COUNTY OF WELLINGTON

2024 Asset Management Plan

BASED ON ACTUALS TO DEC. 31, 2023

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EXECUTIVE SUMMARY

The County of Wellington (the County) is in compliance with the deadlines as outlined in *Ontario Regulation* (O. Reg.) *588/17 Asset Management* (AM) *Planning for Municipal Infrastructure*. This version of the detailed Asset Management Plan (AMP) complies with the deadline of July 1, 2024 (AMP for all municipal assets). This AMP addresses current levels of service and the associated costs of maintaining that service for the assets specified in **Table ES-1**.

Table ES-1 List of County assets included in this AMP, divided between "core" assets (defined in *O. Reg. 588/17*) and other municipal assets.

Core Assets	Bridges and Culverts
	Roads
	Stormwater Network
Other Municipal Assets	Facilities
	Housing
	Roadside Elements
	Vehicles and Equipment
	Pooled Assets

As the County's assets continue to age, it becomes increasingly important to formalize processes to determine how a group of assets is to be managed over the full asset lifecycle to ensure that safety standards, legislative requirements, and expected levels of service continue to be the most cost effective for residents of the County.

This AMP aligns with the County's *Strategic AM Policy*, completed as part of *O. Reg. 588/17* and approved by Council on December 1, 2022. The policy identifies the municipal goals the AMP supports, how the budget is informed, AM planning principles, considerations for climate change, and a commitment to provide opportunities for stakeholder input.

This AMP contains the following information for each of the asset classes:

- Asset inventory and age
- Estimated useful life and lifecycle events
- Data quality indicators
- Condition information, including mapping
- Risk analysis, including mapping
- Estimated replacement cost
- Funding needs
- Levels of service and performance metrics
- Strategy

EXECUTIVE SUMMARY (CONT'D)

In compliance with *O. Reg. 588/17*, the County will prepare an AMP in 2025 that addresses proposed levels of service and the associated costs of maintaining the proposed levels of service for those assets. After completing the requirements of the regulation, the AMP will be updated every 5 years. During years when a new AMP is not published, an updated version of the *Annual State of Infrastructure* report will be produced to reflect changes to the County's assets in order to update financial analysis and the County's *Annual Budget and Ten Year Plan*.

The following sections provide a high-level summary of the information contained in this AMP. Please refer to the Key Concepts (**Section 2**) and Asset Summary (**Section 3**) for more detailed information.

Inventory, Replacement Costs, and Funding Needs Summary

Refer to **Table ES-2** for a summary of the current asset inventory included in this version of the AMP. Each asset class is broken down into its inventory and relevant costs.

Table ES-2 Overview of inventory, replacement costs, and funding needs for County assets, 2023.

Asset	Quantity	Current Replacement Cost	Ten Year Average Capital Needs	Ten Year Average Replacement Needs	Annual Funding Requirement
Bridges and Culverts	101 Bridges 102 Culverts	$ 440,266,958	$ 10,316,601	$ 6,908,854	$ 7,105,323
Facilities	73 Facilities and structures	$281,774,634	$10,711,100	$10,711,100	$5,576,393
Housing	1,359 Housing units	$331,452,920	$6,367,400	$6,367,400	$7,036,460
Roads	709 Centerline-km 1,434 Lane-km	$ 381,991,250	$ 24,064,724	$ 20,821,798	$ 15,288,088
Roadside Elements	50 Retaining walls 43 Traffic signal sets	$ 18,403,851	$ 395,182	$ 395,182	$ 375,925
Stormwater Network	36,583 m of Pipes 1,492 Structures	$ 51,010,723	$ 1,163,368	$ 1,163,368	$ 593,508
Vehicles and Equipment	198 Vehicles 146 Equipment assets	$ 35,329,425	$ 4,345,682	$ 4,345,682	$ 3,588,154
Pooled Assets	4 Pooled asset types	$ 27,033,683	$ 3,846,025	$ 3,846,025	$ 3,601,746
	TOTAL	**$1,567,263,444**	**$61,210,082**	**$54,559,409**	**$43,165,597**

EXECUTIVE SUMMARY (CONT'D)

Capital Needs: This value represents the funding needs to perform the lifecycle events (including replacements) that are scheduled for a specified year. Backlogs from previous years are accounted for in the current year and will be carried forward into each subsequent year until the replacement is completed.

= SCHEDULED AND BACKLOG REPLACEMENT COST + SCHEDULED LIFECYCLE EVENTS COST

Replacement Needs: This value represents the funding needs to replace the assets that are scheduled for a specified year. Backlogs from previous years are accounted for in the current year and will be carried forward into each subsequent year until the replacement is completed.

= SCHEDULED AND BACKLOG REPLACEMENT COST

Annual Funding Requirement: This value represents the annual funding needed to perform all lifecycle events, including the replacement of an asset over its estimated useful life. Annual funding requirement calculates an average over the whole life of an asset assuming all lifecycle events are completed throughout, so there are no backlogs to account for.

$$= \frac{\text{ASSET REPLACEMENT COST + ALL LIFECYCLE EVENTS}}{\text{ESTIMATED USEFUL LIFE OF ASSET}}$$

Operating Needs: This value represents the estimated operational costs required to operate and maintain assets for a specified year. Operating costs for municipal assets are directly linked to maintenance, repairs, and upkeep. Efficient management and timely maintenance of assets can help control operating expenses and extend the lifespan of municipal assets.

= OPERATING COSTS

EXECUTIVE SUMMARY (CONT'D)

Condition Summary

The condition of County asset classes is summarized in **Figure ES-1**, including an overall condition of all County assets. On average, County assets fall within the good condition rating. Below the chart, replacement values are provided for assets that fall within each condition rating.

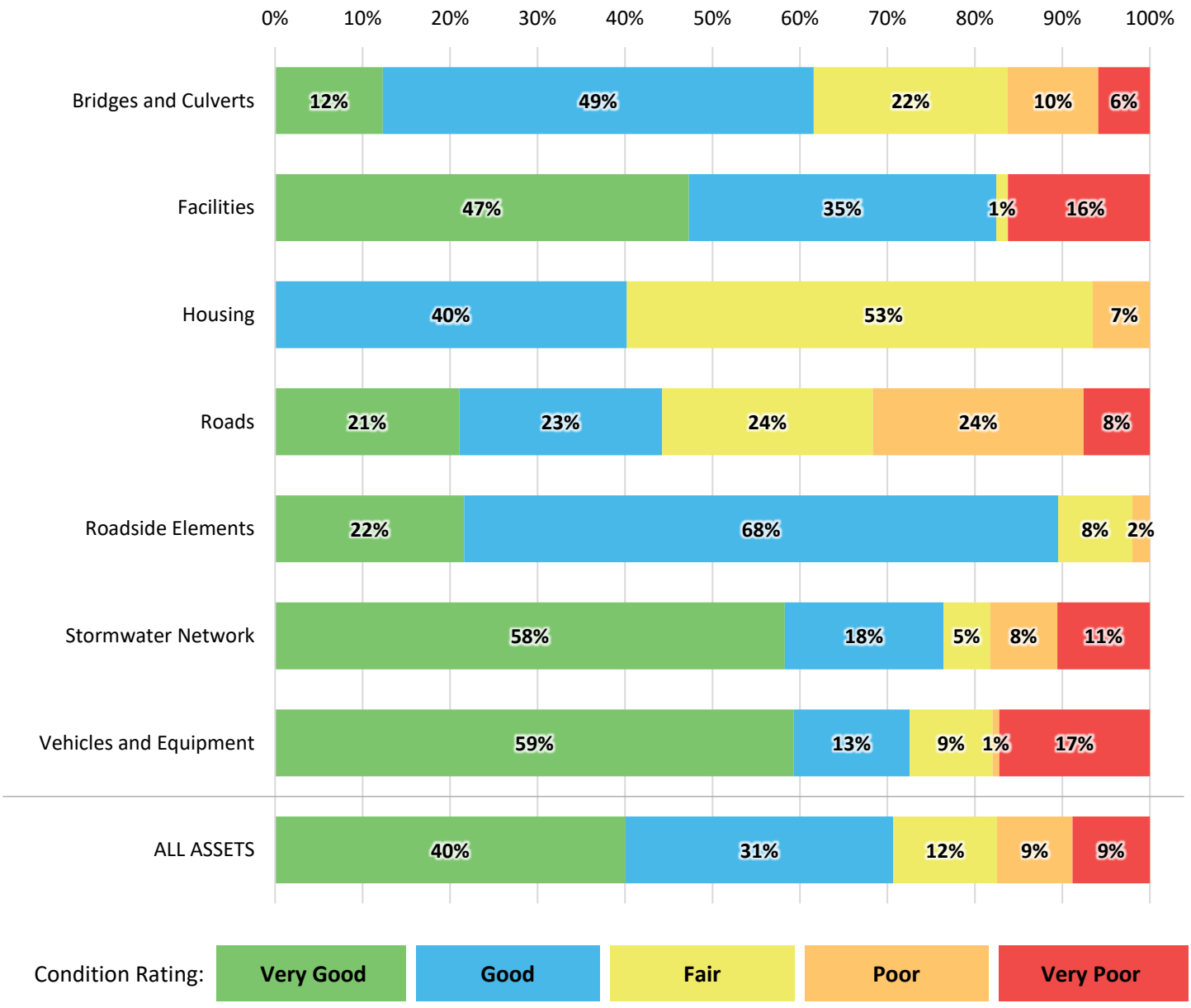


Figure ES-1 Breakdown of asset class condition, including an overall summary of the condition of all County assets, 2023.

EXECUTIVE SUMMARY (CONT'D)

Risk Summary

A risk assessment is conducted on County assets using a matrix to assess the probability and consequence of failure. Assets are grouped into five risk categories: very low, low, moderate, high, and very high. The risk of County asset classes is summarized in **Figure ES-2**, including an overall risk rating for all County assets.

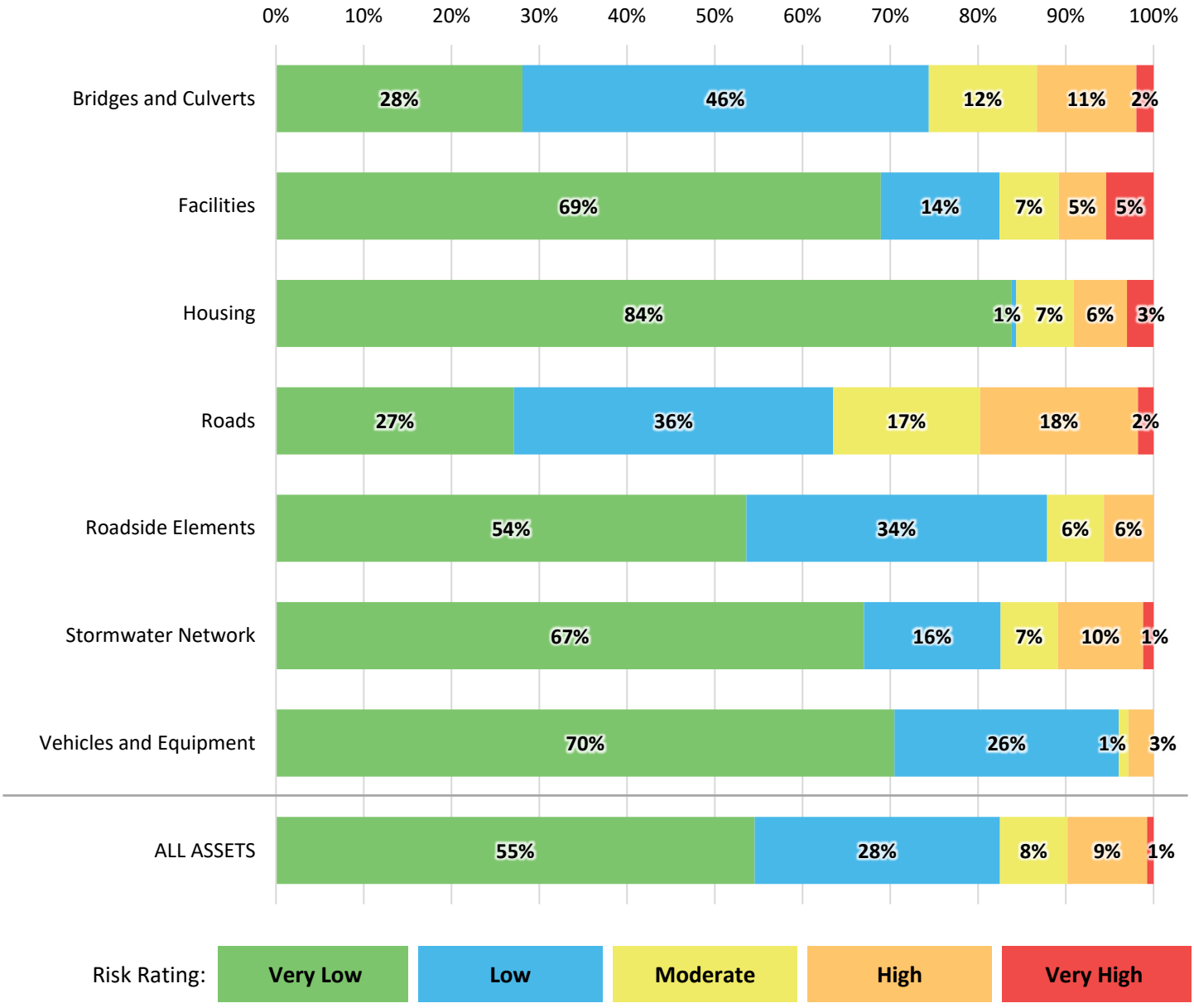


Figure ES-2 Breakdown of asset class risk, including an overall summary of the risk of all County assets, 2023.

EXECUTIVE SUMMARY (CONT'D)

Infrastructure and Backlog Summary

The graph below (**Figure ES-3**) shows the difference between what the County plans to invest (ten-year capital budget for 2024-2033) and what needs to be invested (ten-year capital needs for 2024-2033), to sustain the current levels of service and overall condition. As of 2024, the infrastructure gap is $228.3 million. At the current pace of investment, the gap is estimated to be $100.0 million by 2033. This trend is demonstrated in the graph below, with the red dotted line. If the County were to invest an additional $7.0 million per year, the gap would close in the ten-year timeframe.

The infrastructure gap has increased from an estimated $220.3 million, as reported in the 2023 annual report, to an estimated $228.3 million in 2024. This increase of approximately $8.0 million is attributed to the following inclusions and adjustments:

- Updated replacement value methodology and inflation adjustments.
- Analysis of future facility needs and budget adjustments (roads garages, County led ambulance stations, Erin library).
- A 2% provision of budget for ongoing operations at newly constructed facilities, as well as a 3% provision for ongoing road maintenance has been included in the needs.
- Inclusion of more asset classes including facilities, pooled assets, social and affordable housing, and vehicles and equipment.

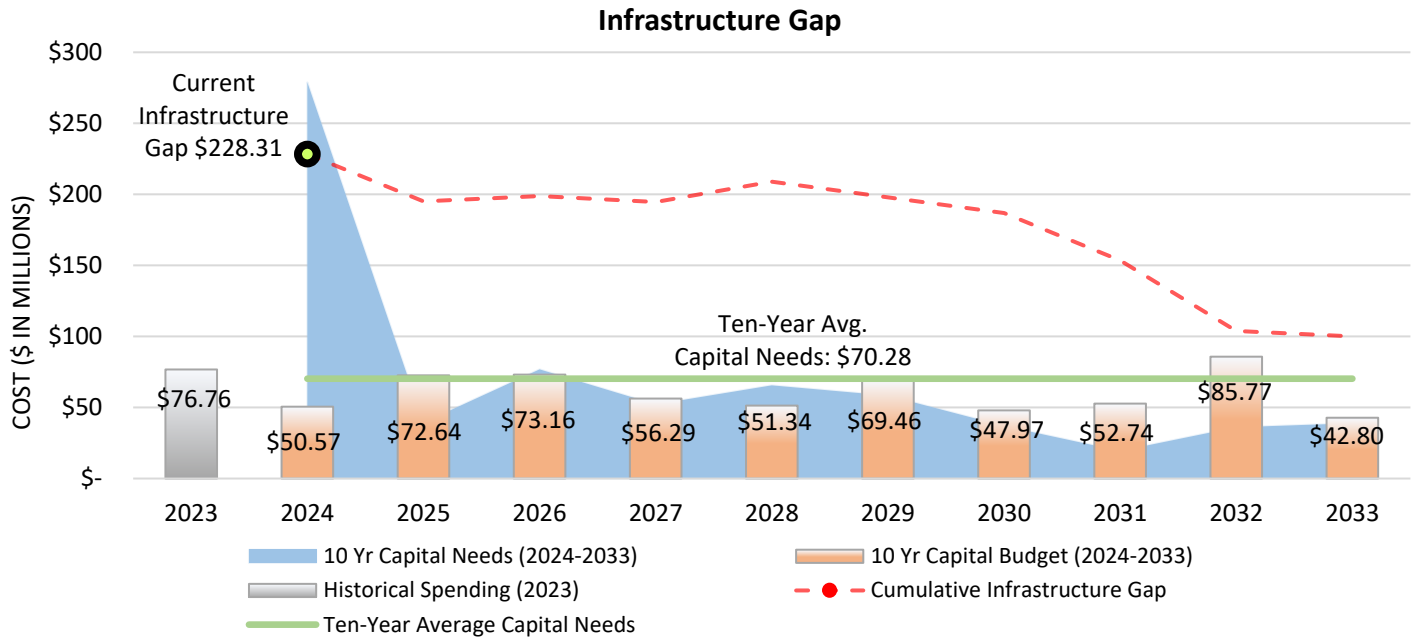


Figure ES-3 County infrastructure gap (2024-2033) for assets contained within this AMP, including the historical spending for 2023.

EXECUTIVE SUMMARY (CONT'D)

Table ES-3, below, is a snapshot of the infrastructure gap in 2024, broken out by asset type. The infrastructure gap is calculated by taking the existing backlog plus the current needs and subtracting the current budget. As demonstrated in the graph above, the total infrastructure gap in 2024 is $228.3 million.

Table ES-3 County infrastructure gap as of 2024, by asset class.

Asset Type	Infrastructure Gap (2024)	Existing Backlog	Current Needs (2024)	Current Budget (2024)
Bridges and Culverts	$ 48,183,818	$ 47,380,000	$ 7,723,818	$ 6,920,000
Facilities	$ 19,283,590	$ 5,067,590	$ 15,456,000	$ 1,240,000
Housing	$ 76,620,501	$ 97,156,801	-	$ 20,536,300
Roads (includes Roadside Elements and Stormwater Network)	$ 77,571,035	$ 30,935,808	$ 62,675,226	$ 16,040,000
Vehicles and Equipment	$ 607,281	$ 798,230	$ 4,199,051	$ 4,390,000
Pooled Assets	$ 6,043,768	$ 3,686,888*	$ 3,801,880	$ 1,445,000
TOTAL	**$ 228,309,991**	**$ 185,025,317**	**$ 93,855,974**	**$ 50,571,300**

* Backlog in pooled assets is attributable to assets that are beyond their useful life but still in productive use (for example, JD Edwards software).

It should be noted that the asset management software assumes the full physical replacement of the building structure itself at the end of its useful life. In practice however, it is the components that make up the structure that are replaced based on their respective useful lives. Due to the discrepancy in the level of detail between the financial data used for financial reporting and the detailed inventory used to manage the asset components, the backlog is a reasonable estimate but will be refined in the next AMP.

1 - Introduction

1.1 What is Asset Management?

AM is an integrated set of processes and practices that minimize the lifecycle costs of owning, operating, and maintaining assets, at an appropriate level of risk, while continuously delivering established levels of service. The core catalysts for the establishment of an organization-wide AM Programme include the increasing costs associated with providing a range of services to residents, population change, and the impacts of climate change within the context of a challenging municipal funding model.

AM planning is the process of making the best possible decisions regarding the building, operation, lifecycle events, renewal, replacement, and disposal of assets.

AM planning allows municipalities to make informed asset investment decisions, such as prioritizing investments, improving financial performance, managing risk, improving organizational sustainability, and improving efficiency and effectiveness.

The five key elements of AM (**Figure 1.1-1**) are:

1. Providing a defined level of service and monitoring performance;
2. Managing the impact of demand changes (growth as well as decline) through demand management, infrastructure investment, and other strategies;
3. Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet that defined level of service;
4. Identifying, assessing, and appropriately controlling risks; and
5. Having a long-term financial plan which identifies required expenditures and how they will be funded.

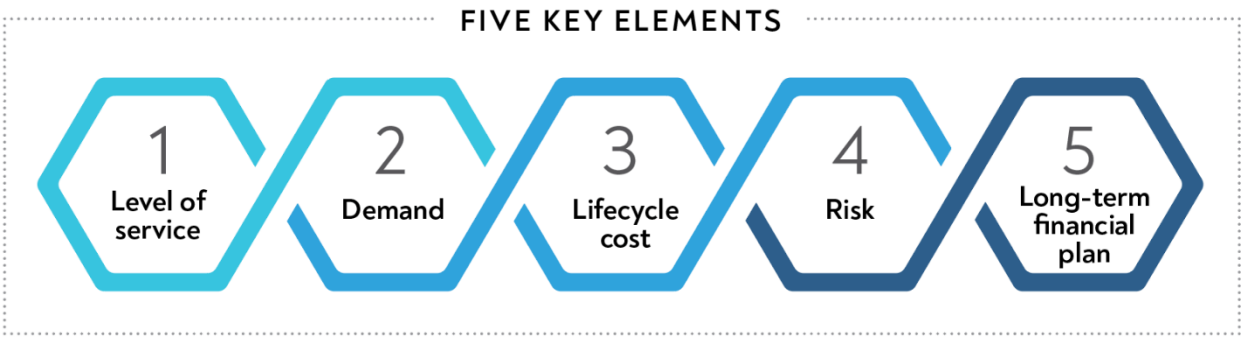


Figure 1.1-1 The five key elements of AM. (Source: International Infrastructure Management Manual)

1.2 COUNTY ASSETS

County assets are essential to the delivery of municipal services. They allow for the efficient flow of people and products, support cultural enrichment and economic development initiatives, and contribute to the quality of life for residents across the County. Fundamentally, infrastructure assets exist to provide services to communities.

The County provides a wide range of services to residents by maintaining capital assets across the County, including over 1,400 lane-km of roadways, over 100 bridges, more than 3,200 social and affordable housing units, several libraries, childcare centres, office spaces, and a long term care facility. The County also maintains a fleet of vehicles and equipment, IT assets, landfill sites, and waste facilities across the County.

Assets are broadly defined as “things that have actual or potential value to the County.” This definition encompasses everything from roads, bridges and culverts, to library books (**Figure 1.2-1**). All of these assets allow the County to provide critical services to residents.

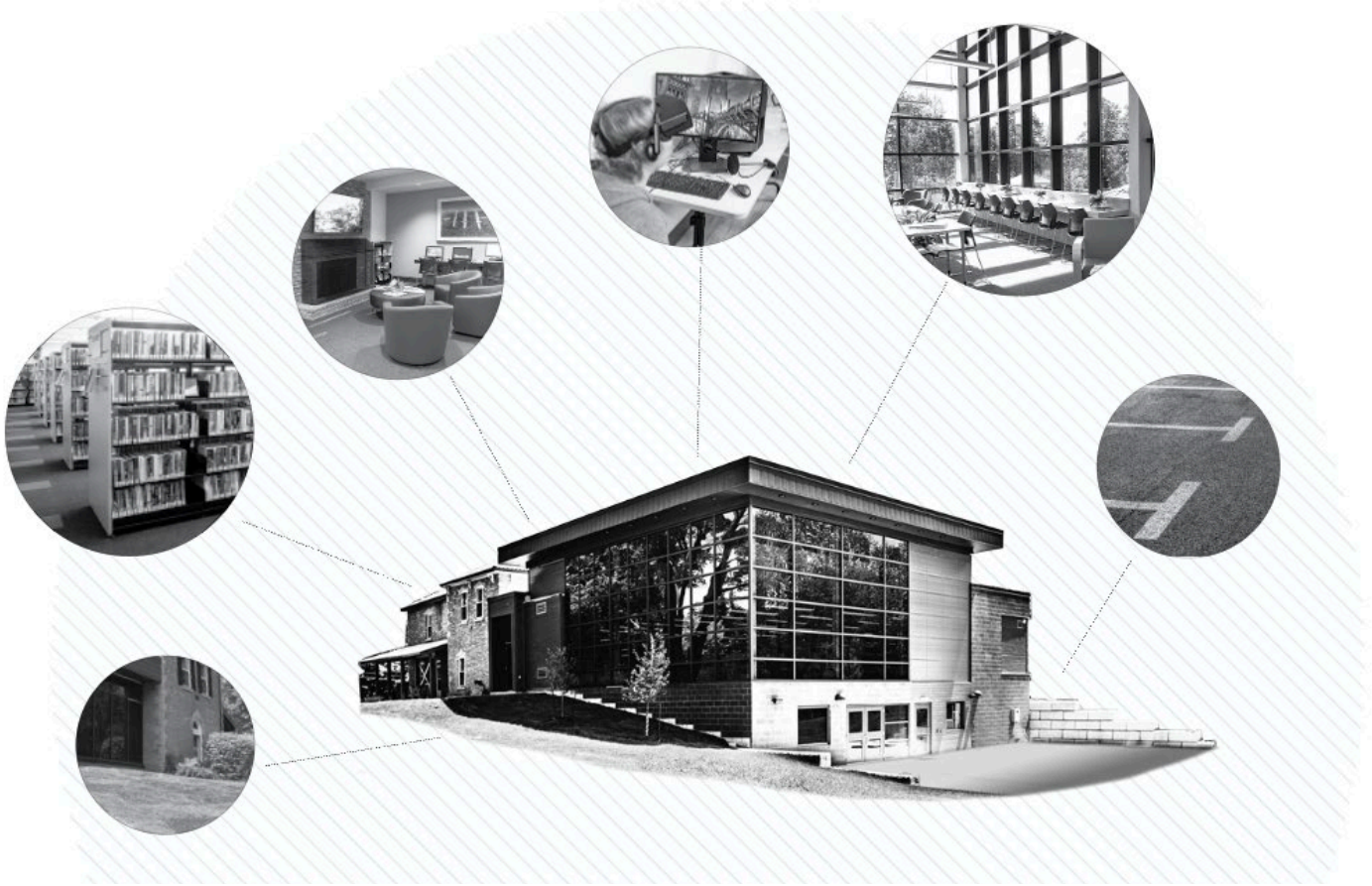


Figure 1.2-1 The County libraries are considered assets, as are the different components that make up the libraries.

1.3 ASSET MANAGEMENT PROGRAMME

Completion of AMPs is coordinated through the AM Programme area at the County. An advanced AMP consists of:

1. **A complete and accurate inventory**. Knowing what the County owns, where it is, and what condition it is in allows the County to predict future lifecycle events and renewal costs, identify any liabilities, and manage risks.
2. **A performance tracking system**. Knowing how well County assets are performing and how reliable they are, provides the County with information to predict when asset performance will drop to an unacceptable level, and schedule required interventions.
3. **A focus on levels of service**, to ensure the County provides the best services in the most cost-effective way.
4. **An optimized lifecycle events strategy**, to allocate resources efficiently.
5. **A demand management strategy** that enables planning for future infrastructure investments.
6. **Integration** of the AMP with capital and operating budgets.

Based on the *State of Maturity Report* completed in 2020, the County's AM capacity is at an intermediate level, with informal AM practices in each department. While these practices vary in completeness and complexity, the common theme across the organization was the need to improve the degree of consistency in data collection and management practices, formalize risk assessment procedures, and work toward improving data quality.

Data quality is critical to AM. Having an up to date, comprehensive asset data inventory is crucial for making informed, timely decisions regarding optimal infrastructure investments. In addition to detailed technical data, the data collected for each asset class includes:

- **Valuation** data: used to calculate replacement costs, track depreciation, and understand the financial useful lives of County assets.
- **Capital investment** data: identifies the cost and frequency of the capital events for each asset, a better estimate of the lifecycle costs of owning an asset.
- **Condition** data: defines the current condition of County assets and provides an understanding of the rate of deterioration of infrastructure.
- **Performance** data: provides an idea of the levels of service provided by County assets.
- **Risk** data: enables the County to prioritize investments based on the likelihood and consequence of asset failure.

Improving the quality of the data available will enhance modeling capacity and will provide more reliable estimates of investment needs for both the short-term and long-term financial plans at the County.

ASSET MANAGEMENT PROGRAMME (1.3 CONT'D)

In 2013, the County demonstrated a commitment to AM through the approval of a *Corporate AM Policy* and Programme. The purpose of this policy was to promote a corporate approach to the management of assets using best practices to support the delivery of services to the community. The policy defined a framework for organizational accountability and responsibility for the Corporate AM Programme and established the first governance model, as outlined in **Figure 1.3-1** and **Figure 1.3-2**. The first AMP was completed and followed the guidelines provided by the *Ontario Ministry of Infrastructure: Guide for Municipal Asset Management Plans*.

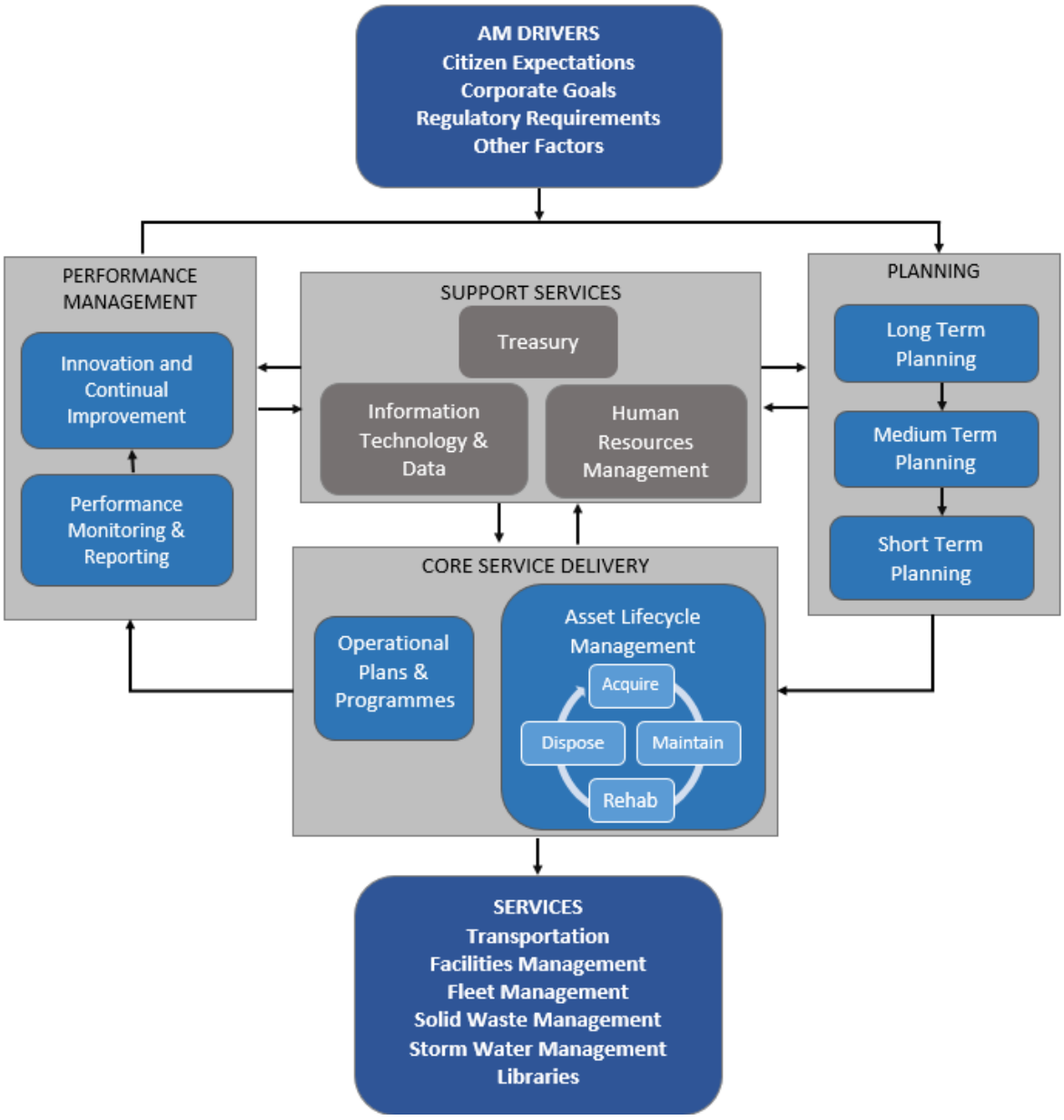


Figure 1.3-1 The Corporate AM Framework illustrates how the various departments interconnect and work together.

ASSET MANAGEMENT PROGRAMME (1.3 CONT'D)

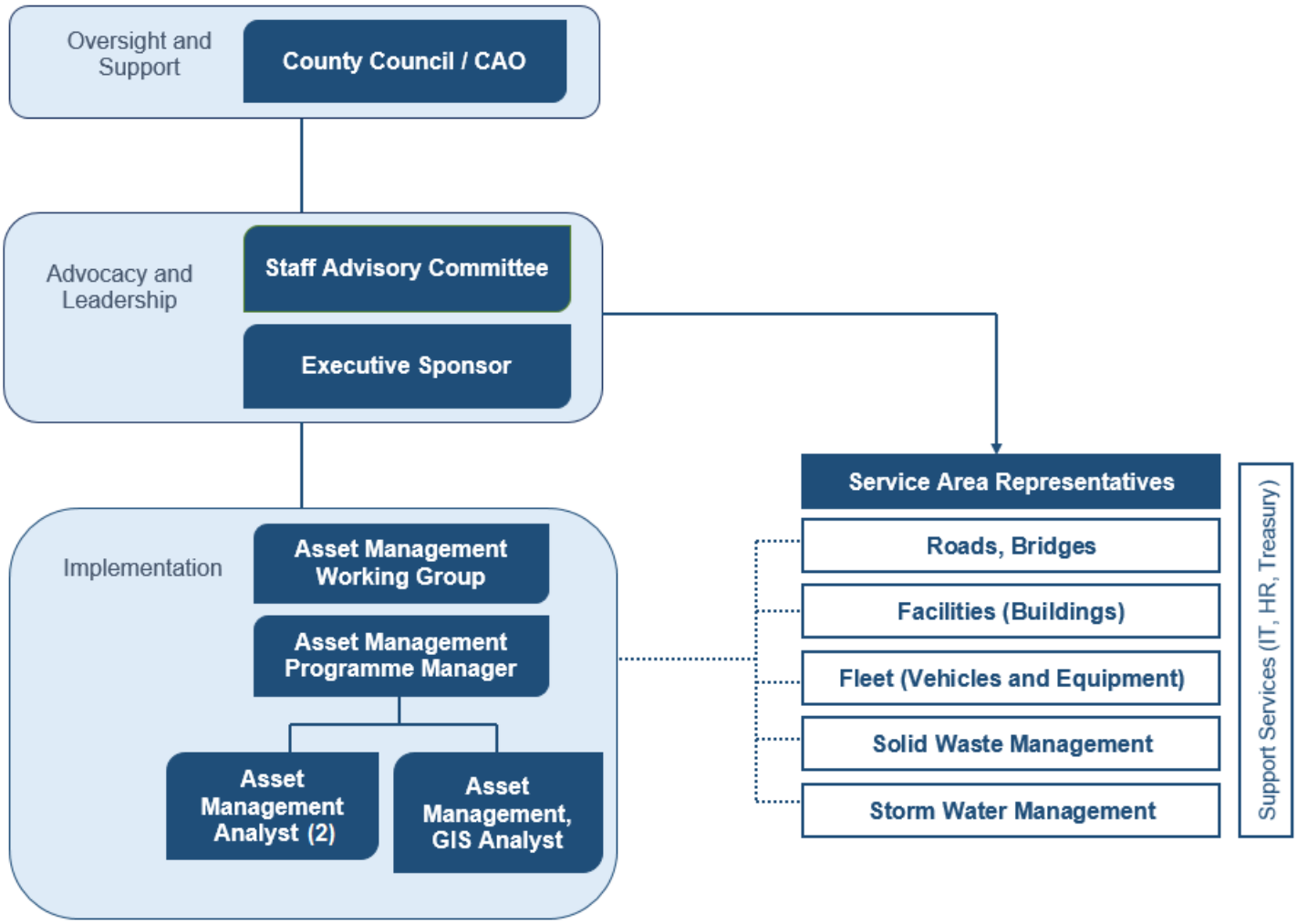


Figure 1.3-2 The Corporate AM Governance Model outlines the roles and responsibilities related to asset management.

Ontario Regulation 588/17 Asset Management Planning for Municipal Infrastructure

In 2017, *O. Reg. 588/17* was released outlining the new requirements for municipal AM planning. The compliance timelines are phased in over a 6-year period (**Table 1.3-1**).

Table 1.3-1 *Ontario Regulation 588/17* requirements.

Date	Requirement	Description
July 1, 2019	Strategic Asset Management Policy	The policy identifies municipal goals the AMP supports, how the budget is informed, AM planning principles, considerations for climate change, and a commitment to provide opportunities for stakeholder input.

ASSET MANAGEMENT PROGRAMME (1.3 CONT'D)

Table 1.3-1 Continued.

Date	Requirement	Description
July 1, 2022	Asset Management Plan (Core assets)	The plan must address current levels of service and the associated costs of maintaining that service for water, wastewater, roads, bridges, culverts, and stormwater assets.
July 1, 2024	Asset Management Plan (All municipal assets)	The plan must address current levels of service and the associated costs of maintaining that service for all municipal assets.
July 1, 2025	Proposed Levels of Service	Builds on the 2024 requirement by including a discussion of proposed levels of service, what activities will be required to meet proposed levels of service, and a strategy to fund those activities

In response to this new regulation, the County and its member municipalities formed an AM working group in order to collaborate and share strategies for implementation, to produce comparable reporting and align budgets for future shared capital projects, and to share GIS resources. In addition, the County established an internal working group with representation from each department to plan for compliance with the new regulation. In 2019, the County updated its original *Corporate AM Policy* in order to comply with the requirements under *O. Reg. 588/17*. The updated *Strategic AM Policy* outlines the fundamental AM principles that will be incorporated into the County's Corporate AM Programme.

Long-Term Financial Sustainability Strategy

The County developed a *Long-Term Financial Sustainability Strategy* to guide investment decisions across the County. This strategy is needed to address current and future asset expenditure requirements. Investment in infrastructure will be based on long-term requirements and consider the levels of service guided by the AMP. The County will not allow for unplanned reduction in service levels or permit County infrastructure to deteriorate.

ASSET MANAGEMENT PROGRAMME (1.3 CONT'D)

Strategic Action Plan

In 2023, the County updated its *Strategic Action Plan: Proudly Moving Forward*. The AMP supports the following strategic actions:

- Tackling a Major Community Opportunity – Housing
- Doing What the County Does Best – Providing Critical Daily Services for Residents
- Making the Best Decisions for the Betterment of the Community
- Cherishing the County's Most Valued Asset – its Staff

Service Efficiency Review

In November 2019, the County and its seven member municipalities completed an *Operational Service Efficiency Review*. The review identified several opportunities to improve AM services between municipalities including the following:

- Establish and implement a county-wide AM system with centralized GIS functions and data, including shared/dedicated AM expertise.
- Establish consistent AM performance measurements and a centralized performance management system.
- Implement consistent standards for infrastructure and asset condition assessments.
- Deploy and use mobile digital tools for AM activities to reduce paper records.

In addition, the County developed a Corporate AM Framework and updated the existing governance model based on industry best practice. This identified the need for additional resources to support an integrated and sustainable approach to service delivery across the county, including coordinating with the seven member municipalities within the County.

In 2020, the County allocated additional resources in AM and undertook the implementation of AM software to consolidate and centralize all asset data across service areas. The County, and its seven member municipalities, all use a common software system for AM. As part of this project, the County moved forward with its AM Programme development initiative and completed the following key elements required in AM planning:

- *State of AM Maturity Report*
- Condition assessment protocols
- Risk analysis and modelling framework
- Levels of service development

1.4 Strategic Asset Management

The County adopted the *Strategic Asset Management Policy* in June of 2019. The policy is in compliance with *O. Reg. 588/17* and it outlines the fundamental AM principles that will be incorporated into the County's overall AM Programme. The County provides a wide range of services to the community that require the ownership and responsible operation, maintenance, rehabilitation, and retirement of physical assets. The intent is to maximize benefits, reduce risk, and provide acceptable levels of service to the community in a sustainable manner. The County is committed to continually improving its AM strategy by incorporating elements of various strategic policies and plans, including the *County of Wellington Strategic Action Plan* and the *Long Term Financial Sustainability Strategy.* AM planning is concurrent with the County's overall goals, plans, and policies in order to support the following community objectives, as outlined in **Figure 1.4-1**.

Figure 1.4-1 The fundamental principles that make up strategic asset management.

1.5 FINANCING STRATEGY

The *Long-Term Financial Sustainability Strategy* helps guide investment decisions across the County. It consists of nine core principles, as shown in **Table 1.5-1**.

Table 1.5-1 The nine core principles of the County's financing strategy.

	Principle	Description
1	**Ensure Long-Term Financial Health**	The County's financial position will allow it to continue to achieve its obligations over the long-term, without undue pressure on taxpayers.
2	**Predictable Infrastructure Investment**	Investments will be based on long-term plans, based on levels of service.
3	**Responsible Debt Management**	The amount and cost of servicing new debt will not negatively affect the County's credit rating.
4	**Strategic Use of Reserves and Reserve Funds**	Reserves and Reserve Funds will be funded to the levels required for their purposes, as set out in the Reserve and Reserve Funds policy.
5	**Competitive Property Taxes**	The County will strive to achieve reasonable and responsible property tax rates to ensure that the County continues to be a desirable place to live, work, and play.
6	**Deliver Value for Money**	The County will continuously seek efficiency and quality improvements in the way services are managed and delivered.
7	**Appropriate Funding for Services**	The County will determine how and when user fees are utilized, and ensure that growth pays for growth via the use of development charges.
8	**Diversify our Economy and Enhance our Assessment Base**	The County will promote economic development activities to enhance the assessment base to ensuring every ratepayer is paying their fair share.
9	**Protect and Preserve Intergenerational Equity**	The County will strive to maintain a strong financial position while establishing fair sharing in the distribution of resources and obligations between current and future taxpayers.

FINANCING STRATEGY (1.5 CONT'D)

These principles (**Figure 1.5-1**) guide the County's infrastructure investment strategies. As the County gains a better understanding of the infrastructure investment needs and the available funding, the County will need to make important decisions regarding investment priorities, risk management, and climate change mitigation. The County will also need to evaluate the ways in which it analyzes the benefits of its investments, the long-term operating budget implications of its capital projects, and how it measures the performance of its assets against investments. All of these decisions and processes will be informed by these nine principles and the County's *Strategic Action Plan*.

The County's *Annual Budget and Ten Year Plan* is supported by several sources of revenue. These sources are described below. The County funds infrastructure renewal activities through a combination of the following:

- Capital Reserves
- Infrastructure Funding (Grants and Subsidies) from Upper Levels of Government:
    - Canada Community Building Fund (CCBF), formerly Federal Gas Tax
    - Ontario Community Infrastructure Fund (OCIF)
- Recoveries from other Municipalities
- Development Charges
- Debt

Figure 1.5-1 Nine principles of the *Long-Term Financial Sustainability Strategy*.

Capital Reserves

The County funds its capital budget predominately through capital reserves providing stable, predictable, and long-term sustainable funding. Capital reserves fund specific replacement or renewal of capital assets. Budgeted operating transfers to reserves helps to smooth the impact on the tax levy. The *Reserves and Reserve Funds Policy* provides guidance on funding sources, use, and funding targets for these reserves. This is in alignment with the *Long-Term Financial Sustainability Strategy* and its principles of predictable infrastructure investment, long-term financial health, and strategic use of reserves.

FINANCING STRATEGY (1.5 CONT'D)

The County currently has twelve capital reserves with a 2023 year-end balance of $62.9 million. **Table 1.5-2** provides a listing of the County's capital reserves with information on target balances, sources, and uses of funding. As the County continues to refine its AMP, target balances and annual contributions to the County's capital reserves will be adjusted to align with recommendations coming out of the AMP.

Table 1.5-2 Capital Reserves: Targets, funding sources, and uses.

Capital Reserve	Target Balance	Typical Sources of Funding	Typical Uses of Funding
Roads Equipment	Sufficient to fund capital replacements over a 2-4 year term	Annual operating budget provision and net auction revenue	Acquisition of new and replacement equipment
Solid Waste Services Equipment	Sufficient to fund capital replacements over a 2-4 year term	Annual operating budget provision	Acquisition of new and replacement equipment
Roads Capital	Sufficient to fund capital requirements over a 1-2 year term (Excluding Equipment and DC)	Annual operating budget provision, Aggregate Resources Act revenue, capital project savings	Funding of roads capital projects; budget adjustments at time of tender; road and bridge emergency capital spending
General Capital	10-15% of average annual capital budget	Transfers from operating budget, capital project savings, interest earned on capital project balances	Financing of capital budget as required for services without a dedicated reserve
Solid Waste Services Capital	Sufficient to fund capital requirements at active landfill sites, transfer stations and capping material over a 1-2 year term	Capital project savings, transfers from operating budget	Financing of Solid Waste Services capital projects; budget adjustments at time of tender and acquisition of capping materials
Housing Development	Sufficient to fund new social and affordable housing units in accordance with the 10-year housing and homelessness plan	Annual operating budget provision, net revenue generated by County-owned affordable housing projects	Funding for County affordable housing incentives and projects
Housing Capital	Sufficient to fund County's social and affordable housing capital requirements over a 1-2 year term	Annual operating budget provision, capital project savings	County share of housing projects per budget; budget adjustments at time of tender; and housing emergency work

FINANCING STRATEGY (1.5 CONT'D)

Table 1.5-2 Continued.

Capital Reserve	Target Balance	Typical Sources of Funding	Typical Uses of Funding
County Property	8 - 12% of total insured building value (excluding Social/Affordable Housing) 2021 insured value $207,864,500	Annual operating budget provision, capital project savings, proceeds from sale of County properties	Fund construction of County facilities, property acquisition and capital improvements to existing facilities
Wellington Terrace Capital	Sufficient to fund the replacement of the Terrace building and components as required	Annual operating budget provision (including debt retirement savings)	To fund capital works related to the Long-Term Care Home
Continuum of Care	TBD	Allocation of year-end surplus and operating budget provision	To fund the Continuum of Care project
Climate Change Mitigation and Adaptation	TBD	Transfers from operating budget and savings from related programmes	Funding of Climate Change Mitigation Plan, Trail Master plan initiatives and related requirements
Ambulance	Sufficient to fund County Share of City capital replacements over a 2-4 term	Annual operating budget provision	Funding of land ambulance initiatives, significant future year end budget shortfalls and future capital or facility costs

The 10-year capital budget (2024-2033) includes $574.2 million for infrastructure-related capital requirements. Capital reserves fund 61% of the 10-year capital budget. Capital reserves will continue to be the most stable and predictable source of capital funding for County infrastructure improvements. Staff will continue to refine the AMP and work to better align the budget with asset categories identified in the AMP, as well as adopt a common asset identification system to better allocate costs to assets. As this work is completed, recommendations will come forward to adjust the *Reserves and Reserve Funds Policy* and annual contributions to reserves through the County's *Annual Budget and Ten Year Plan*. This is in recognition that the AMP is a living document and staff are committed to continuous improvement of its data reliability and alignment with County processes.

FINANCING STRATEGY (1.5 CONT'D)

Government Infrastructure Funding: Canada Community Building Fund (formerly Federal Gas Tax)

Since 2005, the County has received approximately $50.1 million in *Canada Community Building Fund* (CCBF) allocations. This formula-based funding allocation is based upon population counts. In 2024, the 2021 census population count was used. The intent of this funding is to provide up-front, predictable long-term investment to provinces and territories to help address local infrastructure priorities. The current 2024-2028 funding agreement has the County receiving $16.1 million in CCBF funds. The County has planned to utilize $27.6 million for AM and infrastructure improvements to its network of roads, bridges, and culverts over the next 10 years.

Government Infrastructure Funding: Ontario Community Infrastructure Fund (OCIF)

The provincial subsidy revenues are identified from the *Ontario Community Infrastructure Fund* (OCIF) formula-based funding. Since 2017, the County has received approximately $17.4 million in OCIF funding. A change in the funding formula in 2023 has resulted in a reduction in the funding allocated to the County. The County's allocation is $2.8 million in 2024 and County staff have assumed funding decline to $1.9 million in 2027, after which the funding level is maintained through 2033. From 2022 to 2027 there is an anticipated 49% decrease in funding levels. The County has forecasted a reduction of $11.9 million in OCIF funding over the 10-year plan.

Recoveries

Recoveries from other municipalities are budgeted for shared projects. Recoveries in the roads division are used for capital works on boundary roads and bridges shared with neighbouring municipalities. Recoveries from the City of Guelph are used for capital works on all Social Services projects as the County is the Consolidated Municipal Service Manager (CMSM) for Guelph and Wellington. Projects include the City's share of childcare facilities, social housing infrastructure, and lifecycle maintenance and improvements to Social Services administrative buildings.

Development Charges

Development charges (DCs) are determined through the *Development Charge Background Study* in accordance with the County's development charge by-laws. The County funds growth-related work through development charges. The County's current Development Charge By-Law is in effect until May 2027.

FINANCING STRATEGY (1.5 CONT'D)

Recent provincial legislation (Bill 134 and Bill 185) required the phase-in of development charges, reducing development charges received by the County by an estimated $1.0 million to the end of 2023. Some of these changes, including the mandatory phase-in and the exclusion of studies have been reinstated by the province. Legislation regarding reductions and exemptions for rental housing and affordable and attainable housing will continue to impact the County's ability to collect DCs. Work on a new *Development Charge Background Study* is scheduled to commence in 2026 with an updated Development Charge By-Law expected by June 2027.

Debt

Debt financing will be used only when necessary to ensure the tax levy remains reasonable and to ensure reserve balances are adequate to meet the future needs of existing capital assets. It is best practice to contribute to capital reserves for the replacement and refurbishment of capital assets as this reduces the need for debt financing. With the anticipated reduction in senior level government funding and development charge revenues, the County may need to consider debt financing for some of its larger capital initiatives.

The 10-year capital plan includes $81.8 million in debt financing, $20.5 million funded from the tax levy and $61.3 million recovered from development charges. Debt financing projects include funding for five ambulance stations as per the 2018 *Optimal Resource Deployment of Paramedic Services* report, five roads facilities as per the 2022 *Roads Garages Review*, the new Erin library branch, upgrades to the Elora waste facility, and three roads projects.

Other Funding Options

User fees are not currently used at the County but could be considered in the future. For example, stormwater user fees have recently been implemented in several urban municipalities to help fund the rising infrastructure costs of increased rainfall due to the impacts of climate change.

Staff continue to explore grant opportunities to assist in the funding of capital initiatives. In addition to the formula-based grants discussed earlier (CCBF and OCIF), there are a number of application-based grants that come up from time-to-time. For example, the Federation of Canadian Municipalities (FCM) has been offering grants to assist municipalities with research and implementation of climate change initiatives.

1.6 CONTINUOUS IMPROVEMENT

This plan is a living document. As AM practices evolve and improve, the completeness and quality of future AMPs will improve, as will the capacity to plan for future infrastructure investment needs. Once the requirements of the regulation have been met; a comprehensive update of the AMP will take place every five years, and annual reports will be submitted to County Council to summarize the state of the assets and AM related activities throughout the year.

Each section in this AMP contains a data maturity scale, which gives an overview of the confidence the County has in its modeling, based on the quality of the data available. It also gives the County an idea of key data gaps, and the priorities for ongoing improvement.

Each section also includes a strategy for improving the management of those assets. Some asset classes may have limited data, and the key strategic goals for that asset class may include data quality improvements. Other classes may have identified a large infrastructure gap, and the strategy may be more focused on the allocation of available funding to address the gap.

CONTINUOUS IMPROVEMENT (1.6 CONT'D)

In order to guide the continuous improvement of the Corporate AM Programme as a whole, the following short and long-term goals have been identified along with their status in 2023 (**Table 1.6-1**).

Table 1.6-1 Short-and long-term priorities for the County AM Programme as a whole, 2023.

Short Term Improvement Goals	**Status in 2023**
Ensure compliance with provincial asset management regulation (*O. Reg. 588/17*)	
Define replicable methodology for calculating replacement costs for core and other assets	
Develop preliminary risk matrices for all asset groups	
Build data collection templates for all County assets to better align with CityWide AM software	
Define standard operating procedures for the AM software	
Upload and review other asset (non-core) data to ensure accuracy and completeness	
Incorporate operating budget costs (i.e. lifecycle costs) into the funding models for core assets	
Long Term Improvement Goals	**Status in 2023**
Integrate growth projections and master plans (e.g. *Roadmap*), the *Development Charge Study* and the *Climate Change Mitigation Plan* into the AMP	
Define levels of service for all municipal assets	
Improve integration of the ten-year budget forecast with the AMP; this may include re-aligning the budget to better reflect asset categories	
Continue to collaborate with member municipalities	
Further align the component data in CityWide for housing and property services buildings	

Legend: In progress  Complete 

1.7 COLLABORATION

There are ongoing opportunities for the County to work with its seven member municipalities to establish a County-wide AM service delivery approach. County roads lead into member municipality local streets, stormwater pipes managed by the County are fed by those managed by member municipalities, and the County owns and maintains assets throughout the member municipalities, including bridges and buildings. Capital lifecycle events of assets impacts the County's member municipalities, and as a result, coordinated AM practices are necessary to optimize AM across the County.

Throughout the process of establishing a corporate AM Programme, the County has engaged representatives from all seven member municipalities, to share best practices and resources. The County and member municipalities have all implemented common AM software to aid in tracking AM activities and enabling predictive analyses relating to infrastructure investment.

Components of lifecycle management, including condition assessment scales, risk models, and performance measurement have been reviewed to determine the degree to which common definitions, matrices, and procedures can be adopted. The County is continuously evaluating opportunities for further collaboration and efficiency.

In addition, the County has utilized best practices including tools and templates provided by the Federation of Canadian Municipalities (FCM), Municipal Finance Officers' Association (MFOA), and neighbouring municipalities where appropriate for research and peer review.

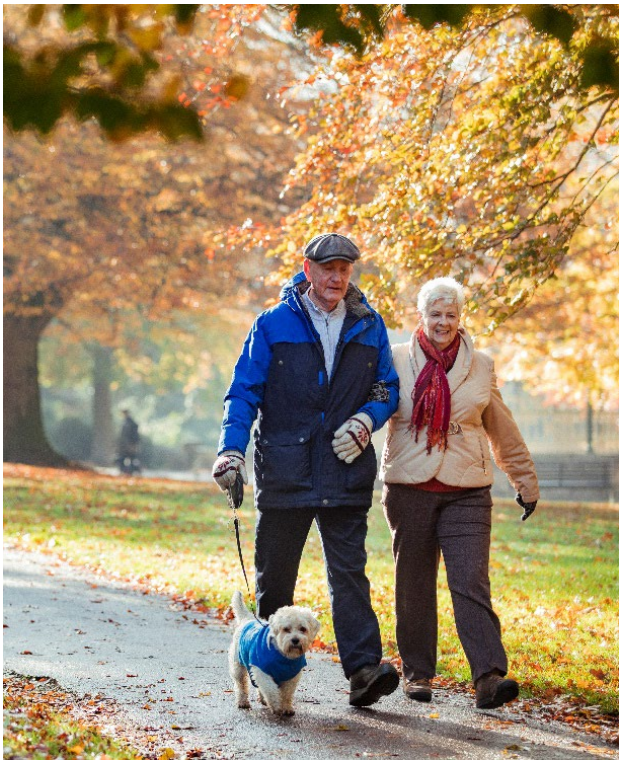
The County will provide opportunities for public engagement where residents and other stakeholders served by the County can provide input into AM planning through the existing strategic and master planning processes.

1.8 Demand Management

Demand is driven by a number of factors, including population and employment forecasts, demographic shifts, economic development trends, environmental shifts and Legislative changes (such as *Ontario's More Homes Built Faster Act*, 2022). Anticipated changes in demand need to be incorporated into long-term planning in order to assess the impact on County infrastructure and the delivery of services to the community.

Increases or decreases in demand can significantly affect what (and how many) assets will be needed to meet the needs of communities. Infrastructure demand trends are analyzed to determine whether they are ongoing, long-term trends such as population and demographic shifts, or more cyclical in nature, such as seasonal variation in demand. This enables the County to predict impacts on future budgets and plan accordingly.

Economic trends, such as tourism growth, housing affordability, and changes in household disposable income also affect the types of services provided and how they are funded. County residents are also increasingly reliant on technology, which impacts services. Changes in technology can create the need for new or improved services and infrastructure, including provision of broadband in rural communities.



The population of the County is projected to grow steadily to approximately 142,000 residents by 2041 (**Figure 1.8-1**). With growth expected in the County, employment within the main industries is also expected to increase (**Figure 1.8-2**).

The County is also witnessing a demographic shift with an aging population in need of significant support, including infrastructure investments to enhance mobility and accessibility throughout communities. Population growth and demographic shifts will necessitate additional infrastructure investment, including widening roads and bridges to prevent congestion, increasing childcare capacity, and making waste collection programmes as efficient as possible.

DEMAND MANAGEMENT (1.8 CONT'D)

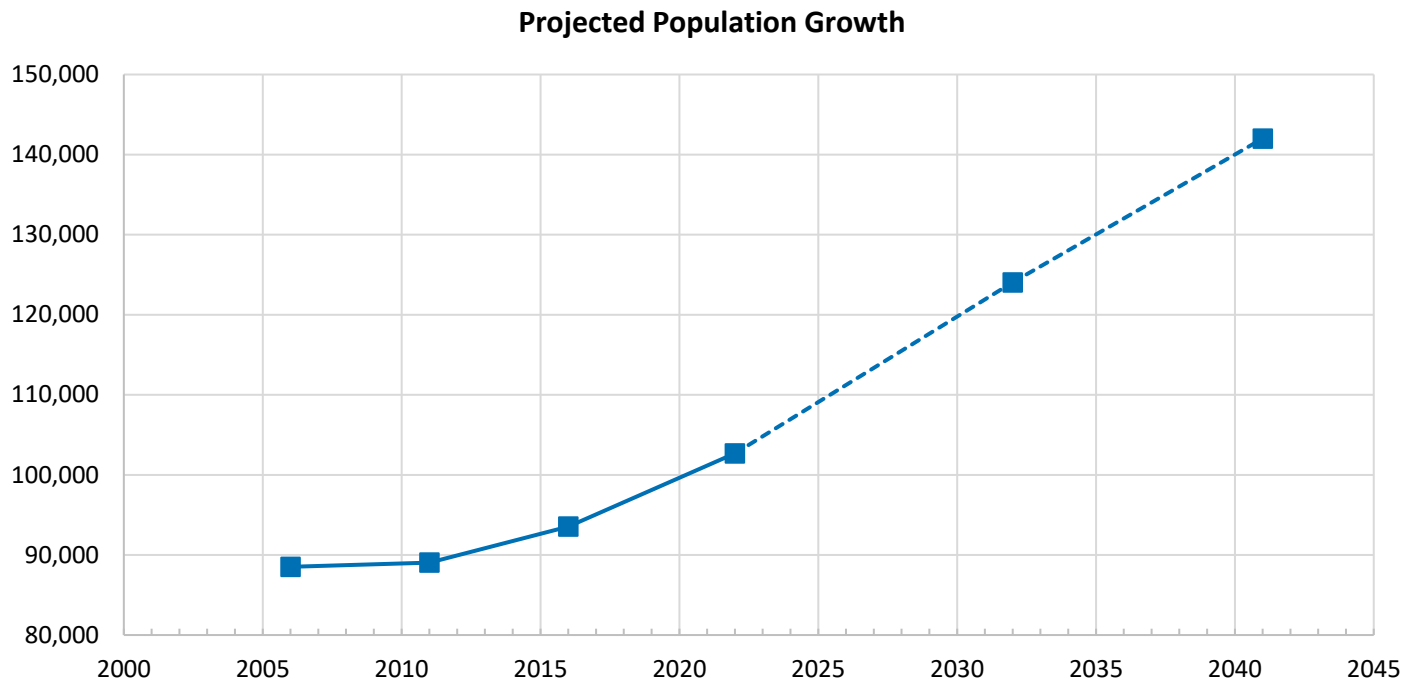


Figure 1.8-1 Past and projected population growth for Wellington County, 2006-2041. Refer to appendix *A.4 Demand Management Statistics, Table A.3-1* for more details and source information.

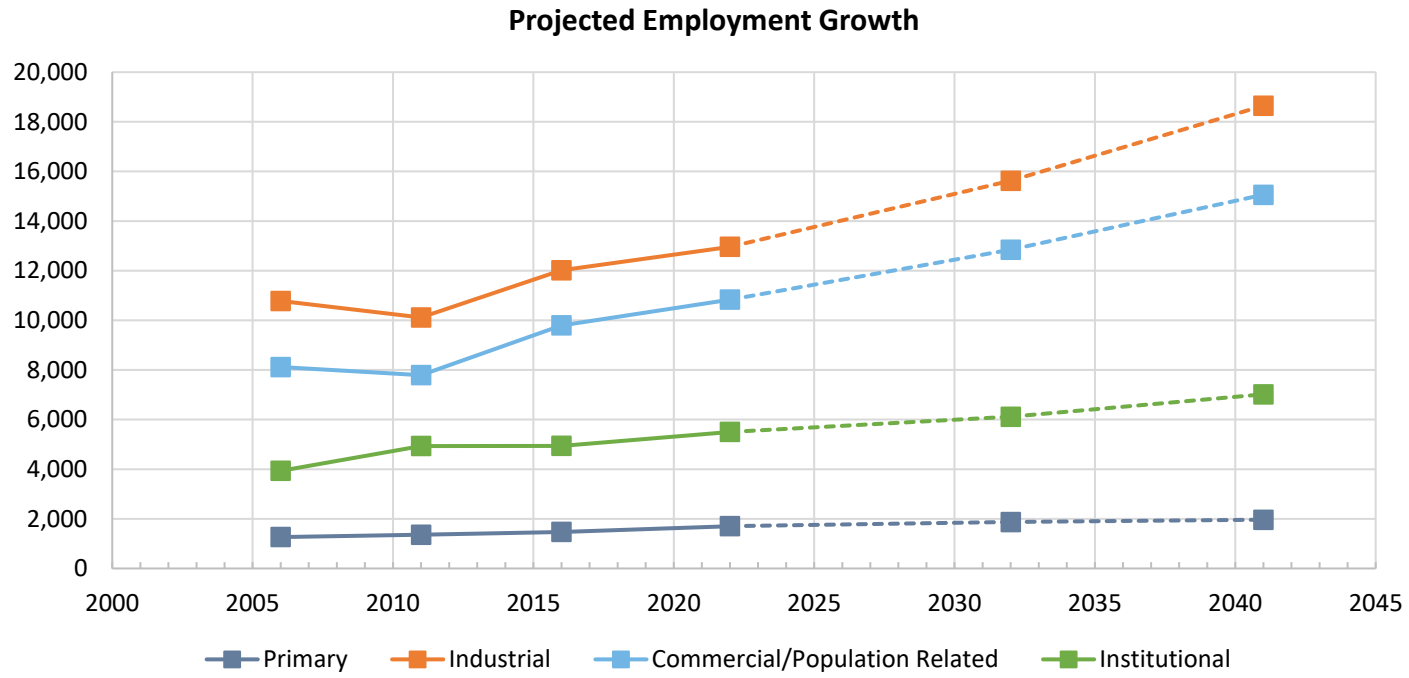


Figure 1.8-2 Past and projected employment growth for Wellington County, 2006-2041. Refer to appendix *A.4 Demand Management Statistics, Table A.3-2* for more details and source information.

1.9 CLIMATE CHANGE

The County is projected to see many climate-related changes in the future. Based on the *County Climate Change Mitigation Plan*, the two most noticeable changes will likely relate to temperature and precipitation. The County is projected to see:

- An increase in average annual temperatures
- An increase in the number of days annually when local temperatures are greater than 30 degrees Celsius.
- An increase in average annual precipitation, the frequency of extreme events, and increase in ice storms.

The County has already begun to see the impacts of a changing climate on Ontario infrastructure. A July 2013 storm that resulted in flash flooding across the Greater Toronto Area (GTA) became the most expensive natural disaster in Ontario history (source: *OSWCA; The State of Ontario's Water and Wastewater infrastructure, March 2018*). In February of 2018, a state of emergency was declared across southwestern Ontario due to heavy rain and melting snow. These previously rare "100-year" storm events are becoming much more common, placing additional pressure on existing infrastructure.

Some assets are at higher risk of climate change events and are more vulnerable to failure. For example, County roads within the 100-year floodplain are more vulnerable to worsening storms, and the County stormwater infrastructure will also need to be able to cope with the additional environmental stressors.

County Council endorsed a climate change mitigation plan for the County in 2021 entitled *Future Focused*. This plan seeks to integrate climate change into decision-making by developing actions and policy to lead the community in the reduction of greenhouse gas emissions. This will ensure the County continues to deliver superior public service resulting in healthy and safe communities within resilient and sustainable ecosystems, now and in the future.

Climate change adaptation is an inevitable, major investment that is made up of an array of projects that help communities withstand the consequences of a changing climate. Enhancing natural infrastructure aids in climate change mitigation (**Figure 1.9-1**). More details regarding the plan and climate change mitigation strategies can be found on the County of Wellington website.

It is projected that the County of Wellington will experience the following changes in climate over the next 80 years:

- Increase in average annual temperature.
- Increase in number of days annually above 30°C.
- Increase in average annual precipitation.
- Shorter return period of extreme events.
- Increase in storm intensity.
- Decrease in snow.
- Increase in ice storms.

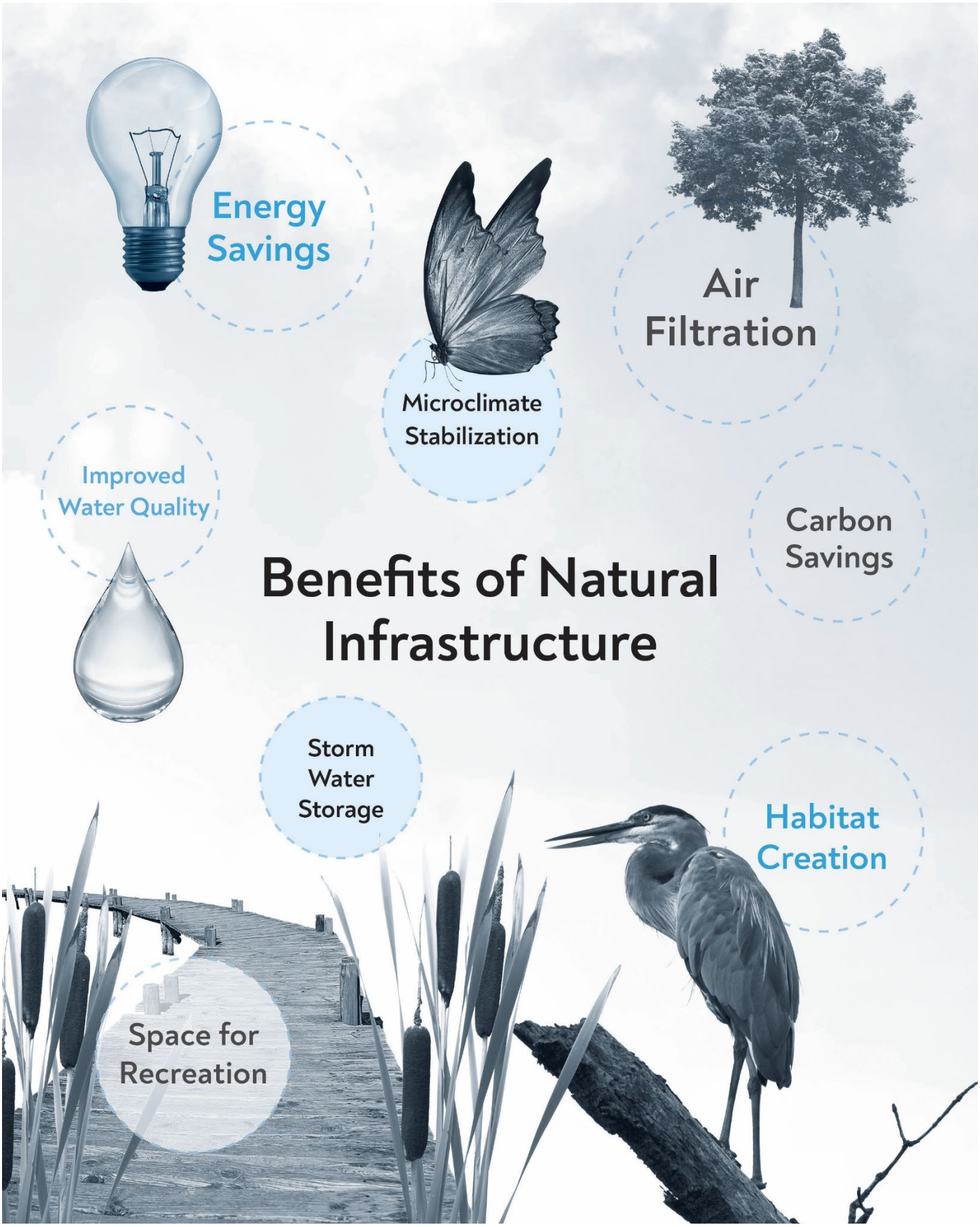


Figure 1.9-1 Overview of the benefits of natural infrastructure assets that aid climate change mitigation.

2 - Key Concepts

2.1 LIFECYCLE

An asset's lifecycle can be broken down into three phases: initial construction or purchase, operating and maintenance, and asset disposal or replacement. Once in service, an asset will begin to deteriorate. Some assets are rehabilitated at regular intervals in order to improve their condition and extend their useful lives. The activities completed throughout an asset's lifecycle are typically referred to as lifecycle events, as illustrated in **Figure 2.1-1**. However, other assets may be used and left to deteriorate at a constant rate with no mitigation measure to extend its life. Reasons for taking this approach vary from asset to asset and are discussed further within the Asset Summaries (**Section 3**) of this AMP.

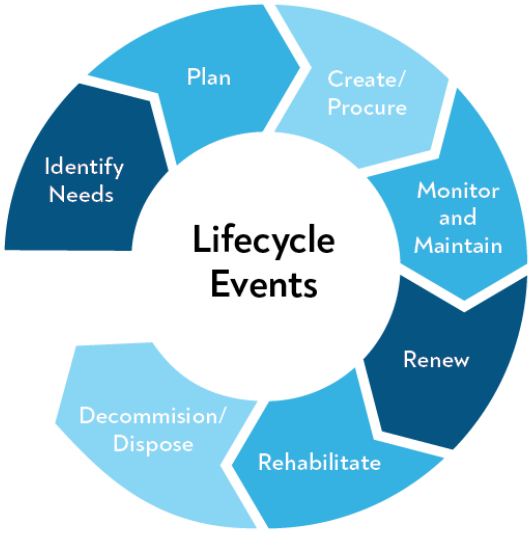


Figure 2.1-1 The events, involved over the lifecycle of an asset.

The estimated useful life (EUL) of an asset reflects how long an asset is expected to be in use. This is referred to as the *estimated* useful life because the *actual* useful life may be different. For example, a new road may show signs of deterioration ahead of what would be expected. At the same time, an older asset may have been maintained well enough throughout its lifecycle that it can serve for longer than originally estimated. EUL can be further broken down and applied to assets using two different methods, as outlined in **Table 2.1-1**.

EUL and lifecycle events directly affect other aspects of an asset, such as its cost and condition, and will be discussed further in those sections of the AMP.

Table 2.1-1 The two EUL methods that are applied to the County assets.

EUL Method	Definition	Application
Lifecycle EUL	An estimate of the number of years an asset is expected to last, until the asset can no longer be in service and must be disposed of or replaced. This estimate considers the lifecycle events that take place throughout an asset's life and the effect these events have on extending the asset's life.	Used for assets that undergo routine maintenance and are managed closely throughout their lifecycle, such as roads.
Financial EUL	An accounting estimate of the number of years an asset is to remain in service for the purpose financial planning and amortization. This measure may not accurately reflect the length of time an asset may last or be used.	Used for assets that are on a regular replacement schedule such as pooled assets.

2.2 CONDITION

The County assesses the condition of its assets on a regular basis to evaluate regulatory and service level requirements, and to inform short and long-term funding decisions. Condition assessments are critical for long-term planning, as they provide information on the current state of infrastructure.

Condition assessment methods and ratings differ by asset class and are based on generally accepted engineering or professional principles specific to the services that they support. Details on condition assessments for County assets are provided in the Asset Summaries (**Section 3**) of this AMP.

In order to compare condition amongst asset classes, a consistent five-point scale was developed to describe the asset's condition and type of action required (**Table 2.2-1**).

Table 2.2-1 The five-point scale used to describe the condition ratings of all County assets, including associated actions that should take place when an asset falls within that condition rating.

Scale	Description	Action
Very Good	**Fit for the future.** The asset is in very good condition, typically new or recently rehabilitated.	Regular maintenance should be undertaken to keep the asset in very good condition.
Good	**Adequate for now.** The asset is physically sound and is in good condition, with some elements showing general signs of wear that require attention. Typically, the asset has been used for some time but is still within early to mid-stage of its expected life.	Regular maintenance should be undertaken to keep the asset in this condition.
Fair	**In need of attention.** The asset shows general signs of deterioration and is performing at a lower level than originally intended. Some components of the asset are becoming physically deficient. Maintenance requirements and costs are increasing.	The asset is in need of either minor capital repairs, or additional maintenance. Component replacement may be necessary.
Poor	**At risk of failure.** The asset is approaching the end of its useful life and exhibits significant deterioration.	Major repairs are required, with significant capital investment. Ongoing monitoring and inspection of the asset condition are required.
Very Poor	**Unfit for sustained service.** The asset is in unacceptable condition with widespread signs of advanced deterioration and has a high probability of failure. Should the asset fail, there is a risk of the asset being out of service. Maintenance costs are unacceptable, and rehabilitation is not cost-effective.	The asset is in need of major refurbishment or replacement. Ongoing monitoring and inspection of the asset condition are required.

CONDITION (2.2 CONT'D)

Condition is constantly changing throughout the lifecycle of an asset. The speed at which condition deteriorates varies for each asset class and depends heavily on how an asset is managed and maintained throughout its lifecycle. If an asset is left to deteriorate at its original rate and no maintenance is completed, the asset's condition will continuously decrease throughout its life. However, assets that undergo one or more maintenance lifecycle events will often see their condition fluctuate throughout their life.

This concept is illustrated in **Figure 2.2-1**. The chart shows the relationship between asset age and condition. It incorporates the effect of maintenance events that occur throughout an asset's lifecycle and the associated changes in condition related to these events. When an event takes place, such as crack sealing a road, the condition of the asset improves. As more lifecycle events take place, the lifecycle EUL of the asset increases.

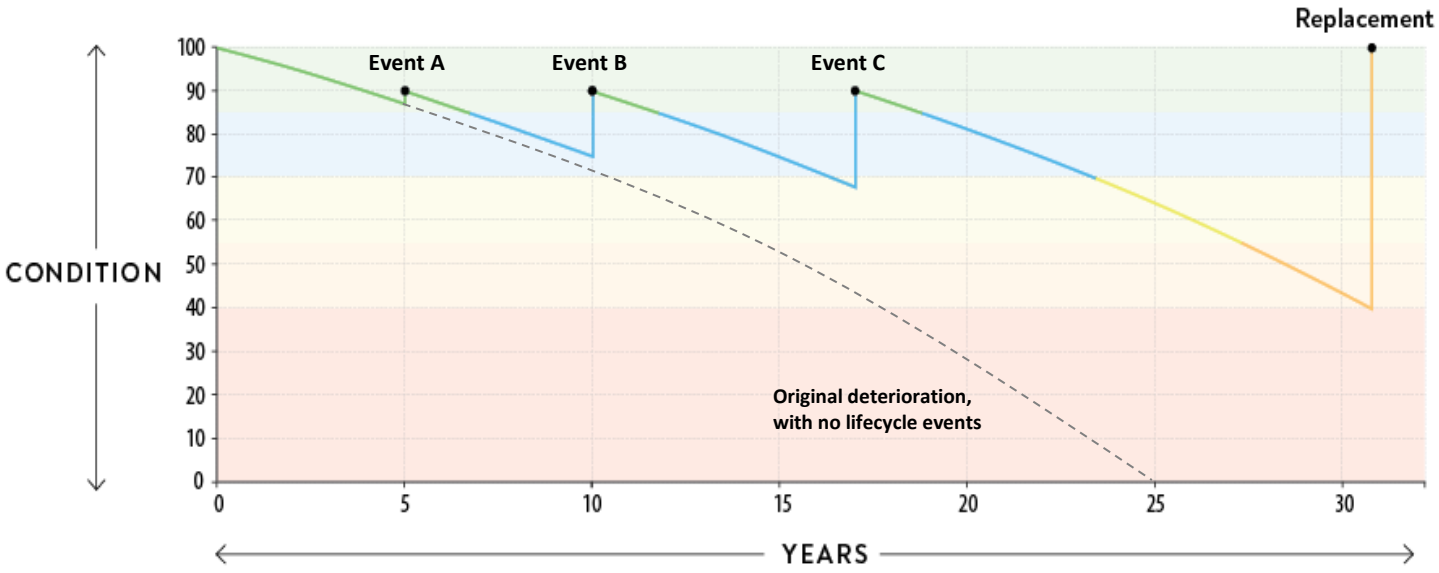


Figure 2.2-1 Example of an asset's lifecycle, showing a comparison between its original deterioration (if the asset did not undergo any lifecycle events) and the effect that maintenance lifecycle events have on an asset's condition and EUL.

2.3 RISK

Risk assessments are conducted on assets to evaluate how likely an asset is to be out of service or fail, and what the impact of that failure would be for the community. Risk is considered to be the relationship between the probability of failure and the consequence of failure, shown in (**Figure 2.3-1**).

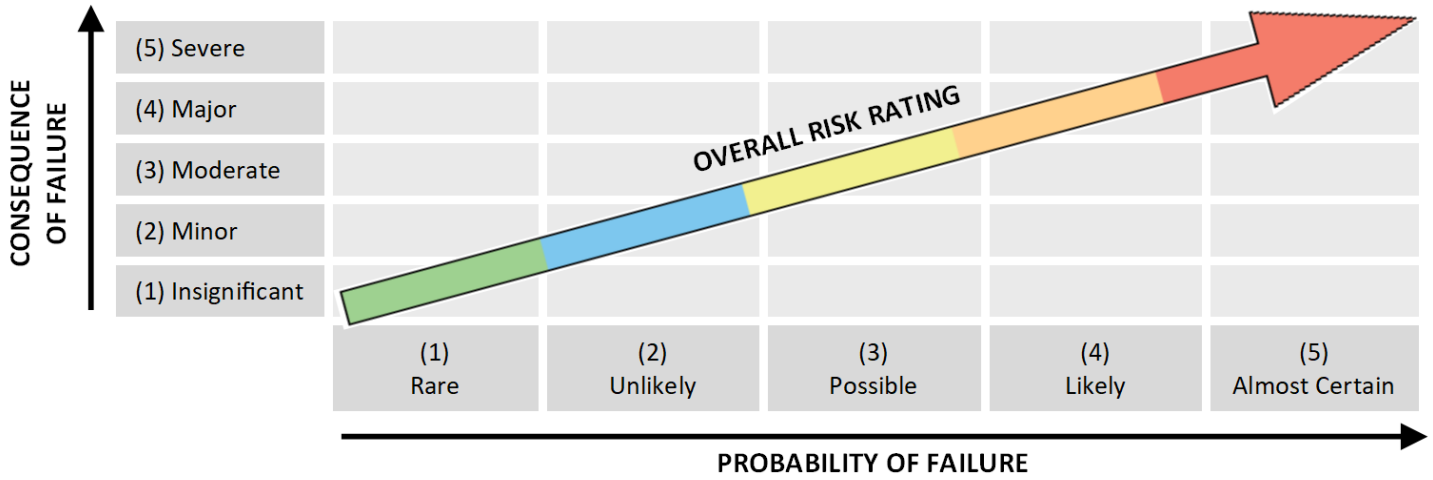


Figure 2.3-1 Risk matrix, showing the relationship between the probability and consequence of asset failure and the overall rating.

The probability of failure represents the likelihood that an asset will not achieve the desired level of service or will not be able to fulfill its needs. The consequence of failure assesses how large or small the impact of failure will be on the County and its residents. The parameters used to measure probability and consequence measure the impact of failure on health and safety, the environment, strategic objectives, or the financial health of the County. The parameters used to measure probability and consequence of failure vary by asset class. However, some parameters are used across multiple asset classes to provide consistency in the risk assessment methodology. Refer to **Table 2.3-1** for a list and description of commonly used risk parameters.

Table 2.3-1 List of common risk parameters used to assess the risk rating of County assets. Parameters listed in this table are used in the assessment of multiple asset classes. The list does not include *all* parameters used for each asset class. Refer to the risk section within each asset summary for a full list of parameters used.

Risk Parameter	Description
Probability of Failure	
Age (or Year Built)	Newly constructed assets are expected to have a lower probability of failing due to having newer components, updated construction methods, and less use. Older assets have a higher probability of failing due to extended use of the asset and its components.

RISK (2.3 CONT'D)

Table 2.3-1 Continued.

Risk Parameter	Description
Probability of Failure (cont'd)	
Condition	Condition is a comprehensive indicator to assess the probability of failure and consider all components of an asset. When an asset is in good condition, there is a low probability of failure. As condition decreases over the lifecycle of an asset, the potential for asset failure increases.
Construction material	Some construction materials, such as concrete, are more durable and typically last longer and perform better over an extended period of time. These materials are considered to have a lower probability of failure, compared to other materials with less durability.
Consequence of Failure	
Average annual daily traffic (AADT)	AADT provides context into how often an asset is used in people's daily travel and how many people would be affected by the asset's failure. The failure of an asset with high AADT counts would cause a large disruption in traffic patterns across the County and therefore increase the consequence of failure. Whereas assets with a lower volume of traffic would have a lower impact or consequence of failure. While this is typically considered a consequence of failure metric, it is also used as a probability of failure metric in the context of the County's road assets. In this case, as daily traffic along a road increases, so does its probability of failure. It is assumed that roads with higher levels of traffic experience a higher rate of deterioration or probability of failure, compared to roads with less traffic.
Proximity to critical infrastructure	The County contains critical infrastructure and services that are crucial to the health and safety of residents and the functioning of municipal government (such as hospitals, emergency services, municipal offices, etc.) within its borders. Many of the County's assets facilitate or support travel to and from these locations and ensure residents can easily access these services. Assets near this infrastructure are extremely important and if they were to fail it would have a detrimental impact upon the residents accessing these locations and services. Residents may need to alter their travel routes, increasing the time it takes to access those locations and services. Therefore, the closer an asset is to critical infrastructure the higher the consequence of failure will be.

RISK (2.3 CONT'D)

Table 2.3-1 Continued.

Risk Parameter	Description
Consequence of Failure (cont'd)	
Replacement Cost	The County must consider how much it would cost to replace assets that it owns. This cost is typically incorporated into financial planning based on the lifespan of an asset. However, if an asset were to unexpectedly fail and need emergency replacement, the County would incur those costs sooner than expected. Therefore, assets with higher replacement costs carry a higher consequence of failure, when compared to assets with lower costs.

Risk provides a consistent metric to determine critical assets owned by the County. Critical assets are defined as those that would have significant impacts on the community, should they fail. These assets should be monitored closely to ensure that the County is proactively managing any risks of failure. Critical assets include key infrastructure like roads and bridges, as well as assets that are central to service networks, like large stormwater pipes that manage significant water flow.

The application of the risk model allows the County to prioritize resources, ensure vital services are available, streamline inspection programmes, optimize operations and maintenance programmes; and prioritize and optimize capital and operating budget programme delivery.

2.4 REPLACEMENT COST

An asset's replacement cost indicates how much it would cost to purchase or reconstruct an asset when it has reached the end of its useful life. Replacement costs are also important for planning purposes, as this cost could be incurred at any point in time if the asset were to experience an emergency failure and need immediate replacement.

Replacement costs for County assets are determined using a number of methods, as outlined in **Table 2.4-1**. In coordination with departmental staff, replacement costs are reviewed and updated on an annual basis to ensure they reflect current market rates or are consistent with inflation rates applied to the County budget. The method used to determine replacement costs is identified in each of the Asset Summaries (**Section 3**) of this AMP.

Table 2.4-1 Methods used to estimate asset replacement costs for County assets.

Method	Description
Asset Assessments	External consultants estimate the cost to replace assets and their components. This is commonly included as part of asset condition assessments or inventory studies.
Current Market Cost	Internal staff analyze recent County capital project or contracts and use the average of these costs to represent the replacement cost. Alternatively, current market rates can be determined through use of construction cost estimating software, such as RSMeans, which contains an estimating database of industry standard construction costs.
Inflated Historical Cost	The historical cost of the asset is inflated to the current dollar value, matching inflation rates used for the County capital and operating budgets.
Property Insurance Values	Replacement costs identified in the most recent insurance contract.

2.5 FUNDING NEEDS

This AMP outlines the funding needs of County assets using four different measures. All measures are calculated using County data and the models provided within the County's AM software. These measures provide information to help the County prioritize asset needs over wants. These calculations provide a forecast of asset funding needs, and when compared to the *Annual Budget and Ten Year Plan* they assist in identifying any funding gaps.

Capital Needs: This value represents the funding needs to perform the lifecycle events (including replacements) that are scheduled for a specified year. Backlogs from previous years are accounted for in the current year and will be carried forward into each subsequent year until the replacement is completed.

- **Includes:** Asset lifecycle events (including replacements), backlog in current year

= SCHEDULED AND BACKLOG REPLACEMENT COST + SCHEDULED LIFECYCLE EVENTS COST

Replacement Needs: This value represents the funding needs to replace the assets that are scheduled for a specified year. Backlogs from previous years are accounted for in the current year and will be carried forward into each subsequent year until the replacement is completed.

- **Includes:** Asset replacements, backlog in current year
- **Excludes:** Asset lifecycle events

= SCHEDULED AND BACKLOG REPLACEMENT COST

Annual Funding Requirement: This value represents the annual funding needed to perform all lifecycle events, including the replacement of an asset over its estimated useful life. Annual funding requirement calculates an average over the whole life of an asset assuming all lifecycle events are completed throughout, so there are no backlogs to account for.

- **Includes:** Asset replacements, asset lifecycle events
- **Excludes:** Backlog, operating costs

$$= \frac{\text{ASSET REPLACEMENT COST + ALL LIFECYCLE EVENTS}}{\text{ESTIMATED USEFUL LIFE OF ASSET}}$$

FUNDING NEEDS (2.5 CONT'D)

Operating Needs: This value represents the estimated operational costs required to operate and maintain assets for a specified year. Operating costs for municipal assets are directly linked to maintenance, repairs, and upkeep. Efficient management and timely maintenance of assets can help control operating expenses and extend the lifespan of municipal assets.

- **Includes:** Maintenance and repair costs, fuel costs, utilities, salaries and labour costs, insurance
- **Excludes:** Capital costs

= OPERATING COSTS

The operating needs in this AMP have been calculated using the following assumptions:

- Operating costs are currently a high-level estimate. Estimates were established by calculating a three-year average for operating repairs and maintenance and related 2023 labour costs for staff positions in charge of the operating of County assets. Through the analysis, an average proxy per-unit cost was generated for asset classes and used to calculate an overall estimate of operating costs for County assets. Over time, this estimate will be refined and incorporated more fully into the AMP.
- Some asset classes do not have current operating costs calculated due to overlap in service areas. For example, the engineering department oversees several asset classes (roads, bridges and culverts, the stormwater network, and a selection of roadside elements). The County's current operating budget does not adequately categorize all operating costs to determine which costs are related to each engineering asset. Due to this complexity, some asset classes will contain operating costs that overlap with other asset classes. Refer to the current funding needs in each of the Asset Summaries (**Section 3**) for more details.
- Salary and labour costs are included for County employees whose primary job function is to oversee the operation and maintenance of assets. A portion of some manager salaries have also been included to account for their labour as it related to the operation of assets. Some salaries and labour costs have been split amongst asset classes to account for employees that oversee the operation of multiple asset classes.
- Operating costs are not included in the annual funding requirement calculation for assets, nor are they included in the future fundings needs for assets. Future versions of the AMP will provide an updated approach for calculating long-term operating needs.

2.6 Infrastructure Gap and Backlog

In 2009, all municipalities across Canada were required to incorporate tangible capital assets (TCA) into their financial statements (*Public Sector Accounting Board [PSAB] Standard 3150*). To implement this standard, municipalities were required to prepare inventories by asset class, determine age, useful life, and historical cost. This raised the level of awareness on both the cost and ownership of the assets themselves and allowed municipalities to understand and better anticipate future investment needs. *PSAB 3150* forced a needed shift towards long-term planning and sustainability practices.

The County maintains approximately $1.2 billion of assets. Some assets are relatively new, or recently repaired, while others are approaching the end of their useful lives and have significant investment needs. Wellington County communities are faced with an aging and quickly deteriorating asset base but have limited revenues to rehabilitate or replace those assets. The County must balance the ongoing operating needs of newer assets with the more capital-intensive repair and rehabilitation needs of older assets.

Construction of infrastructure surged across Canada from the 1950-70's due to growth, modernization, and urbanization following the end of WWII. The following decades saw little investment in infrastructure maintenance, and as a result, a significant proportion of infrastructure across Canada has fallen into disrepair. Poor planning and under-investment have left Ontario with the most serious infrastructure deficit in its history. The burden of this deficit falls largely on municipalities, leading to key decision making.

Assets that have reached the end of their useful life but have not been replaced have resulted in a funding backlog. This backlog represents assets that currently fall into the poor to very poor condition category which are beyond repair and in need of immediate replacement. The backlog for some asset classes may be significant. To accommodate for this backlog, the costs associated with the funding gap are added on to the first year of the ten-year capital needs forecast.

The infrastructure gap can be defined as the difference between the ten-year capital needs and the available funding in the ten-year capital budget. Accurately defining and addressing the gap is an ongoing and integrated process that relies on complete asset inventories, comprehensive condition assessments, clearly defined lifecycle events, and alignment with budget categories. As the available data improves, and the long-term financial plan and AM plan are further integrated, analyses relating to the state of County infrastructure and the investment gap will become more refined.

2.7 LEVELS OF SERVICE

One of the key components of AM is understanding the expected levels of service provided to the community. Infrastructure investment decisions are based on the quality of service that County residents expect, and by analyzing the metrics used to determine the performance of the service being provided (**Figure 2.7-1**).

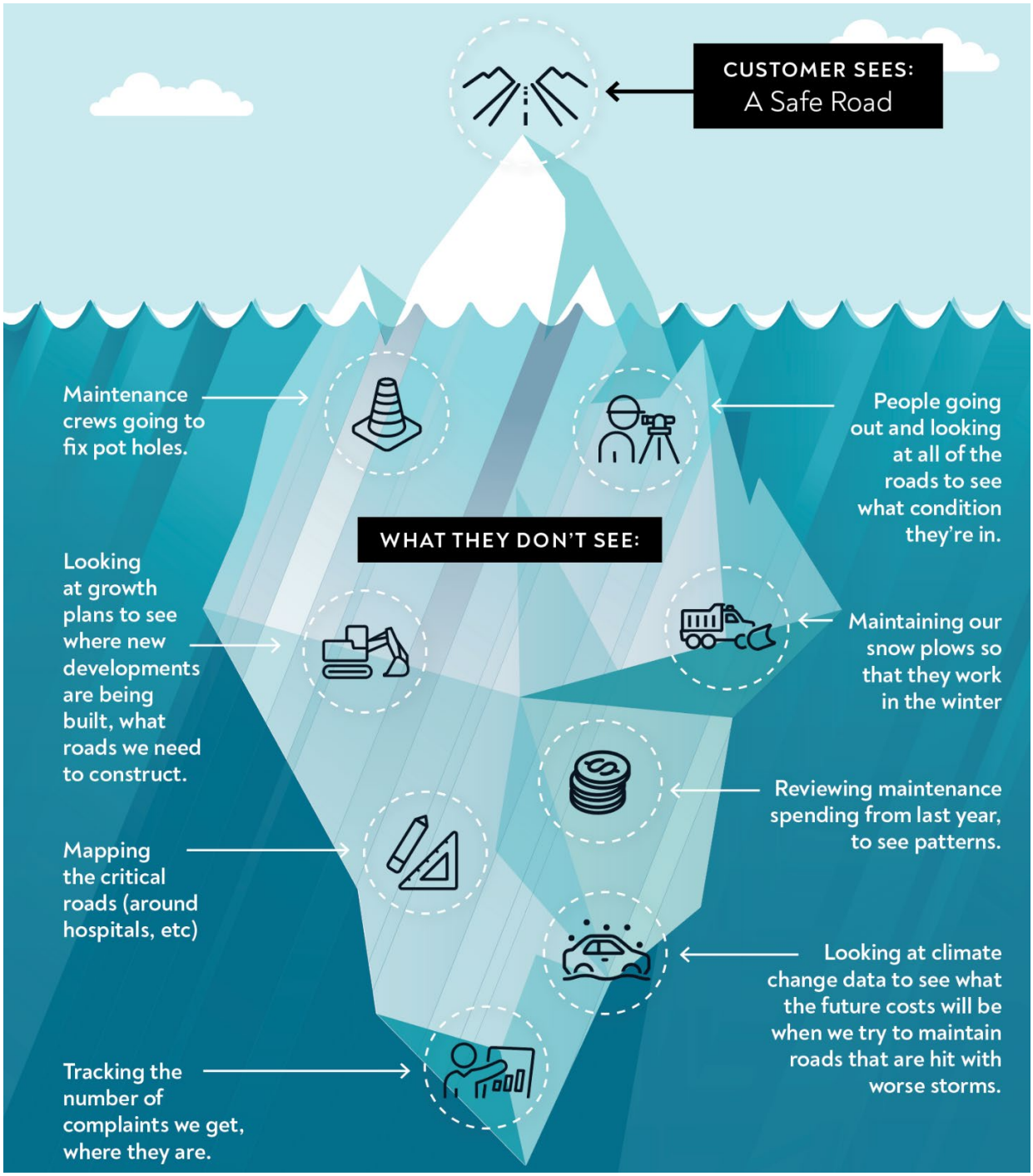


Figure 2.7-1 An example of levels of service depicting the service that is visible to residents, such as safe roads, and the technical metrics that are tracked by County staff in order to measure the services provided and ensure they are meeting expectations.

LEVELS OF SERVICE (2.7 CONT'D)

Levels of service provide the link between high-level strategic goals of the County and the more technical, day-to-day activities completed by staff. Measuring performance across the organization allows the County to monitor its progress towards achieving its strategic objectives (**Figure 2.7-2**).

This AMP discusses the costs associated with delivering the current levels of service to Wellington County residents. Levels of service metrics have been established for County service areas and assets that are contained within this AMP. Metrics are updated annually with data from the previous year to track changes over time.

Figure 2.7-2 The County strives to provide the best services to residents. To do so, the County measures its performance such as the time it takes to plow roads after a storm.

3 - Asset Summary

Asset Details

3.1 Bridges and Culverts

BRIDGES AND CULVERTS

In accordance with the *Canadian Highway Bridge Design Code*, a bridge is defined as "a structure that provides a roadway or walkway for the passage of vehicles, pedestrians, or cyclists across an obstruction, gap, or facility and is greater than three metres in span."

Culverts are defined as "a structure that forms an opening through soil", as per the *Canadian Highway Bridge Design Code*. Culverts included in the *Ontario Structures Inventory Manual* (OSIM) inspection have a span greater than or equal to 3 meters, and more than 600 mm of cover. Smaller culverts are not assessed based on OSIM methodology and are not included as part of this AMP.

Figure 3.1-1 Example of a County CSP arch OSIM culvert (C060800, Wellington Road 6, Minto).

The County currently maintains 101 bridges. The County also maintains a total of 102 OSIM culverts. All County structures are required to support heavy transport vehicles, emergency vehicles, pedestrians, cyclists.

Figure 3.1-2 Example of a County concrete bridge (Badley Bridge, Wellington Road 21, Elora).

BRIDGES AND CULVERTS (CONT'D)

Figure 3.1-3 Map of County bridges and culverts greater than three metres.

DATA QUALITY

	Level 1	Level 2	Level 3	Level 4
Inventory	Inventory data is incomplete.	Inventory data Is complete.	Inventory data is complete and accurate.	**Inventory data is complete, accurate, and in a centralized, accessible format.**
Condition	No condition data exists. Condition is approximated by age.	Condition data exists for these assets.	Condition data was collected recently for these assets.	**Condition data is complete and accurate, and regularly updated. Data is centralized and accessible.**
Risk	Critical assets and services are understood by department staff, but no risk models exist.	Risk is estimated according to a draft risk model. Some parameters lack sufficient data.	**Complete risk models exist for this asset class, and critical assets have been identified.**	Risk management strategies have been developed for critical assets, and department budgets reflect risk-based priorities.
Lifecycle Strategy	Lifecycle events required to maintain current levels of service are not documented.	**Lifecycle events required to maintain current levels of service are documented.**	Capital budget costs of lifecycle events are built into the funding models. Operating costs are not included.	Capital and operating costs are built into the funding model. Projected lifecycle events are defined, and funding shortfalls are identified.
Financial Sustainability Strategy	Budgets are based on prior year spending.	**Asset replacement schedules have been built into the long-term capital forecast.**	Replacement and maintenance costs have been built into long-term capital forecasts.	Replacement and maintenance costs have been built into long-term capital and operating forecasts. Demand forecasts inform the budget.
Levels of Service	Services provided by this asset class are understood by departmental staff, but not formally measured.	Performance metrics are defined to measure levels of service.	**Performance metrics are defined and a data collection strategy exists for all metrics.**	Proposed levels of service have been identified, alongside their financial impacts. Trends in performance measures are tracked and regularly reported.

LIFECYCLE

The estimated useful life for bridges and large culverts is based on a review of historical replacement timelines for similar assets. It varies by construction material, as some materials deteriorate more quickly than others. The estimated useful life (EUL) can be extended even more with regular intervention, like the lifecycle events. With the incorporation of lifecycle maintenance needed to extend the useful life of these assets, concrete bridges and OSIM culverts can have an estimated useful life of 84 years, while steel bridges and CSP OSIM culverts can have an estimated useful life of 73 years (**Table 3.1-1**).

Table 3.1-1 Estimated useful life for bridges and culverts with no intervention, versus EUL using the County lifecycle approach.

	Lifecycle Approach	
Asset	**EUL** with no intervention or lifecycle events	**EUL** with County maintenance lifecycle events
Bridges and Culverts (Concrete)	60 years	**84 years, 1 month**
Bridges and Culverts (Steel, CSP Arch)	50 years	**73 years**

County bridges and culverts undergo regular lifecycle events to meet minimum maintenance standards and ensure that they are safe for County residents to use. During the bi-annual OSIM review, a list of recommended improvements is produced per structure, to give the County an idea of the kind of work that needs to be done.

Recommended improvements are categorized into three categories:

- Minor repairs
- Major repairs and replacements
- Barrier and guide rail needs

Minor repairs are relatively inexpensive but can defer or delay the need for major repairs or replacements in the future, thereby extending the useful life of County bridges and culverts. Minor repairs include work such as extending deck drains, adding scour protection, repairing undermined foundations, and sealing leaking expansion joints.

Barrier and/or approach guide rail work is also included in ongoing maintenance. Some structures already have approach guide rails, but they do not meet current standards for length, post spacing, and/or end treatments, as defined in the *Roadside Safety Manual* (MTO, 1993).

LIFECYCLE (CONT'D)

Asset needs are prioritized based on the condition and/or design of existing guiderails (if any), traffic volumes, speed, road alignment, and the severity of the hazard posed by the lack of guiderails or the inappropriateness of existing guide rails. The need for barrier and guide rail improvements is a safety issue, and as a result, installing or updating barrier and guide rails is a priority investment.

The following is a list of maintenance activities associated with bridges and large culvert structures:

- Annual washing to remove debris from County winter operations (sand and salt)
- Crack sealing of wearing surface
- Regular re-coating of railing systems
- Preventative maintenance and cleaning of wearing items
- Regular clearance of debris around and within the structures
- Monitoring for minimum maintenance standards, including safety systems and signs

While bridges and culverts can last a long time with regular maintenance and lifecycle events, there is a minimum maintenance standard that must be followed for safety reasons. Because of this, the County begins planning for replacements when structures approach a Bridge Condition Index (BCI) of 60. Prior to replacement, County bridges and culverts undergo major rehabilitation approximately every 20 years or when the BCI reaches 65.

The model used to determine the full lifecycle cost of County bridges and culverts includes a 20-year average investment, determined by the County engineering department, that would reflect the maintenance costs incurred to maintain the structure. This cost differs for bridges and culverts (**Table 3.1-2**) and includes all lifecycle events.

Table 3.1-2 Average 20-year investment amount, reflecting the full lifecycle cost, of County bridges and culverts.

Asset	Rehabilitation Investment
Bridges	$ 307,977
Culverts	$ 153,989

Figure 3.1-4 and **Figure 3.1-5** show lifecycle strategies for bridges and culverts based on their construction material. Each of the three rehabilitation events are scheduled when the asset reaches a condition of 60 to 65 BCI and increase the condition of the structure to 85 to 95 BCI. These events extend the useful life of the structures, as well as ensure that the structures meet maintenance standards and are safe.

LIFECYCLE (CONT'D)

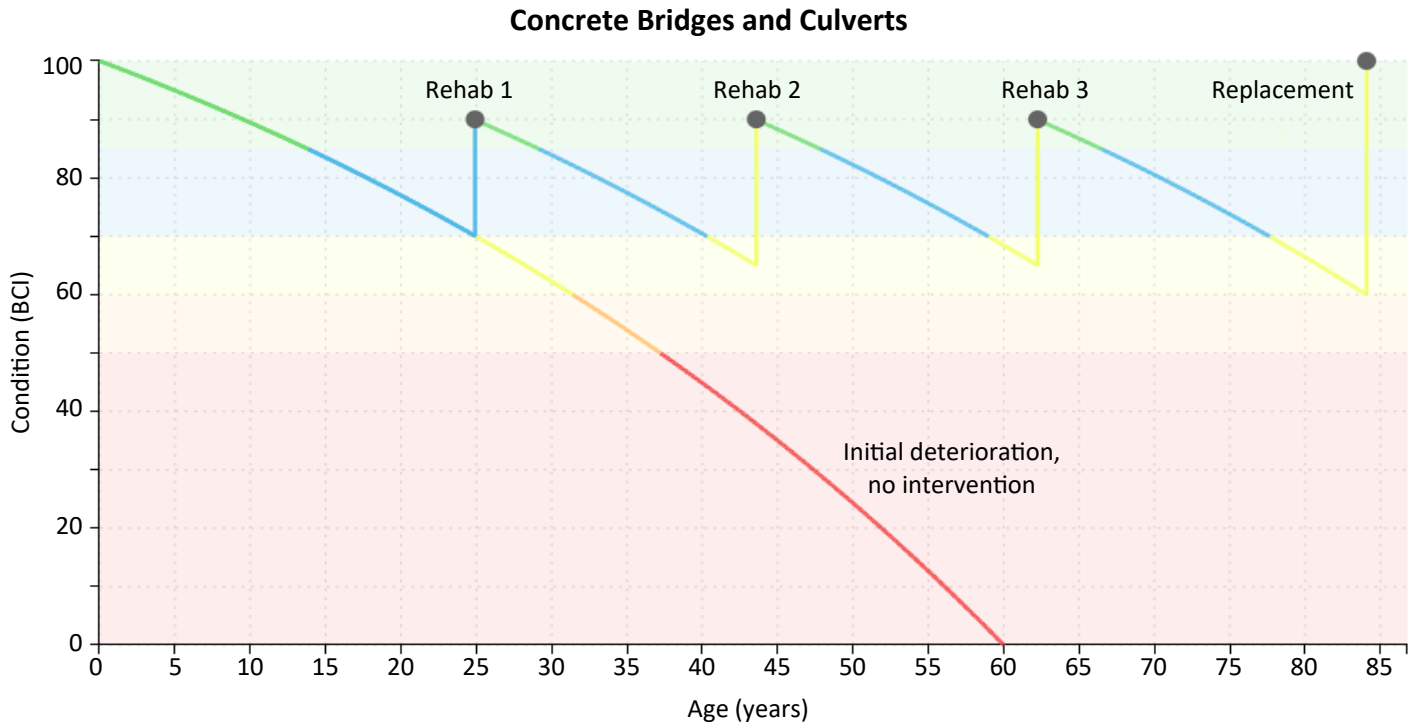


Figure 3.1-4 Visualization of the County concrete bridge and culvert lifecycle strategy. Original asset deterioration shown, in comparison to the lifecycle deterioration with the addition of lifecycle events to extend the estimated useful life of structures.

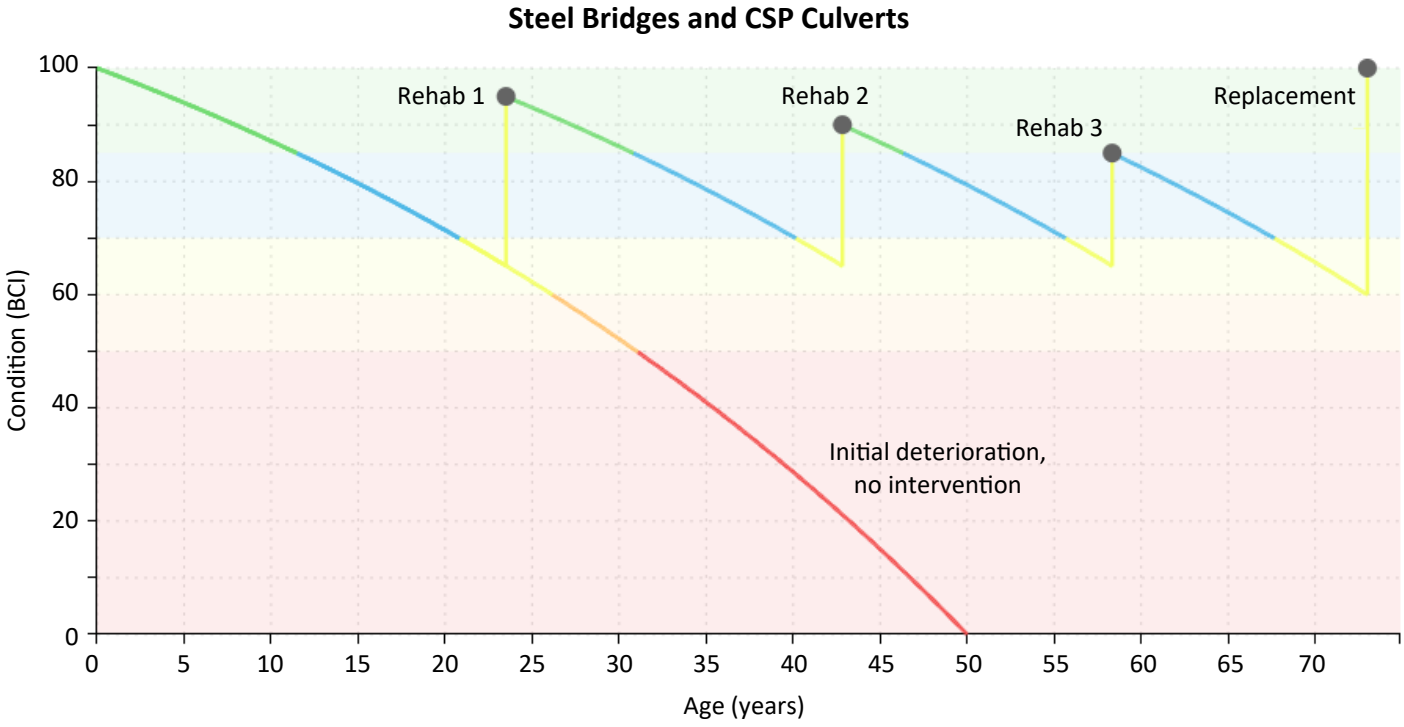


Figure 3.1-5 Visualization of the County steel and CSP bridge and culvert lifecycle strategy. Original asset deterioration shown, in comparison to the lifecycle deterioration with the addition of lifecycle events to extend the estimated useful life of structures.

CONDITION

The condition of County bridges and large culverts is assessed every two years, in accordance with OSIM, by external consultants. The inspection reports produce a list of priority investments through a recommended Time of Need (TON) assessment.

Bridges are made up of various components, each of which deteriorates at different rates. The OSIM inspections visually evaluate each component of the structure. The condition of individual components is compiled into a summary metric, the Bridge Condition Index (BCI). The BCI ranges from 0 (very poor condition) to 100 (very good condition). The scale in **Figure 3.1-6** and **Table 3.1-3** shows how the BCI is grouped into a five-point condition scale.

Figure 3.1-6 These images of County bridges and structures reflect the different condition ranges.

Table 3.1-3 Five-point condition scale for County bridges and culverts.

Condition	BCI	Service Level	Associated Work
Very Good	85 - 100	The structure is relatively new, or newly reconstructed. There are no visible cracks and no structural issues.	Deck cleaning, drainage outlets cleanout
Good	70 - 85	The structure is starting to exhibit few, if any, signs of surface deterioration, random cracks, and rutting.	Deck cleaning, drainage outlets cleanout
Fair	60 - 70	The structure is exhibiting signs of surface deterioration, random cracks, rutting, and some patching of surface defects.	Deck cleaning, drainage outlets cleanout, new asphalt deck surface, waterproofing, rehabilitation
Poor	50 - 60	The structure shows signs of deterioration, cracks, rutting, and patching of surface defects that occurs over 50 percent of the surface. Some structural issues are starting to show.	Rehabilitation, reconstruction
Very Poor	0 - 50	The structure is reaching the end of its useful life. There are significant structural issues with large visible cracks, rutting and patching surface defects that occurs over 75 percent of the surface.	Reconstruction

CONDITION (CONT'D)

County bridges and culverts are in good condition, with an average of 71 BCI (**Table 3.1-4**). This is due to the focus of the County engineering department on rehabilitating these structures over the past decade. Several large capital projects were undertaken during this time in order to rehabilitate or replace bridges and culverts across the County.

Table 3.1-4 Average County bridge and culvert condition rating, 2023.

Asset	Average Condition
Bridges	71 PCI
Culverts	71 PCI

A total of 59% of County bridges (representing a replacement value of $220,500,000) are in good or very good condition and will not need significant investments in the ten-year forecast. Similarly, 64% of culverts (representing a replacement value of $86,039,728) are in good or very good condition. **Figure 3.1-7**, **Figure 3.1-8**, **Figure 3.1-9**, and **Table 3.1-5** provide an overview of the condition for County bridges and culverts, including a breakdown of replacement costs in each category. **Table 3.1-6** identifies the County bridges and culverts in the very poor condition category and whether they are addressed in the upcoming 10-year County budget.

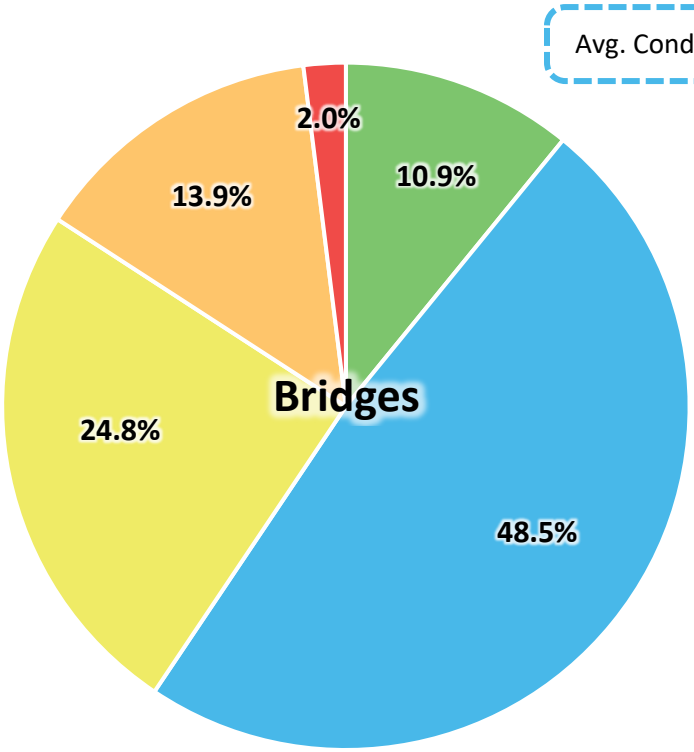


Figure 3.1-7 County bridges condition, 2023.

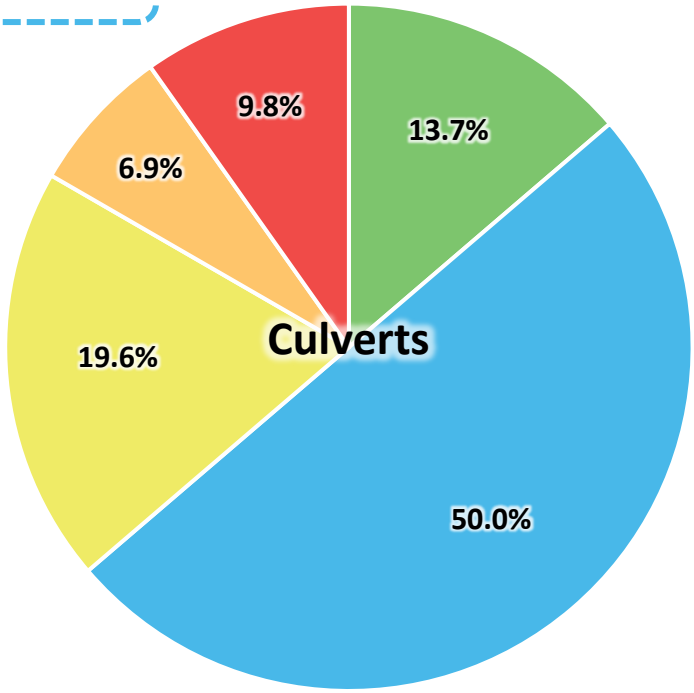


Figure 3.1-8 County culverts condition, 2023.

CONDITION (CONT'D)

Table 3.1-5 Count and replacement cost of bridges and culverts within each condition rating, 2023.

Very Good	Good	Fair	Poor	Very Poor
11 Bridges	49 Bridges	25 Bridges	14 Bridges	2 Bridges
$ 49,900,000	$ 170,600,000	$ 63,747,230	$ 25,400,000	$ 4,300,000
14 Culverts	51 Culverts	20 Culverts	7 Culverts	10 Culverts
$ 14,785,470	$ 71,254,258	$ 22,600,000	$ 6,700,000	$ 10,980,000
$ 64,685,470 Total	$ 241,854,258 Total	$ 86,347,230 Total	$ 32,100,000 Total	$ 15,280,000 Total

Table 3.1-6 County bridges and culverts with a very poor condition rating, 2023.

Bridge/Culvert	Replacement Cost	Condition Rating (BCI)	Addressed in 2024-2033 Financial Plan
B000032 Ostrander Bridge	$ 1,600,000	43	Yes (2029)
B035087 Paddock Bridge	$ 2,700,000	39	Yes (2023 and 2024) [1]
C080120	$ 660,000	25	No [2]
C100970	$ 400,000	48	Yes (2025)
C101000	$ 1,400,000	48	Yes (2025)
C109123 Conestogo River Culvert #5	$ 2,300,000	48	Yes (2025)
C109143	$ 1,600,000	50	No
C110930	$ 1,100,000	37	Yes (2028)
C111040	$ 1,100,000	0	No [2]
C120080	$ 660,000	16	No [2]
C160110	$ 660,000	14	No [2]
C291050	$ 1,100,000	35	No

[1] Bridge demolished in 2023, replacement will be complete in 2024.

[2] Culverts recently discovered during field work and added to inventory with an estimated in-service date. Condition values reflect an estimated aged-based condition and may or may not be accurate. True condition values will be collected during the next OSIM inspection and future budgets will address these culverts, if needed.

CONDITION (CONT'D)

Figure 3.1-9 Map of County bridge and culvert condition, 2023.

RISK

The risk analysis for bridges and culverts is the product of the likelihood of failure and the consequence of failure. **Table 3.1-7** illustrates the parameters used to represent the probability and consequence of failure for these structures.

Table 3.1-7 Probability and consequence of failure parameters currently included in the County bridges and culverts risk model.

Probability of Failure		Consequence of Failure	
Condition	Weight restriction	Average Annual Daily Traffic (AADT)	Detour distance
Construction material	Year built	Proximity to critical infrastructure	Replacement cost

Figure 3.1-10 show the distribution of County bridges and culverts by risk classification. Green represents the bridges and culverts that are very low risk, while red reflects the bridges and culverts with the highest (very high) risk rating. Using the parameters listed, the majority of County bridges and culverts are classified as low and very low risk. **Table 3.1-8** shows the four County culvert in the very high risk category.

Bridges and Culverts Risk Classifications

Very Low (1-4)	Low (5-7)	Moderate (8-9)	High (10-14)	Very High (15-25)
57 Assets	94 Assets	25 Assets	23 Assets	4 Assets
30 Bridges	44 Bridges	14 Bridges	13 Bridges	-
$ 71,100,000	$ 141,547,230	$ 54,500,000	$ 46,800,000	-
27 Culverts	50 Culverts	11 Culverts	10 Culverts	4 Culverts
$ 25,439,728	$ 74,100,000	$ 10,500,000	$ 13,200,000	$ 3,080,000
$ 96,539,728	$ 215,647,230	$ 65,000,000	$ 60,000,000	$ 3,080,000

Figure 3.1-10 Risk classifications for County bridges and culverts, including the number of assets (units) and their total replacement costs, 2023.

Table 3.1-8 County culverts with a very high risk classification, 2023.

Culvert	Replacement Cost	Probability of Failure	Consequence of Failure	Overall Risk Rating	Addressed in 2024-2033 Financial Plan
C080120	$ 660,000	4.6 Likely	4.0 Major	18.4 Very High	No [1]

RISK (CONT'D)

Table 3.1-8 Continued.

Culvert	Replacement Cost	Probability of Failure	Consequence of Failure	Overall Risk Rating	Addressed in 2024-2033 Financial Plan
C111040	$ 1,100,000	3.4 Possible	5.0 Severe	17.0 Very High	No [1]
C120080	$ 660,000	4.2 Likely	4.0 Major	16.8 Very High	No [1]
C160110	$ 660,000	4.2 Likely	4.0 Major	16.8 Very High	No [1]

[1] Culverts recently discovered during field work and added to inventory with an estimated in-service date. Risk parameters incorporate condition which reflect an estimated aged-based condition and may or may not be accurate. True condition values will be collected during the next OSIM inspection to ensure accurate parameters are included in the risk assessment. Future budgets will address these culverts, if needed.

REPLACEMENT COST

The replacement value of bridges and culverts is based on the most recent OSIM inspection, where a cost to replace the structure was provided by the external consultant. The last inspection was completed in 2023 and updated replacement costs were provided for inspected structures. Replacement costs are based on current material and labour costs, as well as construction materials and size of the structure that needs replacement.

Table 3.1-9 displays the current estimated replacement cost for all County bridges and culverts. During years where an OSIM inspection does not take place, an inflation rate is applied that corresponds to the inflation rate forecast used in the County's *Annual Budget and Ten Year Plan* to determine updated replacement costs.

Table 3.1-9 Total estimated replacement cost for County bridges and culverts, 2023.

Asset	Number of Structures	Replacement Cost
Bridges	101	$ 313,947,230
Culverts	102	$ 126,319,728
Total	**203**	**$ 440,266,958**

CURRENT FUNDING NEEDS

The annual funding requirement is a metric that provides an average of the combined cost to maintain and replace assets over their useful life. For bridges and culverts, the annual requirement is a combination of each of the three rehabilitations scheduled at approximately 20-year intervals, and the replacement cost for each structure (**Table 3.1-10**).

Table 3.1-10 Overview of County bridges and culverts costs, including the annual funding requirement, 2023.

Total Replacement Cost	Total Lifecycle Events Cost	Total Network Cost	Estimated Useful Life with Lifecycle Events	Annual Funding Requirement
$ 440,266,958	$ 140,437,597	$ 580,704,555	84 and 73 Years	$ 7,105,323

The total cost to maintain all bridges and culverts over their useful life is $580,704,555. Dividing the total cost to maintain bridges and culverts by the estimated useful life of each structure results in the annual requirement of $7.1 million. This cost assumes that the lifecycle events are done on schedule and that the cost for each bridge and culvert are consistent. The 2023 backlog amount of $47,380,000 is not included in the annual funding requirement. For lifecycle costs refer to **Table 3.1-2**.

The average three-year operating cost for County bridges and culverts is approximately $1,215,368 or $5,987 per structure (**Table 3.1-11**). The current operating needs for bridges and culverts include the following costs and assumptions:

- Drainage and structure maintenance costs related to bridge and culverts routine inspections and maintenance, ditching, and manhole and catch basin repair and maintenance, including the cost of replacement parts and materials. A portion of these costs are related to the stormwater network.
- It is assumed that most operating costs related to bridges and culverts are included in the road network operating needs. Refer to **Section 3.4** for more information.

Table 3.1-11 Current operating needs for County bridges and culverts, 2023.

Total Operating Cost*	Average Per-Unit Cost*
$ 1,215,368	$ 5,987

* Represents a three-year average.

Future Funding Needs

Table 3.1-12 shows the lifecycle events and replacement costs for County bridges and culverts for 2024-2033. The average replacement cost of $6,908,854 and average capital needs of $10,316,601 are close to or higher than the average annual requirement for the network of $7,105,323 (**Table 3.1-13**).

Table 3.1-12 The lifecycle events and replacement costs for County bridges and culverts for 2024-2033.

Year	Inflation Rate	Rehab 1 20 Years	Rehab 2 40 Years	Rehab 3 60 Years	Replacement	Total
2024	5%	$ 1,131,816	$ 808,440	$ 646,752	$ 55,734,000*	$ 58,321,008
2025	3.5%	$ 3,681,636	$ 1,004,083	$ 1,004,083	$ 2,716,875	$ 8,406,677
2026	3.5%	$ 4,503,311	$ 3,637,289	$ 346,409	$ 5,398,974	$ 13,885,982
2027	3.5%	$ 179,266	$ 2,688,996	$ 1,434,131	$ 5,238,692	$ 9,541,086
2028	3.5%	$ 927,704	$ 2,040,948	-	-	$ 2,968,652
2029	3.5%	$ 576,104	$ 2,496,450	$ 384,069	-	$ 3,456,624
2030	3.5%	-	$ 1,192,535	$ 795,023	-	$ 1,987,559
2031	3.5%	$ 822,849	$ 1,851,411	$ 411,425	-	$ 3,085,685
2032	3.5%	$ 425,824	$ 425,825	-	-	$ 851,649
2033	3.5%	$ 440,728	$ 220,364	-	-	$ 661,093
TOTAL		$ 12,689,239	$ 16,366,341	$ 5,021,892	$ 69,088,541	$ 103,166,013
AVERAGE ANNUAL		$ 1,268,924	$ 1,636,634	$ 502,189	$ 6,908,854	$ 10,316,601

* Includes backlog from previous years.

Table 3.1-13 The annual requirement, ten-year average replacement needs, and the ten-year average capital needs for County bridges and culverts.

Annual Funding Requirement	Ten-Year Average Replacement Needs	Ten-Year Average Capital Needs
$ 7,105,323	$ 6,908,854	$ 10,316,601

FUTURE FUNDING NEEDS (CONT'D)

The County has a number of structures that are in poor to very poor condition and require replacement (**Figure 3.1-11**). The replacement costs make up the majority of the funding needs for bridges and culverts. Maintenance needs are relatively low, although they are projected to increase throughout the future.

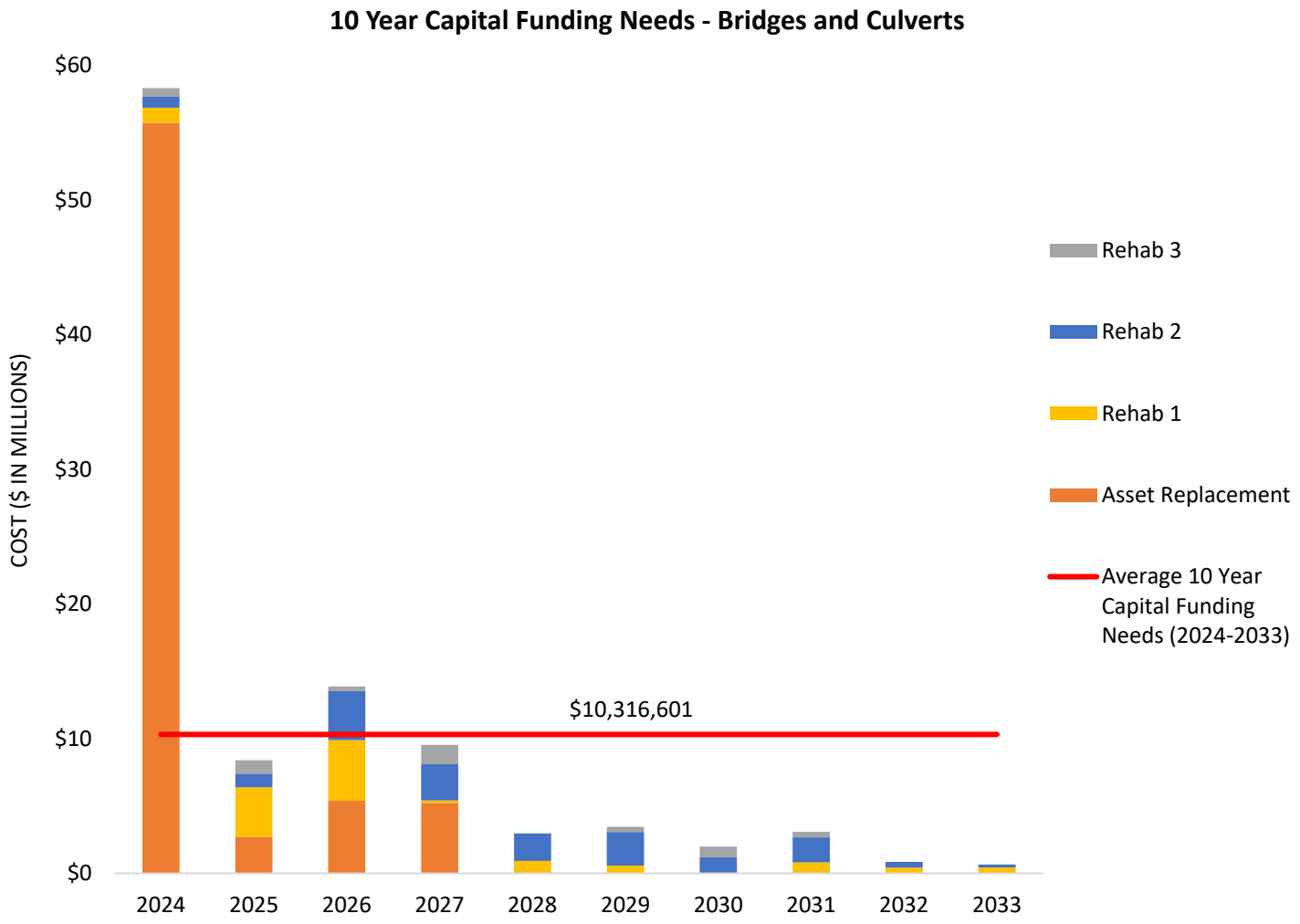


Figure 3.1-11 The ten-year capital funding needs for County bridges and culverts, 2024-2033.

The estimated 20-year (2024-2043) capital needs for bridges and culverts can be found in **Appendix A.4**. These projected lifecycle activities and replacements are estimated using the County's AM software and are used to calculate the capital needs for assets across their lifecycle. The lifecycle plan should be used by County staff to inform budgeting decisions, and to assess the effectiveness and validity of the current AM models.

LEVELS OF SERVICE

Table 3.1-14 is a chart of bridges with load restrictions that are maintained by the County. Level 1 is a single vehicle unit (cube truck), level 2 is a combination of two vehicle units (tractor trailer) and level 3 is a combination of three vehicle units (tractor and two trailers). The restrictions posted reflect the maximum gross tonnes per vehicle class allowed on the bridge. The objective is to reduce the number of bridges with load restrictions, in order to enable easy and accessible travel throughout the County. However, this requires significant investment in each of the structures, which may not be feasible or desirable, based on the location of the structure and the average traffic it supports.

Table 3.1-14 Bridges within the County that have load restrictions associated with them, 2023.

Structure	Location	Gross Tonnes		
		Level III	Level II	Level I
McMullen Bridge	Wellington-Grey Boundary, Town of Minto	16	29	40
Rothsay Bridge	Wellington Road 7, Rothsay, Township of Mapleton	-	37	50
Flax Bridge	Wellington Road 11, Township of Mapleton	17	26	36
Princess Elizabeth Bridge	Wellington Road 12, Township of Mapleton	-	42	52
Blatchford Bridge	Wellington Road 32, Township of Guelph-Eramosa and Township of Puslinch Boundary	-	37	47
Lot 31, Conc. 11	Wellington Road 36, Township of Puslinch	15	-	-
Caldwell Bridge	Wellington Road 43, Scotland Street, Fergus, Township of Centre Wellington	24	35	43

The County must meet legislated requirements to ensure that local bridges are safe, including:

1. Provincial government mandates, through *O. Reg. 239/02 - Minimum Maintenance Standards for Municipal Highways*, that bridges are inspected for deck spalling on regular intervals based on road class.
2. Biannual inspections completed in accordance with *O. Reg. 104/97* using methodology outlines in the *Ontario Structure Inspection Manual* (OSIM). Any safety-related deficiencies identified during the OSIM inspection are prioritized.
3. Bridge and large culvert design work must be done in accordance with *CSA S6-14 Standard - Canadian Highway Bridge Code*, and *O. Reg. 104/97 - Standards for Bridges*.

LEVELS OF SERVICE (CONT'D)

Table 3.1-15 contains a list of performance metrics established by the County engineering department to measure the levels of service provided by County bridges and culverts.

Table 3.1-15 Performance metrics for County bridges and culverts.

	2022	2023
Accessibility & Reliability		
% of bridges in the municipality with loading or dimensional restrictions *	6.8%	6.9%
Average detour distance (km) of all Bridges and Culverts	15.9%	16.1%
# of unplanned Structure closures	0	1
Average duration of unplanned structure closures (days)	0	233
Safety		
% of bridges and structural culverts inspected every two years	100%	100%
# of Minimum Maintenance Standards non-compliance events	0	0
% of bridges with load limits posted	6.8%	6.9%
Affordability		
Gross operating and maintenance costs for bridges & culverts / m^2	$103	$118
Annual capital reinvestment rate **	0.21%	0.83%
Sustainability		
Average bridge condition index value for bridges in the municipality *	73	71
Average bridge condition index value for structural culverts in the municipality *	73	71
% of bridges and culvert replacement cost spent on operating and lifecycle events	1.04%	0.74%

* Metric required under *O. Reg. 588/17*
** Annual capital reinvestment rate = Annual capital expenditure / Total replacement cost

STRATEGY

Master Plans and Studies

Structural bridges and culverts are assessed in accordance with the OSIM protocols under the *Public Transportation and Highway Improvement Act,* 1990. Assessed condition is collected on a two-year cycle as mandated by the Act.

Addressing the Backlog

County bridges and culverts are rated an average condition of good. Approximately 16% of bridges and 17% of culverts are in the poor and very poor category. These assets require immediate attention and are valued at approximately $47.4 million.

Renewal Projects

Lifecycle events and prioritization of projects are driven by both OSIM reports, as well as the County's 10-year forecast. Additionally, the County considers proximity to other bridges, detour distance, and coordination with roads assets to prioritize short term needs.

Data Quality

The County has committed to the following data quality initiatives:

- Collect data for all Levels of Service metrics and report annually.
- Review replacement values on an annual basis.
- Further identify and incorporate asset lifecycle events (including costs).

Asset Details

3.2 Facilities

FACILITIES

The County owns and manages a wide variety of buildings and structures to provide essential services to the community. These include recreational facilities, administrative offices, emergency services, and operational buildings. These assets are crucial for delivering services, ensuring safe and efficient facilities for staff, Council, Boards and Agencies, and the public.

In 2023 the total facility inventory includes 73 facilities and building structures located throughout the County. For a detailed breakdown of these facilities and their locations please refer to **Table 3.2-1** and **Figure 3.2-2.**

Figure 3.2-1 County administration building (downtown Guelph).

Table 3.2-1 Total number County buildings broken down by facility type, 2023.

Facility Type	Quantity
Administrative Offices	13
Apartment Structure	1
Childcare and Learning Centres [1]	3
Community Centre and Shed	2
Libraries [2]	13
Long Term Care Home	1
Museum and Archives (all structures on property)	5
OPP Centres	3
Roads Garages (including domes and sheds)	24
Tree Nurseries	2
Waste Facilities	6
Total	**73**

[1] The Palmerston Childcare and Learning Centre is operated by the County, in leased building space. It is not included in the facility count.

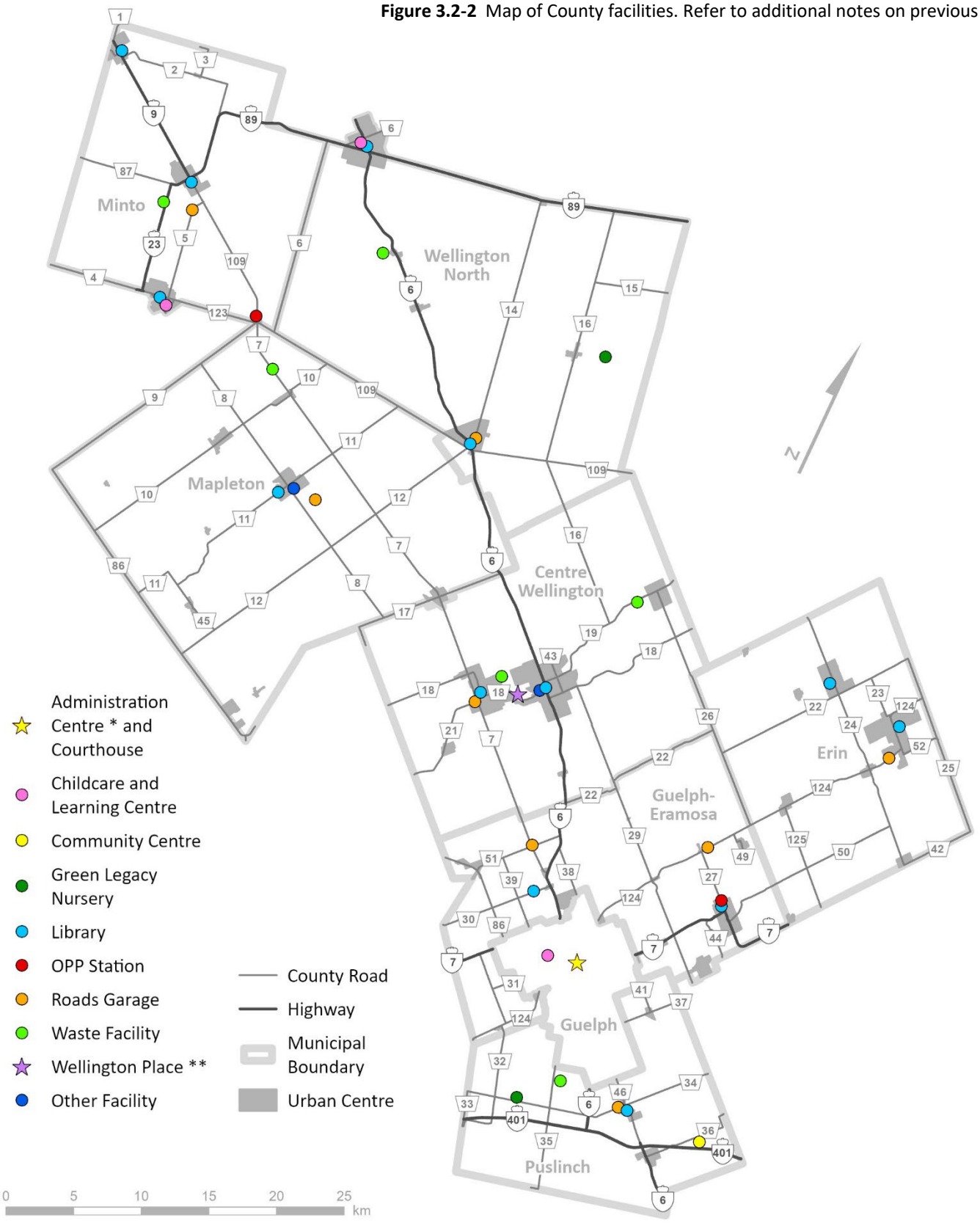
[2] The Erin and Rockwood Libraries are operated by the County, in leased building space. They are not included in the facility count.

Figure 3.2-2 (see next page) notes:

- Some facilities consist of multiple buildings and/or structures which may not be visible at the current map scale.
- * The County Administration Centre is comprised of multiple office buildings located downtown Guelph.
- ** Wellington Place contains several County facilities, including the Museum and Archives, Wellington Terrace Long Term Care Home, the Aboyne OPP station, a childcare and learning centre, and a library.

FACILITIES (CONT'D)

Figure 3.2-2 Map of County facilities. Refer to additional notes on previous page.



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Levels of Service	Services provided by this asset class are understood by departmental staff, but not formally measured.	**Performance metrics are defined to measure levels of service.**	Performance metrics are defined and a data collection strategy exists for all metrics.	Proposed levels of service have been identified, alongside their financial impacts. Trends in performance measures are tracked and regularly reported.

LIFECYCLE

Asset lifecycle strategies seek to optimize the lifecycle of assets to improve service and minimize risk at an appropriate level of investment. The strategy includes several processes that are dependent on lifecycle stage, condition, ability to meet service targets and available operational and capital budgets.

Regularly scheduled inspections and maintenance aim to prevent more significant repairs associated with the lifecycle of the facilities components. Betterment of facilities includes the planned replacement of major building components including roof systems, HVAC systems, electrical systems, plumbing systems, and interior finishes. Replacement of components or systems are based on physical condition, and the timeframe within its lifecycle. The County strives to ensure its new components are energy efficient and sustainable.

As shown in **Figure 3.2-3** below, the replacement of a building structure with no lifecycle events would be 50 years based on its estimated useful life. However, this is just an example of an age based asset approach and is not completely reflective of the strategy used by the County. The County properly maintains its components and building structures in very good, to good condition. This is why the useful life deteriorates gradually as shown in the graph.

Sufficient investment in the right type of asset intervention at the right time minimizes the total cost of ownership for each asset and mitigates other potential risks such as interruption to service delivery or failure that causes damage to the overall structure. Operations, maintenance, and betterment activities are timed to reduce the risk of service failure from deterioration in asset condition and all contribute to the total cost of ownership.

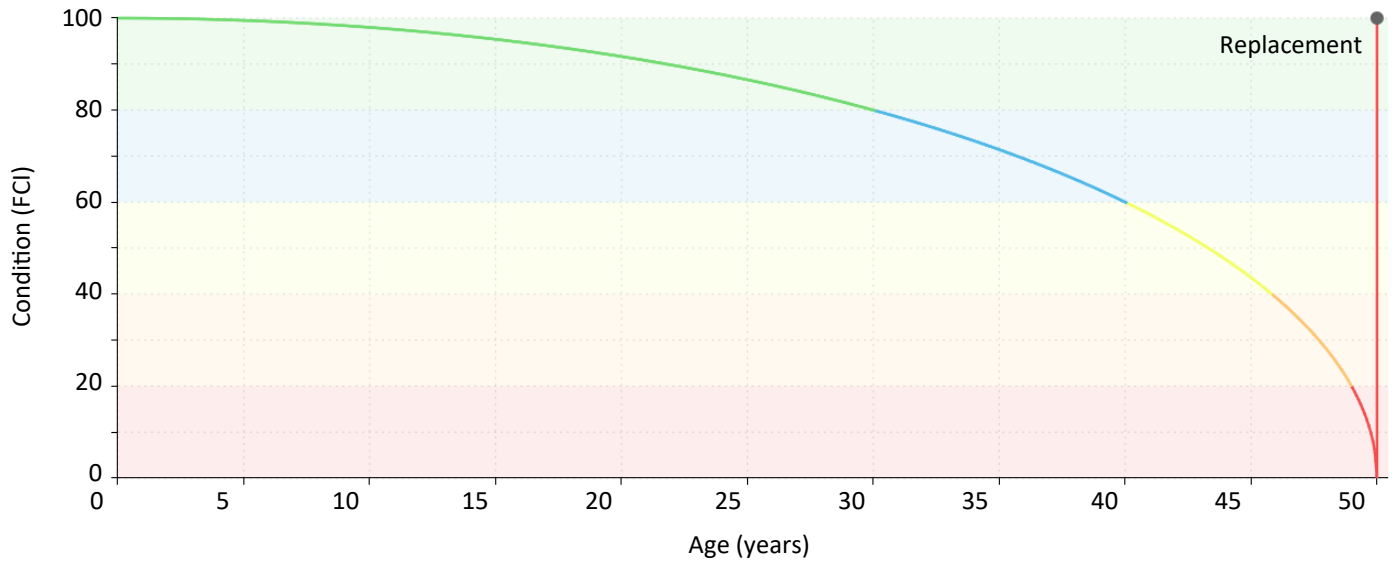


Figure 3.2-3 Visualization of the County facilities lifecycle strategy. Asset deterioration shown until the asset is scheduled for replacement at the end of its estimated useful life.

CONDITION

The condition of County facilities is currently rated in an overall very good condition (**Table 3.2-2** and **Figure 3.2-4**). The County routinely undergoes a Building Condition Assessment (BCA) for its facilities. This type of assessment is a tool that aims to help the County understand the physical condition of all facilities. This can help plan for betterments and replacements and allows the County to prioritize spending. By utilizing a BCA, knowing the facilities condition can identify any issues before they become severe problems. This guides capital planning for major improvements.

Table 3.2-2 Count and replacement cost of County facilities within each condition rating, 2023. [1]

Very Good	Good	Fair	Poor	Very Poor
35 Buildings	26 Buildings	1 Buildings	0 Buildings	12 Buildings [2]
$ 177,693,161	$ 98,141,723	$ 872,160	-	$ 5,067,590

[1] Included in this facility count for the sole purpose of this AMP is a social housing building: 65 Delhi St. This building is currently vacant, but County owned. It falls under the good condition rating.

[2] County garages do not have a BCA rating, which places the assessment of the condition as solely age based. True condition will be collected in future and updated accordingly. Estimated age-based condition may or may not be entirely accurate.

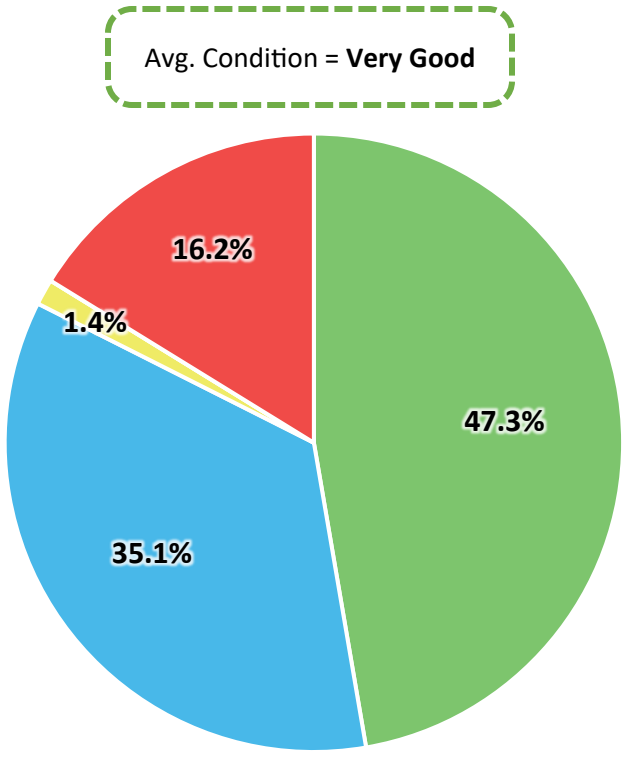


Figure 3.2-4 County facilities condition, 2023.

Table 3.2-3 County road facilities included in capital budget 2024-2033.

Roads Facilities	Total 10-Year Capital Spending
Arthur Garage	$ 7,600,000
Brucedale Garage	$ 20,300,000
Elora Facility Rehab	$ 80,0000
Erin Garage Construction	$ 15,700,000
Harriston Garage	$ 22,505,000

Risk

The overall risk rating of County facilities is very low. **Table 3.2-4** shows a breakdown of the metric used to calculate the risk ratings. The probability of failure uses the BCA scale, and the consequence of failure uses the 2023 estimated replacements costs.

Figure 3.2-5 shows the distribution of County facilities by risk classification. Green represents the County facilities that are very low risk. Red represents the County facilities that are very high risk.

Table 3.2-4 Probability and consequence of failure parameters currently included in the County facilities risk model.

Probability of Failure	Consequence of Failure
Condition	Replacement Cost

Roads Risk Classifications

Very Low (1-4)	Low (5-7)	Moderate (8-9)	High (10-14)	Very High (15-25)
51 Assets $ 144,277,224	10 Assets $ 94,544,264	5 Assets $ 38,227,106	4 Assets $ 1,058,690	4 Assets $ 3,667,350

Figure 3.2-5 County facility risk classifications including the number of assets and the total replacement costs, 2023. [1]

[1] Included in this facility count for the sole purpose of this AMP is a social housing building. This building is currently vacant, but County owned. It falls under the moderate risk rating.

There are four facilities that fall within the very high-risk category. **Table 3.2-5** provides more information per asset. It is important to note that the Roads facilities do not have a BCA condition, therefore are solely relying on age. This does not necessarily reflect the current state of the facilities condition.

Table 3.2-5 County facilities with a very high-risk classification, 2023.

Building	Replacement Cost	Probability of Failure	Consequence of Failure	Overall Risk Rating	Addressed in 2024-2033 Financial Plan
Harriston Garage	$ 15,076,500	5 Almost Certain	3 Moderate	15 Very High	Yes 2031 and 2032
Old Drayton Garage	$ 7,672,627	5 Almost Certain	4 Major	20 Very High	No
Arthur Garage	$ 8,042,985	5 Almost Certain	3 Moderate	15 Very High	Yes 2024 and 2028
Erin Garage [1]	$ 8,111,813	5 Almost Certain	3 Moderate	15 Very High	Yes 2025 and 2026

[1] Construction of new garage.

REPLACEMENT COST

The estimated replacement cost of County facilities is $281.8 million. These include the total number of facilities across all service areas as shown in **Figure 3.2-6**. Replacement costs were calculated using the 2022 building insurance valuations, and then inflated using the County's ten-year plan inflation rate forecast.

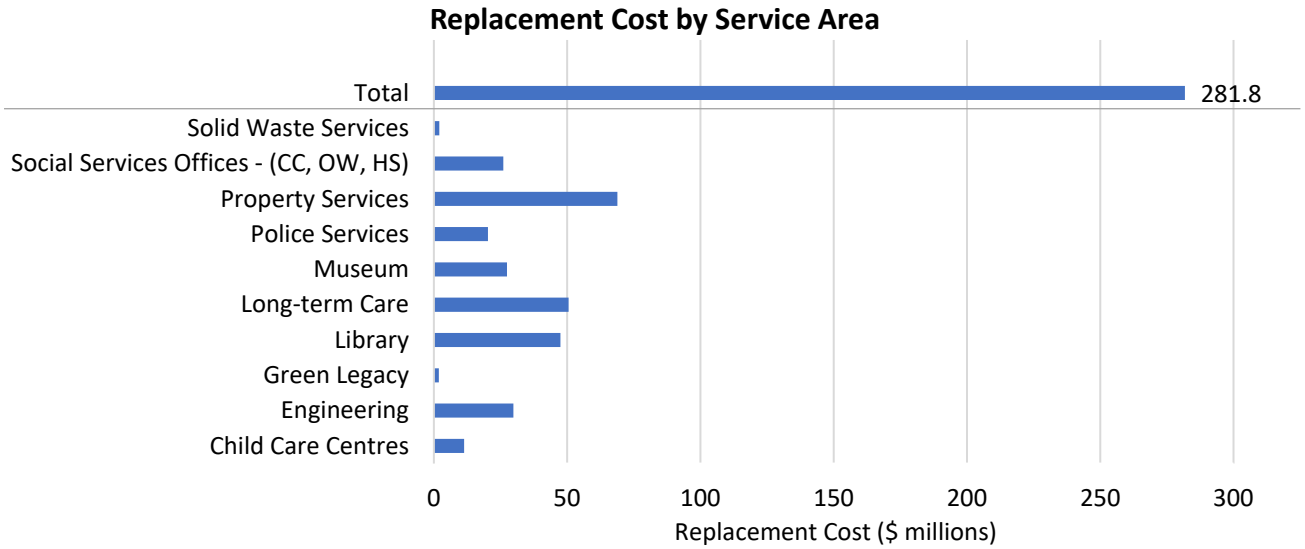


Figure 3.2-6 County facilities replacement costs by service area, 2023.

The estimated replacement cost of County facility site elements is $10.5 million. Replacement costs were calculated using the historical cost by in-service date, and/or construction date, and then inflated by 3.5% per year to get year-end 2022 replacement values. Next, 15% inflation was used to achieve 2023 replacement values. **Table 3.2-6** shows a breakdown of the replacement costs by component type.

Table 3.2-6 County site elements replacement costs by component type, 2023.

Total Site Element Replacement Costs	Site Element Component Type
$ 2,463,502	Playgrounds, Fencing, and Signs
$ 2,866,880	Retaining walls, Pavilions, Ramps, and Stairs
$ 3,183,405	Landscaping
$ 1,818,667	Sidewalks and Curbing
$ 193,583	Driveways and Parking Lots
$ 10,526,038	**TOTAL**

CURRENT FUNDING NEEDS

The annual funding requirement is a metric that provides an average of the combined cost of lifecycle events and asset replacements over their useful life. This is the investment required for all facility service areas to meet demands and established levels of service. Currently the County's asset management software is not driving these financial decisions. The County utilizes extensive analysis applying financial forecasts, budget planning, and DC studies. The annual requirement for all County facility structures is $5,576,393 (this value solely represents building structures and not the sum of its components). It is important to note that the lifecycle of a building doesn't include replacement of the structure. The lifecycle includes the betterment and replacement of the building components. The EUL of a building structure is 50 years; however, proper maintenance of the building components extends its useful life.

Table 3.2-7 Facility components with their estimated useful lives.

Building Component	EUL (years)
Structure frame, foundation	50
Water, drainage, fire systems	30
Electrical systems	25
Mechanical, HVAC, Elevators	20
Roofing (dependent on material used)	20 - 50
Windows, Doors, Siding	20
Millwork	25
Interior fixtures	15

Table 3.2-8 Current operating needs for facilities, 2023.

Total Operating Cost*	Average Per-Unit Cost*
$ 10,689,766	$ 11.34 per ft^2

* Represents a three-year average.

To meet current levels of service for staff and residents the County undergoes Building Condition Audits (BCAs) regularly and conducts monthly inspections. The reported condition of the facilities drives the current funding needs. Utilizing BCAs allows the County to budget for the betterment of facilities; this includes the planned replacement of major building components such as roof systems, HVAC systems, electrical systems, plumbing systems, and interior finishes. Replacement of components or systems are based on physical condition, and the timeframe within its lifecycle. **Table 3.2-7** lists the building components with their estimated useful lives. The County strives to ensure its new components are energy efficient and sustainable.

The average three-year operating cost for County facilities is approximately $10.7 million or $11.34 per ft^2 (**Table 3.2-8**). The current operating needs for County facilities include the following costs:

- Routine inspection and maintenance costs, including the cost of replacement parts and materials.
- Utilities and insurance costs.
- Salary and labour costs for maintenance and operational staff members.
- Insurance cost associated with facilities.

FUTURE FUNDING NEEDS

The financial analysis that determines the future funding needs of the County's facilities is a combination of replacement cost and condition of the assets, the current levels of service, the risks to service delivery, and the lifecycle activities needed to reduce the risks to acceptable levels. The financial strategy considers the affordability of the recommended asset management actions to maintain current service levels. A key challenge to financial sustainability is aligning level of service decisions and affordability. Additional challenges include changes in the cost of infrastructure investments and unforeseen impacts to funding. **Table 3.2-9** shows the budgeted future spending in the 2024-2033 financial plan. The County plans on spending an estimated $107,111,000 on facility improvements over the next ten years. This would be an average of $10,711,100 per fiscal year.

Table 3.2-9 Ten-year budget for County facilities improvements by service area, 2024-2033.

Service Area	Ten-Year Total
Solid Waste Services	$ 4,845,000
Social Services (Childcare, Ontario Work, Housing Services)	$ 3,995,000
Property Services	$ 6,115,000
Police Services	$ 2,100,000
Museum	$ 2,684,000
Long Term Care	$ 4,515,000
Libraries	$ 13,472,000
Green Legacy	$ 235,000
Engineering	$ 68,105,000
Childcare Centres	$ 1,045,000
TOTAL	**$ 107,111,000**
AVERAGE ANNUAL	**$ 10,711,100**

Refinements to investment needs will be required as condition assessments are updated, and data accuracy improves. This AMP is a fluid document and will require continual updating to make the best-informed decisions possible. The County will continue to improve data accuracy and alignment of the asset management software to make informed budget decisions.

LEVELS OF SERVICE

Table 3.2-10 contains a list of metrics related to the County's facility assets that ensure services are meeting legislative requirements and are accessible to both the County and residents.

Table 3.2-10 Performance metrics for County facilities.

	2022	2023
Accessibility & Reliability		
Percentage of facilities meeting Facility Accessibility Design Manual (FADM)	100%	100%
Number of customer request forms handled	1,100	1,068
Safety		
Frequency of health and safety inspections conducted for each facility	Monthly	Monthly
Affordability		
Total estimated replacement value	$ 232,612,690	$ 281,774,634
Percentage of new construction projects managed by Property Services completed on or under budget	100%	100%
Total equivalent kWh energy consumption by square foot of all library facilities [2]	n/a	21 kWh/sq foot
Sustainability		
Average annual reinvestment rate	0.25%	2.37%
Percentage of all facilities in good or very good condition	90%	82%
Percentage of all facilities in poor or very poor condition [1]	n/a	16%
Percentage of library facilities in good or very good condition [2]	n/a	100%

[1] County garages do not have a BCA rating, which places the assessment of the condition as solely age based. True condition will be collected in future and updated accordingly. Estimated age-based condition may or may not be entirely accurate.

[2] These metrics pertain to Library facilities only, assume all county facilities unless otherwise stated.

STRATEGY

Master Planning / Studies

The construction management area strives to successfully plan, coordinate, and supervise County construction projects from early development to completion. Building condition assessments (BCAs) are conducted regularly along with monthly inspections which ensure all County facilities are maintained in very good condition for the health and safety of our residents.

All new County construction projects utilize both the *Green Legacy Building Standards* (GLBS) as well as the *Facility Accessibility Design Manual* (FADM). The GLBS meets the Emerald Level of Certification which is the County's highest building standard. The FADM currently provides a higher level of accessibility than current code requirements. These manuals will continue to be updated as required to coincide with any *Ontario Building Code* (OBC) updates.

Monthly health and safety inspections are conducted, and all findings are prioritized and addressed accordingly.

Addressing the Backlog

County facilities are rated an average condition of very good. Approximately 18% of County facilities are in very poor condition however these ratings are based on age rather than a detailed assessment. Condition assessments will be completed in the future and updated as required. Estimated age-based condition may or may not be entirely accurate.

Renewal Projects

Facility improvements and prioritization of projects are based on BCA's, monthly inspection results as well as the County's 10-year forecast.

Data Quality

The County has committed to the following Quality initiatives:

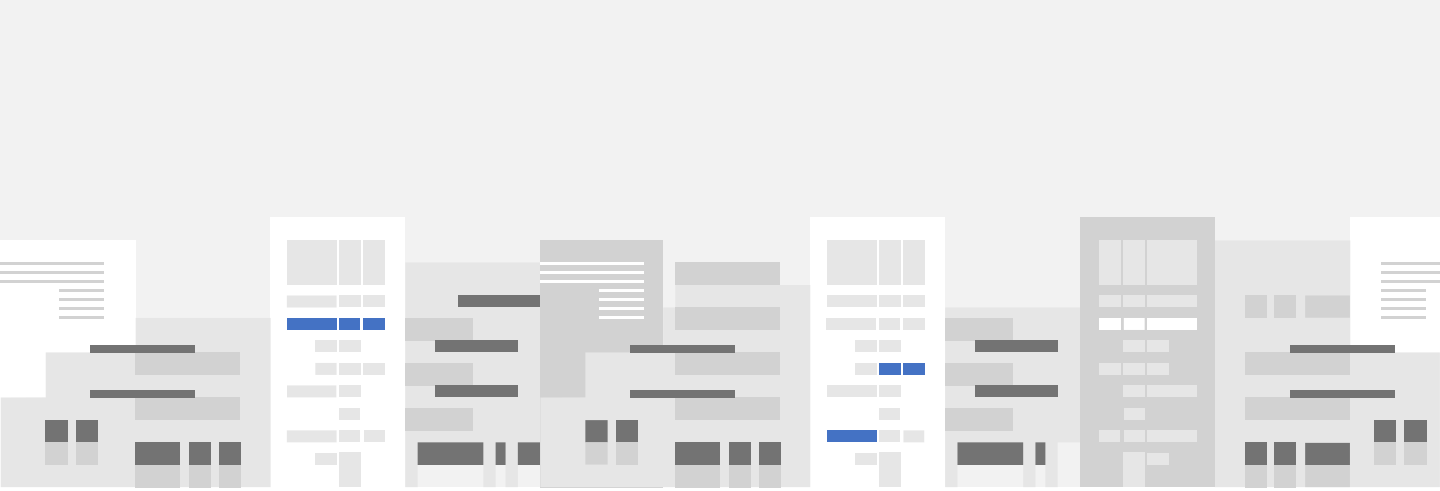
- Collect data for all Levels of service metrics and report annually.
- Review and update replacement values on an annual basis.
- Further identify and incorporate lifecycle events and associated costs.
- The current building assets in CityWide are being refined to better align with industry standards and best practices.

Asset Details

3.3 Housing

HOUSING

The County is the Consolidated Municipal Service Manager ("Service Manager") for Wellington County and the City of Guelph. As the Service Manager for Wellington-Guelph, the County is responsible for the delivery and administration of provincially mandated social and affordable housing programmes, as well as initiatives to prevent and address homelessness. Stable, long-term social and affordable housing is essential to housing stability for low-income households within the County.



To meet the needs of the community, the County owns and operates 1,189 rent-geared-to-income units and 131 units of affordable housing, totaling 1,320 County housing units (**Figure 3.3-1**). These units are spread across a mix of different housing building types, including apartment buildings, townhouses, semi-detached, and detached houses. On average, the County's housing units are 47 years old. Refer to **Table 3.3-1** for a breakdown building type and unit count. In addition to the social and affordable housing units, Wellington Housing Corporation has 39 townhouses.

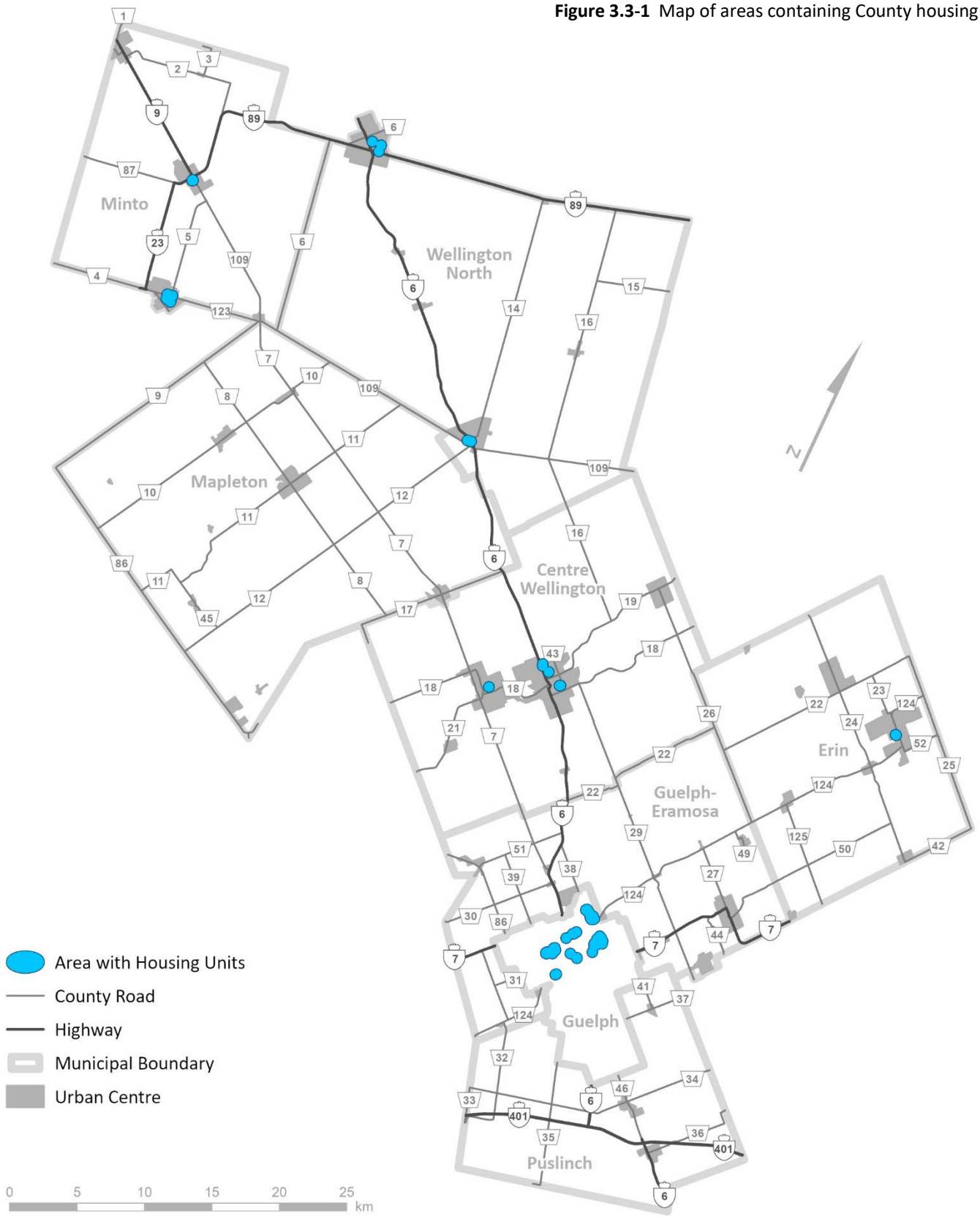
Table 3.3-1 Total number of social and affordable housing units broken down by building type, 2023.

Building Type	Quantity	Unit of Measure
Detached Homes	62	Units
Semi Detached Homes	67	Units
Townhouses	207	Units
Apartments	1,023	Units
Total	**1,359** [1]	

[1] This figure includes the number of townhouses that are part of the Wellington Housing Corporation (WHC).

HOUSING (CONT'D)

Figure 3.3-1 Map of areas containing County housing units.



DATA QUALITY

	Level 1	Level 2	Level 3	Level 4
Inventory	Inventory data is incomplete.	**Inventory data Is complete.**	Inventory data is complete and accurate.	Inventory data is complete, accurate, and in a centralized, accessible format.
Condition	No condition data exists. Condition is approximated by age.	**Condition data exists for these assets.**	Condition data was collected recently for these assets.	Condition data is complete and accurate, and regularly updated. Data is centralized and accessible.
Risk	**Critical assets and services are understood by department staff, but no risk models exist.**	**Risk is estimated according to a draft risk model. Some parameters lack sufficient data.**	Complete risk models exist for this asset class, and critical assets have been identified.	Risk management strategies have been developed for critical assets, and department budgets reflect risk-based priorities.
Lifecycle Strategy	Lifecycle events required to maintain current levels of service are not documented.	**Lifecycle events required to maintain current levels of service are documented.**	Capital budget costs of lifecycle events are built into the funding models. Operating costs are not included.	Capital and operating costs are built into the funding model. Projected lifecycle events are defined, and funding shortfalls are identified.
Financial Sustainability Strategy	Budgets are based on prior year spending.	Asset replacement schedules have been built into the long-term capital forecast.	**Replacement and maintenance costs have been built into long-term capital forecasts.**	Replacement and maintenance costs have been built into long-term capital and operating forecasts. Demand forecasts inform the budget.
Levels of Service	Services provided by this asset class are understood by departmental staff, but not formally measured.	**Performance metrics are defined to measure levels of service.**	Performance metrics are defined and a data collection strategy exists for all metrics.	Proposed levels of service have been identified, alongside their financial impacts. Trends in performance measures are tracked and regularly reported.

LIFECYCLE

The County's social and affordable housing buildings require the proper lifecycle activities to deliver safe and functional facilities. If proper lifecycle activities do not occur, there is a potential risk of failure which may result in environmental, economic, and social impacts. The consequences of the failure of these facilities are tied directly to the function of the facility. The failure of a facility or part of a facility may pose a risk to the health and safety of occupants and staff alike.

Regularly scheduled inspections and maintenance aim to prevent more significant repairs associated with the lifecycle of the facilities components. Betterment of facilities includes the planned replacement of major building components including roof systems, HVAC systems, electrical systems, plumbing systems, and interior finishes. Replacement of components or systems are based on physical condition, and the timeframe within its lifecycle. The County strives to ensure its new components are energy efficient and sustainable.

The County properly maintains its components in compliance with legislation and the betterment and/or timely replacement of its components extends its useful life.

The disposal of facility components occurs once the asset has reached the end of its useful life, is in poor condition, and/or requires a betterment/replacement. These components are regularly inspected and undergo a comprehensive building condition assessment. This approach allows the County to take appropriate action, using concise and efficent decision making.

CONDITION

The condition of social and affordable housing units is currently rated in an overall fair condition. The condition was calculated using the Facility Condition Index (FCI). This index is the total cost of building betterments and/or replacements divided by the current estimated replacement cost. **Figure 3.3-2** breaks down the calculation. This FCI calculation uses the forecasted budget and current needs for the estimated cost of repairs/replacements. Therefore, it utilizes current and future needs for repairs and replacements and does not use the backlog.

$$\frac{\text{Estimated Cost of Repairs and Replacements}}{\text{Replacement Value}} \times 100 = \text{FCI}$$

Figure 3.3-2 Facility Condition Index calculation.

The lower the value of FCI, the better condition that a building is in. Current industry benchmarks for social housing indicate subjective condition ratings for facilities with various ranges of FCI (**Table 3.3-2** and **Table 3.3-3**).

Table 3.3-2 Ranges of FCI from very good to very poor.

Condition	FCI
Very Good	0 - 0.01
Good	0.01 - 5
Fair	5 - 10
Poor	10 - 30
Very Poor	30 - 100

Table 3.3-3 Count and replacement cost of social and affordable housing buildings within each condition rating, 2023.

Very Good	Good	Fair	Poor	Very Poor
0 Buildings	80 Buildings	106 Buildings	13 Buildings	0 Buildings
-	$ 39,603,909	$ 164,704,953	$ 131,024,618	-

With an overall fair condition rating, as shown in **Figure 3.3-4**, The County is actively repairing and maintaining its buildings. The County is spending funds in the wisest possible manner when considering the cost of a building's repair and maintenance relative to its overall lifespan. This would mean that the County is not relying solely on historical spending, and the FCI data can be used to articulate the need for a more precise amount to be spent in any given year to provide a balance between reliable spaces and spending capital dollars.

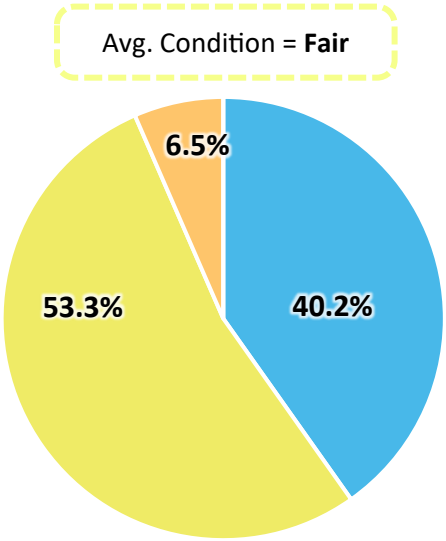


Figure 3.3-4 Social and affordable housing buildings condition, 2023.

Risk

Risk of social and affordable housing buildings has been determined using a matrix framework taking into consideration both the probability of failure that used the FCI condition scale and the consequence of failure using the 2023 estimated replacement cost of each building. For the purpose of this AMP, the risk parameter represents the economic risk to the County. It is not the measured risk of building safety. **Table 3.3-4** illustrates the ranges used to determine both metrics below.

Table 3.3-4 Probability and consequence of failure parameters currently included in the County social and affordable housing buildings risk model, 2023.

Probability of Failure	Consequence of Failure
Condition	Replacement Cost

Figure 3.3-5 shows the distribution of social and affordable housing buildings by risk classification. Green represents the social and affordable buildings that are very low risk. Red represents the social and affordable housing buildings that are in the very high risk category. Using the metrics listed above the majority of the social and affordable housing buildings are classified as very low risk.

Housing Risk Classifications

Very Low (1-4)	Low (5-7)	Moderate (8-9)	High (10-14)	Very High (15-25)
166 Assets	12 Assets	6 Assets	11 Assets	3 Assets
$ 59,973,662	$ 39,599,738	$ 44,446,178	$ 135,178,849	$ 52,254,494

Figure 3.3-5 Social and affordable housing buildings risk classifications including the number of assets and the total replacement costs, 2023.

REPLACEMENT COST

The estimated replacement costs for social and affordable housing units totaled $331.5 million (**Figure 3.3-6**). These include the total number of dwellings within the County's social housing portfolio: apartment buildings, townhouse complexes, semi-detached, and detached homes. Replacement costs were calculated using the *2022 Construction Cost Guide Average* and then inflated using the County's ten-year plan inflation rate forecast. In addition to the replacement cost of all social and affordable housing units, the WHC replacement cost is $12.8 million.

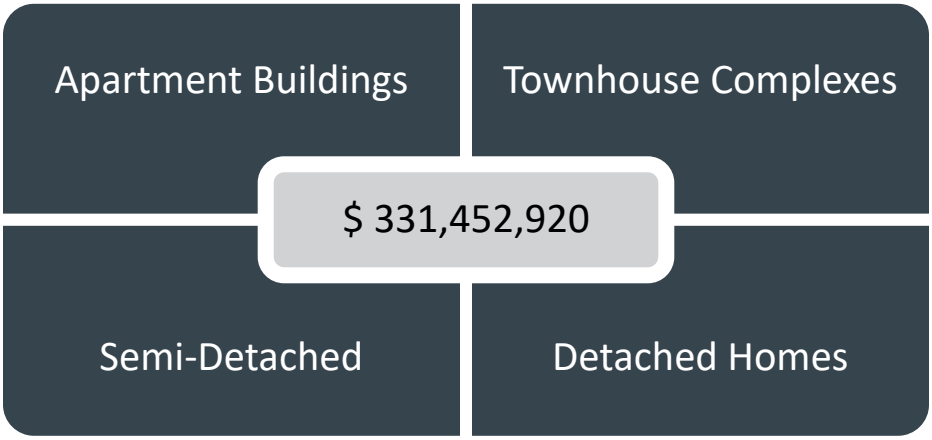


Figure 3.3-6 Social and affordable housing buildings estimated replacement cost, 2023.

The estimated replacement cost of the social and affordable housing site elements is $11.3 million. Replacement costs were calculated using the historical cost by in-service date, and/or construction date, and then inflated by 3.5% per year to get year-end 2022 replacement values. Next, 15% inflation was used to achieve 2023 replacement values. **Table 3.3-5** shows a breakdown of the replacement costs by component type.

Table 3.3-5 Social and affordable housing site elements replacement costs by component type, 2023.

Site Element Component Type	Total Site Element Replacement Costs
Playgrounds, Fencing, and Signs	$ 3,025,028
Retaining walls, Pavilions, Ramps, and Stairs	$ 1,679,847
Landscaping	$ 684,219
Sidewalks and Curbing	$ 1,865,630
Driveways and Parking Lots	$ 4,086,429
TOTAL	$ 11,341,153

CURRENT FUNDING NEEDS

The annual funding requirement is a metric that provides an average of the combined cost of lifecycle events and asset replacements over their useful life. This is the investment required for all social and affordable housing units to meet the established levels of service. Currently our asset management software is not driving these financial decisions. The County utilizes extensive analysis applying financial forecasts, and budget planning. The annual requirement for all social and affordable housing is $7,036,460. The lifecycle includes the betterment and replacement of the building components. The EUL of a building structure is 50 years; however, proper maintenance of the building components extends its useful life.

To meet current levels of service for all tenants the County undergoes Building Condition Audits (BCAs) regularly and conducts regular inspections. The reported condition for the social and affordable housing buildings, drives the current funding needs. Utilizing BCAs allows the County to budget for the betterment of these facilities; this includes the planned replacement of major building components such as roof systems, HVAC systems, electrical systems, plumbing systems, and interior finishes. Replacement of components or systems are based on physical condition, and the timeframe within its lifecycle. **Table 3.3-6** lists the building components with their estimated useful lives. The County strives to ensure its new components are energy efficient, Accessibility for Ontarians with Disabilities Act (AODA) compliant, meet safety regulations, and are sustainable.

Table 3.3-6 Building components with their estimated useful lives.

Building Component	EUL (years)
Structure frame, foundation	50
Water, drainage, fire systems	30
Electrical systems	25
Mechanical, HVAC, Elevators	20
Roofing (dependent on material used)	20 - 50
Windows, Doors, Siding	20
Millwork	25
Interior fixtures	15

The average three-year operating cost for County social and affordable housing is approximately $11.2 million or $9.49 per ft^2 (**Table 3.3-7**). The operating needs for social and affordable housing include the following costs:

Table 3.3-7 Current operating needs for housing, 2023.

Total Operating Cost*	Average Per-Unit Cost*
$ 11,162,919	$ 9.49 per ft^2

* Represents a three-year average.

- Routine inspection and maintenance costs, including the cost of replacement parts and materials.
- Utilities and insurance costs.
- Salary and labour costs for maintenance and operational staff members.
- Insurance cost associated with social housing units.

FUTURE FUNDING NEEDS

The financial analysis that determines the future funding needs of the social and affordable housing units is a combination of; replacement cost and condition of the assets, the current levels of service, the risks to service delivery, and the lifecycle activities needed to reduce the risks to acceptable levels. The financial strategy considers the affordability of the recommended asset management actions to maintain current service levels. A key challenge to financial sustainability is aligning level of service decisions and affordability. Additional challenges include changes in the cost of infrastructure investments and unforeseen impacts to funding.

The County plans on spending an estimated $63,674,004 on building improvements over the next ten years. This would be an average of $6,367,400 per fiscal year.

Refinements to investment needs will be required as condition assessments are updated, and data accuracy improves. This Plan is a fluid document and will require continual updating to make the best-informed decisions possible. The County will continue to improve data accuracy and alignment of the asset management software to make informed budget decisions.

LEVELS OF SERVICE

Social and affordable housing buildings levels of service are determined in accordance with legislated requirements, capital planning, available funding and needs. **Table 3.3-8** highlights these metrics in more detail.

Table 3.3-8 Performance metrics for County social and affordable housing.

	2022	2023
Accessibility & Reliability		
Percentage of all apartment facilities that are visitable	93%	93%
Percentage of social housing units that are modified for accessibility	17%	21%
Percentage of affordable housing units that are modified for accessibility	56%	59%
Percentage of social housing units that meet/exceed AODA standards	0.2%	0.2%
Percentage of affordable housing units that meet/exceed AODA standards	12%	12%
Number of households on Centralized Waitlist	3,377	3,181
Safety		
Percentage of facilities with one or more violations of the Ontario Building Code of Canada constructed after 2010	1%	0%
Percentage of facilities with one or more violations of the Fire Code of Canada unaddressed exceeding 30 days in length	0%	0%
Affordability		
Operating and maintenance cost divided by number of social housing units	-	$ 8,167
Operating and maintenance cost divided by number of affordable housing units	-	$ 7,966
Sustainability		
Average building condition (FCI)	-	6%
Number of maintenance requests per year	6,209	5,973
Percentage of buildings and facilities inspected annually	100%	100%

STRATEGY

Master Planning / Studies

The Housing Services division is deeply committed to preserving the existing subsidized and government-funded affordable housing in the Wellington-Guelph area. These units serve as vital community infrastructure and play a crucial role in providing safe and affordable housing options for low-income households.

Addressing the Backlog

In 2023, over $10.6 million was allocated towards various maintenance, capital projects, and operational expenditures for subsidized and government-funded affordable housing. This encompassed $1.9 million for capital projects and retrofits, along with more than $8.7 million dedicated to maintenance and upkeep of County-owned subsidized and government-funded housing stock. Furthermore, an additional $12 million in funding from other levels of government was secured in 2023. This funding is earmarked for capital repairs and upgrades required in County-owned social housing over the next two years. These capital repairs will benefit over 1,320 units of subsidized housing in the Wellington-Guelph region.

Renewal Projects

Beyond maintenance and capital repairs, the Housing Services division is actively planning sustainable and energy-reduction projects to modernize and enhance the housing stock. These initiatives include replacing windows and doors with more energy-efficient alternatives, enhancing attic insulation and ventilation, upgrading aging systems with high-efficiency boilers and air make-up replacements, as well as implementing roof system replacements and accessibility upgrades.

Data Quality

The current social housing assets in CityWide are being refined to better align with industry standards and best practices. The County will continue to make strides on improving the overall data quality of the social and affordable housing buildings.

Data for levels of service metrics are being collected and reported on annually. Replacement values are updated on an annual basis. Lifecycle events and strategies will continue to be developed and implemented.

3.4 Roads

ROADS

County roads are at the core of the transportation system and support essential community services. As a rural County, the surface area that needs to be covered by the road network is extensive, while the population supporting investments in the network, through property taxes, is relatively small compared to more urban municipalities. As a result, maintaining the County's road network is a significant financial challenge.

The County maintains 709 km, or 1,434 lane-km, of roads and roundabouts. Road lengths measured along the center line of the road are reported in kilometers, whereas lane-kilometers take into consideration the number lanes on the road. Incorporating the number of lanes into the road length allows for a more accurate calculation of costs for the road network. The age of County roads varies significantly (**Figure 3.4-1**). In 1998, 103 km of roads were downloaded from the Province to the County. Since that time, the County has invested in road upgrades, resulting in over 60% of the road network having been replaced since 2000.

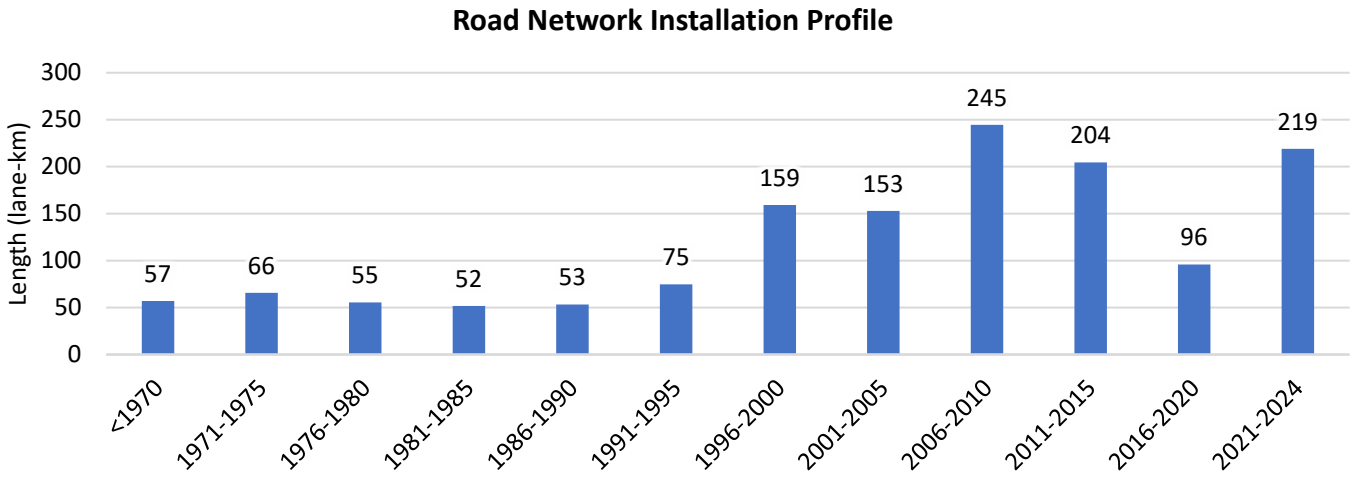


Figure 3.4-1 County road network installation dates and associated replacement cost, 2020.

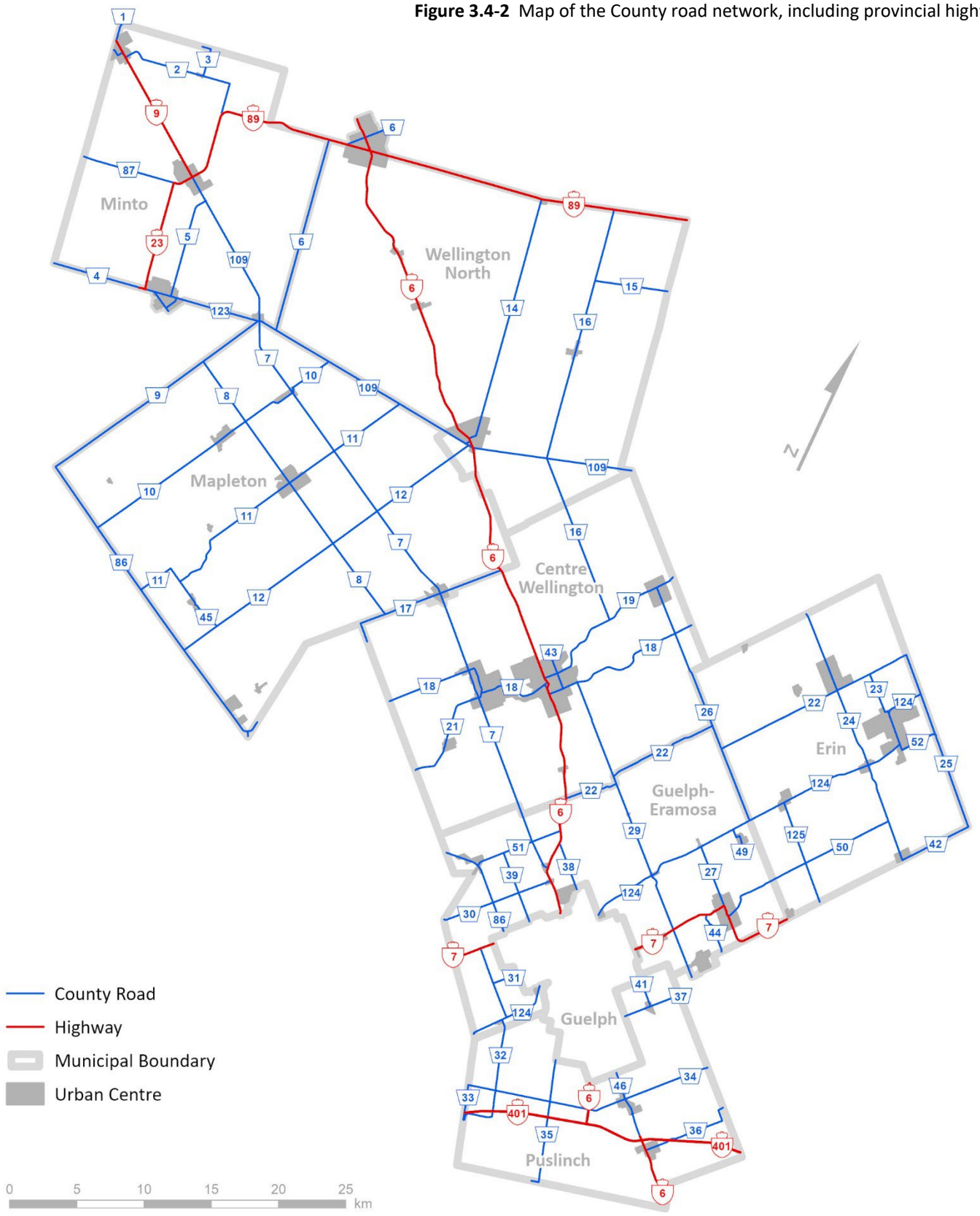
County roads are divided into classes that range from Class 2 to 5 as per the *Minimum Maintenance Standards* (MMS) *O. Reg. 239/02* (the County does not own any Class 1 or 6 roads). Roads with higher posted speed limits and higher average daily traffic require more frequent inspection, and more rapid responses to any identified deficiencies such as potholes and debris. Refer to **Table 3.4-1** for an overview of County road classes.

Table 3.4-1 Classes of County roads and associated metrics.

MMS Class	Patrolling Frequency	Length (km)	Length (lane-km)
Class 2	2 times every 7 days	222	461
Class 3	Once every 7 days	407	813
Class 4	Once every 14 days	72	144
Class 5	Once every 30 days	8	16

ROADS (CONT'D)

Figure 3.4-2 Map of the County road network, including provincial highways.



DATA QUALITY

	Level 1	Level 2	Level 3	Level 4
Inventory	Inventory data is incomplete.	Inventory data Is complete.	Inventory data is complete and accurate.	**Inventory data is complete, accurate, and in a centralized, accessible format.**
Condition	No condition data exists. Condition is approximated by age.	Condition data exists for these assets.	Condition data was collected recently for these assets.	**Condition data is complete and accurate, and regularly updated. Data is centralized and accessible.**
Risk	Critical assets and services are understood by department staff, but no risk models exist.	Risk is estimated according to a draft risk model. Some parameters lack sufficient data.	**Complete risk models exist for this asset class, and critical assets have been identified.**	Risk management strategies have been developed for critical assets, and department budgets reflect risk-based priorities.
Lifecycle Strategy	Lifecycle events required to maintain current levels of service are not documented.	Lifecycle events required to maintain current levels of service are documented.	**Capital budget costs of lifecycle events are built into the funding models. Operating costs are not included.**	Capital and operating costs are built into the funding model. Projected lifecycle events are defined, and funding shortfalls are identified.
Financial Sustainability Strategy	Budgets are based on prior year spending.	Asset replacement schedules have been built into the long-term capital forecast.	**Replacement and maintenance costs have been built into long-term capital forecasts.**	Replacement and maintenance costs have been built into long-term capital and operating forecasts. Demand forecasts inform the budget.
Levels of Service	Services provided by this asset class are understood by departmental staff, but not formally measured.	Performance metrics are defined to measure levels of service.	**Performance metrics are defined and a data collection strategy exists for all metrics.**	Proposed levels of service have been identified, alongside their financial impacts. Trends in performance measures are tracked and regularly reported.

LIFECYCLE

County roads are meticulously managed and maintained throughout their lifespan to maximize their estimated useful life (EUL) and ensure they adequately serve County residents for as long as possible. Initially, new road segments deteriorate at a relatively slow pace. However, as cracks begin to appear in the wearing surface, the rate of deterioration accelerates until the road reaches the end of its useful life. Once a road's condition falls to a Pavement Condition Index (PCI) of 40, any preservation efforts (Lifecycle events) would be ineffective due to the advanced level of deterioration, necessitating a complete reconstruction. The initial 25-year lifespan of a road assumes it will be used until it reaches failure or a PCI of 0 without any lifecycle events.

Table 3.4-2 Estimated useful life for roads with no intervention, versus EUL for roads using the County lifecycle approach.

Lifecycle Approach	EUL
With no intervention or lifecycle events	25 years
With County capital lifecycle events	**33 years, 9 months**

The deterioration curve for roads is based on an estimate of the condition of the road over its useful life. However, new roads may deteriorate faster than anticipated if, for example, environmental stressors prove to be more detrimental than anticipated. Similarly, older roads that would be expected to be in poor condition and at the end of their useful life may actually be in fairly good condition because of excellent initial construction and low daily traffic. Therefore, relying solely on the age of the road and its estimated useful life is not sufficient to determine when lifecycle events should be completed. Instead, the County uses a combination of road condition, age and engineering judgment to plan lifecycle events.

Throughout the life of a County road, different lifecycle events are scheduled to extend its estimated useful life past its initial estimate (**Table 3.4-2**). There are four lifecycle events that are scheduled on County paved roads:

1. **Crack sealing**: The sealing of cracks on the road surface.
2. **Micro surface resurfacing**: A cold mix asphalt blend of high-quality aggregates and emulsified asphalt, that is mixed and spread with a machine over the road surface. This treatment extends the life of the pavement surface, and seals minor cracks and other irregularities.
3. **Mill and pave or overlay resurfacing**: Involves the removal, recycling, and replacement of the top layer of asphalt. This is required when surface cracking is more extensive.
4. **Full replacement/reconstruction**: The complete replacement of the road surface. The depth of the asphalt replacement depends on a variety of factors, including the condition of the road being replaced. This treatment is applied to sections of pavement where replacement is more cost-effective than treatment.

LIFECYCLE (CONT'D)

Table 3.4-3 shows the trigger for each of the events for a typical road surface, the impact of the event, and its cost per lane-km. For example, crack sealing is scheduled when a road reaches the age of 5 years. Once it is completed, the condition of the road is presumed to be improved, to roughly 90 PCI, and the cost is expected to be roughly $2,710 per lane-km. The costs for lifecycle events are reviewed on an annual basis to ensure that it is as accurate as possible.

Table 3.4-3 Roads capital budget for the Lifecycle Events, 2023.

Treatment	Class	Budget	Timeline	Impact	Cost per lane-km
Crack Seal	Maintenance	Capital	Condition = 80 to 85 PCI	Set condition to 90 PCI Add 3 years 4 months EUL	$2,710
Micro Surface	Maintenance	Capital	Condition = 75 PCI	Set condition to 90 PCI Add 4 years 11 months EUL	$16,630
Mill and Pave	Rehabilitation	Capital	Condition = 65 PCI	Set condition to 90 PCI Add 7 years 9 months EUL	$73,914
Replacement	Replacement	Capital	Condition = 40 PCI	Set condition to 100 PCI Add 25 years EUL to new asset	$266,469

The following list outlines the lifecycle strategy for a County road. With the addition of all lifecycle events, the estimated useful life (EUL) of a road increases from 17 years to approximately 34 years. The lifecycle is visually represented in **Figure 3.4-3**, showing the condition and age of a road throughout its life and how both parameters are affected by the lifecycle events.

- The new road starts at a PCI of 100 and begins deteriorating along a 25-year useful life deterioration curve. Although a road remains useful up to 25 years without intervention, the County's minimum requirements dictates a road is replaced at 40 PCI to ensure the road meets its intended service levels. This replacement would take place at 17 years without intervention.
- When the road reaches a condition of 80 to 85 PCI, a crack seal event is applied, which improves the condition back to 90 PCI and extends the estimated useful life of the road by approximately 3.5 years.
- The road then continues to deteriorate along the same curve until it reaches a condition of 75 PCI, at which point a micro surface event is scheduled, which will also increase the PCI to 90 and extend the estimated useful life by approximately 5 years.

LIFECYCLE (CONT'D)

- After further deterioration, at 65 PCI, the road will receive a mill and pave event, which will set the condition back up to 90 PCI and extend the estimated useful life of the road by approximately another 8 years.
- When the condition of the road deteriorates to 40 PCI, the County schedules an asset replacement. As a result of the lifecycle events throughout the road's life, the original estimated useful life of 25 years is extended. With this intervention, the County delays the replacement to approximately 34 years.

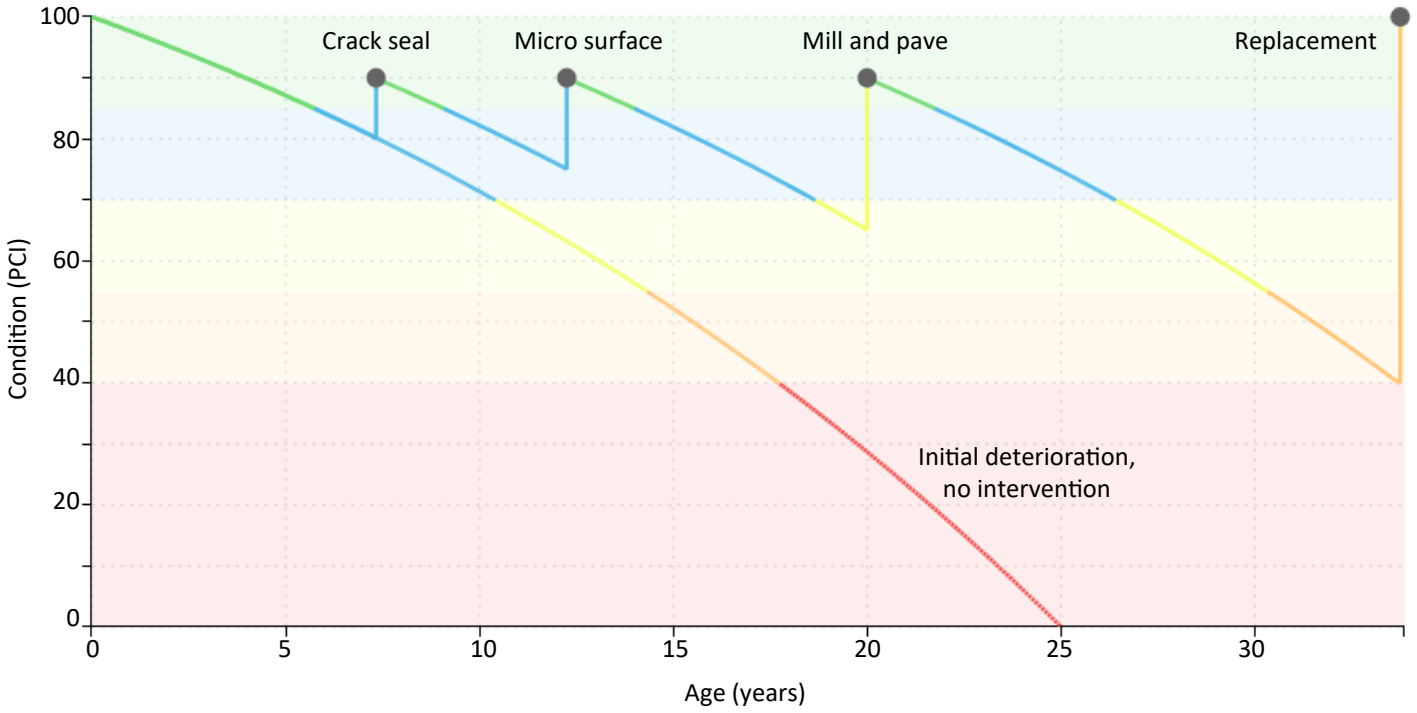


Figure 3.4-3 Visualization of the County road network lifecycle strategy. Original asset deterioration is shown, in comparison to the lifecycle deterioration with the addition of lifecycle events to extend the estimated useful life of a County road asset.

CONDITION

The County engineering services department determines the overall condition of the road surface using the PCI rating. The PCI ranges from 0 to 100, with 0 being the lowest possible condition and 100 being the best possible condition (**Figure 3.4-4** and **Table 3.4-4**). PCI evaluations are performed for all County roads every three years, with the most recent assessment completed in 2021.

The Riding Condition Rating ("RCR") is also assessed, with higher ratings reflecting more comfortable driving conditions. Most County roads have a posted speed limit of 80 km/hour requiring a higher PCI to maintain a comfortable RCR.

Figure 3.4-4 Example of varying County road condition ranges.

Table 3.4-4 This scale is used to translate the PCI score onto a five-point condition scale.

Scale	PCI	Service Level	Associated Work
Very Good	85 - 100	The road segment is relatively new, or newly reconstructed. There are no visible cracks and no structural issues. The ride is smooth.	Minor maintenance
Good	70 - 85	The road segment is starting to exhibit few, if any, signs of surface deterioration, random cracks, and rutting. The ride is relatively smooth.	Crack sealing, spot drainage
Fair	55 - 70	The road segment is exhibiting signs of surface deterioration, random cracks, rutting, and some patching of surface defects. The ride is becoming rough.	Spot drainage, micro surfacing, bonded wearing course, re-ditching
Poor	40 - 55	The road segment shows signs of deterioration, cracks, rutting, and patching of surface defects that occurs over 50 percent of the surface. Some structural issues are starting to show. The ride is uncomfortable.	Resurface, asphalt recycling, re-ditching, reconstruction
Very Poor	0 - 40	The road segment is reaching the end of its useful life. There are significant structural issues with large visible cracks, rutting and patching surface defects that occurs over 75 percent of the surface. The road is difficult to drive at the posted speed limit.	Reconstruction, widen, resurface, asphalt recycling, re-ditching

CONDITION (CONT'D)

The average condition of the County road network in 2023 is 67 PCI, which means that the network is in fair condition. The average condition of the network in 2022 was 70 PCI, indicting a slight downward trend in the overall condition of the road network which is expected during years where replacements aren't keeping up pace with deterioration. Budget limitations are discussed further in the funding needs and infrastructure gap sections.

Figure 3.4-5 and **Table 3.4-5** show the distribution of the road network condition, from very good to very poor, with the associated replacement costs of assets in each condition rating category. **Table 3.4-6** identifies the County roads in the very poor condition category and whether they are addressed in the upcoming 10-year County budget.

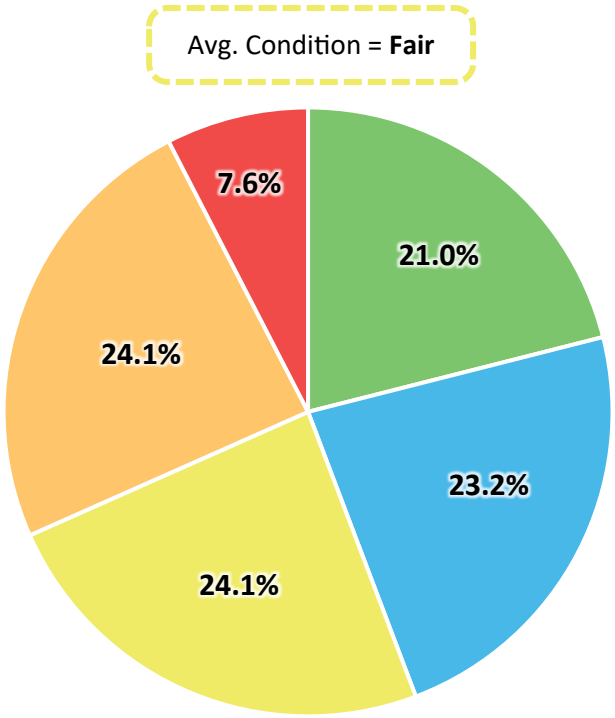


Figure 3.4-5 County road network condition, 2023.

Table 3.4-5 Length and replacement cost of roads within each condition rating, 2023.

Very Good	Good	Fair	Poor	Very Poor
149 km of Roads	164 km of Roads	171 km of Roads	171 km of Roads	54 km of Roads
$ 80,401,946	$ 90,960,779	$ 91,103,073	$ 90,931,734	$ 28,593,718

Table 3.4-6 County roads with a very poor condition rating, 2023.

Road Segment	From	To	Replacement Cost	Condition Rating (PCI)	Addressed in 2024-2033 Financial Plan
WR007-29764	WR 12	200 m S of Sideroad 16	$1,846,097	37	No
WR007-33228	200 m S of Sideroad 16	WR 11	$1,085,062	37	No

CONDITION (CONT'D)

Table 3.4-6 Continued.

Road Segment	From	To	Replacement Cost	Condition Rating (PCI)	Addressed in 2024-2033 Financial Plan
WR007-35264	WR 11	500 m S of WR 10	$2,530,922	39	Yes (2026)
WR016-21097	Line 6	WR 15	$2,938,087	38	Yes (2029)
WR025-01225	1.2 km N of WR 42	WR 52	$3,202,424	24	Yes (2026, 2027, and 2028)
WR025-10437	WR 124	WR 22	$1,661,700	30	Yes (2027)
WR026-09855	800 m S of Sideroad 30	WR 18	$2,726,510	34	Yes (2031 and 2032)
WR035-00000	Cooper Rd	WR 35	$291,517	29	Yes (2025)
WR035-00547	Gore Rd	Hwy 401 Overpass	$2,597,006	36	Yes (2025)
WR035-05834	400 m N of Hwy 401 Overpass	WR 34	$347,476	38	Yes (2025)
WR052-00000	WR 124	Ninth Li	$242,487	43	No
WR052-00455	Ninth Li	WR 25	$1,511,945	45	Yes (2028)
WR109-02134	WR 5	WR 7	$5,188,684	36	Yes (2024)
WR124-25153	400 m W of Fourth Li	WR 24	$2,423,802	39	Yes (2027)

There are a number of factors contributing to the current road condition, including:

- The PCI values used for 2023 are a measure of projected condition. They are based on the 2021 assessed condition, which is then plotted onto the deterioration curve to provide an estimate of the condition of the road two years later. This may not be the actual condition of the road. An updated road condition assessment is scheduled for 2024.

CONDITION (CONT'D)

- There is a backlog of roads in very poor condition that need replacement or rehabilitation. Roads continue to deteriorate across the County's road network at a quicker pace than those being replaced, and has continued to impact the average condition rating of the network.
- The reason for the growth of this backlog is a lack of lifecycle needs identified through asset management planning for large rehabilitation projects as well as regular lifecycle events such as crack sealing. As a result, the engineering services department has adopted a "worst-first" approach to maintaining roads, by including those roads in poorest condition in the 10-Year Capital Plan. With the additional investment in AM software that allows for more detailed planning and scenario analysis, as well as additional funding, the engineering services department will be able to prioritize higher-return projects such as timely maintenance of relatively new road segments.
- The investments listed in this plan assume that the County wishes to maintain the existing condition of the network. To improve the condition of the road network, investments beyond those listed in this plan will need to be made. This will be assessed in the next version of the AMP through proposed levels of service, as required by O. Reg. 588/17.

CONDITION (CONT'D)

Figure 3.4-6 Map of the County road network condition, 2023.

Risk

The risk analysis for roads is the product of the likelihood of road failure and the consequence of failure. **Table 3.4-7** illustrates the parameters used to represent the probability and consequence of failure for roads.

Table 3.4-7 Probability and consequence of failure parameters currently included in the County roads risk model.

Probability of Failure	Consequence of Failure	
Average Annual Daily Traffic (AADT)	Average Annual Daily Traffic (AADT)	Replacement cost
	MMS class	Road class
Age	Percentage of road within floodplain *	Roadside environment
Condition	Proximity to critical infrastructure	Speed limit

* Refer to the stormwater risk section for more information relating to the floodplain risk parameter and assessment.

Figure 3.4-7 shows the distribution of County roads by risk class. Green represents the replacement costs of roads that are very low risk, while red reflects the highest (very high) risk roads. Using the parameters above, the vast majority of County roads are classified as low risk. **Table 3.4-8** identifies the County roads in the very high risk category and whether they are addressed in the upcoming 10-year County budget.

Roads Risk Classifications

Very Low (1-4)	Low (5-7)	Moderate (8-9)	High (10-14)	Very High (15-25)
104 Assets	127 Assets	55 Assets	48 Assets	2 Assets
192 km	258 km	119 km	128 km	12.57 km
$ 101,840,440	$ 141,832,102	$ 63,633,321	$ 67,991,154	$ 6,694,233

Figure 3.4-7 Risk classifications for County roads including the number of assets, road centerline length, and total replacement costs associated with each classification, 2023.

Table 3.4-8 County roads with a very high risk classification, 2023.

Road Segment	From	To	Replacement Cost	Probability of Failure	Consequence of Failure	Overall Risk Rating	Addressed in 2024-2033 Financial Plan
WR034-09126	Hwy 6	WR 46	$ 1,505,550	4.0 Likely	3.8 Moderate	15.1 Very High	No
WR109-02134	WR 5	WR 7	$ 5,188,684	4.1 Likely	3.7 Moderate	15.2 Very High	Yes (2024)

REPLACEMENT COST

A typical pavement structure is composed of different layers of material which receives the loads from the above layer, spreads them out, and then passes them on to the layer below and so on. The structure of a road is comprised by the subgrade, granular base, base course asphalt, and surface asphalt (**Figure 3.4-8**). Proper drainage is also important to ensure a high quality, long-lived pavement.

To replace a section of road that is past its useful life, two broad strategies can be employed: replacing the road surface to varying depths depending on the extent of deterioration, or replacing the entire road segment, including the base. The County applies a strategy of replacing and recycling the asphalt component of the road structure, leaving the granular base in place, when the driving surface of the road is nearing the end of its useful life.

To replace the surface of the road, it is estimated to cost $266,469 per lane-km. This reflects the average cost of the most recent road rehabilitation projects. The cost per lane-km increased significantly in 2022, due to a reallocation of costs from the stormwater network. The road excavation cost associated with stormwater infrastructure replacement is now included in the road replacement costs, resulting in an approximately 31% increase in the cost per lane-km. Replacement costs are updated on an annual basis to incorporate shifts in material and labour costs that may result in significant changes to the estimated replacement costs.

The total cost to replace all County roads

$ 381,991,250

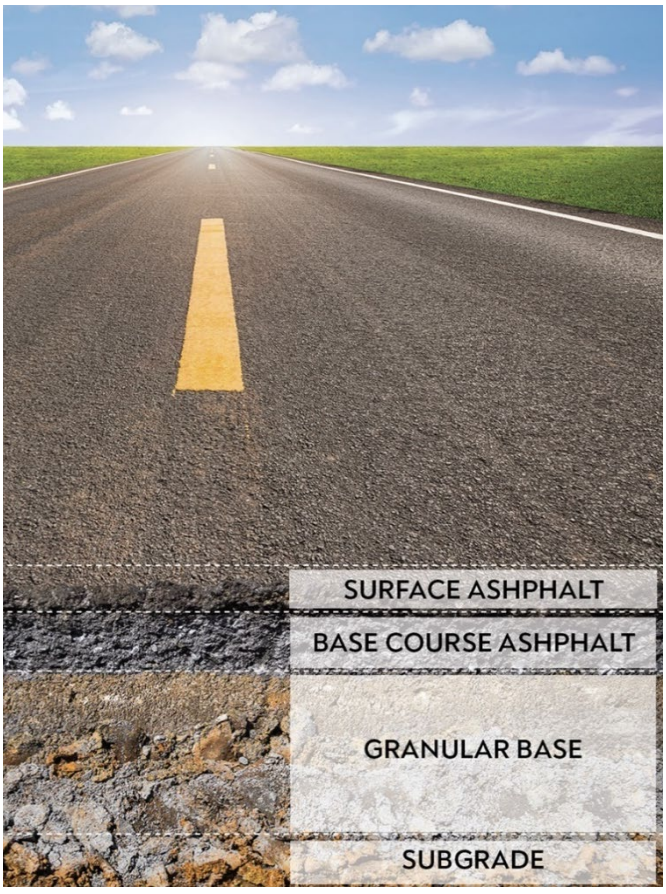


Figure 3.4-8 Cross-section of a road segment.

CURRENT FUNDING NEEDS

Future demand on the road network will be shaped by usage and growth. Shifting changes in utilization, such as changing transportation preferences, may reduce the pressure on County road networks. On the other hand, increasing population density and an increase in heavy truck volumes may increase the load on County roads and accelerate deterioration, requiring more frequent and earlier intervention.

The annual funding requirement is a metric that provides an average of the combined cost of lifecycle events and asset replacements over their useful life. For the road network, the annual funding requirement is a combination of each of the three lifecycle event costs (crack seal, micro surface, and mill and pave) and the replacement cost for each County road. The annual funding requirement calculation does not incorporate a backlog.

The total cost to maintain all roads over their useful life is $515,675,807. When the lifecycle events are completed on the road network, its estimated useful life is extended to approximately 34 years. Dividing the total network cost by the new estimated useful life results in the annual requirement of $15,288,088 (**Table 3.4-9**). This cost assumes that the lifecycle events are done on schedule for all roads across the County. It also assumes that the costs for replacement and lifecycle events are accurate. Finally, it assumes that the life of the roads is extended to approximately 33 years and 9 months with the lifecycle events, based on the deterioration curve. This value may not be accurate for all roads, as they may deteriorate differently based on a variety of factors.

Table 3.4-9 Annual requirement for the road network. Calculated as the total replacement and lifecycle events costs of all County roads, divided by the extended estimated useful life of an average road segment, 2023.

Total Replacement Cost	Total Lifecycle Events Cost	Total Network Cost	Estimated Useful Life with Lifecycle Events	Annual Funding Requirement
$ 381,991,250	$ 133,684,557	$ 515,675,807	33 Years 9 Months	$ 15,228,088

The annual requirement cost alone does not adequately account for the annual budget for roads, because it does not take into consideration the backlog of roads in which replacements are overdue. The backlog amount for 2023 was $28,593,718.

CURRENT FUNDING NEEDS (CONT'D)

The average three-year operating cost for the County road network is approximately $7,114,958 or $4,962 per lane-km (**Table 3.4-10**). The current operating needs for roads include the following costs and assumptions:

- Road surface management costs related to road patching, shoulder and loose surface grading, dust control, washout and base repairs, and sweeping.
- Roadside maintenance costs related to mowing, tree removal and planting, brush cutting, debris removal, and weed control.
- Winter maintenance costs including snow plowing and winter pavement preparation such as salting, sanding, and de-icing, including the cost of these materials.
- Routine inspection and maintenance costs, including the cost of replacement parts and materials.
- Salary and labour costs for maintenance and operational staff members, including engineering staff responsible for bridges, culverts, and the stormwater network.
- Insurance costs associated with roads, bridges, culverts and the stormwater network.

Table 3.4-10 Current operating needs for the County road network, 2023.

Total Operating Cost*	Average Per-Unit Cost*
$ 7,114,958	$ 4,962

* Represents a three-year average.

It is assumed that some of the operating needs attributed to the road network include costs that may be related to maintaining other engineering assets, such as bridges, culverts, stormwater infrastructure, and roadside elements. Due to the complexity of these assets, their needs are often managed in coordination with each other making it difficult to separate costs amongst asset classes.

FUTURE FUNDING NEEDS

Table 3.4-11 shows the lifecycle events (including replacements) for the road network for 2024-2033. The ten-year average capital needs of $24,064,724 is higher than the annual requirement of $15,228,088. This is due to the large proportion of roads that are in very poor condition and require immediate attention.

Table 3.4-11 Lifecycle Events cost of County roads for 2024-2033.

Year	Inflation Rate	Crack Seal	Micro Surface	Mill and Pave	Asset Replacement	Total
2024	5%	$ 327,729	$ 335,940	$ 5,198,956	$ 59,946,363*	$ 65,808,988
2025	3.5%	$ 413,130	$ 627,512	$ 4,890,606	$ 15,768,490	$ 21,699,737
2026	3.5%	$ 363,338	$ 15,769	$ 3,230,412	$ 38,789,843	$ 42,399,363
2027	3.5%	$ 124,885	-	-	$ 30,025,308	$ 30,150,192
2028	3.5%	-	$ 43,624	-	$ 36,260,803	$ 36,304,427
2029	3.5%	$ 155,897	$ 2,522,741	$ 36,133	$ 27,427,176	$ 30,141,948
2030	3.5%	$ 55,910	$ 2,871,995	$ 156,365	-	$ 3,084,270
2031	3.5%	$ 744,770	$ 2,648,036	$ 121,058	-	$ 3,513,864
2032	3.5%	$ 309,291	$ 910,169	$ 2,266,340	-	$ 3,485,801
2033	3.5%	$ 356,635	$ 380,789	$ 3,321,223	-	$ 4,058,648
TOTAL		$ 2,851,586	$ 10,356,575	$ 19,221,093	$ 208,217,983	$ 240,647,237
AVERAGE ANNUAL		$ 285,159	$ 1,035,657	$ 1,922,109	$ 20,821,798	$ 24,064,724

* Includes backlog from previous years.

Taken together, the values shown in **Table 3.4-12** provide a range for capital funding required which can potentially guide the ten-year capital budget forecast. Annual funding will need to be increased to address the existing backlog and continue to complete the recommended Lifecycle Events schedule. This funding maintains the road network in its current condition. Improvements in condition will require additional funding.

FUTURE FUNDING NEEDS (CONT'D)

Table 3.4-12 The annual requirement, ten-year average replacement, and the ten-year average capital needs for County roads.

Annual Funding Requirement	Ten-Year Average Replacement Needs	Ten-Year Average Capital Needs
$ 15,228,088	$20,821,798	$24,064,724

The County must balance the costs of addressing this backlog with the lifecycle events costs of maintaining the rest of the network. This depends on available funding and staff capacity, as well as changes in material and labour costs that may impact the estimated funding required. It is insufficient to focus solely on the replacement of very poor roads, because the rest of the network will continue to deteriorate without proper maintenance. It is more expensive to rehabilitate or replace a road than to maintain it.

Additionally, these figures reflect the costs associated with keeping the overall condition of the network in its *current state* (i.e. an average PCI of 67). Should the County set a higher target PCI for the average condition of the road network, the lifecycle strategy would change, and annual funding needs would increase. For example, additional crack sealing events may be scheduled for new roads to keep them in very good condition as long as possible. Rehabilitation events such as mill and pave resurfacing may be done earlier than at the 17-year mark, to increase the condition of those roads earlier, and improve the overall condition of the network.

FUTURE FUNDING NEEDS (CONT'D)

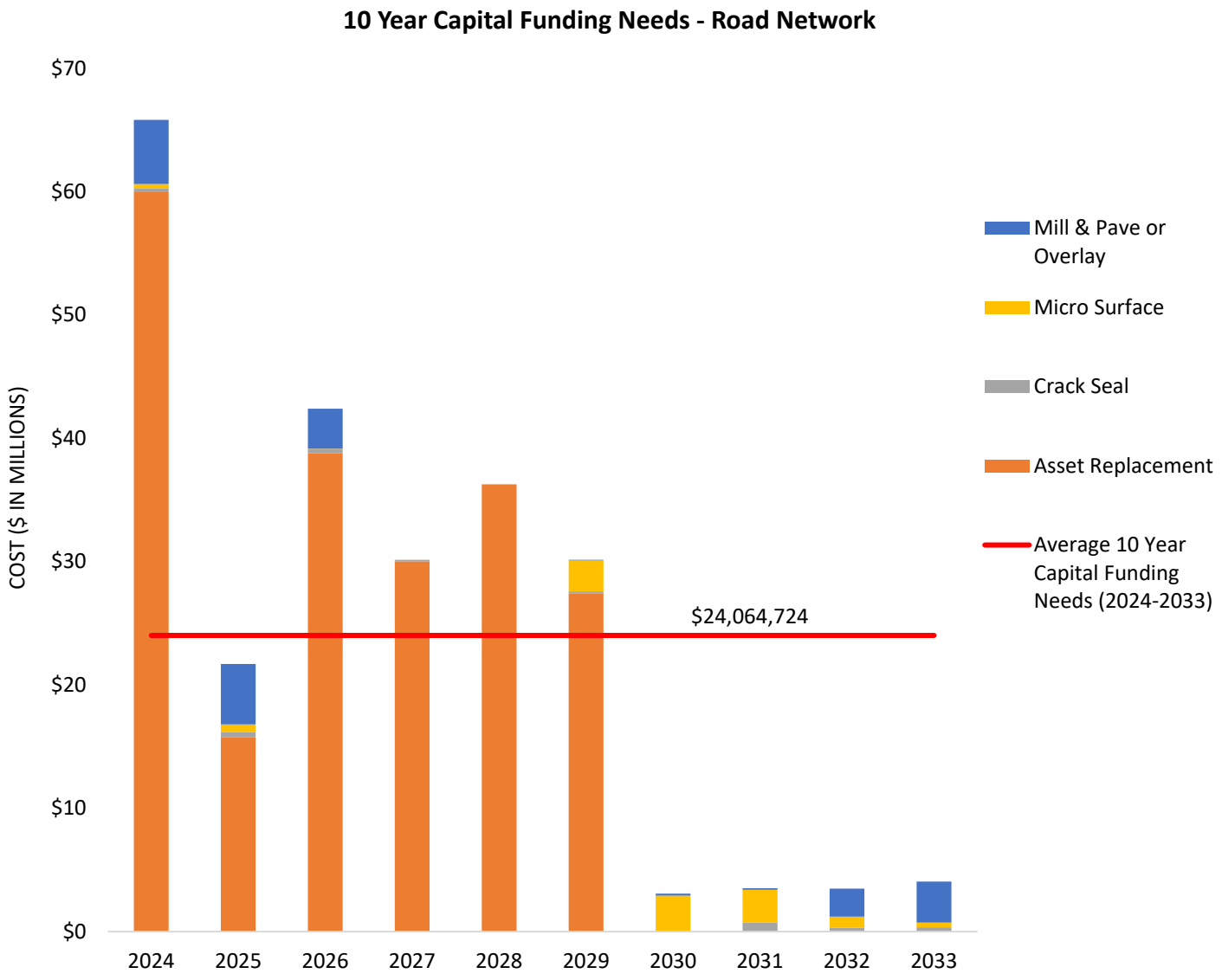


Figure 3.4-9 Ten-year capital funding needs for the road network, 2024-2033.

The estimated 20-year (2024-2043) capital needs for the road network can be found in **Appendix A.4**. These projected lifecycle activities and replacements are estimated using the County's AM software and are used to calculate the capital needs for assets across their lifecycle. The lifecycle plan should be used by County staff to inform budgeting decisions, and to assess the effectiveness and validity of the current AM models.

LEVELS OF SERVICE

Table 3.4-13 contains a list of performance metrics established by the County engineering services department to measure the levels of service provided by the County road network.

Table 3.4-13 Performance metrics for the road network.

		2022	2023
Accessibility & Reliability			
Length of arterial roads (MMS classes 1 and 2) Length as a proportion of land area in the municipality *	lane-km lane-km / sq. km	461 0.18	461 0.18
Length of collector roads (MMS classes 3 and 4) Length as a proportion of land area in the municipality *	lane-km lane-km / sq. km	957 0.37	957 0.37
Length of local roads (MMS classes 5 and 6) Length as a proportion of land area in the municipality *	lane-km lane-km / sq. km	16 0.01	16 0.01
# of road closures per year		14	8
# of unplanned road closures per year related to maintenance		1	0
Average # of days to complete pothole repair requests		7	14
Average duration of road closure (days) (planned)		75	101
Average duration of road closure (days) (unplanned)		.83	0
Safety			
% of signs inspected for reflectivity		100%	100%
# of reported motor vehicle crashes		875	~ 933
Affordability			
Gross operating and maintenance costs for paved roads per lane-km		$7523	$8101
Operating and maintenance costs for unpaved roads per lane-km		NA	NA
Winter control costs per lane-km		$1001	$846
Annual capital reinvestment rate **		4.2%	3.9%
Sustainability			
Average pavement condition index for paved roads *		70	67
Average surface condition for unpaved roads *		85	82

* Metric required under O. Reg. 588/17

** Annual capital reinvestment rate = Annual capital expenditure / Total replacement cost

STRATEGY

Master Planning / Studies

The *Road Master Action Plan* ("RMAP"), shown in **Figure 3.4-10**, will review current and future network requirements to accommodate future population and employment growth projected in the County. The RMAP will be utilized as a background document for the County's future *Development Charges Background Study* and *Official Plan Review*. It will also guide capital project prioritization to meet the needs across the County and integrate with corporate asset management.

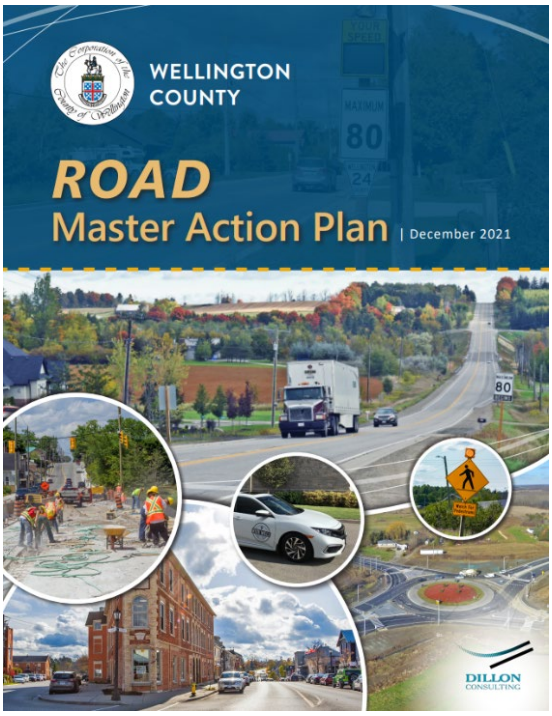


Figure 3.4-10 Wellington County RMAP, 2021.

Addressing the Backlog

Approximately 32% of the road network is rated in poor to very poor condition. These assets are at risk of failure or are unfit for sustained service. The County is addressing the needs of these assets using the following strategies:

- Replacing approx. 30 kms/year within the existing roads construction budget.
- Maintain the pavement preservation budget of $2.0 million. The intent of this programme is to keep the roads in fair or above condition and prevent them from falling into the poor or very poor category.
- Condition inspections will be completed every 3 years and will inform the 10-year capital budget process.

Renewal Projects

The County uses a mix of proactive and reactive planning on the road network. Assessed condition is used to identify priority locations, which is supplemented by a ride comfort rating (rideability). Other considerations include: AADT volumes, road classifications, and springtime load restrictions. In addition, coordination with member municipal projects is also considered. Road replacement and resurfacing projects consider coordination with growth related needs and other assets, such as bridges and stormwater structures.

STRATEGY (CONT'D)

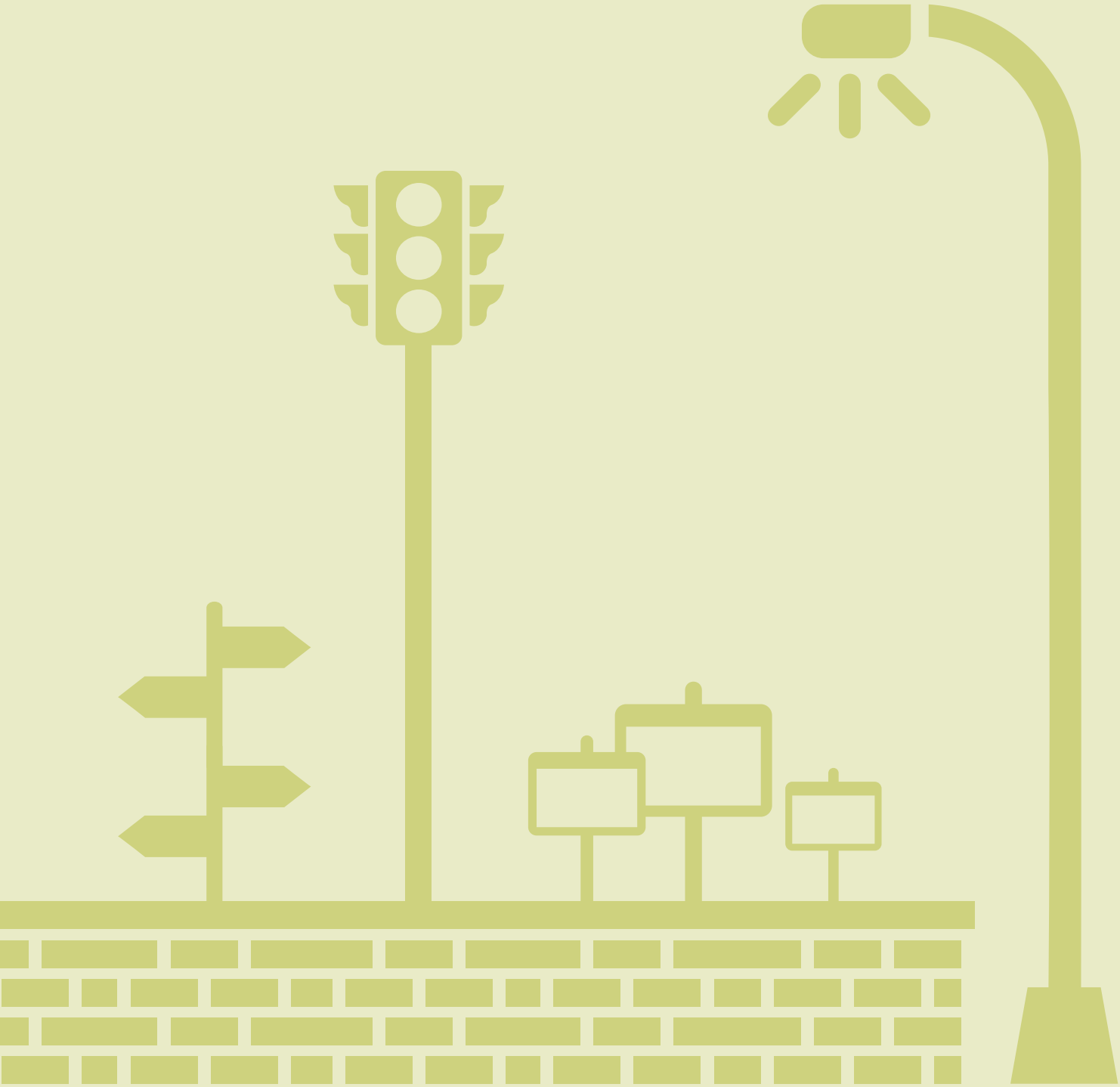
Data Quality

The County has committed to the following data quality initiatives:

- Define and implement procedures to update replacement cost annually using actuals from existing contracts.
- Collect data for all Levels of Service metrics and report annually.
- Ensure future condition inspections align with previous years to ensure consistency in methodology.
- Separate storm costs from road base costs to better inform the gap.
- Modify existing terminology to better align with the budget.
- Further identify and incorporate asset lifecycle events (including costs).

Asset Details

3.5 Roadside Elements



ROADSIDE ELEMENTS

In addition to the roads maintained across the County, Wellington County owns and manages many elements along the roadside. This section of the AMP provides an overview of the County's roadside elements, including retaining walls and traffic signals.

A retaining wall (**Figure 3.5-1**) is a structure designed to hold back soil or other materials and prevent erosion on sloped terrain. Its primary purpose is to provide support, stability, and containment, thereby preventing the movement of soil and maintaining the integrity of the landscape. Retaining walls are commonly used to create level areas for construction, landscaping, or infrastructure development, as well as to prevent landslides, control water runoff, and enhance the aesthetic appeal of outdoor spaces.

Traffic signals (**Figure 3.5-2**) play a vital role in promoting safety, efficiency, and orderliness on roadways by controlling the movement of vehicles and pedestrians, managing intersections, and enforcing traffic laws. Their proper operation and maintenance are essential for ensuring smooth traffic flow, reducing congestion, and enhancing the overall quality of transportation systems.

The County currently owns 50 retaining walls constructed with a variety of materials and 43 traffic signal sets (**Table 3.5-1** and **Figure 3.5-3**). Each traffic signal asset represents a set of signals (2 or more) at each location. For the purpose of the AMP, the terminology "traffic signal(s)" and "traffic signal sets" are used interchangeably.

Table 3.5-1 County roadside elements inventory, 2023.

Retaining Walls	
Armour Stone	13
Concrete	30
Gabion Wall	4
Masonry	1
Wood	2
Traffic Signal Sets	
43	

Figure 3.5-1 Example of a County retaining wall (RW036-033) along Wellington Road 36.

Figure 3.5-2 Example of a County traffic signal (WC-TS-041) along Wellington Road 18.

ROADSIDE ELEMENTS (CONT'D)

Figure 3.5-3 Map of County retaining walls and traffic signals.

DATA QUALITY

	Level 1	Level 2	Level 3	Level 4
Inventory	Inventory data is incomplete.	Inventory data Is complete.	Inventory data is complete and accurate.	**Inventory data is complete, accurate, and in a centralized, accessible format.**
Condition	**No condition data exists. Condition is approximated by age.**	**Condition data exists for these assets.**	Condition data was collected recently for these assets.	Condition data is complete and accurate, and regularly updated. Data is centralized and accessible.
Risk	Critical assets and services are understood by department staff, but no risk models exist.	**Risk is estimated according to a draft risk model. Some parameters lack sufficient data.**	Complete risk models exist for this asset class, and critical assets have been identified.	Risk management strategies have been developed for critical assets, and department budgets reflect risk-based priorities.
Lifecycle Strategy	Lifecycle events required to maintain current levels of service are not documented.	**Lifecycle events required to maintain current levels of service are documented.**	Capital budget costs of lifecycle events are built into the funding models. Operating costs are not included.	Capital and operating costs are built into the funding model. Projected lifecycle events are defined, and funding shortfalls are identified.
Financial Sustainability Strategy	**Budgets are based on prior year spending.**	Asset replacement schedules have been built into the long-term capital forecast.	Replacement and maintenance costs have been built into long-term capital forecasts.	Replacement and maintenance costs have been built into long-term capital and operating forecasts. Demand forecasts inform the budget.
Levels of Service	Services provided by this asset class are understood by departmental staff, but not formally measured.	**Performance metrics are defined to measure levels of service.**	Performance metrics are defined and a data collection strategy exists for all metrics.	Proposed levels of service have been identified, alongside their financial impacts. Trends in performance measures are tracked and regularly reported.

LIFECYCLE

The lifecycle for retaining walls and traffic signals varies. Please refer to each section below for an overview of the lifecycle for each asset class.

Retaining Walls

Table 3.5-2 County roadside elements inventory, 2023.

Material	EUL
Concrete (including Armour Stone, Gabion Wall, and Masonry)	75 Years
Wood	40 Years

There are minimal lifecycle events for these assets, with limited capital activities and maintenance. Typically, maintenance involves replacing broken or cracked portions of a wall as needed. The overall approach is to install the assets and then assess their condition during road reconstruction projects. The estimated useful life (EUL) of a retaining wall ranges from approximately 40 to 75 years, based on its construction material (**Table 3.5-2**). Retaining wall replacements are considered if the assets are in poor condition, while taking their location into account. A retaining wall is typically replaced when the condition reaches 20 prior to the asset failing (when condition reaches 0), as shown in **Figure 3.5-4**.

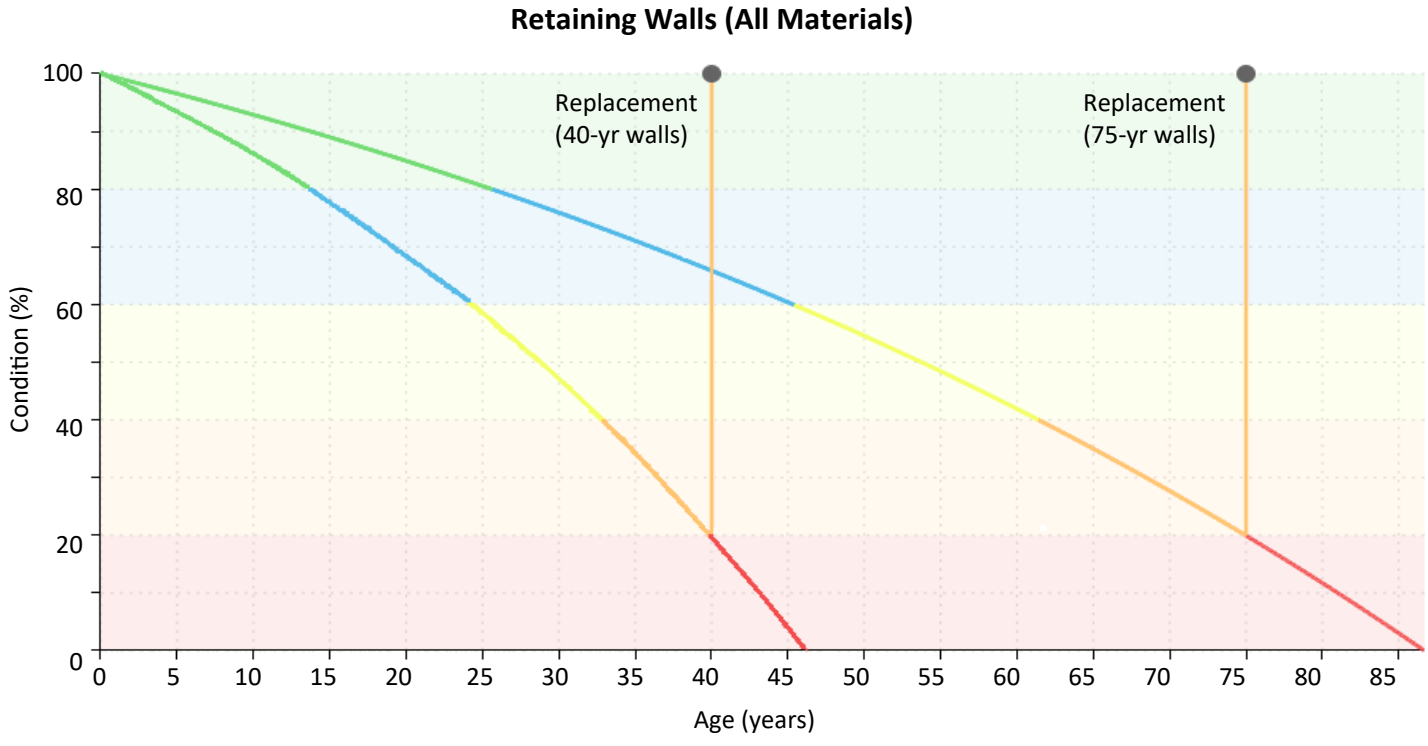


Figure 3.5-4 Visualization of the County retaining wall lifecycle strategy. Asset deterioration shown for each material type and associated EUL, including replacement when the asset reaches a condition of 20%. Remaining deterioration shown if asset were left in-service until its failure at a condition of 0%.

LIFECYCLE (CONT'D)

Traffic Signals

Traffic signal assets have an estimated useful life of 35 years and are expected to be replaced at the end of this period. While there are no capital lifecycle events planned for these assets, there are annual inspection and maintenance costs for all traffic signals. These costs cover routine inspections and maintenance but do not extend the underlying useful life of the traffic signals. As such, replacement can be expected at the end of their 35-year lifecycle. The lifecycle for traffic signals is shown in **Figure 3.5-5**.

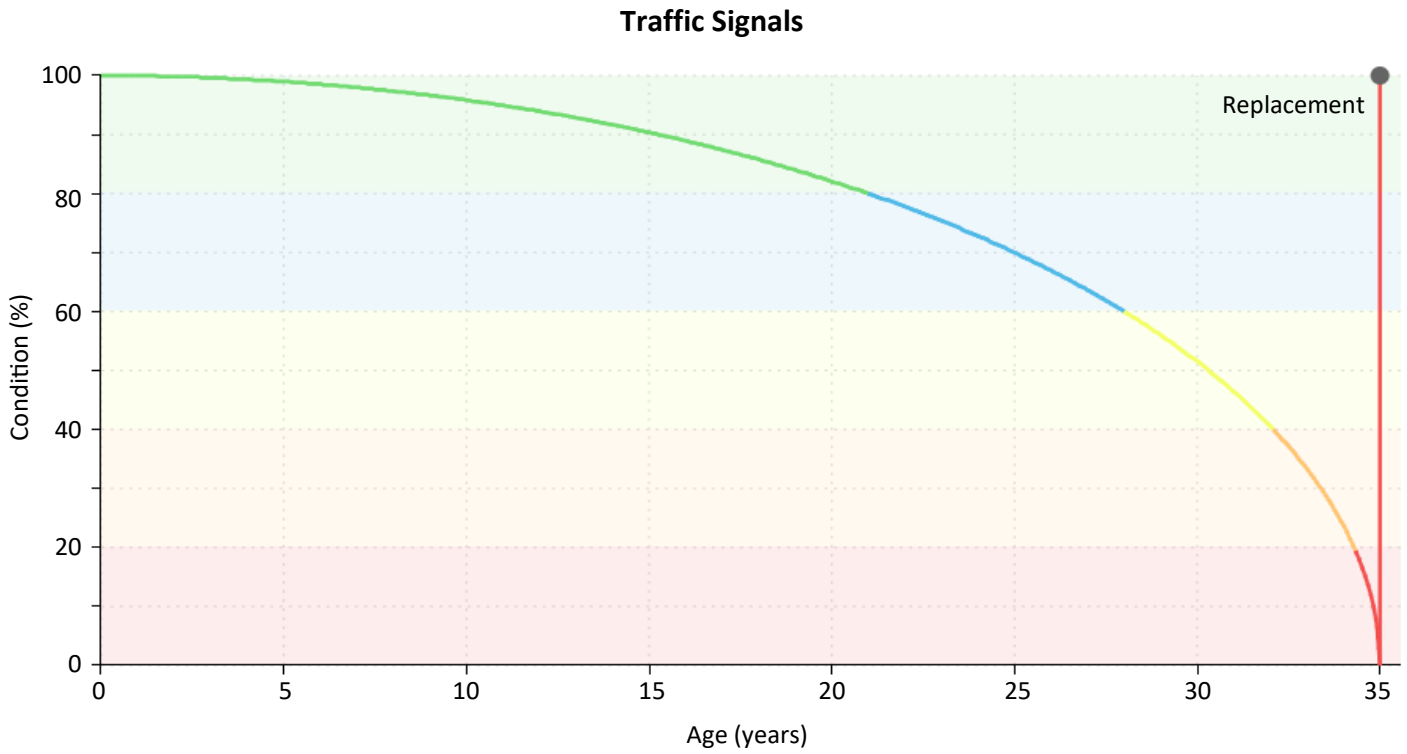


Figure 3.5-5 Visualization of the County traffic signal lifecycle strategy. Asset deterioration shown until the asset is scheduled for replacement at the end of its estimated useful life.

CONDITION

The management, inspection, and maintenance of retaining walls is guided by the Ontario Structure Inspection Manual (OSIM). County retaining walls were recently assessed in 2022 by a consultant, and condition values were generated. Retaining walls are evaluated based on their structural integrity, stability, functionality, and safety. Inspectors assess factors such as cracks, bulges, settlement, corrosion, drainage problems, vegetation growth, and signs of distress that may indicate potential issues or hazards.

The assessment of traffic signals reveals a range of conditions from very good to fair (**Table 3.5-3**). Signals classified as fair show some wear but have no operational deficiencies and require more frequent attention. The County ensures that no traffic signal falls below a fair condition threshold, recognizing the critical importance of maintaining a reliable traffic management system.

Table 3.5-3 Five-point condition scale for the County roadside elements.

Condition	Retaining Walls	Traffic Signals
Very Good	80 - 100%	80 - 100%
Good	60 - 80%	60 - 80%
Fair	40 - 60%	40 - 60%
Poor	20 - 40%	20 - 40%
Very Poor	0 - 20%	0 - 20%

The majority of retaining walls and traffic signals are in good condition (**Table 3.5-4**, **Table 3.5-5**, **Figure 3.5-6**, **Figure 3.5-7**, and **Figure 3.5-8**), necessitating regular routine maintenance. Those in very good condition require minimal maintenance.

To maintain an efficient and safe traffic management system, it is crucial to prioritize the upkeep and repair of signals that exhibit wear. Regular maintenance and timely repairs not only extend the lifespan of these signals but also prevent potential issues that could disrupt traffic flow and compromise safety. By proactively managing these assets, the County can ensure consistent and reliable operation, contributing to overall public safety and transportation efficiency.

Table 3.5-4 Average County roadside elements condition rating, 2023.

Asset	Average Condition
Retaining Walls	71%
Traffic Signals	78%

CONDITION (CONT'D)

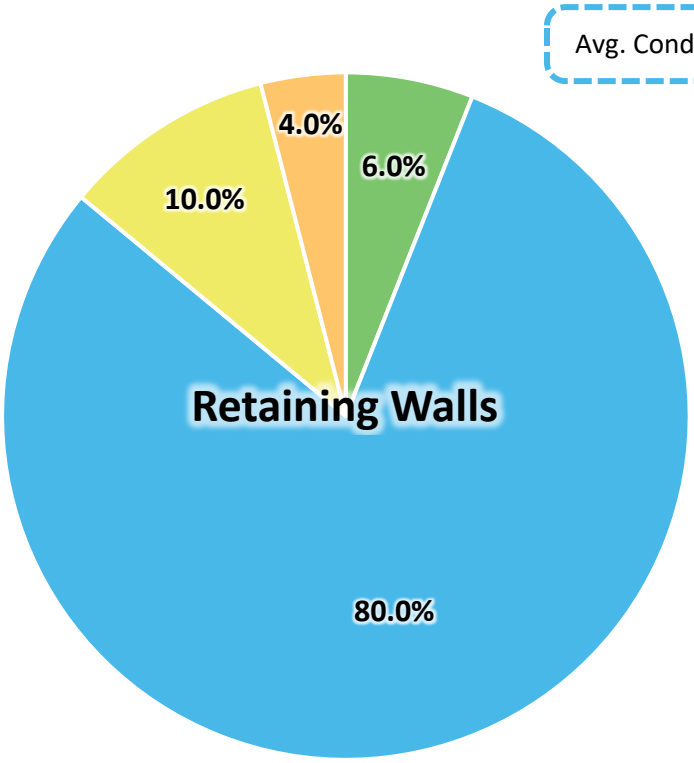


Figure 3.5-6 County retaining walls condition, 2023.

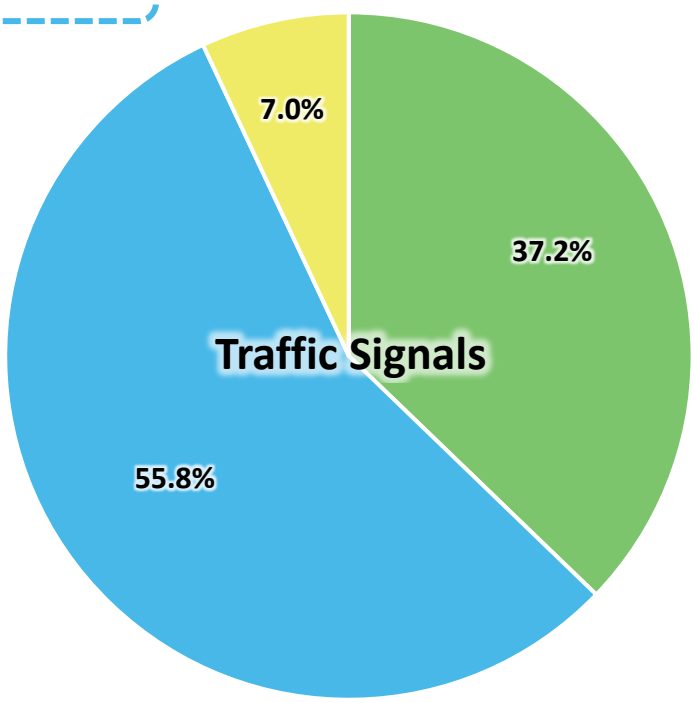


Figure 3.5-7 County traffic signals condition, 2023.

Table 3.5-5 Count and replacement cost of roadside elements within each condition rating, 2023.

Very Good	Good	Fair	Poor	Very Poor
3 Retaining Walls	40 Retaining Walls	5 Retaining Walls	2 Retaining Walls	0 Retaining Walls
$ 103,500	$ 8,257,000	$ 1,437,500	$ 92,000	-
16 Traffic Signal Sets	24 Traffic Signal Sets	3 Traffic Signal Sets	0 Traffic Signal Sets	0 Traffic Signal Sets
$ 3,009,409	$ 4,865,412	$ 639,030	-	-
$ 3,112,909 Total	$ 13,122,412 Total	$ 2,076,530 Total	$ 92,000 Total	-

CONDITION (CONT'D)

Figure 3.5-8 Map of County retaining wall and traffic signal condition, 2023.

RISK

The risk analysis for roadside elements is the product of the likelihood of failure and the consequence of failure. **Table 3.5-6** and **Table 3.5-7** illustrates the parameters used to represent the probability and consequence of failure for these assets.

Table 3.5-6 Probability and consequence of failure parameters currently included in the County retaining walls risk model.

Probability of Failure	Consequence of Failure	
Age	Average wall height	Proximity to critical infrastructure
Condition	Replacement cost	

Table 3.5-7 Probability and consequence of failure parameters currently included in the County traffic signals risk model.

Probability of Failure	Consequence of Failure	
Age	Average Annual Daily Traffic (AADT)	Replacement cost
Condition	Proximity to critical infrastructure	Rural/urban classification
		Speed limit

Figure 3.5-9 show the distribution of County roadside elements by risk classification. Green represents the assets that are very low risk, while red reflects those with the highest (very high) risk rating. Using the parameters listed, the majority of County roadside elements are classified as low and very low risk. There are no roadside elements in the very high risk category.

Bridges and Culverts Risk Classifications

Very Low (1-4)	Low (5-7)	Moderate (8-9)	High (10-14)	Very High (15-25)
16 Assets	20 Assets	3 Assets	4 Assets	0 Assets
35 Retaining Walls	11 Retaining Walls	3 Retaining Walls	1 Retaining Wall	-
$ 3,024,500	$ 2,300,000	$ 3,300,500	$ 1,265,000	-
16 Traffic Signal Sets	20 Traffic Signal Sets	3 Traffic Signal Sets	4 Traffic Signal Sets	-
$ 3,009,409	$ 3,696,430	$ 567,532	$ 1,240,480	-
$ 6,033,909	$ 5,996,430	$ 3,868,032	$ 2,505,480	-

Figure 3.5-9 Risk classifications for County roadside elements, including number of assets and their total replacement costs, 2023.

REPLACEMENT COST

In 2022, an external consultant (GM BluePlan), conducted a comprehensive condition assessment of the retaining wall inventory. This assessment included the determination of replacement cost values. To reflect the current market conditions, these values were subsequently adjusted by a 15% inflation rate for 2023, providing us with up-to-date replacement cost estimates for the year (**Table 3.5-8**). The total replacement cost for all 50 retaining walls is $9,890,000. There are 43 traffic signals with an estimated replacement value of $8,513,851. The combined total to replace all roadside elements in 2023 is $18,403,851.

Table 3.5-8 Total estimated replacement value for County retaining walls and traffic signals, 2023.

Asset	Number of Assets	Estimated Replacement Cost
Retaining Walls (Concrete)	2	$ 69,000
Retaining Walls (Wood)	48	$ 9,821,000
Traffic Signals	43	$ 8,513,851
Total	**93**	**$ 18,403,851**

CURRENT FUNDING NEEDS

The annual funding requirement of the County's roadside elements provides a vital measure of the costs needed to plan for the replacement of these structures. This amount ensures that the replacement costs are systematically addressed each year, preserving the functionality and stability of the retaining wall infrastructure.

The total replacement cost for retaining walls stands at $9,890,000 (**Table 3.5-9**). Considering the estimated useful lives – 46 years for wood retaining walls and 86 years for concrete retaining walls – the calculated annual requirement is $132,672. The total replacement cost for the traffic signals is $8,513,851. Given an estimated useful life of 35 years and the service life remaining of each asset, the annual requirement for these assets is calculated to be $243,253, which is solely the annual requirement for replacement. Overall for all County roadside elements, the County must plan to invest a total of $375,925 annually to cover the capital funding needs of the assets.

Table 3.5-9 Overview of County roadside elements, including the annual funding requirement, 2023.

Asset	Total Network Cost (Replacement Cost)	Estimated Useful Life	Annual Funding Requirement
Retaining Walls	$ 9,890,000	40 and 75 Years	$ 132,672
Traffic Signals	$ 8,513,851	35 Years	$ 243,253
Total	**$ 18,403,851**	**35, 40, and 75 Years**	**$ 375,925**

The average three-year operating cost for County roadside elements is approximately $2,102,299 or $22,605 per structure (**Table 3.5-10**). The current operating needs for roadside elements include the following costs and assumptions:

- Routine inspection and maintenance costs, including the cost of replacement parts and materials.
- Salary and labour costs for maintenance and operational staff members.
- It is assumed that most operating costs related to roadside elements are included in the road network operating needs. Refer to **Section 3.4** for more information.

Table 3.5-10 Current operating needs for County roadside elements, 2023.

Total Operating Cost*	Average Per-Unit Cost*
$ 2,102,299	$ 22,605

* Represents a three-year average.

FUTURE FUNDING NEEDS

The future funding needs for the County's traffic signals and retaining walls are projected based on an annual assessment of traffic signal operating expenses and replacement costs, all adjusted according to the inflation rate specified in the County's 10-year plan.

Major replacement expenses are strategically scheduled over the coming years, with allocated $1,090,872 for 2032 and $1,751,974 for 2033. In addition, retaining walls have a planned replacement cost of $64,675 in 2026. The total funding required from 2024 to 2033 amounts to $3,951,814 averaging an annual investment of $395,181. These costs are modest in comparison to other asset classes, highlighting the cost-effectiveness of maintaining these critical infrastructure elements. These costs are outlined in **Table 3.5-11**, **Table 3.5-12**, and **Figure 3.5-10**.

Table 3.5-11 The lifecycle events and replacement costs for County retaining walls and traffic signals for 2024-33.

Year	Inflation Rate	Traffic Signals Replacement	Retaining Walls Replacement	Total
2024	5%	-	-	-
2025	3.5%	-	-	-
2026	3.5%	-	$ 64,675	$ 64,675
2027	3.5%	$ 235,921	-	$ 235,921
2028	3.5%	-	-	-
2029	3.5%	$544,191	-	$544,191
2030	3.5%	-	-	-
2031	3.5%	$ 264,181	-	$ 264,181
2032	3.5%	$ 1,090,872	-	$ 1,090,872
2033	3.5%	$1,751,974	-	$1,751,974
TOTAL		$ 3,887,138	$ 64,675	$ 3,951,814
AVERAGE ANNUAL		$ 388,714	$ 6,468	$ 395,181

FUTURE FUNDING NEEDS (CONT'D)

Table 3.1-12 The annual requirement, ten-year average replacement needs, and the ten-year average capital needs for County roadside elements.

Asset	Annual Funding Requirement	Ten-Year Average Replacement Needs	Ten-Year Average Capital Needs
Retaining Walls	$ 132,672	$ 6,468	$ 6,468
Traffic Signals	$ 243,253	$ 388,714	$ 388,714

There is no backlog for this asset section, ensuring that all projected needs are current and accurate. In 2024, external consultants will conduct a comprehensive traffic signal condition assessment, providing updated condition values and significantly enhancing the accuracy of actual asset conditions compared to forecasts. This proactive approach allows for precise planning and resource allocation. Additionally, all concrete retaining walls are in excellent condition and require no immediate attention. However, one of the two wood retaining walls is scheduled for replacement in 2026, ensuring that this critical infrastructure remains in optimal condition.

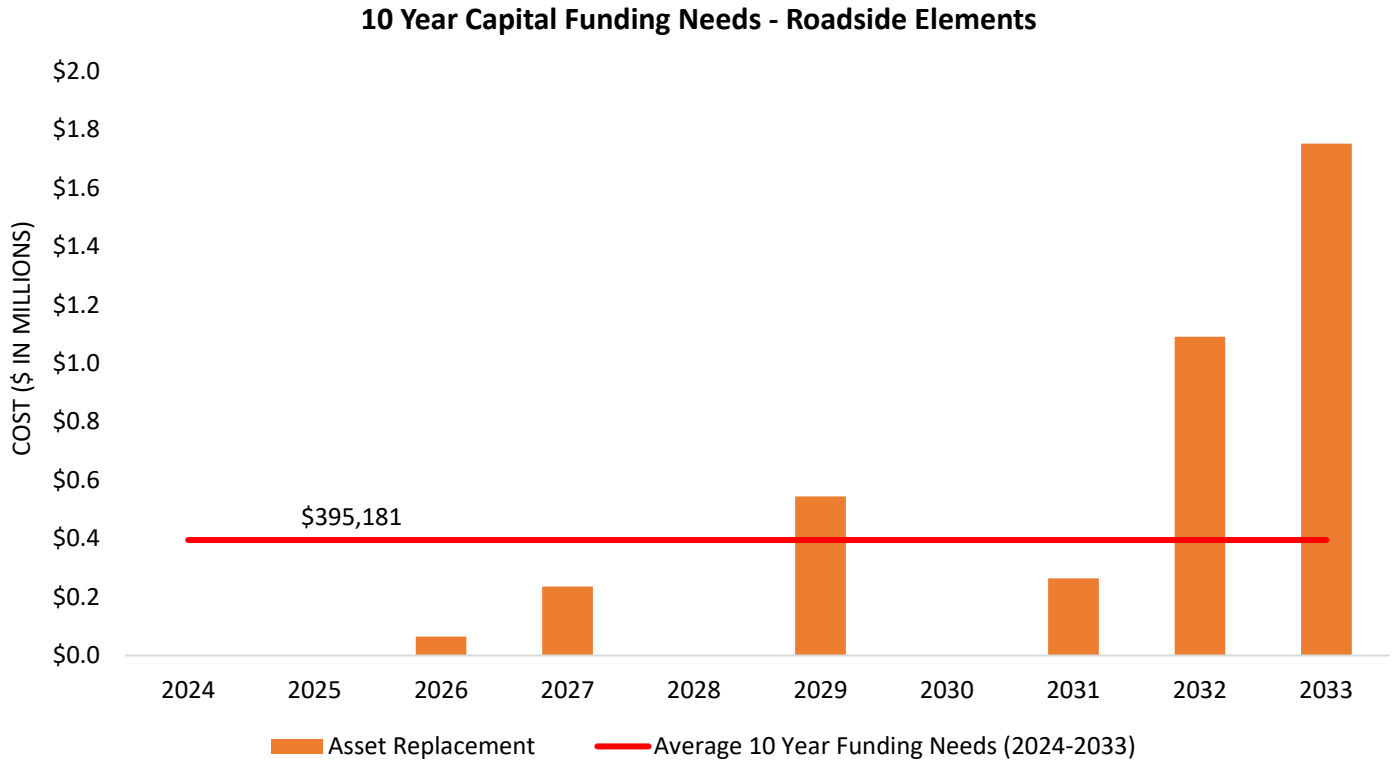


Figure 3.5-10 The ten-year plan for County roadside elements for 2024-2033.

LEVELS OF SERVICE

Table 3.5-13 contains a list of performance metrics established by County departments to measure the levels of service provided by roadside elements.

Table 3.5-13 Performance metrics for County roadside elements.

	2022	2023
Accessibility & Reliability		
Total number of traffic signal sets	43	43
Traffic signals at road intersections	35	35
Midblock (crosswalk) traffic signals	5	5
Temporary Traffic Signals	3	3
Safety		
Average annual daily traffic expected to travel through traffic signals	11,982	11,982
Average percentage of daily truck traffic	5.2	5.2
Affordability		
Total estimated replacement value (Traffic Signals)	$ 7,403,349	$ 8,513,851

STRATEGY

Master Planning / Studies

In 2021, a Traffic Impact Study was conducted to assess the effects of new developments on surrounding transportation networks. The purpose of performing the study is to identify and resolve at least one of the following cases.

- Peak hours auto trips generated by the development exceeds 100 trips.
- Safety and/or capacity issues currently exist.
- Safety and/or capacity issues are expected to occur as a result of the proposed development.
- Characteristics of the development warrant a detailed transportation analysis.

Addressing the Backlog

There is no backlog associated with roadside element assets.

Renewal Projects

Traffic signals and their components are regularly monitored and replaced when their condition falls below specified standards, eliminating the need for renewal projects. Retaining walls are replaced using the operating budget if visible damage is detected. Additionally, when the associated road undergoes rehabilitation or replacement, the retaining wall may also be replaced, depending on its condition and location.

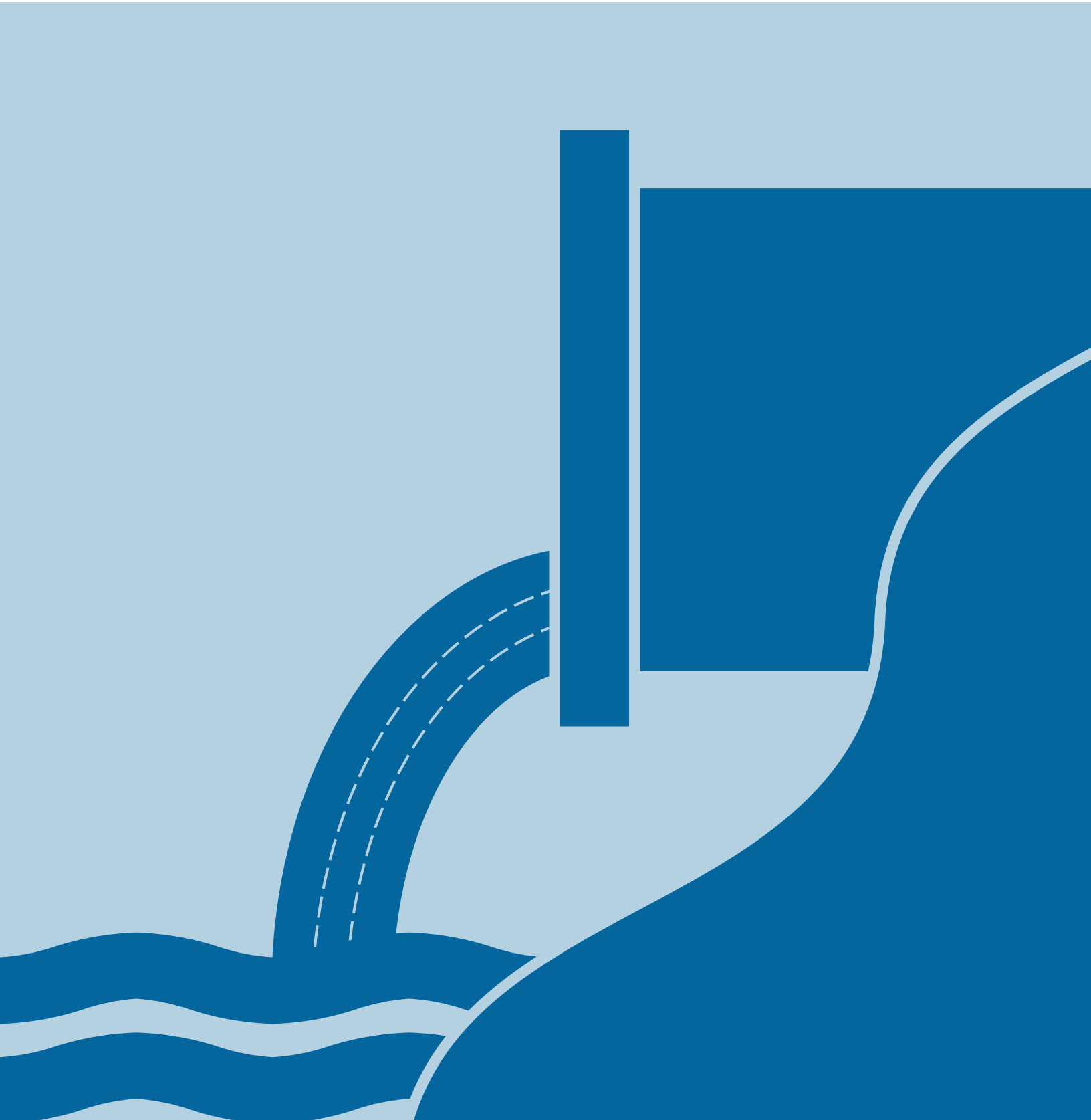
Data Quality

The County has committed to the following data quality initiatives:

- Collect data for all Levels of Service metrics and report annually.
- Review replacement values on an annual basis.
- Further identify and incorporate asset lifecycle events (including costs).

Asset Details

3.6 Stormwater Network



STORMWATER NETWORK

The County stormwater network is composed of two asset classes: stormwater pipes and stormwater structures (**Table 3.6-1**). Pipes can be further segmented into their varying construction materials, which include clay, concrete, galvanized corrugated steel (CSP), high-density polyethylene (HDPE), or polyvinyl chloride (PVC), as shown in **Table 3.6-2**. The stormwater structures comprise the access points of the system, for maintenance and inspection work (manholes), or inlet/outlet structures designed to catch the runoff water from hard surfaces (catch basins, see **Figure 3.6-1** for an example).

The stormwater network is designed to convey runoff from frequent storms (e.g. common, to 2-year, and to 5-year storms). The main purpose of this system is to control the amount and quality of run off to reduce flooding, erosion, and pollution from rain and melting snow.

Table 3.6-1 County asset's pipes and structures and their respective quantities, 2023.

Asset	Quantity
Stormwater Pipes	36.6 km
Storm Structures	1,492 units

Having accurate and complete data is critical for all assets but is especially important for underground infrastructure. As shown in the table above, 36.6 km of stormwater pipes and 1,492 stormwater structures are maintained across the County (**Figure 3.6-2**). The County collects data on the location, length, size (diameter), construction material, and other attributes about each of its stormwater assets. The stormwater inventory is derived from historical construction record drawings and data collected by external consultants. The inventory continues to be improved upon by County staff as more field work is conducted.

Table 3.6-2 County stormwater pipe material types and total length, 2023.

Pipe Material	Quantity
Clay	0.3 km
Concrete	20.3 km
CSP	3.5 km
HDPE	3.0 km
PVC	4.9 km
No material data available	4.6 km

The exact construction year of stormwater infrastructure is not available for the entire stormwater network. Therefore, in-service dates were estimated using the age of the road segment above each stormwater asset, assuming that any replacement or construction of new road would have included updating the stormwater infrastructure below the road.

Figure 3.6-1 Example of stormwater structures (catch basins) along a curb.

STORMWATER NETWORK (CONT'D)

Figure 3.6-2 Map of areas containing the County stormwater network, 2023.

DATA QUALITY

	Level 1	Level 2	Level 3	Level 4
Inventory	Inventory data is incomplete.	**Inventory data Is complete.**	Inventory data is complete and accurate.	Inventory data is complete, accurate, and in a centralized, accessible format.
Condition	No condition data exists. Condition is approximated by age.	Condition data exists for these assets.	**Condition data was collected recently for these assets.**	Condition data is complete and accurate, and regularly updated. Data is centralized and accessible.
Risk	Critical assets and services are understood by department staff, but no risk models exist.	**Risk is estimated according to a draft risk model. Some parameters lack sufficient data.**	Complete risk models exist for this asset class, and critical assets have been identified.	Risk management strategies have been developed for critical assets, and department budgets reflect risk-based priorities.
Lifecycle Strategy	Lifecycle events required to maintain current levels of service are not documented.	**Lifecycle events required to maintain current levels of service are documented.**	Capital budget costs of lifecycle events are built into the funding models. Operating costs are not included.	Capital and operating costs are built into the funding model. Projected lifecycle events are defined, and funding shortfalls are identified.
Financial Sustainability Strategy	Budgets are based on prior year spending.	**Asset replacement schedules have been built into the long-term capital forecast.**	Replacement and maintenance costs have been built into long-term capital forecasts.	Replacement and maintenance costs have been built into long-term capital and operating forecasts. Demand forecasts inform the budget.
Levels of Service	Services provided by this asset class are understood by departmental staff, but not formally measured.	**Performance metrics are defined to measure levels of service.**	Performance metrics are defined and a data collection strategy exists for all metrics.	Proposed levels of service have been identified, alongside their financial impacts. Trends in performance measures are tracked and regularly reported.

LIFECYCLE

The estimated useful life of a stormwater pipe is based on the construction material of the pipe and varies between 40 and 100 years (**Table 3.6-3**). Stormwater structures are constructed of concrete and have a useful life of 100 years.

Table 3.6-3 Stormwater network assets' estimated useful life.

Asset	EUL
Stormwater Pipes	
Concrete, polyvinyl chloride (PVC), high-density polyethylene (HDPE)	100 years
Corrugated steel pipe (CSP), Clay	40 years
No material data available	75 years
Stormwater Structures	
Concrete (catch basins, manholes)	100 years

The deterioration of stormwater pipes and structures is modelled along a straight line with asset replacement taking place when the asset reaches a condition of 10%, prior to the asset failing (when condition reaches 0%), as shown below in **Figure 3.6-3** and **Figure 3.6-4**. There are no major lifecycle events scheduled for stormwater pipes, because of the prohibitively high costs of removing the road above the stormwater asset to access the stormwater pipes. As a result, the lifecycle strategy for stormwater pipes and structures is to allow them to deteriorate to the point at which they need to be replaced, with minimal intervention.

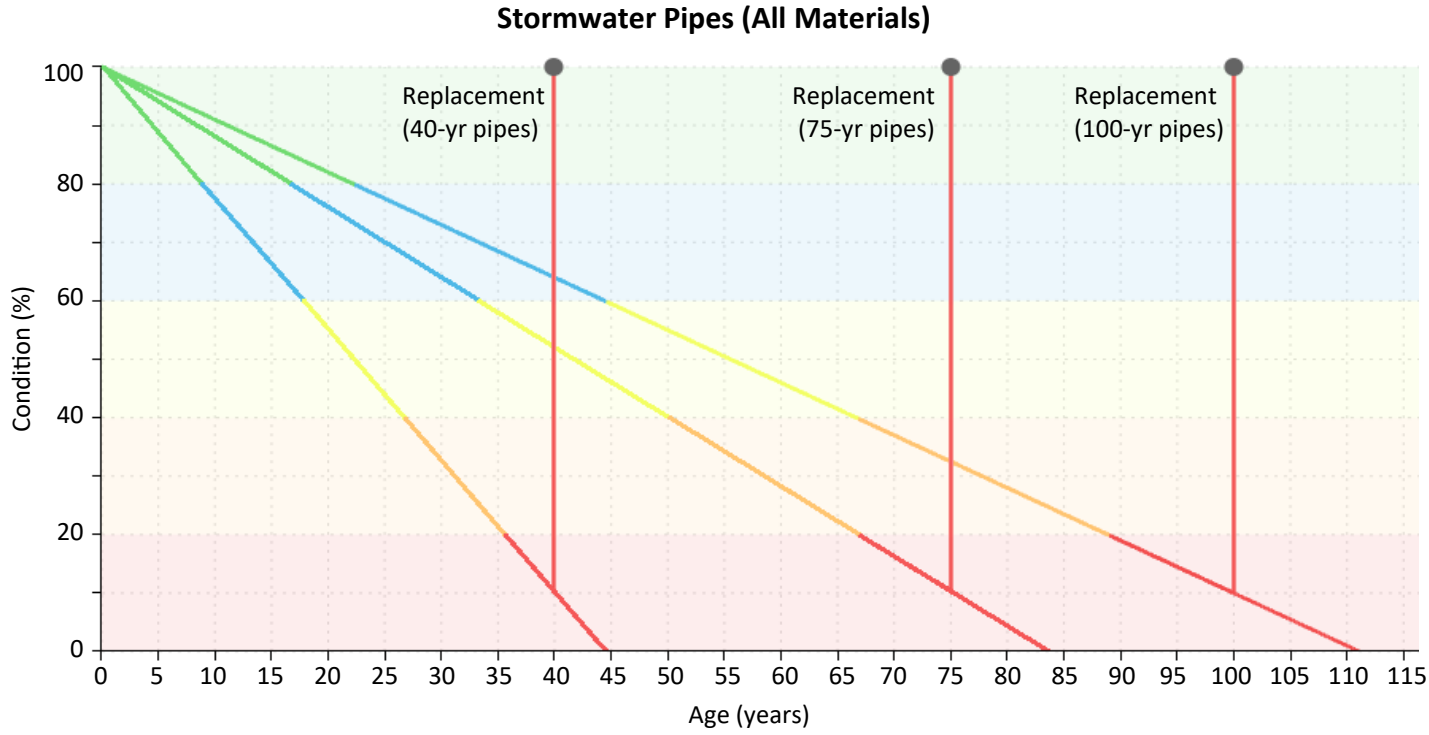


Figure 3.6-3 Visualization of the County stormwater pipe lifecycle strategy. Asset deterioration shown for each material type and associated EUL, including replacement when the asset reaches a condition of 10%. Remaining deterioration shown if asset were left in-service until its failure at a condition of 0%.

LIFECYCLE (CONT'D)

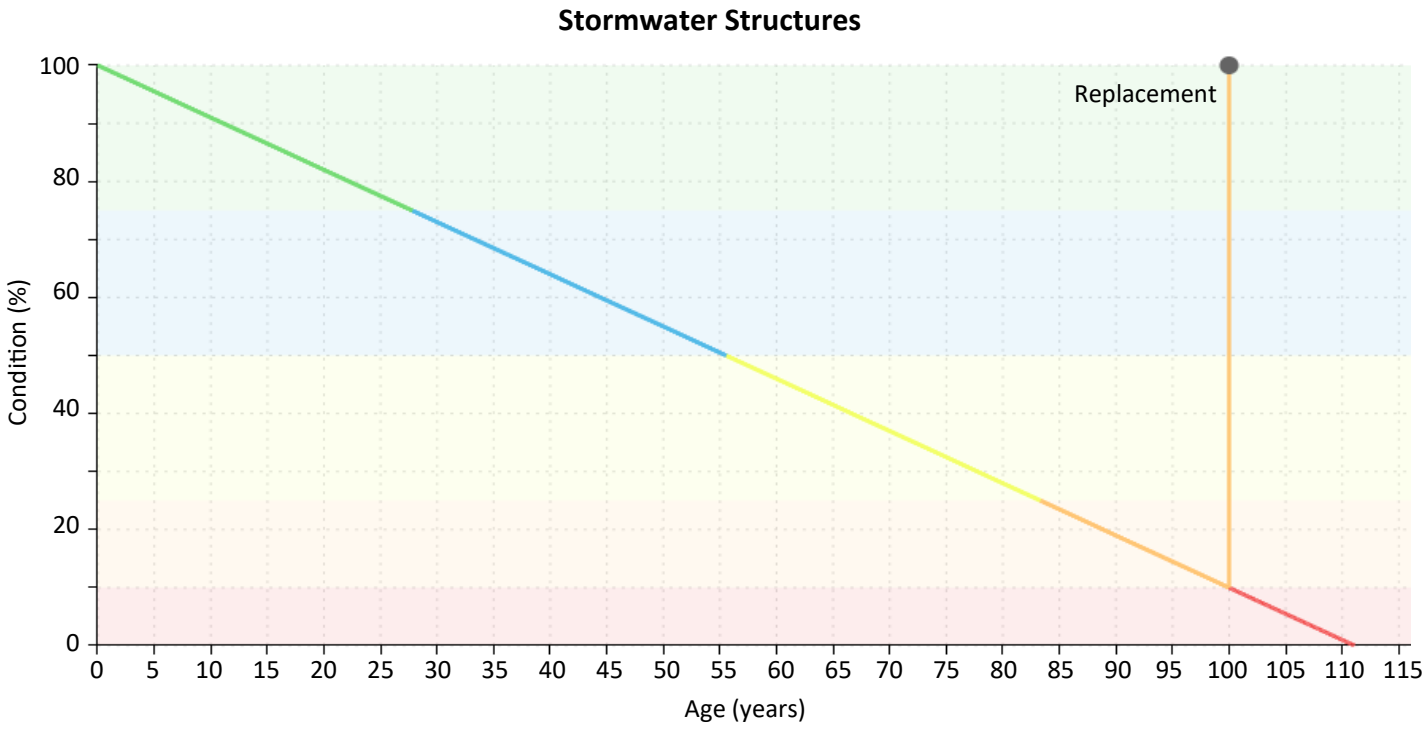


Figure 3.6-4 Visualization of the County stormwater structure lifecycle strategy. Asset deterioration shown for structures, including replacement when the asset reaches a condition of 10%. Remaining deterioration shown if asset were left in-service until its failure at a condition of 0%.

Stormwater replacement requires excavation of the road surface above storm infrastructure. This is the only time the County will excavate to maintain the stormwater network. However, there are minor lifecycle events completed without excavation. All rehabilitation and lifecycle events are typically coordinated with pavement rehabilitation projects unless the defect is critical and/or threatens public safety.

Stormwater pipes and connecting structures undergo regular flushing to clear out debris. For example, catch basins are cleared out on an annual basis to remove leaves and other debris that gathers over time (**Figure 3.6-5**). However, these are lifecycle events that do not extend the useful life of the assets. The cost of these minor lifecycle events will be built into future versions of the AMP.

Figure 3.6-5 Example of stormwater structure maintenance (clearing/flushing).

CONDITION

Stormwater pipe inspection is conducted using closed circuit television (CCTV), based on the CSA Pipeline Assessment and Certification Programme ("PACP") standard. A camera is placed into a pipeline and the picture is relayed to an operator located above ground, who interprets the images and records the location and nature of any observed deficiencies. The images are recorded, allowing for further review by engineering staff at a later date. Based on PACP, the defects are rolled into a pipe score value, which represents the condition of the entire length of a stormwater pipe. A pipe score of 1 would represent a new pipe, whereas a pipe score of 5 would represent a pipe that requires rehabilitation. The most recent condition assessment for stormwater pipes was completed in 2021.

Stormwater structure condition is currently rated using age-based approach. Instead of using a value from 1 to 5 like pipes, a condition score from 0 to 100 is applied based on the approximate age of the asset. If structure age was not readily available, the age of the road segment above each pipe was used as a proxy for pipe age.

Even though pipe and structure condition are graded using different methods and values, they each use a five-point condition rating system ranging from very good to very poor, like other assets in this AMP. Their respective condition scales have been converted into a condition percentage value for comparison between the two asset classes. Refer to **Table 3.6-4** for an overview of the stormwater condition ratings.

Most County pipes (41%) are in good or very good condition, meaning that they have at least 50% of their estimated useful life (EUL) remaining. CSV pipes have the shortest estimated useful life of 40 years, meaning that those structures are not expected fall within the County long-term financial plan for the next 20 years. The same is true for County stormwater structures. Approximately 75% of structures fall within the good or very good condition rating. With an EUL of 100 years, these structures are not scheduled to be replaced within the near future. **Figure 3.6-6**, **Figure 3.6-7, Table 3.6-5**, and **Table 3.6-6** provide an overview of the condition for the stormwater network, including a breakdown of replacement costs in each category.

Table 3.6-4 Five-point condition scale for the County stormwater network.

Condition	Stormwater Pipes	Stormwater Structures
Very Good	80 - 100%	75 - 100%
Good	60 - 80%	50 - 75%
Fair	40 - 60%	25 - 50%
Poor	20 - 40%	10 - 25%
Very Poor	0 - 20%	0 - 25%

Table 3.6-5 Average County stormwater network condition rating, 2023.

Asset	Average Condition
Stormwater Pipes	63%
Stormwater Structures	81%

CONDITION (CONT'D)

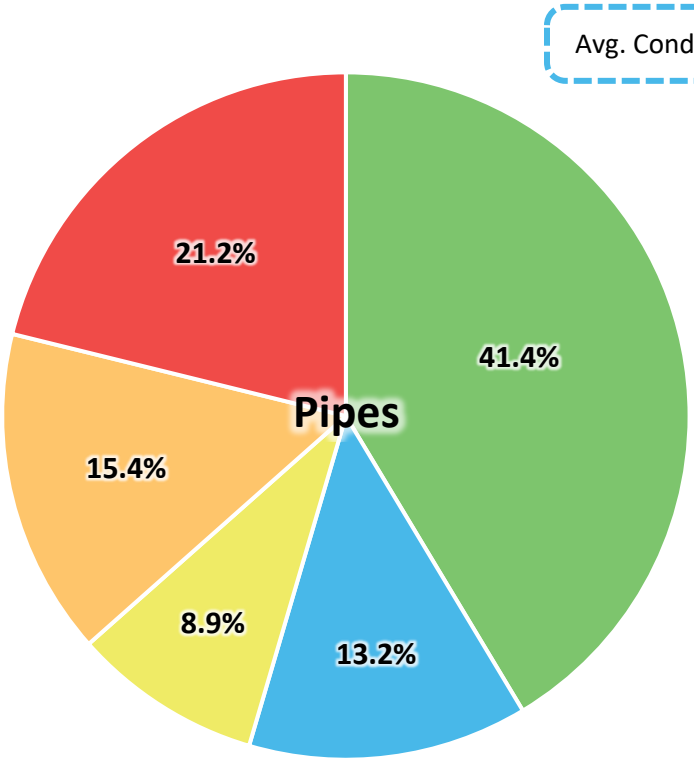


Figure 3.1-6 County bridges condition, 2023.

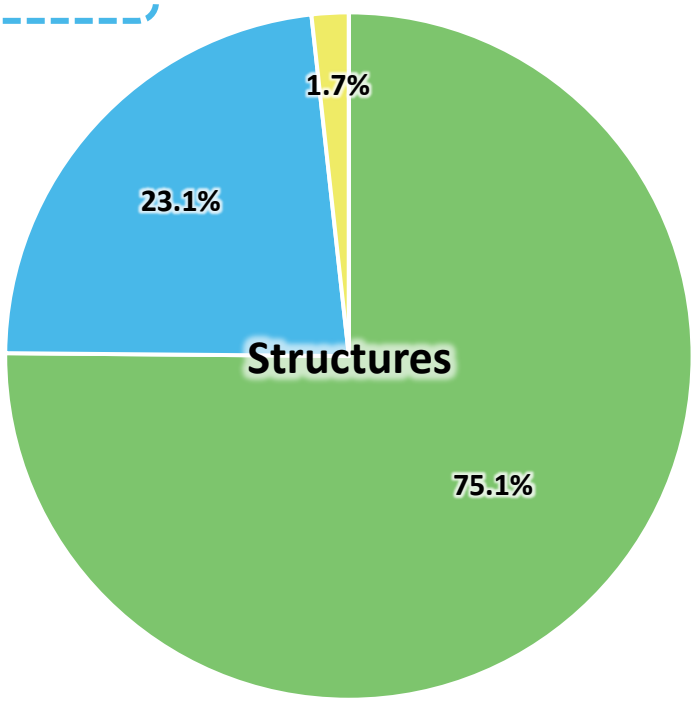


Figure 3.1-7 County culverts condition, 2023.

Table 3.6-6 Count and replacement cost of stormwater pipes and structures within each condition rating, 2023.

Very Good	Good	Fair	Poor	Very Poor
15,141 m of Pipes	4,813 m of Pipes	3,261 m of Pipes	5,628 m of Pipes	7,740 m of Pipes
$ 17,473,388	$ 5,534,030	$ 3,749,690	$ 6,472,775	$ 8,901,575
1,121 Structures	345 Structures	26 Structures	0 Structures	0 Structures
$ 6,671,351	$ 2,053,181	$ 154,733	-	-
$ 24,144,739 Total	$ 7,587,211 Total	$ 3,904,423 Total	$ 6,472,775 Total	$ 8,901,575 Total

Even though the stormwater network is in an overall good condition, events outside of the regular deterioration of these assets may necessitate earlier intervention and replacement. For example, heavy flooding may lead to severe damage of some stormwater pipes, which may need to be replaced earlier. Expansion of the County road network may also necessitate the replacement of stormwater pipes and/or structures.

CONDITION (CONT'D)

Figure 3.6-8 Map of areas containing the County stormwater network, 2023.

RISK

The risk analysis for the stormwater network includes parameters for the probability of failure of stormwater assets and the consequences of failure. The parameters used in the model shown in **Table 3.6-7**.

Table 3.6-7 Risk model parameters for the stormwater network. Some parameters (*) are included for pipes only.

Probability of Failure	Consequence of Failure	
Condition	Diameter *	Proximity to critical infrastructure
Material *	Distance to floodplain	Replacement cost

Figure 3.6-9 show the distribution of the County stormwater network by risk classification. Green represents the pipes and structures that are very low risk, while red reflects the pipes and structures with the highest (very high) risk rating. Using the parameters listed, the majority of the stormwater network is classified as low and very low risk.

Stormwater Network Risk Classifications

Very Low (1-4)	Low (5-7)	Moderate (8-9)	High (10-14)	Very High (15-25)
2,230 Assets	412 Assets	135 Assets	129 Assets	13 Assets
13,696 m of Pipes	10,136 m of Pipes	4,765 m of Pipes	7,118 m of Pipes	867 m of Pipes
$ 15,814,283	$ 11,654,100	$ 5,479,865	$ 8,186,275	$ 996,935
1,441 Structures	51 Structures	-	-	-
$ 8,575,751	$ 303,514	-	-	-
$ 24,390,034	$ 11,957,614	$ 5,479,865	$ 8,186,275	$ 996,935

Figure 3.6-9 Risk classifications for the County stormwater network, including the number of assets (units) and their total replacement costs, 2023.

Flooding Risk Analysis

The County has conducted an analysis of the risk of flooding for County roads located within the County floodplain, to determine flooding risk for roads and the stormwater network for 5-year storms and 100-year storms. To conduct the analysis, up to date 100-year floodplain data was obtained and compiled from all conservation authorities operating within the County's boundaries, to establish high-risk regions within the County.

RISK (CONT'D)

County road and stormwater network maps were overlaid onto the floodplain data to determine which roads and stormwater pipes and structures were at higher risks of flooding during 100-year storms. The County Roads Division assisted with identifying areas that frequently flood and designated those areas a high-risk area for 5-year storms.

Risk models were also updated to account for flooding risk and identify roads and stormwater structures that would need to be monitored and potentially refurbished to address flooding risk. The following parameters were included:

- Roads were evaluated to determine the proportion of the road located within the floodplain. Roads with a higher percentage of surface area located within the floodplain were designated as higher risk.
- Stormwater structures and pipes were evaluated by their distance to the floodplain. Structures and pipes located within or near the floodplain areas were designated as high risk.

Figure 3.6-10 Aerial photo showing the extreme flooding event in Harriston, June 2017.

RISK (CONT'D)

The following charts, shown in **Figure 3.6-11**, highlight the results of the analysis.

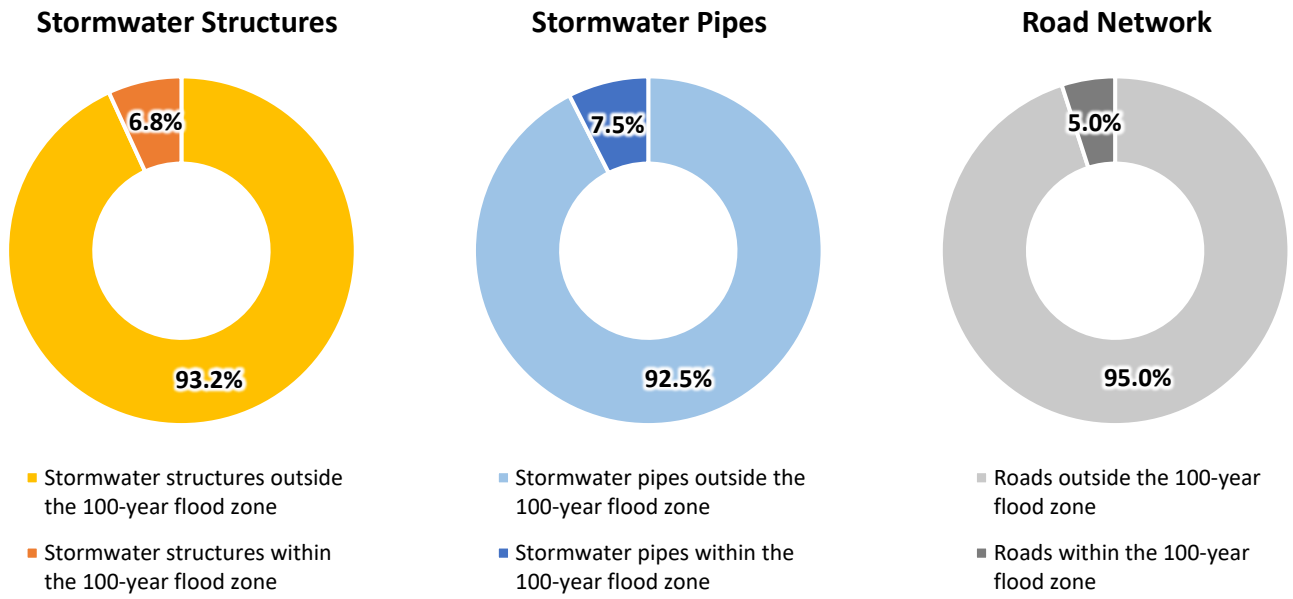


Figure 3.6-11 Percentage of the stormwater and road network within and outside of the 100-year flood zone.

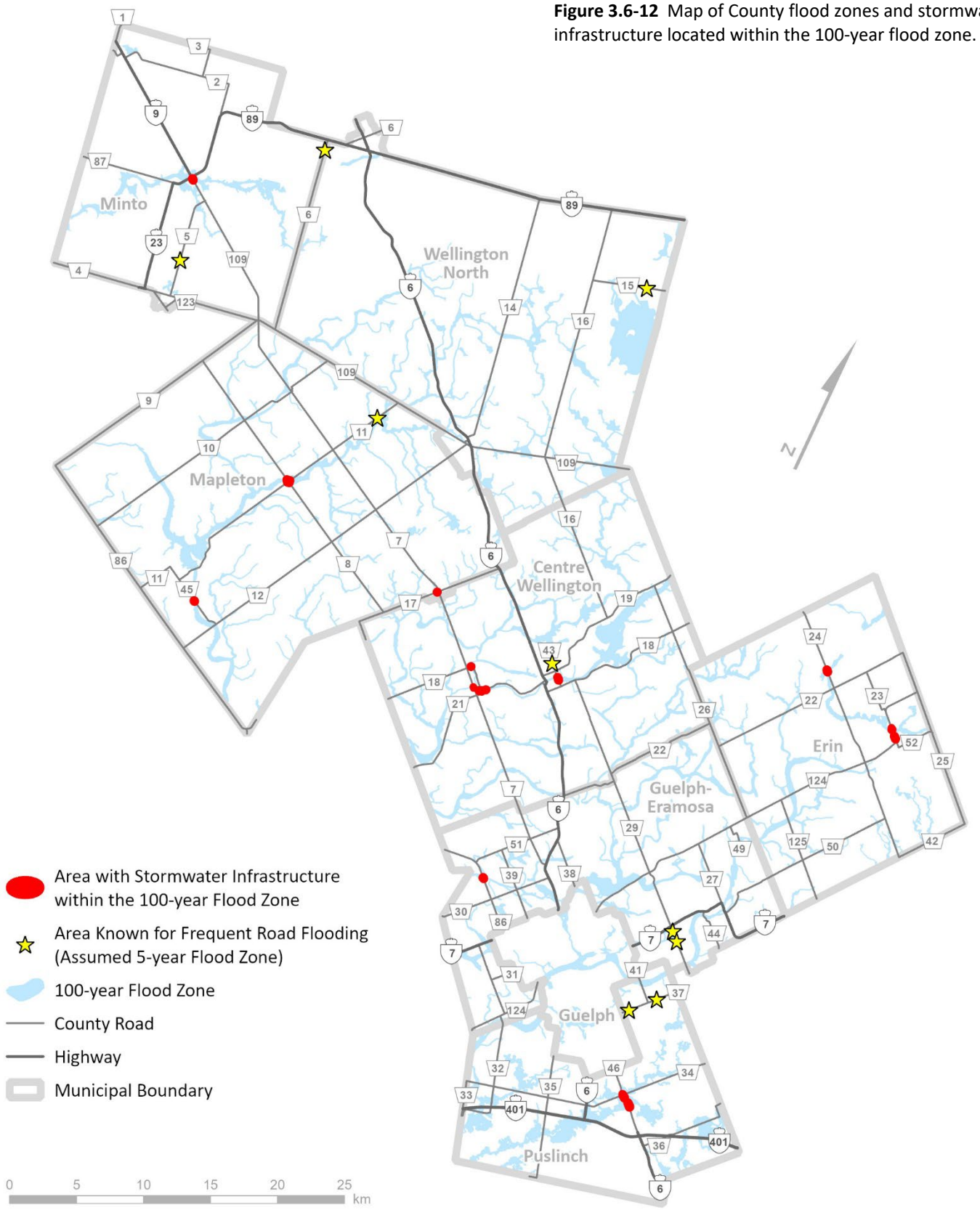
Most of the stormwater network and road network is located outside of the 100-year flood zone and considered to have no flooding risk. However, 6.8% of stormwater structures, 7.5% of pipes, and 5% of County roads are located within the 100-year flood zone. Assets within the flood zone are at a higher risk of failure which could result in road flooding or stormwater structure and pipe failure or backup during an extreme storm event which would negatively impact the communities that rely on them.

The results of the current flooding analysis highlight a decrease in high risk road and stormwater assets within the 100-year zone. This decrease can be attributed to the changes in the floodplain mapping between the last version of the AMP and this version. Within this time, the floodplain in northern Wellington County was updated, resulting in less floodplain coverage and a smaller number of assets located within the revised floodplain.

The maps on the following pages (**Figure 3.6-12** and **Figure 3.6-13**) identify which County roads and stormwater network features are located within the County's 100-year flood zone.

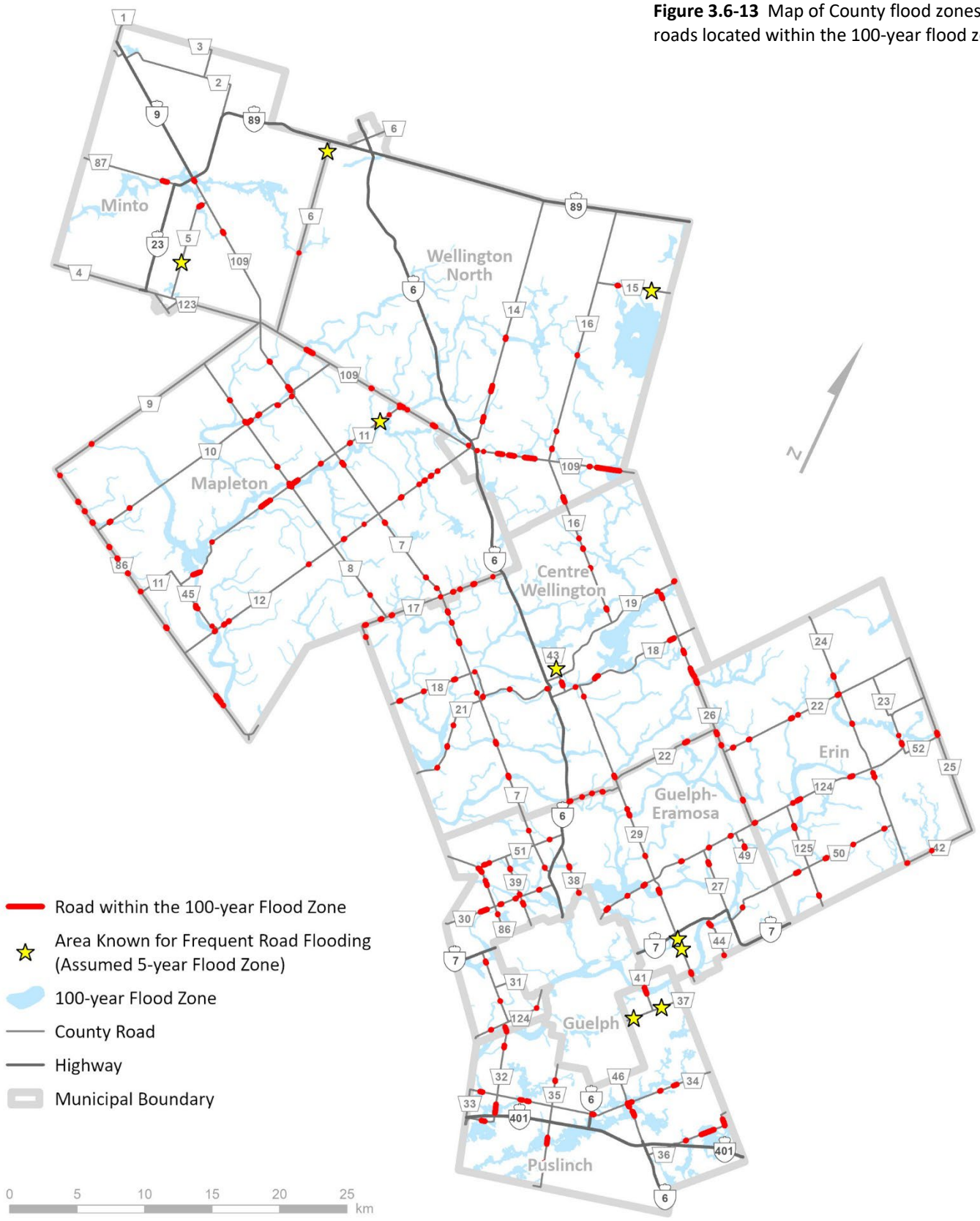
RISK (CONT'D)

Figure 3.6-12 Map of County flood zones and stormwater infrastructure located within the 100-year flood zone.



RISK (CONT'D)

Figure 3.6-13 Map of County flood zones and roads located within the 100-year flood zone.



REPLACEMENT COST

Estimating the replacement cost of stormwater pipes is complex due to several factors, such as the excavation cost of the road base above the pipe, the pipe's depth, construction material, and diameter. In 2022 the County updated its methodology for calculating storm pipe replacement costs, the excavation cost of the road above the pipe is now included in the overall road network replacement cost. The engineering team reassessed the stormwater pipe replacement cost, establishing a unit cost of $1,000 per meter for 2022. After adjusting for 2023 inflation at a rate of 15%, the updated cost is $1,150 per meter.

The cost of stormwater structures was estimated at $5,951 per structure. **Table 3.6-8** provides a breakdown of all stormwater network unit and total replacement costs.

Table 3.6-8 Stormwater network total replacement costs by dollar/meter for pipes and per unit for structures, 2023.

Asset	Unit Replacement Cost	Total Replacement Cost
Stormwater Pipes	$ 1,150 per meter of pipe	$ 42,131,457
Stormwater Structures	$ 5,951 per structure	$ 8,879,265

Figure 3.6-14 Example of underground stormwater infrastructure during an excavation and replacement.

CURRENT FUNDING NEEDS

The estimate for the annual funding requirement for the stormwater network is based on a number of critical assumptions:

- The estimated useful lives, based on construction material, are accurate.
- The replacement values for pipes and structures are accurate.
- The excavation costs built into the model reflect those incurred by the County when undertaking stormwater infrastructure projects.
- If asset age was not readily available, the age of the road segment above each pipe or structure was used as a proxy for pipe age.
- The method of measuring condition of stormwater assets varies. Some pipes and structures were assessed using a CCTV inspection, while others were not accessible during the inspection or have been discovered since the assessment took place.
- Assets without a condition assessment use an age-based approach to condition.

Should any of these assumptions be revised, the estimated cost of maintaining the stormwater network will change. Based on these assumptions, the annual requirement for stormwater pipes is $504,715. This value represents the funding that the County needs to set aside on an annual basis in order to be able to replace stormwater pipes on schedule. As there are no lifecycle events or treatments applied to stormwater pipes, this cost reflects solely the average replacement cost over the useful life of the asset. The annual requirement for stormwater structures is $88,793 and only reflects the cost of replacement. The total stormwater network annual funding requirement, to ensure adequate funding for asset replacement, is therefore $593,508 (**Table 3.6-9**).

Table 3.6-9 Annual requirement for the stormwater network. Calculated as the total replacement costs of the County stormwater network, divided by the extended estimated useful life of each stormwater asset, 2023.

Total Network Cost (Replacement Cost)	Estimated Useful Life	Annual Funding Requirement
$ 51,010,723	40, 75 & 100 Years	$ 593,508

The operating needs for the stormwater network are currently included as part of the bridges and culverts and road network operating costs. Refer to the **Section 3.1** and **Section 3.4** for more information.

FUTURE FUNDING NEEDS

The County has a number of pipes that, according to their age, require replacement. The total replacement needs in 2024 are $2,459,195, which includes a backlog of $2,342,090 from previous years. The total ten-year replacement needs for the 2024-33 period is $11,633,683, with the 2024 needs representing approximately 21% of the ten-year replacement costs. Spreading that out over the ten-year period yields an average annual replacement needs of $1,163,683 (**Table 3.6-10**).

The annual requirement and the ten-year average capital (replacement) needs provide a range for capital funding required which can potentially guide the ten-year capital budget forecast (**Table 3.6-11**).

Table 3.6-11 The annual requirement and the ten-year average capital (replacement) needs for the County stormwater network.

Annual Funding Requirement	Ten-Year Average Capital (Replacement) Needs
$ 593,508	$ 1,163,368

Table 3.6-10 Lifecycle (replacement) cost of the County stormwater network for 2024-2033.

Year	Inflation Rate	Asset Replacement
2024	5%	$ 2,459,195*
2025	3.5%	-
2026	3.5%	$ 341,744
2027	3.5%	$ 29,587
2028	3.5%	-
2029	3.5%	$ 533,927
2030	3.5%	$ 30,132
2031	3.5%	-
2032	3.5%	$ 8,104,151
2033	3.5%	$ 134,947
TOTAL		$ 11,633,683
AVERAGE ANNUAL		$ 1,163,368

* Includes backlog from previous years.

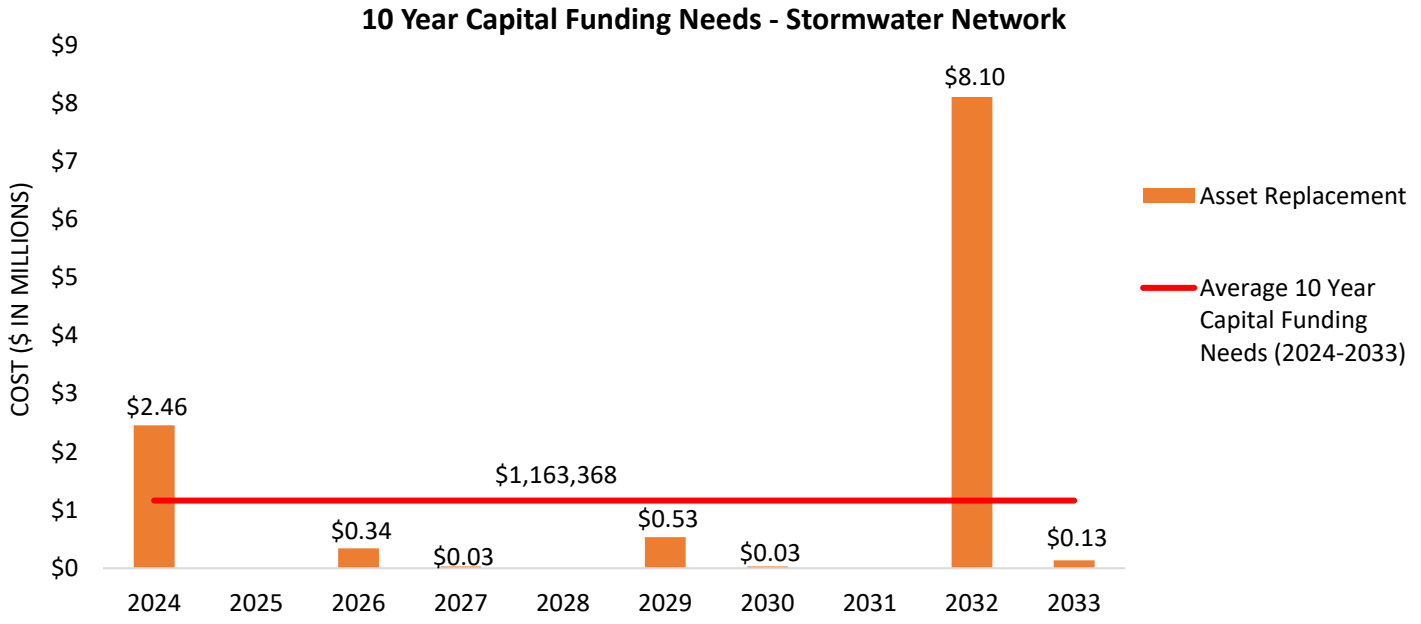


Figure 3.6-15 Ten-year capital (replacement) funding needs for the stormwater network, 2024-2033.

LEVELS OF SERVICE

Table 3.6-12 contains a list of performance metrics established by the County engineering department to measure the levels of service provided by the County stormwater network.

Table 3.6-12 Performance metrics for the stormwater network.

	2022	2023
Accessibility & Reliability		
% of catch basins cleaned annually	100%	100%
Safety		
% of roads in municipality resilient to a 100-year storm*	94%	95%
% of the municipal stormwater management system resilient to a 5-year storm*	100%	100%
# of surface flooding inquiries per 1,000 people (rural)	92%	92%
Sustainability		
% of the stormwater network that is in good or very good condition	64%	62%
Condition assessment cycle	4	4
% of the stormwater network that is in poor or very poor condition	29%	30%

* Metric required under *O. Reg. 588/17*

STRATEGY

Master Planning / Studies

Regular condition assessment studies will be completed every 4 years.

Addressing the Backlog

- Less than 19% of the total storm network is estimated to be in poor to very poor condition.
- The most recent condition assessment was conducted in 2021 which inform the needs for the storm water network.

Renewal Projects

The primary consideration for replacement and rehabilitation are noted deficiencies and coordination with roads and bridge assets. Relining is considered for locations where the road base is still in good condition.

Data Quality

The County has committed to the following data quality initiatives:

- Import assessed condition data into the AM system.
- Define and implement procedures to update replacement cost on an annual basis.
- Collect required data for all levels of service metrics and report annually.
- Separate stormwater costs from road base costs to better inform the budget and infrastructure gap.
- Further review and refine the risk model.
- Identify and incorporate additional asset lifecycle events, including costs and impacts on asset condition.

Asset Details

3.7 Vehicles & Equipment

VEHICLES AND EQUIPMENT

In managing its infrastructure and capital assets, the County maintains an extensive inventory, which currently includes 198 vehicles and 146 pieces of large equipment. Vehicles and equipment such as road maintenance trucks, snow plows, and landscaping equipment are necessary for inspecting, repairing, and maintaining these assets to ensure they remain safe, functional, and accessible to the public.

The inventory in this section primarily encompasses significant capital assets, with smaller or lower-cost equipment often excluded or pooled. Currently, equipment pools – singular assets representing multiple pieces of equipment – are excluded from this section but can be found in the **Pooled Assets Section 3.8**.

The inclusion of assets in the inventory is typically governed by expense thresholds, ensuring that only items meeting certain value criteria are capitalized (**Table 3.7-1**). Assets falling below these thresholds may be expensed immediately, reflecting their limited individual value or shorter useful life. This approach helps streamline asset management and financial reporting while maintaining a clear picture of the County's significant infrastructure investments.

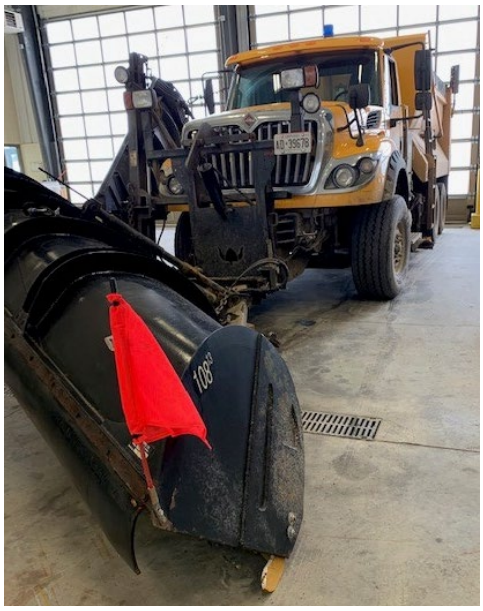


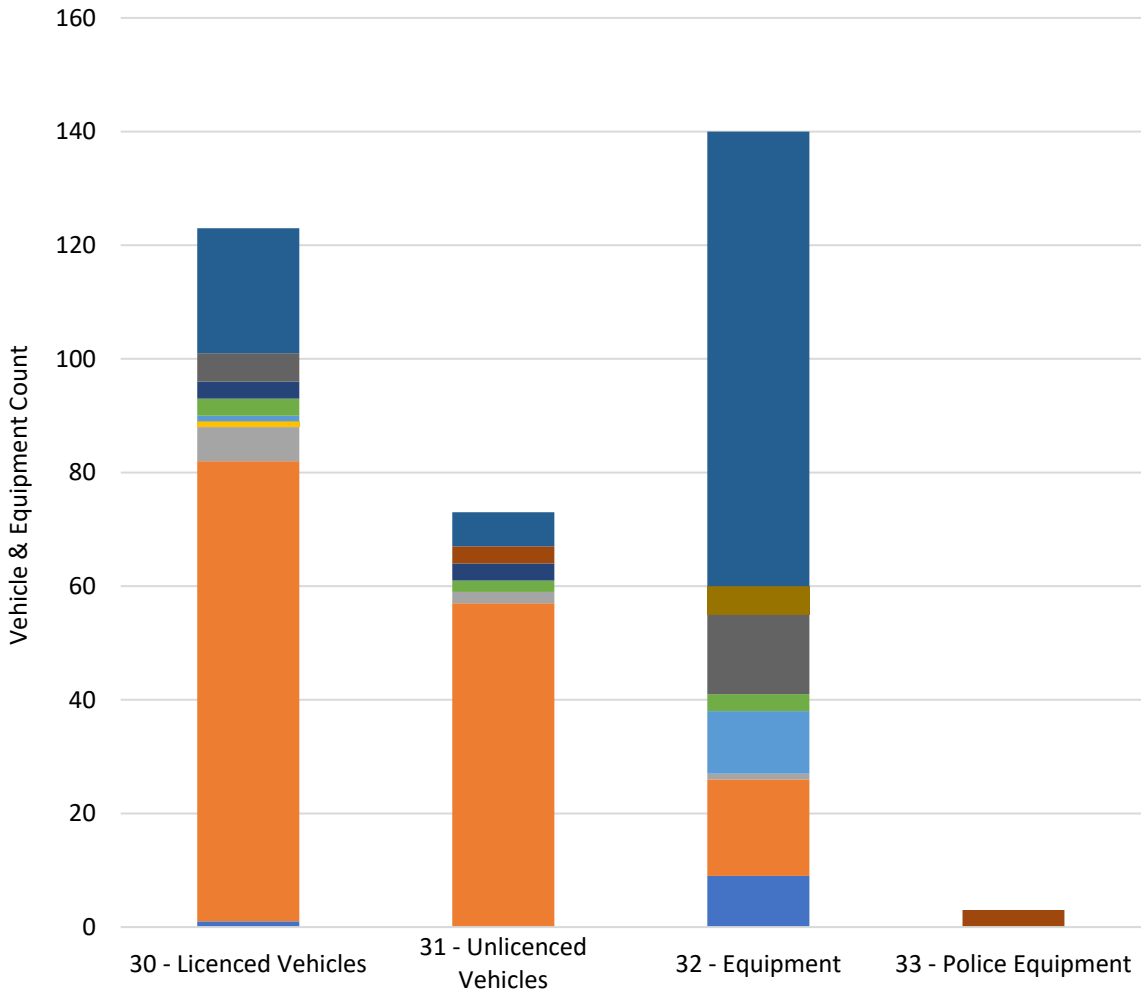
Figure 3.7-1 Example of a County vehicle (snow plow).

Table 3.7-1 County vehicles and equipment capitalization thresholds.

Asset	Asset Type (Segment)	Threshold Value	Minimum Useful Life
Vehicles	Licensed	$ 10,000	7 to 20 Years
	Unlicensed	$ 10,000	15 Years
Equipment	Equipment	$ 10,000	7 to 20 Years
	Police Equipment	$ 10,000	7 Years

VEHICLES AND EQUIPMENT (CONT'D)

The County's inventory of vehicles and equipment is distributed across various departments, reflecting their diverse operational needs (**Figure 3.7-2**).



	30 - Licenced Vehicles	31 - Unlicenced Vehicles	32 - Equipment	33 - Police Equipment
Solid Waste Services	22	6	80	
Social Housing			5	
Property Services	5		14	
Police Services		3		3
Museum	3	3		
Long-term Care	3	2	3	
Libraries	1		11	
Information Technology	1			
Green Legacy	6	2	1	
Fleet	81	57	17	
Community Emergency Measures	1		9	

Figure 3.7-2 County vehicles and equipment by department, 2023.

DATA QUALITY

	Level 1	Level 2	Level 3	Level 4
Inventory	Inventory data is incomplete.	Inventory data Is complete.	Inventory data is complete and accurate.	**Inventory data is complete, accurate, and in a centralized, accessible format.**
Condition	**No condition data exists. Condition is approximated by age.**	Condition data exists for these assets.	Condition data was collected recently for these assets.	Condition data is complete and accurate, and regularly updated. Data is centralized and accessible.
Risk	Critical assets and services are understood by department staff, but no risk models exist.	**Risk is estimated according to a draft risk model. Some parameters lack sufficient data.**	Complete risk models exist for this asset class, and critical assets have been identified.	Risk management strategies have been developed for critical assets, and department budgets reflect risk-based priorities.
Lifecycle Strategy	Lifecycle events required to maintain current levels of service are not documented.	Lifecycle events required to maintain current levels of service are documented.	**Capital budget costs of lifecycle events are built into the funding models. Operating costs are not included.**	Capital and operating costs are built into the funding model. Projected lifecycle events are defined, and funding shortfalls are identified.
Financial Sustainability Strategy	Budgets are based on prior year spending.	Asset replacement schedules have been built into the long-term capital forecast.	**Replacement and maintenance costs have been built into long-term capital forecasts.**	Replacement and maintenance costs have been built into long-term capital and operating forecasts. Demand forecasts inform the budget.
Levels of Service	Services provided by this asset class are understood by departmental staff, but not formally measured.	**Performance metrics are defined to measure levels of service.**	Performance metrics are defined and a data collection strategy exists for all metrics.	Proposed levels of service have been identified, alongside their financial impacts. Trends in performance measures are tracked and regularly reported.

LIFECYCLE

The estimated useful life of vehicles and equipment varies based on the type, make, and/or model of the asset (**Table 3.7-2** and **Table 3.7-3**). Lifecycle costs for vehicles and equipment are incurred at the end of their useful life. The lifecycle strategy follows a deterioration curve, meaning that the rate of deterioration increases as the assets age. There are no lifecycle events to extend the useful life, apart from routine maintenance, which is considered a required operating expense and currently not factored in, as a lifecycle event.

Table 3.7-2 County vehicle estimated useful life, by type.

Vehicles	EUL
Vehicle Attachments	7
Heavy Duty Vehicles	7
Large Vehicular Equipment	14
Light Vehicles	7
Sign Trailers	7
Small Vehicular Equipment	14
Utility and Miscellaneous Trailers	14

Table 3.7-3 County equipment estimated useful life, by type.

Equipment	EUL
Buildings Equipment	25
Electronic Vehicle Chargers	10
Fuel Pumps	15
Machines	7
Roll Off Bins	25
Solar Panels	25
Solid Waste Services Scales & Tarp Machines	20

Equipment is projected for replacement when its estimated condition reaches zero, while vehicles are scheduled for replacement when their estimated condition drops to 70. Refer to **Figure 3.7-3** for an example of vehicles and equipment lifecycles, keeping in mind that the timeline for each type of asset will vary.

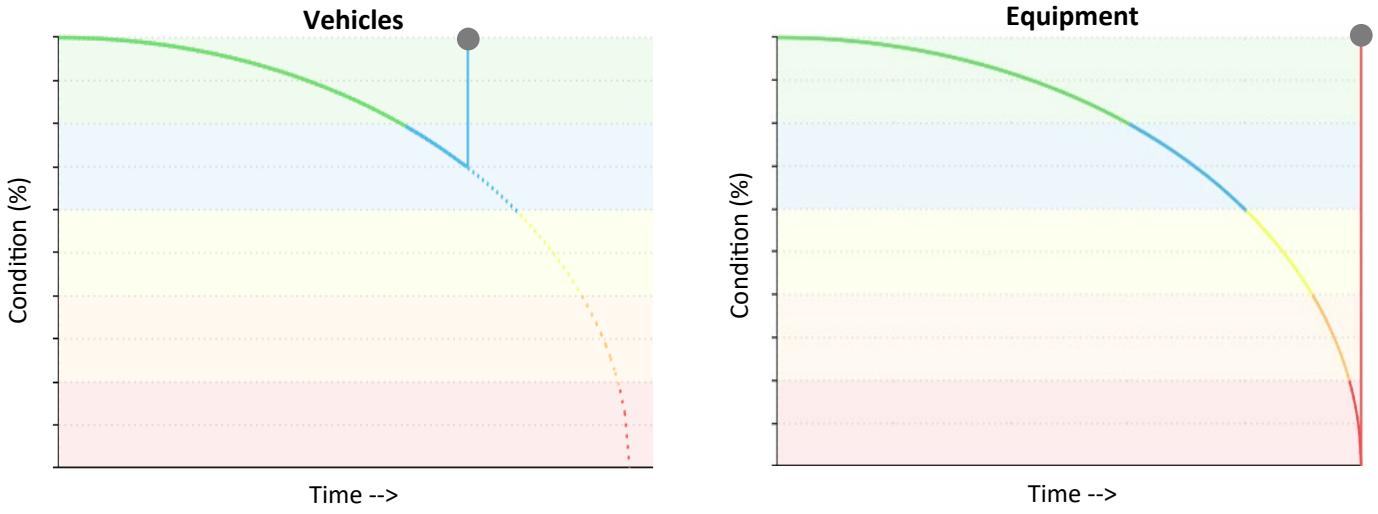


Figure 3.7-3 Visualization of the County vehicles and equipment lifecycle strategy. Asset deterioration shown until the asset is scheduled for replacement at the appropriate condition or at the end of its estimated useful life.

CONDITION

The vehicle and equipment condition rating system offers a comprehensive breakdown from "very good" to "very poor" to evaluate their overall condition. Ratings are based on criteria including exterior panel conditions, interior quality, mechanical soundness, fluid levels, tire condition, and structural integrity. Ratings span from 80 and above for vehicles and equipment in excellent condition with minimal defects, to 20 and below for those showing significant wear nearing the end of their estimated useful life. Refer to **Figure 3.7-4**, **Figure 3.7-5**, and **Table 3.7-4** for an overview of condition, including condition values included in each condition category.

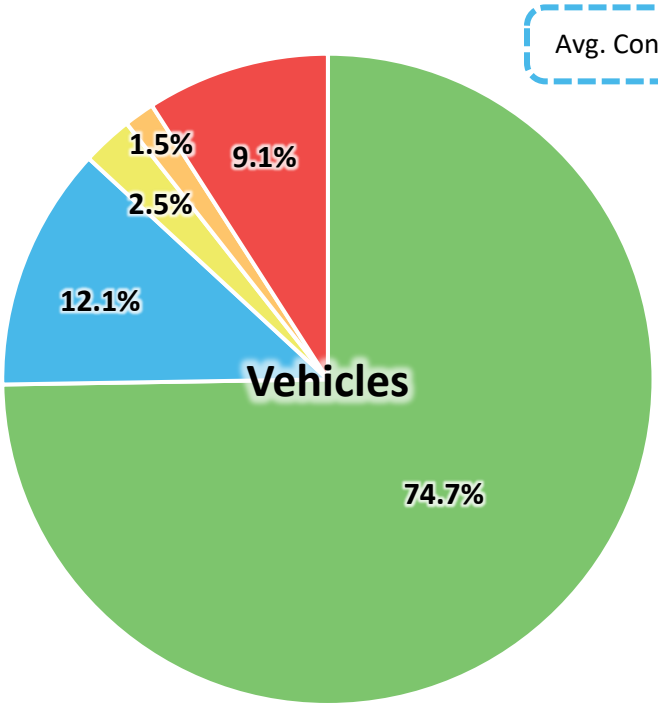


Figure 3.7-4 County vehicles condition, 2023.

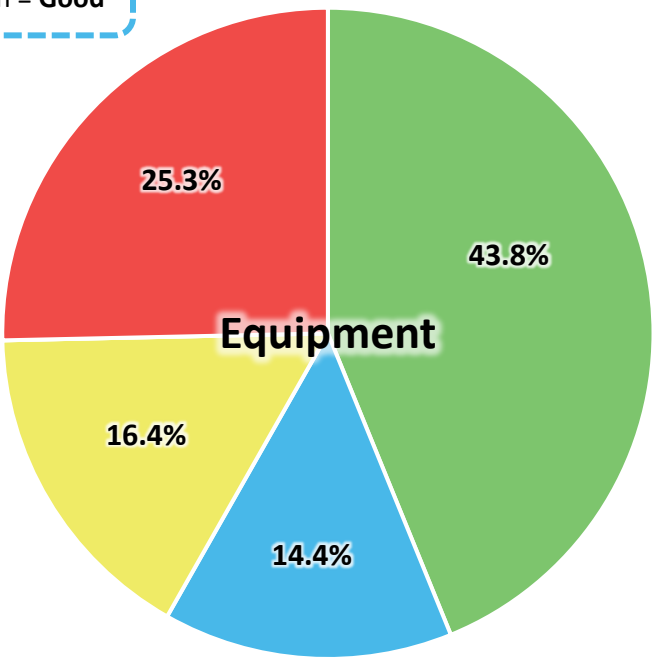


Figure 3.7-5 County equipment condition, 2023.

Table 3.7-4 Count and replacement cost of vehicles and equipment within each condition rating, 2023.

Very Good 80 - 100	**Good** 60 - 80	**Fair**	**Poor**	**Very Poor**
148 Vehicles	24 Vehicles	5 Vehicles	3 Vehicles	18 Vehicles
$ 24,022,802	$ 4,066,000	$ 182,724	$ 207,672	$ 604,204
64 Equipment	21 Equipment	24 Equipment	0 Equipment	37 Equipment
$ 4,875,044	$ 582,681	$ 349,369	-	$ 438,929
$ 28,897,845 Total	$ 4,648,681 Total	$ 532,093 Total	$ 207,672 Total	$ 1,043,133 Total

RISK

The risk analysis for vehicles and equipment is the product of the likelihood of failure and the consequence of failure (**Table 3.7-5**).

Table 3.7-5 Probability and consequence of failure parameters currently included in the County vehicles and equipment risk model.

Probability of Failure	Consequence of Failure
Condition	Replacement cost

Figure 3.7-6 show the distribution of County vehicles and equipment by risk classification. The County's asset and equipment risk assessment categorizes vehicles and equipment into five risk levels: very low, low, moderate, high, and very high. The assessment indicates varying levels of risk across these categories, providing valuable insights to prioritize maintenance, repair, and replacement efforts effectively. The majority of County vehicles and equipment fall into the very low and low risk classification.

Vehicles and Equipment Risk Classifications

Very Low (1-4)	Low (5-7)	Moderate (8-9)	High (10-14)	Very High (15-25)
232 Assets	88 Assets	4 Assets	11 Assets	0 Assets
134 Vehicles	51 Vehicles	3 Vehicles	10 Vehicles	-
$ 9,746,045	$ 15,866,578	$ 639,237	$ 2,831,542	-
107 Equipment	37 Equipment	1 Equipment	1 Equipment	-
$ 5,342,507	$ 735,853	$ 116,539	$ 51,124	-
$ 15,088,552	$ 16,602,431	$ 755,776	$ 2,882,666	-

Figure 3.7-6 Risk classifications for County vehicles and equipment, including number of assets and their total replacement costs for each risk classification, 2023.

REPLACEMENT COST

Vehicle and equipment replacement costs are calculated based on historical values adjusted annually for inflation, corresponding to the forecasted inflation rates in the County's *Annual Budget and Ten Year Plan*. Historical values from periods before 2020 were adjusted using the CPI inflation factor to estimate their 2020 replacement value, which was then inflated annually based on the forecasted inflation rates. Given the highly liquid and active vehicle and equipment markets, the fair value (FV) of replacement costs is readily available to ensure alignment with current market conditions.

Table 3.7-6 Vehicles and Equipment inventory counts and replacement cost, 2023.

Asset	Count	Replacement Cost
Vehicles	198	$ 29,083,402
Equipment	146	$ 6,246,023
Total	**344**	**$ 35,329,425**

The County's fleet department accounts for over 75% of the total vehicle replacement cost due to its extensive array of specialized vehicles and equipment necessary for maintaining and servicing the county's infrastructure. This includes heavy-duty trucks, snowplows, and construction machinery, all of which require significant investment due to their specialized functions and durability requirements. Proper asset management is important as it ensures the fleet remains reliable and efficient, minimizing downtime and enhancing the county's ability to provide essential services. Proper investment in vehicle replacement is crucial to maintain operational readiness and cost-efficiency over the long term.

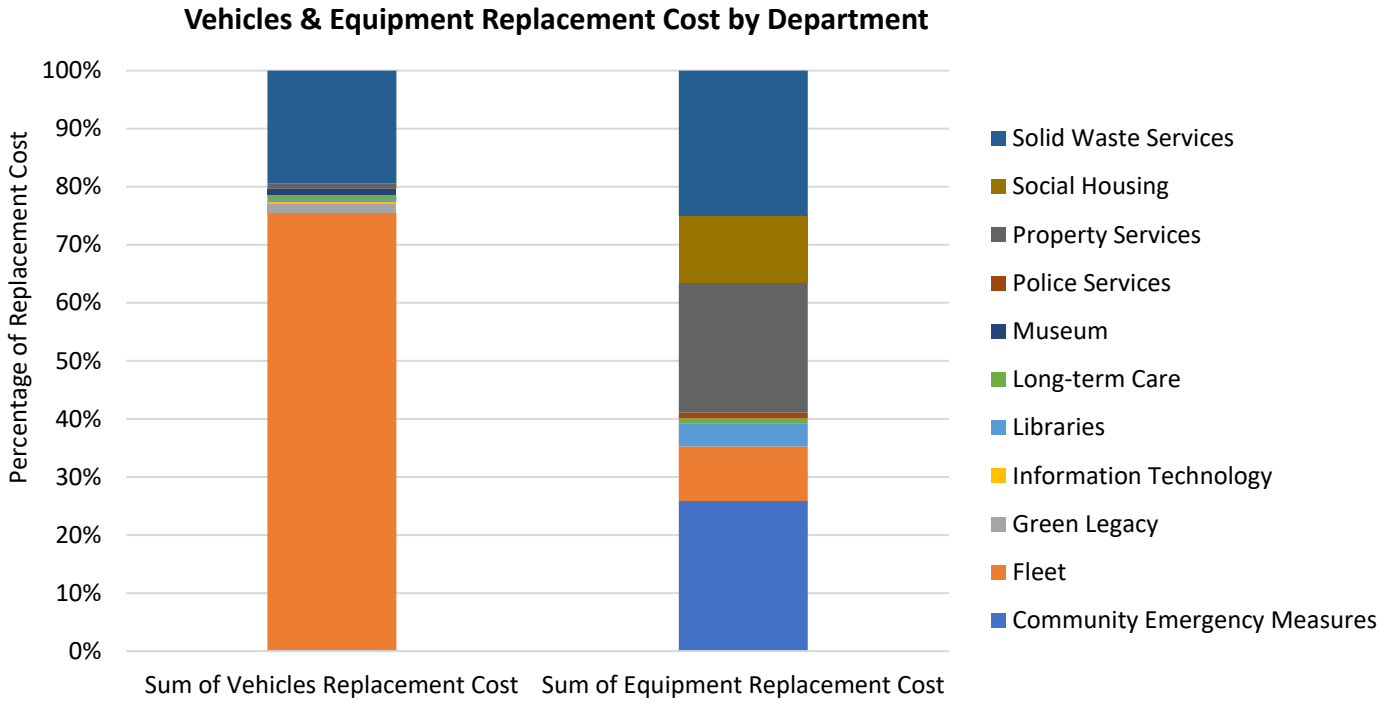


Figure 3.7-7 Percentage of total replacement cost by department, 2023.

CURRENT FUNDING NEEDS

The County's fleet of vehicles and equipment is subject to evolving usage patterns and growth trends, which will significantly shape future demands. The annual funding requirement is a crucial metric, encompassing the average cost of lifecycle events and replacements throughout the useful life of each asset. Currently, the estimated useful life forecast includes only the replacement of the asset, as regular maintenance is funded through the operating budget. Vehicles and equipment are essential inputs that enable the County to develop and maintain other asset categories, underscoring their critical role in sustaining infrastructure and service delivery. For better viewability, vehicles and equipment have been combined in **Table 3.7-7**.

Table 3.7-7 Overview of County vehicles and equipment, including the annual funding requirement, 2023.

Total Replacement Cost	Estimated Useful Life	Annual Funding Requirement
$ 35,329,425	Vehicles: 7 to 14 Years Equipment: 7 to 25 Years	$ 3,588,154

The average three-year operating cost for County vehicles and equipment is approximately $3,422,771 or $9,950 per asset (**Table 3.7-8**). The current operating needs for vehicles and equipment include the following costs:

- Routine inspection and maintenance costs, including the cost of replacement parts and materials.
- Fuel and insurance costs.
- Salary and labour costs for mechanics and operational staff members.
- Insurance cost associated with vehicles and equipment.

Table 3.7-8 Current operating needs for County vehicles and equipment, 2023.

Total Operating Cost*	Average Per-Unit Cost*
$ 3,422,771	$ 9,950

* Represents a three-year average.

FUTURE FUNDING NEEDS

Over the next decade, the County's fleet of vehicles and equipment will require substantial investment to maintain and replace assets. The projected annual replacement costs significantly vary year by year, with the highest anticipated expenditures in 2029 and 2033 at $6,163,765 and $8,302,869, respectively (**Table 3.7-9**) In contrast, the lowest annual replacement cost is expected in 2025, totaling $873,579. On average, the County will need to allocate approximately $4,345,682 annually to meet these replacement needs. Which will ensure that the fleet remains operational and capable of supporting the County's infrastructure and service delivery needs.

Table 3.7-9 The ten-year asset replacement requirements for County vehicles and equipment for 2024-2033.

Year	Inflation Rate	Asset Replacement
2024	5%	$5,247,145
2025	3.5%	$873,579
2026	3.5%	$4,971,881
2027	3.5%	$3,153,073
2028	3.5%	$2,211,966
2029	3.5%	$6,163,765
2030	3.5%	$3,501,174
2031	3.5%	$5,883,125
2032	3.5%	$3,148,241
2033	3.5%	$8,302,869
TOTAL		$43,456,818
AVERAGE ANNUAL		$4,345,682

The ten-year average replacement needs are closely aligned with the annual funding requirements. This alignment occurs because asset replacement is the only lifecycle activity for vehicles and equipment. Additionally, the inflation component within the ten-year average replacement needs is almost completely offset by the funding requirements projected beyond the ten-year time horizon.

FUTURE FUNDING NEEDS (CONT'D)

Table 3.7-10 Equivalency of ten-year average replacement & ten-year average capital needs.

Annual Funding Requirement	Ten-Year Average Replacement Needs
$ 3,588,154	$ 4,345,682

The County's asset replacement expenses will remain significantly below the average 10-year capital funding needs until 2026. However, three specific years – 2029, 2031, and 2033 will account for nearly 50% of the total asset replacement costs over the next decade. By identifying these future peaks in asset replacement expenses, the County can ensure that the necessary funds are available when needed.

To manage this effectively, the County has developed a strategic financial planning approach that allocates resources in anticipation of these high-cost years. This proactive strategy will help maintain the County's fiscal stability and ensure the timely replacement of critical assets. By smoothing out the financial impact over the entire period, the County can avoid potential budgetary stresses and maintain consistent service levels for the community. Additionally, this forward-looking approach enables the County to explore potential cost-saving measures and funding opportunities, further optimizing the asset management process.

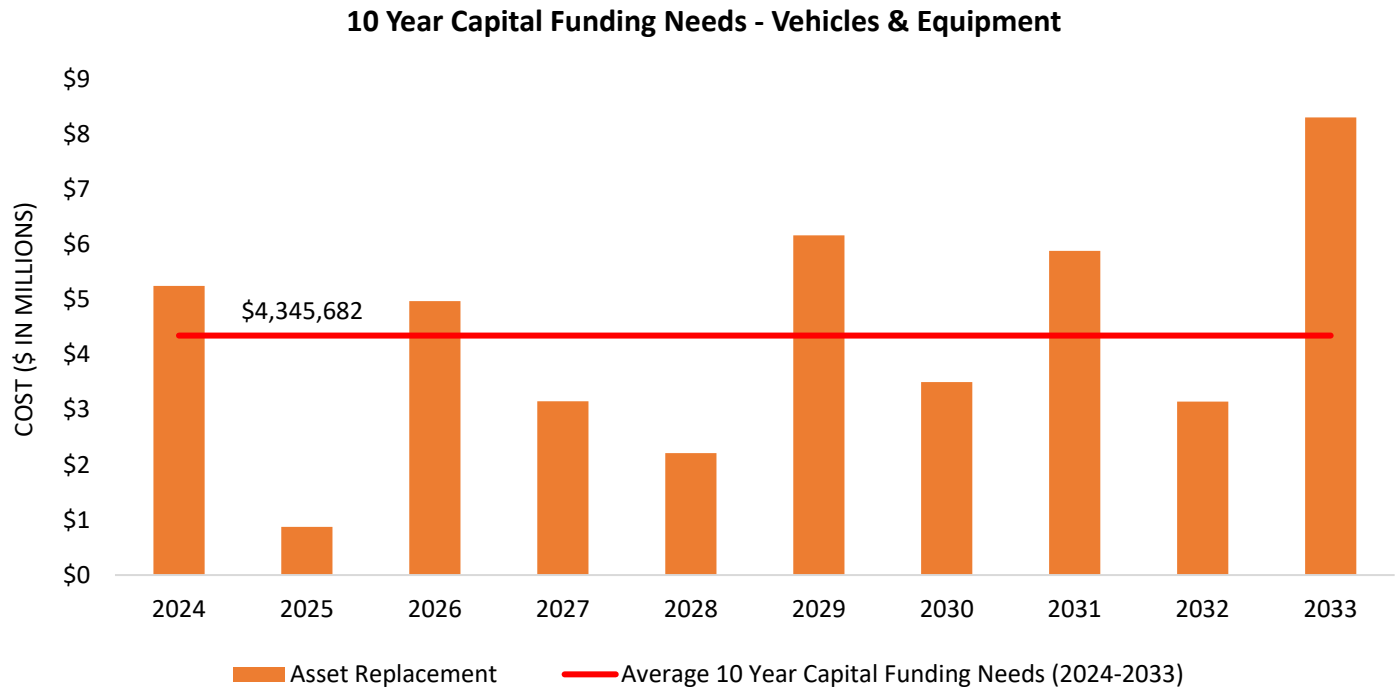


Figure 3.7-8 The ten-year capital funding needs for County vehicles and equipment, 2024-2033.

LEVELS OF SERVICE

Table 3.7-11 contains a list of performance metrics established by County departments to measure the levels of service provided by vehicles and equipment.

Table 3.7-11 Performance metrics for County vehicles and equipment.

	2022	2023
Safety		
% of regulated MTO maintenance inspections complete	100%	100%
Average number of fleet maintenance work orders completed per month	119	115
Average number of vehicles seen by fleet mechanics per month	49	53
Affordability		
Gross operating and maintenance cost per vehicle	$ 17,799	$ 16,624
Sustainability		
Annual capital reinvestment rate (%)	12%	14%
% of vehicles with preventative maintenance inspections completed per year	100%	100%

* Annual capital reinvestment rate = Annual capital expenditure / Total replacement cost

STRATEGY

Renewal Projects

The county proactively renews its vehicles and equipment assets on a regular basis to ensure they remain in optimal condition for various operations. This routine renewal process is critical for maintaining the efficiency, reliability, and safety of county services. By keeping the fleet and equipment up-to-date, the county minimizes downtime, reduces maintenance costs, and enhances overall performance. This strategic approach not only extends the lifespan of these assets but also ensures compliance with evolving safety and environmental regulations, ultimately contributing to the well-being and satisfaction of the community.

Data Quality

The County maintains precise and comprehensive inventory data along with a thorough log of all maintenance activities performed on its vehicles and equipment. This robust record-keeping ensures that the County has a clear understanding of the current status and history of its assets. As the County continues to enhance the data quality of the vehicles and equipment asset profiles, it anticipates significant improvements in the methods used to calculate and assess their condition. This ongoing refinement process will lead to more accurate and reliable evaluations, ultimately contributing to better decision-making and optimized asset management.

Asset Details

3.8 Pooled Assets

Overview of Pooled Assets

An asset pool is a group of identical, similar, or related tangible capital assets. Pooling assets involves identifying, treating, accounting for, and reporting on a set of individual assets as a collective group. Managing assets with a pool is a cost-effective approach for handling large numbers of smaller value items rather than trying to maintain individual accounting records for each one. These groups of assets are reported and accounted for as a single "pooled" asset based on the total value of purchases or acquisitions in the applicable year. When assets are handled this way, it is understood that there are secondary systems for managing the day-to-day needs of these assets within the appropriate County departments.

The County uses asset pools to account for the following asset categories:

- Furniture and fixtures
- Library books and materials
- Technology and communications
- Tools and small equipment

The following sections provide an overview of the County's pooled assets, including:

- A basic description of how County staff manage the pooled assets.
- Examples of the types of assets found within each pool.
- The costs associated with each pool, including replacement costs which have been calculated by inflating their initial purchase price into 2023-dollar values.
- Any applicable levels of service measures used to track the performance of the assets.

Furniture and Fixtures

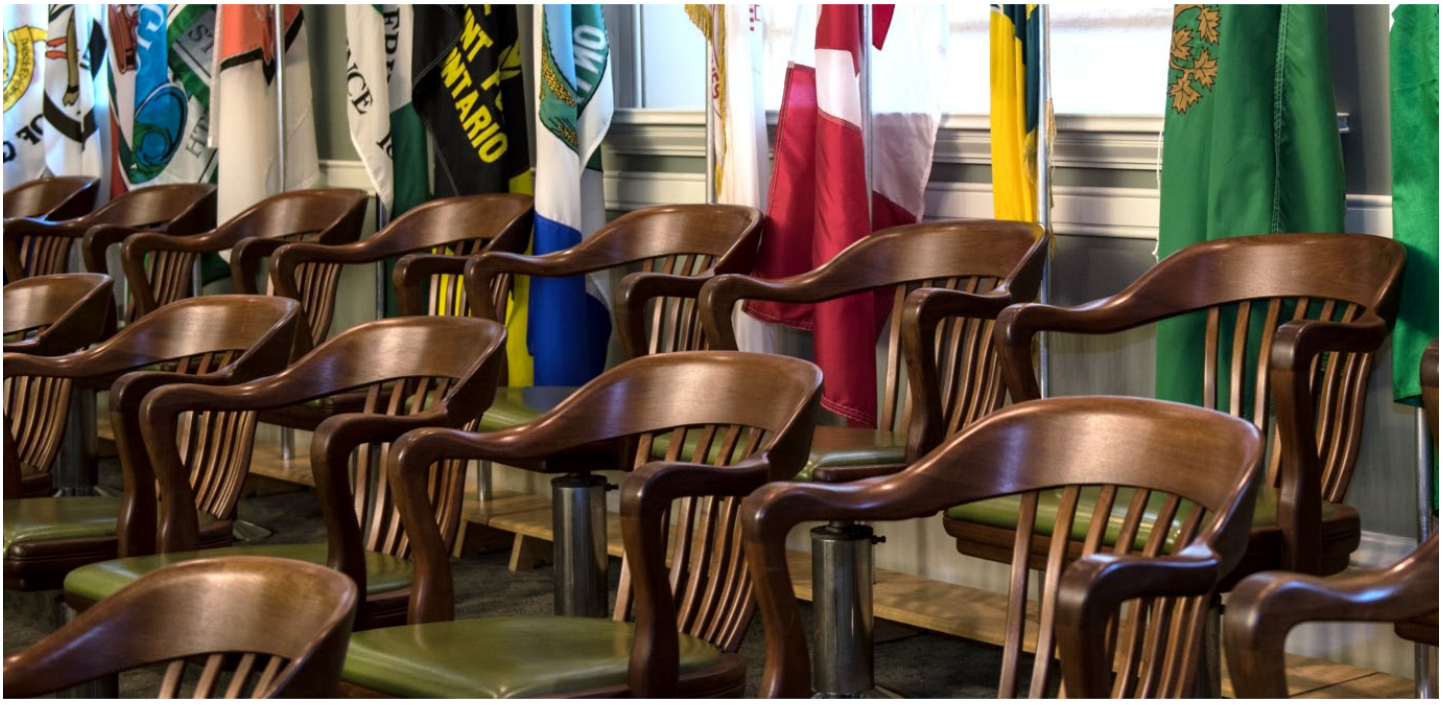
The County's furniture and fixtures are maintained day-to-day by housekeeping staff to ensure they are kept clean and in good condition. Furniture and fixtures are used and reworked throughout buildings when offices are moved or rearranged. Items are repurposed as often as possible to keep costs low and to ensure they are only replaced when necessary. The property services department also conducts monthly inspections of offices and their interior components, including furniture and fixtures. Small components, such as hinges and other replacement parts, are kept in stock and used to fix assets that are identified as deficient during the regular inspections or as reported by staff.

Assets include:

Tables
Desks
Chairs
Couches
Keyboard trays
Shelving
Filing cabinets
Lighting
Long-term care beds
Mattresses
Bed frames
Lift tracks
Appliances
Fridges
Dishwashers
Microwaves

Total Pooled Replacement Cost	$ 10,320,393
Annual Requirement	$ 733,873
Ten-Year Average Annual Replacement Needs	$ 710,958

The County currently has no established levels of service measures for furniture and fixtures.



Library Books and Materials

The County owns a variety of library materials throughout its library system. Software called *Collection HQ* is used to manage the library collections at each location. County libraries aim to replace approximately 8% of its collections on an annual basis. When determining which materials to replace, library staff consider factors, including wear and tear, popularity, demand, and out of date materials (such as medical books).

Assets include:

Books
Audio books
CDs and DVDs
Video games
Magazine and news subscriptions
Interactive multi-media
Periodicals
Board games
Card games
Learning aids
Launch pads & tablets
GRCA passes

Total Pooled Replacement Cost	$ 4,146,526
Annual Requirement	$ 829,305
Ten-Year Average Annual Replacement Needs	$ 903,300

Levels of Service Measures	2022	2023
Number of materials circulated	848,589	962,289
Library website traffic including database and catalogue	698,440	850,797
Number of programmes offered	2,168	2,810
Number of people attending programmes	40,791	35,612

TECHNOLOGY AND COMMUNICATIONS

Technology and communication equipment at the County is managed by the IT department, using the *IT Roadmap*. The roadmap was developed based on experience, industry standards, and vendor specific best practices. Technology is kept as current as possible by ensuring it receives appropriate software updates throughout its life. IT equipment is replaced on a regular replacement cycle that varies for each type of asset unless a staff member reports issues with their equipment prior to the scheduled replacement date.

Total Pooled Replacement Cost	$ 12,050,176
Annual Requirement	$ 1,975,723
Ten-Year Average Annual Replacement Needs	$ 2,179,522

Assets include:

Desktop computers
Laptops
Printers and scanners
Keyboards and mice
Tablets
Phones
Headsets
Servers
Storage
Switches and routers
Cameras
UPS devices
Cabling
Software

Levels of Service Measures	2022	2023
Total visitors to Wellington.ca	614,465	617,104
Total page views on Wellington.ca	2,810,385	2,443,456
User accounts to manage	1,477	1,319
Helpdesk requests closed	5,945	5,475
Devices managed by IT (laptops, desktops, phones, and tablets)	1,755	1,308

TOOLS AND SMALL EQUIPMENT

Small tools and equipment are used and managed by several departments across the County. Tools and equipment are kept as long as possible and maintained to a high standard. They are typically used until they fail or no longer operate, at which point they are replaced. Components for specialty equipment are kept on hand so staff can repair or replace individual parts to keep the asset running past its typical useful life. Staff monitor these assets to ensure they are functioning as expected and meeting their expected useful lives. When issues arise, staff will analyze the asset's performance to determine whether it should be replaced with the same unit or whether a different model should be acquired in its place. Replacement tools and equipment are sourced prior to failure to acquire the best possible price. However, when an asset fails sooner than expected staff typically source whatever is in stock and available soonest to ensure service levels at the County are met.

Total Pooled Replacement Cost	$ 516,587
Annual Requirement	$ 62,845
Ten-Year Average Annual Replacement Needs	$ 52,246

Assets include:

Hand tools
Power tools
Drains and snakes
Vacuums
Chainsaws
Pole saws
Hammers
Wrenches
Pliers
Scissors
Files
Nails
Screws
Staples
Nuts and bolts
AEDs
OPP equipment
Fingerprinting units

The County currently has no established levels of service measures for tools and small equipment.

Appendices

A.1 ACRONYMS

AADT	Average Annual Daily Traffic
AM	Asset Management
AMP	Asset Management Plan
BCI	Bridge Condition Index
CCTV	Closed Circuit Television
CIRC	Canadian Infrastructure Report Card
County, COW	County of Wellington
CSP	Galvanized Corrugated Steel Pipe
DC	Development Charge
EUL	Estimated Useful Life
FCI	Facility Condition Index
FCM	Federation of Canadian Municipalities
FIR	Financial Information Return
GHG	Greenhouse Gas
GIS	Geographic Information System
HDPE	High-density Polyethylene
IT	Information Technology
KPI	Key Performance Indicator
LEED	Leadership in Energy and Environmental Design
LOS	Level of Service
MTO	Ministry of Transportation, Ontario
OCIF	Ontario Community Infrastructure Fund
OSIM	Ontario Structure Inspection Manual
PACP	Pipeline Assessment and Certification Programme
PCI	Pavement Condition Index
PSAB	Public Sector Accounting Board
PVC	Polyvinyl Chloride
SOP	Standard Operating Procedure
TON	Time of Need

A.2 GLOSSARY

Annual Capital Reinvestment Rate – Annual Capital Expenditures / Total Replacement

Asset Management – Is an integrated set of processes and practices that minimize lifecycle costs of owning, operating, and maintaining assets, at an appropriate level of risk while continuously delivering established levels of service.

Asset Management Plan – A document that states how a group of assets is to be managed over a period of time. Asset Management Plans describe the condition, characteristics, and values of the assets; expected levels of service; action plans to ensure assets are providing the expected level of service; financial strategies to implement the action plans.

Asset Management Programme – The application of asset management strategies and best practices on a corporate level in order to ensure consistency across all departments and asset groups. The Corporate Asset Management Programme consists of the following:

- Strategic Plans and Documents
- Strategic Asset Management Policy
- Asset Management Framework
- Asset Management Governance
- Asset Management Plans
- Operational Strategies and Plans

Backlog – Backlog refers to lifecycle events that are necessary to prevent the deterioration of an asset or its function but which have not been carried out.

Components – Parts of an asset having independent physical or functional identity, and having specific attributes such as different life expectancy, maintenance regimes, risk, or criticality. Complex assets, such as buildings, are often broken down into components for asset management purposes, to reflect the differing needs of various components.

Condition – The physical state of the asset, which can be represented on a scale ranging from very good to very poor.

GLOSSARY (A.2 CONT'D)

Condition Assessment – The inspection, assessment, measurement, and interpretation of the resultant data, to indicate the condition of a specific asset or component, so as to determine the need for preventative or remedial action.

Critical Assets – Those assets that are likely to result in a more significant financial, environmental, and social impact should they fail. The maintenance of these assets is a priority.

Deterioration Curve – The rate at which an asset approaches the end of its useful life, represented by a curve. With no intervention (e.g. repair or rehabilitation), the rate of deterioration increases as assets near the end of their useful life. The deterioration curve differs for each asset class and can differ for assets within the same class, based on usage, construction materials, weather, etc.

Disposal – Tangible capital assets are considered disposed when they are sold, taken out of service, destroyed, damaged or replaced due to obsolescence, scrapping or dismantling.

Financial Sustainability – The ability to provide and maintain service and infrastructure levels without resorting to unplanned increases in rates or cuts to service. It is the ability to meet present needs without compromising the ability to meet future needs.

Geographic Information System (GIS) – A computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. It can show many different kinds of data on one map. This enables people to easily see, analyze, and understand patterns and relationships.

Historical Cost – A historical cost is a measure of value used in accounting in which the value of an asset on the balance sheet is recorded at its original cost when acquired by the company.

Infrastructure Gap – The cumulative shortfall of required asset renewal. This gap represents the cumulative deferred maintenance and investment needs for the County.

GLOSSARY (A.2 CONT'D)

Levels of Service – Describe the outputs or objectives that an organization or activity intends to deliver to customers. This includes commonly measured attributes or metrics such as quality, reliability, responsiveness, sustainability, timeliness, accessibility, and cost.

Lifecycle Cost – The total cost of all lifecycle events throughout an asset's useful life.

Lifecycle Events – Are all activities associated with asset ownership including initial purchase or procurement costs, operating costs, operating and capital maintenance costs, and disposal costs.

Maintenance (Operating) – Actions required to keep an asset as near to its original condition as possible in order to provide service over its useful life. Includes both corrective and preventative maintenance.

Maintenance (Capital) – Subsequent expenditures on tangible capital assets that fulfill one or more of the following requirements:

- Increase service potential (i.e.: capacity/output)
- Lower associated operating cost
- Extend the useful life of the asset
- Improve the quality of output of the asset
- Includes rehabilitation, renewal and replacement.

Operating Costs – The aggregate of costs, including energy costs (such as fuel and utilities) and labour costs, of operating a municipal infrastructure asset over its service life.

Performance Measure – A qualitative or quantitative measure used to measure actual performance against a standard or other target. Performance measures are used to indicate how the organization is doing in relation to delivering levels of service.

GLOSSARY (A.2 CONT'D)

Pooled (Grouped) Assets – Assets that have a unit value below the capitalization threshold but have a material value as a group. Such assets shall be "pooled" as a single asset with one combined value. Although recorded in the financial systems as a single asset, each unit may be recorded in the asset subledger for monitoring and control of its use and maintenance. Examples include computers, furniture, and fixtures.

Remaining Useful Life – The time remaining until an asset ceases to provide the required service levels.

Replacement Cost – The cost that would be incurred to replace the asset with a new modern equivalent asset (not a second hand one) with the same economic benefits (gross service potential).

Reserve – Accumulated net revenue set aside for a designated purpose. Funds held in a reserve can be utilized at the discretion of Council.

Reserve Fund – A reserve fund is established based on a statutory requirement or defined liability payable in the future and is usually prescriptive as to the basis for collection and use of monies in the fund.

Risk Management – The process of identifying and assessing risks, identifying and evaluating actions that can be taken to reduce risk, and implementing the appropriate actions to mitigate risk.

Strategic Action Plan – The Wellington County Strategic Action Plan identifies key challenges and opportunities for the County, and sets the strategic direction for County programmes and investments.

Strategic Asset Management Policy – A policy developed and approved at the County of Wellington which outlines the objectives of Asset Management and the processes and procedures that enable the realization of those objectives.

Tangible Capital Asset – Non-financial assets having physical substance that are held for use in the production or supply of goods and services, for rental to others, for administrative purposes, or for the development, construction, maintenance, or repair of other tangible capital assets; have useful economic lives extending beyond one year; are to be used on a continual basis; are not for sale in the ordinary course of operations.

GLOSSARY (A.2 CONT'D)

Useful Life (Estimated) – The period over which a tangible capital asset is expected to be used, or the number of production or similar units that can be obtained from the tangible capital asset. The life of a tangible capital asset may extend beyond the useful life of a tangible capital asset. The life of a tangible capital asset, other than land, is finite, and is normally recorded as the shortest of the physical, technological, commercial, or legal life.

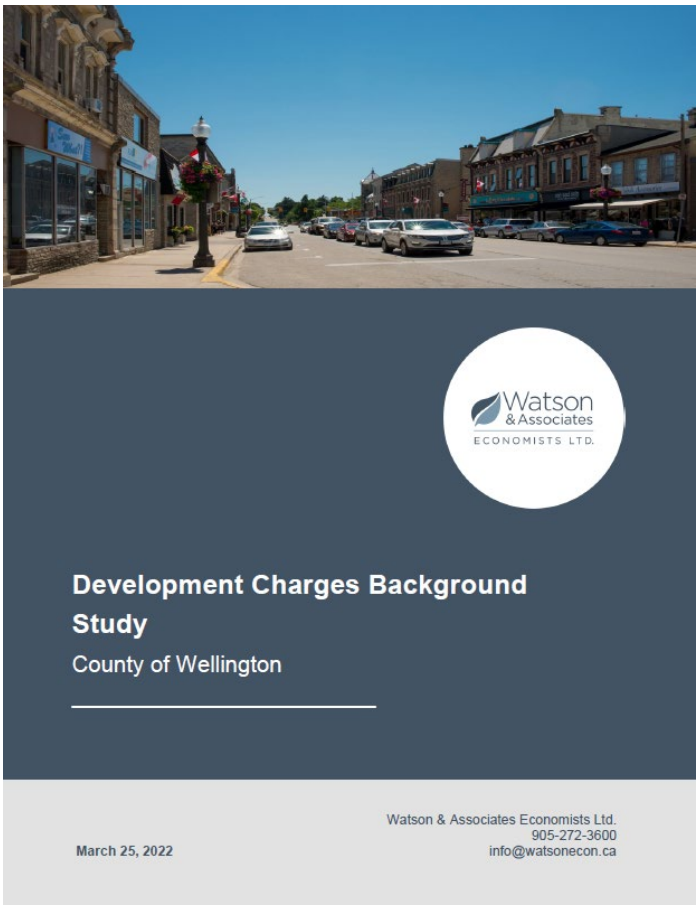
User Fee – Fee or charge to individuals or groups and/or businesses for the provision of a service, activity, or product, or for conferring certain rights and privileges, which grant authorization or special permission to a person, or group of persons to access County-owned resources (including property) or areas of activity

A.3 DEMAND MANAGEMENT STATISTICS

The *Development Charges Background Study* for the County of Wellington is required by the Development Charges Act, 1997 as amended (DCA). Development charges provide for the recovery of growth-related capital expenditures from new development.

The growth forecasts contained within this report provide the anticipated development for which the County will be required to provide services, over a ten-year (mid-2022 to mid-2023) and long term (mid-2022 to mid-2041) time horizon.

Under *O. Reg. 588/17, Asset Management Planning for Municipal Infrastructure*, AMPs must include population and employment forecasts. The *Development Charges Background Study* completed in March 2022 is the source for these estimates.



The full *Development Charges Background Study* can be found on the Couty of Wellington website.

The following pages in this appendix include:

- **Table A.3-1** Residential Growth Forecast Summary
- **Table A.3-2** Employment and Gross Floor Area (GFA) Forecast, 2022 to 2041

DEMAND MANAGEMENT STATISTICS (A.3 CONT'D)

Table A.3-1 Residential Growth Forecast Summary

	Year	Population (Including Census Undercount)[1]	Excluding Census Undercount			Housing Units						Person Per Unit (P.P.U.): Total Population/ Total Households
			Population	Institutional Population	Population Excluding Institutional Population	Singles & Semi-Detached	Multiple Dwellings[2]	Apartments[3]	Other	Total Households	Equivalent Institutional Households	
Historical	*Mid 2006*	88,520	85,470	1,222	84,248	25,795	1,075	2,570	575	30,015	1,111	2.85
	Mid 2011	89,050	86,675	1,342	85,333	26,200	1,230	2,565	965	30,960	1,220	2.80
	Mid 2016	93,540	90,955	1,597	89,358	28,275	1,385	3,000	535	33,195	1,452	2.74
Forecast	*Mid 2022*	102,680	99,704	1,746	97,958	30,187	1,890	3,726	535	36,338	1,587	2.74
	Mid 2032	124,040	120,455	2,134	118,321	36,561	3,026	4,436	535	44,558	1,940	2.70
	Mid 2041	142,000	137,891	2,421	135,470	40,897	4,256	5,316	535	51,004	2,201	2.70
Incremental	**Mid 2006 - Mid 2011**	**530**	**1,205**	**120**	**1,085**	**405**	**155**	**-5**	**390**	**945**	**109**	
	Mid 2011 - Mid 2016	**4,490**	**4,280**	**255**	**4,025**	**2,075**	**155**	**435**	**-430**	**2,235**	**232**	
	Mid 2016 - Mid 2022	**9,140**	**8,749**	**149**	**8,600**	**1,912**	**505**	**726**	**0**	**3,143**	**135**	
	Mid 2022 - Mid 2032	**21,360**	**20,751**	**388**	**20,363**	**6,374**	**1,136**	**710**	**0**	**8,220**	**353**	
	Mid 2022 - Mid 2041	**39,320**	**38,187**	**675**	**37,512**	**10,710**	**2,366**	**1,590**	**0**	**14,666**	**614**	

[1] Census undercount estimated at approximately 3.0%. Note: Population including the undercount has been rounded.
[2] Includes townhouses and apartments in duplexes.
[3] Includes bachelor, 1-bedroom and 2-bedroom+ apartments.
Source: Derived from County of Wellington Phase 1 MCR Report: Urban Structure and Growth Allocation, Final Report (As Amended January 31, 2022), Watson & Associates Economists Ltd.

DEMAND MANAGEMENT STATISTICS (A.3 CONT'D)

Table A.3-2 Employment and Gross Floor Area (GFA) Forecast, 2022 to 2041

Period	Population	Employment					Gross Floor Area in Square Feet (Estimated)[1]				
		Primary[2]	Industrial	Commercial/ Population Related	Institutional[3]	Total	Primary	Industrial	Commercial/ Population Related	Institutional	Total
Mid 2006	85,470	1,265	10,780	8,115	3,935	24,095					
Mid 2011	86,675	1,360	10,115	7,790	4,935	24,200					
Mid 2016	90,955	1,470	12,015	9,795	4,940	28,220					
Mid 2022	99,704	1,705	12,962	10,832	5,502	31,002					
Mid 2032	120,455	1,874	15,626	12,846	6,116	36,462					
Mid 2041	137,891	1,965	18,648	15,061	7,017	42,690					
Incremental Change											
Mid 2006 - Mid 2011	1,205	95	-665	-325	1,000	105					
Mid 2011 - Mid 2016	4,280	110	1,900	2,005	5	4,020					
Mid 2016 - Mid 2022	8,749	235	947	1,037	562	2,782					
Mid 2022 - Mid 2032	20,751	168	2,664	2,014	614	5,460	588,800	3,729,800	1,006,900	394,600	5,720,100
Mid 2022 - Mid 2041	38,187	260	5,686	4,228	1,515	11,688	908,300	7,960,300	2,114,200	1,029,900	12,012,700
Annual Average											
Mid 2006 - Mid 2011	241	19	-133	-65	200	21					
Mid 2011 - Mid 2016	856	22	380	401	1	804					
Mid 2016 - Mid 2022	1,458	39	158	173	94	464					
Mid 2022 - Mid 2032	2,075	17	266	201	61	546	58,900	373,000	100,700	39,500	572,010
Mid 2022 - Mid 2041	2,010	14	299	223	80	615	47,800	419,000	111,300	54,200	632,200

[1] Square Foot Per Employee Assumptions

Primary	3,500
Industrial	1,400
Commercial/Population Related	500
Institutional	680

[2] Primary industry includes bona-fide, non bona-fide farming and cannabis growing operation related employment.

[3] Forecast institutional employment and gross floor area has been adjusted downward to account for employment associated with special care units.

* Reflects Mid 2022 to Mid 2041 forecast period

Note: Numbers may not add to totals due to rounding.

Source: Derived from County of Wellington Phase 1 MCR Report: Urban Structure and Growth Allocation, Final Report (As Amended January 31, 2022), Watson & Associates Economists Ltd.

A.4 20-Year Capital Needs for Core Assets

The tables in this appendix have been prepared to show the estimated 20-year capital needs for the County's core assets. These projected lifecycle activities and replacements are estimated using the County's AM software and are used to calculate the capital needs for assets across their lifecycle. The lifecycle plan should be used by County staff to inform budgeting decisions, and to assess the effectiveness and validity of the current AM models.

The following pages in this appendix include:

- **Table A.4-1** 20-Year Capital Needs for Bridges, 2024-2043
- **Table A.4-2** 20-Year Capital Needs for Culverts, 2024-2043
- **Table A.4-3** 20-Year Capital Needs for Roads, 2024-2043

20-YEAR CAPITAL NEEDS FOR CORE ASSETS (A.4 CONT'D)

Table A.4-1 20-Year Capital Needs for Bridges, 2024-2043.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
B000012 Crow Bridge								$391,833 Rehab 2													**$391,833**
B000013 Mcmullen Bridge	$4,000,000 Replace																				**$4,000,000**
B000032 Ostrander Bridge	$1,600,000 Replace																				**$1,600,000**
B000058 Irvine River Bridge							$378,583 Rehab 2														**$378,583**
B002095					$353,411 Rehab 2																**$353,411**
B005014 Ranton's Bridge				$341,460 Rehab 3																	**$341,460**
B005015 Bramwell Bridge	$1,200,000 Replace																				**$1,200,000**
B006007			$1,392,593 Replace																		**$1,392,593**
B006008 O'Dwyers Bridge			$329,913 Rehab 2																		**$329,913**
B006009 Townline Bridge		$2,587,500 Replace																			**$2,587,500**
B006010 Spring Creek Bridge	$307,977 Rehab 3														$3,237,389 Replace						**$3,545,366**
B007019 Rothsay Bridge			$2,142,450 Replace																		**$2,142,450**
B007028 Bosworth Bridge	$4,000,000 Replace																				**$4,000,000**
B007045 Moore's Bridge													$465,375 Rehab 1								**$465,375**
B007046 Burnett's Bridge														$481,663 Rehab 1							**$481,663**
B007071 Marden Creek Bridge						$365,780 Rehab 2															**$365,780**
B008018 Lawless Bridge				$341,460 Rehab 3																	**$341,460**
B008022 Walker Bridge						$365,780 Rehab 2															**$365,780**
B008089 Main Street Bridge						$365,780 Rehab 3															**$365,780**
B008116	$900,000 Replace																				**$900,000**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-1 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
B009117			$329,913 Rehab 2																		**$329,913**
B010021 Maxwell Bridge						$365,780 Rehab 2															**$365,780**
B010023 Moorefield Bridge				$341,460 Rehab 3															$3,714,978 Replace		**$4,056,438**
B010024 Wyandot Bridge				$341,460 Rehab 2																	**$341,460**
B010091			$329,913 Rehab 2																		**$329,913**
B011025 Flax Bridge	$2,000,000 Replace																				**$2,000,000**
B011026 Arnold's Bridge						$365,780 Rehab 2															**$365,780**
B011027 Mcnabb Bridge					$353,411 Rehab 2																**$353,411**
B011029 Simmon's Bridge		$318,756 Rehab 2															$534,028 Rehab 3				**$852,785**
B012033 Sanderson Bridge	$1,400,000 Replace																				**$1,400,000**
B012035			$329,913 Rehab 1																		**$329,913**
B012036 Thorpe Bridge							$378,583 Rehab 2														**$378,583**
B012037 Princess Elizabeth Bridge				$4,989,230 Replace																	**$4,989,230**
B012094 Mcgrath Bridge													$465,375 Rehab 2								**$465,375**
B012100	$1,100,000 Replace																				**$1,100,000**
B012119		$318,756 Rehab 1																			**$318,756**
B015102			$329,913 Rehab 1																		**$329,913**
B016003 Arnott Beam Bridge					$353,411 Rehab 2																**$353,411**
B016038 Penfold Bridge														$481,663 Rehab 2							**$481,663**
B016049 Rae Bridge								$391,833 Rehab 1													**$391,833**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-1 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
B016103	$307,977 Rehab 2																			$592,087 Rehab 3	**$900,064**
B016104		$318,756 Rehab 1																		$592,087 Rehab 2	**$910,843**
B017040 Creekbank Bridge													$465,375 Rehab 2								**$465,375**
B017098 Alma Bridge				$341,460 Rehab 2																	**$341,460**
B017114	$1,200,000 Replace																				**$1,200,000**
B017115								$391,833 Rehab 2													**$391,833**
B018050 Salem Bridge																				$592,087 Rehab 1	**$592,087**
B018055 Tower Street Bridge						$365,780 Rehab 1															**$365,780**
B018056 CNR Subway		$318,756 Rehab 3														$3,015,628 Replace					**$3,334,384**
B018090 Carroll Creek Bridge																$515,969 Rehab 1					**$515,969**
B021057 Badley Bridge																				$592,087 Rehab 1	**$592,087**
B022066 Scott Bridge			$329,913 Rehab 1																		**$329,913**
B022107									$405,547 Rehab 2												**$405,547**
B024112			$329,913 Rehab 1																		**$329,913**
B024121	$307,977 Rehab 2																		$572,064 Rehab 3		**$880,041**
B025072 West Credit River Bridge I		$318,756 Rehab 1																		$592,087 Rehab 2	**$910,843**
B025108												$449,637 Rehab 2									**$449,637**
B026048 Belwood Bridge				$341,460 Rehab 3																	**$341,460**
B027106			$329,913 Rehab 1																		**$329,913**
B029065 Dow Bridge		$318,756 Rehab 3																			**$318,756**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-1 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
B029069 Barrie Hill Bridge								$391,833 Rehab 2													**$391,833**
B029083			$329,913 Rehab 2																		**$329,913**
B032085 Blatchford Bridge	$3,000,000 Replace																				**$3,000,000**
B034123 Irish Creek Bridge	$700,000 Replace																				**$700,000**
B035087 Paddock Bridge	$2,700,000 Replace																				**$2,700,000**
B036086	$1,000,000 Replace																				**$1,000,000**
B036122	$800,000 Replace																				**$800,000**
B036150 Bronte Creek Bridge	$307,977 Rehab 1																			$592,087 Rehab 2	**$900,064**
B038078 Monkey Bridge				$341,460 Rehab 2																	**$341,460**
B038113			$329,913 Rehab 2																		**$329,913**
B041084 Watson Rd Bridge						$365,780 Rehab 2															**$365,780**
B042080		$318,756 Rehab 1																			**$318,756**
B042110				$341,460 Rehab 2																	**$341,460**
B042111																$515,969 Rehab 1					**$515,969**
B043054 Caldwell Bridge		$318,756 Rehab 3															$8,669,930 Replace				**$8,988,687**
B044093 Eramosa River Bridge I				$341,460 Rehab 2																	**$341,460**
B044112	$307,977 Rehab 1																		$572,064 Rehab 2		**$880,041**
B045092 Glen Allan Bridge			$329,913 Rehab 1																		**$329,913**
B049097 Everton Bridge					$353,411 Rehab 1																**$353,411**
B052109 Erin Bridge		$318,756 Rehab 2																			**$318,756**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-1 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
B086125 Conestogo R. Bridge (Wallenstein)								$391,833 Rehab 2													**$391,833**
B086126 Smith Creek Bridge			$329,913 Rehab 3																		**$329,913**
B087137 Maitland River Overflow Bridge					$353,411 Rehab 2																**$353,411**
B087138 Maitland Bridge				$341,460 Rehab 2																	**$341,460**
B109127 Elora Street Bridge			$329,913 Rehab 1																		**$329,913**
B109128 Maitland River Bridge							$378,583 Rehab 3														**$378,583**
B109129 Mallet R. Bridge								$391,833 Rehab 3													**$391,833**
B109130 Mitchell's Creek Bridge			$329,913 Rehab 1																		**$329,913**
B109131 Conestogo R. Bridge # 2			$329,913 Rehab 1																		**$329,913**
B109132 Conestogo R. Bridge # 6	$2,800,000 Replace																				**$2,800,000**
B109133 Conestogo R. Bridge #4	$2,500,000 Replace																				**$2,500,000**
B109134 Conestogo R. Bridge # 10	$2,100,000 Replace																				**$2,100,000**
B109141							$378,583 Rehab 3														**$378,583**
B124135 Eramosa River Bridge II																				$592,087 Rehab 1	**$592,087**
B124136 West Credit River Bridge II			$329,913 Rehab 2																		**$329,913**
B900000CNR Trestle Bridge	$307,977 Rehab 3															$21,109,395 Replace					**$21,417,372**
B990000 Hopewell Creek Bridge	$1,100,000 Replace																				**$1,100,000**
Bridges Total	**$35,947,863**	**$5,456,308**	**$8,813,648**	**$8,403,829**	**$1,767,055**	**$2,560,462**	**$1,514,330**	**$2,350,998**	**$405,547**	**-**	-	**$449,637**	**$1,396,124**	**$963,326**	**$3,237,389**	**$25,156,962**	**$9,203,958**	**-**	**$4,859,107**	**$4,144,606**	**$116,631,149**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-2 20-Year Capital Needs for Culverts, 2024-2043.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
C020790			$164,956 Rehab 2																		**$164,956**
C050770				$170,730 Rehab 2																	**$170,730**
C050780													$232,687 Rehab 3								**$232,687**
C060800		$159,378 Rehab 1																			**$159,378**
C060810			$164,956 Rehab 1																		**$164,956**
C060820				$170,730 Rehab 2																$296,043 Rehab 3	**$466,773**
C070290					$176,705 Rehab 1																**$176,705**
C070470					$176,705 Rehab 1																**$176,705**
C070510						$182,890 Rehab 2															**$182,890**
C070960					$176,705 Rehab 2																**$176,705**
C071040		$159,378 Rehab 1																		$296,043 Rehab 2	**$455,421**
C071200 Bosworth Culvert		$159,378 Rehab 1																			**$159,378**
C071270											$217,216 Rehab 3										**$217,216**
C071470 Alma Culvert																			$286,032 Rehab 1		**$286,032**
C080120	$660,000 Replace																				**$660,000**
C090750		$159,378 Rehab 1																			**$159,378**
C090760			$164,956 Rehab 1																		**$164,956**
C100200 Cheese Factory Bridge			$164,956 Rehab 2																$286,032 Rehab 3		**$450,989**
C100940										$209,871 Rehab 2											**$209,871**
C100950						$182,890 Rehab 2															**$182,890**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-2 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
C100970	$400,000 Replace																				**$400,000**
C100980		$159,378 Rehab 2																		$296,043 Rehab 3	**$455,421**
C100990	$600,000 Replace																				**$600,000**
C101000	$1,400,000 Replace																				**$1,400,000**
C101010				$170,730 Rehab 2																	**$170,730**
C101400			$164,956 Rehab 1																		**$164,956**
C109123 Conestogo River Culvert #5	$2,300,000 Replace																				**$2,300,000**
C109142		$159,378 Rehab 1																			**$159,378**
C109143	$1,600,000 Replace																				**$1,600,000**
C110030		$159,378 Rehab 1																			**$159,378**
C110050					$176,705 Rehab 2																**$176,705**
C110900																$257,985 Rehab 1					**$257,985**
C110910			$164,956 Rehab 2																		**$164,956**
C110920											$217,216 Rehab 3										**$217,216**
C110930	$1,100,000 Replace																				**$1,100,000**
C111020						$182,890 Rehab 2															**$182,890**
C111030		$159,378 Rehab 1																			**$159,378**
C111040	$1,100,000 Replace																				**$1,100,000**
C120060		$159,378 Rehab 1																			**$159,378**
C120070														$240,831 Rehab 2							**$240,831**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-2 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
C120080	$660,000 Replace																				**$660,000**
C120240															$249,260 Rehab 2						**$249,260**
C120860	$2,100,000 Replace																				**$2,100,000**
C120870																$257,985 Rehab 1					**$257,985**
C120880			$164,956 Rehab 2																		**$164,956**
C120890						$182,890 Rehab 1															**$182,890**
C120900															$249,260 Rehab 1						**$249,260**
C123122 Maitland R. Culvert		$159,378 Rehab 1																			**$159,378**
C123230	$900,000 Replace																				**$900,000**
C123240			$164,956 Rehab 2																		**$164,956**
C124124	$1,000,000 Replace																				**$1,000,000**
C124130	$900,000 Replace																				**$900,000**
C125125			$164,956 Rehab 2															$276,360 Rehab 3			**$441,316**
C140830		$159,378 Rehab 1																			**$159,378**
C140840										$209,871 Rehab 1											**$209,871**
C140850								$195,916 Rehab 1													**$195,916**
C140860									$202,774 Rehab 1												**$202,774**
C151280	$153,989 Rehab 1																		$286,032 Rehab 2		**$440,021**
C160040									$202,774 Rehab 1												**$202,774**
C160080																				$296,043 Rehab 1	**$296,043**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-2 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
C160110	$660,000 Replace																				**$660,000**
C170700	$153,989 Rehab 1																			$296,043 Rehab 2	**$450,032**
C170710		$159,378 Rehab 1																		$296,043 Rehab 2	**$455,421**
C170720	$1,300,000 Replace																				**$1,300,000**
C170730		$159,378 Rehab 2																			**$159,378**
C170740			$749,858 Replace																		**$749,858**
C180210	$800,000 Replace																				**$800,000**
C180850			$164,956 Rehab 1																		**$164,956**
C180860 Bothwick Drain																				$296,043 Rehab 1	**$296,043**
C190260			$164,956 Rehab 1																		**$164,956**
C191070	$153,989 Rehab 2																			$296,043 Rehab 3	**$450,032**
C191440			$164,956 Rehab 1																		**$164,956**
C191450			$164,956 Rehab 1																		**$164,956**
C210600		$159,378 Rehab 1																			**$159,378**
C220100					$176,705 Rehab 1																**$176,705**
C221100	$400,000 Replace																				**$400,000**
C221110			$428,490 Replace																		**$428,490**
C221460			$164,956 Rehab 1																		**$164,956**
C260126			$164,956 Rehab 2																		**$164,956**
C260740		$159,378 Rehab 1																			**$159,378**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-2 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
C261080			$164,956 Rehab 2																		$164,956
C290110													$232,687 Rehab 2								$232,687
C291050	$1,100,000 Replace																				$1,100,000
C291060			$428,490 Replace																		$428,490
C391150							$189,291 Rehab 2														$189,291
C450010		$159,378 Rehab 1																			$159,378
C461130					$176,705 Rehab 2															$296,043 Rehab 3	$472,749
C860170								$195,916 Rehab 2													$195,916
C860180			$164,956 Rehab 2																		$164,956
C861160 Kirkland Creek Culvert No. 1												$224,819 Rehab 2									$224,819
C861170 Kirkland Creek Culvert No. 2											$217,216 Rehab 2										$217,216
C861180 Kirkland Creek Culvert No. 3							$189,291 Rehab 2														$189,291
C861190 Logel Creek Culvert														$240,831 Rehab 1							$240,831
C861210 Linsman Culvert								$195,916 Rehab 1													$195,916
C861280				$170,730 Rehab 1																	$170,730
C861390 Kirkland Creek Culvert										$209,871 Rehab 1											$209,871
C871430	$153,989 Rehab 1																		$286,032 Rehab 2		$440,021
Culverts Total	**$19,595,954**	**$2,550,051**	**$4,411,097**	**$682,920**	**$1,060,233**	**$731,561**	**$378,583**	**$587,749**	**$405,547**	**$629,612**	**$651,648**	**$224,819**	**$465,375**	**$481,663**	**$498,521**	**$515,969**	**-**	**$276,360**	**$1,144,129**	**$2,664,389**	**$37,956,178**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 20-Year Capital Needs for Roads, 2024-2043.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR001-00000	$44,903 Micro S.								$262,795 M+P/Overlay												**$307,698**
WR002-00000		$17,867 Micro S.								$104,566 M+P/Overlay											**$122,433**
WR002-00519		$2,429 Crack Seal					$17,704 Micro S.							$100,109 M+P/Overlay							**$120,242**
WR002-00952		$2,382,320 Replace							$30,827 Crack Seal					$224,673 Micro S.							**$2,637,820**
WR002-05271	$1,089,325 Replace							$14,096 Crack Seal					$102,732 Micro S.								**$1,206,153**
WR002-07315		$11,456 Crack Seal					$83,491 Micro S.							$472,107 M+P/Overlay							**$567,054**
WR002-09357						$1,503,920 Replace							$19,461 Crack Seal					$141,832 Micro S.			**$1,665,213**
WR003-00000		$11,708 Crack Seal					$85,331 Micro S.														**$97,039**
WR003-02087		$3,708 Crack Seal					$27,026 Micro S.								$158,171 M+P/Overlay						**$188,905**
WR004-00000					$4,054,021 Replace							$52,459 Crack Seal					$382,328 Micro S.				**$4,488,809**
WR005-00000		$21,275 Micro S.							$120,302 M+P/Overlay												**$141,577**
WR005-00618		$273,589 Replace							$3,540 Crack Seal					$25,802 Micro S.							**$302,931**
WR005-01115							$4,058 Crack Seal					$29,574 Micro S.							$167,226 M+P/Overlay		**$200,857**
WR005-01723	$526,124 M+P/Overlay														$3,070,220 Replace						**$3,596,344**
WR005-05282		$531,074 M+P/Overlay														$3,099,106 Replace					**$3,630,180**
WR006-00000		$425,502 M+P/Overlay														$2,483,035 Replace					**$2,908,537**
WR006-02781	$742,398 M+P/Overlay													$4,185,794 Replace							**$4,928,192**
WR006-07803						$1,196,300 Replace							$15,480 Crack Seal					$112,821 Micro S.			**$1,324,601**
WR006-09693					$3,061,462 Replace							$39,616 Crack Seal					$288,721 Micro S.				**$3,389,799**
WR006-14700	$6,597 Crack Seal					$48,077 Micro S.								$281,368 M+P/Overlay							**$336,041**
WR006-15916		$1,324 Crack Seal					$9,649 Micro S.							$54,563 M+P/Overlay							**$65,536**
WR006-16152		$3,338 Crack Seal					$24,328 Micro S.							$137,563 M+P/Overlay							**$165,229**
WR006-16747			$203,015 M+P/Overlay														$1,184,705 Replace				**$1,387,720**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR007-00000						$15,077 Crack Seal					$109,884 Micro S.								$643,092 M+P/Overlay		**$768,053**
WR007-02342								$20,089 Crack Seal					$146,409 Micro S.							$827,879 M+P/Overlay	**$994,377**
WR007-05255		$55,234 M+P/Overlay													$311,422 Replace						**$366,656**
WR007-05616		$7,784 Crack Seal					$56,731 Micro S.							$320,787 M+P/Overlay							**$385,302**
WR007-06541		$4,771 Crack Seal					$34,774 Micro S.							$196,634 M+P/Overlay							**$236,180**
WR007-07108		$164,325 M+P/Overlay														$958,928 Replace					**$1,123,254**
WR007-08182		$17,428 Crack Seal					$127,015 Micro S.							$718,217 M+P/Overlay							**$862,660**
WR007-10253	$333,355 M+P/Overlay														$1,945,307 Replace						**$2,278,661**
WR007-12508						$801,331 Replace							$10,369 Crack Seal					$75,572 Micro S.			**$887,273**
WR007-13774					$540,618 Replace							$6,996 Crack Seal					$50,985 Micro S.				**$598,598**
WR007-14658				$622,194 Replace							$8,051 Crack Seal					$58,678 Micro S.					**$688,924**
WR007-15711		$120,798 Replace							$1,563 Crack Seal					$11,392 Micro S.							**$133,754**
WR007-15930		$1,543 Crack Seal					$11,244 Micro S.								$65,805 M+P/Overlay						**$78,591**
WR007-16205		$14,104 Crack Seal					$102,790 Micro S.							$581,232 M+P/Overlay							**$698,126**
WR007-17881	$20,988 Crack Seal					$152,961 Micro S.								$895,199 M+P/Overlay							**$1,069,148**
WR007-21753		$1,571 Crack Seal					$11,448 Micro S.								$67,001 M+P/Overlay						**$80,020**
WR007-22033		$2,177 Crack Seal					$15,864 Micro S.								$92,845 M+P/Overlay						**$110,885**
WR007-22421	$2,054 Crack Seal					$14,972 Micro S.								$87,624 M+P/Overlay							**$104,651**
WR007-22800	$3,710,847 Replace								$49,699 Crack Seal					$362,212 Micro S.							**$4,122,758**
WR007-29764	$1,846,097 Replace							$23,889 Crack Seal					$174,102 Micro S.								**$2,044,088**
WR007-33228	$1,085,062 Replace							$14,041 Crack Seal					$102,330 Micro S.								**$1,201,433**
WR007-35264	$2,530,922 Replace							$32,750 Crack Seal					$238,687 Micro S.								**$2,802,360**
WR007-40014			$89,789 M+P/Overlay														$523,969 Replace				**$613,758**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR007-40581	$1,632 Crack Seal					$11,891 Micro S.								$69,591 M+P/Overlay							**$83,113**
WR007-40882	$12,041 Micro S.								$70,468 M+P/Overlay												**$82,509**
WR007-41244	$1,384,040 Replace							$17,910 Crack Seal					$130,526 Micro S.								**$1,532,476**
WR007-43841		$95,290 Micro S.								$557,685 M+P/Overlay											**$652,975**
WR008-00000	$21,454 Micro S.								$125,557 M+P/Overlay												**$147,011**
WR008-00645		$4,701 Crack Seal					$34,263 Micro S.							$193,744 M+P/Overlay							**$232,709**
WR008-01483			$1,765 Crack Seal					$12,865 Micro S.								$75,290 M+P/Overlay					**$89,920**
WR008-01788		$836,621 M+P/Overlay													$4,717,045 Replace						**$5,553,666**
WR008-07255			$580,224 M+P/Overlay														$3,385,928 Replace				**$3,966,152**
WR008-10919			$523,512 Replace								$7,011 Crack Seal				$49,372 Micro S.						**$579,895**
WR008-11836		$4,999 Crack Seal					$36,430 Micro S.							$205,998 M+P/Overlay							**$247,426**
WR008-12727		$819 Crack Seal					$5,969 Micro S.								$34,936 M+P/Overlay						**$41,725**
WR008-12873						$455,733 Replace								$6,104 Crack Seal					$44,484 Micro S.		**$506,321**
WR008-13593			$2,695,773 Replace								$36,104 Crack Seal					$263,132 Micro S.					**$2,995,009**
WR008-18514	$950,837 M+P/Overlay														$5,548,653 Replace						**$6,499,489**
WR009-00000		$139,699 Micro S.								$817,589 M+P/Overlay											**$957,288**
WR009-04058	$51,358 Crack Seal					$374,303 Micro S.								$2,190,603 M+P/Overlay							**$2,616,264**
WR009-13533					$3,077,974 Replace							$39,829 Crack Seal					$290,279 Micro S.				**$3,408,082**
WR010-00000		$30,356 Crack Seal					$221,239 Micro S.								$1,294,799 M+P/Overlay						**$1,546,394**
WR010-05411			$30,896 Crack Seal					$225,174 Micro S.								$1,317,827 M+P/Overlay					**$1,573,897**
WR010-10732			$9,406 Crack Seal					$68,555 Micro S.								$401,218 M+P/Overlay					**$479,179**
WR010-12352		$6,788 Crack Seal					$49,473 Micro S.							$279,750 M+P/Overlay							**$336,011**
WR010-13562	$22,804 Crack Seal					$166,194 Micro S.								$972,651 M+P/Overlay							**$1,161,649**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR010-17769				$284,212 Replace								$3,806 Crack Seal					$27,742 Micro S.				**$315,760**
WR010-18250			$1,906,794 Replace							$24,674 Crack Seal					$179,827 Micro S.						**$2,111,295**
WR011-00000	$14,781 Crack Seal					$107,728 Micro S.								$630,477 M+P/Overlay							**$752,987**
WR011-02727		$6,749 Crack Seal					$49,187 Micro S.							$278,131 M+P/Overlay							**$334,067**
WR011-03930		$6,463 Crack Seal					$47,102 Micro S.								$275,662 M+P/Overlay						**$329,227**
WR011-05082		$19,382 Micro S.								$113,431 M+P/Overlay											**$132,813**
WR011-05645		$3,022,166 Replace							$39,107 Crack Seal					$285,015 Micro S.							**$3,346,288**
WR011-11124					$2,024,259 Replace							$26,194 Crack Seal					$190,904 Micro S.				**$2,241,357**
WR011-14434						$506,370 Replace							$6,552 Crack Seal					$47,755 Micro S.			**$560,678**
WR011-15234	$4,357 Micro S.							$24,638 M+P/Overlay													**$28,996**
WR011-15365	$35,775 M+P/Overlay														$208,765 Replace						**$244,539**
WR011-15607	$2,046,482 Replace								$27,409 Crack Seal					$199,755 Micro S.							**$2,273,645**
WR011-19446		$154,380 M+P/Overlay													$870,428 Replace						**$1,024,808**
WR011-20456	$3,415 Crack Seal					$24,888 Micro S.								$145,655 M+P/Overlay							**$173,957**
WR011-21086						$1,404,545 Replace								$18,811 Crack Seal					$137,096 Micro S.		**$1,560,452**
WR011-23304	$1,138,888 Replace								$15,253 Crack Seal					$111,166 Micro S.							**$1,265,307**
WR012-00000				$1,793,314 Replace							$23,206 Crack Seal					$169,124 Micro S.					**$1,985,644**
WR012-03035						$736,769 Replace							$9,534 Crack Seal					$69,483 Micro S.			**$815,786**
WR012-04198			$632,008 M+P/Overlay													$3,563,392 Replace					**$4,195,400**
WR012-08189			$1,999,850 Replace							$25,878 Crack Seal					$188,602 Micro S.						**$2,214,331**
WR012-11692					$1,117,929 Replace							$14,466 Crack Seal					$105,430 Micro S.				**$1,237,825**
WR012-13721		$606,963 M+P/Overlay													$3,422,187 Replace						**$4,029,150**
WR012-17688				$2,615,816 Replace								$35,034 Crack Seal					$255,327 Micro S.				**$2,906,177**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR012-22115			$2,257,895 Replace							$29,217 Crack Seal					$212,938 Micro S.						**$2,500,051**
WR012-26071			$958 Crack Seal					$6,982 Micro S.								$40,865 M+P/Overlay					**$48,805**
WR012-26235			$1,126 Crack Seal					$8,210 Micro S.								$48,047 M+P/Overlay					**$57,383**
WR014-00000		$2,951 Crack Seal					$21,507 Micro S.								$125,867 M+P/Overlay						**$150,324**
WR014-00588		$20,759 Micro S.							$117,382 M+P/Overlay												**$138,140**
WR014-01190		$27,624 Crack Seal					$201,327 Micro S.								$1,178,264 M+P/Overlay						**$1,407,216**
WR014-06114		$11,815 Crack Seal					$86,108 Micro S.								$503,945 M+P/Overlay						**$601,868**
WR014-08220	$27,677 Crack Seal					$201,709 Micro S.								$1,180,498 M+P/Overlay							**$1,409,883**
WR014-13327		$11,641 Crack Seal					$84,840 Micro S.							$479,736 M+P/Overlay							**$576,218**
WR014-15401		$17,156 Crack Seal					$125,032 Micro S.								$731,749 M+P/Overlay						**$873,937**
WR014-18460			$51,150 M+P/Overlay													$288,393 Replace					**$339,542**
WR015-00000	$29,552 Crack Seal					$215,377 Micro S.								$1,260,492 M+P/Overlay							**$1,505,422**
WR016-00000				$3,694,759 Replace							$47,810 Crack Seal					$348,446 Micro S.					**$4,091,016**
WR016-06253			$3,780,476 Replace							$48,920 Crack Seal					$356,530 Micro S.						**$4,185,926**
WR016-12875						$5,204,222 Replace								$69,700 Crack Seal					$507,979 Micro S.		**$5,781,902**
WR016-21097	$2,938,087 Replace							$38,019 Crack Seal					$277,086 Micro S.								**$3,253,192**
WR016-26610	$29,351 Crack Seal					$213,916 Micro S.								$1,251,938 M+P/Overlay							**$1,495,205**
WR017-00000						$9,290 Crack Seal					$67,704 Micro S.								$396,235 M+P/Overlay		**$473,228**
WR017-01443					$1,292,835 Replace							$16,729 Crack Seal					$121,925 Micro S.				**$1,431,489**
WR017-03557		$127,306 Micro S.								$745,058 M+P/Overlay											**$872,364**
WR017-07255	$16,032 Micro S.							$90,654 M+P/Overlay													**$106,687**
WR017-07737		$1,616 Crack Seal					$11,775 Micro S.							$66,585 M+P/Overlay							**$79,976**
WR017-08025			$2,456 Crack Seal					$17,901 Micro S.								$104,762 M+P/Overlay					**$125,119**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR017-08448			$2,377,213 Replace							$30,761 Crack Seal					$224,191 Micro S.						**$2,632,165**
WR018-00000	$3,364,970 Replace							$43,543 Crack Seal					$317,345 Micro S.								**$3,725,858**
WR018-06314			$3,780 Crack Seal					$27,549 Micro S.								$161,230 M+P/Overlay					**$192,559**
WR018-06965			$1,138 Crack Seal					$8,294 Micro S.								$48,542 M+P/Overlay					**$57,975**
WR018-07161			$58,434 M+P/Overlay														$340,995 Replace				**$399,430**
WR018-07530		$86,906 M+P/Overlay														$507,143 Replace					**$594,048**
WR018-08098	$781 Crack Seal					$5,689 Micro S.							$32,167 M+P/Overlay								**$38,636**
WR018-08242	$2,336 Crack Seal					$17,026 Micro S.								$99,646 M+P/Overlay							**$119,009**
WR018-08673								$2,179 Crack Seal					$15,882 Micro S.							$89,808 M+P/Overlay	**$107,869**
WR018-08989	$88,254 M+P/Overlay														$515,010 Replace						**$603,264**
WR018-09586						$244,957 Replace							$3,170 Crack Seal					$23,101 Micro S.			**$271,228**
WR018-09973		$479,206 M+P/Overlay														$2,796,428 Replace					**$3,275,634**
WR018-13105					$363,266 Replace								$4,865 Crack Seal					$35,458 Micro S.			**$403,589**
WR018-13699	$41,096 M+P/Overlay													$231,711 Replace							**$272,807**
WR018-13978			$159,851 Replace							$2,068 Crack Seal					$15,075 Micro S.						**$176,995**
WR018-14259		$1,694 Crack Seal					$12,348 Micro S.							$69,822 M+P/Overlay							**$83,864**
WR018-14560		$1,481 Crack Seal					$10,794 Micro S.								$63,173 M+P/Overlay						**$75,448**
WR018-14823						$532,322 Replace							$6,888 Crack Seal					$50,202 Micro S.			**$589,413**
WR018-15664						$153,177 Replace								$2,051 Crack Seal					$14,951 Micro S.		**$170,180**
WR018-15906				$530,608 Replace							$6,866 Crack Seal					$50,041 Micro S.					**$587,515**
WR018-16804			$1,215,438 Replace							$15,728 Crack Seal					$114,626 Micro S.						**$1,345,792**
WR018-18933						$4,152 Crack Seal				$29,239 Micro S.								$171,122 M+P/Overlay			**$204,513**
WR018-19578						$38,530 Crack Seal				$271,312 Micro S.								$1,587,852 M+P/Overlay			**$1,897,694**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR018-25563						$8,820 Crack Seal				$62,105 Micro S.								$363,468 M+P/Overlay			**$434,393**
WR019-00000					$620,120 Replace								$8,305 Crack Seal					$60,529 Micro S.			**$688,955**
WR019-01014					$231,169 Replace							$2,991 Crack Seal					$21,801 Micro S.				**$255,962**
WR019-01393			$25,926 Crack Seal					$188,950 Micro S.								$1,105,825 M+P/Overlay					**$1,320,701**
WR019-05858			$7,148 Crack Seal					$52,093 Micro S.								$304,876 M+P/Overlay					**$364,117**
WR019-07088	$7,372 Crack Seal					$53,726 Micro S.								$314,429 M+P/Overlay							**$375,527**
WR019-08449	$8,852 Crack Seal					$64,510 Micro S.								$377,547 M+P/Overlay							**$450,909**
WR019-10082	$5,540 Crack Seal					$40,373 Micro S.								$236,285 M+P/Overlay							**$282,198**
WR019-11104		$12,290 Micro S.							$69,495 M+P/Overlay												**$81,785**
WR019-11461				$851,455 Replace							$11,018 Crack Seal					$80,299 Micro S.					**$942,772**
WR021-00000				$1,643,231 Replace							$21,264 Crack Seal					$154,970 Micro S.					**$1,819,465**
WR021-02781					$470,900 Replace								$6,307 Crack Seal					$45,964 Micro S.			**$523,171**
WR021-03551					$2,410,764 Replace							$31,195 Crack Seal					$227,355 Micro S.				**$2,669,314**
WR021-07493				$291,894 Replace								$3,909 Crack Seal					$28,491 Micro S.				**$324,294**
WR021-07987			$581 Crack Seal					$4,232 Micro S.								$24,767 M+P/Overlay					**$29,579**
WR021-08140			$1,812 Crack Seal					$13,203 Micro S.								$77,272 M+P/Overlay					**$92,286**
WR022-00000				$2,352,285 Replace							$30,439 Crack Seal					$221,840 Micro S.					**$2,604,563**
WR022-03982	$2,250,597 Replace								$30,142 Crack Seal					$219,679 Micro S.							**$2,500,418**
WR022-08204		$2,263,177 Replace							$29,286 Crack Seal					$213,436 Micro S.							**$2,505,899**
WR022-12375						$17,704 Crack Seal					$129,026 Micro S.							$729,589 M+P/Overlay			**$876,319**
WR022-15124							$27,482 Crack Seal					$200,289 Micro S.							$1,132,550 M+P/Overlay		**$1,360,321**
WR022-19249	$1,312,360 Replace							$16,982 Crack Seal					$123,766 Micro S.								**$1,453,108**
WR022-21711	$1,664 Crack Seal					$12,128 Micro S.								$70,978 M+P/Overlay							**$84,770**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR022-22018		$1,494,811 Replace								$20,020 Crack Seal				$140,973 Micro S.							**$1,655,804**
WR022-24748		$1,696,693 Replace								$22,724 Crack Seal				$160,012 Micro S.							**$1,879,429**
WR023-00000	$61,940 M+P/Overlay														$361,456 Replace						**$423,396**
WR023-00419	$450,879 M+P/Overlay													$2,542,149 Replace							**$2,993,028**
WR024-00000						$443,074 Replace							$5,733 Crack Seal					$41,786 Micro S.			**$490,593**
WR024-00700			$742,165 Replace							$9,604 Crack Seal					$69,992 Micro S.						**$821,761**
WR024-02000			$611,430 Replace							$7,912 Crack Seal					$57,663 Micro S.						**$677,005**
WR024-03071	$43,018 M+P/Overlay														$251,035 Replace						**$294,053**
WR024-03362				$1,281,614 Replace							$16,584 Crack Seal					$120,867 Micro S.					**$1,419,065**
WR024-05531	$297,284 M+P/Overlay														$1,734,817 Replace						**$2,032,101**
WR024-07542			$954,900 M+P/Overlay														$5,572,365 Replace				**$6,527,265**
WR024-13572					$765,060 Replace							$9,900 Crack Seal					$72,151 Micro S.				**$847,111**
WR024-14823			$247,198 Replace								$3,311 Crack Seal					$24,129 Micro S.					**$274,638**
WR024-15256				$179,036 Replace							$2,317 Crack Seal					$16,885 Micro S.					**$198,237**
WR024-15559				$2,448,598 Replace								$32,794 Crack Seal					$239,005 Micro S.				**$2,720,397**
WR025-00000			$7,113 Crack Seal					$51,840 Micro S.								$303,390 M+P/Overlay					**$362,342**
WR025-01225	$3,202,424 Replace							$41,440 Crack Seal					$302,015 Micro S.								**$3,545,879**
WR025-07234	$473,496 M+P/Overlay														$2,763,112 Replace						**$3,236,608**
WR025-10437	$1,661,700 Replace							$21,503 Crack Seal					$156,712 Micro S.								**$1,839,915**
WR026-00000		$748,797 M+P/Overlay														$4,369,642 Replace					**$5,118,439**
WR026-04894					$508,205 Replace							$6,576 Crack Seal					$47,928 Micro S.				**$562,709**
WR026-05725			$1,048,737 Replace							$13,571 Crack Seal					$98,905 Micro S.						**$1,161,212**
WR026-07562	$1,222,027 Replace								$16,367 Crack Seal					$119,281 Micro S.							**$1,357,674**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR026-09855	$2,726,510 Replace							$35,281 Crack Seal					$257,133 Micro S.								**$3,018,924**
WR026-14971			$1,705,839 Replace							$22,074 Crack Seal					$160,875 Micro S.						**$1,888,787**
WR026-17959				$410,660 Replace								$5,500 Crack Seal				$38,729 Micro S.					**$454,889**
WR027-00000	$103,776 M+P/Overlay														$605,590 Replace						**$709,366**
WR027-00702			$1,481 Crack Seal					$10,791 Micro S.								$63,155 M+P/Overlay					**$75,426**
WR027-00957			$2,153,992 Replace								$28,848 Crack Seal					$210,249 Micro S.					**$2,393,090**
WR029-00000		$5,341 Crack Seal					$38,924 Micro S.							$220,101 M+P/Overlay							**$264,366**
WR029-00952	$1,515,143 Replace							$19,606 Crack Seal					$142,891 Micro S.								**$1,677,639**
WR029-03795	$17,237 Crack Seal					$125,624 Micro S.							$710,348 M+P/Overlay								**$853,208**
WR029-06975		$6,934 Crack Seal					$50,536 Micro S.							$285,761 M+P/Overlay							**$343,231**
WR029-08211			$23,789 Crack Seal					$173,377 Micro S.								$1,014,684 M+P/Overlay					**$1,211,850**
WR029-12308			$18,679 Crack Seal					$136,137 Micro S.								$796,739 M+P/Overlay					**$951,555**
WR029-15525			$4,198 Crack Seal					$30,596 Micro S.								$179,062 M+P/Overlay					**$213,856**
WR029-16248			$21,635 Crack Seal					$157,677 Micro S.								$922,801 M+P/Overlay					**$1,102,112**
WR029-19974			$21,147 Crack Seal					$154,122 Micro S.								$901,997 M+P/Overlay					**$1,077,266**
WR030-00000				$2,294,378 Replace							$29,689 Crack Seal					$216,379 Micro S.					**$2,540,447**
WR030-03883						$13,094 Crack Seal					$95,433 Micro S.							$539,631 M+P/Overlay			**$648,158**
WR030-05917				$1,504,375 Replace							$19,467 Crack Seal					$141,875 Micro S.					**$1,665,717**
WR031-00000		$281,373 M+P/Overlay														$1,641,964 Replace					**$1,923,337**
WR032-00000								$12,855 Crack Seal				$90,517 Micro S.								$529,752 M+P/Overlay	**$633,124**
WR032-01868								$4,041 Crack Seal				$28,457 Micro S.								$166,542 M+P/Overlay	**$199,040**
WR032-02450			$1,064,151 Replace								$14,252 Crack Seal					$103,871 Micro S.					**$1,182,274**
WR032-04548			$2,999,490 Replace								$40,172 Crack Seal					$292,777 Micro S.					**$3,332,439**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR032-09803	$14,760 Crack Seal					$107,570 Micro S.								$629,553 M+P/Overlay							**$751,882**
WR032-12525		$15,512 Crack Seal				$109,229 Micro S.								$639,263 M+P/Overlay							**$764,004**
WR033-00000		$159,735 M+P/Overlay														$932,143 Replace					**$1,091,878**
WR033-00522			$244,822 M+P/Overlay														$1,428,669 Replace				**$1,673,491**
WR033-01295				$781,731 Replace								$10,470 Crack Seal					$76,304 Micro S.				**$868,505**
WR034-00000			$1,116,673 Replace							$14,450 Crack Seal					$105,312 Micro S.						**$1,236,435**
WR034-02169			$1,118,957 Replace								$14,986 Crack Seal					$109,220 Micro S.					**$1,243,164**
WR034-04129						$1,246,304 Replace							$16,127 Crack Seal					$117,537 Micro S.			**$1,379,968**
WR034-06283			$1,129,804 Replace								$15,131 Crack Seal					$110,279 Micro S.					**$1,255,215**
WR034-08262			$493,255 Replace								$6,606 Crack Seal				$46,518 Micro S.						**$546,379**
WR034-09126	$1,505,550 Replace								$20,164 Crack Seal					$146,955 Micro S.							**$1,672,669**
WR034-12090			$11,979 Crack Seal					$87,302 Micro S.								$510,933 M+P/Overlay					**$610,214**
WR034-14153	$24,099 Crack Seal					$175,636 Micro S.							$993,147 M+P/Overlay								**$1,192,882**
WR035-00000	$291,517 Replace							$3,772 Crack Seal					$27,492 Micro S.								**$322,782**
WR035-00547	$2,597,006 Replace							$33,605 Crack Seal					$244,919 Micro S.								**$2,875,531**
WR035-05420		$228,359 Replace							$2,955 Crack Seal					$21,536 Micro S.							**$252,850**
WR035-05834	$347,476 Replace							$4,496 Crack Seal					$32,770 Micro S.								**$384,742**
WR035-06699					$1,843,237 Replace							$23,852 Crack Seal					$173,833 Micro S.				**$2,040,922**
WR036-00000				$398,843 Replace							$5,161 Crack Seal					$37,614 Micro S.					**$441,618**
WR036-00675				$725,007 Replace							$9,382 Crack Seal					$68,374 Micro S.					**$802,763**
WR036-01902			$2,412,608 Replace							$31,219 Crack Seal					$227,529 Micro S.						**$2,671,357**
WR036-06128		$127,605 M+P/Overlay													$719,462 Replace						**$847,066**
WR036-06962			$2,288 Crack Seal					$16,673 Micro S.								$97,580 M+P/Overlay					**$116,541**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR037-00000						$1,086,165 Replace							$14,055 Crack Seal					$102,434 Micro S.			**$1,202,654**
WR037-01716		$1,857 Crack Seal					$13,534 Micro S.								$79,205 M+P/Overlay						**$94,596**
WR037-02047		$797 Crack Seal					$5,806 Micro S.								$33,979 M+P/Overlay						**$40,582**
WR037-02189												$1,687,641 Replace							$21,838 Crack Seal		**$1,709,479**
WR038-00000						$23,530 Crack Seal					$171,488 Micro S.								$1,003,630 M+P/Overlay		**$1,198,647**
WR039-00000						$1,436,193 Replace								$19,235 Crack Seal					$140,186 Micro S.		**$1,595,614**
WR039-02269	$105,572 Micro S.								$617,859 M+P/Overlay												**$723,431**
WR041-00000			$1,661 Crack Seal					$12,103 Micro S.							$68,437 M+P/Overlay						**$82,201**
WR041-00286		$7,753 Crack Seal					$56,506 Micro S.								$330,699 M+P/Overlay						**$394,958**
WR041-01668		$2,934 Crack Seal					$21,384 Micro S.								$125,149 M+P/Overlay						**$149,467**
WR042-00000	$102,002 M+P/Overlay														$595,238 Replace						**$697,240**
WR042-00690				$2,702,675 Replace								$36,197 Crack Seal				$254,885 Micro S.					**$2,993,757**
WR042-05264			$1,376 Crack Seal					$10,029 Micro S.								$58,697 M+P/Overlay					**$70,102**
WR043-00000					$403,017 Replace							$5,215 Crack Seal					$38,008 Micro S.				**$446,240**
WR043-00659					$344,307 Replace							$4,455 Crack Seal					$32,471 Micro S.				**$381,234**
WR043-01223			$703 Crack Seal					$5,120 Micro S.								$29,967 M+P/Overlay					**$35,791**
WR043-01343			$1,492 Crack Seal					$10,876 Micro S.								$63,650 M+P/Overlay					**$76,018**
WR043-01600					$502,090 Replace								$6,724 Crack Seal					$49,009 Micro S.			**$557,823**
WR044-00000				$12,176 Crack Seal					$88,737 Micro S.								$519,332 M+P/Overlay				**$620,244**
WR044-02026			$6,219 Crack Seal					$45,323 Micro S.								$265,249 M+P/Overlay					**$316,791**
WR045-00000	$9,361 Crack Seal					$68,224 Micro S.							$385,777 M+P/Overlay								**$463,362**
WR045-01727		$2,642 Crack Seal				$18,607 Micro S.								$108,894 M+P/Overlay							**$130,143**
WR045-02198	$37,419 Micro S.								$218,995 M+P/Overlay												**$256,415**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR045-03323	$6,076 Crack Seal					$44,284 Micro S.								$259,173 M+P/Overlay							**$309,534**
WR046-00000		$15,358 Crack Seal					$111,928 Micro S.								$655,057 M+P/Overlay						**$782,342**
WR046-01095			$5,586 Crack Seal					$40,710 Micro S.								$238,254 M+P/Overlay					**$284,550**
WR046-01852			$11,868 Crack Seal					$86,498 Micro S.								$506,228 M+P/Overlay					**$604,594**
WR046-03077		$11,080 Crack Seal					$80,752 Micro S.							$456,616 M+P/Overlay							**$548,448**
WR049-00000		$12,870 Crack Seal					$93,795 Micro S.							$530,369 M+P/Overlay							**$637,033**
WR050-00000			$6,166 Crack Seal					$44,942 Micro S.								$263,020 M+P/Overlay					**$314,129**
WR050-01062						$3,952,221 Replace							$51,142 Crack Seal					$372,727 Micro S.			**$4,376,091**
WR050-07306			$7,879 Crack Seal					$57,425 Micro S.								$336,082 M+P/Overlay					**$401,387**
WR050-08663						$18,277 Crack Seal					$133,202 Micro S.								$779,564 M+P/Overlay		**$931,042**
WR050-11502			$15,701 Crack Seal					$114,428 Micro S.								$669,687 M+P/Overlay					**$799,815**
WR051-00000					$1,337,478 Replace							$17,307 Crack Seal					$126,135 Micro S.				**$1,480,921**
WR051-02187				$435,477 Replace							$5,635 Crack Seal					$41,069 Micro S.					**$482,181**
WR051-02925			$244,980 M+P/Overlay														$1,429,593 Replace				**$1,674,574**
WR051-04472			$13,088 Crack Seal					$95,385 Micro S.								$558,237 M+P/Overlay					**$666,710**
WR052-00000	$242,487 Replace							$3,138 Crack Seal					$22,869 Micro S.								**$268,493**
WR052-00455	$1,511,945 Replace							$19,565 Crack Seal					$142,589 Micro S.								**$1,674,099**
WR085-00000						$363,321 Replace								$4,866 Crack Seal					$35,463 Micro S.		**$403,650**
WR086-00000		$126,411 Micro S.								$739,819 M+P/Overlay											**$866,230**
WR086-03672		$10,306 Crack Seal					$75,109 Micro S.								$439,576 M+P/Overlay						**$524,991**
WR086-05509			$32,621 Crack Seal					$237,742 Micro S.								$1,391,383 M+P/Overlay					**$1,661,746**
WR086-11128					$3,376,415 Replace							$43,691 Crack Seal					$318,424 Micro S.				**$3,738,530**
WR086-16648					$2,259,097 Replace							$29,233 Crack Seal					$213,052 Micro S.				**$2,501,382**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR086-20342	$61,368 Micro S.								$359,153 M+P/Overlay												**$420,520**
WR086-22187							$21,708 Crack Seal					$158,211 Micro S.							$894,617 M+P/Overlay		**$1,074,537**
WR086-25446						$1,614,056 Replace							$20,886 Crack Seal					$152,219 Micro S.			**$1,787,161**
WR086-27995						$1,886,230 Replace							$24,408 Crack Seal					$177,887 Micro S.			**$2,088,525**
WR086-30976					$1,384,569 Replace								$18,544 Crack Seal					$135,146 Micro S.			**$1,538,258**
WR087-00000			$34,984 Crack Seal					$254,966 Micro S.								$1,492,183 M+P/Overlay					**$1,782,133**
WR087-06025		$5,251 Crack Seal					$38,270 Micro S.							$216,401 M+P/Overlay							**$259,923**
WR109-00000		$2,373 Crack Seal					$17,295 Micro S.								$101,220 M+P/Overlay						**$120,888**
WR109-00423			$3,879 Crack Seal					$28,268 Micro S.								$165,440 M+P/Overlay					**$197,588**
WR109-01091		$1,229 Crack Seal					$8,954 Micro S.							$50,632 M+P/Overlay							**$60,815**
WR109-01310			$3,513 Crack Seal					$25,602 Micro S.							$144,771 M+P/Overlay						**$173,886**
WR109-02134	$5,188,684 Replace							$67,142 Crack Seal					$489,336 Micro S.								**$5,745,162**
WR109-12118				$7,680 Crack Seal					$55,975 Micro S.								$327,594 M+P/Overlay				**$391,250**
WR109-13396				$27,476 Crack Seal					$200,249 Micro S.								$1,171,957 M+P/Overlay				**$1,399,683**
WR109-17968				$36,719 Crack Seal					$267,612 Micro S.								$1,566,198 M+P/Overlay				**$1,870,530**
WR109-24078				$34,886 Crack Seal					$254,254 Micro S.								$1,488,016 M+P/Overlay				**$1,777,156**
WR109-29883						$34,413 M+P/Overlay														$200,816 Replace	**$235,229**
WR109-30079		$2,014 Crack Seal					$14,678 Micro S.								$85,905 M+P/Overlay						**$102,598**
WR109-30439			$3,181,606 Replace								$42,611 Crack Seal					$310,554 Micro S.					**$3,534,771**
WR109-36011								$38,088 Crack Seal					$277,589 Micro S.							$1,569,645 M+P/Overlay	**$1,885,322**
WR109-41534								$5,855 Crack Seal					$42,671 Micro S.							$241,287 M+P/Overlay	**$289,813**
WR123-00000						$411,426 Replace								$5,510 Crack Seal					$40,159 Micro S.		**$457,095**
WR123-00650					$298,441 Replace							$3,862 Crack Seal					$28,145 Micro S.				**$330,448**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR123-01138					$86,230 Replace							$1,116 Crack Seal					$8,132 Micro S.				**$95,478**
WR123-01279				$469,157 Replace								$6,283 Crack Seal					$45,794 Micro S.				**$521,234**
WR123-02073	$11,375 Micro S.								$66,575 M+P/Overlay												**$77,950**
WR123-02415								$43,619 Crack Seal				$307,147 Micro S.								$1,797,575 M+P/Overlay	**$2,148,341**
WR124-00000		$7,607 Crack Seal					$55,443 Micro S.								$324,477 M+P/Overlay						**$387,527**
WR124-00798	$804,736 Replace							$10,413 Crack Seal					$75,893 Micro S.								**$891,043**
WR124-02308	$196,121 Replace								$2,627 Crack Seal					$19,143 Micro S.							**$217,891**
WR124-02676	$1,981,996 Replace							$25,647 Crack Seal					$186,919 Micro S.								**$2,194,562**
WR124-06396		$27,950 Crack Seal					$203,699 Micro S.							$1,151,829 M+P/Overlay							**$1,383,477**
WR124-11377	$2,367,310 Replace							$30,633 Crack Seal					$223,257 Micro S.								**$2,621,200**
WR124-15819	$324,026 Replace							$4,193 Crack Seal					$30,558 Micro S.								**$358,778**
WR124-16427		$14,011 Crack Seal					$102,115 Micro S.							$577,417 M+P/Overlay							**$693,544**
WR124-18093		$237,736 Replace							$3,076 Crack Seal					$22,420 Micro S.							**$263,232**
WR124-18523	$746,113 Replace							$9,655 Crack Seal					$70,365 Micro S.								**$826,133**
WR124-19923	$1,537,526 Replace							$19,896 Crack Seal					$145,001 Micro S.								**$1,702,423**
WR124-22808					$258,689 Replace							$3,347 Crack Seal					$24,397 Micro S.				**$286,433**
WR124-23231		$16,174 Crack Seal					$117,877 Micro S.								$689,873 M+P/Overlay						**$823,924**
WR124-25153	$2,423,802 Replace							$31,364 Crack Seal					$228,585 Micro S.								**$2,683,750**
WR124-29700		$1,477,712 Replace							$19,122 Crack Seal					$139,360 Micro S.							**$1,636,194**
WR124-32379	$5,422 Micro S.								$31,730 M+P/Overlay												**$37,152**
WR124-32542						$179,762 Replace							$2,326 Crack Seal					$16,953 Micro S.			**$199,041**
WR124-32826				$284,212 Replace								$3,806 Crack Seal					$27,742 Micro S.				**$315,760**
WR124-33308						$762,721 Replace							$9,870 Crack Seal					$71,931 Micro S.			**$844,521**

* Includes backlog from previous years.

20-Year Capital Needs for Core Assets (A.4 cont'd)

Table A.4-3 Continued.

Asset ID/Name	2024* 5% inflation	2025 3.5%	2026 3.5%	2027 3.5%	2028 3.5%	2029 3.5%	2030 3.5%	2031 3.5%	2032 3.5%	2033 3.5%	2034 3.5%	2035 3.5%	2036 3.5%	2037 3.5%	2038 3.5%	2039 3.5%	2040 3.5%	2041 3.5%	2042 3.5%	2043 3.5%	20-Year Total
WR124-34571		$264,764 Replace							$3,426 Crack Seal					$24,969 Micro S.							**$293,159**
WR124-35051		$1,555,486 Replace								$20,833 Crack Seal					$151,830 Micro S.						**$1,728,148**
WR125-00000					$1,901,947 Replace							$24,611 Crack Seal					$179,369 Micro S.				**$2,105,928**
WR125-03110	$701,153 M+P/Overlay														$4,091,614 Replace						**$4,792,767**
RAB-WR005-WR109-8thLi			$15,018 Micro S.							$84,922 Micro S.											**$99,940**
RAB-WR007-WR109-WR123					$17,099 Micro S.							$96,690 Micro S.									**$113,789**
RAB-WR008-WR012		$13,633 Micro S.							$77,086 Micro S.												**$90,719**
RAB-WR014-DomvilleSt-ElizaSt		$3,718 Micro S.							$21,024 Micro S.												**$24,742**
RAB-WR021-McNabSt-VictoriaSt			$17,261 Micro S.														$100,728 Replace				**$117,989**
RAB-WR032-WR034							$76,777 Micro S.														**$76,777**
RAB-WR034-WR035							$72,143 Micro S.														**$72,143**
RAB-WR034-WR046		$3,271 Crack Seal					$23,837 Micro S.							$134,789 Micro S.							**$161,896**
RAB-WR046-GilmourRd	$3,838 Crack Seal					$27,969 Micro S.							$158,153 Micro S.								**$189,960**
RAB-WR124-KossuthRd					$24,447 Micro S.							$138,237 Micro S.									**$162,683**
Roads Total	**$62,675,226**	**$20,666,416**	**$40,380,345**	**$28,714,469**	**$34,575,645**	**$28,706,617**	**$2,937,400**	**$3,346,537**	**$3,319,810**	**$3,865,379**	**$1,152,659**	**$3,278,205**	**$7,268,769**	**$29,014,469**	**$41,661,706**	**$38,623,401**	**$22,682,228**	**$5,292,010**	**$5,959,070**	**$5,423,304**	**$389,543,666**

* Includes backlog from previous years.