use of the infrastructure asset.

9. Risk Assessment

9.1 Staff continuously monitor and assess asset risk including likelihood and impact and the effectiveness of mitigation controls.

9.2 Table 7 includes a sample of identified risks for the Region's assets in achieving its service level standards as well as the mitigation controls to address these risks.

Table 7: Asset-Related Risks and Mitigation Measures

Risk	Existing Controls	Remediation
Disruption to Water Supply	Maintenance, repair and rehabilitation (e.g., lining and cathodic pipe protection) Studies, inspections, monitoring controls and systems (e.g., leak detection, SCADA alerts) Source water and well head protection	Continue condition assessments and prioritize repair, maintenance, and rehabilitation needs and programs Continue erosion mitigation studies and strategies, monitoring, and use of systems Continue to include prioritized remediation work and system improvements for funding through financial and business planning
Loss of Utilities and Fuel	Essential services policies and business continuity/emergency plans Standby power, on call service contracts, system redundancies, and re-routing plans Fuel delivery system and water and sewer monitoring systems	Continue programs to ensure facility/depot standby power and fuel storage systems, water and sewer monitoring, service contracts and continuity plans Assess criticality of facilities/depots and continue prioritization and planning Continue implementation of Traffic UPS equipment

Risk	Existing Controls	Remediation
Major Facility System Failures	Well maintained assets and equipment (i.e., proactive and preventive maintenance programs) Business continuity/emergency plans Standby power, on call service contracts, parts inventory, and system redundancies Capital and financing planning	Continued condition assessments and maintenance and rehabilitation program Continue programs to ensure standby power, fuel storage systems, IT services, service contracts and continuity plans Prioritize remediation work and continue rehabilitation funding
Disruption to Sanitary Sewerage Collection	Asset condition assessments for forcemains and gravity pipes Maintenance, repair and rehabilitation System alerts/controls and emergency response planning Increase contingency through pipe twinning	Continued condition assessments (including larger pipe inspections) and maintenance, repairs and rehabilitation programs and funding through budget process Reassess contingency planning and prioritize needs and available funding Continue with SCADA system upgrades to improve management control during storms
Sanitary Sewerage Inflow and Infiltration (I/I)	I/I program, flow monitoring equipment and performance assessments during storms Capital investments and system repairs Household drainage surveys and education	Continue to prioritize I/I program strategies Continue to include and prioritize funding through the financial and business planning and budget process

10. Next Steps

10.1 Infrastructure needs identified in this report will inform the 2025 business planning and budget process, including the 2025 Budget Guideline Report, capital planning, and departmental 2025 to 2034 business plans and budgets.

10.2 Asset management staff will continue to work collaboratively to meet the remaining asset management regulatory requirements due by July 1, 2025. The specific next steps include:

- Continue aligning asset management practices with additional regulatory requirements including the development and presentation of a financing strategy;
- Refining data collection processes and analysis to improve asset management planning capabilities and lifecycle costing, to inform future business plans, budgets, capital forecasts, and long-term financial planning strategies;
- Refining the Region's non-core asset inventory;
- Continuing to work with the Office of the CAO to seek alignment between corporate climate initiatives and asset management processes; and
- Continuing to assess risk, business continuity, asset criticality, and asset reliability.

11. Conclusions

11.1 The Asset Management process is a critical element in the Region's business planning, budget and long-term financial planning processes. The Asset Management Plan details the current condition of the Region's assets and forecasts future investment needs for repair, maintenance, and replacements.

11.2 The Region's 2024 Asset Management Plan complies the additional reporting requirements for core and non-core assets required under Ontario Regulation 588/17.

11.3 The overall replacement value of the Region's assets is increasing due to growth demands for additional infrastructure and inflationary pressures which were higher in 2023 than in recent years. The asset class attachments (Attachments #2 through #9) provide additional details on the change in replacement values for each asset class.

11.4 The condition of the Region's assets remained relatively stable year-over-year as a result of preventative maintenance, rehabilitation and timely repairs and replacements with strategic investments planned that will address many assets currently in Very Poor condition.

11.5 As part of continual improvement, the asset management planning processes of data collection, asset assessment and asset and lifecycle analysis will continue to be refined and improved.

11.6 Regional staff will continue to work collaboratively to refine and enhance our lifecycle costing and the development of financing strategies for core and non-core assets. The Region is well positioned to meet the additional Ontario Regulation 588/17 requirements due in 2025.

Regional Asset Inventory, Replacement Value and Condition

Provides an overview of Regional assets and their critical considerations

Asset Service Area	2021 Inventory	2021 Replacement Value ($m)	2021 Condition	2022 Inventory	2022 Replacement Value ($m)	2022 Condition	2023 Inventory	2023 Replacement Value ($m)	2023 Condition
Water Supply System									
Vertical Assets - Treatment, Pumping and Storage									
Supply Plants and Well Systems	14.0	719.5	Fair	14.0	837.6	Fair	14.0	906.5	Fair
Pumping Stations	11.0	35.6	Fair	11.0	41.4	Fair	11.0	45.4	Fair
Water Storage Facilities	14.0	79.5	Good	14.0	92.4	Good	14.0	100.0	Good
Combined Pumping Station/Storage	8.0	206.8	Fair	8.0	263.3	Fair	8.0	285.0	Fair
Facilities (Other)	5.0	4.0	Good	5.0	4.6	Good	5.0	5.0	Good
Vertical Assets Subtotal	52.0	1,045.4	Fair	52.0	1,239.3	Fair	52.0	1,342.0	Fair
Linear Assets - Water Distribution									
Mains (km)	2,631.2	2,909.9	Good	2,639.9	3,392.9	Good	2,693.4	3,756.1	Good
Control Valves	27,698.0	236.5	Good	27,858.0	276.3	Good	28,537.0	307.4	Good
Specialty Valves	696.0	17.2	Good	697.0	20.2	Good	712.0	22.5	Good
Service Connections	182,448.0	960.6	Good	184,132.0	1,126.6	Good	186,997.0	1,126.6	Good
Hydrants	16,785.0	201.0	Good	16,866.0	234.7	Good	17,254.0	259.9	Good
Fire Lines	1,948.0	22.2	Good	2,042.0	27.1	Good	2,070.0	29.8	Good
Meters	182,063.0	36.6	Good	183,357.0	37.1	Good	185,362.0	46.1	Good
Depots	1.7	20.2	Fair	1.7	23.4	Poor	1.7	25.4	Poor
Linear Assets Subtotal		4,404.2	Good		5,138.3	Good		5,573.8	Good
Fleet	142.0	12.6	Good	136.0	15.0	Fair	164.0	17.1	Fair
Equipment		27.3			28.5			30.2	

Regional Asset Inventory, Replacement Value and Condition

Provides an overview of Regional assets and their critical considerations

Asset Service Area	2021 Inventory	2021 Replacement Value ($m)	2021 Condition	2022 Inventory	2022 Replacement Value ($m)	2022 Condition	2023 Inventory	2023 Replacement Value ($m)	2023 Condition
Other Supporting Assets									
Facilities	0.5	17.1	Very Good	0.5	19.8	Good	0.5	21.5	Good
Fleet	0.2	0.0	Good	0.3	0.0	Fair	0.3	0.0	Fair
Equipment		3.9			4.3			4.7	
Other Supporting Assets Subtotal	0.7	21.0	Very Good	0.8	24.1	Good	0.8	26.2	Good
Water Supply System Total		**5,510.5**	**Good**		**6,445.2**	**Good**		**6,989.3**	**Good**
Sanitary Sewerage System									
Vertical Assets - Treatment, Pumping and Storage									
Water Pollution Control Plants	11.0	1,236.5	Fair	11.0	1,439.4	Good	11.0	1,557.9	Fair
Wastewater Pumping Stations	51.0	327.3	Fair	51.0	380.4	Fair	52.0	417.2	Fair
Wastewater Storage Facilities	2.0	7.5	Very Good	2.0	8.8	Very Good	2.0	9.5	Very Good
Facilities (Other)	1.0	2.6	Very Good	1.0	3.0	Very Good	1.0	3.3	Very Good
Vertical Assets Subtotal	65.0	1,574.0	Fair	65.0	1,831.7	Good	66.0	1,987.9	Fair
Linear Assets - Sewage Collection									
Gravity Sewers/Siphons (km)	2,204.5	2,808.8	Good	2,215.3	3,282.3	Good	2,261.6	3,639.6	Good
Forcemains (km)	65.1	139.9	Good	65.1	162.5	Very Good	65.5	176.3	Good
Maintenance Holes	32,096.0	533.2	Good	32,313.0	625.3	Good	32,981.0	690.4	Good
Service Connections	178,581.0	1,013.1	Very Good	180,687.0	1,191.7	Very Good	183,152.0	1,307.4	Very Good
Depots	1.7	20.2	Fair	1.7	23.4	Poor	1.7	25.4	Poor
Linear Assets Subtotal		4,515.2	Good		5,285.1	Good		5,839.2	Good
Fleet	88.0	12.7	Good	78.0	10.8	Good	89.0	13.6	Fair
Equipment		17.4			20.5			21.7	

Regional Asset Inventory, Replacement Value and Condition

Provides an overview of Regional assets and their critical considerations

Asset Service Area	2021 Inventory	2021 Replacement Value ($m)	2021 Condition	2022 Inventory	2022 Replacement Value ($m)	2022 Condition	2023 Inventory	2023 Replacement Value ($m)	2023 Condition
Other Supporting Assets									
Facilities	0.5	17.8	Very Good	0.4	20.7	Good	0.4	22.4	Good
Fleet	0.2	0.0	Good	0.3	0.0	Fair	0.3	0.0	Fair
Equipment		5.1			5.6			6.1	
Other Supporting Assets Subtotal	0.7	22.9	Very Good	0.7	26.3	Good	0.7	28.5	Good
Sanitary Sewerage System Total		**6,142.2**	**Good**		**7,174.4**	**Good**		**7,890.9**	**Good**
Transportation System									
Roads, Bridges and Culverts									
Urban (lane km)	1,068.3	1,341.5	Fair	1,090.0	1,598.9	Fair	1,103.5	1,752.2	Fair
Rural (lane km)	1,392.7	1,541.3	Fair	1,377.4	1,815.2	Fair	1,346.4	2,031.7	Fair
Bridges and Culverts (> 3m)	240.0	788.6	Good	246.0	932.6	Good	247.0	999.1	Good
Roads, Bridges and Culverts Subtotal	2,701.0	3,671.4	Fair	2,713.4	4,346.7	Fair	2,696.9	4,783.0	Fair
Storm Sewer System									
Storm Sewer Mains (km)	321.8	573.1	Fair	329.7	680.1	Fair	335.6	745.7	Fair
Culverts (< 3m)	29.8	44.0	Fair	30.1	51.5	Fair	31.4	57.4	Fair
Maintenance Holes	5,053.0	35.0	Fair	5,182.0	45.1	Fair	5,309.0	46.2	Fair
Catchbasins	5,878.0	40.7	Fair	6,058.0	48.7	Fair	6,208.0	54.0	Fair
Outfalls	475.0	1.2	Fair	480.0	1.4	Fair	491.0	1.4	Fair
Storm Sewer System Subtotal		693.9	Fair		826.9	Fair		904.8	Fair

Regional Asset Inventory, Replacement Value and Condition

Provides an overview of Regional assets and their critical considerations

Asset Service Area	2021			2022			2023		
	Inventory	Replacement Value ($m)	Condition	Inventory	Replacement Value ($m)	Condition	Inventory	Replacement Value ($m)	Condition
Traffic Control System									
Control Signals/ Flashing Beacons	493.0	88.3	Good	496.0	78.9	Fair	509.0	110.8	Good
Traffic Management Systems	16.0	5.7	Fair	16.0	7.6	Fair	16.0	5.2	Fair
Communications Infrastructure (km)	337.9	12.6	Good	337.9	14.6	Good	337.9	15.8	Good
Regulatory, Warning and Information Signs	20,961.0	4.7	Very Good	17,586.0	4.4	Very Good	25,952.0	4.9	Very Good
Roadside Protection (km)	110.9	23.1	Very Good	104.2	20.9	Very Good	104.2	20.9	Very Good
Closed-Circuit Television	108.0	0.4	Fair	120.0	0.3	Fair	127.0	0.5	Poor
Traffic Control System Subtotal		134.7	Good		126.8	Good		158.1	Good
Facilities	3.4	32.6	Poor	3.4	37.8	Poor	3.4	41.0	Poor
Fleet	148.0	31.9	Good	141.0	37.4	Good	225.0	48.9	Fair
Equipment		7.6			8.9			8.9	
Other Supporting Assets									
Facilities	0.3	11.8	Very Good	0.3	13.7	Good	0.3	14.8	Good
Fleet	0.3	0.0	Good	0.5	0.0	Fair	0.5	0.0	Fair
Equipment		7.1			7.9			8.6	
Other Supporting Assets Subtotal	0.6	18.9	Very Good	0.8	21.6	Good	0.8	23.4	Good
Transportation System Total	**152.0**	**4,591.0**	**Fair**	**145.2**	**5,406.2**	**Fair**	**229.2**	**5,968.2**	**Fair**

Regional Asset Inventory, Replacement Value and Condition

Provides an overview of Regional assets and their critical considerations

Asset Service Area	2021 Inventory	2021 Replacement Value ($m)	2021 Condition	2022 Inventory	2022 Replacement Value ($m)	2022 Condition	2023 Inventory	2023 Replacement Value ($m)	2023 Condition
Durham Regional Transit									
Facilities	3.0	91.9	Very Good	3.0	106.9	Good	2.0	96.3	Very Good
Fleet	241.0	136.9	Fair	230.0	135.9	Good	182.0	121.5	Good
Bus Pads and Shelters	2,579.0	11.3	Very Good	2,538.0	14.4	Very Good	2,638.0	14.9	Very Good
Equipment		15.3			16.5			16.8	
Other Supporting Assets									
Facilities	0.2	6.6	Very Good	0.2	7.7	Good	0.2	8.4	Good
Fleet	0.4	0.0	Good	0.6	0.0	Fair	0.6	0.0	Fair
Equipment		9.3			10.3			11.2	
Other Supporting Assets Subtotal	0.6	15.9	Very Good	0.8	18.0	Good	0.8	19.6	Good
Durham Regional Transit Total	**2,823.6**	**271.3**	**Good**	**2,771.8**	**291.7**	**Good**	**2,822.8**	**269.1**	**Very Good**
Social Services									
Housing Services									
Facilities	23.0	293.7	Very Poor	24.0	354.5	Poor	27.0	403.5	Poor
Fleet	10.0	0.7	Good	9.0	1.0	Fair	8.0	0.8	Good
Equipment		0.2			0.2			0.5	
Housing Services Subtotal	33.0	294.6	Very Poor	33.0	355.7	Poor	35.0	404.8	Poor

Regional Asset Inventory, Replacement Value and Condition

Provides an overview of Regional assets and their critical considerations

Asset Service Area	2021 Inventory	2021 Replacement Value ($m)	2021 Condition	2022 Inventory	2022 Replacement Value ($m)	2022 Condition	2023 Inventory	2023 Replacement Value ($m)	2023 Condition
Childrens Services									
Facilities	4.0	10.3	Poor	4.0	12.0	Poor	zz	13.0	Fair
Equipment		0.7			0.7			0.7	
Childrens Services Subtotal	4.0	11.0	Poor	4.0	12.7	Poor	0.0	13.7	**Fair**
Long Term Care Facilities									
Facilities	4.0	295.8	Good	4.0	343.9	Good	4.0	372.2	Good
Fleet	3.0	0.2	Fair	3.0	0.2	Good	2.0	0.2	Good
Equipment		18.8			20.5			21.9	
Long Term Care Facilities Subtotal	7.0	314.8	Good	7.0	364.6	Good	6.0	394.3	Good
Other Supporting Assets									
Facilities	1.2	44.3	Very Good	1.2	51.5	Good	1.2	55.8	Good
Fleet	1.1	0.1	Good	1.5	0.1	Fair	2.5	0.2	Fair
Equipment		25.7			28.4			30.9	
Other Supporting Assets Subtotal	2.3	70.1	Very Good	2.7	80.0	Good	3.7	86.9	Good
Social Services Total	**46.3**	**690.5**	**Poor**	**46.7**	**813.0**	**Fair**	**44.7**	**899.6**	**Fair**
Solid Waste									
Facilities	7.0	296.8	Very Good	7.0	345.0	Very Good	7.0	373.3	Very Good
Fleet	8.0	0.7	Good	8.0	0.7	Good	6.0	1.7	Good
Equipment		14.5			14.5			14.5	

Regional Asset Inventory, Replacement Value and Condition

Provides an overview of Regional assets and their critical considerations

Asset Service Area	2021 Inventory	2021 Replacement Value ($m)	2021 Condition	2022 Inventory	2022 Replacement Value ($m)	2022 Condition	2023 Inventory	2023 Replacement Value ($m)	2023 Condition
Other Supporting Assets									
Facilities	0.1	3.2	Very Good	0.1	3.7	Good	0.1	4.0	Good
Fleet	0.1	0.0	Good	0.1	0.0	Fair	0.1	0.0	Fair
Equipment		1.2			1.3			1.5	
Other Supporting Assets Subtotal	0.2	4.4	Very Good	0.2	5.0	Good	0.2	5.5	Good
Solid Waste Total	**15.2**	**316.4**	**Very Good**	**15.2**	**365.2**	**Very Good**	**13.2**	**395.0**	**Very Good**
Health									
Public Health									
Facilities	0.3	4.8	Very Poor	0.3	5.6	Very Poor	0.3	6.1	Very Poor
Equipment		2.3			3.3			3.3	
Public Health Subtotal	0.3	7.1	Very Poor	0.3	8.9	Very Poor	0.3	9.4	Very Poor
Paramedic Services									
Facilities	8.0	36.1	Good	9.0	43.7	Very Good	9.0	47.3	Very Good
Fleet	84.0	10.9	Good	82.0	16.8	Good	82.0	16.4	Good
Equipment		5.6			6.1			6.4	
Paramedic Services Subtotal	92.0	52.6	Good	91.0	66.6	Very Good	91.0	70.1	Very Good

Regional Asset Inventory, Replacement Value and Condition

Provides an overview of Regional assets and their critical considerations

Asset Service Area	2021 Inventory	2021 Replacement Value ($m)	2021 Condition	2022 Inventory	2022 Replacement Value ($m)	2022 Condition	2023 Inventory	2023 Replacement Value ($m)	2023 Condition
Other Supporting Assets									
Facilities	0.8	32.2	Very Good	0.8	37.4	Good	0.8	40.5	Good
Fleet	0.6	0.0	Good	0.8	0.1	Fair	0.8	0.1	Fair
Equipment		12.8			14.2			15.3	
Other Supporting Assets Subtotal	1.4	45.0	Very Good	1.6	51.7	Good	1.6	55.9	Good
Health Total	**93.7**	**104.7**	**Good**	**92.9**	**127.2**	**Good**	**92.9**	**135.4**	**Good**
Durham Region Police Service									
Facilities	8.0	131.8	Good	8.0	153.2	Good	8.0	165.8	Fair
Fleet	363.0	25.8	Very Good	367.0	29.5	Very Good	378.0	31.0	Very Good
Equipment		49.2			52.5			53.6	
Other Supporting Assets									
Facilities	0.5	19.8	Very Good	0.5	23.0	Good	0.5	24.9	Good
Other Supporting Assets Subtotal	0.5	19.8	Very Good	0.5	23.0	Good	0.5	24.9	Good
Durham Region Police Service Total	**371.5**	**226.6**	**Good**	**375.5**	**258.2**	**Good**	**386.5**	**275.3**	**Fair**
TOTAL		**17,853.3**	**Good**		**20,881.1**	**Good**		**22,822.9**	**Good**

1. 2021 Replacement values have been restated to reflect reporting by service area.
2. The condition and quantity is not included for equipment assets as these are pooled assets.



Water Supply

Asset Class Report

Replacement Value

$6,989.3M

Average Condition

GOOD

Service Level Objectives

To provide a safe and sufficient water supply while complying with all Provincial and Federal Acts and Regulations.

To protect the environment and the quality and quantity of ground and surface water.

To support the coordination of growth and achieve and maintain an optimal condition standard for all existing and new water supply system assets.

- 14 Water Supply Plants and Well Systems
- 11 Water Pumping Stations
- 8 Combined Water Pumping Stations/ Storage Facilities
- 14 Water Storage Facilities
- 5 Other Water Facilities
- 2,693 km watermains
- 28,537 control valves
- 186,997 service connections
- 712 Specialty Valves
- 17,254 Hydrants
- 2,070 Fire Lines
- 185,362 Meters

1.1. Water Supply Inventory Overview

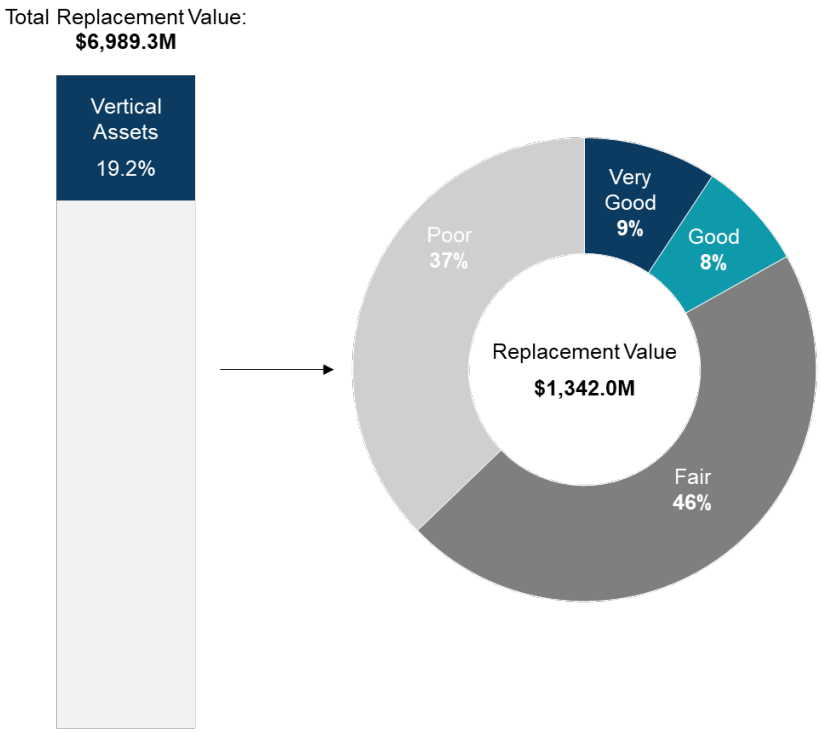
Durham's water supply system assets consist of vertical and linear assets, fleet assets, equipment assets, and other supporting assets. Vertical assets treat, store and pump drinking water and linear assets distribute the water to residents and businesses through pipes. Supporting assets include a portion of the Region's administrative facilities, fleet and equipment that support the Region's water supply system.

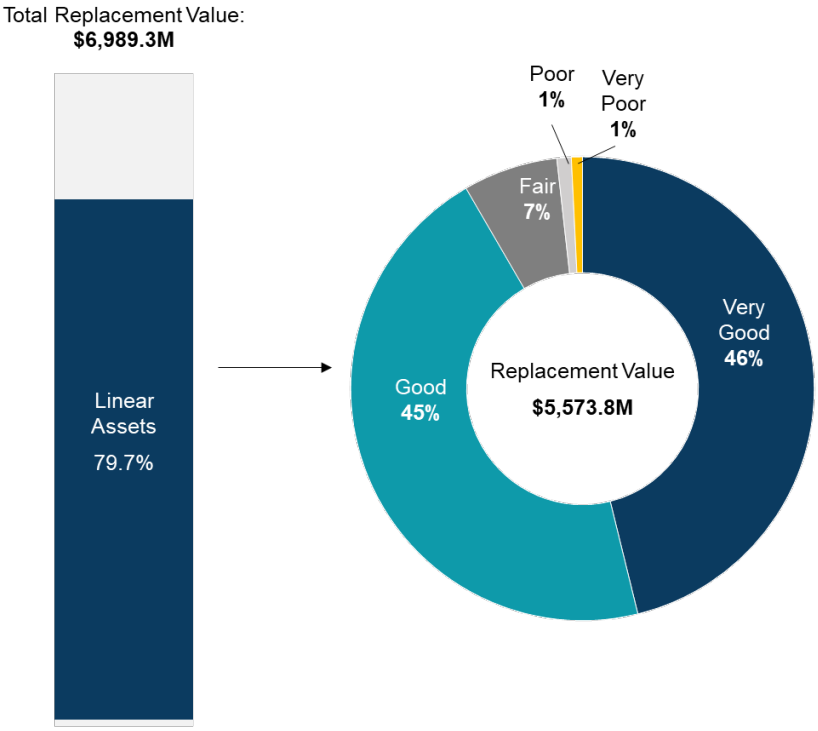
1.2. Water Supply Condition Ratings, Replacement Values and Average Ages

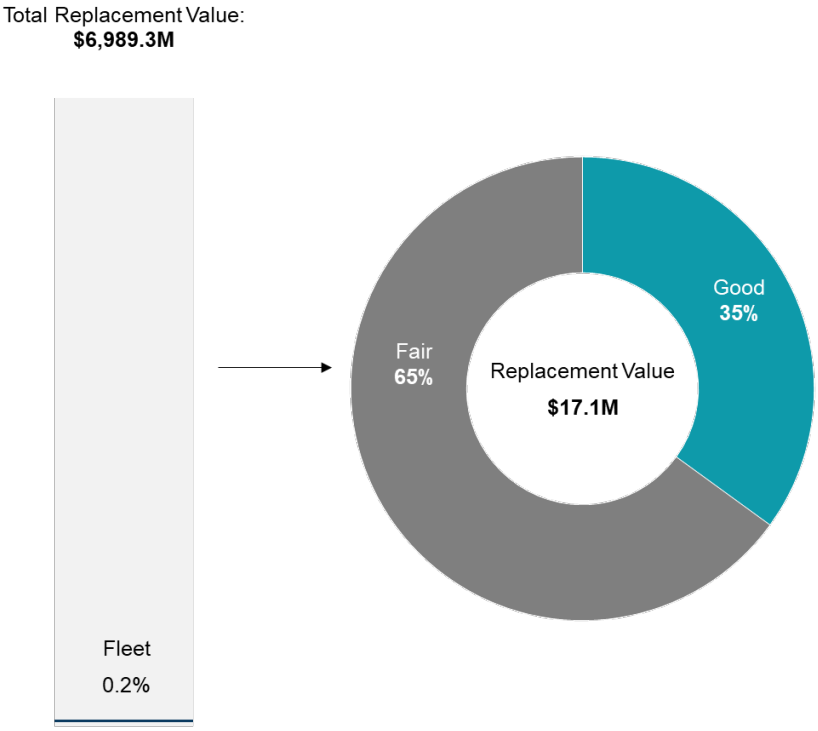
The overall water supply condition rating in 2023 was Good representing no year-over-year condition change. Condition ratings for linear assets (Good), vertical assets (Fair), fleet (Fair) and other supporting assets (Good) also remained stable year-over-year. Overall replacement values totalled $6,989.3 million, an 8.4 per cent increase over 2022 primarily a result of inflationary replacement cost increases and increases to linear assets to accommodate growth.

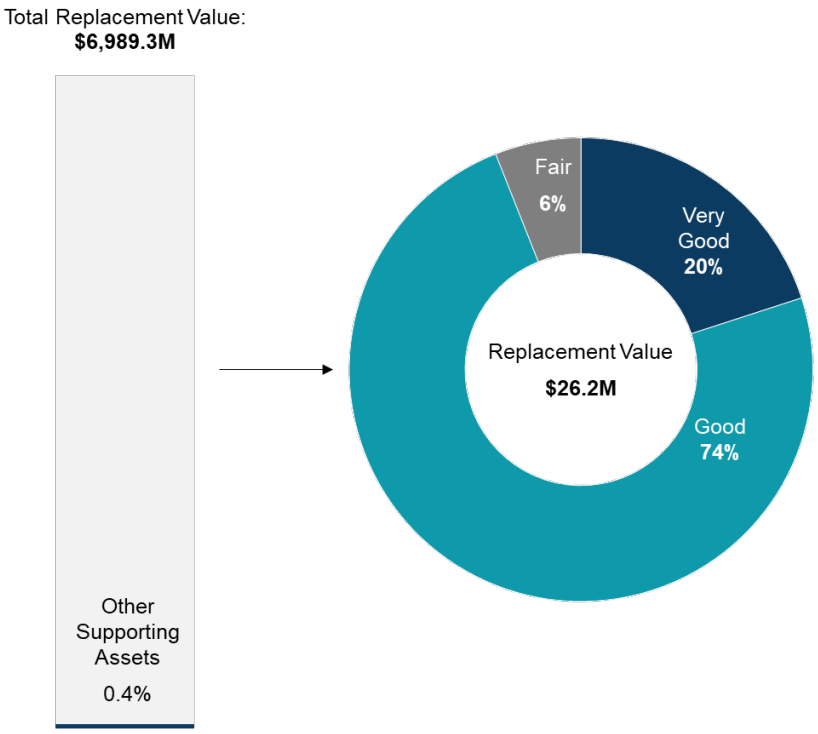
Figure 1 illustrates the condition rating and replacement value of water supply assets.

Figure 1: Water Supply Assets Condition and Replacement Values*




Total Replacement Value:
$6,989.3M
Linear Assets
79.7%
Poor
1%
Very Poor
1%
Fair
7%
Very Good
46%
Good
45%
Replacement Value
$5,573.8M


Total Replacement Value:
$6,989.3M
Fleet
0.2%
Good
35%
Fair
65%
Replacement Value
$17.1M



* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include the condition for equipment assets as these are pooled assets.

1.3. Water Supply Condition Assessment Methods

Table 1 outlines the assessment methods used to determine condition ratings.

Table 1: Water Supply Condition Assessment Methods

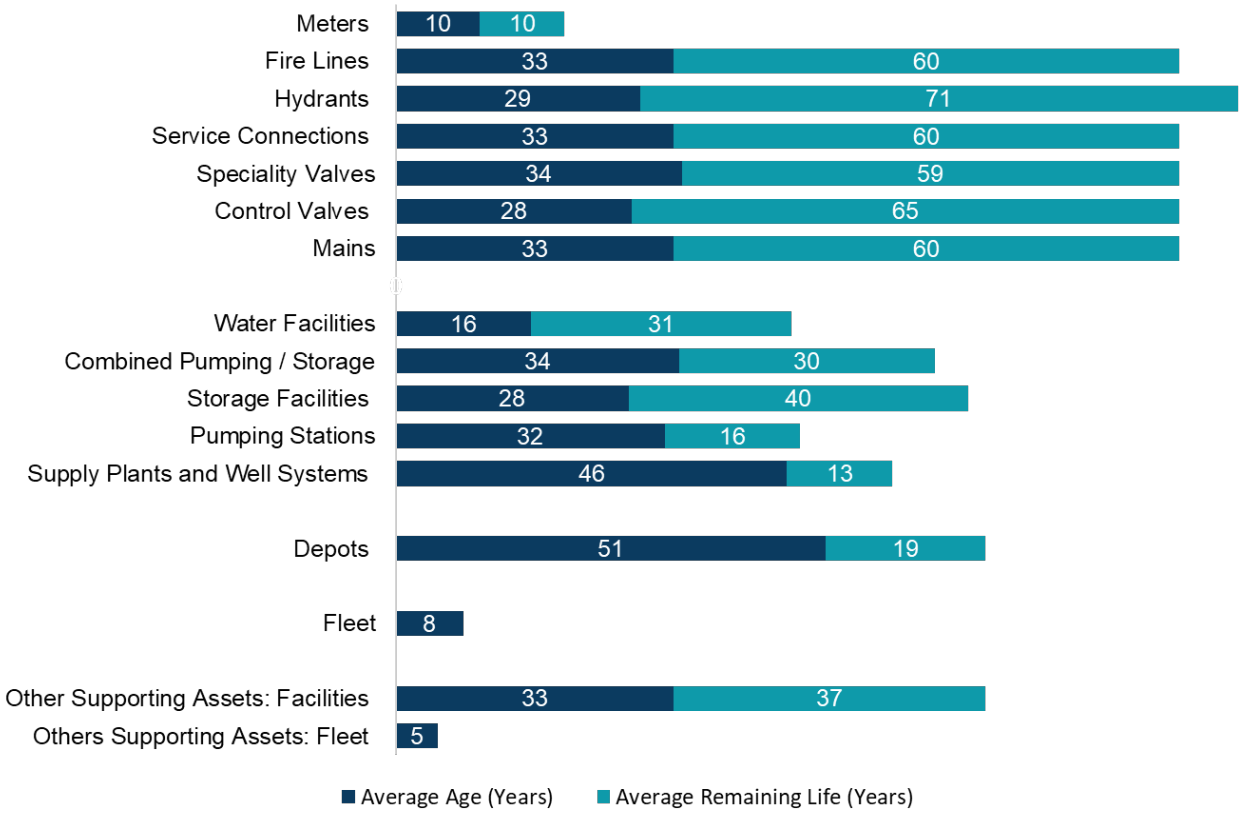
Asset Class	Assessment Methods
Plants, pumping stations, wells and reservoirs	Site-specific detailed condition assessments for the process equipment and building structure are planned at all facilities in the coming years. They are coordinated with upcoming capital projects where possible. In the interim, a high-level scoring was done for all sites by Operations and Facilities staff for long range planning. Staff also recommend repair work for incorporation into the annual operating and capital budgets.
Water towers/standpipes	Annual site-specific inspections per legislated requirements.
Watermains	Consideration of the number of watermain breaks, break rate, pipe material, age, maintenance concerns and issues, lining type, and cathodic protection.
Fire lines, hydrants and water meters	Condition rating is based on age.

Asset Class	Assessment Methods
Control valves, service connections and specialty valves	Condition rating is based on the connected watermain condition scores.
Fleet	Mileage and vehicle inspection.
Facilities	Regional staff employ a Building Condition Assessment (BCA) method for assess the condition of Regionally-owned facilities. For each facility, a BCA is performed on a 10-year cycle by external consultants. BCAs assess the condition of major building elements, sub-structures, shells, interiors, services and site work.

1.4. Water Supply Average Age and Remaining Useful Life

Figure 2 summarizes the average age and remaining asset life of water system assets. Overall, the water system is relatively young as evidenced by generally significant remaining useful life.

Figure 2: Water System Average Age and Remaining Useful Life



1.5. Water Supply Levels of Service and Performance Measurement

Service level objectives and performance targets are set through Regional Council approved master plans, studies, policies and procedures, as well as through departmental studies and regulatory and/or compliance guidelines.

Table 2: Plans, Studies, Policies, Procedures, Regulations that Inform Service Levels

Regional Plans, Studies, Policies, & Procedures
• Regional Water Supply System Design Standards & Specifications • Regional Water Supply System By-law 89-2003 • Regional Backflow Prevention By-law 24-2018 • Region's Service Connection Cleaning By-law 90-2003 • Service Levels for Water Operation • The Great Lakes St Lawrence Cities Initiative and the Sustainable Municipal Water Management Framework • Credit Valley, Toronto and Region and Central Lake Ontario Source Protection Plan • South Georgian Bay Lake Simcoe Source Protection Plan • Trent Conservation Coalition Source Protection Plan • Lake Simcoe Protection Plan

Regulatory Compliance Requirements and Guidelines

• Ontario Safe Drinking Water Act 2002 and associated Regulations:
  • Ontario Regulation 169/03 Ontario Drinking Water Quality Standards
  • Ontario Regulation 170/03 Drinking Water Systems
  • Ontario Regulation 128/04 Certification of Drinking Water System Operators and Water Quality Analysts
  • Ontario Regulation 188/07 Licensing of Municipal Drinking Water Systems
  • Ontario Regulation 453/07 Financial Plans
  • Ontario Regulation 248/03 Drinking Water Testing Services
• Clean Water Act 2006

Regulatory Compliance Requirements and Guidelines

• Ontario Water Resources Act, R.S.O. 1990 and associated Regulations:
  • R.R.O. 1990, Reg. 903: Wells
  • Ontario Regulation 387/04 Water Taking and Transfer
• Great Lakes Protection Act, 2015
• Lake Simcoe Protection Act, 2008
• Environmental Protection Act, R.S.O. 1990
• Water Opportunities and Conservation Act, 2010
• Oak Ridges Moraine Conservation Act, 2001
• Greenbelt Act, 2005
• Planning Act, R.S.O. 1990
• Building Code Act, 1992 and Ontario Regulation 332/12 Building Code
• Ontario Regulation 319/08 Small Drinking Water Systems
• Canadian Drinking Water Guidelines
• Environmental Management Standard ISO 14001
• Quality Management Standard ISO 9001:2000
• Technical Support Document for Ontario Drinking Water Standards, Objectives, and Guidelines.

Detailed service level descriptions and targets are outlined in the Community Levels of Service, Technical Levels of Service and Performance Measures subsections that follow.

Community Levels of Service

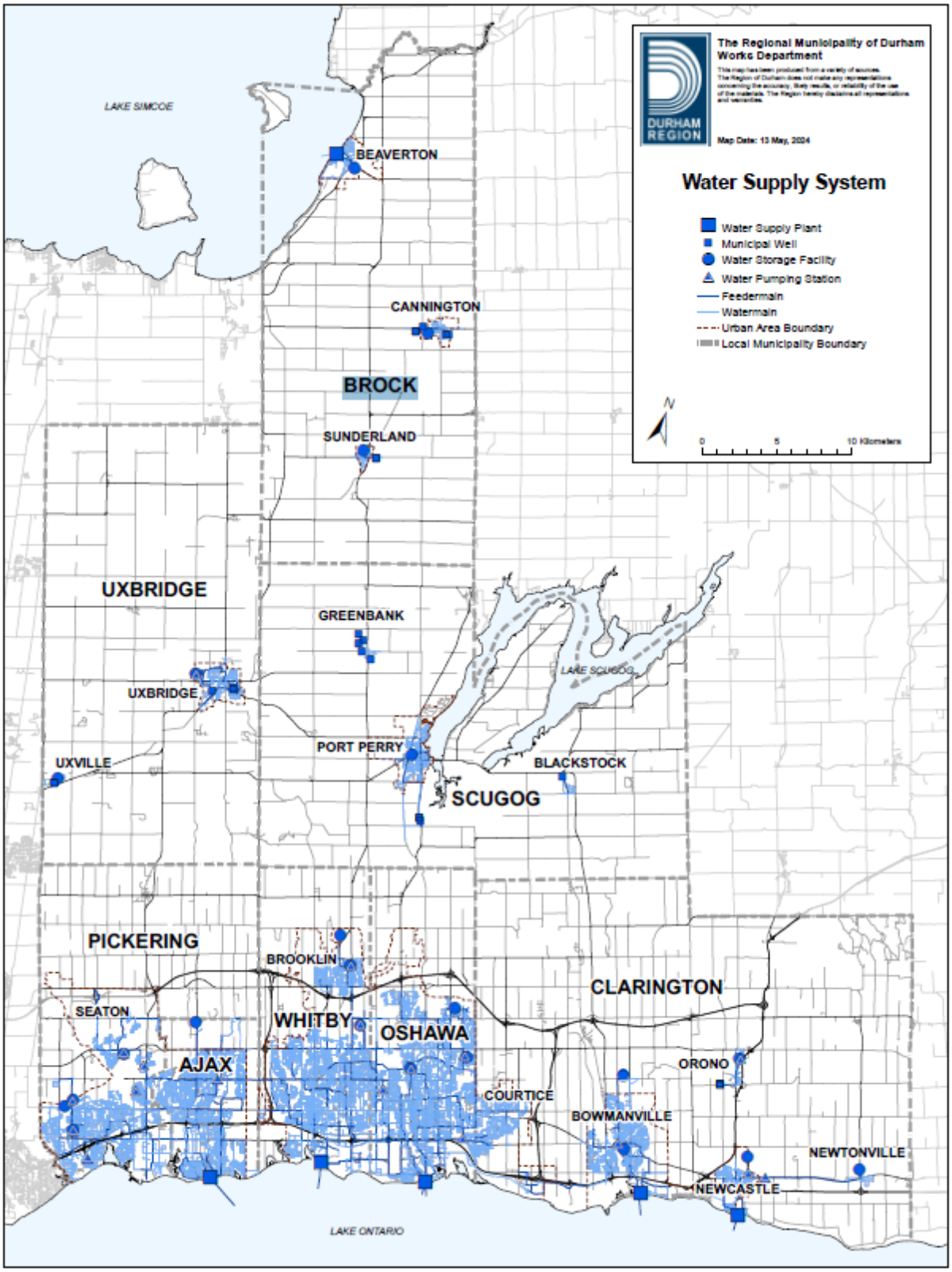
Community levels of service provide qualitative descriptions of service reliability, service standards and service scope as required by Ontario Regulation 588/17.

Table 3: Community Levels of Service

Criteria	Description
Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system.	Approximately 95 per cent of Durham's municipal tap water comes from Lake Ontario, with the remaining from underground sources (wells) and Lake Simcoe for the Beaverton area. Map 1 identifies the areas that are connected to the Region of Durham’s water supply system.

Criteria	Description
Description, which may include maps, of the user groups or areas of the municipality that have fire flow.	Proximity to a hydrant is a benefit of being connected to the water supply system for fire protection. There are 17,254 fire hydrants in Durham Region. There is 100 per cent fire flow in the Region of Durham with 92 per cent of residents having direct supply from hydrants.
Description of boil water advisories and service interruptions.	Boil water advisories can be issued due to adverse water quality testing results or suspected contaminants. They protect water users from potential health risks. Due to the Region's rigorous and thorough water treatment and testing process, there were zero boil advisory days in 2023.

Map 1: Durham Region's Water Supply and Fire Flow System



Technical Levels of Service

Ontario Regulation 588/17 includes a list of required technical metrics for water supply systems as shown in Table 4.

Table 4: Technical Service Levels per Ontario Regulation 588/17

Technical Metric	Target	Year of Measure		
		2021	2022	2023
Percentage of Properties Connected to the Region's Water Supply System	100 per cent of Properties with Proximity to a Watermain to be Connected	99%	99%	99%
Measures the percentage of properties connected to the Region's treated water supply system. Only properties within an Urban Boundary can be potentially connected to a water system. Durham has a number of properties in rural areas.				
Percentage of Properties Where Fire Flow is Available	100 per cent of Properties with Proximity to a Watermain has Fire Flow	100%	100%	100%
This measure tracks the percentage of properties that have fire flow in the Region. Any property in proximity to a watermain has fire flow through hydrants.				
Service Interruptions due to Watermain breaks	0.00 per cent	0.00%	0.00%	0.00%
The number of connection-days per year where service is disrupted due to watermain breaks compared to the total number of properties connected to the municipal water system.				
Boil Water Advisory Days	Zero days annually	0	0	0
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.				

Performance Measures

Beyond community service levels and technical reporting requirements of Ontario Regulation 588/17, a number of performance metrics are being tracked to measure how well assets are meeting service level objectives.

Table 5: Performance Measures

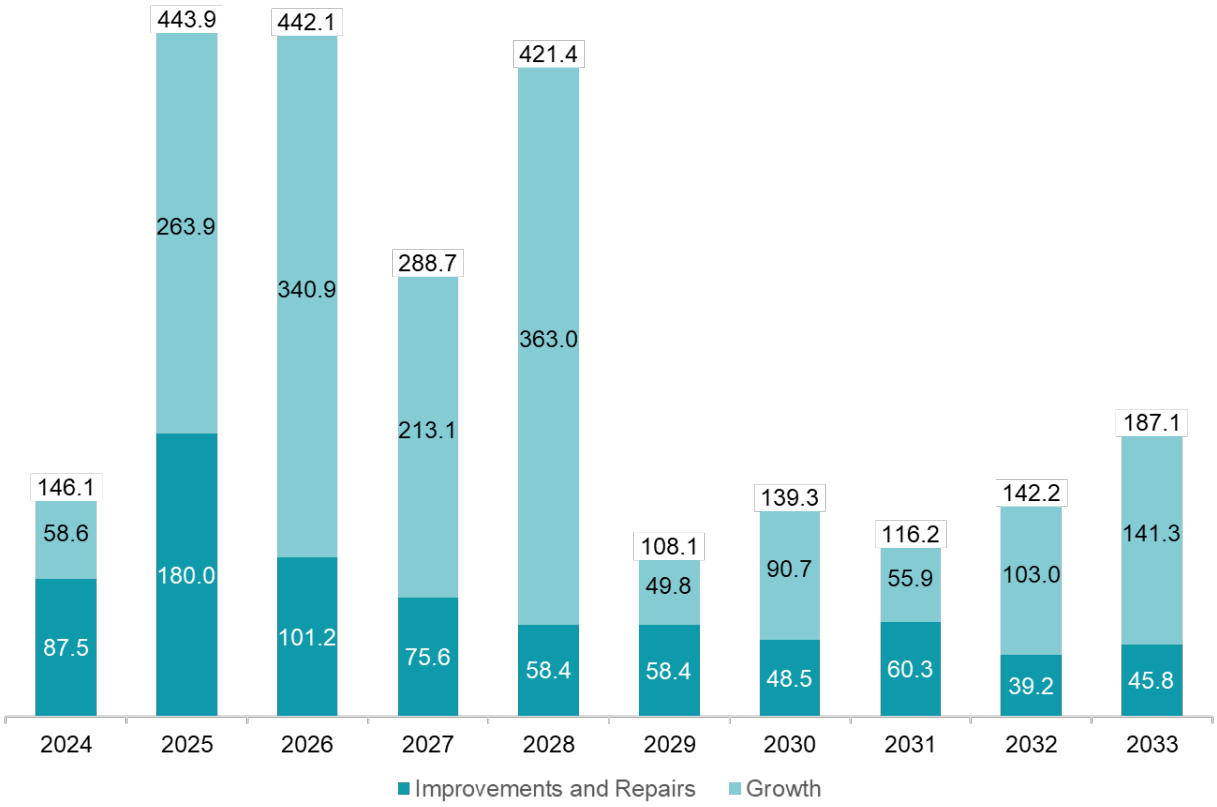
Performance Measure	Target	Year of Measure		
		2021	2022	2023
Condition Index Rating	0.2 per cent of linear assets rated as very poor	0.58%	0.62%	0.61%
Measure identifies the per cent of linear assets (watermains, hydrants, valves, service connections, fire lines and water meters) rated as "Very Poor" calculated on total replacement value of these assets.				
Non-Revenue Water	Reduce non-revenue water by 0.5 per cent annually	13.69%	14.00%	14.20%
Measures non-revenue water as a percentage of total water treated. Non-revenue water is a total of unbilled authorized consumption, apparent losses and real losses. Examples of each type are as follows: • Unbilled Authorized = flushing hydrants at dead ends, in new developments or following replacement or repair of hydrant. • Apparent Losses = unauthorized consumption like water theft at hydrants and customer metering inaccuracies. • Real Losses = leakage on mains and service connections, overflows at water storage facilities and at point of customer metering.				
Valves Inspected	100 per cent of line valves ≥300mm every 2 years	84%	96%	78%
	100 per cent of line valves <300mm every 6 years	89%	94%	90%
Percent of valves inspected per current Durham Service Levels. The purpose is to ensure all valves are operational when required for use and to minimize water losses.				
Hydrants Inspected	100 per cent of hydrants inspected annually	99%	99%	98%
Measures the percentage of hydrants inspected annually per Durham Service Level. The goal is to ensure sufficient, reliable service for fire protection.				
Condition Index Rating	0 per cent of vertical assets rated as very poor	0.00%	0.00%	0.00%
Measure identifies the percentage of plants (including wells, pumping stations and water storage facilities) rated very poor. The condition percentage is based on replacement value rather than number of sites.				

Performance Measure	Target	Year of Measure		
		2021	2022	2023
Compliance to Drinking Water Standards and MECP Regulatory Requirements	100 per cent compliance of drinking water test results annually	99.88%	99.84%	99.95%
Measures compliance to MECP drinking water standards using number of drinking water test results within standards (Ontario Regulation 169/03 microbiological tests only) / total number of drinking water tests performed at the plants and on the distribution system. Purpose is to ensure a safe water source for all residents of Durham. Microbiological tests on commissioned and operating systems including any tests carried out in addition to Regulatory requirements.				
Back-up power capabilities	100 per cent of plants, wells, and pumping stations with back up generators	86%	87%	87%
	100 per cent of generators newer than 30 years in age	76%	70%	62%
Ensure that all plants, wells and pumping stations' back-up power generators are no older than 30 years. Portable generators used at maintenance hole-type pumping stations and those too small to house a generator are not included in the calculation. The age measure is calculated using only the number of existing generators currently in place.				
Mainline Valves in Operable Condition	100 per cent of valves in operable condition	99%	99%	99%
This measures the percent of valves that are found to be operable during annual inspections. The Region strives to keep all valves operable, and schedules required valve repairs as soon as possible.				

1.6. Water System Capital Forecast

Major capital investments for the water supply system identified through the 2024 business plans and budget process (rehabilitation and growth) total $146.1 million for 2024 and $2,289.0 million over the 2025 to 2033 forecast period.

Figure 3: Water System Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to Total due to rounding.

The 2024 Water Supply Capital Budget includes $20.4 million in linear betterments and replacements (watermains, valves, connections) to address those assets in various conditions with differing risk profiles and is based on the ability to achieve access as part of Regional Road, Area Municipal Road, Ministry of Transportation Ontario (MTO) projects.

There is an additional $3.4 million included for other linear replacements such as water meters and hydrants.

For water supply buildings and plant equipment (vertical assets), there is approximately $19.3 million approved in the 2024 Water Supply Capital Budget to address asset management needs.

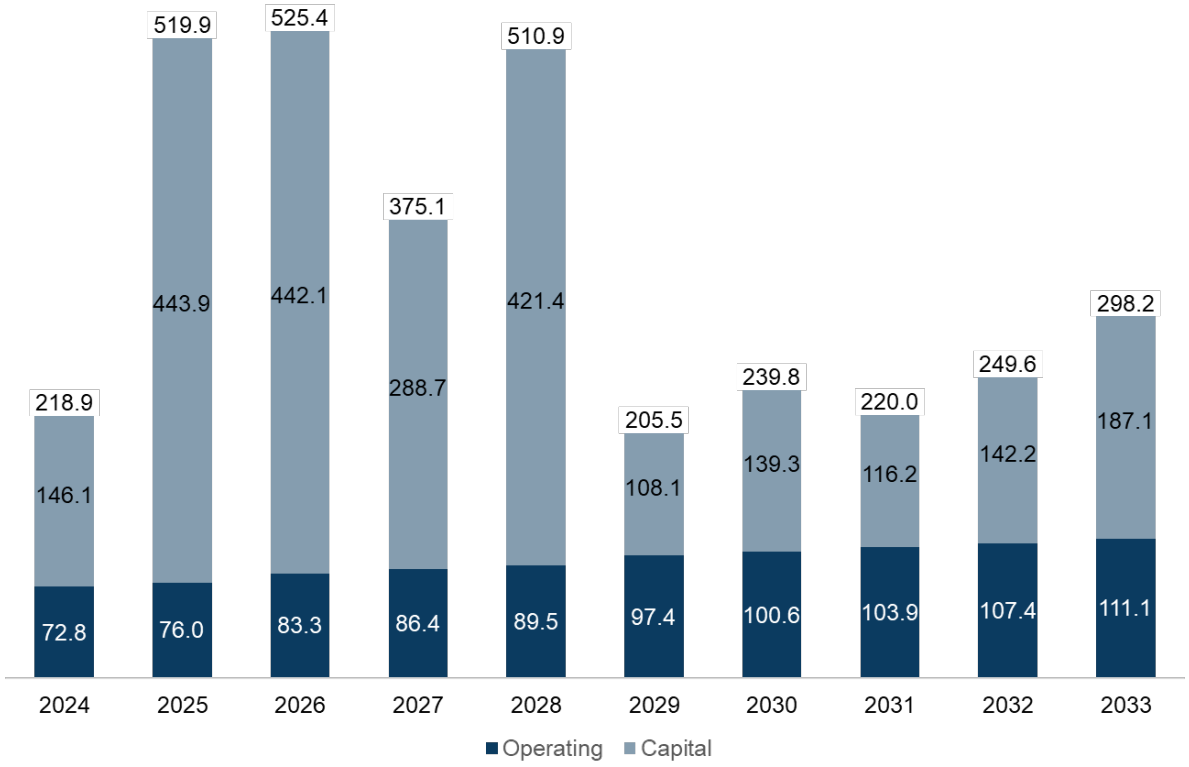
Capital investments in water supply assets to meet growth needs totals approximately $58.6 million in 2024 and $1,621.6 million over the 2025 to 2033 forecast period.

1.7. Lifecycle

Water Supply System maintenance and rehabilitation lifecycle activities aim to extend the useful life of linear and vertical assets and improve service delivery. For some linear assets such as cast iron and ductile iron watermains, there are activities that can be done to slow deterioration and extend the useful life.

Figure 4 illustrates the projected capital and maintenance lifecycle costs for the water supply asset class.

Figure 4: Lifecycle Costs Water Supply Operating and Capital ($ millions)*



*Operating and Capital may not add to Total due to rounding.

Lifecycle Activities

In the past, cement lining was used to improve water flow and quality as well as reduce internal pipe corrosion. The structural lining technology that is used by the Region now provides the same benefits but also renews the pipe to an almost new condition. Cathodic protection is used extensively throughout the Region to slow external corrosion on iron watermains. These rehabilitation methods have the benefit of improving the condition of the watermains while limiting the amount of disruption to residents and the cost to rate payers.

Full pipe replacement is preferred when the watermain condition is in very poor condition or when there is an opportunity to coordinate with other infrastructure work such as road reconstruction or sanitary sewer replacement.

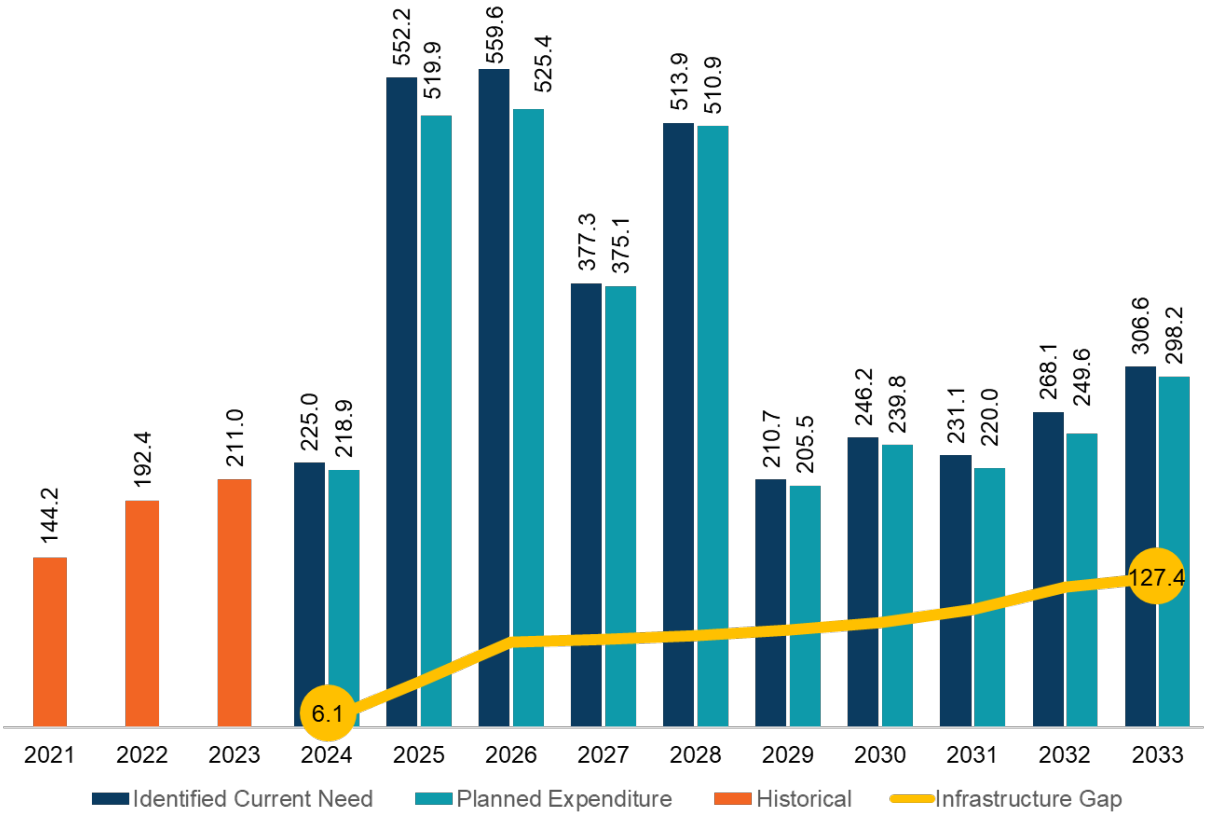
For vertical water system assets, lifecycle activities are informed by detailed site-specific condition assessments as well as by Operations and Facilities staff knowledge of issues as they attend the various sites regularly. The detailed inspections inform rehabilitation and renewal activities and forecast investment needs over the long-term.

In addition to repair and maintenance activities, other ongoing operating expenditures are required to ensure water assets can meet service levels. Some examples include gas and fuel, utilities, chemicals, fleet rentals and overhead costs (e.g., office staff, training, software, etc.).

Total operating lifecycle expenditures for water total $928.3 million over the 2024 Budget and nine-year forecast period (2025 to 2033) while capital expenditures total $2,435.1 million over this period. Figure 5 below provides planned capital and operating expenditures for the water system for 2024 and the nine-year forecast period. Additionally, staff have undertaken an analysis to forecast the funding required to optimally sustain current service levels.

Any rehabilitation or replacement work required to meet health and safety or legislative standards are reflected in the planned total expenditures while the identified current need builds on the approved budget to accelerate some lower priority works as illustrated in Figure 5.

Figure 5: Water System: Lifecycle Gap Analysis ($ millions)



In 2024, the infrastructure gap is estimated at $6.1 million. Based on currently planned expenditures this infrastructure gap grows to $127.4 million in 2033.

The identified current need reflects accelerating replacements for some non-urgent linear projects. Not accelerating these projects may result in increased repair and maintenance work which is balanced with cost savings to rate payers and ensuring full value is extracted from assets by avoiding premature replacement. It is important to note that the planned total expenditure poses no health and safety risk or material impacts to service as compared to the identified current need scenario.

Staff will continue to monitor funding needs and refine identification and assessment processes.

Moving forward, staff will be further refining lifecycle costing analysis and data collection for both linear and vertical water supply assets that will be reported in future asset management plans.

1.8. Climate Change

Climate Mitigation: Water Supply System Strategies to Reduce GHG Emissions

The Durham Region Corporate Climate Action Plan has set targets to achieve net-zero GHG emissions by 2045. The corporate GHG inventory includes emissions produced to treat, store and pump water as well as non-energy GHG emissions associated with water management operations.

Key climate change mitigation accomplishments in water supply systems for 2023 include:

- Energy management programs and equipment replacements which are more energy efficient to reduce the growth of emissions.
- Adoption of a Light-Duty Fleet Electrification Plan for corporate light duty fleets.

Key 2024 to 2033 initiatives that support GHG reductions include:

- Completion and implementation of the Water & Wastewater GHG Emission Management Strategy that charts a path to decarbonize water supply and wastewater treatment operations over the next 20 years.
- Significant water supply process and facility upgrades including the implementation of initiatives from Durham’s 2024 to 2029 Energy Conservation and Demand Management Plan.

Climate Adaptation: Increasing the Resiliency of Water Supply System

A changing climate can put additional pressures on systems through extreme weather events that necessitate proactive measures and modifications to system design.

Priority climate change mitigation measures for the water supply system include:

- New well and pumphouses with standby power at Cannington Water Supply System, Sunderland Water Supply System Site 1, Sunderland Water Supply System Site 2.
- Updates at Rosebank Road Water Pumping Station, Cherrywood Water Pumping Station, Grandview Water Pumping Station, Waverly Road Water Pumping Station, Newtonville Water Pumping Station, Orono Water Supply System, Mill Street Water Pumping Station, and Beaverton Water Supply Plant including standby power.
- Upgrades to the uninterrupted power supply at the Oshawa Water Supply Plant and the Bowmanville Water Supply Plant.
- Continued advancement of sustainability as a core element in the design and construction of Regional infrastructure using best practices and innovations developed through in-house research and partnerships with academia.

Climate adaptation will continue to be addressed through the business planning, budget and long-term financial planning processes to ensure a proactive approach.

1.9. Risk Assessment

Regional staff investigate potential risks to water supply assets on an ongoing basis, considering probability, potential consequences and suitability of risk mitigation controls. Table 6 highlights some key identified risks as well as ongoing and new mitigation measures.

Table 6: Water Systems Risk Mitigation Strategies

Risk	Mitigation
Loss of external utilities	Standby generation assessments, options analysis and implementation. Uninterrupted Power Supply (UPS) systems and upgrades. Update depot-specific contingency plans and training programs. Essential services policies, contingency plans, and continuity plans. Capital redundancy and work around programs. (e.g., twinning, looping, etc.).

Risk	Mitigation
Disruption to water supply and water quantity losses	Maintenance and infrastructure rehabilitation and replacement programs. Inspections, risk assessments and source water protection practices. Capital redundancy and continuity programs (e.g., twinning, looping, etc.). Engineering, hydrology, design and erosion mitigation studies and strategies. Water meter replacement and funding strategy. Wellhead protection and management program. Cement lining and cathodic pipe protection strategy. Bulk water dispensing strategy. Leak detection program. SCADA alerts and controls.
Potential for water contamination	Regional source water protection plans and wellhead protection programs. Water quality testing and SCADA alerts and controls. Lead pipe strategy. Sewer Use By-law and Backflow Prevention Program and By-law. Maintain effective emergency, contingency, and continuity plans. Spill control procedures. Maintenance and infrastructure rehabilitation and replacement programs.



Sanitary Sewerage System

Asset Class Report

Replacement Value	Average Condition
$7,890.9M	**GOOD**

Service Level Objectives

To provide safe and reliable wastewater collection and treatment for all Durham residents, businesses and industries.

To protect the environment, improve the quality of effluent discharged, and comply with all Provincial and Federal Acts and Regulations.

To support the coordination of growth and maintain an optimal condition standard for all existing and new sanitary sewerage system assets.

- 11 Water Pollution Control Plants
- 52 Pumping Stations
- 3 Other Wastewater Facilities
- 2,262 km Gravity Sewers
- 66 km Forcemains
- 32,981 Maintenance Holes
- 183,152 Service Connections

1.1 Asset Inventory Overview

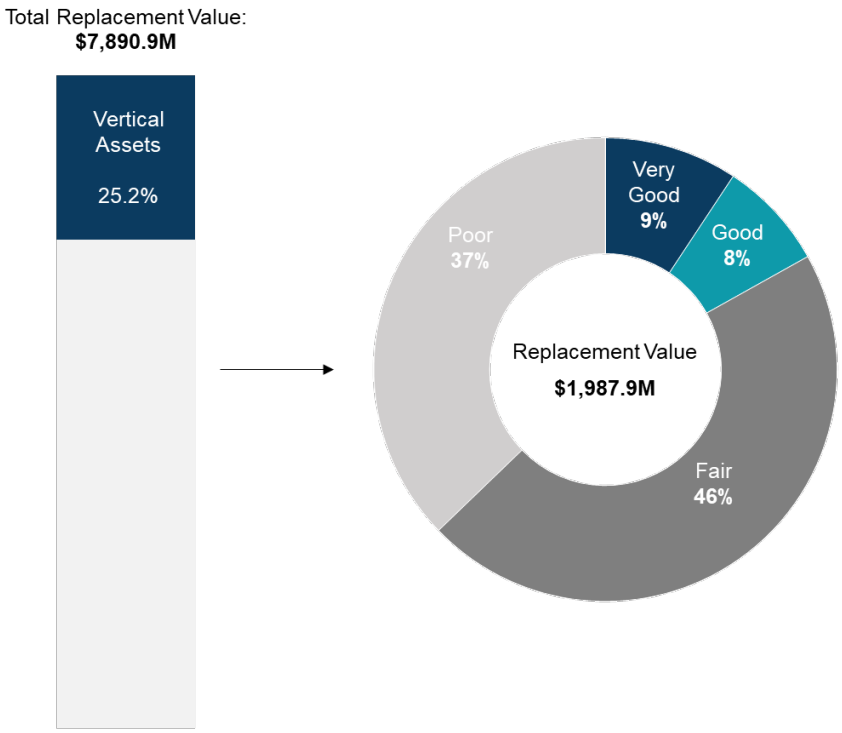
Durham Region's sanitary sewerage system consists of vertical and linear assets, fleet assets, equipment assets and other supporting assets. Vertical assets refer to facilities that treat and pump sanitary sewage and store excess sewage while linear assets collect sanitary sewage and provide a piped route from customers to the treatment plants. Supporting assets include a portion of the Region's administrative facilities, fleet and equipment that support the Region's sanitary sewerage system.

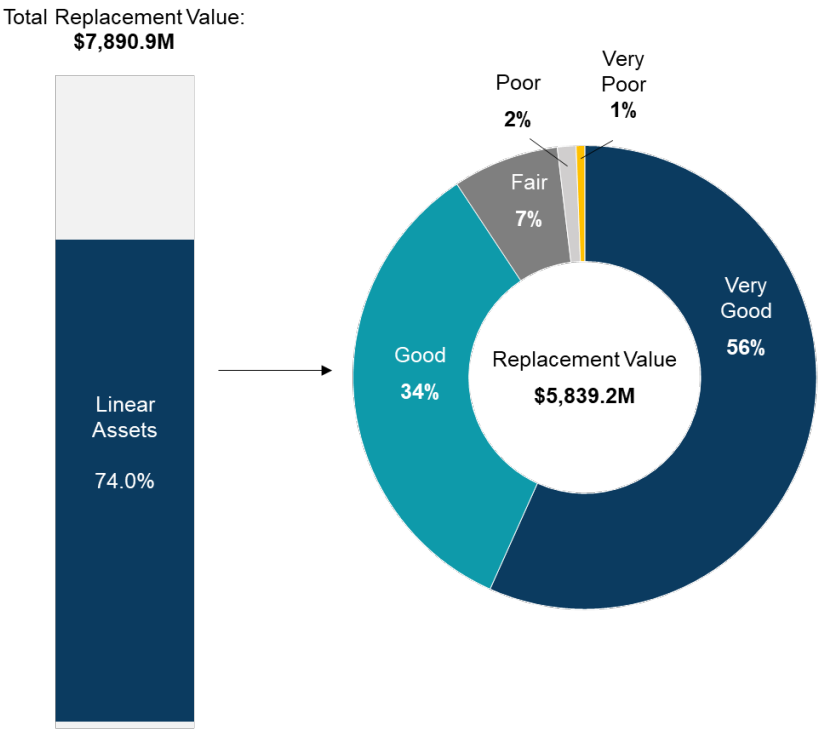
1.2 Sanitary Sewerage Condition Ratings, Replacement Values and Average Ages

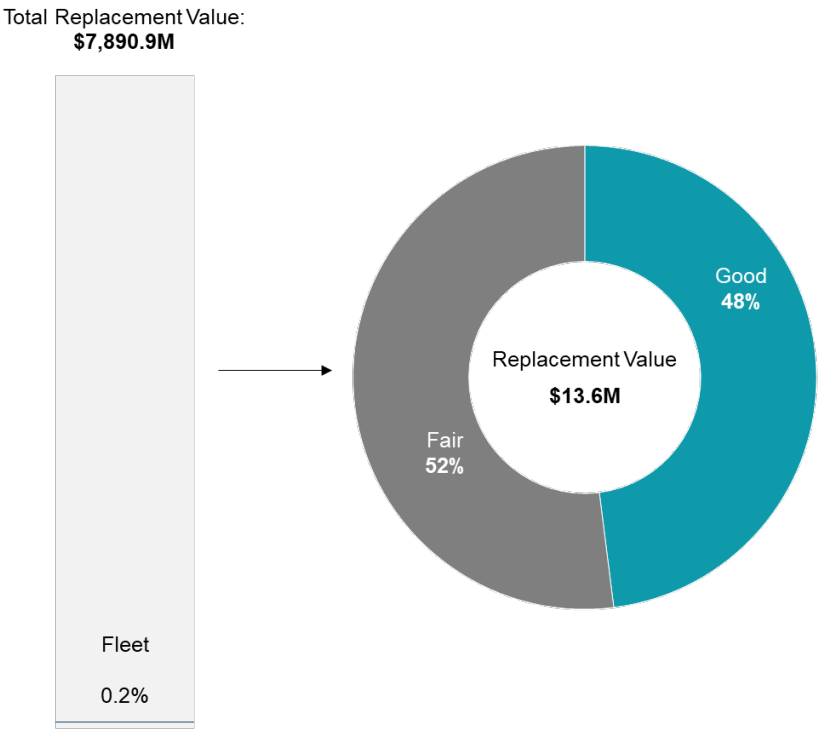
The overall condition rating for sanitary sewerage remained Good in 2023, representing no year-over-year condition change. Condition ratings for linear assets (Good) remained stable while vertical assets dropped to Fair in 2023 compared to Good in 2022. Overall replacement values increased 10.0 per cent over 2022 primarily as a result of inflationary replacement cost increases and increases to linear assets to accommodate growth including the addition of a new wastewater pumping station.

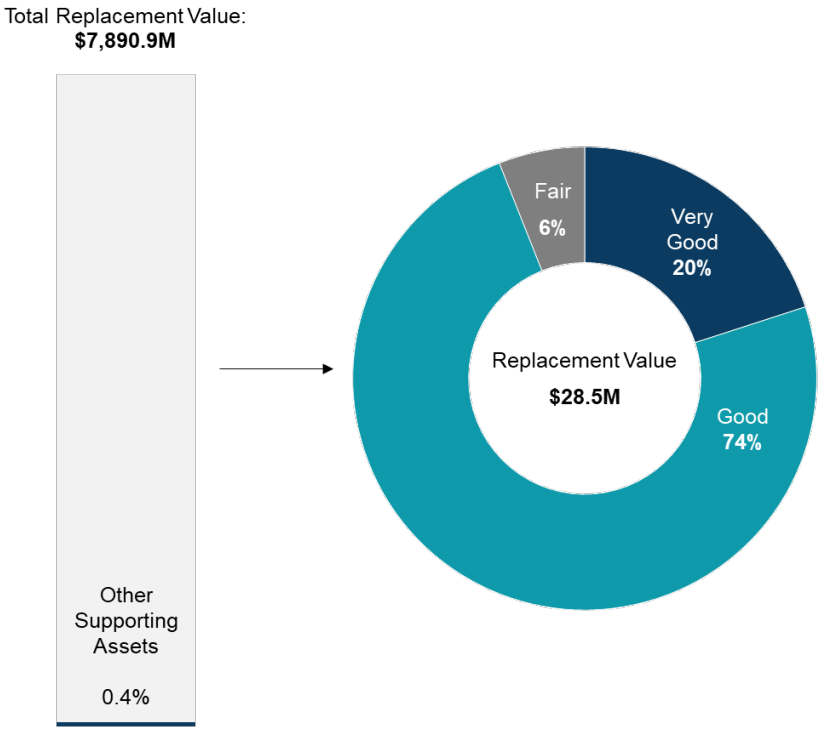
Figure 1 below illustrates the condition rating and replacement value of sanitary sewerage assets.

Figure 1: Sanitary Sewerage Assets Condition and Replacement Values




Total Replacement Value:
$7,890.9M
Linear Assets
74.0%
Very Poor
1%
Poor
2%
Fair
7%
Very Good
56%
Good
34%
Replacement Value
$5,839.2M


Total Replacement Value:
$7,890.9M
Fleet
0.2%
Good
48%
Fair
52%
Replacement Value
$13.6M



* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include the condition for equipment assets as these are pooled assets.

1.3 Sanitary Sewerage Condition Assessment Methods

Table 1 outlines the assessment methods used to determine condition ratings.

Table 1: Sanitary Sewerage Condition Assessment Methods

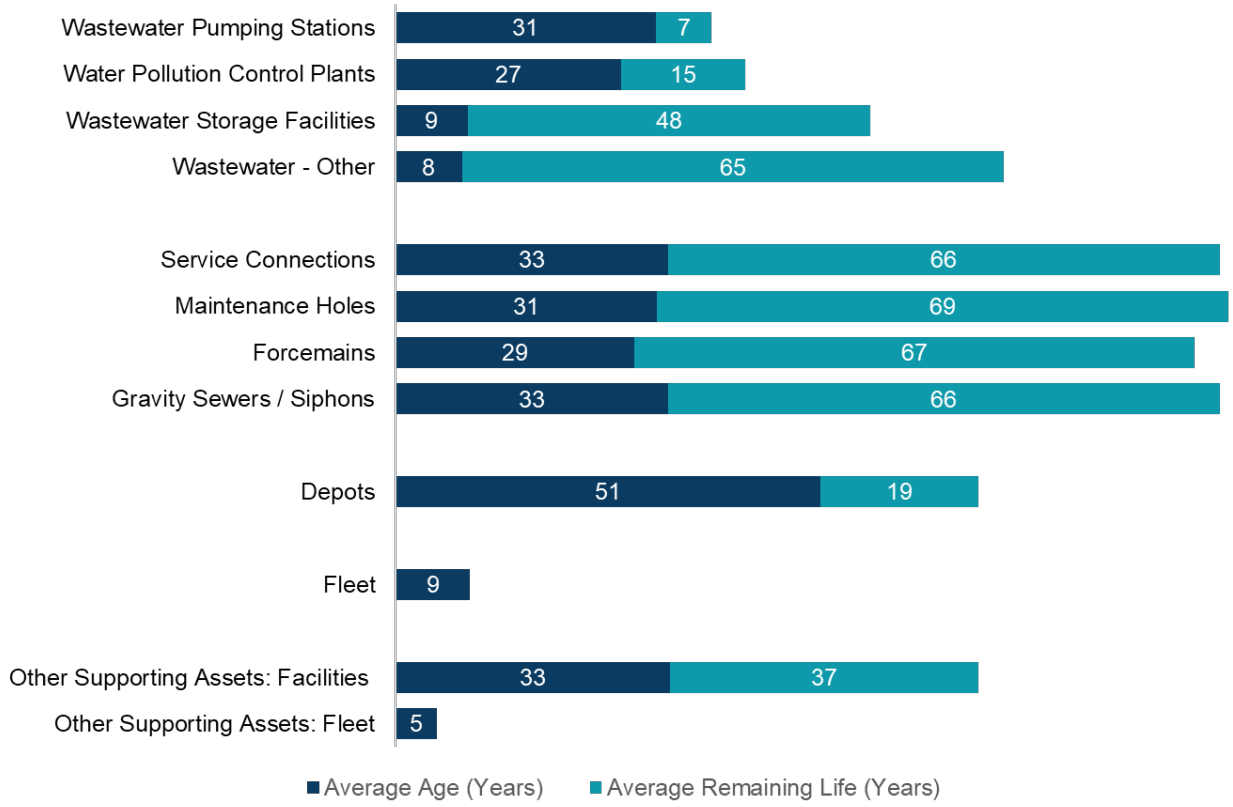
Asset Class	Assessment Methods
Plants, Pumping Stations and Storage	Site-specific detailed condition assessments for the process equipment and building structure are planned at all facilities in the coming years. They are coordinated with upcoming capital projects where possible. In the interim, a high-level scoring was done for all sites by Operations and Facilities staff for long range planning. Staff recommend repair work for incorporation into the annual operating and capital budgets.
Gravity Sanitary Sewers and Forcemains	Structural grade score from CCTV inspections, material type, age of the pipe and any concerns or issues from Maintenance Operations are used to compile a score for each pipe segment. Forcemains also use break history in scoring.
Maintenance Holes and Chambers	Infrastructure age.

Asset Class	Assessment Methods
Service Connections	Assigned same score as the gravity sewer they are connected to.
Fleet	Mileage and vehicle inspection.
Facilities	Regional staff employ a Building Condition Assessment (BCA) method for assess the condition of Regionally-owned facilities. For each facility, a BCA is performed on a 10-year cycle by external consultants. BCAs assess the condition of major building elements, sub-structures, shells, interiors, services and site work.

1.4 Sanitary Sewerage Average Age and Remaining Useful Life

Figure 2 summarizes the average age and remaining asset life of sanitary sewerage system. Overall, the sanitary sewerage system is relatively young as evidenced by generally significant remaining useful life.

Figure 2: Sanitary Sewerage System Average Age and Remaining Useful Life



1.5 Sanitary Sewerage Levels of Service and Performance Measurement

Service levels objectives and performance targets are set through Regional Council approved master plans, studies, policies and procedures, as well as through departmental studies and regulatory and/or compliance guidelines.

Table 2: Plans, Studies, Policies, Procedures, Regulations that Inform Service Levels

Regional By-Laws, Departmental Studies, Policies, & Procedures
• The Region's Sanitary Sewer System By-Law • Service Levels for Sanitary Sewerage Operation • The Region's Service Connection Cleaning By-law 90-2003 • Water Pollution Control Plan and Storm Water System By-law • Regional Sanitary Sewerage System Design Standards and Specifications

Regulatory Compliance Requirements and Guidelines
• Wastewater System Effluent Regulations (WSER) • Environmental Protection Act of Ontario • Pollution Prevention Plan (P2) • Lake Simcoe Protection Plan • Water Opportunities and Water Conservation Act • Ontario Water Resources Act • Fisheries Act • Ontario Regulation 129/04 Licencing of Sewage Works Operators • Ontario Regulation 248/03 Drinking Water Testing Services • Clean Water Act • Human Pathogens and Toxins Act and Regulation (SOR/2015-44) • Canadian Biosafety Standard and Guidelines • ISO/IEC 17025:2017 General requirements for competence of testing and calibrating laboratories

Detailed service level descriptions and targets are outlined in the Community Level of Service, Technical Levels of Service and Performance Measures subsections that follow.

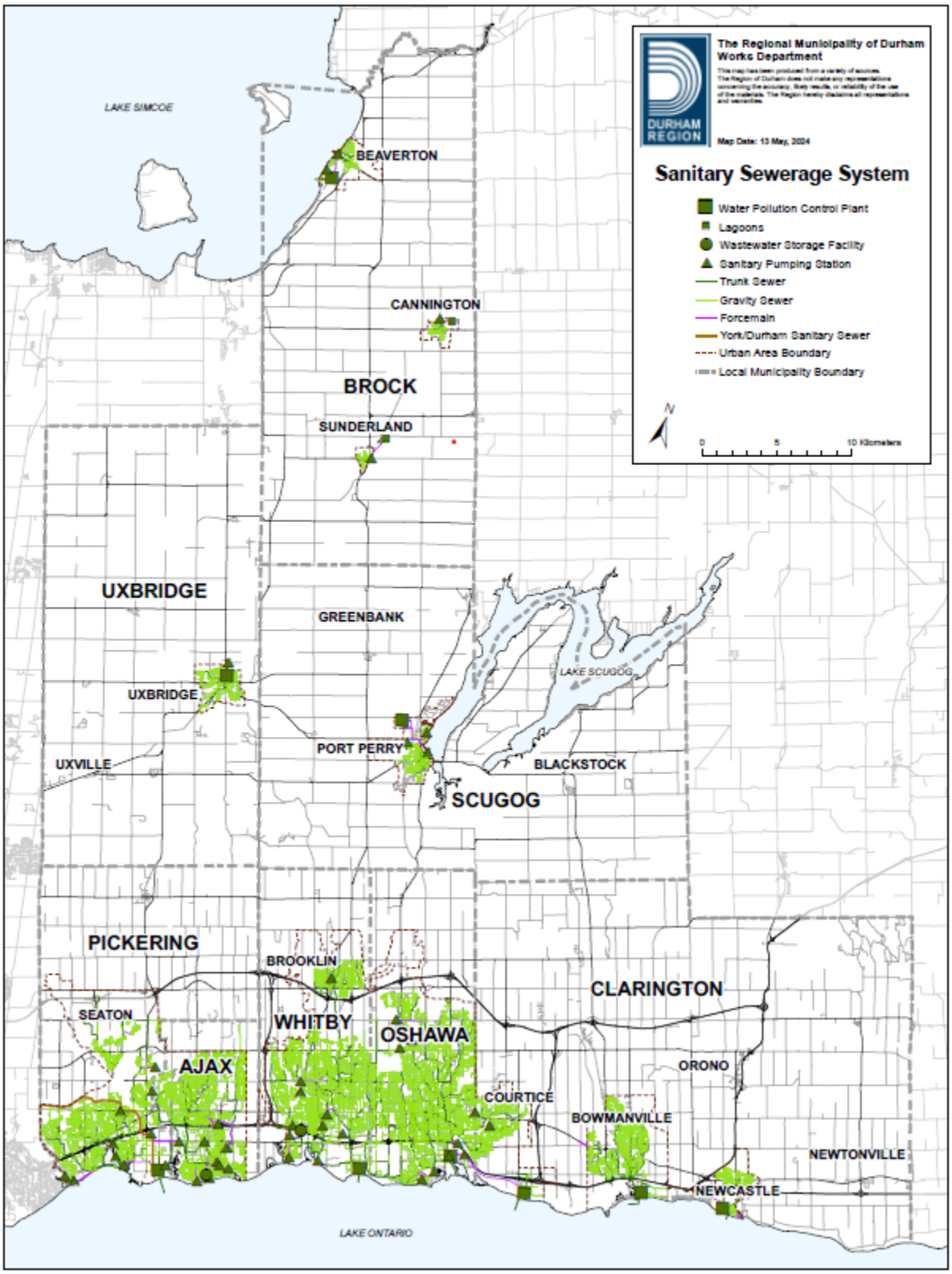
Community Levels of Service

Community levels of service provide qualitative descriptions of service reliability, service standards and service scope as required in Ontario Regulation 588/17.

Table 3: Community Levels of Service

Criteria	Description
Description, which may include maps of areas of the municipality that are connected to the wastewater system.	Refer to Map 1.
Description of how stormwater can get into sanitary sewers in the wastewater system, causing sewage to overflow into streets or backup into homes.	Infiltration can occur at poor joints in the pipe or at lids of maintenance holes along the sewer system. In older neighbourhoods, the foundation drains are connected to the sewer system.
Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described above.	Annual inflow & infiltration reduction program to continue identifying potential stormwater entry points in the sanitary sewerage system. Additional flow monitoring work on key sewers on selected sanitary sewers to identify cross connections from the storm drainage system and rainwater downspouts. Prohibiting the connection of foundation drains to the sanitary sewerage system for new builds and educating the public on disconnecting existing foundation drains. Backflow prevention program on all water services that could pose a hazard to the municipal drinking water system.
Description of the effluent (treated sewage liquid) that is discharged from sewage treatment plants.	The Region's sanitary sewage is treated in accordance with Ministry of the Environment, Conservation and Parks effluent quality regulations. Effluent undergoes full unit processes as per each plant's Environmental Compliance Approval before being discharged into the plant's approved receiving water body.

Map 1: Map of Durham Region Sanitary Sewerage System



Technical Levels of Service

Ontario Regulation 588/17 includes a list of required technical metrics for sanitary sewerage systems as shown in Table 4.

Table 4: Technical Service Levels per Ontario Regulation 588/17

Technical Metric	Target	Year of Measure		
		2021	2022	2023
Percentage of Properties connected to Region's Wastewater System	100 per cent of Properties with Proximity to a Sanitary Sewer to be Connected	99%	99%	99%
Measures the percentage of properties in proximity to a sanitary sewer that are connected to Durham's wastewater system. Only properties within an Urban Boundary can be potentially connected to a sewage system. Durham has a number of properties in rural areas.				
Number of Effluent Violations Per Year to Total Number of Properties Connected to Region's Wastewater System	0 per cent of Effluent Violations to Properties Connected to Region's Wastewater System	0%	0%	0%
This measures the percentage of effluent violations compared to the total number of properties connected to the Region's wastewater system.				
Number of Wastewater Backups to Total Number of Properties Connected to Region's Wastewater System	0 per cent of Wastewater Backups to Properties Connected to Region's Wastewater System	0%	0%	0%
This measures the percentage of wastewater backups compared to the total number of properties connected to the Region's wastewater system.				

Performance Measures

Beyond community service levels and technical reporting requirements of Ontario Regulation 588/17, a number of performance metrics are being tracked to measure how well assets are meeting service level objectives.

Table 5: Performance Measures

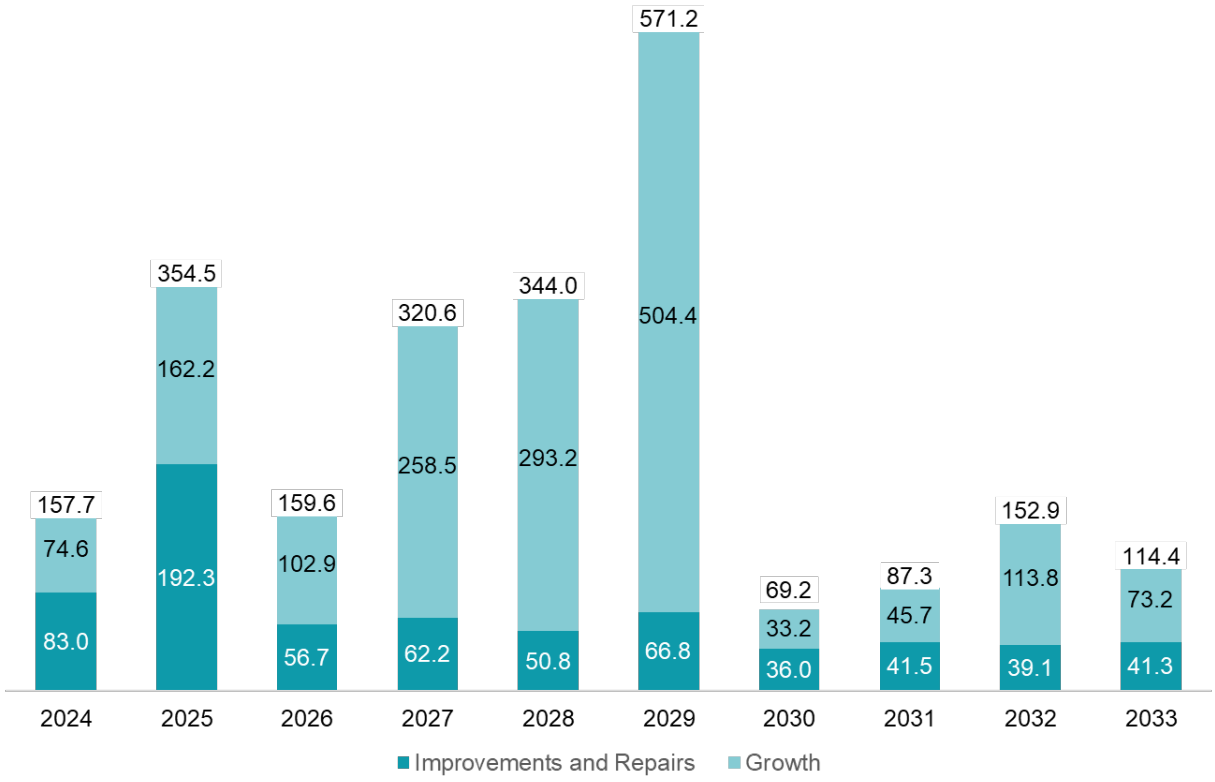
Performance Measure	Target	Year of Measure		
		2021	2022	2023
Condition Index Rating	0.1 per cent of linear assets rated as very poor	0.71%	0.63%	0.63%
Measure identifies the percentage of sewer system (gravity, forcemains, maintenance holes, chambers and service connections) rated as “Very Poor” calculated on the total replacement value of these assets. Condition scoring factors include material type of pipe, remaining service life, CCTV inspection score and Operational staff input.				
Mainline Sewer Inspections	10 per cent of sanitary sewers inspected by CCTV per year	6.70%	8.19%	8.22%
Measures percentage of sanitary sewers inspected by CCTV every year as per Durham Service Levels. The target is 10 per cent of gravity sewers only (not including siphons) per year so a number of 10 per cent or greater in the above chart is meeting the target. The procedure provides a report on the condition of gravity sewers (preventative inspection). Based on the results, a full replacement or a repair/ rehabilitation is scheduled as required.				
Sanitary Maintenance Hole Inspections	50 per cent of maintenance holes inspected annually	47%	44%	44%
Measures the percentage of maintenance holes inspected on a two-year cycle as per Durham Service Levels. The target is 50 per cent inspected each year. It is a preventative maintenance procedure which validates condition.				
Mainline Sewer Cleanings	50 per cent of ≤375mm diameter sewers cleaned annually	49%	39%	50%
Measures percentage of sewers cleaned based on size as per Durham Service Levels. A value in the chart above of 50 per cent indicates that the target has been met for the gravity pipes 375 mm diameter and less. This is a maintenance program that can reduce the number of sewer blockages and emergency type calls.				
Condition Index Rating	0 per cent of vertical assets rated as very poor	0.00%	0.00%	0.00%
Measure identifies the percentage of plants, pumping stations and sewage storage facilities which are rated “Very Poor”. A high-level assessment completed by plant operations staff for the process equipment and facilities staff for the building condition is used for scoring until a detailed condition inspection can be done at that location. It is anticipated that detailed condition assessments of all facilities will be done over the next 5 to 7 years. The condition percentage is calculated on replacement value not number of sites.				

Performance Measure	Target	Year of Measure		
		2021	2022	2023
Odour Complaints	0 valid odour complaints per year	0	0	0
Odour complaints can be indicative of the operating process at the sewerage treatment plants. The annual target for this measure is zero valid odour complaints from the public.				
Compliance with MECP Regulatory Requirements	0 per cent wastewater by-passed treatment annually	0.00%	0.02%	0.00%
Measures the percentage of untreated wastewater in accordance with wastewater by-passes as reported to the MECP (numerator) as a share of total megalitres of treated wastewater plus estimated megalitres of untreated wastewater (denominator).				
Back up Power Capabilities	100 per cent of plants and pumping stations with back-up generators	96%	98%	98%
	100 per cent of generators newer than 30 years in age	61%	62%	60%
Ensure that all plants (lagoons not included) and pumping stations have a back up power generator that is no older than 30 years. Only pumping stations that can house a generator are included in the calculation. Portable generators can be used at the other locations. The age measure is calculated using only the number of existing generators currently in place.				

1.6 Sanitary Sewerage System Capital Forecast

Major capital investments for sanitary sewerage services identified through the 2024 business planning and budget process (improvements and repairs and growth) total $157.7 million for 2024 and $2,173.6 million over the 2025 to 2033 forecast period.

Figure 3: Sanitary Sewerage Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to Total due to rounding.

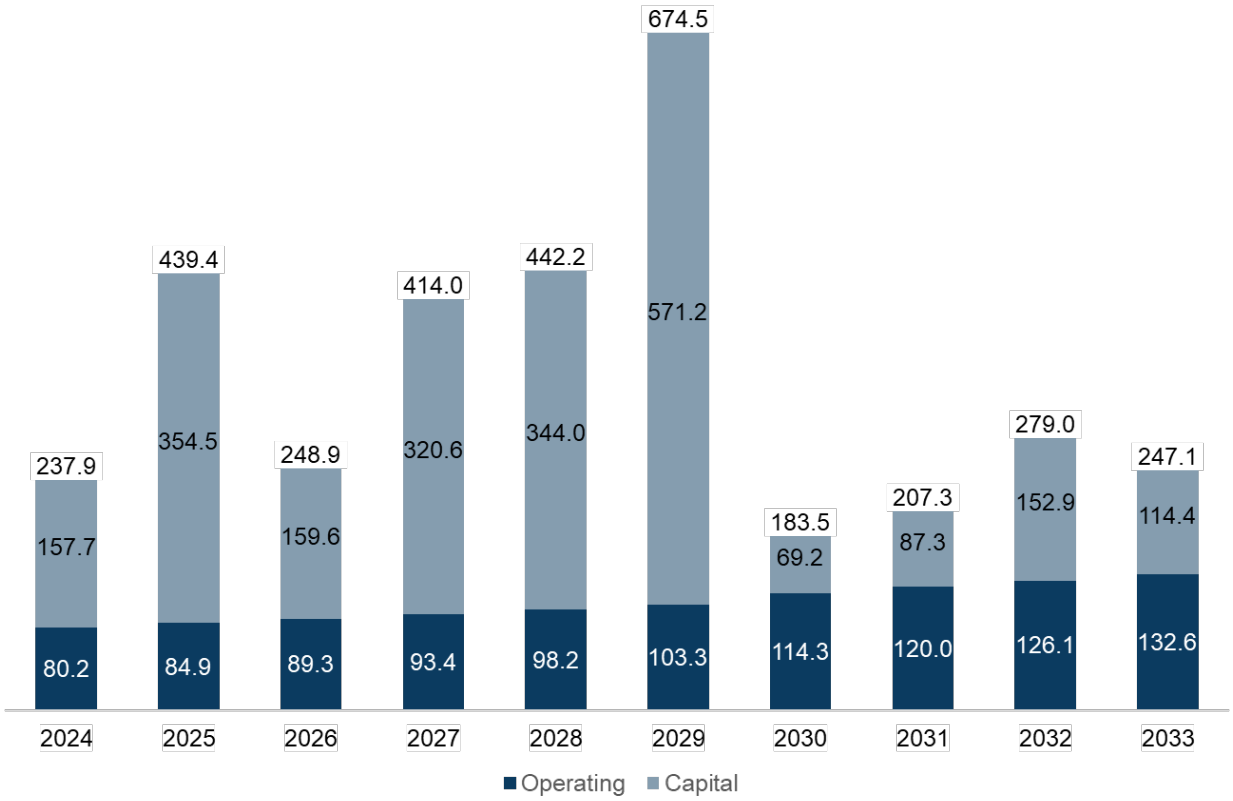
The 2024 Sanitary Sewerage Systems Business Plans and Budget includes $14.0 million to address the priority sewer linear assets in poor or very poor condition and $20.6 million to address asset management needs in sanitary sewerage buildings and equipment.

1.7 Lifecycle

Sanitary sewerage system maintenance and rehabilitation lifecycle activities aim to extend the useful life of linear and vertical assets and improve service delivery. For linear assets these renewal activities include pipe liners, ream and seal technology, and pipe segment replacements.

Figure 4 illustrates capital and maintenance lifecycle costs for the Sanitary Sewerage asset class.

Figure 4: Lifecycle Costs Sanitary Sewerage Operating and Capital ($ millions)*



*Operating and Capital may not add to Total due to rounding.

Total operating lifecycle expenditures for sanitary sewerage systems total $1,042.4 million over the 2024 Budget and nine-year forecast period (2025 to 2033) while capital expenditures total $2,331.3 million over this period.

Lifecycle Activities

Full replacements are preferred when the linear asset condition is in Very Poor condition, or when there is an opportunity to coordinate with other infrastructure work such as road reconstruction or watermain replacement for cost savings.

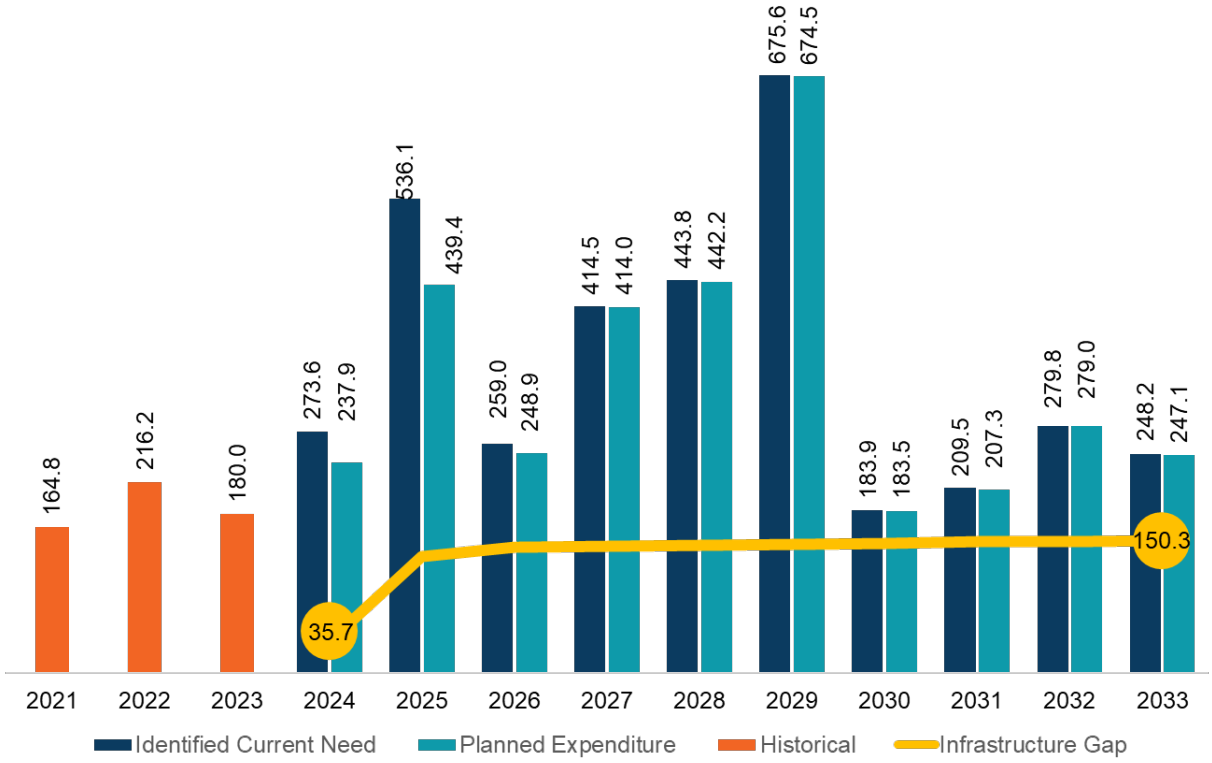
For vertical sewage system assets, lifecycle activities are informed by detailed site-specific condition assessments as well as by Operations and Facilities staff knowledge of issues by attending the various sites regularly. The detailed inspections inform rehabilitation and renewal activities and forecast investment needs over the long-term.

In addition to repair and maintenance activities, other ongoing operating expenditures are required to ensure sanitary sewerage assets can meet service levels. Some examples include gas and fuel, utilities, chemicals, fleet rentals and overhead costs (e.g., office staff, training, software, etc.).

Lifecycle Gap Analysis

Staff have undertaken an analysis to forecast the funding required to optimally sustain current service levels. Any rehabilitation or replacement work required to meet health and safety or legislative standards are reflected in the planned total expenditures while the identified current need builds on the approved budget to accelerate some non-urgent works as illustrated in Figure 5.

Figure 5: Sanitary Sewerage: Lifecycle Gap Analysis ($ millions)



In 2024, the infrastructure gap is estimated at $35.7 million. Based on currently planned expenditures this infrastructure gap increases to $150.3 million in 2033.

The identified current need primarily reflects earlier replacements for some non-urgent linear projects. Not accelerating these projects, may result in increased repair and maintenance work. It is important to note that the planned expenditure investment level poses no health and safety risk or material impacts to service as compared to the identified current need scenario.

Staff will continue to monitor funding needs and refine identification and assessment processes. Moving forward, staff will be further refining lifecycle costing analysis and data collection for both linear and vertical sanitary sewerage assets that will be reported in future asset management plans.

1.8 Climate Change

Climate Mitigation: Sanitary Sewerage Strategies to Reduce GHG Emissions

The Durham Region Corporate Climate Action Plan has set targets to achieve net-zero GHG emissions by 2045. The corporate GHG inventory includes emissions produced to pump and treat wastewater as well as non-energy GHG emissions associated with wastewater management operations.

Key climate change mitigation accomplishments for sanitary sewerage systems in 2023 include:

- Energy management programs and equipment replacements which are more energy efficient to reduce the growth of emissions.

- Adoption of a Light-Duty Fleet Electrification Plan for corporate light-duty fleets.

Key Budget 2024 to 2033 initiatives that support GHG reductions include:

- Completion and implementation of the Water & Wastewater GHG Emission Management Strategy that charts a path to decarbonize water supply and wastewater treatment operations over the next 20 years. The Strategy considers key opportunities such as process emissions measurement, production, and utilization of renewable natural gas and wastewater heat recovery.

- Significant sanitary sewerage process and facility upgrades, renewable energy utilization (e.g., digester gas utilization at wastewater treatment facilities) including the implementation of initiatives from Durham's 2024 to 2029 Energy Conservation and Demand Management Plan.

Climate Adaptation: Increasing the Resiliency of Sanitary Sewerage System

A changing climate can put additional pressures on systems through extreme weather events that necessitate proactive measures and modifications to system design. Priority climate change mitigation measures for sanitary sewerage system include:

- Ensure adequate standby power, redundancies, business continuity and supervisory control and data (SCADA) systems throughout program areas;

- Reduce potential infiltration and inflow of groundwater or stormwater into the sanitary sewer collection system to mitigate flooding and inflow risk;

- Enhance erosion protection at creek crossings to protect sanitary sewer systems; and,

- Continued advancement of sustainability as a core element in the design and construction of Regional infrastructure using best practices and innovations developed through in-house research and partnerships with academia.

Climate adaptation will continue to be addressed through the business planning, budget and long-term financial planning processes to ensure a proactive approach.

1.9 Risk Assessment

Regional staff investigate potential risks to sanitary sewerage system assets on an ongoing basis. Table 6 highlights some high impact potential risks as well as ongoing and new risk mitigation measures.

Table 6: Sanitary Sewerage Systems Risk Mitigation Strategies

Risk	Mitigation
Broken forcemain/trunk sanitary sewer	Pipe twinning capital program to increase forcemain redundancy. SCADA system alerts, controls and improvements. Maintain emergency, contingency re-routing and continuity plans. Forcemain condition assessment pilot project. Inspection and asset repairs, maintenance, and replacements.
Sanitary sewerage inflow and infiltration (I&I)	Gather data to understand performance during extreme storms. System repairs, proactive maintenance, and capital investments. Monitor flows, conduct household drainage surveys and I&I education. Minimize on-site water retention.
Disruptions to wastewater treatment services (e.g., extended loss of power)	Maintain emergency, contingency and continuity plans. Ensure adequate stand-by power and UPS as needed. On-call service contracts. SCADA alerts, response, communication and control. Repairs, preventative maintenance and rehabilitation investments.
Potential contamination of adjacent drinking water sources	Source Water Protection Plan implementation. Phosphorous Reduction Strategy. Effluent Requirements. Sewer Use By-law.

Risk	Mitigation
	SCADA alerts, response, communication and control. Monitor and ensure adequate capacity at all facilities. Vertical and linear condition assessments. Plant upgrades/ replacements. Capital improvements and effluent improvements. Maintain emergency, contingency and continuity plans.



Transportation System

Asset Class Report

Replacement Value	Average Condition
$5,968.2M	**FAIR**

Service Level Objectives

Achieve and maintain an acceptable condition standard for all Regional transportation assets.

Regional roads will be continuous and connected.

Regional roads will be reliable, functional, and serve all modes and users as appropriate and feasible within the context of each project.

Regional roads will be expanded and grow with the Region to provide capacity for users.

Continue to plan asset management infrastructure investments that recognize service impacts.

- 2,450 lane km Road Network
- 247 Bridges and Culverts >3m
- 12,008 Storm Appurtenances
- 367 km Storm Mains and Culverts
- 16 Traffic Management Systems
- 26,461 Traffic Control
- 338 km Traffic Communication Infrastructure
- 104 km Roadside Protection
- 127 CCTV

1.1 Description of Transportation System Assets

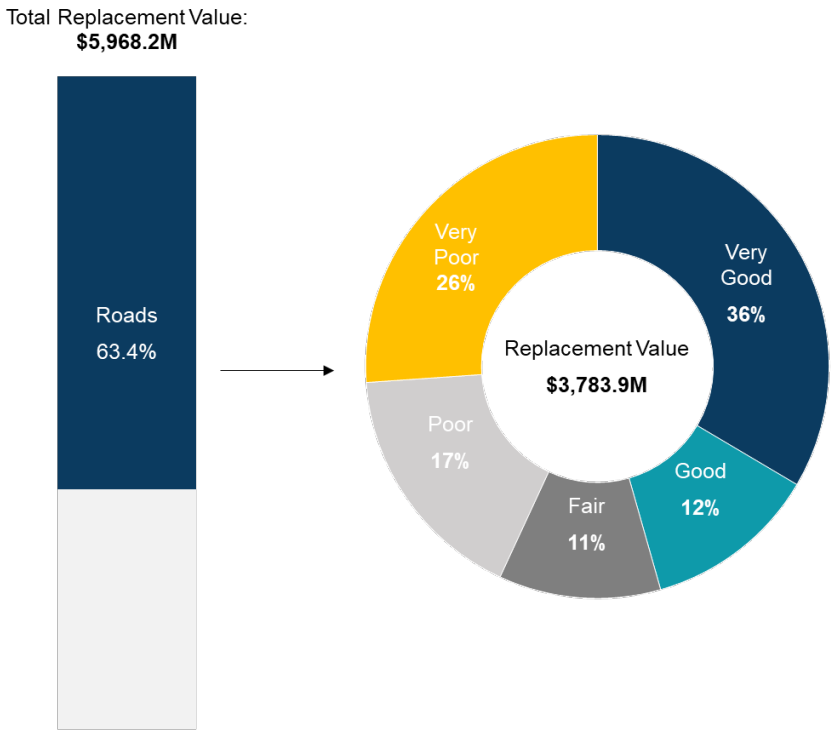
Durham's transportation system assets include a network of urban and rural arterial road segments (including bus only and cycling lanes), bridges, culverts, infrastructure to capture storm water flows from Regional roads, traffic control, safety systems, facilities, fleet assets, equipment assets and other supporting assets. Supporting assets include a portion of the Region's administrative facilities, fleet and equipment that supports the Region's transportation system.

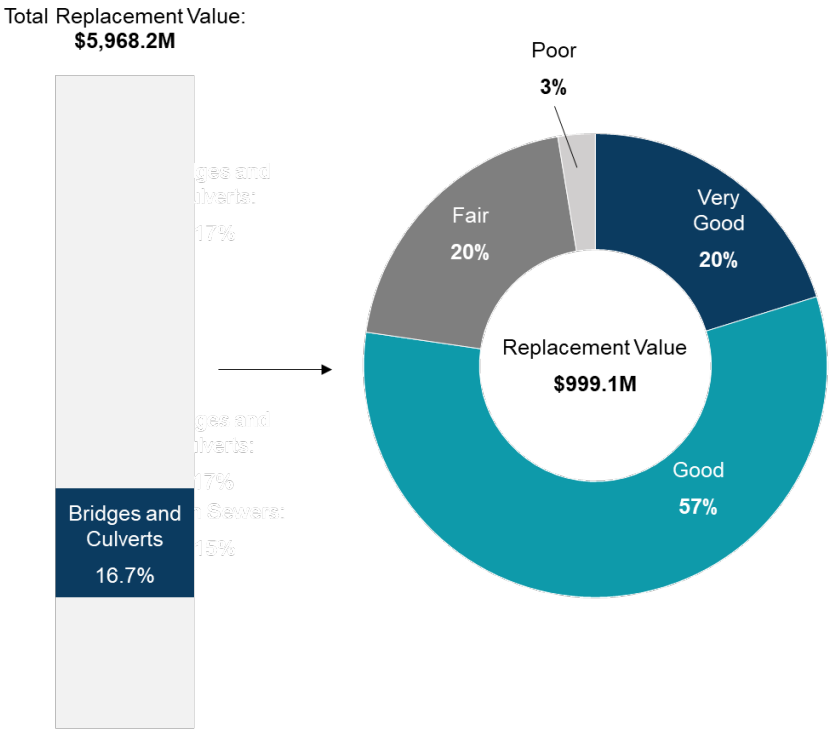
1.2 Transportation Condition Ratings, Replacement Values and Average Ages

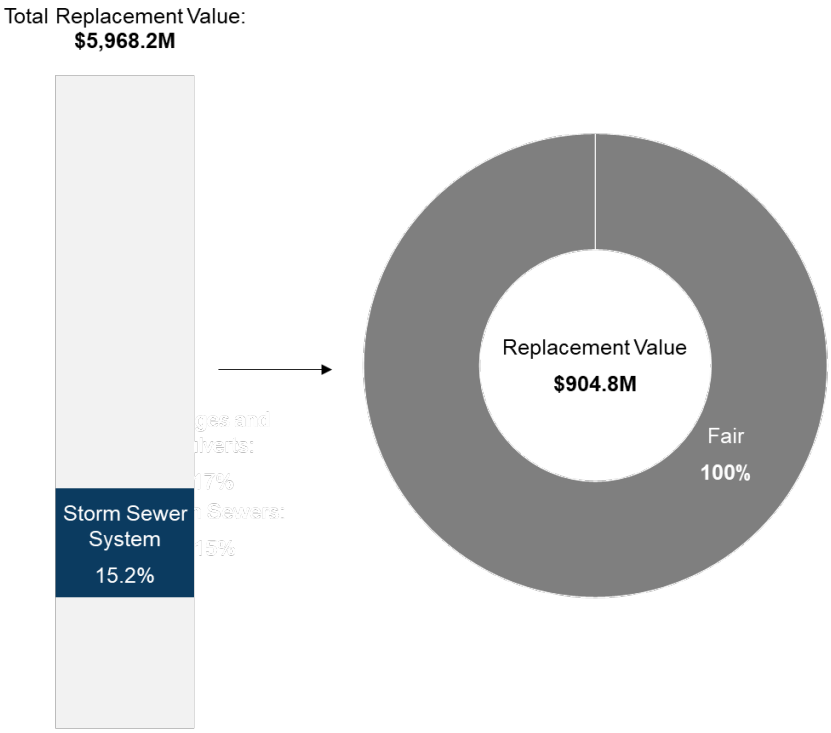
The Transportation asset class has an overall condition rating of Fair comprised of the road network (Fair), bridges and culverts (Good), storm sewers (Fair), and traffic control (Good). Condition ratings have remained stable year-over-year for Transportation asset classes.

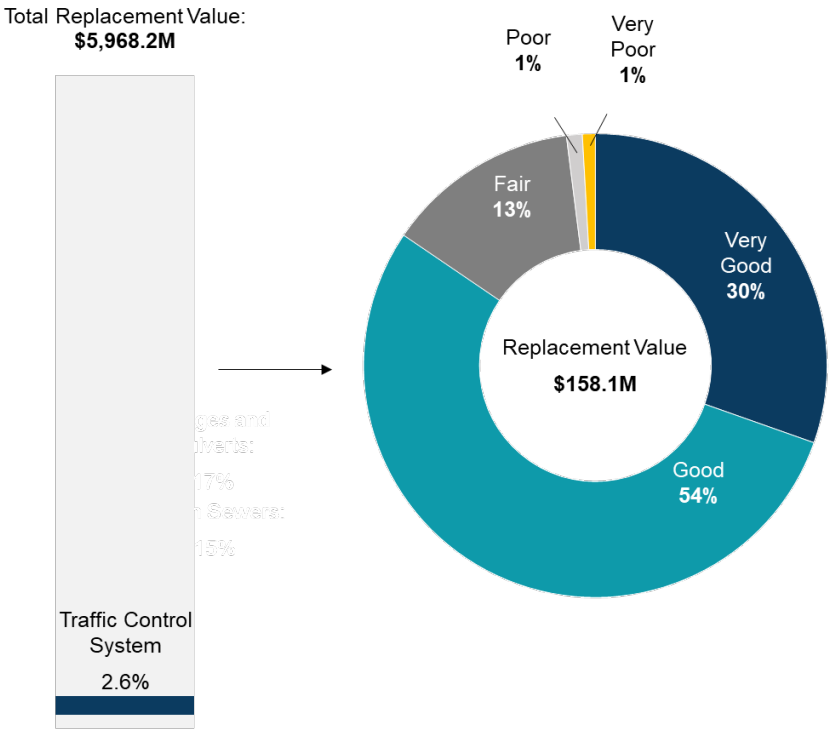
The average Pavement Condition Index (PCI) for Regional Roads was 55.4 in 2023, a slight increase from 52.0 in 2022. The average Bridge Condition Index (BCI) for bridges increased slightly from 76.6 in 2022 to 76.9 in 2023 while the average BCI for culverts greater than 3m decreased slightly from 74.2 in 2022 to 74.1 in 2023.

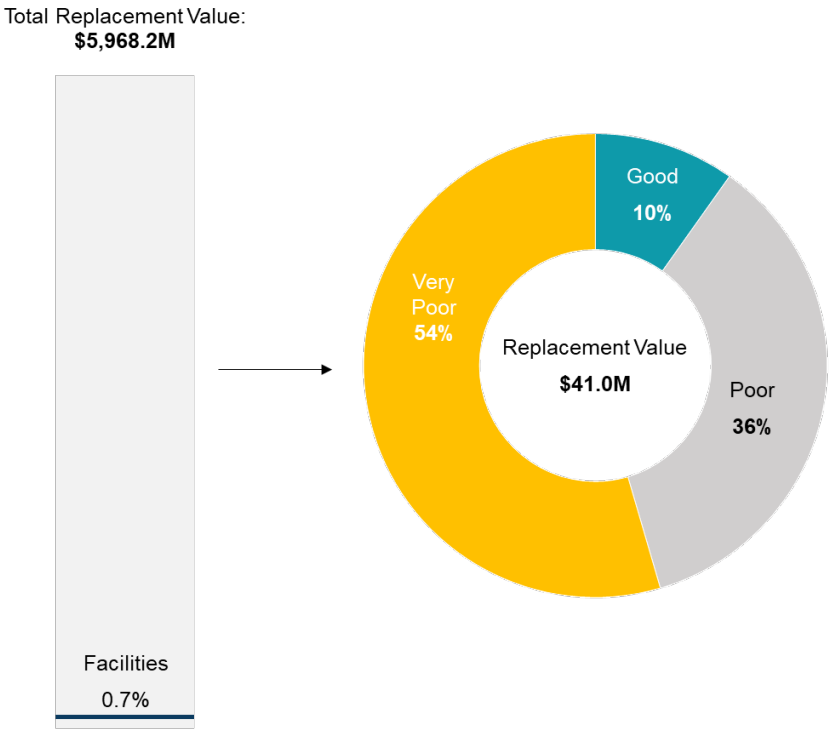
Figure 1: Transportation Condition and Replacement Values

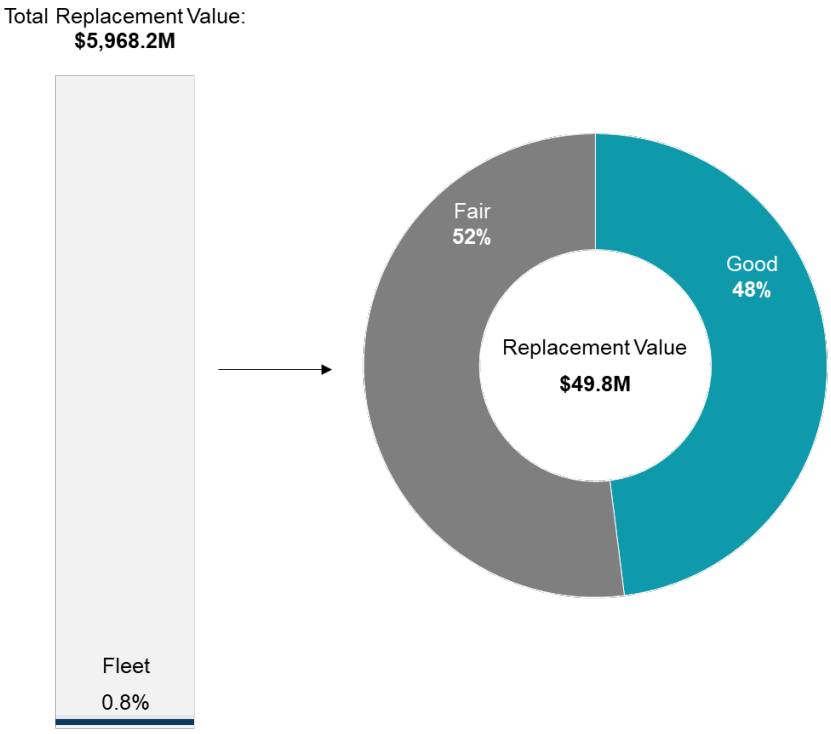


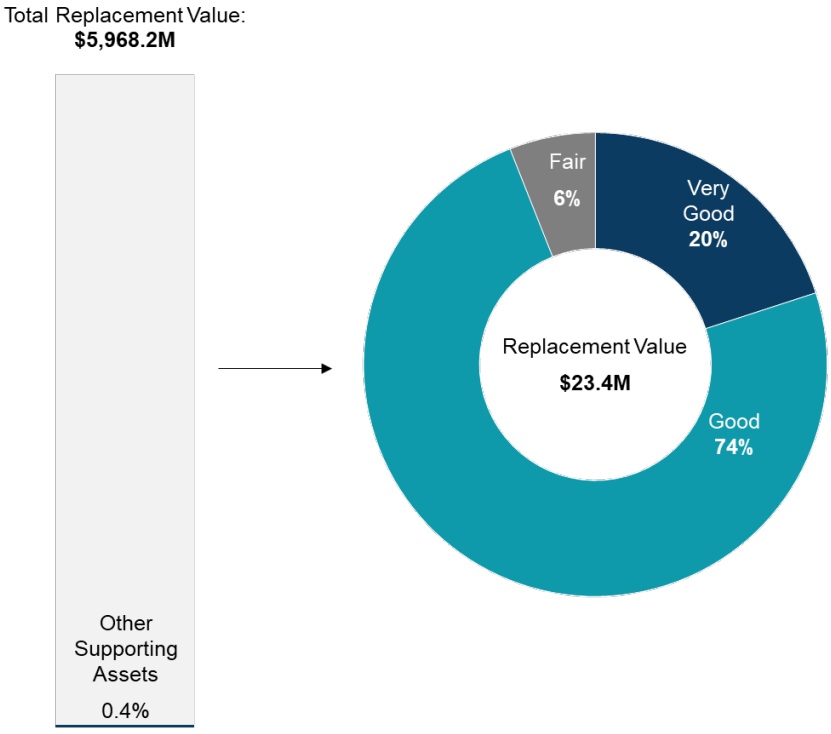

Total Replacement Value:
$5,968.2M
Bridges and Culverts
16.7%
Poor
3%
Very Good
20%
Fair
20%
Replacement Value
$999.1M
Good
57%


Total Replacement Value:
$5,968.2M
Storm Sewer System
15.2%
Replacement Value
$904.8M
Fair
100%


Total Replacement Value:
$5,968.2M
Traffic Control System
2.6%
Poor
1%
Very Poor
1%
Fair
13%
Very Good
30%
Replacement Value
$158.1M
Good
54%


Total Replacement Value:
$5,968.2M
Facilities
0.7%
Good
10%
Very Poor
54%
Replacement Value
$41.0M
Poor
36%





* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include the condition for equipment assets as these are pooled assets.

Overall replacement value of $5,968.2 million represents an increase of 10.4 per cent ($562.0 million) from 202 to 2023 driven primarily by inflationary increases to construction and material costs, shifts among the four types of roads and other minor increases to overall asset inventory.

1.3 Transportation Condition Assessment Methods

Table 1 provides details on the assessment methods used to determine the condition of Transportation assets.

Table 1: Transportation Assets Condition Assessment Methods.

Asset Class	Assessment Methods
Roads	Typically the Works Department assesses the pavement for 50 per cent of the road network annually to generate a Pavement Condition Index (PCI) based on: • Road surface condition (i.e., ride). • Structural adequacy (i.e., distress). In 2023, the Region completed 100 per cent of the road network. PCI is converted into a condition rating.
Bridges and culverts greater than 3m*	Works Department assessment of 50 per cent of inventory annually to generate Bridge Condition Index (BCI). For BCI, each structure element is inspected in accordance with the Ministry of Transportation Ontario Structure Inspection Manual 2018. BCI is then calculated using the MTO Bridge Condition Index Manual 2009 and is a weighted average of all structure elements and their conditions. BCI is converted into a condition rating.
Traffic Control Signals	Each signalized intersection is rated based on condition.
Traffic Signs	Visual condition assessments including testing for reflectivity.
Other Traffic Assets	A combination of condition assessments and age-based assessments.
Fleet	Mileage and vehicle inspection.

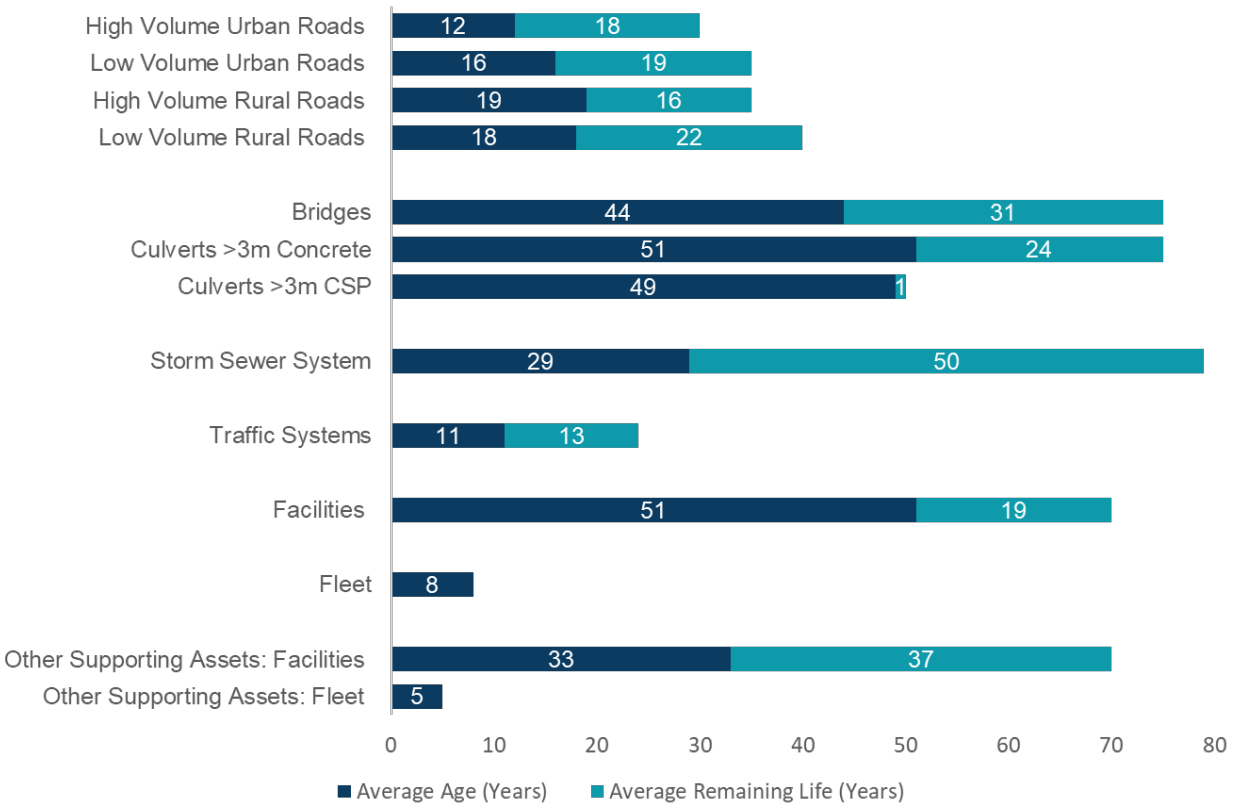
Asset Class	Assessment Methods
Facilities	Regional staff employ a Building Condition Assessment (BCA) method to assess the condition of Regionally-owned facilities. For each facility, a BCA is performed on a 10-year cycle by external consultants. BCAs assess the condition of major building elements, sub-structures, shells, interiors, services and site work.

*BCI is not used to rate or indicate the safety of a bridge or culvert. Any safety issues are immediately reported to the Region by the inspector for immediate action and repair.

1.4 Transportation System Average Age and Remaining Useful Life

Figure 2 summarizes the average age and remaining life of the transportation system.

Figure 2: Transportation System Remaining Useful Life



1.5 Levels of Service and Performance Measurement

Service levels objectives and performance targets are set through Regional Council approved master plans, studies, policies and procedures, as well as through departmental studies and regulatory and/or compliance guidelines.

Table 2: Plans, Studies, Policies, Procedures, Regulations that Inform Service Levels

Departmental Plans, Studies, Policies, & Procedures
• Transportation Master Plan • Road Maintenance Operations Service Levels • Transportation System Design and Maintenance Standards and Specifications • Salt Management Plan • Traffic and Parking By-law • Intelligent Transportation System Strategic Plan • Sign Inventory and Reflectivity Review • Roadside Protection Inventory Review • Regional Cycling Plan • Vision Zero

Regulatory Compliance Guidelines and Requirements
• Minimum Maintenance Standards for Municipal Highways (Ontario Regulation 239/02) • Standards for Bridges (Ontario Regulation 472/10) • Public Transportation and Highway Improvement Act, • Transportation Association of Canada Geometric Design Guide for Canadian Roads • Environmental Assessment Act • Canada Transportation Act • Highway Traffic Act

Detailed service level descriptions and targets are outlined in the Community Level of Service, Technical Levels of Service and Performance Measures subsections that follow.

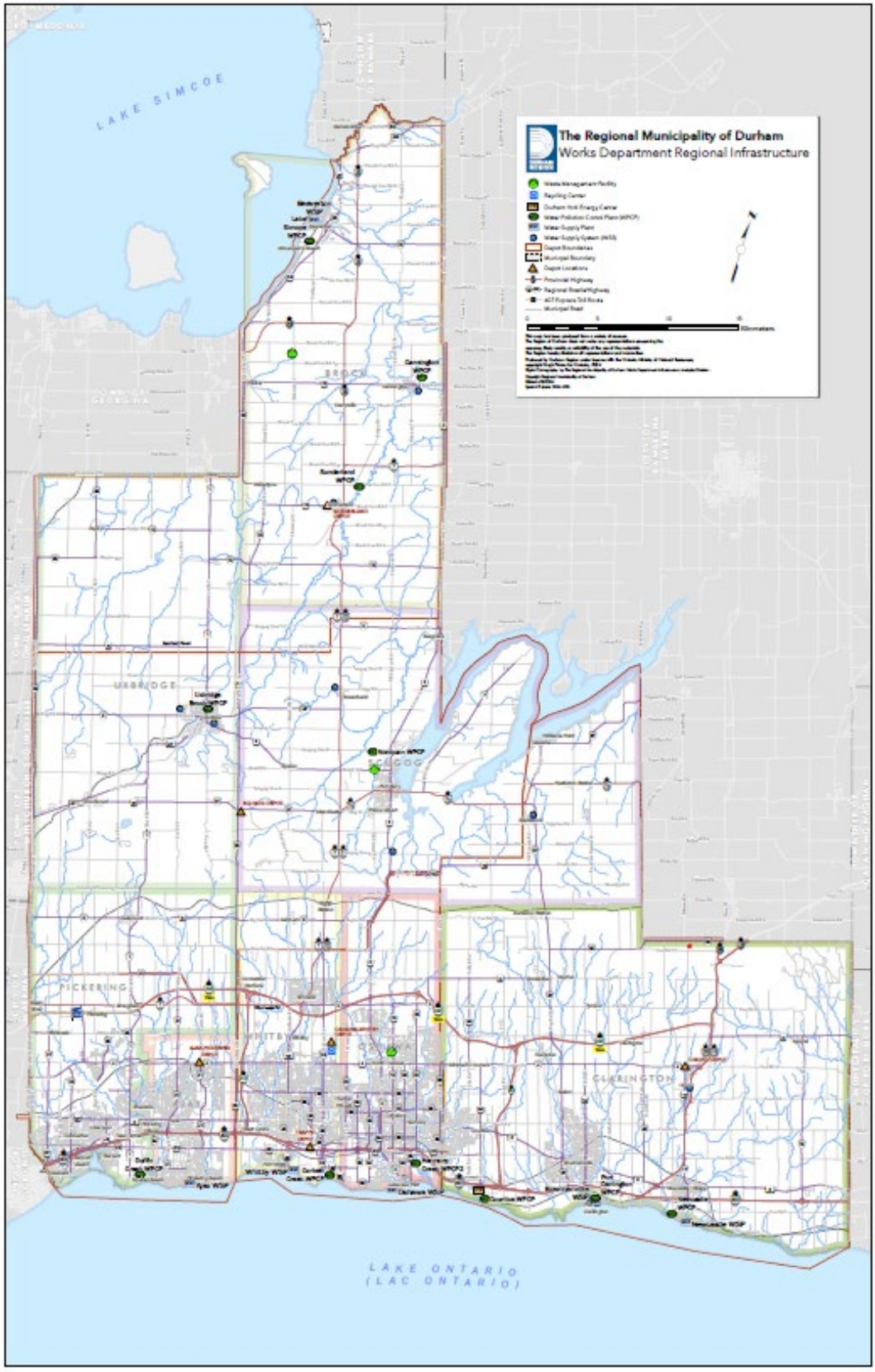
Community Levels of Service

Community levels of service provide qualitative descriptions of service reliability, service standards and service scope and reporting criteria are mandated in Ontario Regulation 588/17.

Table 3: Community Levels of Service

Criteria	Description
Description, which may include maps, of the road network in the municipality and its level of connectivity.	Refer to Map 1.
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.	Refer to Map 2.
Description or images that illustrate the different levels of road class pavement condition.	Refer to Figure 3.
Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	The Region's bridges and culverts are designed, built and support all vehicular traffic, including motor vehicles, heavy transport vehicles and emergency vehicles. Cyclists and pedestrians are also accommodated where bike lanes, sidewalks and/or multi-use paths are provided on the bridge structures.
Description or images of the condition of bridges and how this would affect use of the bridges.	Refer to Figure 4.
Description or images of the condition of culverts and how this would affect use of the culverts.	Refer to Figure 4.

Map 1: Durham Region Road Network



Map 2: Regional Floodplain Potential

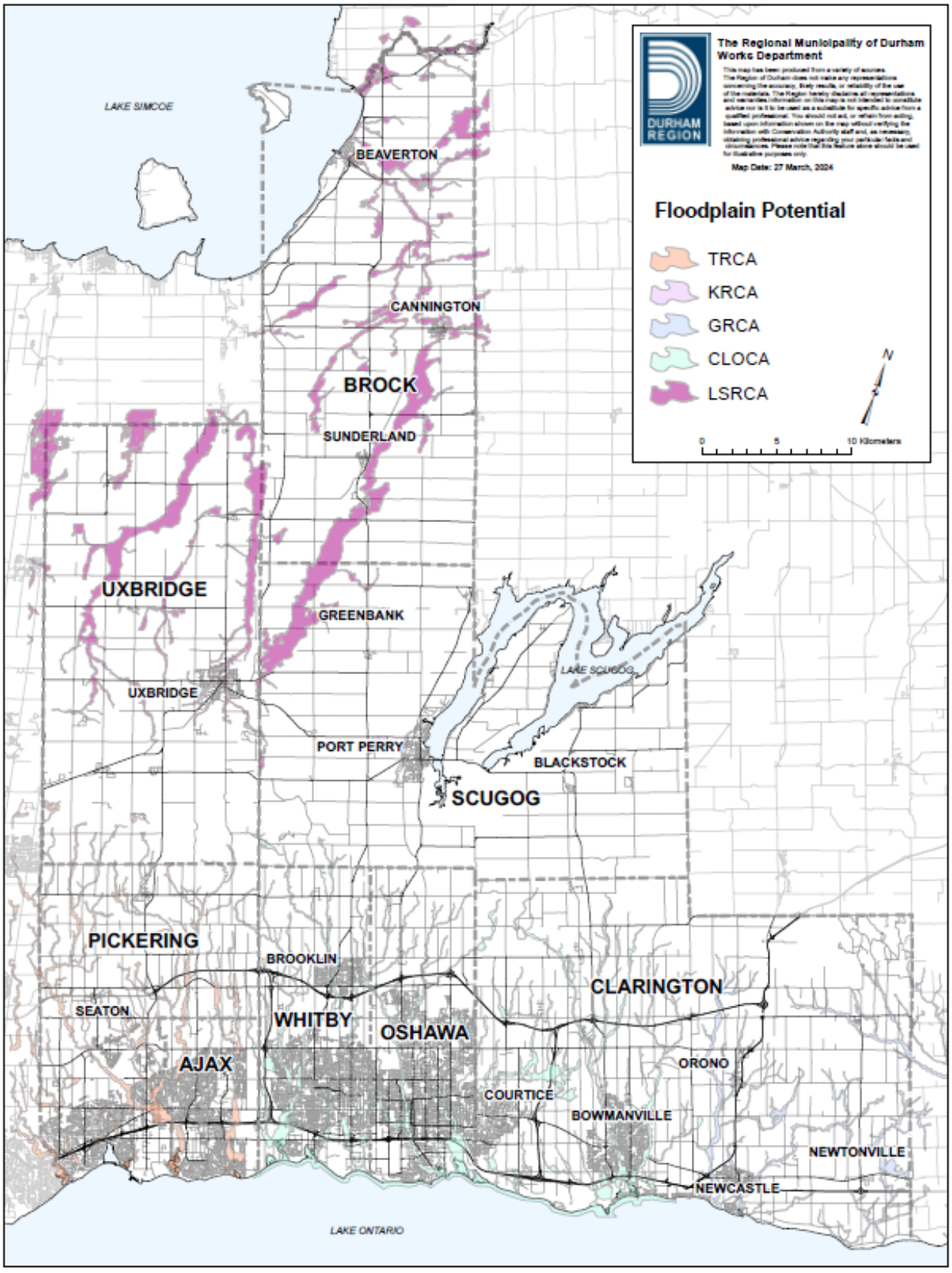


Figure 3: Regional Road Condition Index Rating

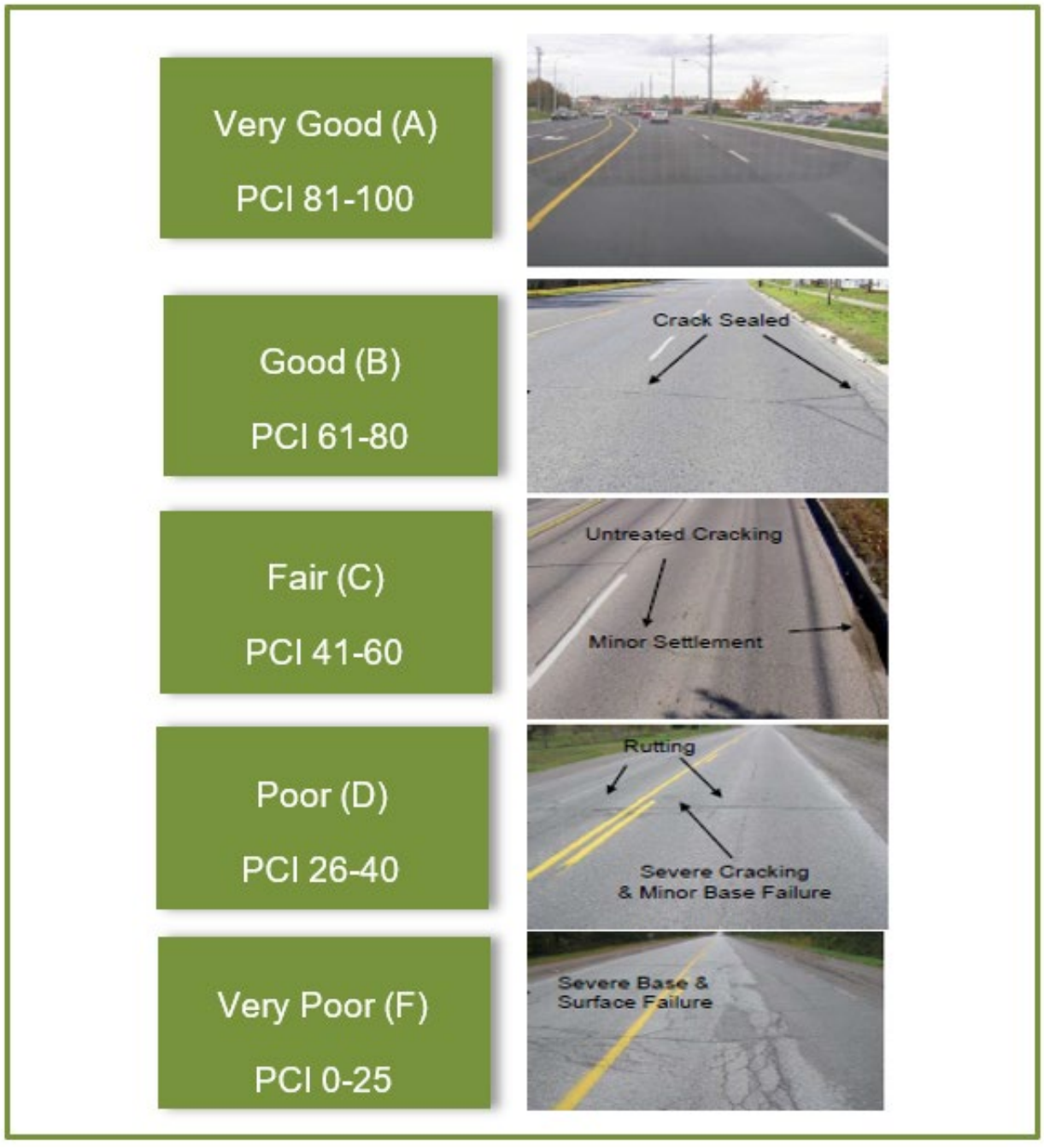


Figure 4: Structure BCI Condition Ratings

Rating	Bridge Condition	Culvert Condition	Description/How Condition Impacts Use
Very Good (BCI 80-100)			New bridge or culvert, no signs of deterioration, use not affected
Good (BCI 70-79)			Minor signs of deterioration, minor levels of maintenance required, use not affected
Fair (BCI 60-69)			Signs of deterioration, exceeding levels of maintenance, may require load posting
Poor (BCI<60)			Significant deterioration, approaching end of service life, may require load posting

Technical Levels of Service

Ontario Regulation 588/17 mandates reporting on prescribed technical metrics for roads, bridges, culverts greater than 3m and stormwater management assets.

Table 4: Technical Levels of Service per Ontario Regulation 588/17

Technical Metric	Target	Year of Measure		
		2021	2022	2023
Network average pavement condition index (PCI)	Network average PCI rating of 65	52.0	52.0	55.4
PCI summary of every regional road segment in a network-weighted average. PCI is rated between 0 to 100, with 100 being the best condition and 0 being the worst condition.				
Number of lane km's of regional roads per Durham's land area (km^2).	To achieve a target of 1.1	0.97	0.97	0.97
This measure reports the number of Regional road lane kilometres as a proportion of the size of the Region's land area (2,537 km^2). This measure identifies growth in the Regional road network over time relative to its land size.				
Weighted average bridge condition index value for structures	Inventory weighted average BCI rating of 70 for Bridges	75.9	76.6	76.9
	Inventory weighted average BCI rating of 70 for culverts (> 3m)	76.6	74.2	74.1
Summary of the inventory weighted average bridge condition index (BCI) value for bridges and culverts greater than 3m.				
Number of bridges with loading and dimensional restrictions	To have no bridges with loading or dimensional restrictions	1	2	2
This measure summarizes the number of bridges that have loading and/or dimensional restrictions. The target is 0 to ensure the transportation network is fully accessible, functional and available for all users.				

Technical Metric	Target	Year of Measure		
		2021	2022	2023
Number of culverts with loading and dimensional restrictions	To have no culverts with loading or dimensional restrictions	1	1	0
This measure summarizes the number of culverts that have loading and/or dimensional restrictions. The target is 0 to ensure the transportation network is fully accessible, functional and available for all users.				
Percentage of bridges in the municipality with loading or dimensional restrictions	To have 0% of bridges with loading or dimensional restrictions	1%	2%	2%
This measure provides the percentage of the Region's bridges that have a loading or dimensional restriction. The target is 0 to ensure the transportation network is fully accessible, functional and available for all users.				
Percentage of culverts in the municipality with loading or dimensional restrictions	To have 0% of culverts with loading or dimensional restrictions	1%	1%	0%
This measure provides the percentage of the Region's culverts that have a loading or dimensional restriction. The target is 0 to ensure the transportation network is fully accessible, functional and available for all users.				
Percentage of properties in municipality resilient to a 100-year storm	90% of properties resilient to 100-year storm	94%	N/A	95%
2021 was the first year technical levels of service for stormwater were analyzed/reported. These measures will continue to be reviewed and refined for future Asset Management Reports.				
Percentage of the municipal stormwater management system resilient to a 5-year storm	100 per cent of the SWM system resilient to a 5-year storm	98%	N/A	98%
2021 was the first year technical service levels for stormwater were analyzed/reported. These measures will continue to be reviewed and refined for future Asset Management Reports.				

Note the Region does not have unpaved, collector or local roads and does not report on these technical metrics.

Performance Measures

Beyond community service levels and technical reporting requirements of Ontario Regulation 588/17, Transportation tracks a number of performance metrics to measure how well assets are meeting service level objectives.

Table 5: Transportation Performance Measures

Performance Measures	Target	Year of Measure		
		2021	2022	2023
Road Condition Distribution	No more than 25 per cent of Inventory is in Poor to Very Poor Condition	42%	42%	44%
Measure identifies percentage of road assets (lane kms) falling into the Poor to Very Poor condition category (not weighted by replacement value). Target recognizes that implementation of additional funding generally is phased over time. Condition distribution provides a clearer overall picture rather than just focusing on one asset condition. Current/Baseline measure data is the percentage of total lane kms.				
Structure Condition for Bridges and Culverts	85 per cent of Structures Rated Good to Very Good	69.9%	71.3%	67.6%
This measure summarizes the percentage of bridges and culverts (quantity) that are rated in Good to Very Good condition based on the bridge condition index (BCI) value (not weighted by replacement value).				

1.6 Transportation Capital Forecast

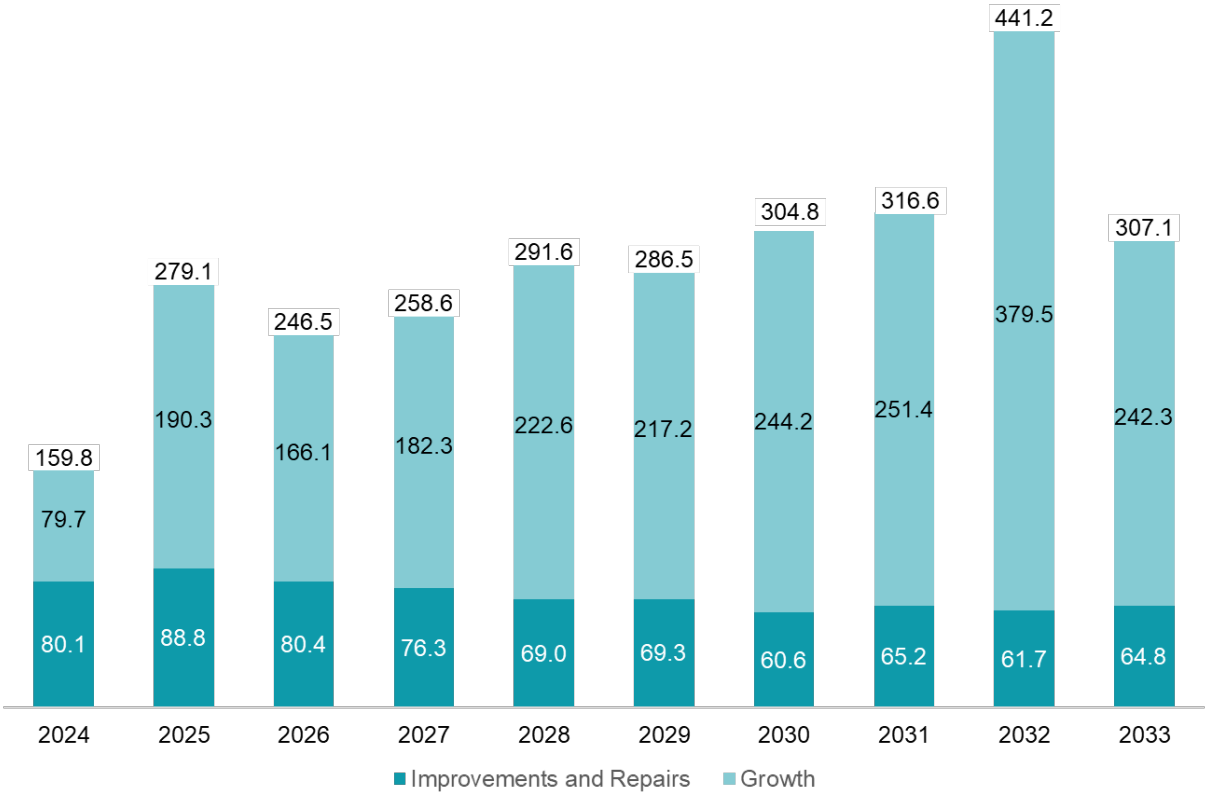
Major capital investments for Transportation identified through the 2024 business planning and budget process (improvements and repairs and growth) total $159.8 million and includes:

- $38.7 million for road rehabilitation projects, $18.1 million for bridge rehabilitation and replacement projects.
- $32.4 million in Transportation infrastructure to support bus rapid transit which is partially funded through the Investing in Canada Infrastructure Program Transit Stream (ICIP). This initiative will contribute to reducing community GHG emissions.
- $1.5 million in capital expenses related to increasing safety on the Regional road network.

The total transportation capital expenditure over the 2025-2033 forecast period is estimated at $2.7 billion. Key highlights of the forecast include:

- Annual average investment of $47 million throughout the forecast period to increase the average pavement condition of the Region's road network.
- The forecast also includes significant costs related to bridge rehabilitation and replacements, including pressures in 2025 and 2026 related to the advancement of rehabilitation work on three bridges in coordination with Metrolinx as it implements the Bowmanville GO Rail Expansion project.
- $12.4 million in cycling infill projects over the forecast to support the Regional Cycling Plan.

Figure 9: Transportation Capital Forecast ($ millions)*



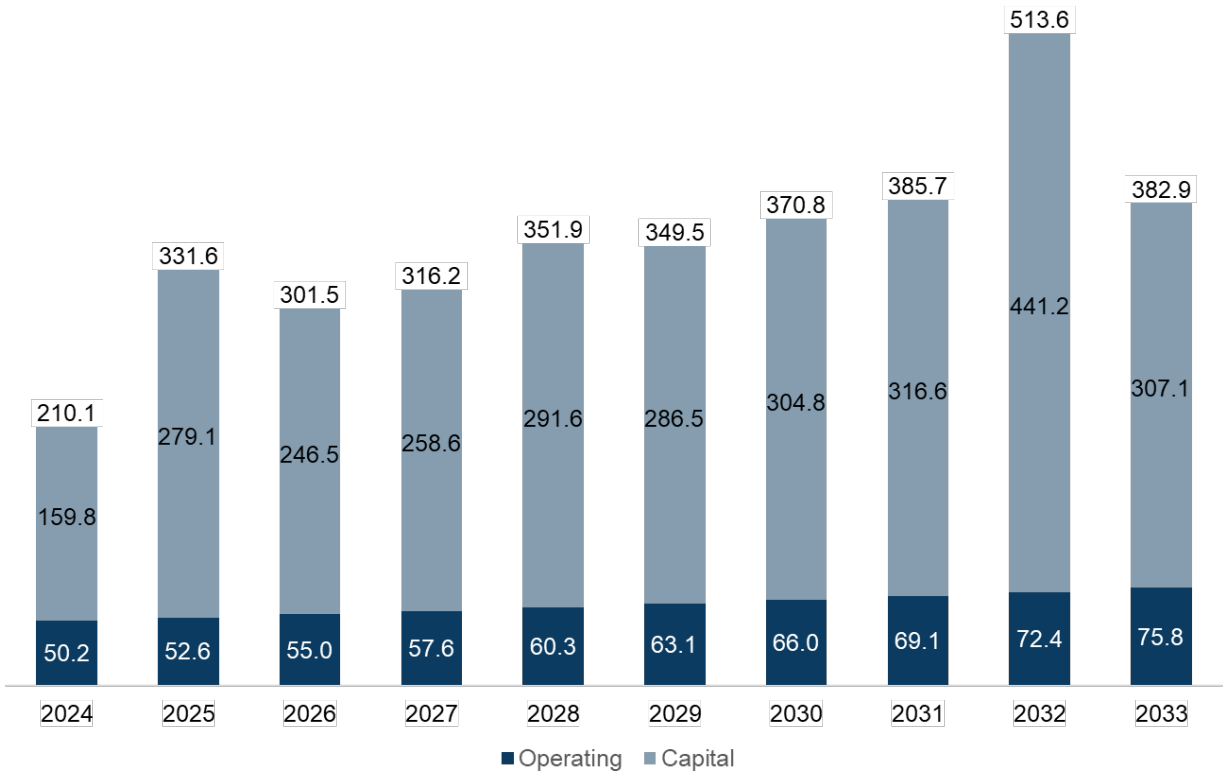
*Improvements and Repairs and Growth may not add to Total due to rounding.

1.7 Lifecycle

Transportation lifecycle activities include capital investments and operating activities required to meet service needs at the lowest cost and risk for Regional roads, bridges, culverts, stormwater management systems assets and traffic systems over their entire useful lives.

Figure 5 illustrates operating and capital lifecycle costs for the Transportation asset class.

Figure 5: Lifecycle Costs Transportation Operating and Capital ($ millions)*



*Operating and Capital may not add to Total due to rounding.

Total operating lifecycle expenditures for Transportation totals $622.1 million over the 2024 Budget and nine-year forecast period (2025 to 2033) while capital expenditures total $2,891.7 million over this period.

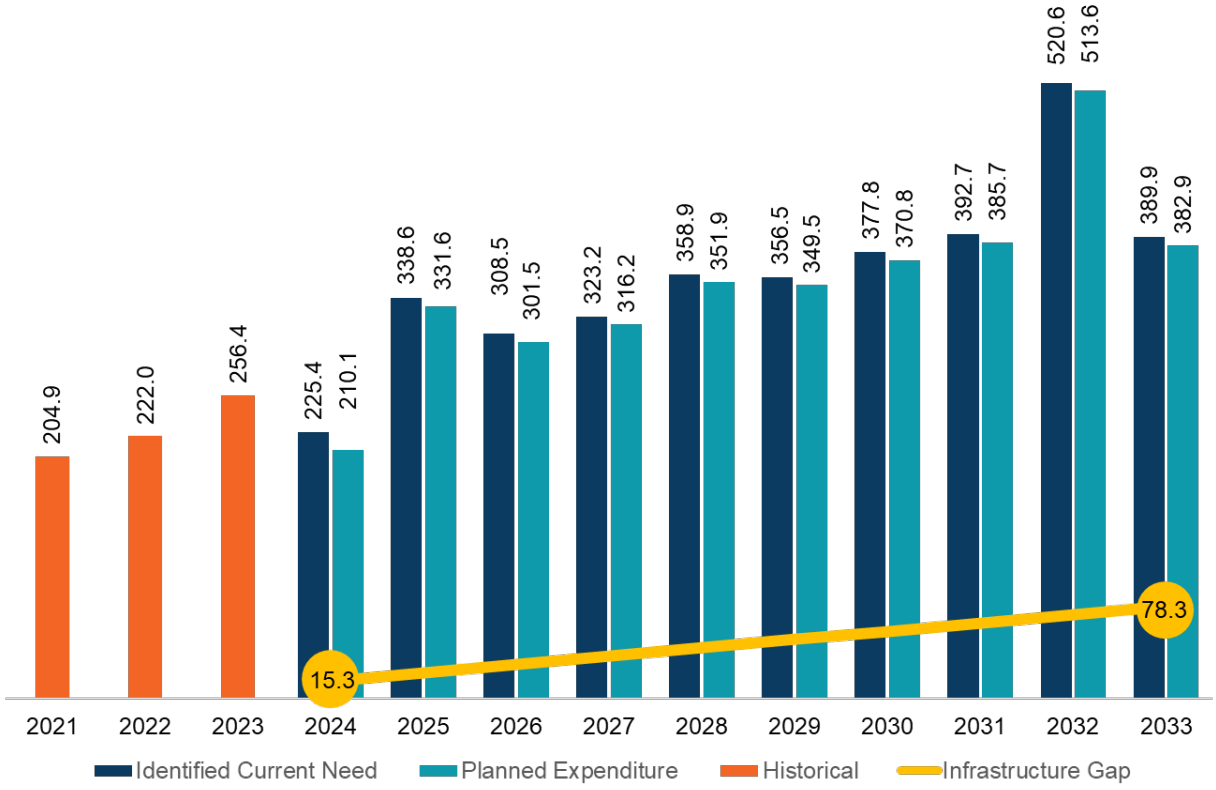
Lifecycle Activities

Staff in various service areas of Transportation (Roads, Structures and Traffic) have undertaken an analysis to forecast the current funding required to optimally sustain current service levels. Figure 6 illustrates historical lifecycle costs as well as identifies an infrastructure gap for the Transportation Asset class as a whole. Any rehabilitation or replacement work required to meet health and safety or legislative standards are reflected in the planned total expenditures.

In 2024, the infrastructure gap is estimated at $15.3 million. Based on currently planned expenditures this infrastructure gap increases to $78.3 million by 2033.

Further details on lifecycle costing and the identified infrastructure gap are provided in the subsections that follow.

Figure 6: Transportation: Lifecycle Gap Analysis ($ millions)



Roads

Timely road maintenance and rehabilitation lifecycle activities can extend the useful life of a road avoiding costly, premature replacement and improve PCI ratings for the Regional roads network. Figures 7 and 8 illustrates how following rehabilitation and maintenance guidelines can prolong the useful life of a road.

Figure 7: Preventative Maintenance Impact on Road Replacement (High Volume Urban)

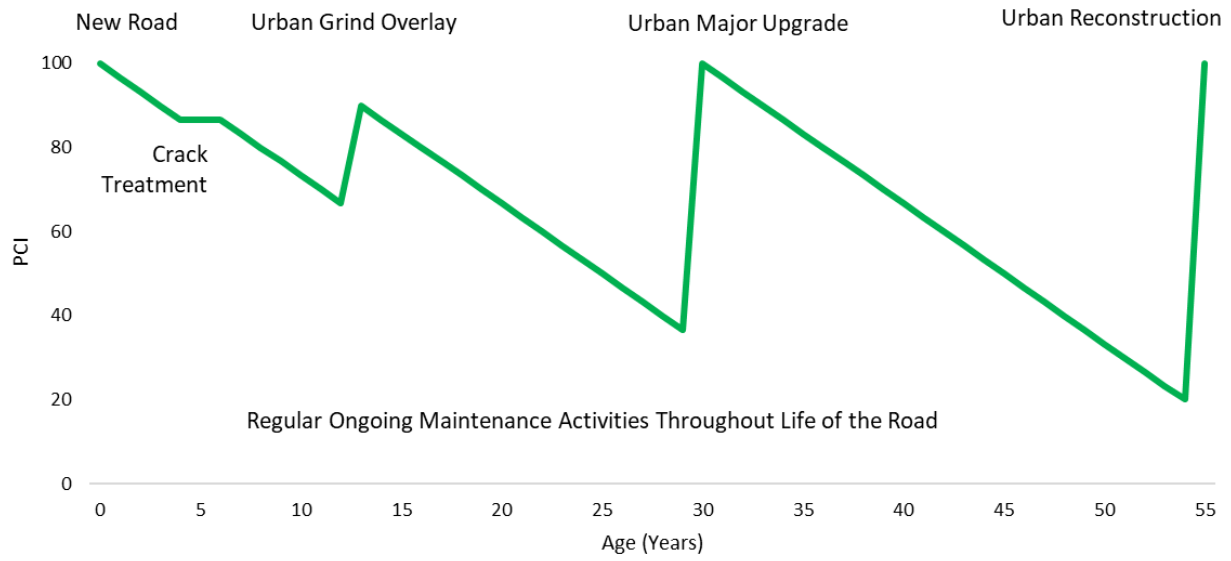
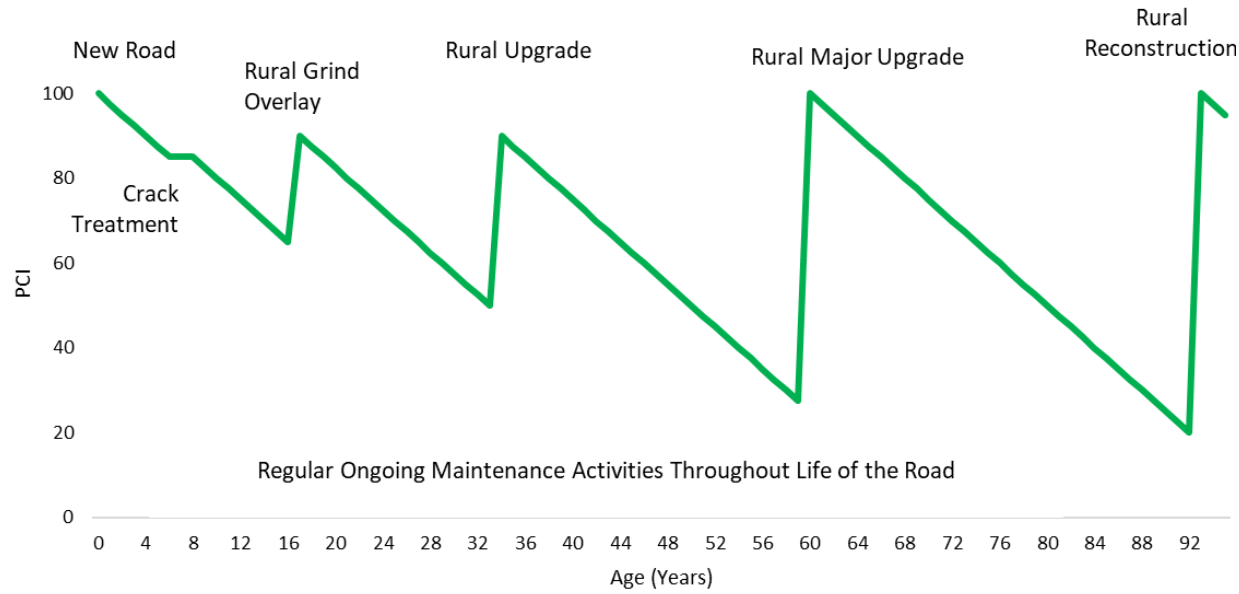


Figure 8: Preventative Maintenance Impact on Road Replacement (Low Volume Rural Roads)



The Region uses a road rehabilitation optimization software program, along with road treatment guidelines (Table 6), and the consideration of other factors (e.g., volumes), to determine the timing and type of treatment to be applied within the confines of available funding.

Table 6: Road Maintenance Guideline

Activity	PCI Criteria	PCI Reset
Rural/Urban Crack Treatment	PCI >80<= 90	Maintain
Rural Grind Overlay	PCI >65<= 75	90
Rural Upgrade	PCI >35<= 65	90
Rural Major Upgrade	PCI =>20<= 35	100
Rural Reconstruction	PCI <20	100
Urban Grind Overlay	PCI >45<= 70	90
Urban Major Upgrade	PCI >30<= 45	100
Urban Reconstruction	PCI<= 30	100

The exact timing and type of road lifecycle treatment can vary due to car and truck volumes and strategic prioritization decisions. For example, there may be instances where it would be beneficial to allow the pavement condition of a particular road to reach the next suggested treatment type to align timing of rehabilitation works.

In addition to maintenance activities, staff must undertake other ongoing operating activities to ensure that Regional roads deliver their expected levels of service. Some key non-maintenance operating lifecycle activities include winter plowing, roadside dust control, and overhead (payroll, communication expenses, vehicle fuel) at facilities and depots.

The identified current need for roads is not met in planned expenditures resulting in a cumulative infrastructure funding gap of $78.3 million by 2033. Identified current needs represents a backlog of reconstruction or rehabilitation of roads falling below a PCI of 65. Planned expenditures reflect prioritizing road investments and an overall slower pace of improving network road conditions.

Bridges and Culverts (greater than 3m)

The bridges and culverts greater than 3m are inspected biennially, where a Bridge Condition Index (BCI) is calculated that assists in informing which treatment shall be applied to structures to maintain or improve their condition. The BCI is not used to rate or indicate the safety of a bridge or culvert. Any safety issues are immediately reported to the Region by the inspector for immediate action and repair.

The Region's bridge maintenance and repairs program and culvert maintenance and repairs program are essential to maintaining the Region's bridge network in a safe and optimal condition and extending their useful life at the lowest cost to taxpayers.

In addition to maintenance activities, staff must undertake other ongoing operating activities to ensure that Regional structures deliver their expected levels of service. Some key non-maintenance operating lifecycle activities include tree and lawn cutting, bridge cleaning/washing, and overhead (staff support and administrative expenses).

The current approved budget and planned nine-year forecast are meeting service needs for bridges and culverts, as such there is no identified infrastructure funding gap.

Traffic

The capital traffic program targets and prioritizes annual modernization needs of aging traffic signal equipment (typically traffic signal controllers) to improve reliability, functionality, and operating efficiency as well as to address the replacement for LED traffic signals.

In addition to capital replacement and improvement activities, staff must undertake operating activities to ensure that the traffic network delivers its expected levels of service. Some operating costs include overhead (payroll, communication expenses, uniforms, software), signal maintenance and systems and a portion of facility costs for 101 Consumers Drive in Whitby.

The planned expenditures deliver traffic signal capital improvements according to forecast and approved schedules which result in improved service over the nine-year forecast period without the risk of premature replacement of assets. It is important to note that the approved budget and forecast poses no health and safety risk as compared to the identified current need scenario.

Going forward, lifecycle costing for Transportation will be refined including refining assumptions to identify needs and further defining traffic service levels. These improvements will be reflected in future asset management reports and lifecycle gap analysis.

1.8 Climate Change

Climate Mitigation: Transportation Strategies to Reduce GHG Emissions

The Durham Region Corporate Climate Action Plan has set targets to achieve net-zero GHG emissions by 2045. The corporate GHG inventory related to Transportation assets includes emissions associated with Works Depots used to support the operating and maintenance of the Regional Road network and from operating traffic signals. GHG emissions from Transportation assets represent a very small portion of overall corporate emissions.

Climate Adaptation: Increasing the Resiliency of Transportation Assets

Staff continue to assess transportation strategies to mitigate against the impacts of a changing climate and have already integrated several considerations into Regional business and financial plans.

Risk and climate related mitigation programs for 2024 include:

- Continuation of the Uninterrupted Power Supply (UPS) for traffic signals to ensure adequate backup power for key intersections ($0.5 million);

- Paved shoulders for rural road construction projects where feasible (as recommended in the Transportation Master Plan);

- Other ongoing traffic initiatives including $0.6 million for Intelligent Transportation Systems (ITS) projects, $1.0 million for Accessible Pedestrian Signal (APS) installations, and $1.5 million for roadway safety program and Durham Vision Zero Program; and

- Implementation of the Region's Light-Duty Fleet Electrification Plan for corporate light duty fleets

Moving forward, staff will continue to investigate, monitor, and explore ongoing proactive strategies and programs, which help prevent adverse climate impacts to roads and structures including:

- Resilient Asphalt: Monitoring the impacts of climate changes on the performance of asphalt and concrete products used in regional roads construction, with product specifications adjusted as needed to mitigate and enhance materials' performance;

- Adaptive Structures (culverts, bridges and storm sewers): Monitoring of the impacts from increased storm intensity on the capacity and integrity of regional structures;

- Build on flood risk and vulnerability assessment work completed with the Conservation Authorities in 2021 – 2023 to incorporate flood risk data into corporate decision-making that informs capital planning and asset management for critical infrastructure by expanding flood risk assessment work into areas of the Region where significant development is planned over the coming decades;

- Embankment and Erosion Control: Adjusting specifications and design criteria to mitigate erosion. Road shoulders are primed with liquid asphalt and liquid calcium chloride to control dust and erosion with frequent inspections of erosion prone areas; and

- Road Safety and Response: State-of-the-art road weather information systems to monitor weather/pavement conditions (e.g. infrared road temperature sensors).

Staff will continue to ensure asset management plans advance long-term and effective responses to climate change.

1.9 Risk Assessment

Table 7 includes a sample of identified risks for the Region's Transportation assets in achieving its service level standards as well as the mitigation controls to address these risks.

Table 7: Risk Mitigation Strategies

Risk	Mitigation
Extended power outage	Ensure standby power at traffic intersections and Traffic Operations Centre. Ensure effective emergency, contingency and business continuity plans.
Asset structural failures or impacts to asset effectiveness	Optimization of asset life cycles, proactive maintenance and cleaning. Asset Management database, inspections and patrols. Pest control programs (e.g., beaver damage to culverts, bridges). Design considerations for future storm events. Effective emergency, contingency and business continuity plans. Adequate redundancies and proactive detours and closures where required.
Extreme wind events and storms beyond existing capacity/response capability affecting roads, structures and sites.	Adequate redundancies and proactive detours and closures where required. Effective emergency, contingency and business continuity plans (REMS). Post-storm clean-up protocol, assessments and improvements.

Risk	Mitigation
An increase in winter freeze-thaw cycles and temperatures at or near 0ºC	Extensive winter control programs (e.g., salt management plan). State-of-the-art weather systems and Roadway Condition Advisory System. Optimization of asset life cycles including proactive maintenance. Design considerations and erosion control (roads, shoulders, structures).
Potential for road washouts/ditch flooding and overland flooding that could cause contaminant migration (e.g., road salt, oil, grease)	Optimization of asset life cycles, proactive maintenance and cleaning. Inspections and patrols. Effective emergency, contingency and business continuity plans (REMS). Adequate redundancies and proactive detours and closures where required. Design considerations and erosion control (roads, shoulders, structures).
Motor vehicle road incidents	Design, inspection and maintenance standards. Road signage, roadside protection and inventory assessments. Effective emergency, contingency and business continuity plans. Extensive Winter Control Program (RCAS) and Roadway Event Management System (e.g., speed and condition warnings). Implementation of the Region’s Vision Zero Program. Proactive detours and closures where required for safety.

Durham Region Transit

Asset Class Report

Replacement Value	Average Condition
$269.1M	**VERY GOOD**

Service Level Objectives

Increase ridership and enhance customer experience.

Develop and operate a transit system that is available, consistent, direct, frequent and seamless thereby providing enhanced mobility for Durham Region residents and visitors with an attractive alternative to the personal car.

Increase operational effectiveness through asset management planning for future growth and existing assets.

Maintain an acceptable condition standard for all Regional Transit assets.

- 161 Conventional Buses
- 5 Specialized Buses
- 16 Supervisory Fleet
- 2 Maintenance, Administrative and Bus Storage Facilities
- 2, 638 Bus Pads and Shelters

1.1 Asset Inventory Overview

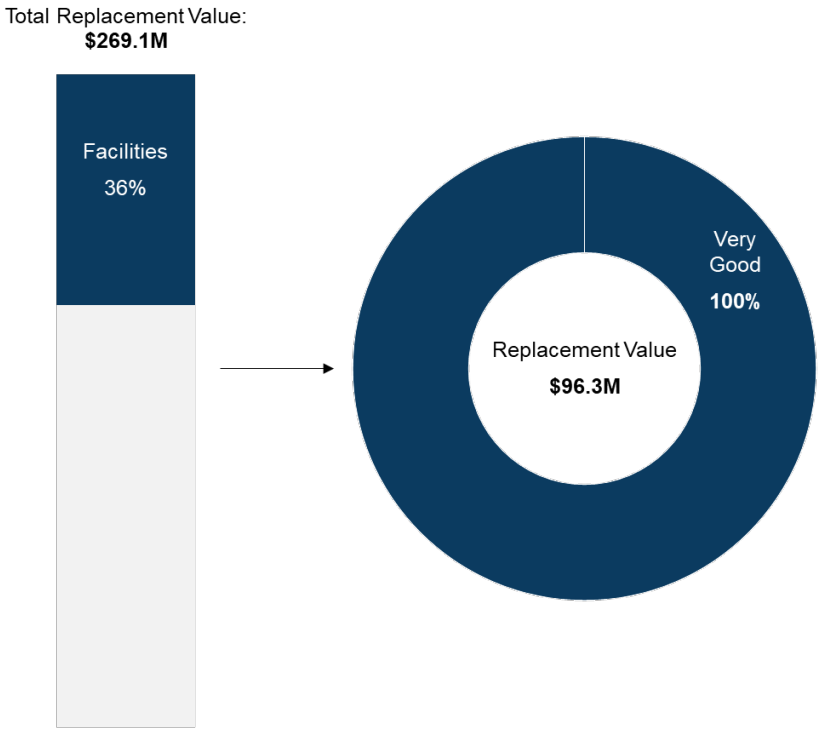
Durham Region Transit's (DRT) assets consist of a fleet of revenue vehicles, non-revenue vehicles, facilities, hard surface bus stops and shelters, equipment and other supporting assets. Supporting assets include a portion of the Region's administrative facilities, fleet and equipment that support the DRT.

1.2 DRT Condition Ratings, Replacement Values and Average Ages

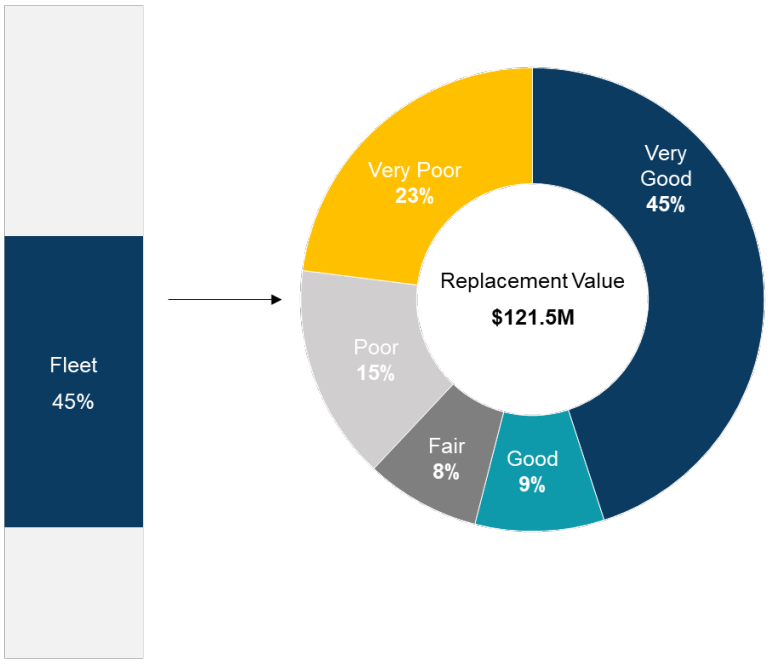
The overall DRT condition rating in 2023 was Very Good. Overall replacement values totalled $269.1 million, a decrease of $22.6 million from 2024 which is primarily the result of the 2023 fire and the loss of the Raleigh Transit facility and buses as well as the service delivery transition of demand response transit. These asset reductions are partially offset by inflationary pressures.

Figure 1 below illustrates the condition rating and replacement value of DRT assets.

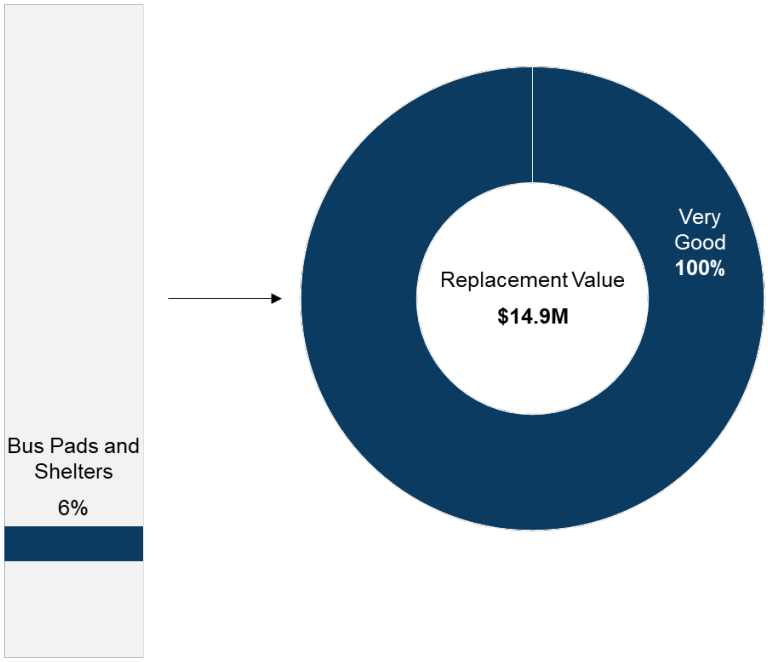
Figure 1: DRT Assets Condition and Replacement Values*

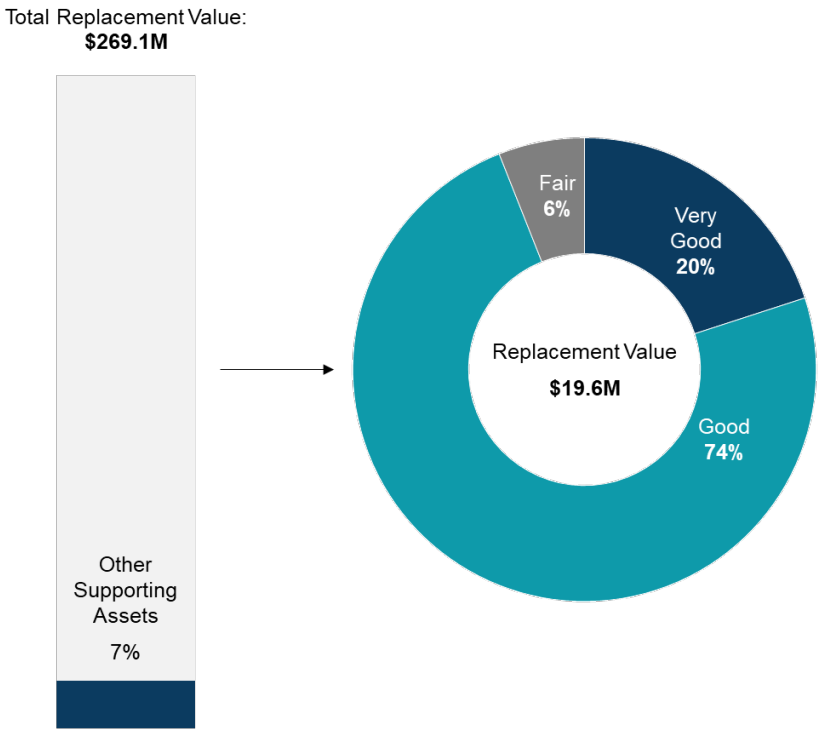


Total Replacement Value:
$269.1M



Total Replacement Value:
$269.1M





* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include the condition for equipment assets as these are pooled assets.

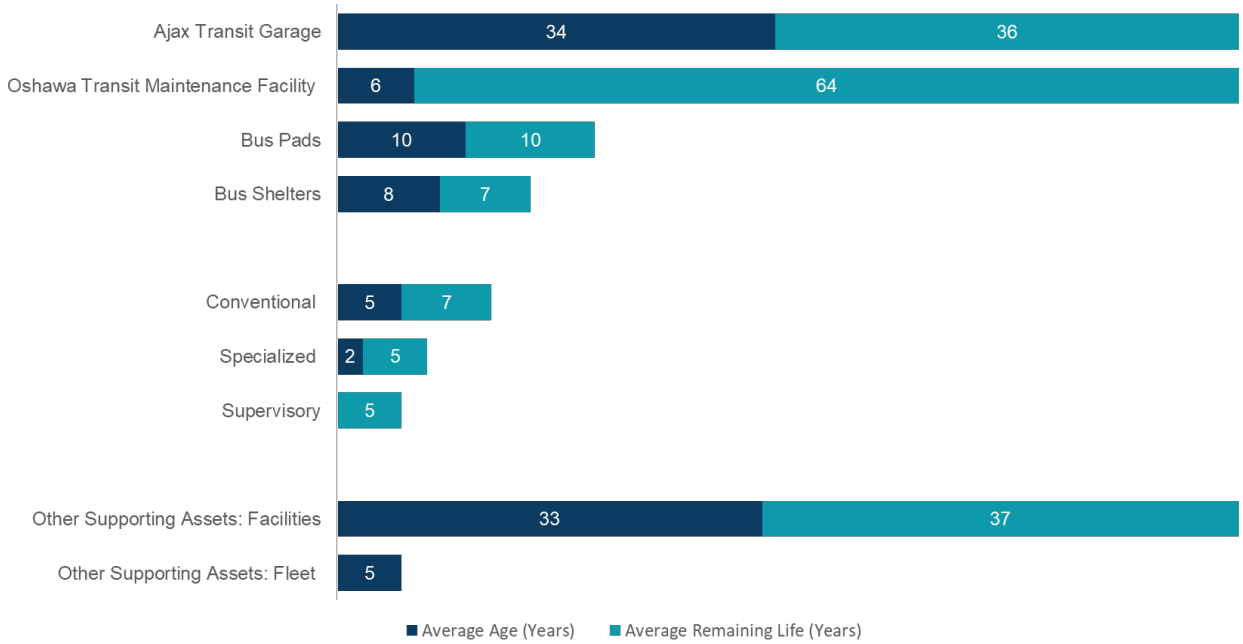
Table 1 outlines the assessment methods used to determine condition ratings.

Table 1: DRT Condition Assessment Methods

Asset Class	Assessment Methods
Facilities	Building Condition Assessments (BCA). Facilities staff undertake high-level surveys where assessments have not yet been undertaken. Condition rating criteria are used as the basis for rating facility sub structures, shells, interiors, and site work, which are considered major building elements evaluated through the BCA assessment.
Bus Stop Pads and Shelters	All bus shelters have been installed since 2016 except for 2 older ones which are in good condition. There is no formal method for assessing the condition of bus shelters however, when there is an issue with bus shelters, they are repaired immediately.
Fleet	Condition rating criteria is based on mileage.

Figure 2 summarizes the average age and remaining asset life of the DRT storage and maintenance garages and fleet as of December 31, 2023. The Transit Maintenance Facility and Ajax Transit Garage are relatively young while ongoing maintenance and rehabilitation has resulted in a Very Good rating. Recovery from the Raleigh bus fire continues to pose operational risk for Durham Region Transit. The 2024 approved budget included funding for the design of the rebuild of this facility.

Figure 2: DRT Average Age and Remaining Useful Life



As of December 31, 2023, the average age of DRT's conventional fleet is 5 years.

1.3 DRT Community Levels of Service

Table 2 outlines the various Regional Council approved plans, studies, and policies, as well as regulatory and or compliance guidelines that inform DRT's service level priorities.

Table 2: Plans, Studies, Polices, Procedures, Regulations that Inform Service Levels

Departmental Plans, Studies, Policies, & Procedures
• Transit Service and Financing Strategy (2023 – 2032) • Durham Region Transit Demand Responsive Transit Study • Transportation Master Plan • 2024 DRT Business Plans and Budget • Regional Transit 2022 Development Charge Background Study and By-law • Facility Needs Study • Durham Standard which provides a green development standard of net zero facilities for new construction and major facility retrofits for Region-owned facilities (and leased facilities where appropriate) • Regional Official Plan

Regulatory/Compliance Guidelines
• Ministry of Transportation Periodic Mandatory Commercial Vehicle Inspections (PMCVI) • Motor Vehicle Inspection Station Licencing & Standards • Public Transportation and Highway Improvement Act • Commercial Vehicle Operators Registration Program (CVOR) • Motor Vehicle Repair Standards • Truck and Bus National Safety Code • Ontario Building Code Standards • Accessibility for Ontarians with Disabilities Act (AODA) • Environmental Assessment Act • Ontario Fire Code

Technical Service Levels and Performance Measures

Asset management staff have identified key asset-related technical service levels and performance measures as noted in Table 3.

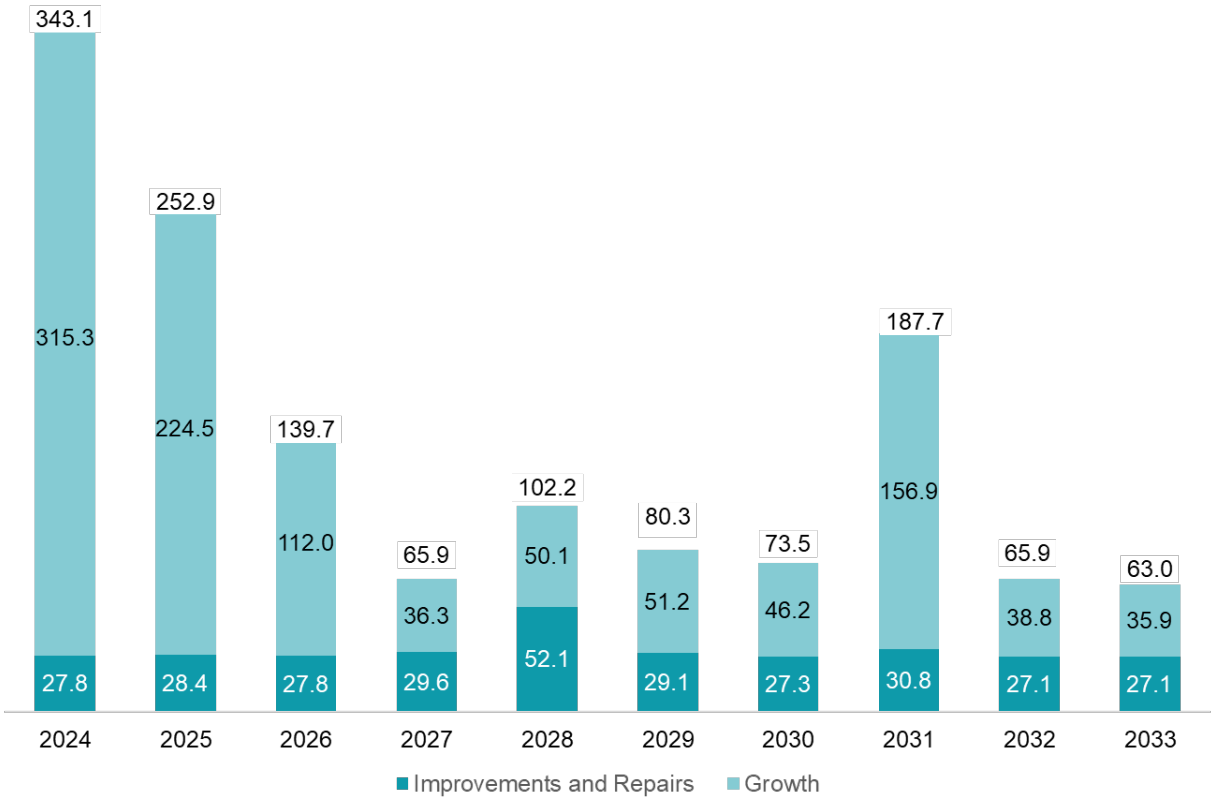
Table 3: DRT Performance Measures

Performance Measure	Target	Year of Measure		
		2021	2022	2023
Average Conventional Fleet Age	Maintain Average Age of Conventional Fleet at 7 years of age	6.4	7.3	7.2
This performance measure captures the average age of the conventional bus fleet.				
Percentage of Conventional Fleet Exceeding 12 Year Useful Life	To allow no more than 10 per cent of conventional bus fleet to exceed 12 years of age or older	8.5%	10.7%	14.0%
This performance measure identifies the percentage of conventional bus fleet which is 12 years of age or older. Typically, it is acceptable to have a small portion of the fleet exceed its useful life to a threshold of 10 per cent.				
Kilometres per litre of Diesel Fuel	To achieve 2.1 kilometres per litre of diesel fuel	2.3	2.5	TBC
This performance measure captures the fuel economy of DRT's conventional fleet by calculating the number of kilometres that is achieved for each litre of diesel fuel. Target is based on industry standards.				

1.4 DRT Capital Forecast

Major capital investments for DRT identified through the 2024 business plans and budget process total $343.1 million for 2024 and $1,031.2 million over the 2025 to 2033 forecast period.

Figure 3: Durham Region Transit Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to Total due to rounding.

The 2024 DRT Business Plans and Budget include the following significant capital projects:

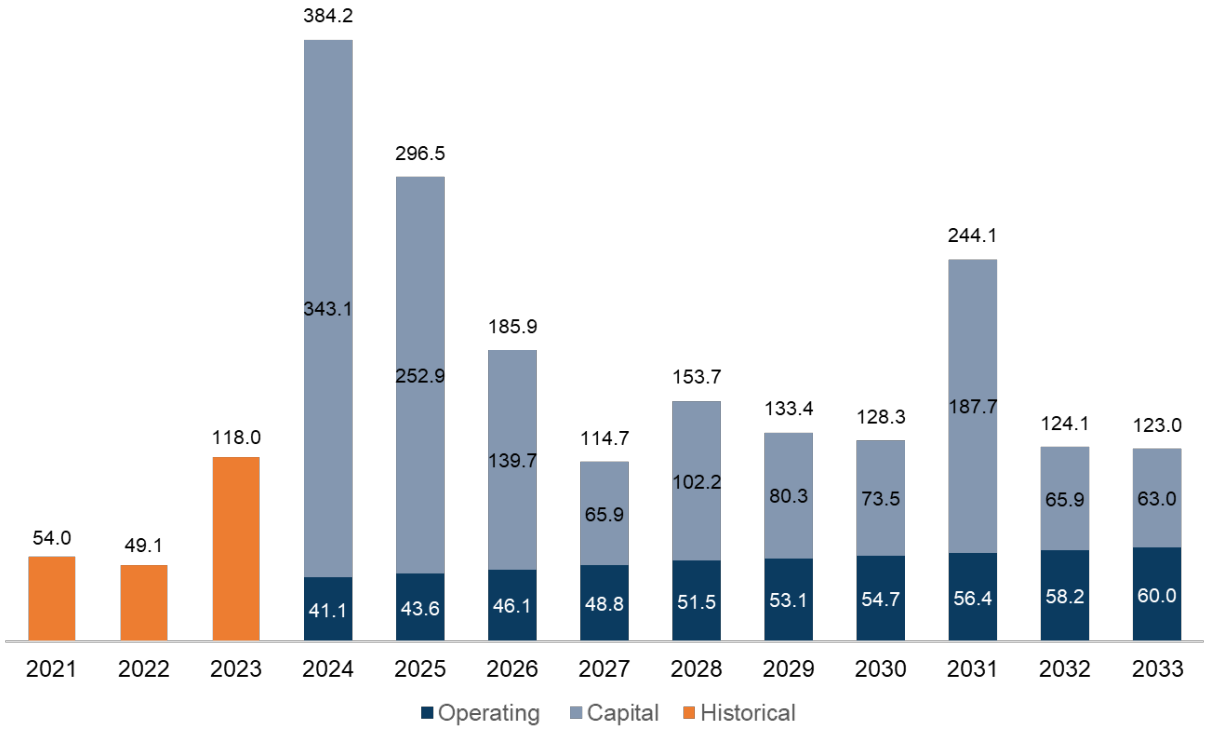
- 34 battery electric buses to be delivered in 2026 ($59.3 million) (pending approval of federal grant funding);
- Electrical vehicle charging infrastructure and related equipment ($7.5 million) (pending approval of federal grant funding);
- Construction expenses for DRT's new indoor bus storage/servicing facility in North Oshawa to support fleet electrification ($239.7 million) (pending approval of federal grant funding);
- Construction of Harmony Terminal and upgrades to the Pickering Parkway Termination ($15.0 million)
- Design work for the reconstruction of the Raleigh storage facility ($8.7 million); and
- Bus stop infrastructure ($5.7 million), including infrastructure partially funded by the federal and provincial Investing in Canada Infrastructure Program (ICIP). Acquisition of two replacement BRT buses ($1.4 million).

1.5 Lifecycle

Durham Region Transit's maintenance and rehabilitation lifecycle activities aim to extend the useful life of assets and improve service delivery.

Figure 4 illustrates capital and maintenance lifecycle costs for DRT.

Figure 4: Lifecycle Costs Durham Region Transit Operating and Capital ($ millions)*



*Operating and Capital may not add to Total due to rounding.

Fleet Maintenance and Repairs

Vehicle deterioration occurs by component, rather than holistically. DRT maintains the condition of its fleet assets using a three phased approach:

- Annual review of major powertrain components on a bus-by-bus basis;
- A preventative maintenance schedule based on manufacturers' recommendations and a semi-annual vehicle safety inspection process as regulated by the Ontario Ministry of Transportation.
- Required unscheduled repairs and running repairs.

Fleet preventative maintenance is scheduled when kilometres reach prescribed targets. Kilometers are tracked through nightly recording of kilometers driven for each bus into the fuel reporting software, which is then transferred to Maximo, the Region's maintenance management workorder software system.

Table 4: Preventative Maintenance Schedules for DRT Conventional Fleet

Inspection Type	KMs
A Inspection	Every 10,000 km
B Inspection	Every 20,000 km
C Inspection	Every 40,000 km
D Inspection	Every 80,000 km

DRT targets an expected useful life of twelve years for conventional buses after which point a bus can require significant structural refurbishment and becomes more costly to repair. Both maintenance costs and bus reliability can be impacted as a bus nears the end of its useful life and eventually, the bus will become a spare and used only when necessary.

Facilities Maintenance and Repairs

Facilities deteriorate by component rather than as a whole. Staff in the Facilities area of the Works Department undertake maintenance, repair and rehabilitation activities for these components at optimal times to allow the assets to provide service levels at the lowest risk in the most cost-effective manner.

Maintenance and replacement decisions are informed through the information in the Region's maintenance management workorder software system and Ameresco, the Region's capital asset management workorder planning software system (CAMPs). DCAM staff can better identify and refine forecasted future repair, maintenance, and rehabilitation needs and subsequent cost estimates based on the recording and tracking of past treatments, current condition ratings and needs, useful life, changing compliance, building and energy codes, modernization and return on investment.

Table 6 provides a summary of some useful life guidelines for facility components, which provides some broad time frames for when replacements could potentially occur. Changing compliance, building and energy codes, modernization, return on investment and other specific needs of DRT are also considerations in facility infrastructure decisions.

Table 5: Building Elements' Useful Life

Less than 10 Years	12 to 20 Years	25 to 50 Years	Over 50 Years
Interior Finishes	Building Envelope	Mechanical Electrical Plumbing Elevators	Structure

1.8 Climate Change

Climate Mitigation: DRT Strategies to Reduce GHG Emissions

The Durham Region Corporate Climate Action Plan has set targets to achieve net-zero GHG emissions by 2045.

DRT's E-Mission Zero Fleet Electrification Plan outlined DRT's approach to transitioning all vehicles to zero greenhouse gas tailpipe emission alternatives by 2037 with a focus on battery electric technologies. The plan is aligned with the Region's Climate Change Action Plan (CCAP) and the 2020-2024 Strategic Plan.

Implementation of Durham Region Transit's fleet electrification plan continues to advance in alignment with the Transit Service and Financing Strategy (2023 – 2032). Pending approval of federal grant funding, the Region will proceed with the planned purchase of 34 battery electric buses in 2024 (with anticipated delivery in 2026), procurement and installation of related charging equipment at Durham Region Transit's Raleigh Depot in Oshawa, Westney Depot in Ajax and a new facility in North Oshawa. While transit's share of the overall corporate carbon footprint may increase as the DRT fleet expands, DRT continues to explore and implement strategies to make transit an attractive alternative to personal vehicles to support community GHG reductions.

Climate Adaptation: Increasing the Resiliency of DRT Assets

The current focus of DRT climate adaptation work includes ensuring effective and up-to-date emergency, contingency and business continuity plans, in addition to adequate standby power and redundancies (e.g., spare parts and vehicles). DRT is also expanding bus shelters, which will increase protection against the potential impacts of a changing climate (e.g., a higher frequency of extreme storms) in addition to the usual impacts of cold and ice related to winter weather.

Climate adaptation will continue to be addressed through the Region's business planning cycle, including risk management, asset management and long-term financial planning processes to ensure a proactive approach.

1.9 Risk Assessment

Regional staff analyze potential risks to DRT's assets on an ongoing basis. Table 6 highlights some high impact potential risks and ongoing and planned risk mitigation measures.

Table 6: DRT Risk Mitigation Strategies

Risk	Mitigation
Chargeable Equipment Failure (e.g., engine and/or transmission failure, emission control systems)	Preventative maintenance, repairs, replacements and proper storage of vehicles and equipment. Inspections and maintenance of operational and compliance standards. Inventories of critical parts and spare vehicles and re-scheduling/re-routing. Maintenance protocols and warranties. Driver training and protocols.
Loss of External Utilities or Fuel	Maintain effective up-to-date emergency, contingency and continuity plans. Ensure adequate standby power at DRT facilities and other Region Facilities. Development of fuel shortage plans. Essential services policies and procedures.
Vehicle Collision	Supervisory investigation. Driver screening, training and recertification programs. Compliance and licensing standards. MTO specified procedures inspection audit of Driver Certification Program by Internal Audit Division. Maintain effective emergency and contingency plans.

Risk	Mitigation
Security Breach (e.g., theft, vandalism, terrorism)	On-site/on-bus safety systems and protocols including on-board surveillance system. Geographical Positioning System technology on buses and other vehicles. Durham Region Transit Security Strategy. Maintain effective up-to-date emergency, contingency and continuity plans.
Weather Related (e.g., Winter ice/cold and more frequent freeze-thaw cycles)	Winter control program (e.g., vehicle, shelter and facility warming and/or de-icing and snow removal etc.). In-bus water/ice slip hazard identification and mitigation. Asset management – preventative maintenance (e.g., in-bus HVAC). Post-storm clean-up. Condition audits and inspections. Maintain effective up-to-date emergency, contingency and continuity plans.



Social Services

Asset Class Report

Replacement Value	Average Condition
$899.6M	**FAIR**

Service Level Objectives

Take care of people by providing high-quality programs and human services that meet the needs of Durham residents at all stages of their lives

- 27 Housing Facilities
- 4 Childcare Centers
- 4 Long-Term Care Facilities
- 12.5 Fleet Vehicles

1.1. Social Services Department Inventory Overview

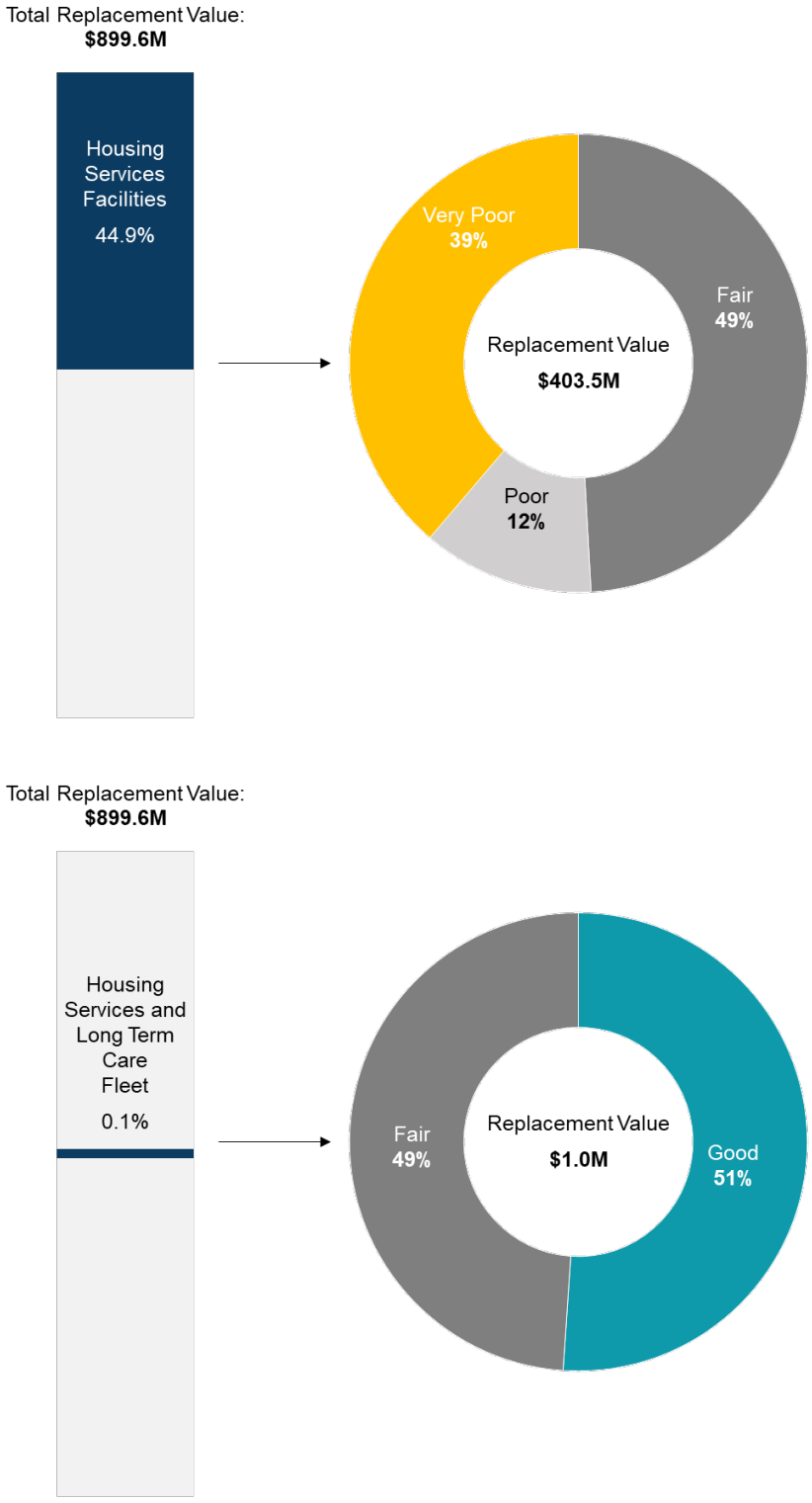
The Social Service's Department provides direction and management of facilities, vehicles, equipment and other supporting assets for the delivery of Housing Services, Childrens Services and Long-term Care Services for Seniors. Supporting assets include a portion of the Region's administrative facilities, fleet and equipment that support the Region's social services.

1.2. Condition Ratings, Replacement Values and Average Ages

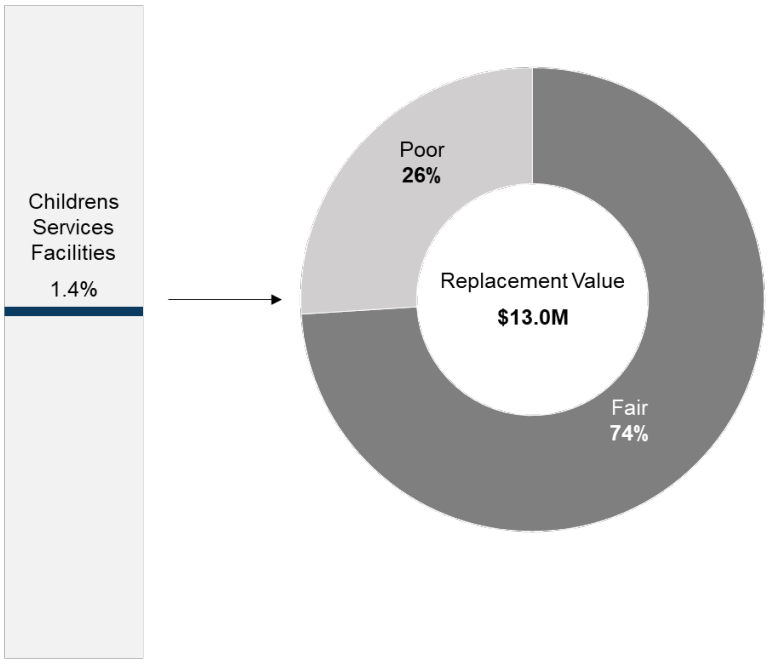
The overall rating in 2023 was Fair with an overall replacement value of $899.6 million.

Figure 1 illustrates the condition rating and replacement value of Social Services Department assets.

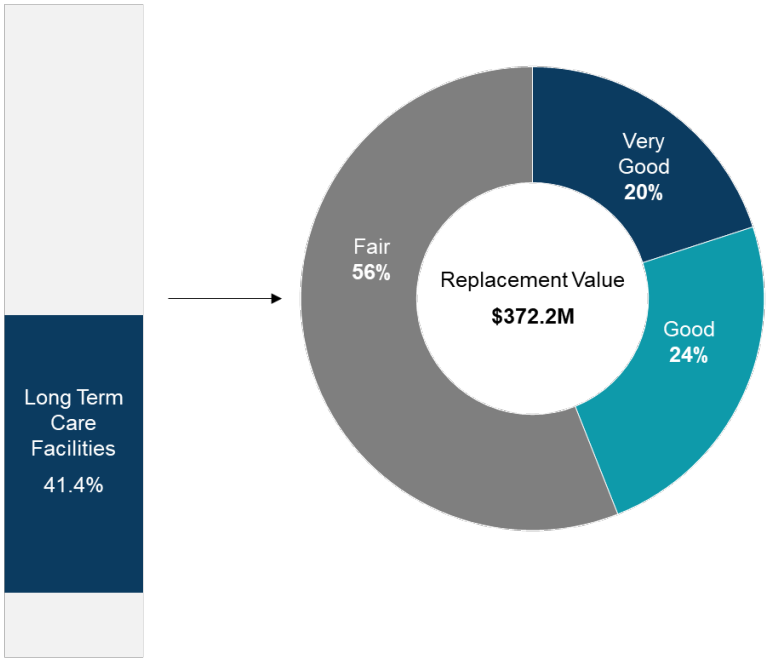
Figure 1: Assets Condition and Replacement Values*

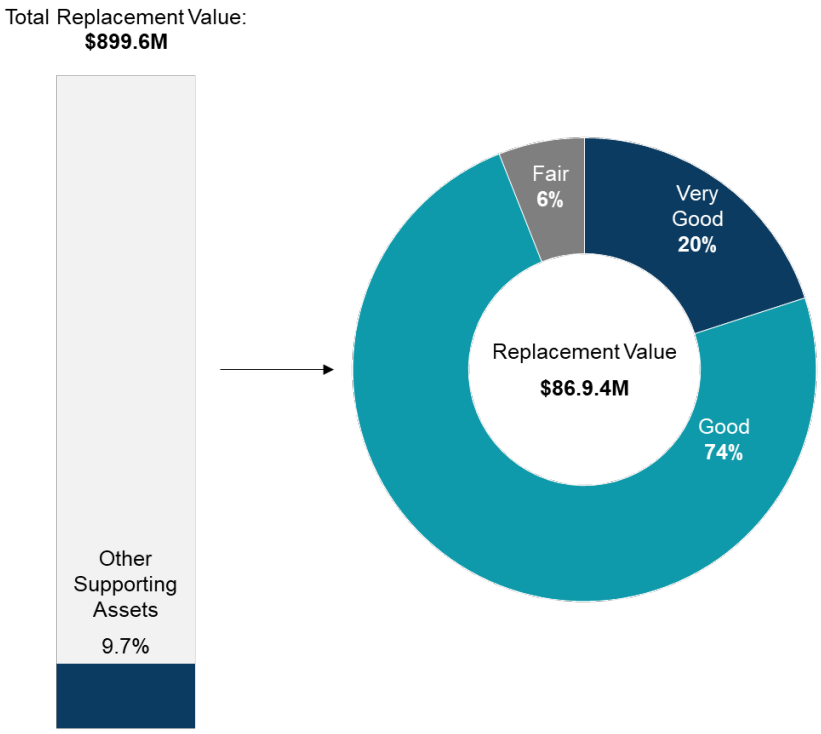


Total Replacement Value:
$899.6M



Total Replacement Value:
$899.6M





* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include the condition for equipment assets as these are pooled assets.

1.3. Assessment Methods

Table 1 outlines the assessment methods used to determine condition ratings.

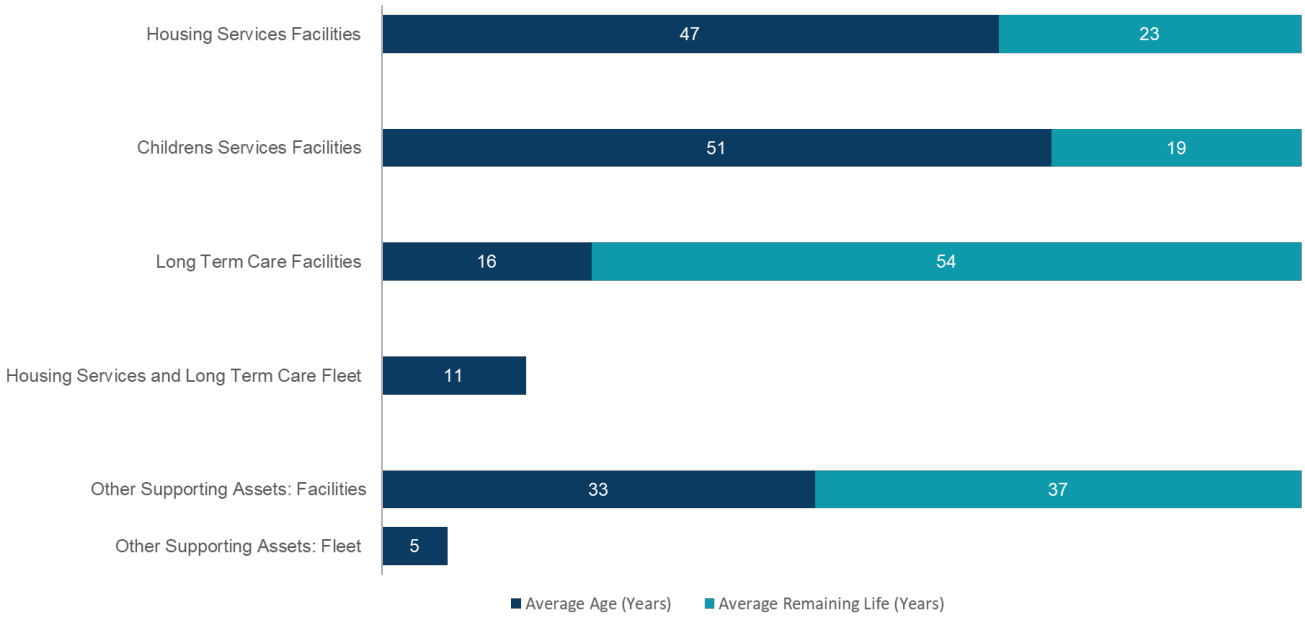
Table 1: Condition Assessment Methods

Asset Class	Assessment Methods
Fleet	Mileage, vehicle inspection
Facilities	Regional staff employ a Building Condition Assessment (BCA) method for assessing the condition of Regionally-owned facilities. For each facility, a BCA is performed on a 10-year cycle by external consultants. BCAs assess the condition of major building elements, sub-structures, shells, interiors, services and site work.

1.4. Average Age and Remaining Useful Life

Figure 2 summarizes the average age and remaining asset life of the Social Services assets.

Figure 2: Average Age and Remaining Useful Life



1.5. Levels of Service and Performance Measurement

Service level objectives and performance targets are set through the Durham Regional Council and approved plans, studies, policies and procedures, as well as through regulatory and/or compliance guidelines.

Table 2: Plans, Studies, Policies, Procedures, Regulations that Inform Service Levels

Regional Plans, Studies, Policies, & Procedures
• At Home in Durham • 2023 to 2027 Early Learning and Child Care Service Plan • Annual Business Plans and Budgets • Durham Region's Strategic Plan

Regulatory Compliance Requirements and Guidelines
• Child Care and Early Years Act, 2014 • Long-Term Care Homes Act, 2007 • Fixing Long Term Care Act, 2021 • Various provincial legislation, agreements and guidelines

Technical Service Levels and Performance Measures

Asset management staff have identified key asset-related technical service levels and performance measures as noted in Table 3.

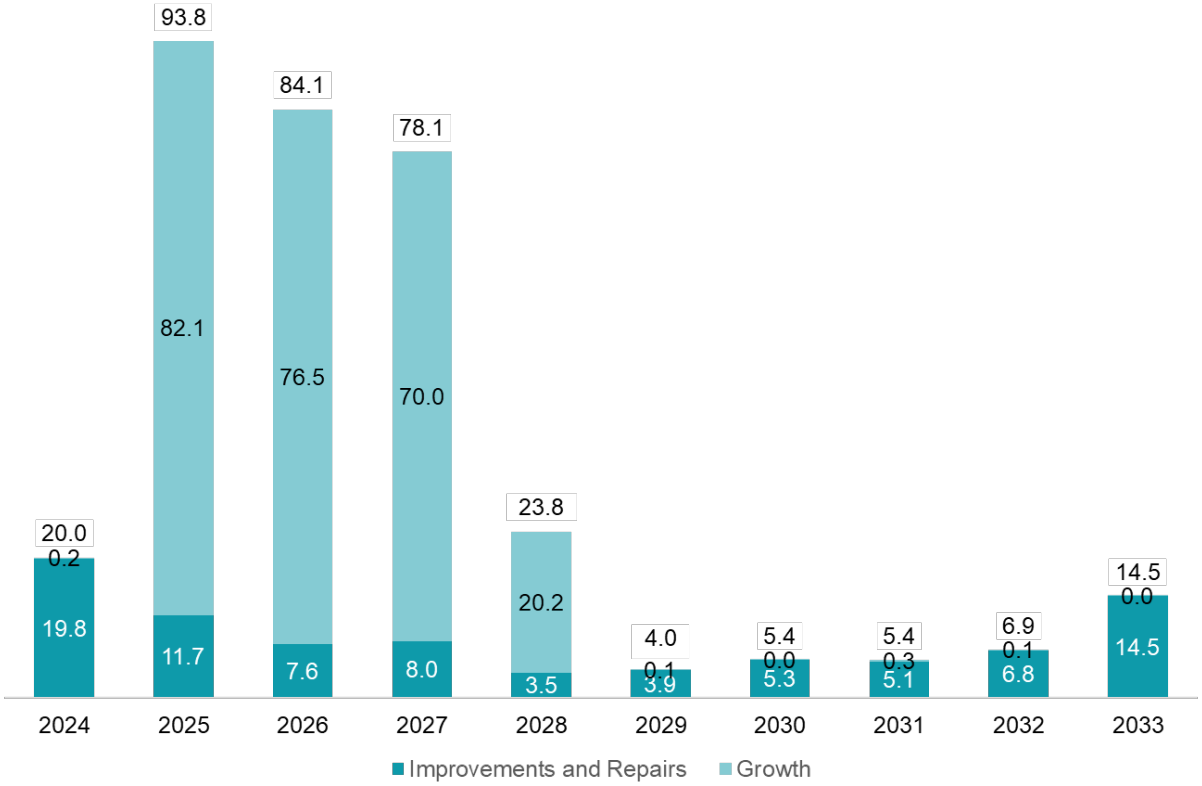
Table 3: Performance Measures

Performance Measure	Target	Year of Measure		
		2021	2022	2023
Facility Condition Index (FCI)	0% of facilities rated as either Poor or Very Poor	49.4%	48.2%	26.3%
Measure used as an indicator of relative facility condition. The FCI is defined as the ratio of current maintenance cost to the current replacement value of the facility. It is recognized that the baseline measure may shift as BCAs are completed and FCI ratings are updated to reflect more up-to-date information.				
% of facilities with completed Building Condition Assessments	100% of facilities to have a completed BCA	0%	0%	14.2%
This measures the percentage of facilities that have had a Building Condition Assessment. Performance target is to complete BCA for all Regionally owned facilities.				

1.6. Social Services Capital Forecast

Major capital investments for Social Services assets identified through the 2024 business plans and budget process (rehabilitation and growth) total $20.0 million for 2024 and $315.9 million over the 2025 to 2033 forecast period.

Figure 5: Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to Total due to rounding.

Highlights of the 2024 capital plan include $2.4 million to replace aging equipment in the Region's four long-term care homes including beds, ceiling lifts, kitchen appliances, shower chairs, and furniture.

A major priority for the Region is the redevelopment of the social housing portfolio. The capital forecast for 2025, 2026 and 2027 includes a provision of $220 million for the redevelopment of two social housing sites. The cost estimates are indicative only and will be further refined and updated in advance of the 2025 Budget and will be informed by the Region's ongoing work. Significant senior government funding contributions will be required to advance these redevelopments.

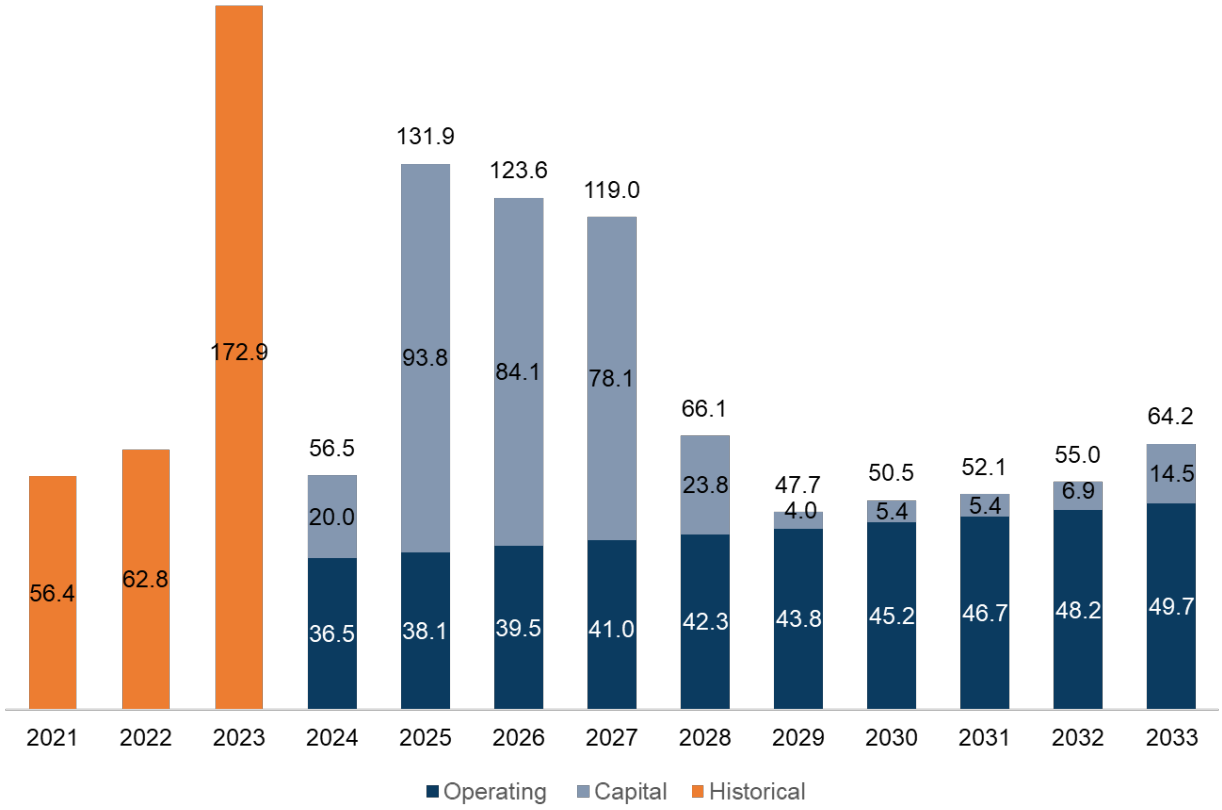
Staff are developing a 10-year Housing Service and Financing Strategy that will be brought forward to Council in conjunction with the 2025 Business Plans and Budget. This strategy will be informed by the Region's Asset Management Plan and will provide an integrated 10-year operating and capital forecast for Housing Services.

1.7. Lifecycle

Maintenance and rehabilitation lifecycle activities aim to extend the useful life of assets and improve service delivery.

Figure 3 illustrates capital and maintenance lifecycle costs for the Social Services Department assets.

Figure 3: Lifecycle Costs Operating and Capital ($ millions)*



*Operating and Capital may not add to Total due to rounding.

Moving forward, staff will be further refining lifecycle costing analysis and data collection for assets that will be reported in future asset management plans.

1.8. Climate Change

Climate Change Mitigation

Supporting Council's declaration of a climate change emergency in 2019, the Region continues to integrate a climate lens into the annual business planning and budget process to align corporate capital and operating plans with achieving the Region's greenhouse gas reduction target of net zero by 2045. The Durham Standard provides a green development standard of net zero facilities for new construction and major facility retrofits for Region-owned facilities (and leased facilities where appropriate).

Staff will continue to identify and evaluate opportunities to advance deep energy retrofits of the Social Services facilities over the capital forecast. The completion of the Greenhouse Gas Reduction Pathway Feasibility Studies for up to 55 Regional sites will further support this work and position the Region to pursue outside funding opportunities.

In addition, the Social Services Department will advance the implementation of the Region's Light Duty Fleet Electrification Strategy where operationally feasible.

1.9. Risk Assessment

Table 4 includes a sample of identified risks for the Region's fleet and facilities in achieving its service level standards as well as the mitigation controls identified to address these risks.

Table 4: Risk Mitigation Strategies

Risk	Mitigation
Loss of Fuel	Maintain effective and up-to-date emergency, contingency and continuity plans. Ensure adequate standby power. Essential services policies and procedures. Audit of fuel purchasing cards. Fuel deliveries and re-routed programs/services and redundancies. Mobile services and on-call service contracts.
Security Breaches and Theft	Onsite safety systems and protocols (e.g., surveillance, patrols, fencing, emergency training, policies and plans). Geographical Positioning System technology on vehicles. Maintain effective and up-to-date emergency, contingency and continuity plans.
Vehicle Accidents	Supervisory oversight. Compliance and licensing standards. Maintain effective emergency and contingency plans.
Equipment Failures	Preventative maintenance and capital replacement programs and plans. External service contracts. Safety codes, warranties and guidelines. Inspections, checklists and accreditations. Proper equipment and vehicle storage. Fleet maintenance re-scheduling and redundancies (e.g., spare vehicles and parts inventory).

Risk	Mitigation
Winter ice/cold and more frequent freeze-thaw cycles	Slip hazard identification and mitigation. Inspections. Maintain effective and up-to-date emergency, contingency and continuity plans.

Solid Waste

Asset Class Report

Replacement Value

$395.0M

Average Condition

VERY GOOD

Service Level Objectives

Responsible for the collection, processing and disposal of garbage, recyclables (until transition to extended producer responsibility) and compost, the collection of special waste such as electronic and household hazardous waste, and the operation of the Durham York Energy Centre

- 7 Facilities
- 6 Fleet Vehicles

1.1. Solid Waste Inventory Overview

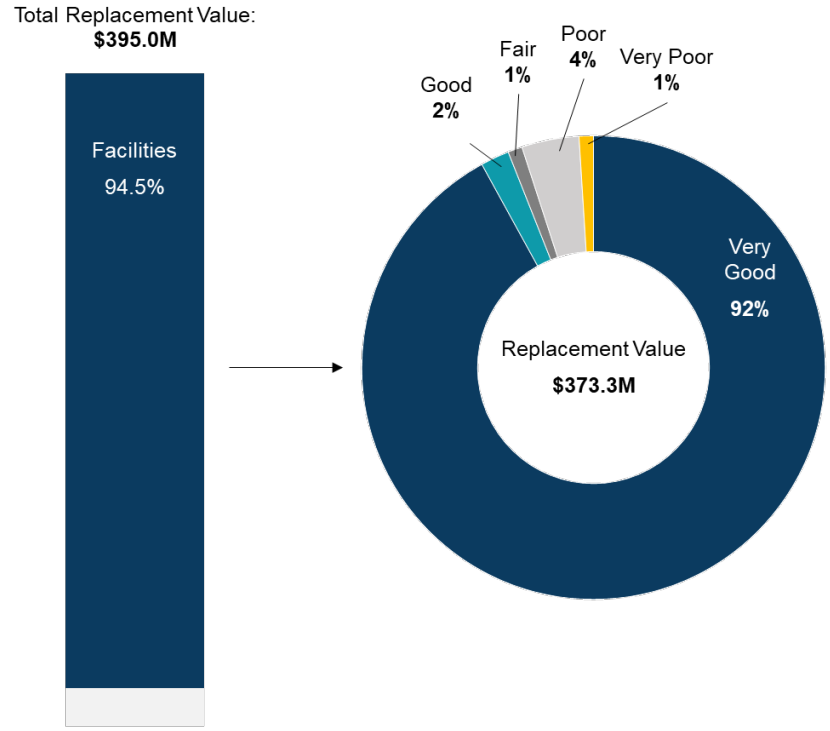
Solid Waste operates a series of facilities, fleet, equipment and associated supporting assets. Supporting assets include a portion of the Region's administrative facilities, fleet and equipment that support solid waste services.

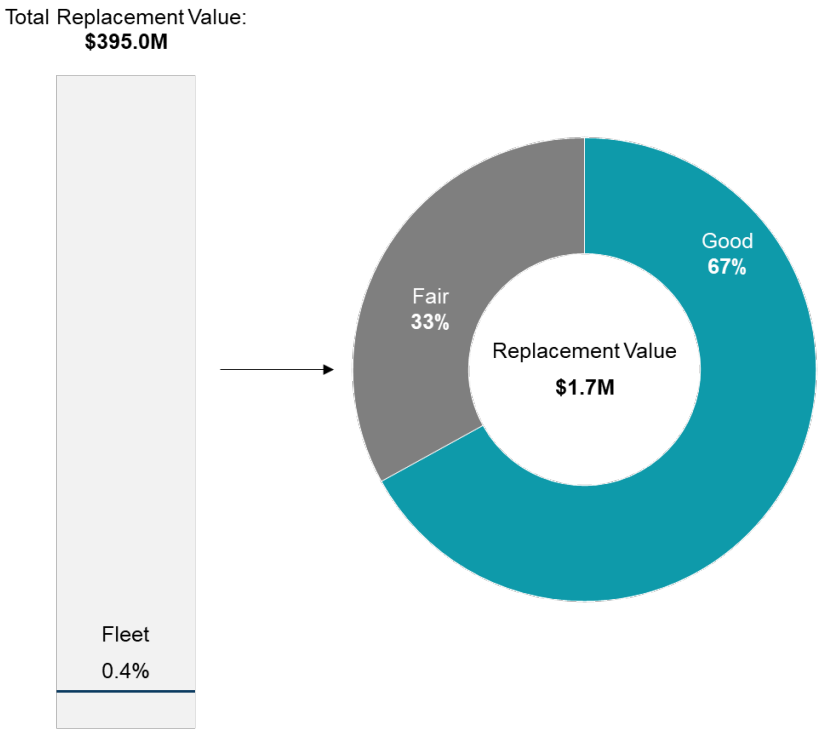
1.2. Condition Ratings, Replacement Values and Average Ages

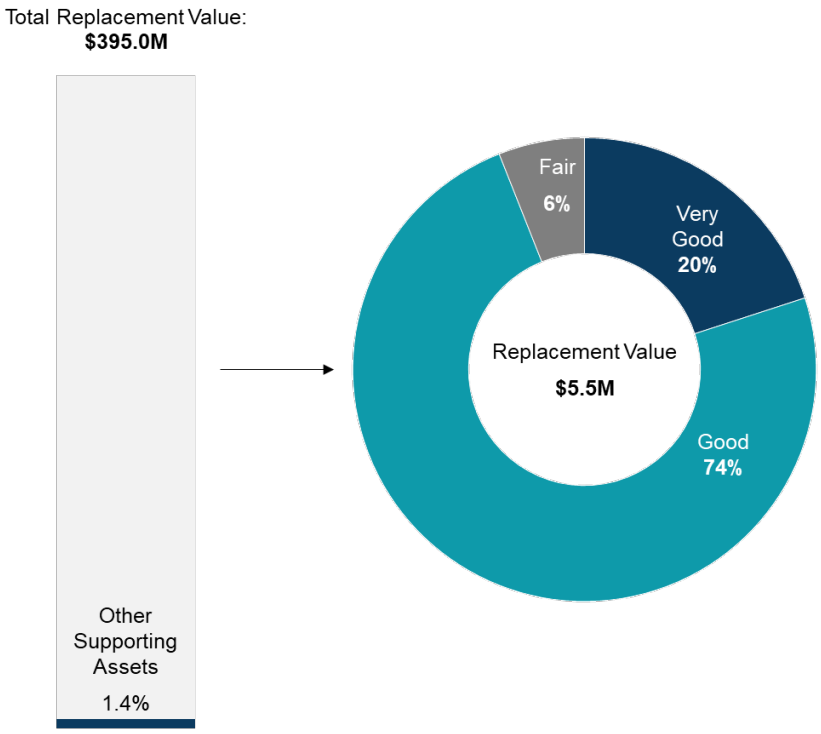
The overall rating in 2023 was Very Good with an overall replacement value $395.0 million.

Figure 1 illustrates the condition rating and replacement value of Solid Waste assets.

Figure 1: Assets Condition and Replacement Values*







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1.3. Assessment Methods

Table 1 outlines the assessment methods used to determine condition ratings.

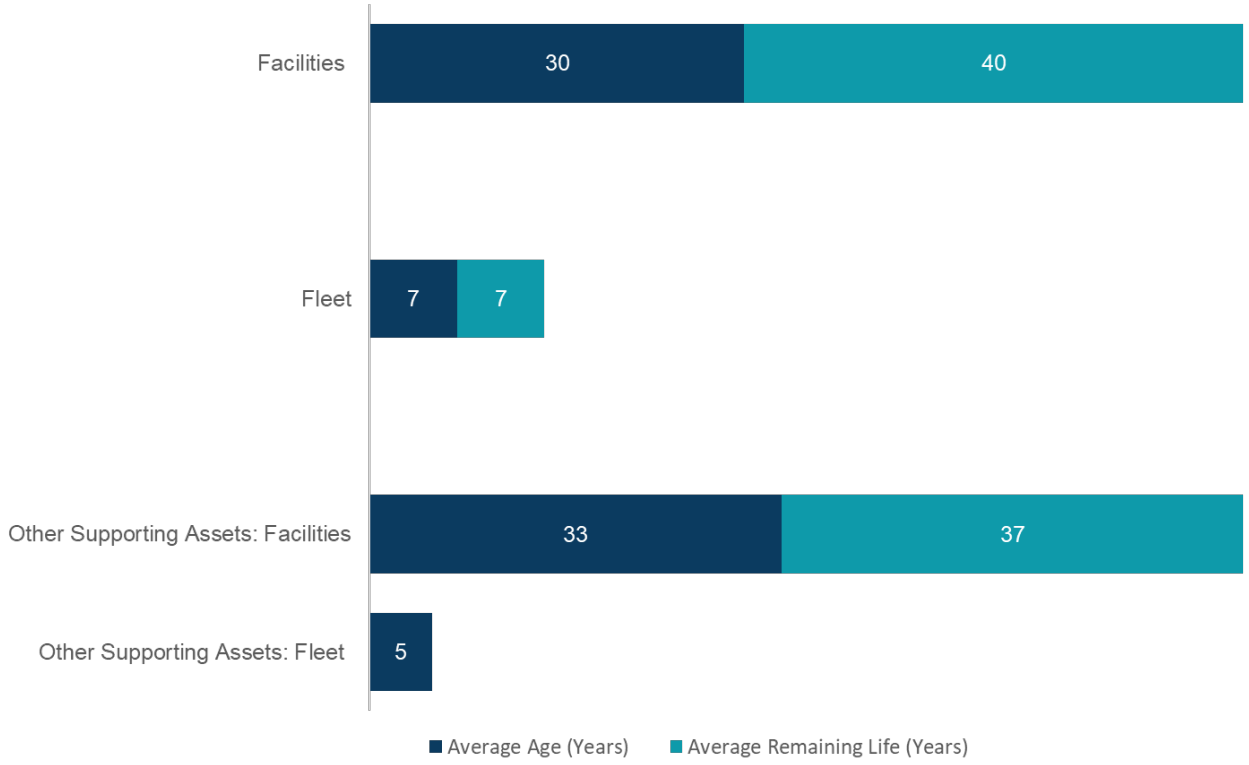
Table 1: Condition Assessment Methods

Asset Class	Assessment Methods
Fleet	Mileage, vehicle inspection
Facilities	Regional staff employ a Building Condition Assessment (BCA) method for assessing the condition of Regionally-owned facilities. For each facility, a BCA is performed on a 10-year cycle by external consultants. BCAs assess the condition of major building elements, sub-structures, shells, interiors, services and site work.

1.4. Average Age and Remaining Useful Life

Figure 2 summarizes the average age and remaining asset life of assets.

Figure 2: Average Age and Remaining Useful Life



1.5. Levels of Service and Performance Measurement

Service level objectives and performance targets are set through Durham Regional Council, approved plans, studies, policies and procedures, as well as through regulatory and/or compliance guidelines.

Table 2: Plans, Studies, Policies, Procedures, Regulations that Inform Service Levels

Regional Plans, Studies, Policies, & Procedures
• Region's Long-term Waste Management Strategy • Region's Corporate Climate Change Action Plan • Durham Standard • Annual Business Plans and Budgets • Durham Region's Strategic Plan

Regulatory Compliance Requirements and Guidelines
• Environmental Protection Act, 1990 • Ontario Regulation 347 • Extended Producer's Responsibility • Various provincial legislation, agreements and guidelines

Technical Service Levels and Performance Measures

Asset management staff have identified key asset-related technical service levels and performance measures as noted in Table 3.

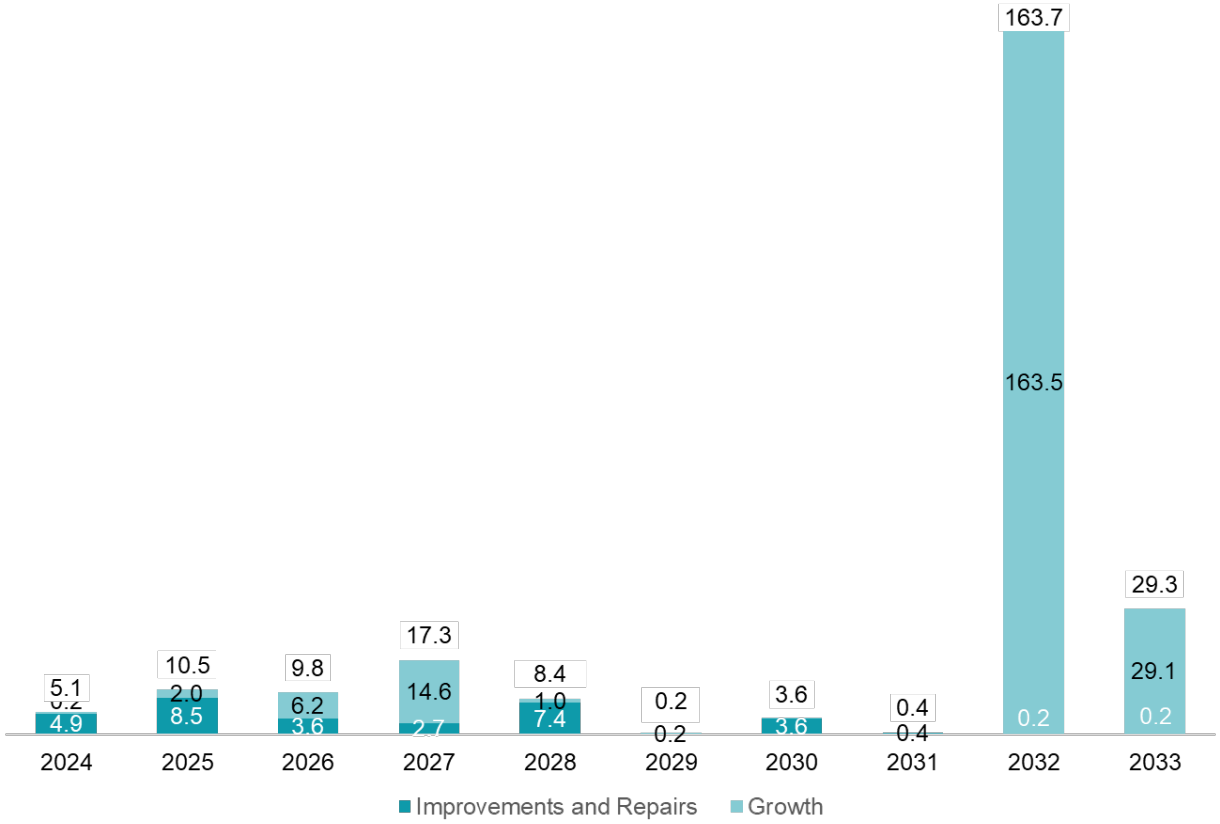
Table 3: Performance Measures

Performance Measure	Target	Year of Measure		
		2021	2022	2023
Facility Condition Index (FCI)	0% of facilities rated as either Poor or Very Poor	0%	0%	5%
Measure used as an indicator of relative facility condition. The FCI is defined as the ratio of current maintenance costs to the current replacement value of the facility. It is recognized that the baseline measure may shift as BCAs are completed and FCI ratings are updated to reflect more up-to-date information.				
% of facilities with completed Building Condition Assessments	100% of facilities to have a completed BCA	0%	14.3%	42.9%
This measures the percentage of facilities that have had a Building Condition Assessment. Performance target is to complete a BCA for all Regionally owned facilities.				

1.6. Solid Waste Capital Forecast

Major capital investments for Solid Waste assets identified through the 2024 business plans and budget process (rehabilitation and growth) total $5.1 million for 2024 and $243.2 million over the 2025 to 2033 forecast period.

Figure 3: Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to Total due to rounding.

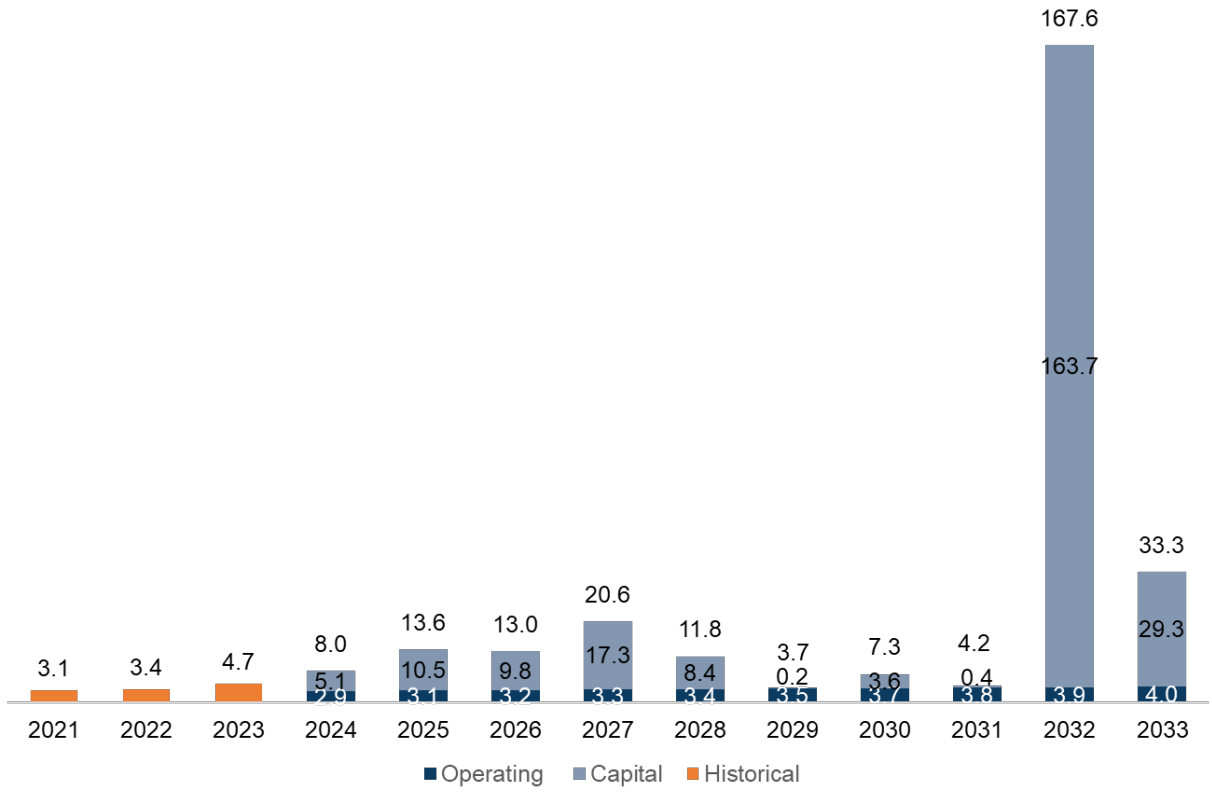
The 2032 capital forecast includes a provision for a Mixed Waste Pre-sort and Anerobic Digestion Facility. This project is subject to additional business case analysis, review and Council consideration.

1.7. Lifecycle

Maintenance and rehabilitation lifecycle activities aim to extend the useful life of assets and improve service delivery.

Figure 4 illustrates capital and maintenance lifecycle costs for Solid Waste assets.

Figure 4: Lifecycle Costs Operating and Capital ($ millions)*



*Operating and Capital may not add to Total due to rounding.

Moving forward, staff will be further refining lifecycle costing analysis and data collection for assets that will be reported in future asset management plans.

1.8. Climate Change

Climate Change Mitigation: Reducing GHG Emissions from Fleet

Supporting Council's declaration of a climate change emergency in 2019, the Region continues to integrate a climate lens into the annual business planning and budget process to align corporate capital and operating plans with achieving the Region's greenhouse gas reduction target of net zero by 2045. The Durham Standard provides a green development standard of net zero facilities for new construction and major facility retrofits for Region-owned facilities (and leased facilities where appropriate).

In addition, Solid Waste staff will advance the implementation of the Region's Light Duty Fleet Electrification Strategy where operationally feasible.

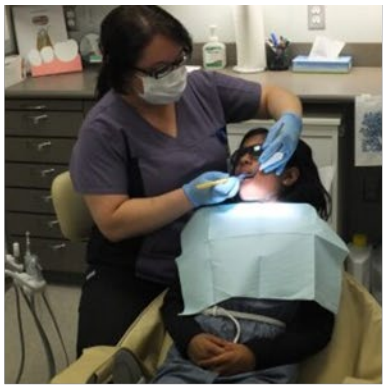
1.9. Risk Assessment

Table 4 includes a sample of identified risks for the Region's fleet and facilities in achieving its service level standards as well as the mitigation controls identified to address these risks.

Table 4: Risk Mitigation Strategies

Risk	Mitigation
Loss of Fuel	Maintain effective and up-to-date emergency, contingency and continuity plans. Ensure adequate standby power. Essential services policies and procedures. Audit of fuel purchasing cards. Fuel deliveries and re-routed programs/services and redundancies. Mobile services and on-call service contracts.
Security Breaches and Theft	Onsite safety systems and protocols (e.g., surveillance, patrols, fencing, emergency training, policies and plans). Geographical Positioning System technology on vehicles. Maintain effective and up-to-date emergency, contingency and continuity plans.
Vehicle Accidents	Supervisory oversight. Compliance and licensing standards. Maintain effective emergency and contingency plans.
Equipment Failures	Preventative maintenance and capital replacement programs and plans. External service contracts. Safety codes, warranties and guidelines. Inspections, checklists and accreditations. Proper equipment and vehicle storage. Fleet maintenance re-scheduling and redundancies (e.g. spare vehicles and parts inventory).
Winter ice/cold and more frequent freeze-thaw cycles	Slip hazard identification and mitigation. Inspections. Maintain effective and up-to-date emergency, contingency and continuity plans.





Health Department

Asset Class Report

Replacement Value

$135.4M

Average Condition

GOOD

Service Level Objectives

Protects and promotes the health of Durham Region residents through the delivery of public health and paramedic programs and services

- 82 Ambulances and other Paramedic Service Vehicles
- 9 Paramedic Stations
- Shared Public Health Facility

1.1. Health Department Inventory Overview

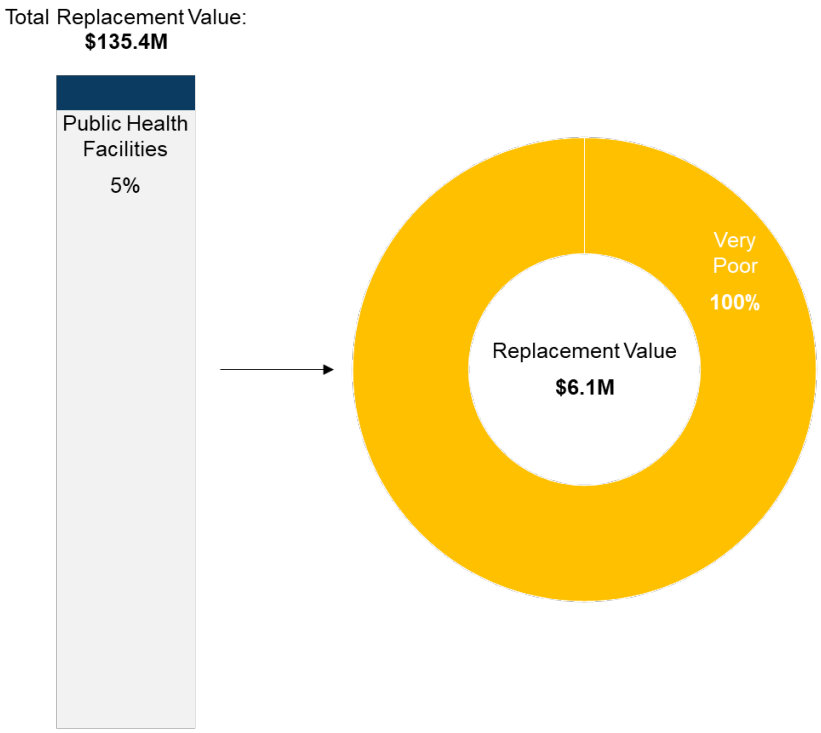
The Health Department provides direction and management of vehicles, facilities and equipment and other supporting services for Public Health services and Region of Durham Paramedic Services (RDPS). Supporting assets include a portion of the Region's administrative facilities, fleet and equipment that supports the Health Department.

1.2. Condition Ratings, Replacement Values and Average Ages

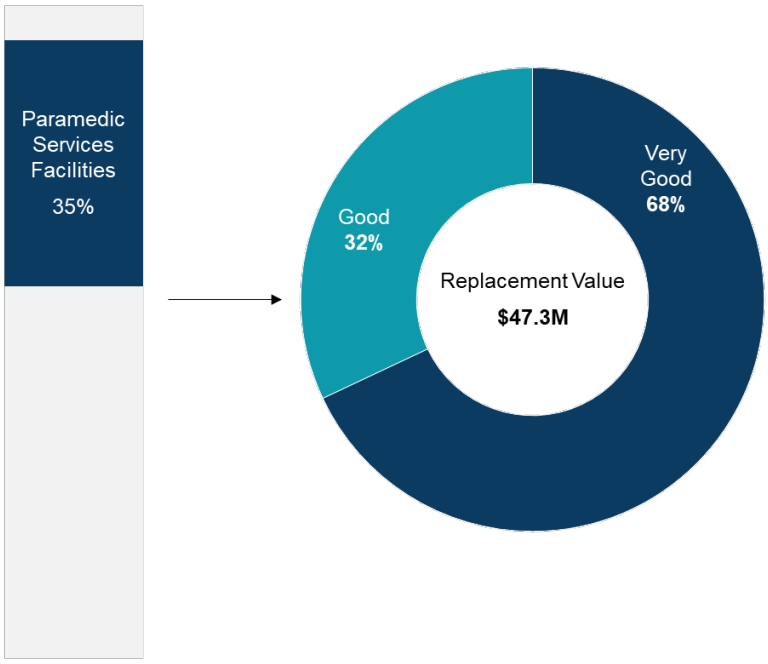
The overall rating in 2023 was Good with an overall replacement value of $135.4 million.

Figure 1 illustrates the condition rating and replacement value of Health Department assets.

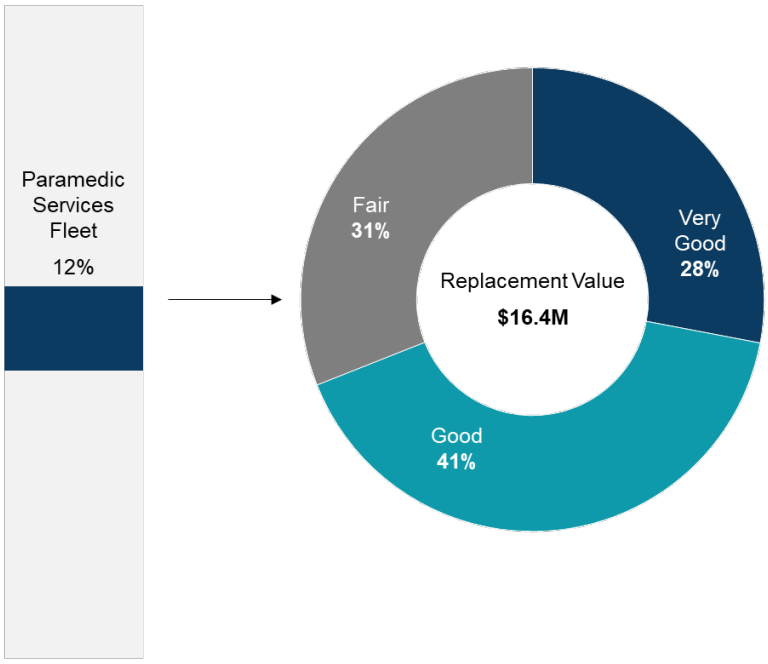
Figure 1: Assets Condition and Replacement Values*

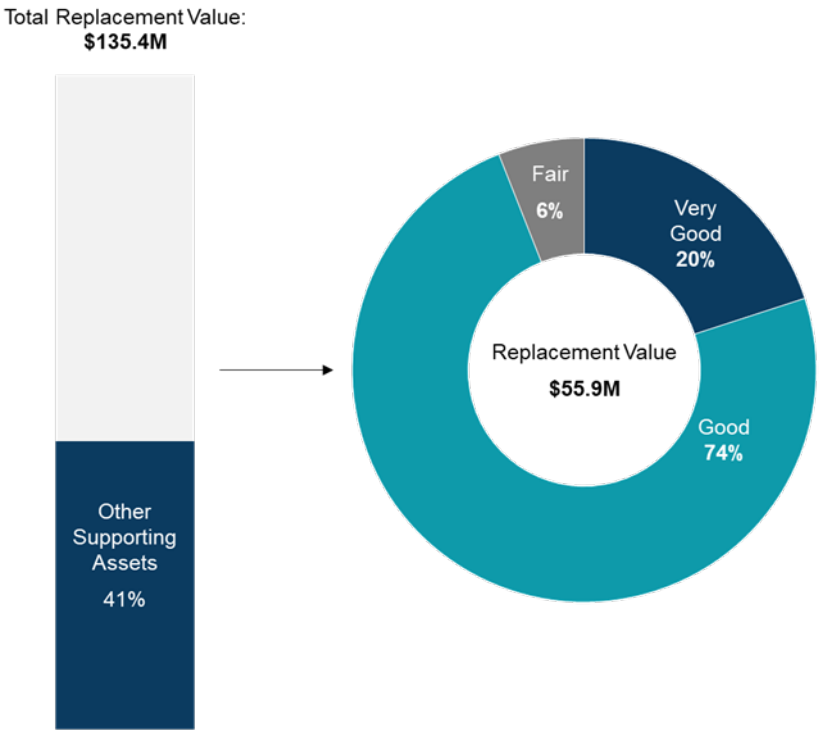


Total Replacement Value:
$135.4M



Total Replacement Value:
$135.4M





* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include the condition for equipment assets as these are pooled assets.

1.3. Assessment Methods

Table 1 outlines the assessment methods used to determine condition ratings.

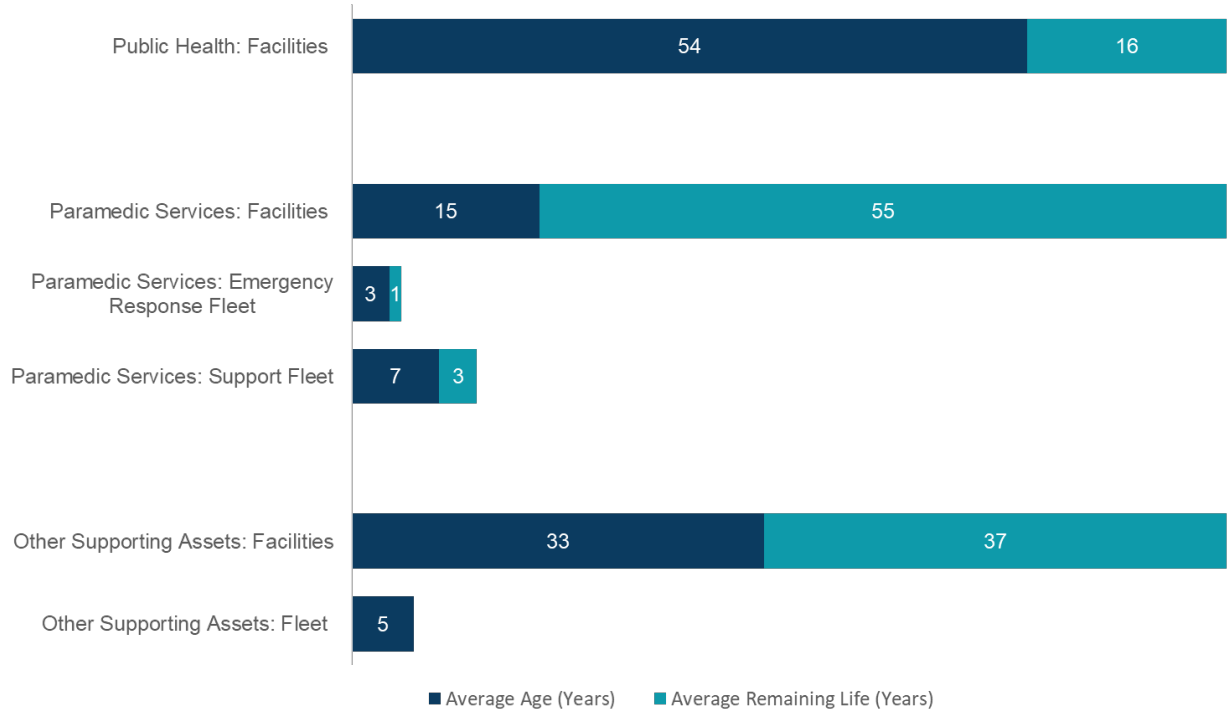
Table 1: Condition Assessment Methods

Asset Class	Assessment Methods
Fleet	Mileage, vehicle inspection
Facilities	Regional staff employ a Building Condition Assessment (BCA) method for assessing the condition of Regionally-owned facilities. For each facility, a BCA is performed on a 10-year cycle by external consultants. BCAs assess the condition of major building elements, sub-structures, shells, interiors, services and site work.

1.4. Average Age and Remaining Useful Life

Figure 2 summarizes the average age and remaining asset life of assets.

Figure 2: Average Age and Remaining Useful Life



1.5. Levels of Service and Performance Measurement

Service level objectives and performance targets are set through the Durham Regional Council and approved plans, studies, policies and procedures, as well as through regulatory and/or compliance guidelines.

Table 2: Plans, Studies, Policies, Procedures, Regulations that Inform Service Levels

Regional Plans, Studies, Policies, & Procedures
• 2023 – 2032 Region of Durham Paramedic Services Service and Financing Strategy • Annual Business Plans and Budgets • Durham Region's Strategic Plan

Regulatory Compliance Requirements and Guidelines
• Child Care and Early Years Act, 2014 • Immunization of School Pupils Act, 1990 • Ambulance Act, 1990 • Ontario Public Health Standards • Various provincial requirements

Technical Service Levels and Performance Measures

Asset management staff have identified key asset-related technical service levels and performance measures as noted in Table 3.

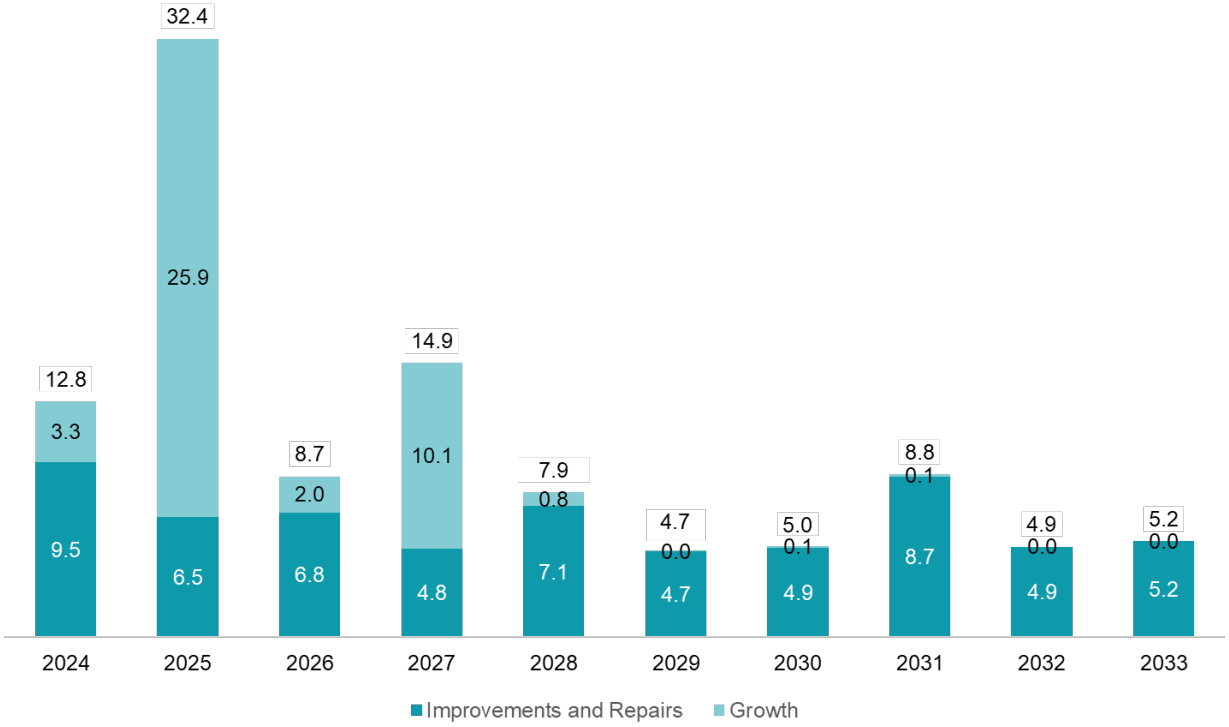
Table 3: Performance Measures

Performance Measure	Target	Year of Measure		
		2021	2022	2023
Facility Condition Index (FCI)	0% of facilities rated as either Poor or Very Poor	30%	10%	10%
Measure used as an indicator of relative facility condition. The FCI is defined as the ratio of current maintenance cost to the current replacement value of the facility. It is recognized that the baseline measure may shift as BCAs are completed and FCI ratings are updated to reflect more up-to-date information.				
% of facilities with completed Building Condition Assessments	100% of facilities to have a completed BCA	90%	90%	90%
This measures the percentage of facilities that have had a Building Condition Assessment. Performance target is to complete BCA for all Regionally owned facilities.				

1.6. Capital Forecast

Major capital investments in Health assets identified through the 2024 business plans and budget process (rehabilitation and growth) total $12.8 million for 2024 and $92.5 million over 2025 to 2033 forecast period.

Figure 5: Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to Total due to rounding.

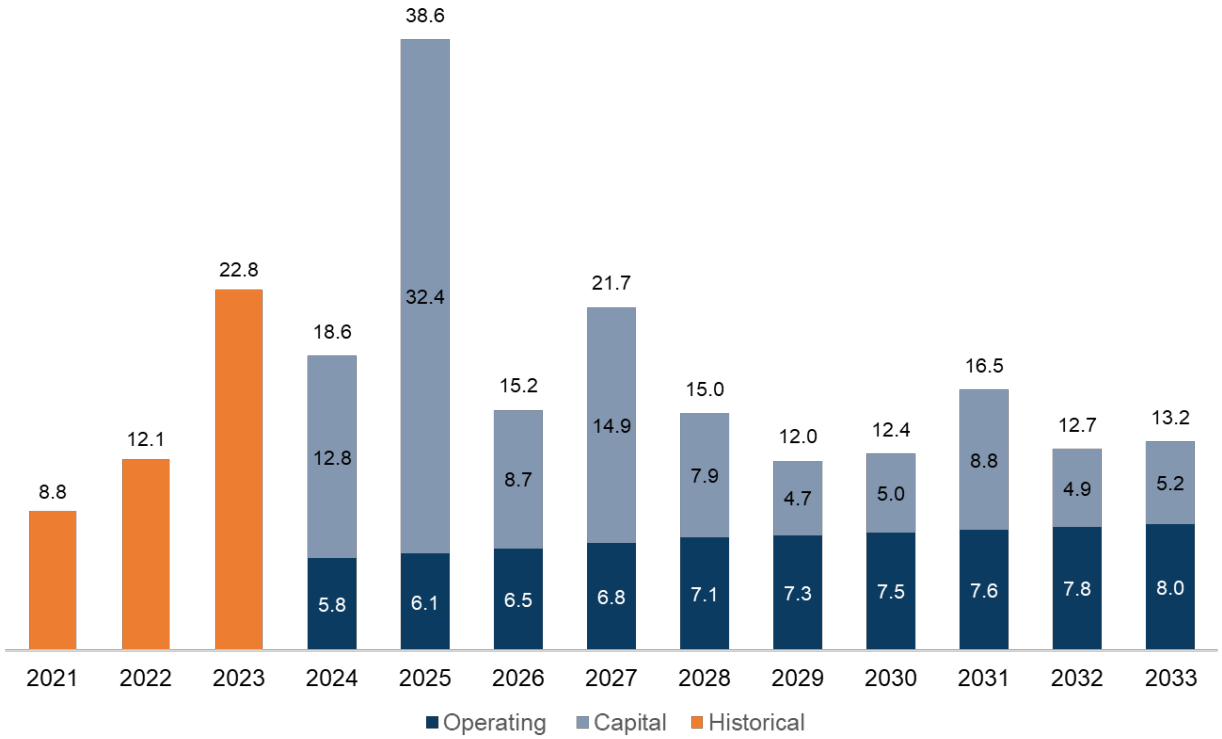
The 2024 capital budget and nine year capital forecast is informed and aligned with the 10-year Region of Durham Paramedic Services Service and Financing Strategy (2023 – 2032) and includes increased investment in repairs and improvements at the Region's existing paramedic stations as well as investments in new paramedic stations to meet the needs of the community.

1.7. Lifecycle

Maintenance and rehabilitation lifecycle activities aim to extend the useful life of assets and improve service delivery.

Figure 3 illustrates capital and maintenance lifecycle costs for Health Department assets.

Figure 3: Lifecycle Costs Operating and Capital ($ millions)*



*Operating and Capital may not add to Total due to rounding.

Moving forward, staff will be further refining lifecycle costing analysis and data collection for assets that will be reported in future asset management plans.

1.8. RDPS Fleet Lifecycle Management

RDPS has two main vehicle types: emergency response vehicles (ambulances, rapid response vehicles, and emergency support units) and management support vehicles. These vehicle types are managed differently given their use in operations.

The Region has a rigorous preventative maintenance program to keep vehicles in peak working condition while optimizing cost efficiency by ensuring preventative maintenance is completed and avoiding more costly repairs. Preventative maintenance programs for ambulances are delivered in accordance with provincial standards.

RDPS uses a staged vehicle deployment approach for ambulance and other emergency response vehicles that balance service demands and maximizes the life of the fleet, where:

- For the first 3 years of a vehicle's life it serves as frontline.
- After 3 years, a vehicle becomes a spare/contingency.
- After 4 years, the vehicle becomes a secondary spare and is mainly utilized in support of contracted event services (e.g., Canadian Tire Motorsport Park, Tribute Communities Centre events).

- After 4.5 years, vehicles are classified as pending decommission and are replaced shortly thereafter subject to annual Business Plans and Budget approvals.

Vehicles demonstrating higher prevalence of mechanical issues and maintenance requirements and/or unusually high kilometres of travel or engine hours are replaced first. Retired rapid response vehicles, command vehicles and management support vehicles are often used administratively as paramedic transport vehicles until such time as they are permanently decommissioned and removed from service. Paramedic transport vehicles are used during shift changes to transport incoming paramedics to change tours of duty where on-duty paramedic crews are operationally unable to return to their originating paramedic response station. This is required, for example, for hospital offload delay challenges.

Moving forward, staff will be further refining lifecycle costing analysis and data collection for assets that will be reported in future asset management plans.

1.9. Climate Change

Climate Change Mitigation

Supporting Council's declaration of a climate change emergency in 2019, the Region continues to integrate a climate lens into the annual business planning and budget process to align corporate capital and operating plans with achieving the Region's greenhouse gas reduction target of net zero by 2045. The Durham Standard provides a green development standard of net zero facilities for new construction and major facility retrofits for Region-owned facilities (and leased facilities where appropriate).

In addition, staff will advance the implementation of the Region's Light Duty Fleet Electrification Strategy where operationally feasible.

1.10. Risk Assessment

Table 4 includes a sample of identified risks for the Region's fleet and in achieving its service level standards as well as the mitigation controls identified to address these risks.

Table 7: Risk Mitigation Strategies

Risk	Mitigation
Loss of Fuel	Maintain effective and up-to-date emergency, contingency and continuity plans. Ensure adequate standby power. Essential services policies and procedures. Audit of fuel purchasing cards. Fuel deliveries and re-routed programs/services and redundancies. Mobile services and on-call service contracts.
Security Breaches and Theft	Onsite safety systems and protocols (e.g., surveillance, patrols, fencing, emergency training, policies and plans). Geographical Positioning System technology on vehicles. Maintain effective and up-to-date emergency, contingency and continuity plans.
Vehicle Accidents	Supervisory oversight. Compliance and licensing standards. Maintain effective emergency and contingency plans.
Equipment Failures	Preventative maintenance and capital replacement programs and plans. External service contracts. Safety codes, warranties and guidelines. Inspections, checklists and accreditations. Proper equipment and vehicle storage. Fleet maintenance re-scheduling and redundancies (e.g., spare vehicles and parts inventory).
Winter ice/cold and more frequent freeze-thaw cycles	Slip hazard identification and mitigation. Inspections. Maintain effective and up-to-date emergency, contingency and continuity plans.


Durham Regional Police Service

Asset Class Report

Replacement Value	Average Condition
$275.3M	**FAIR**

Service Level Objectives

Responsible for the delivery of policing services and community support programs to ensure the safety and security of all residents.

- 8 Facilities
- 378 Fleet Vehicles

1.1. Durham Regional Police Service Inventory Overview

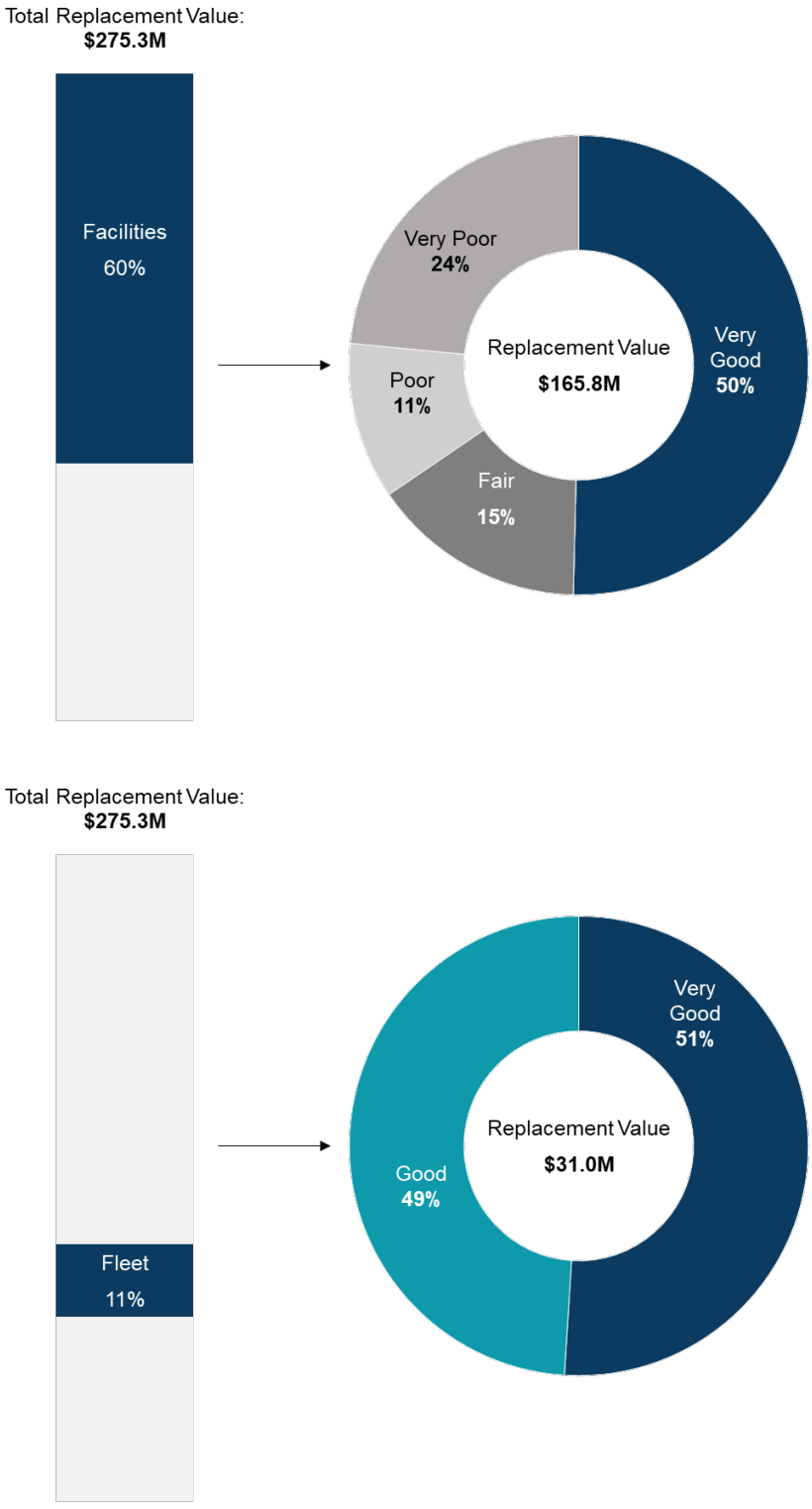
Durham Regional Police Service (DRPS) assets consist of vehicles, facilities, equipment and other supporting assets. Other supporting assets include a portion of the Region's administrative facility that supports the DRPS.

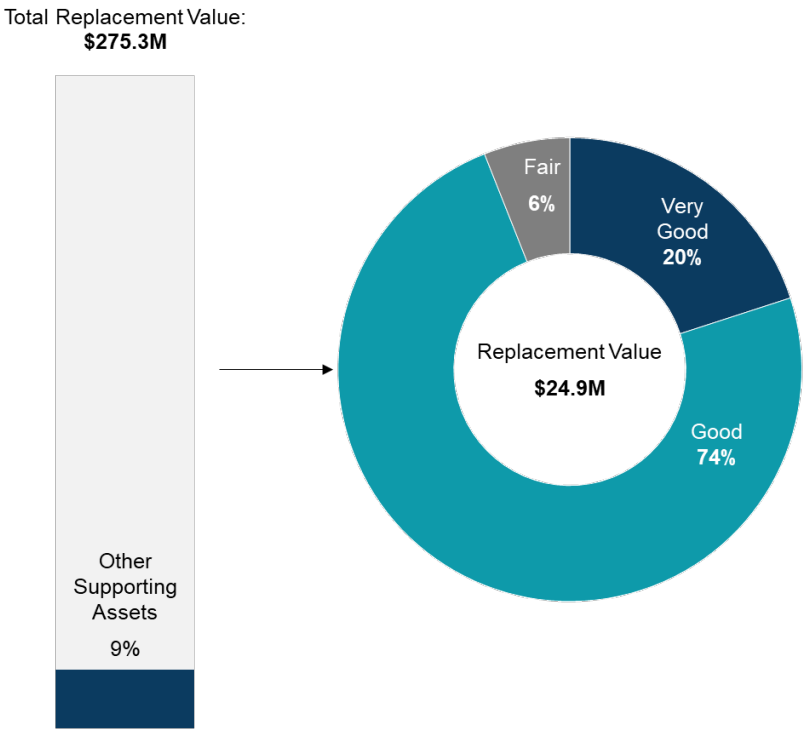
1.2. Condition Ratings, Replacement Values and Average Ages

The overall rating in 2023 was Fair with an overall replacement value of $275.3 million.

Figure 1 illustrates the condition rating and replacement value of DRPS assets.

Figure 1: Assets Condition and Replacement Values*





* Percentages may not add to 100 per cent due to rounding. The condition breakdown does not include the condition for equipment assets as these are pooled assets.

1.3. Assessment Methods

Table 1 outlines the assessment methods used to determine condition ratings.

Table 1: Condition Assessment Methods

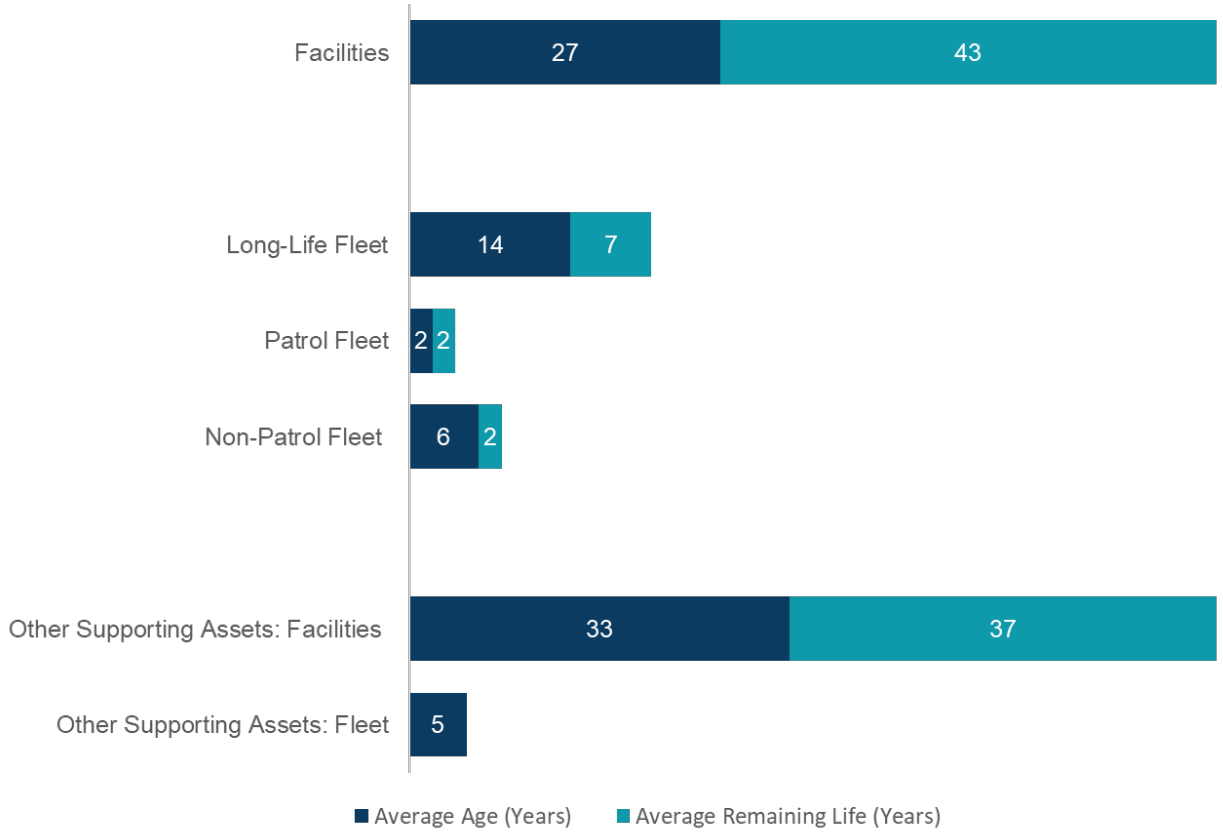
Asset Class	Assessment Methods
Fleet	Age, odometer, ongoing/pending maintenance requirements, and visual assessment for condition factors as per the scale below: • A+ or A++ would be Excellent or “as new” condition, A has minor wear and tear but still in peak operating condition. • B is a mid-life vehicle which, while it may have significant use, is still highly reliable but shows its age with more obvious signs of interior/exterior wear and tear from severe or long service. • C is approaching end of life due or overdue for replacement based on time, odometer reading, condition or greater emergence of costly maintenance/repair issues and non-safety related component failures.

Asset Class	Assessment Methods
Facilities	Regional staff employ a Building Condition Assessment (BCA) method for assessing the condition of Regionally-owned facilities. For each facility, a BCA is performed on a 10-year cycle by external consultants. BCAs assess the condition of major building elements, sub-structures, shells, interiors, services and site work.

1.4. Average Age and Remaining Useful Life

Figure 2 summarizes the average age and remaining asset useful life of assets.

Figure 2: Average Age and Remaining Useful Life



1.5. Levels of Service and Performance Measurement

Service level objectives and performance targets are set through Durham Regional Council, approved plans, studies, policies and procedures, as well as through regulatory and/or compliance guidelines.

Table 2: Plans, Studies, Policies, Procedures, Regulations that Inform Service Levels

Regional Plans, Studies, Policies, & Procedures
• Board End Policies • Durham Regional Police Service Annual Report • Durham Regional Police Service Strategic Plan • Annual Business Plans and Budgets • Durham Region's Community Safety and Wellbeing Plan

Regulatory Compliance Requirements and Guidelines
• Community Safety and Policing Act (2019) • Highway Traffic Act • Motor Vehicle Inspection Station Licencing and Standards • Motor Vehicle Repair Standards • Various provincial requirements

Technical Service Levels and Performance Measures

Asset management staff have identified key asset-related technical service levels and performance measures as noted in Table 3.

Table 3: Performance Measures

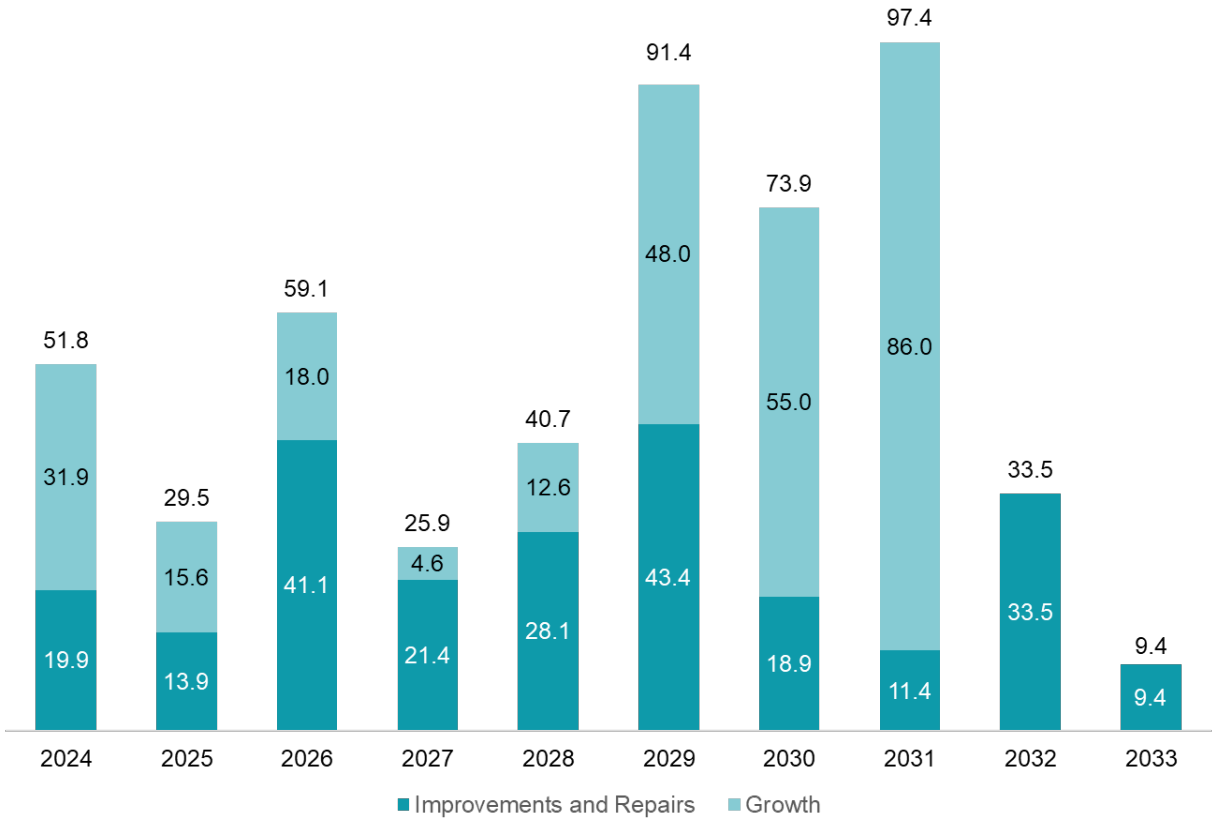
Performance Measure	Target	Year of Measure		
		2021	2022	2023
Facility Condition Index (FCI)	0% of facilities rated as either Poor or Very Poor	25%	50%	38%
Measure used as an indicator of relative facility condition. The FCI is defined as the ratio of current maintenance costs to the current replacement value of the facility. It is recognized that the baseline measure may shift as BCAs are completed and FCI ratings are updated to reflect more up-to-date information.				

Performance Measure	Target	Year of Measure		
		2021	2022	2023
% of facilities with completed Building Condition Assessments	100% of facilities to have a completed BCA	0%	0%	0%
This measures the percentage of facilities that have had a Building Condition Assessment. Performance target is to complete a BCA for all Regionally owned facilities.				

1.6. Capital Forecast

Major capital investments in DRPS assets identified through the 2024 business plans and budget process (rehabilitation and growth) total $51.8 million for 2024 and $460.7 million over the 2025 to 2033 forecast period.

Figure 5: Capital Forecast ($ millions)*



*Improvements and Repairs and Growth may not add to Total due to rounding.

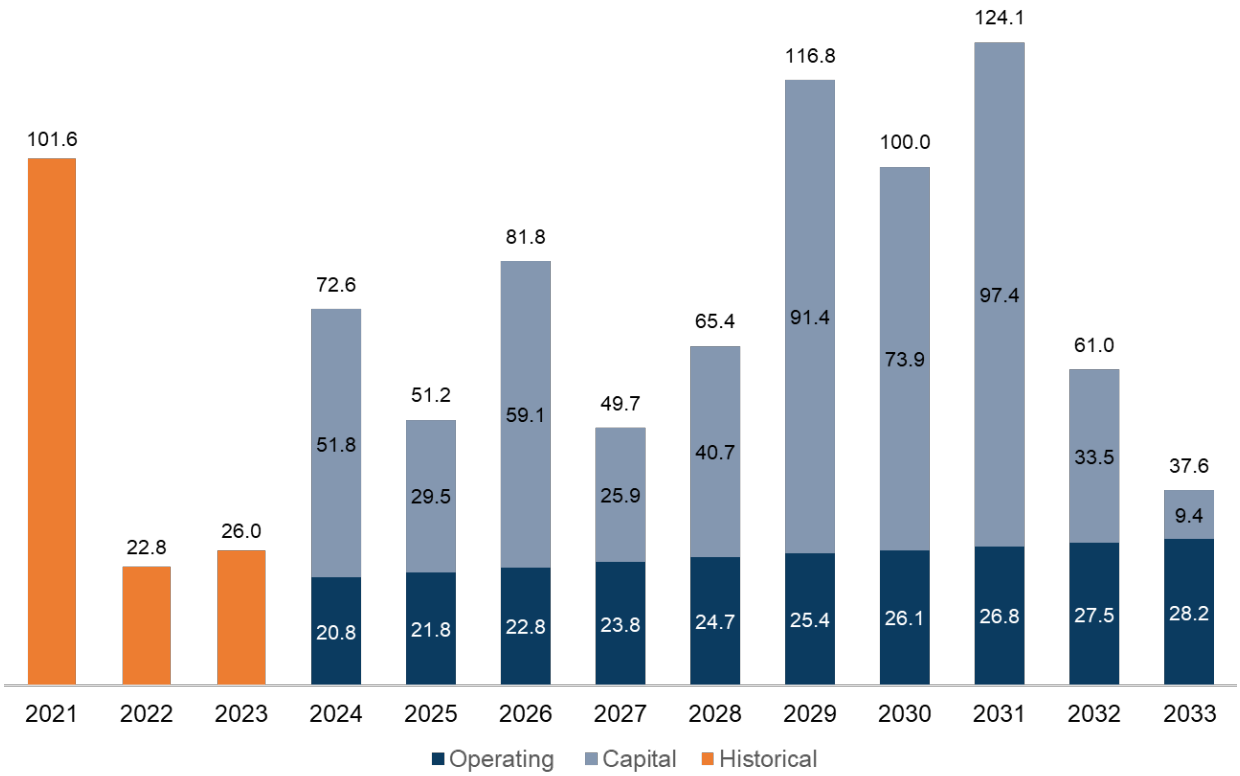
DRPS is currently conducting a long-term facility needs study that is anticipated to be completed by the end of the year. Once completed this study will help inform future business plans and budgets and asset management plans.

1.7. Lifecycle

Maintenance and rehabilitation lifecycle activities aim to extend the useful life of assets and improve service delivery.

Figure 3 illustrates capital and maintenance lifecycle costs for DRPS assets.

Figure 3: Lifecycle Costs Operating and Capital ($ millions)*



*Operating and Capital may not add to Total due to rounding.

Moving forward, staff will be further refining lifecycle costing analysis and data collection for assets that will be reported in future asset management plans.

1.8. DRPS Fleet Lifecycle Management

DRPS has a preventative maintenance program to ensure vehicles remain at peak operating condition to minimize the risk of failure and optimize cost efficiency by maintaining versus repairing the fleet. DRPS vehicles are maintained in accordance with guidelines based on manufacturers' service program and severe duty requirements.

DRPS employs the following fleet replacement criteria:

- Marked patrol automobiles are replaced at the earlier of 5 years of service or 160,000 to 200,000 km;
- Unmarked vehicles are replaced at the earlier of 7 years of service or 170,000 to 200,000 km; and,

- HD Trucks are replaced at the earlier of 10 years of service or 300,000 km.
- Long life vehicles are replaced on a 20-30 year schedule.

The replacement schedule ensures that vehicles are available for officers to serve the public, while minimizing the total cost of ownership over their useful life. The kilometres driven and vehicle age do not fully capture the engine wear resulting from the significant time cruiser engines are required to idle while officers are carrying out their duties which also impacts the useful life of the vehicles. This should be captured in future years through the introduction of fleet maintenance telematics.

Consistent with the fleet replacement plan for DRPS, the 2024 DRPS Business Plans and Budget includes the replacement of 37 marked patrol vehicles ($1.86 million), and 19 unmarked vehicles ($0.8 million) as well as the addition of four new marked patrol vehicles ($0.2 million), and one new unmarked vehicle ($0.04 million) to respond to growth in service requirements. The cost of the primary response vehicles does not include the transfers of upfit equipment from old to new vehicles or purchase of new equipment (e.g., sirens, light bars, push bars, communication systems, etc.) which forms part of the overall maintenance budget and is required to meet operational requirements and ensure public safety. This upfit amount is not reported in Tables 4 and 5 below. The nine-year capital forecast (2024 to 2032) includes the projected replacement of 310 marked vehicles ($24.5 million) and 157 unmarked vehicles ($6.6 million).

The following are fleet maintenance and fuel measures for 2022 and 2023.

Table 4: DRPS Maintenance and Fuel Measures for Primary Response Vehicles

Year	Annual Vehicle Availability	Annual Kilometers	Maintenance Cost	Fuel Cost	
			Annual Cost	Annual Total	$/Km
2022	95.7%	5,345,260	$902,943	$1,582,901	$0.30
2023	94.3%	5,324,336	$1,113,189	$1,543,858	$0.29

Table 5: DRPS Maintenance and Fuel Measures for Secondary Response Vehicles

Year	Annual Vehicle Availability	Annual Kilometers	Maintenance Cost	Fuel Cost	
			Annual Cost	Annual Total	$/Km
2022	96.5%	3,251,935	$718,177	$535,556	$0.16
2023	96.8%	3,221,189	$593,008	$550,979	$0.17

Moving forward, DRPS will continue to monitor, track, and refine lifecycle costing for internal fleet management, investment decisions through business planning and budgets, external and internal reporting, and to comply with the future requirements of Ontario Regulation 588/17. Updates will be reported in future Asset Management Plans.

1.9. Climate Change

Climate Change Mitigation

Supporting Council's declaration of a climate change emergency in 2019, the Region continues to integrate a climate lens into the annual business planning and budget process to align corporate capital and operating plans with achieving the Region's greenhouse gas reduction target of net zero by 2045. The Durham Standard provided a green development standard of net zero facilities for new construction and major facility retrofits for Region-owned facilities (and leased facilities where appropriate).

In addition, staff are advancing the implementation of the Region's Light Duty Fleet Electrification Strategy where operationally feasible.

Key climate change mitigation accomplishments in 2023 include:

- Addition of 4 plug-in electric vehicles and additional hybrid models where available.
- Greater education and enforcement of the anti-idling policy has also had an impact on GHG emissions.
- DRPS fuel consumption reduced by 32,250 litres from 2022 due to increasing use of vehicles with hybrid, stop-start and electric power and improved fuel mileage by 0.39 litres/100 km. Further, in 2023 our vehicles travelled about 46,000 km less than in 2022, resulting in a savings of about 7,800 litres of fuel due to reduced travel to meet the needs of the public, though this varies year by year due to number of calls for service.
- In total, in 2023 the DRPS fleet reduced its output by approximately 25 tonnes of carbon emissions.

Key 2022 initiatives that support fleet greening include:

- DRPS fleet vehicle replacements continue to transition the fleet to lower emission outputs through the reduction of vehicles powered solely by an internal combustion engine (ICE), and the adoption of technologies to support green fleet operations. As an example, fleet maintenance telematics ensure prompt attention to vehicle faults that impact fuel consumption and emissions and provide engine idle monitoring and reporting to address anti-idle policy compliance.

1.10. Risk Assessment

Table 6 includes a sample of identified risks for the Region's fleet in achieving its service level standards as well as the mitigation controls identified to address these risks.

Table 6: Risk Mitigation Strategies

Risk	Mitigation
Loss of Fuel	Maintain effective and up-to-date emergency, contingency and continuity plans. Ensure adequate standby power. Essential services policies and procedures. Audit of fuel purchasing cards. Fuel deliveries and re-routed programs/services and redundancies. Mobile services and on-call service contracts.
Security Breaches and Theft	Onsite safety systems and protocols (e.g., surveillance, patrols, fencing, emergency training, policies and plans). Geographical Positioning System technology on vehicles. Maintain effective and up-to-date emergency, contingency and continuity plans.
Vehicle Accidents	Supervisory oversight. Driver screening, training and recertification programs. Compliance and licensing standards. Maintain effective emergency and contingency plans.
Equipment Failures	Preventative maintenance and capital replacement programs and plans. External service contracts. Safety codes, warranties and guidelines. Inspections, checklists and accreditations. Proper equipment and vehicle storage. Fleet maintenance re-scheduling and redundancies (e.g., spare vehicles and parts inventory).
Winter ice/cold and more frequent freeze-thaw cycles	Slip hazard identification and mitigation. Inspections. Maintain effective and up-to-date emergency, contingency and continuity plans.