ASSET MANAGEMENT PLAN

MUNICIPALITY OF SOUTHWEST MIDDLESEX

June 2025

Infralevel

SOUTHWEST MIDDLESEX

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1. Acknowledgements

The development of this Asset Management Plan was a significant corporate-wide initiative involving staff across the organization. Infralevel would like to acknowledge the efforts of the Municipality of Southwest Middlesex staff in the various service areas who participated in the preparation of the asset management plan, providing their time, expertise and support in developing this plan.

This Asset Management Plan reflects a collaborative effort and a shared commitment to building resilient infrastructure and fostering sustainable growth in the Municipality of Southwest Middlesex.

We will begin by acknowledging that the land of Southwest Middlesex is the territory of First Nations people who have longstanding relationships to the land, water and region of Southwestern Ontario. We also acknowledge the watersheds of the local lower Thames River and St. Clair Region communities of this area, which include Chippewas of the Thames First Nation, Oneida Nation of the Thames, Munsee Delaware Nation and Delaware Nation of Moraviantown, Chippewas of Kettle & Stony Point First Nation, Aamjiwnaang First Nation, Bkejwanong Territory, and Caldwell First Nation. We value the significant historical and contemporary contributions of local and regional First Nations and all of the Original peoples of Turtle Island (North America). We are thankful for the opportunity to live, learn and share with mutual respect and appreciation.

2. Executive Summary

This asset management plan serves as a strategic, tactical and financial document ensuring the activities, resources and timelines required for municipal infrastructure are met, while balancing costs, opportunities and risks against the desired performance of assets. Infrastructure plays an essential role in supporting the Municipality's mission and vision:

Mission

Providing responsible, efficient, and effective local services for safe and strong communities by building local economies, affordable and suitable homes, to enhance quality of life for our residents.

Vision

- *Growing Communities through Population Retention and Attraction*
- *A Place Where People Can Live, Work, and Play*
- *Strong Agricultural System*
- *Resilient Natural Environment*
- *Interconnected Systems for Mobility*
- *Open and Responsive Government*

The Municipality's Strategic Asset Management Policy documents the Municipality's commitment to implementing best practices in the following areas:

- Complete and accurate asset data
- Condition assessment protocols
- Risk and criticality models
- Lifecycle management
- Financial strategy development
- Level of service framework

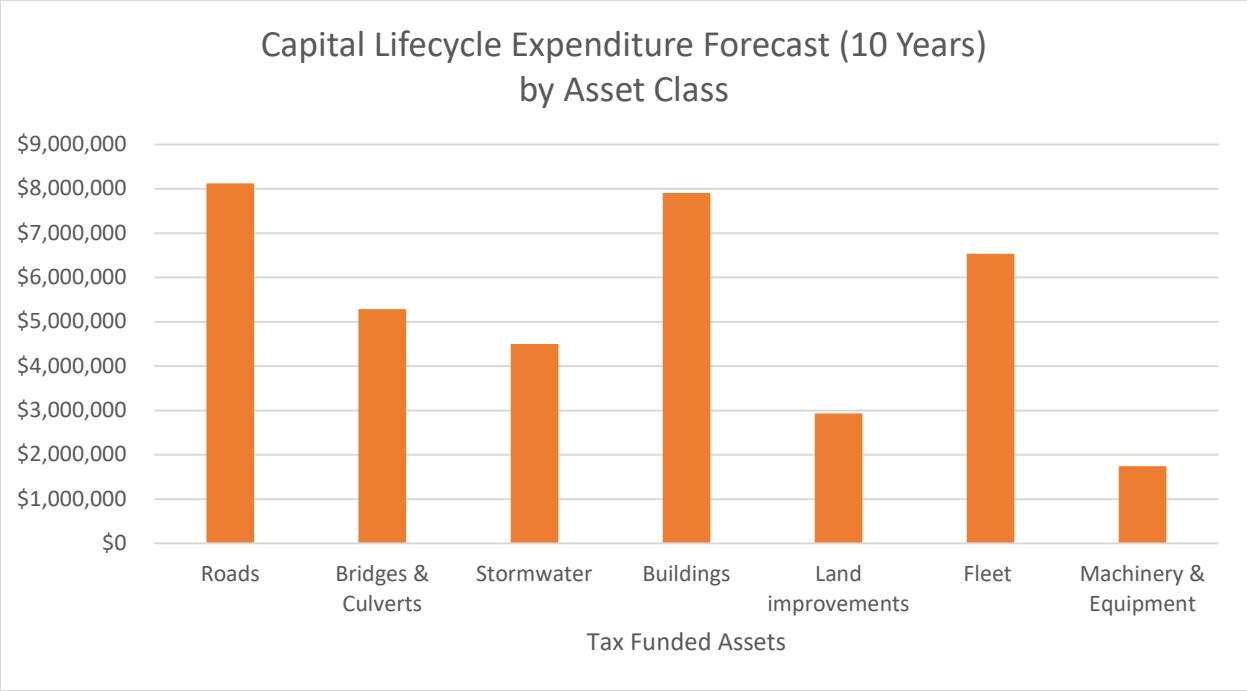
This asset management plan has been developed to support these principles and address the July 1, 2024 and July 1, 2025 requirements of O. Reg. 588/17. It utilizes the best information available to the Municipality at this time and advances asset management maturity through a diligent process.

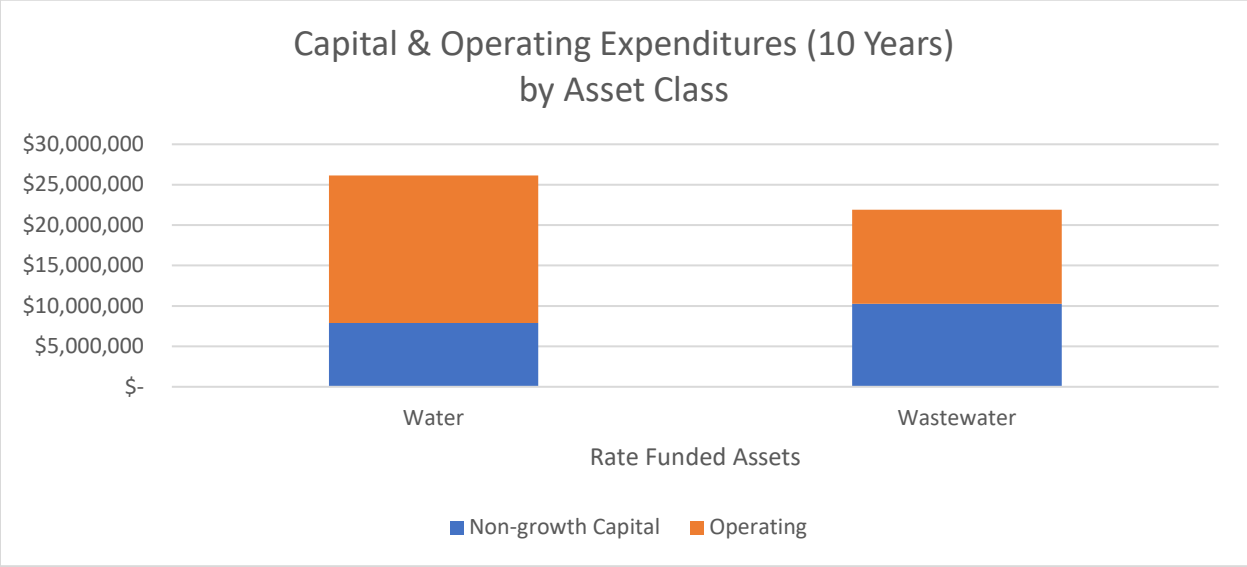
The plan includes all Municipality assets. As detailed in the following table, the Municipality's infrastructure has a replacement value of approximately **$424.2** Million and the overall condition is **Good**.

Asset Class	Replacement Cost (2025$)	Condition
Roads	$224,841,215	Good
Bridges and culverts	$20,725,888	Poor
Water	$78,273,094	Good
Wastewater	$22,293,756	Fair
Stormwater	$17,758,198	Good
Buildings	$43,935,703	Fair
Land improvements	$4,391,785	Poor
Fleet	$9,900,175	Fair
Machinery & Equipment	$2,095,707	Fair
Total:	**$424,215,521**	**Good**

Level of service is a key component of asset management decision-making that describes the planned outcome from the use of the Municipality's assets, from a customer and technical performance perspective. The Municipality's current and proposed level of service statements describe the asset outputs that the Municipality intends to deliver to the community and can be represented in terms of attributes such as availability, cost-effectiveness, reliability, responsiveness, safety, suitability and sustainability.

The Municipality's lifecycle management strategy details the use of a combination of lifecycle activities that maintain these levels of service while planning for growth and striving to optimize costs based on defined risk. The following charts summarize the total capital lifecycle expenditure needs for each asset class, forecast for the next ten years and separated for tax-funded assets and rate-funded assets. The chart for rate-funded assets also includes operating expenses associated with asset management.





A detailed risk assessment process has been completed that identifies the likelihood and consequence of risk and provides mitigation recommendations to ensure the effective management, resilience, and sustainability of public assets. The risk assessment allows for the strategic prioritization of lifecycle activities. The assets identified to be at the highest risk level are typically those that deliver essential services and are beyond their expected service life. The condition of these assets should be assessed and monitored, with capital projects prioritized as required.

A financing strategy has been prepared to outline the recommended use of various funding sources to finance the required lifecycle activities that achieve the current and

proposed levels of service recommendations. The strategy is separated for tax-supported assets and rate-supported assets. The following table shows the funding gap for tax-supported assets.

10-Year Funding Analysis	
Tax-Supported Assets	
Funding Need	$37,028,689
Funding Available	$31,583,610
Funding Gap	**$5,445,079**

To bridge the funding gap for tax-supported assets, it is recommended that the Municipality continue to budget for a capital levy in an ongoing manner, the magnitude of which may be determined as part of the annual budget process. The following table provides a summary of the revenue generated over time by different levels of capital levies.

Timeframe	2% Capital Levy	2.5% Capital Levy	3% Capital Levy
10 years	$2.7M	$3.3M	$4.0M
20 years	$8.0M	$10.3M	$12.8M

Implementing a capital levy provides the following benefits:

- Stable and predictable funding
- Affordability
- Minimized borrowing
- Fair distribution of costs across current taxpayers
- Improved asset management

The following table shows the funding surplus for rate-supported assets.

10-Year Funding Analysis	
Rate-Supported Assets	
Funding Need	$48,068,390
Funding Available	$50,467535
Funding Surplus	**$2,399,145**

For rate-supported assets, it is recommended that the annual funding surplus identified over the 10-year evaluation period be contributed to water/wastewater reserves. To achieve this surplus, 5% annual rate increases are required for the drinking water program; this will prepare for the increased long-term lifecycle cost projections. For wastewater, annual 10% rate increases are required from 2026 to 2029, followed by 5% rate increases from 2030 to 2034.

Purpose

Objectives

Regulatory Environment

Line of Sight

Strategic Alignment

INTRODUCTION

3. Introduction

3.1 Purpose

Municipal asset management planning is the process of making the best possible decisions regarding the building, operating, maintaining, renewing, replacing and disposing of public infrastructure assets. The purpose is to maximize benefits, manage risk, and provide satisfactory levels of service to residents in a sustainable manner.

Asset management requires a thorough understanding of the characteristics and condition of infrastructure assets, as well as the service levels expected from them. It also involves setting strategic priorities to optimize decision making about when and how to proceed with investments. Finally, it requires the development of a financial plan, which is the most critical step in putting the plan into action.

Because it takes a long-term perspective, good asset management can maximize the benefits provided by infrastructure. It also affords the opportunity to achieve cost savings by detecting deterioration early on and taking action to rehabilitate or renew assets.

3.2 Objectives

There are several objectives that this Asset Management Plan will fulfill to enable the Municipality to achieve the full extent of benefits derived from a diligent infrastructure planning process. The key objectives are to:

- **Achieve regulatory compliance**: A comprehensive asset management plan provides compliance with Ontario Regulation 588/17, mitigating the risk of legal and regulatory issues, and ensuring eligibility for ongoing Provincial funding.

- **Engage with stakeholders:** Transparency and accountability are achieved by engaging with stakeholders, including staff and Council, and seeking their input to ensure that the asset management planning process contributes to enhancing residents' quality of life.

- **Maintain a long-term focus:** Financial sustainability over the long term is of primary importance. Significant contributing factors will be weighed, including the implications of climate change, population and employment growth, and future levels of service.

- **Utilize data-driven decision-making:** The asset management plan relies on data collection and analysis, enabling informed decision-making. Data gained through supporting projects, such as Building Condition Assessments, informs this process and enhances the efficiency of asset management.

- **Manage the municipality's risk:** The asset management plan's risk assessment and prioritization process enable the Municipality to identify vulnerabilities and take proactive measures to enhance the resilience of its infrastructure.

- **Foster continuous improvement:** Preparation of an asset management plan contributes to a culture of continuous improvement, ensuring that asset management practices evolve with changing circumstances, emerging technologies, and lessons learned from past experiences.

3.3 Regulatory Environment

In January 2018, the province of Ontario enacted *O.Reg. 588/17: Asset Management Planning for Municipal Infrastructure*, which was created under the 2015 Federal Infrastructure for Jobs and Prosperity Act. The regulation was created because the province recognized that many Ontario municipalities were facing similar issues with existing infrastructure deteriorating faster than it was being repaired or replaced. The goals of the regulation were to standardize asset management plans, spread best practices among municipalities, and improve infrastructure planning in municipalities.

O. Reg. 588/17 prescribed timelines and scope requirements that municipalities were to adhere to for the preparation of a Strategic Asset Management Policy (SAMP), and Asset Management Plans (AMPs). The regulation separated the AMP requirements into core and non-core assets and current and proposed levels of service.

Core assets are those supporting the delivery of the following services: roads, bridges & culverts, water, wastewater, and stormwater. Non-core assets are any other assets supporting all other municipal services.

Levels of service are the means of defining the outcomes and outputs that customers can expect from asset-based activities, measured through a combination of customer values, customer performance measures and technical performance measures.

The timelines and requirements of O. Reg. 588/17 are summarized in the following table.

Schedule	Regulatory Requirement	Southwest Middlesex Status
July 1, 2019	Completion of an Asset Management Policy that outlines asset management principles, commitments to best practices and continuous improvement	Completed in January 2019
July 1, 2022	Completion of an Asset Management Plan for **core** assets, including current levels of service	Completed in 2020
July 1, 2024	Completion of an Asset Management Plan for **all** assets, including current levels of service	This document provides compliance
July 1, 2025	Completion of an Asset Management Plan for all assets, including current and proposed levels of service, assessment of achievability and affordability, and preparation of a financial strategy	This document provides compliance

3.4 Line of Sight

The concept of *Line of Sight* in municipal asset management is crucial for aligning the organization's strategic goals with the value expected from the assets. It ensures a clear connection between all activities performed within an organization and the achievement of the organization's overall objectives.

In the context of municipal infrastructure, having a line of sight from asset information to organizational objectives enables an organization to be agile if circumstances, such as extreme weather events and the consequences of climate change, require organizational objectives to change.

Line of sight in asset management achieves two important things:

1. People doing the physical work on the infrastructure can see how the work they do supports the strategic goals of the Municipality.
2. People setting the strategic goals of the Municipality can see how their decisions change how infrastructure is managed. Asset Management at the Municipality enables this line of sight, connecting the service outcomes down to the assets that support them.

3.5 Strategic Alignment

The Municipality's strategic goals and objectives are shaped by internal drivers such as Council-approved strategies and plans, as well as external forces such as resident expectations, and legislative and regulatory requirements. Asset Management supports

the strategic objectives of Council, the delivery of services to the public, and the sustainability of the Municipality.

Numerous relevant planning and governance documents have been prepared by and for the Municipality. The following documents have been reviewed and considered for alignment purposes in the preparation of this Asset Management Plan.

Document Title	Date
Operating and Capital Budgets	2024 & 2025
Joint Multi-Year Accessibility Plan	2022
Reserves and Reserve Funds	2023 & 2024
Audited Financial Statement	2023
Official Plan	2024 (consolidated)
Facilities & Recreation Master Plan	2021
Strategic Asset Management Policy	2019
Asset Management Plan	2020
Water Ontario Regulation 453/07 Financial Plan	2024
Master Servicing Plan – Water and Wastewater Modeling	2022
Bridge and Culvert Inspection and Assessment Report	2023
Road Needs Study	2023
Municipal Stormwater Management System O&M Manual	2024
Wardsville Storm Sewer Study 2019	2021
Master Fire Plan	2022

Infralevel reviewed a number of relevant regulations, industry standards and guiding documents in order to adhere to best practices and ensure regulatory compliance. These documents are listed in the following table.

Document Title	Date
MFOA Asset Management Framework	2021
O. Reg. 588/17 (amended by O. Reg. 193/21)	2017 / 2021
Building Together: Guide for Municipal Asset Management Plans	2016
Infrastructure for Jobs and Prosperity Act	2015
ISO 55000 Series	2014

Scope of Work for Compliance

Assets included in the Scope of Work

Methodology

SCOPE AND METHODOLOGY

4. Scope and Methodology

4.1 Scope of Work for Compliance

The scope of work for this asset management plan has been developed to address the July 1, 2024 and July 1, 2025 requirements of O. Reg. 588/17. It utilizes the best information available to the Municipality at this time and advances asset management maturity through a diligent process. The regulatory requirements of O. Reg. 588/17 for 2024 and 2025 are detailed in the following table.

2024 Requirements	2025 Requirements
Asset management plan for all assets with the following scope: • Current levels of service • State of local infrastructure • Lifecycle activities and costs • Growth impacts	Asset management plan for all assets with the following *additional* scope: • Proposed levels of service • Updated state of local infrastructure • Lifecycle management strategy • Financial strategy to manage funding gaps • Impact of growth on lifecycle and financial strategies

4.2 Assets included in the Scope of Work

The Municipality of Southwest Middlesex is a lower tier municipality located within Middlesex County. Resident services are provided by both levels of government, with asset ownership and responsibility split accordingly. In accordance with the requirements of O.Reg. 588/17, the scope of this document includes all assets owned by the Municipality. Ownership and responsibility for each asset class are summarized in the following table.

Asset Class	Asset Ownership & Responsibility	
	Municipality of Southwest Middlesex	Middlesex County
Roads	Local roads	County roads
Bridges and Culverts	Local road bridges and culverts	County road bridges and culverts
Water	Drinking water assets	None
Wastewater	Wastewater assets	None
Stormwater	Point assets and local road storm sewers	County road storm sewers

Buildings	Municipality buildings	County buildings
Land Improvements	Municipality land improvements	County land improvements
Fleet	Municipality fleet	County fleet
Equipment & Machinery	Municipality machinery and equipment	County machinery and equipment

4.3 Methodology

The objectives of the asset management plan are met through the completion of the main report sections detailed in the following table.

Report Section	Content
State of Local Infrastructure	What assets the Municipality has, what condition they are in, and what they are worth.
Levels of Service	How the Municipality's assets should perform to meet the needs of residents and other stakeholders.
Proposed Levels of Service	Asset performance objectives that are the future target state, in 10 years time.
Risk Management Strategy	How the Municipality minimizes risk exposure by focusing the limited available funding on critical assets that have a high level of consequence.
Lifecycle Management Strategy	A set of actions that should be undertaken on the right assets at the right time to ensure they continue to meet their levels of service over the long term.
Growth Impacts	How changes in population and economic activity impact lifecycle management and financial strategies.
Financial Strategy	A forecast for the spending required to support the Lifecycle Management Strategy, and a plan to fund and prioritize the work.
Advancing Asset Management Maturity	Recommendations for actions that can be undertaken to improve the maturity of asset management practices in the Municipality.

Asset Summary

Asset Inventory, Age and Replacement Cost

Asset Condition

STATE OF LOCAL INFRASTRUCTURE

5. State of Local Infrastructure

O. Reg. 588/17 requires Asset Management Plans to include the following information for each asset category:

- Summary of the assets
- Replacement cost of the assets
- Average age of the assets
- Information available on the condition of assets
- The municipality's approach to condition assessments

This information is detailed in the following report sections.

5.1 Asset Summary

As required by O. Reg. 588/17, this asset management plan includes all Municipality assets. The assets are categorized as follows.

Roads	Buildings
Bridges and culverts	Land improvements
Water	Fleet
Wastewater	Equipment & Machinery
Stormwater	

Some of the Municipality's green infrastructure assets are included within these asset categories:

- **Land Improvements**: this category includes parks and landfills.

- **Buildings**: this category includes site improvements such as natural drainage features, engineered drainage and trees.

Over time, the Municipality will continue to add green infrastructure assets to the asset register and incorporate these assets into lifecycle management planning, documented levels of service and the risk management strategy.

5.2 Asset Inventory, Age and Replacement Cost

Asset inventory, age and replacement cost data was sourced from the Municipality's asset register or from condition assessment reports where available. Average ages have been calculated based on weighting of replacement costs.

Asset replacement values represent the cost the Municipality would have to pay to acquire an equivalent new asset with the same service potential at the time of reporting. Replacement costs are derived from user-defined costs and, as appropriate, the application of historical cost inflation. The non-residential building construction price index in metropolitan areas of Canada has been utilized. Over the past several years, the inflation rate has been significant and has resulted in a large increase in the value of the Municipality's assets since the date of the previous asset management plan.

5.2.1 Roads

The Municipality's road network consists of:

- gravel roads
- paved roads (hot mix asphalt)
- tar and chip roads (surface treatment)
- concrete roads

The roads asset class also includes the Municipality's sidewalks and streetlights.

Asset	Quantity	Average Age (years)	Replacement Cost
Gravel roads	346.1 km	78	$158,052,922
Paved roads	19.6 km	32	$47,837,039
Tar and chip roads	39.3 km	25	$7,723,723
Concrete roads	1.8 km	41	$7,179,202
Sidewalks	19.0 km	37	$3,044,102
Streetlights	458	12	$1,004,227
		Total:	**$224,841,215**

5.2.2 Bridges and Culverts

The Municipality has jurisdiction over a total of 14 bridges and 69 culverts that are more than 3 meters in length.

Asset	Quantity	Average Age (years)	Replacement Cost
Bridges	14	55	$2,333,656
Culverts	69	55	$18,392,232
		Total:	**$20,725,888**

5.2.3 Water

The Southwest Middlesex drinking water distribution system services the communities of Melbourne, Appin, Glencoe, Wardsville and rural areas of Southwest Middlesex receiving water from the West Elgin Distribution System. In addition to the watermains and fire hydrants, the Southwest Middlesex Distribution System includes a reservoir, a high lift pumping station, rechlorination facilities and elevated storage facilities. The source of drinking water is Lake Erie.

The Ontario Clean Water Agency (OCWA) is the Operating Authority for the drinking water system. OCWA operates the Tri-County Drinking Water System, which is 25% owned by the Municipality.

Asset	Quantity	Average Age (years)	Replacement Cost
Watermains	112.9 km	33	$65,628,809
Hydrants	161	34	$850,164
Water buildings and equipment	8 buildings	20	$11,794,121
		Total:	**$78,273,094**

5.2.4 Wastewater

OCWA inspects, operates and maintains the Municipality's wastewater collection and treatment system. Municipality wastewater assets include sewage lagoons, manholes, sanitary equipment and sanitary sewer mains. Southwest Middlesex also owns two wastewater treatment facilities. The largest system is in Glencoe and the other system is in Wardsville.

Asset	Quantity	Average Age (years)	Replacement Cost
Sanitary mains	29.6 km	45	$10,172,707
Sanitary storage tanks	7	25	$884,082
Sewer lift stations	2	23	$112,302
Wastewater treatment plants	10 assets	10	$1,029,206
Sanitary lagoons	3	13	$8,468,516
Pumping stations	6	20	$1,626,943
		Total:	**$22,293,756**

5.2.5 Stormwater

The Municipality's stormwater management system provides for conveyance of stormwater and includes storm mains, manholes and catchbasins. The manholes and catchbasins are not yet included in the asset registry. The estimated quantities and replacement costs included below are based on the length of storm mains and related inventories in similar municipalities.

Asset	Quantity	Average Age (years)	Replacement Cost
Catchbasins	210 (estimated)	Not known	$840,000
Manholes	145 (estimated)	Not known	$1,520,000
Storm mains	25.1 km	31	$15,398,198
		Total:	**$17,758,198**

5.2.6 Buildings

The Municipality's buildings, their age and replacement cost are summarized in the following table. The Municipality owns the following buildings:

- 2 arenas/community centres
- 3 cultural services buildings
- 1 municipal office building
- 3 libraries
- 5 park buildings
- 1 pool house, pool and deck
- 3 protective services buildings
- 6 transportation buildings

The buildings are grouped into the Fire, Public Works and Facilities & Recreation departments, as summarized below.

Building Name	Building Age (years)	Replacement Cost
Fire	51	$6,889,740
Public Works	29	$2,553,860
Facilities & Recreation	30	$34,492,103
	Total:	**$43,935,703**

5.2.7 Land Improvements

Land improvements include a splash pad, playground equipment, fencing, lighting, parking lots, landfills, furniture and fixtures.

Asset	Quantity	Average Age (years)	Replacement Cost
Splash pad, playground equipment, fencing, lighting, parking lots	15 assets	16	$2,496,733
Landfills	4	49	$1,418,961
Furniture and fixtures	13 assets	16	$476,091
		Total:	**$4,391,785**

5.2.8 Fleet

Fleet assets are utilized by Fire, Facilities & Recreation and Public Works. Fire vehicles include tankers, pumpers, engines and rescues. Facilities & Recreation vehicles include tractors, pickups, mowers and trailers. Public Works vehicles include mowers, pickups, chippers, tractors, loaders, graders, plow trucks, backhoes and trackless snow blowers.

Asset	Quantity	Average Age (years)	Replacement Cost
Fire	8 assets	14	$4,511,157
Facilities & Recreation	7 assets	6	$335,785
Public Works	28 assets	9	$5,053,233
		Total:	**$9,900,175**

5.2.9 Machinery & Equipment

Machinery and equipment assets are grouped into Fire, General Government, Facilities & Recreation, and Public Works.

Fire assets include thermal imaging cameras, compressors, cutters, heavy hydraulics, emergency generators, defibrillators, air compressors, radios, SCBA equipment and extractors.

General Government assets include emergency generators, photocopier/printers, software, audio video equipment and a postage machine.

Facilities & Recreation assets include dishwashers, dehumidifiers, pool filtration equipment, arena chillers, brine pumps, condensers, compressors, heaters, ice resurfacers, benches, diamond draggers, flagpoles, pool pumps, lighting and an accessible pool lift.

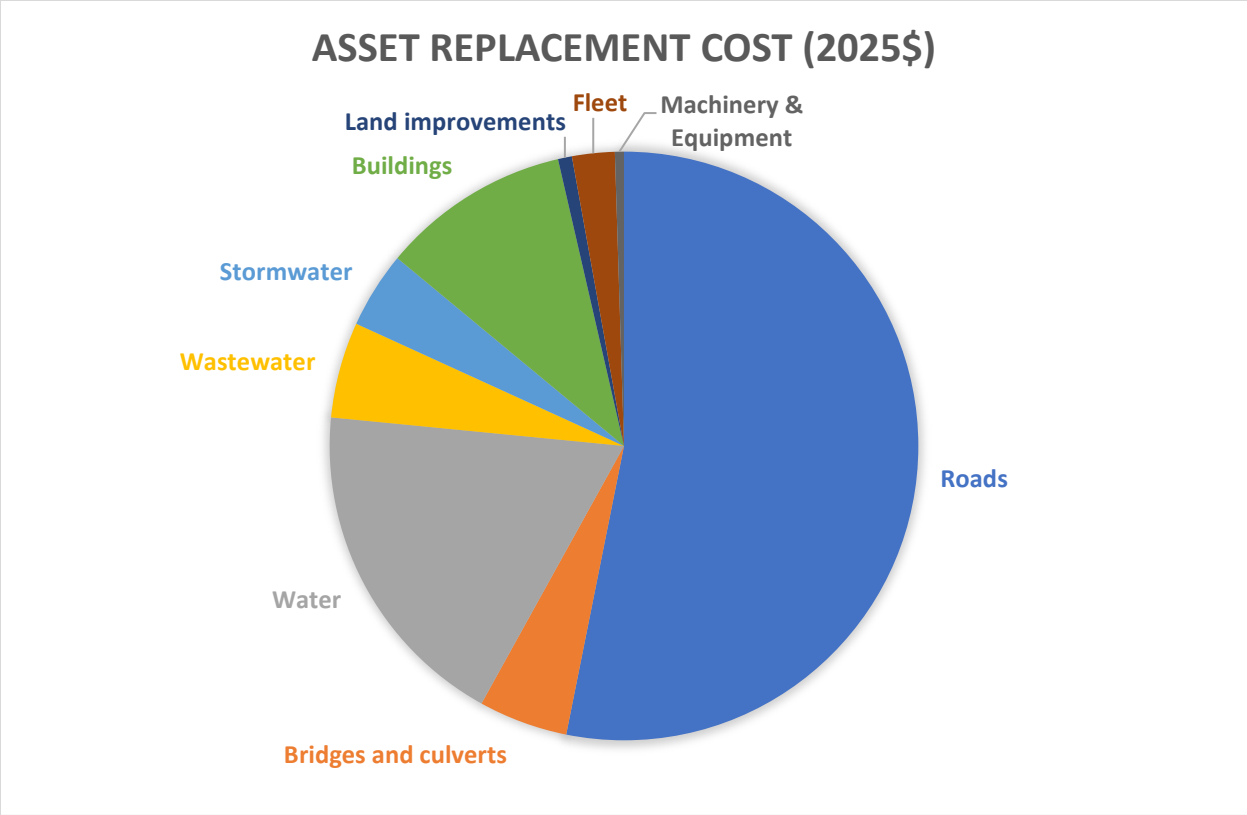
Public Works assets include pressure washers, pressure monitoring gauges and a pavement edger.

Asset	Quantity	Average Age (years)	Replacement Cost
Fire	12 assets	7	$704,451
General government	8 assets	7	$360,444
Facilities & Recreation	19 assets	12	$960,248
Public Works	3 assets	12	$70,564
		Total:	**$2,095,707**

5.2.10 Asset Replacement Cost Summary

The total replacement cost for each asset class is summarized in the following table and pie charts.

Asset Class	Replacement Cost (2025$)
Roads	**$224,841,215**
Bridges and culverts	**$20,725,888**
Water	$**78,273,094**
Wastewater	$**22,293,756**
Stormwater	$**17,758,198**
Buildings	$**43,935,703**
Land improvements	**$4,391,785**
Fleet	$**9,900,175**
Machinery & Equipment	$**2,095,707**
Total:	**$424,215,521**



5.3 Asset Condition

Assessed condition is the preferred measurement for planning lifecycle activities to ensure assets deliver the agreed-upon levels of service and reach their expected useful life.

Although the Municipality considers condition as the ideal basis for infrastructure planning, some assets do not yet have a process to determine condition. For assets with no known condition information, the condition was assumed based on the asset's age, expected useful life and remaining service life. In the future, the Municipality is investigating completing condition assessments for assets where no program currently exists. For some assets, condition assessments are not economical, but for many assets, regular inspections provide strategic value to the Municipality.

A summary of available asset condition data is included in the following table.

Assets with Available Condition Data	Assets with No Available Condition Data (condition is based on age)
Roads	Water
Bridges and culverts	Wastewater
Buildings	Stormwater*
	Land Improvements
	Fleet
	Machinery & Equipment

* A report titled "Wardsville Storm Sewer Study 2019", dated February 2021, assesses the capacity of the storm sewer system in Wardsville and makes recommendations to improve functionality of the system. The report does not assess the physical condition of the stormwater infrastructure.

The following report sections provide detailed information regarding the condition of each asset class.

5.3.1 Condition Based on Inspection Data

Asset condition data is available for roads, bridges, culverts, and buildings. The following table details the condition assessment reports that were reviewed for these asset classes to inform the asset management plan.

Asset Class	Report Title	Prepared By	Report Date
Roads	2023 Southwest Middlesex Road Needs Study	R.J. Burnside & Associates Limited	2023
Bridges and culverts	Bridge and Culvert Inspection and Assessment Report	Spriet Associates	2023
Buildings	Building Condition Assessments	BOLD Engineering Inc.	2023

5.3.1.1 Roads

Detailed road condition data is included in the Road Needs Study prepared by R.J. Burnside & Associates (Burnside). Condition ratings from the Burnside report have been mapped to the condition grading methodology of the asset management plan as follows.

Condition Grading	Condition Description	Pavement Condition Index and Gravel Condition Rating
Very Good	No noticeable defects	85 – 100
Good	Minor deterioration	70 – 84
Fair	Deterioration evident, function is affected	55 – 69
Poor	Serious deterioration, function is inadequate	40 – 54
Very Poor	No longer functional, general or complete failure	< 40

The Burnside report provides an overall weighted average condition of 80.6 for all roads (gravel, paved, tar and chip, concrete). This corresponds to a 'Good' overall condition rating.

The percentage of paved roads in each condition grading category is summarized in the following table. The average pavement condition index is a weighted value based on road segment length.

Asset	Condition Grading	% of Assets	Average Pavement Condition Index
Paved Roads (hot mix, concrete, tar and chip)	Very Good	47%	Good (80.6)
	Good	52%	
	Fair	1%	
	Poor	0%	
	Very Poor	0%	

5.3.1.2 Bridges and Culverts

The condition of Municipality bridges and culverts was assessed in a report titled 'Bridge and Culvert Inspection and Assessment Report' by Spriet Associates in 2023. The assessment was completed as part of the inspections required to be completed every two years by O. Reg. 104/97. The assessment follows the Ontario Structure Inspection Manual (OSIM).

Bridge and culvert repair recommendations from the Spriet report have been incorporated into the lifecycle costing portion of this report. The condition metrics summarized in the following table utilize data from the asset registry. The average bridge condition index is a weighted value based on replacement cost.

Asset	Condition Grading	% of Assets	Average Bridge Condition Index
Bridges	Very Good	8%	Poor (32%)
	Good	6%	
	Fair	0%	
	Poor	63%	
	Very Poor	23%	
Culverts	Very Good	9%	Poor (33%)
	Good	4%	
	Fair	25%	
	Poor	23%	
	Very Poor	38%	

5.3.1.3 Buildings

BOLD Engineering Inc. completed Building Condition Assessments for municipal facilities in 2023.

Condition can be assessed at the asset level, as well as at the facility level using the industry standard Facility Condition Index (FCI). This value represents the ratio between repair and renewal costs and the replacement value of the asset.

$$\text{Facilty Condition Index (FCI)} = 1 - \frac{\text{Repair and renewal costs}}{\text{Current replacement value}}$$

Condition ratings from the Building Condition Assessment reports have been mapped to the condition grading methodology of the asset management plan as follows.

Condition Grading	Condition Description	Facility Condition Index (%)
Very Good	Minimal maintenance required	0 – 2
Good	Some maintenance and renewal required	3 – 5
Fair	Moderate level of wear and tear	6 – 10
Poor	Building requires significant repair and renewal	11 – 50
Very Poor	Major deferred maintenance impacts building operations and user experience	51 – 100

The Building Condition Assessment reports assigned a Facility Condition Index score to each building, as summarized in the following table.

Building Name	Facility Condition Index (%)
Pool and Pool House	Very Poor (100%)
Glencoe Public Works Garage	Poor (28%)
Municipal Office	Poor (18%)
Train Station	Very Poor (56%)
Historical Society	Very Poor (73%)
Little Kin Park Pavilion	Poor (37%)
Glencoe Central Garage	Poor (19%)
Glencoe Salt Dome	Very Good (0%)
Glencoe Sand Shed	Poor (45%)
Wardsville Fire Station	Poor (21%)
Wardsville Museum	Poor (27%)
Wardsville Library	Poor (31%)
Glencoe OPP Station	Fair (8%)
Appin Ball Diamond Canteen	Very Poor (79%)
Appin Museum	Poor (40%)
Appin Park Pavilion	Very Poor (58%)

Appin PW Garage	Fair (6%)
Appin Sand and Salt Storage	Good (5%)
Ekfrid Community Centre	Fair (9%)
Wardsville Storage Garage	Poor (18%)
Appin Post Office	Poor (39%)
Overall FCI	**Poor (29%)**

The buildings assessed by BOLD Engineering are in poor condition overall. The average Facility Condition Index is 29%; this is a weighted value based on replacement cost.

The condition of the portfolio has also been assessed from an asset age and expected lifespan perspective, organized by department. The average condition is a weighted value based on replacement cost.

Department	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Fire	10 - 60	51	Fair	45
Public Works	60	29	Fair	55
Facilities and Recreation	5 - 60	30	Fair	46

The average facility condition and the percentage of buildings in each condition grading category are summarized in the following table:

Asset	Condition Grading	% of Assets	Average Facility Condition
Buildings	Very Good	30%	Fair (46%)
	Good	17%	
	Fair	8%	
	Poor	3%	
	Very Poor	42%	

5.3.2 Condition Based on Asset Age

Asset age, expected useful life and remaining useful life are used to determine the condition of assets that have no assessed condition data available. The following table maps the percentage of remaining useful life to the standard condition grading categories used in this report.

Condition Grading	Condition Description	Remaining Useful Life (%)
Very Good	The asset is new, recently rehabilitated, or very well maintained. Only preventative maintenance is required.	80 - 100
Good	The asset is adequate and has slight defects and shows signs of some deterioration that has no significant impact on asset's usage. Minor/preventative maintenance may be required.	60 - 80
Fair	The asset is sound but has minor defects. Deterioration has some impact on asset usage. Minor to significant maintenance is required.	40 – 60
Poor	The asset has significant defects and deterioration. Deterioration has an impact on asset usage. Rehabilitation or major maintenance is required in the next year.	20 – 40
Very Poor	The asset has serious defects and deterioration, rendering it unfit for use. Urgent rehabilitation or closure is required.	0 – 20

5.3.2.1 Roads – Miscellaneous Assets

Miscellaneous roads assets include sidewalks and streetlights. The age-based condition of miscellaneous road assets is summarized in the following table. The average condition is a weighted value based on replacement cost.

Asset	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Sidewalks	50	37	Poor	33
Streetlights	30	12	Good	61

The percentage of miscellaneous road assets in each condition grading category is summarized in the following table.

Asset	Condition Grading	% of Assets	Average Condition
Roads – Sidewalks and streetlights	Very Good	11%	Fair (40%)
	Good	32%	
	Fair	8%	
	Poor	17%	
	Very Poor	32%	

5.3.2.2 Water

The age-based condition of water assets is summarized in the following table. The average condition is a weighted value based on replacement cost.

Asset	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Hydrants	60	34	Fair	43
Water buildings & equipment	15 - 60	20	Good	66
Watermains	100	33	Good	67

The percentage of water assets in each condition grading category is summarized in the following table.

Asset	Condition Grading	% of Assets	Average Condition
Water	Very Good	15%	Good (67%)
	Good	50%	
	Fair	32%	
	Poor	2%	
	Very Poor	1%	

5.3.2.3 Wastewater

The age-based condition of wastewater assets is summarized in the following table. The average condition is a weighted value based on replacement cost.

Asset	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Sanitary mains	70 - 100	45	Poor	37
Sanitary storage tanks	60	25	Fair	58
Sewer lift stations	60	23	Good	61
Wastewater treatment plants	15 - 60	10	Good	68
Sanitary lagoons	50	13	Good	74
Pumping stations	60	20	Good	67

The percentage of wastewater assets in each condition grading category is summarized in the following table.

Asset	Condition Grading	% of Assets	Average Condition
Wastewater	Very Good	1%	Fair (56%)
	Good	58%	
	Fair	8%	
	Poor	33%	
	Very Poor	0%	

5.3.2.4 Stormwater

The age-based condition of stormwater management assets is summarized in the following table. The average condition is a weighted value based on replacement cost. The average age and condition of the Municipality's manholes and catch basins is not known. The condition has been assumed to be the same as the storm mains condition.

Asset	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Storm mains	80	31	Good	61
Manholes	60	Not known	Good (assumed)	61 (assumed)
Catch basins	85	Not known	Good (assumed)	61 (assumed)

The percentage of stormwater management assets in each condition grading category is summarized in the following table.

Asset	Condition Grading	% of Assets	Average Condition
Stormwater	Very Good	9%	Good (61%)
	Good	51%	
	Fair	40%	
	Poor	0%	
	Very Poor	0%	

5.3.2.5 Land Improvements

The age-based condition of land improvement assets is summarized in the following table. The average condition is a weighted value based on replacement cost.

Asset	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Splash pad, playground equipment, fencing, lighting, parking lots	20 – 60	16	Poor	38%
Landfills	50	49	Very Poor	12%
Furniture and fixtures	10 - 25	16	Poor	29%

The percentage of land improvement assets in each condition grading category is summarized in the following table.

Asset	Condition Grading	% of Assets	Average Condition
Land Improvements	Very Good	14%	Poor (29%)
	Good	1%	
	Fair	24%	
	Poor	12%	
	Very Poor	49%	

5.3.2.6 Fleet

The age-based condition of fleet assets is summarized in the following table. The average condition is a weighted value based on replacement cost.

Asset	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Fire	25 - 30	14	Fair	54%
Facilities & Recreation	8 - 15	6	Good	65%
Public Works	8 - 30	9	Fair	45%

The percentage of fleet assets in each condition grading category is summarized in the following table.

Asset	Condition Grading	% of Assets	Average Condition
Fleet	Very Good	13%	Fair (51%)
	Good	40%	
	Fair	13%	
	Poor	16%	
	Very Poor	17%	

5.3.2.7 Machinery & Equipment

The age-based condition of machinery and equipment assets is summarized in the following table. The average condition is a weighted value based on replacement cost.

Asset	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Fire	10 - 20	7	Good	62%
General government	5 - 20	7	Poor	38%
Facilities & Recreation	10 - 25	12	Poor	27%
Public Works	10 - 15	12	Poor	36%

The percentage of machinery and equipment assets in each condition grading category is summarized in the following table.

Asset	Condition Grading	% of Assets	Average Condition
Machinery & Equipment	Very Good	27%	Fair (41%)
	Good	9%	
	Fair	19%	
	Poor	9%	
	Very Poor	36%	

5.3.3 Asset Condition Summary

A summary of average condition for each asset class is provided in the following table. The overall condition, weighted by asset value, is **Good**.

Asset Class	Average Condition
Roads	Good
Bridges & Culverts	Poor
Water	Good
Wastewater	Fair
Stormwater	Good
Land improvements	Poor
Fleet	Fair
Buildings	Fair
Machinery & Equipment	Fair
Overall Condition:	**Good**

Current Levels of Service

Proposed Levels of Service

Levels of Service Tables

LEVELS OF SERVICE

6. Levels of Service

6.1 Current Levels of Service

Levels of service is a key component of asset management decision-making that describe the planned outcome from the use of an asset, from a customer and technical performance perspective.

The Municipality's current level of service statements describe the asset outputs that the Municipality intends to deliver to the community and can be represented in terms of attributes such as availability, cost-effectiveness, reliability, responsiveness, safety, suitability and sustainability. Current levels of service measures for each service area are established through discussions with Municipality staff or are prescribed metrics included in O. Reg. 588/17.

In addition to the measures required by O. Reg. 588/17, the Municipality has developed other foundational asset service measures which assist the Municipality in defining its performance levels and identifying areas of improvement. The levels of service inform the planned actions required to deliver the expected service levels and this link enables the Municipality to gain an understanding of the costs associated with delivering its services to the community.

The service levels and performance reporting in this asset management plan are compliant with O. Reg. 588/17. Through each update of the plan, the Municipality will continue to develop and refine service levels, performance measurements and targets. The Municipality will also consider impacts of external factors affecting levels of service, such as changing regulations, population growth, customer expectations and trends, demographic changes, and climate change impacts. Internal and external factors may lead to changes in the current levels of service provided by the Municipality; proposed levels of service address these changes.

6.2 Proposed Levels of Service

The Municipality is evolving over time and resident needs and expectations also change due to numerous internal and external factors. Strategic corporate documents such as the Official Plan, DC Background Study, master plans and annual budget present and propose new initiatives and projects that represent changes to current levels of service.

These proposed changes to the current levels of service are referred to as 'proposed levels of service' and for the purposes of asset management planning and in relation to O. Reg. 588/17, they are considered the future target state, in 10 years' time. Proposed levels of service are often categorized as impacting capacity and use, function, quality or affordability.

Service Attribute	Strategic Theme	Description
Capacity and Use	Capacity	Convenient and accessible to the community
	Availability	Consistent readiness for use
Function	Regulatory Compliance	Conforms with appropriate legislation and other standards
	Enhanced Safety	Safe for community use
	Resilience	Withstands stresses and continues to perform as expected
	Enhanced Environment	Contributes positively to a sustainable environment
Quality	Reliability	Continued function without failure
	Customer Satisfaction	The community is informed and needs are met
Affordability	Financial Sustainability	Value is achieved for the community now and into the future

O. Reg. 588/17 requires an assessment of the appropriateness of the proposed levels of service for the municipality, including a review of achievability, affordability, available options, the risks associated with the options, and the differences between the current and proposed levels of service.

Differences Between Current and Proposed Levels of Service

The differences between the current and proposed levels of service pertain mainly to higher standards for asset condition and reliability, improved capacity and environmental performance and enhanced due diligence for asset condition assessments.

Achievability

The proposed levels of service are driven by community needs and expectations. They are determined to be achievable based on a review of resource availability, including personnel, equipment, technology and funding. Infrastructure capacity and regulatory compliance have also been considered as part of the achievability assessment.

Affordability

The Municipality's finite budget resources have been taken into account when developing its proposed levels of service. A long-term perspective has been applied to forecast and

plan for operating, maintenance, rehabilitation and replacement costs over the lifecycle of each asset.

Options & Risks

Options have been reviewed for each proposed level of service and a cost-benefit analysis has been utilized to distinguish between and prioritize the various available options. Costs and benefits have been adjusted for the potential impacts of risk, providing decision makers with a realistic understanding of the potential outcomes of a service level change and informing decisions that seek long-term sustainability for the Municipality.

6.3 Levels of Service Tables

The levels of service tables in this section follow the same structure for each service area. They include components such as identifying customer values, customer- and Council-focused performance measures, and technical-focused performance measures. Each table contains the following components:

- **Service Attribute** - Summarizes the type of service being provided to residents, businesses and the wider community.
- **Performance Measures**:
  - *Community Levels of Service* - Communicates service outcomes from the perspective of the customer, for both current and proposed levels of service.
  - *Technical Levels of Service* - Communicates service outcomes in technical terms, for both current and proposed levels of service.
- **Current Performance** - The current performance of the metric quantified through the best available information.
- **Performance Target** - The future performance of the metric representing the target state, in 10 years' time.

Where appropriate, proposed levels of service have been included in the tables for each asset class.

6.3.1 Roads

Community and technical levels of service for the roads asset class are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Maps of the road network and its level of connectivity	Refer to maps in Appendix B
Quality	Images that illustrate the different levels of road class pavement condition	Refer to images in Appendix B

Service Attribute	Technical Levels of Service	Current Performance
Scope	Lane kilometres of arterial roads per Municipality land area	0.024 lane km/km^2
	Lane kilometres of collector roads per Municipality land area	0 lane km/km^2
	Lane kilometres of local roads per Municipality land area	1.91 lane km/km^2
Quality	Average pavement condition index for paved and gravel roads	Good (80.6)
	% of paved roads with pavement condition index less than 70	1.2%

Service Attribute	Proposed Levels of Service	Performance Target
Quality	% of paved roadway assets in fair or better condition	90%
	% of sidewalk and streetlight assets in fair or better condition	70%

6.3.2 Bridges and Culverts

Community and technical levels of service for the bridges and culverts asset class are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Description of the traffic that is supported by municipal bridges	Municipal bridges provide passage for heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians and cyclists
Quality	Images of the condition of bridges and how this affects use	Refer to images in Appendix B
	Images of the condition of culverts and how this affects use	Refer to images in Appendix B

Service Attribute	Technical Levels of Service	Current Performance
Scope	Percentage of bridges with loading or dimensional restrictions	0%
Quality	Average bridge condition index for bridges	32
	Average bridge condition index for structural culverts	31

Service Attribute	Proposed Levels of Service	Performance Target
Quality	% of bridges in fair or better condition	60%
	% of culverts in fair or better condition	60%

6.3.3 Stormwater

Community and technical levels of service for the stormwater asset class are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Maps of areas that are protected from flooding, including the extent of protection provided by the municipal stormwater management system	Refer to maps in Appendix B

Service Attribute	Technical Levels of Service	Current Performance
Scope	Percentage of properties that are resilient to a 100-year storm	Not known
	Percentage of the stormwater management system resilient to a 5-year storm	Not known

Service Attribute	Proposed Levels of Service	Performance Target
Quality	CCTV condition inspection program, flushing and hydro vacuuming (as per Spriet report)	Completion every 10 years
Resilience	Upgraded storm sewer system in Wardsville	Meet or exceed 2-year storm resilience

6.3.4 Water

Community and technical levels of service for the water asset class are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Maps of areas that are connected to the municipal water system	Refer to maps in Appendix B
	Maps of areas that have fire flow	Refer to maps in Appendix B
Reliability	Description of boil water advisories and service interruptions	The Municipality is committed to ensuring a consistent supply of safe drinking water. The Municipality's drinking water systems operate under a Quality Management System as legislated under the Safe Drinking Water Act, 2002, and regulated by MECP. Water quality is tested as required, and the results of this testing are reported annually. The Municipality reports any incidents to MOH, follows Ministry direction and communicates to stakeholders as required.

Service Attribute	Technical Levels of Service	Current Performance
Scope	Percentage of properties connected to the municipal water system	88%
	Percentage of properties with available fire flow	100%
Reliability	Number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	Number of connection-days lost per year due to watermain breaks compared to the total number of properties connected to the municipal water system	0

Service Attribute	Proposed Levels of Service	Performance Target
Quality	Number of drinking water non-compliances	0

6.3.5 Wastewater

Community and technical levels of service for the wastewater asset class are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Maps of areas that are connected to the municipal wastewater system	Refer to maps in Appendix B
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Municipality does not have combined sewers
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	The Municipality does not have combined sewers
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Municipality sanitary sewers are subject to inflow and infiltration (I&I) via sump pumps, downspouts, and holes/cracks in the pipes. I&I reduces available sewer capacity and increases risk of overflow and backup.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described above	Design of the sanitary sewers varies due to the wide range of sewer construction dates, however the sewers have generally been designed for watertightness and use of durable materials.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent may include nutrients such as nitrogen and phosphorus, and suspended solids.

Service Attribute	Technical Levels of Service	Current Performance
Scope	Percentage of properties connected to the municipal wastewater system	75%
Reliability	The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	N/A
	The number of connection-days lost per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	0
	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	0

Service Attribute	Proposed Levels of Service	Performance Target
Quality	CCTV condition inspection program	Completion every 10 years
Quality	Effluent quality for sewage lagoons	CBOD concentration < 7mg/L

6.3.6 Buildings

Community and technical levels of service for building assets are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Number of community centres per 1,000 residents	0.17
	Number of fire stations per 1,000 residents	0.34

Service Attribute	Technical Levels of Service	Current Performance
Scope	Per centage of life safety systems that are functional and tested as mandated	100%
Quality	Average facility condition index (FCI)	29%

Service Attribute	Proposed Levels of Service	Performance Target
Quality	% of buildings in fair condition or better	70%
Environment	Reduce energy consumption in public and recreation facilities	2% annual reduction

6.3.7 Land Improvement

Community and technical levels of service for the land improvement asset class are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Number of ball diamonds per 1,000 residents	0.85
	Number of soccer pitches per 1,000 residents	1.02
	Number of parks	13
	Description of the mission of the Parks and Recreation Department	Working in collaboration with community partners to provide parks, recreation, tourism and cultural opportunities that are inclusive, accessible and responsive to local needs

Service Attribute	Technical Levels of Service	Current Performance
Scope	Area of parkland per 1,000 residents	12.4 hectares (2.1 hectares per 1,000 residents)
	Number of playgrounds per 1,000 residents	1.19

Service Attribute	Proposed Levels of Service	Performance Target
Quality	Fully accessible playgrounds	All playgrounds fully accessible

6.3.8 Fleet

Community and technical levels of service for the fleet asset class are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Number of vehicles in the fleet	Adequate fleet are available to meet service levels for Fire, Public Works and Facilities & Recreation
Quality	Description of common lifecycle activities	Inspections, regulatory maintenance, oil change, tire rotation, collision repair, component replacement such as breaks, transmission and shocks, etc.

Service Attribute	Technical Levels of Service	Current Performance
Scope	% of fleet assets beyond their expected useful life	17%

Service Attribute	Proposed Levels of Service	Performance Target
Reliability	% of fleet within expected useful life	> 90%

6.3.9 Machinery & Equipment

Community and technical levels of service for the machinery and equipment asset class are included in the following tables.

Service Attribute	Community Levels of Service	Current Performance
Scope	Contribution to a safe, equitable and sustainable municipality	Machinery and equipment support the delivery of services across the organization
	Description of healthy lifestyle options supported with machinery and equipment	The Municipality provides fitness equipment and an accessible pool lift to support a healthy community

Service Attribute	Technical Levels of Service	Current Performance
Quality	Average condition of assets	Fair

Service Attribute	Proposed Levels of Service	Performance Target
Quality	% of machinery and equipment in fair condition or better	55%

Emerging Risks and Challenges

Climate Change

Risk Management Process

Risk Assessment

Current Risks

Risk Treatment

Risk-Based Prioritization

RISK MANAGEMENT STRATEGY

7. Risk Management Strategy

Risk is defined as the effect of uncertainty on objectives. In the context of a municipal asset management plan, risk presents uncertainty in the Municipality's objective to effectively manage its infrastructure and assets to ensure sustainability, functionality, and longevity. Risk is often expressed as the consequences of an event in combination with the associated likelihood of that event occurring.

Risk management is an essential component of effectively managing infrastructure assets. The Municipality is maturing to a state where it will manage risk and opportunities through a formal risk analysis process. Through continuous application and expansion of the risk process, the Municipality will ensure that it explicitly and continually considers risks to its objectives. This process will be completed as part of the asset management planning process and will enable the Municipality to address risk proactively versus reactively.

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

The risk management strategy outlined in this report will allow the Municipality to minimize its risk exposure by focusing the available funding on critical assets that have high financial, social or environmental consequences. By continuously monitoring risk, the Municipality can:

- Prioritize maintenance and upgrade work
- Optimize resource allocation
- Mitigate unexpected costs, service interruptions and downtime
- Enhance resilience and sustainability
- Comply with regulatory requirements
- Make informed, fact-based decisions

7.1 Emerging Risks and Challenges

The Municipality is a dynamic, thriving community that is facing a changing and dynamic environment especially as it continues the recovery stage of COVID-19. There are several challenges and unknown conditions underlying the asset portfolio that result in increased service pressures and create infrastructure risks for which the Municipality must be prepared.

Major trends which are resulting in increased service pressures and more complex community challenges include:

Growing and Rapidly Aging Population

A growing and aging population increases service demands and places stress on existing infrastructure, creating more demand for new infrastructure investment.

Aging Infrastructure

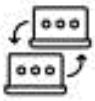
Southwest Middlesex's infrastructure is aging, requiring increased levels of investment to maintain a state of good repair.

Climate Change

Climate change leading to extreme weather events presents risks for effective and long-lasting infrastructure.

Changing Economy

Changes to economic conditions including inflation, energy costs, grants and subsidies may adversely affect the Financing Strategy.



Rapidly Changing Technology

Rapidly changing technology in a changing and uncertain macro environment challenges how quickly we adapt in the way we connect with residents and deliver services.

Changing Legislative Environment

Constantly evolving legislation and regulations impact infrastructure decisions.

Continued Pandemic Recovery

Continued COVID-19 pandemic recovery can have multi-year implications on how the Municipality operates and maintains assets. COVID-19 may also cause permanent impacts on asset design and delivery of capital programs.

7.2 Climate Change

Ontario municipalities are experiencing the impacts of climate change. Anticipated future impacts, including severe heat waves, threats to the water supply, extreme storms, and adverse health effects, could disrupt society and the economy. Integrating climate change into asset management means taking stock of the physical and financial impacts climate change will have on the condition, performance, and longevity of assets and service delivery, and using this information to identify and prioritize investment needs, both in the near and long-term.

O. Reg. 588/17 requires the Municipality to consider climate change in the development of its asset management policy and asset management plan. The following sections outline climate change considerations and adaptation action plans for the asset classes most impacted by climate change.

7.2.1 Municipal Buildings

- Rising extreme and average summer temperatures strain the cooling systems provided in municipal facilities. It is recommended that summer air conditioning demand be monitored to identify where capacity issues may be a concern as summer temperatures rise. Cooling system capacity should be upgraded as required, typically when lifecycle replacement is completed, to meet future cooling demands.

- Prior to replacement of HVAC systems, assess and upgrade the electrical system as required based on increased maximum cooling loads. Energy efficiency opportunities can be leveraged through the design process.

- Replacement of old cooling systems with energy efficient units has the additional benefit of reducing emissions; low carbon heating and cooling options should be prioritized.

- The Municipality may consider designating central facilities for use as community cooling stations. Facilities utilized by vulnerable populations may be prioritized.

- To address increasing storm intensity and resulting power outages, provide backup power generation where feasible; prioritize facilities that are critical for safe gathering/sheltering and maintaining essential services during power outages.

- Continue to inspect and maintain roof systems regularly and after extreme wind events. Proactively repair signs of material distress to avoid roof failure.

- As part of lifecycle activities, replace roofs with reflective roofing where feasible. This will reduce the heat island effect, mitigate the impact of heat waves, reduce energy demand for cooling buildings and lower maintenance costs.

- Monitor air quality for key municipal facilities. When lifecycle replacement is completed, consider upgrading HVAC systems to accommodate improved filters to address poor air quality events related to wildfires and increased temperatures.

- Store electrical and mechanical equipment above grade where possible to avoid damage from flooding.

7.2.2 Roads, Bridges and Culverts

- There is a need to enhance the resilience of infrastructure by using more durable materials and construction techniques. For example, bridges might need to be designed to handle higher loads and more significant flooding events.

- Extreme temperatures and more severe weather conditions can accelerate the deterioration of roads and bridges. This could lead to increased maintenance needs and shorter lifecycles for infrastructure assets.

- The costs associated with repairing damage from climate events or upgrading infrastructure to handle new conditions is likely to rise. Asset management plans need to incorporate these potential cost increases and budget accordingly.

7.2.3 Municipal Fleet

- Higher temperatures can affect vehicle engines, tires, and other components, potentially leading to more frequent breakdowns and increased maintenance needs. Cold temperatures can also impact battery performance and fluid viscosity.
- Municipalities might need to adjust their fleet composition to include vehicles better suited for changing conditions, such as those equipped for off-road capabilities in areas prone to flooding, and those suitable for rescue and recovery operations during extreme events.
- Fleet management strategies may need to incorporate climate resilience measures, such as investing in vehicles that are more durable or that use alternative fuels to reduce emissions and dependency on fossil fuels.
- There may be increased availability of incentives for transitioning to electric or hybrid vehicles, influencing fleet renewal strategies.

7.3 Risk Management Process

This report presents an infrastructure-based risk process to ensure that all assets will be reviewed utilizing a standardized approach. This will ensure that the Municipality is able to measure and compare risks consistently across a broad spectrum of assets and services.

The risk assessment process seeks to identify credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks. An assessment of risks associated with service delivery identifies risks that will result in loss or reduction in service, personal injury, environmental impacts, financial setbacks, reputational impacts, or other consequences.

7.4 Risk Assessment

To ensure a consistent approach to risk, this report standardizes scales for both consequence and likelihood.

7.4.1 Risk Consequence Matrix

Standardized risk consequence categories can be applied municipality-wide with respect to assets and services. The risk categories are:

- Interruption/reduction of services
- Financial
- Human safety
- Reputational
- Environmental

The risk consequence categories are assigned values from 1 (minimal) to 5 (catastrophic). Descriptions of the consequences of risk along this scale, for each risk category, are included in the following Risk Consequence Matrix.

	Service	Financial	Safety	Reputation	Environmental
1 Negligible	Little to no service interruption	< $2.5K	Potential for minor injury	Minimal concern	Negligible impact (restored within 1 week)
2 Minor	Minor service interruption (< 4 hr of downtime)	$2.5K - $25K	Lost time incident, minor injury to few people	Internal concerns	Minor impact (restored within 1 month)
3 Moderate	Moderate service interruption (4 – 24 hrs downtime)	$25K - $250K	Permanent injury	Public concerns, phone calls, Council questions	Significant short-term impact (restored within 2 months)
4 Major	Major service interruption (1 day to 1 week downtime)	$250K - $2.5M	Disabling injury or casualty	Local news, TV, social media	Significant long-term impact (up to 1 year)
5 Catastrophic	Catastrophic interruption of service (>1 week of downtime)	> $2.5M	Multiple casualties	National/ international news coverage	Major long-term impact (> 1 year/ permanent)

Every municipal asset has been assigned a risk consequence score based on the above matrix. The risk consequence score for each asset category is provided in the following table:

Asset Class	Asset	Risk Consequence
Roads	Gravel roads	3
	Hot mix (paved) roads	3
	Tar and chip roads	3
	Concrete roads	3
	Streetlights	3
	Sidewalks	3
Bridges & Culverts	Bridges	4
	Culverts	4

Stormwater	Catchbasins	3
	Manholes	3
	Storm mains	3
Water	Hydrants	4
	Water buildings & equipment	4
	Watermains	4
Wastewater	Sanitary mains	4
	Sanitary storage tank	4
	Sewer lift station	4
	Wastewater treatment plant	4
	Sanitary lagoons	4
	Pumping stations	4
Buildings	Fire	4
	Public Works	3
	Facilities & Recreation	2
Land Improvements	Splash pad, playground equipment, fencing, lighting, parking lots	2
	Landfills	4
	Furniture and fixtures	2
Fleet	Fire	4
	Facilities & Recreation	2
	Public Works	3
Machinery & Equipment	Fire	4
	General Government	2
	Facilities & Recreation	2
	Public Works	3

7.4.2 Risk Likelihood Scale

The likelihood of an asset risk event indicates how likely it is for the risk event to happen. The likelihood can be measured through qualitative or quantitative methodologies. Alternatively, it can be quantified as the probability or frequency within a specified timeframe. Evaluating the likelihood of failure is done individually for each asset, utilizing a qualitative scoring system ranging from 1 (very unlikely) to 5 (commonly occurring), as defined in the following table.

	Likelihood	Description	Condition Grading	Remaining Useful Life (%)
1	Rare	Event only occurs in exceptional circumstances; it is not expected.	Very Good	80 - 100
2	Unlikely	Event could occur, but infrequently.	Good	60 - 80
3	Possible	Event is expected to occur at some time.	Fair	40 - 60
4	Regular	Event will probably occur regularly or in most circumstances.	Poor	20 - 40
5	Almost certain	Event is expected to occur very frequently.	Very Poor	0 - 20

7.4.3 Risk Rating Matrix

A quantitative risk rating is determined based on the following equation:

$$\text{Risk} = \text{Consequence} \times \text{Likelihood}$$

For example, an aging but important drinking water asset with a consequence rating of 4 and a likelihood rating of 5 would generate a risk score of 20. A high-risk score draws attention to an asset that requires attention in the short term.

The range of risk rating scores is summarized in the following risk rating matrix.

Likelihood	Consequence				
	1 Negligible	2 Minor	3 Moderate	4 Major	5 Catastrophic
5 Almost Certain	5	10	15	20	25
4 Regular	4	8	12	16	20
3 Possible	3	6	9	12	15
2 Unlikely	2	4	6	8	10
1 Rare	1	2	3	4	5

Definitions for each range of risk rating scores, ranging from 1 to 25, are included in the following table.

Risk Category / Score	Definition
Extreme Risk (20 – 25 Points)	The process/task must not occur or must cease until actions are taken to eliminate or minimise the risk.
Very High Risk (15 – 16 points)	Actions are to be taken to eliminate the hazard or minimise the risk.
High Risk (10 – 12 points)	Attention is required to plan improved controls or actions to minimise the risk.
Moderate Risk (4 – 9 points)	The process or activity may continue; however effort is required to ensure that controls are effective.
Low Risk (1 – 4 points)	The process or activity in question continues with existing controls.

All levels of the organization should have awareness of the risks the organisation is exposed to, even moderate and low risks. Senior management may not need to be involved in the active management of these risks but should be aware of them – particularly regarding common themes between minor risks and the catastrophic events that the organization may be exposed to but is controlling with its safety systems.

7.5 Current Risks

A risk map has been prepared for all asset classes and is presented in the table below. The risk map shows the quantity and value of assets in each risk category, as measured by 2025 dollar value.

Likelihood	Consequence				
	1 Negligible	2 Minor	3 Moderate	4 Major	5 Catastrophic
5 Almost Certain	0 assets $0	32 assets $16,977,026	163 assets $18,272,219	65 assets $14,545,560	0 assets $0
4 Regular	0 assets $0	8 assets $1,741,425	336 assets $159,571,609	245 assets $15,328,864	0 assets $0
3 Possible	0 asset $0	17 assets $4,523,423	193 assets $9,622,500	240 assets $32,402,687	0 assets $0
2 Unlikely	0 assets $0	21 assets $1,848,080	325 assets $48,120,728	267 assets $58,432,408	0 assets $0
1 Rare	0 asset $0	22 assets $13,897,609	159 assets $12,209,445	129 assets $14,361,938	0 assets $0

7.6 Risk Treatment

A list of projects/replacements corresponding with the extreme and very high risk assets is included in the appendices and summarized in the discussion below. It is recommended that the Municipality prioritize the completion of these projects in the short term.

An inspection plan should be put in place for assets that are nearing the end of their useful life to identify those requiring replacement. Risk should be monitored going forward to ensure that assets in the moderate risk category do not move to the high-risk classification. Infralevel recommends improving condition data, thus replacing age-based condition with assessed condition wherever possible, to improve the accuracy of the risk assessment process; risk may be overstated when age-based condition is used.

7.7 Risk-Based Prioritization

The results of the Risk Assessment and the Current Risks table provide direction as to which projects the Municipality may choose to prioritize in the near term. The list is not exhaustive and should also be weighed in consideration of resident input, non-infrastructure requirements, broader priorities and the Financial Strategy presented in this

report. High priority infrastructure projects, categorized as extreme risk, include the following:

Asset Class	High Priority Projects	Replacement/ Project Cost
Roads	None	$0
Bridges & Culverts	Various repairs and structure replacements to address safety issues as outlined in the OSIM report	$795,000
Water	Replace/rehabilitate water treatment plant building, replace aged fire hydrants	$1,330,713
Wastewater	Replace/rehabilitate PFJ Pump Station	$35,597
Stormwater	None	$0
Buildings	Replace/renew aged fire station and OPP station	$3,090,852
Land improvements	Rehabilitation of aged landfills	$1,080,273
Fleet	Replacement of aged fire vehicle	$869,847
Machinery & Equipment	Replacement of aged fire department equipment	$143,002

A more detailed list of priority projects is included in Appendix C.

Note that many assets in the very high and extreme risk categories have conditions determined by age and should have their condition verified prior to prioritizing lifecycle activities.

Lifecycle Activity Categories

Lifecyle Activity Options and Risks

Asset Class Lifecycle Strategies
- Operating Budget
- Capital Budget

LIFECYCLE MANAGEMENT STRATEGY

8. Lifecycle Management Strategy

8.1 Lifecycle Activity Categories

The Municipality's lifecycle management strategy details the use of a combination of lifecycle activities that maintain current levels of service while striving to optimize costs based on defined risk. This strategy includes activities for maintenance, rehabilitation and replacement, and regular investments in planning studies, while continuing to prepare for population change and introduce service improvements. The standard lifecycle activity categories are defined in the following table.

Lifecycle Activity	Definition
Acquisition	Adding new assets or improving an existing asset through purchasing, design and construction, or assumption.
Operations & Maintenance	The ongoing management of deterioration, including all actions necessary for retaining or returning an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating.
Rehabilitation	Significant treatment intended to restore an asset to its former condition, thus extending its useful life.
Replacement	Activities that are expected to occur once an asset has reached the end of its service life and rehabilitation is no longer an option.
Disposal	Activities associated with the disposal of a decommissioned asset including sale, closure, decommissioning or relocation.
Non-infrastructure solutions	Activities that consider how to influence, plan and manage assets, including planning studies, process improvements and technology implementation

When feasible, the Municipality strives to optimize asset lifecycle activities by coordinating and synchronizing work across multiple assets or asset categories, which can result in cost and service efficiencies.

8.2 Lifecycle Activity Options and Risks

O. Reg. 588/17 requires the identification of the lifecycle activities required to be undertaken for each asset category to maintain the current levels of service over a ten-year period. Options for lifecycle activities are to be considered along with associated costs and risks. Asset-specific lifecycle activity options are included in the following report sections, however there are two general approaches that are relevant to all asset classes:

- Proactive maintenance of assets; or,
- Reactive repair and replacement of assets.

A proactive approach to asset maintenance is utilized by the Municipality for most assets. The benefits of this approach include:

- **Extended Asset Lifespan:** Proactive maintenance involves timely interventions to address minor issues before they escalate into major problems. By identifying and addressing potential infrastructure issues early on, the overall lifespan of the assets is extended. This aligns with the overarching goal of lifecycle activity analysis, ensuring that assets remain in optimal condition for as long as possible.

- **Cost Savings:** Early identification and remediation of maintenance issues can lead to significant cost savings in the long run. Proactive maintenance is more cost-effective than reactive measures, as it prevents the need for extensive repairs or, in some cases, full-scale replacements.

- **Enhanced Safety and Performance:** Proactive maintenance contributes to improved infrastructure safety and performance. Regular inspections and interventions help identify and address potential safety hazards, ensuring that infrastructure meets or exceeds established levels of service.

- **Optimized Capital Planning:** By systematically maintaining assets, the Municipality can better plan and allocate their capital budgets. Proactive maintenance allows for a more predictable expenditure pattern, enabling better financial planning and resource allocation.

- **Community Satisfaction:** Well-maintained municipal assets contribute to overall community satisfaction. Proactive maintenance measures, such as timely repairs and improvements, have a positive impact on the quality of life for residents.

The risks associated with a reactive approach to asset lifecycle activities include:

- Asset deterioration and reduced lifespan
- Increased repair costs
- Service disruptions and operational inefficiencies
- Public safety concerns
- Environmental degradation
- Negative community perception
- Inefficient resource allocation

The Regulation requires similar information and analysis for the lifecycle activities required to achieve the Municipality's proposed levels of service. This information is included in the following sections.

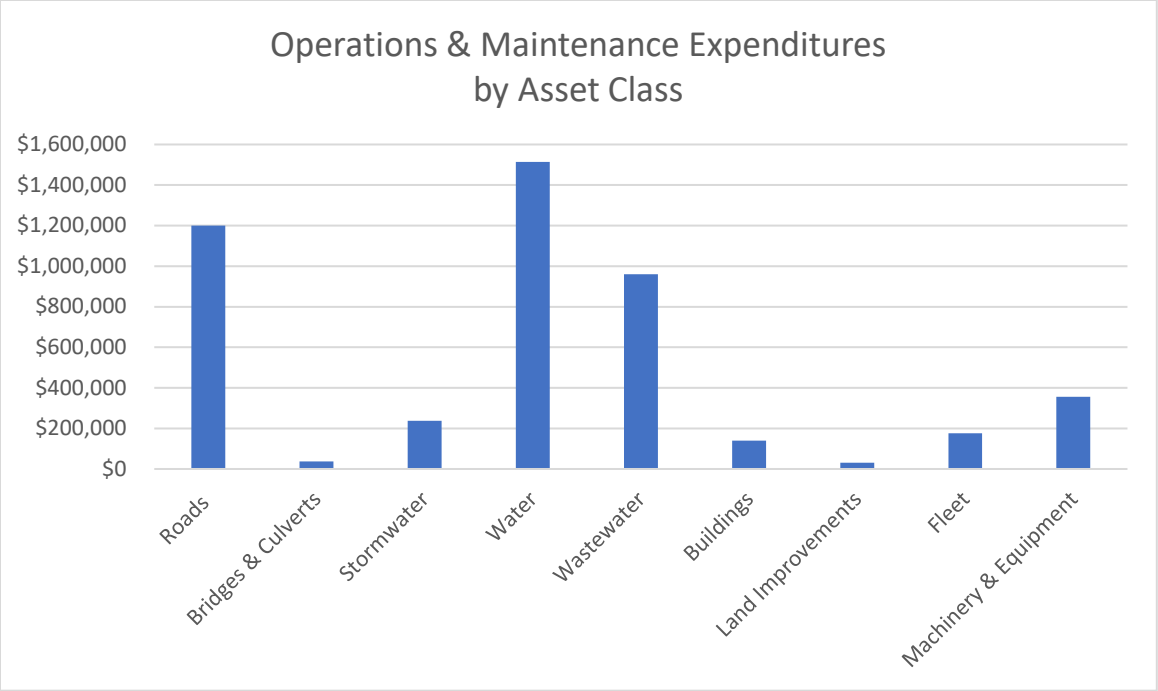
8.3 Asset Class Lifecycle Strategies – Operating Budget

The majority of the asset lifecycle activities outlined in Section 8.1 are funded through the capital budget, including acquisition, rehabilitation, replacement and disposal. Operations and maintenance activities are funded from the operating budget, while non-infrastructure solutions can be funded through capital or operating.

Infralevel completed a line-by-line review of all operating expenditures included in the Municipality's 2025 Operating Budget and determined which expenditures, or portions of expenditures, are attributable to asset management functions. These functions mainly relate to operations and maintenance activities.

The review process also yielded an understanding of the lifecycle activities undertaken within each department and for each asset class. The following table and chart outline the 2025 operating expenditures related to asset management.

Asset Class	2025 Asset Management Operating Expenditure
Roads	$1,200,000
Bridges & Culverts	$37,000
Stormwater	$237,500
Water	$1,514,002
Wastewater	$960,400
Buildings	$139,589
Land Improvements	$31,697
Fleet	$176,000
Machinery & Equipment	$356,363
Total	**$4,652,551**



It is understood that the Municipality's operations and maintenance expenditures, while controlled through a diligent budget process, are adequate to maintain current levels of service. Therefore, no funding gap has been identified in relation to actual operating expenditures versus the operating expenditures required to achieve the current levels of service.

A review of the impact of proposed levels of service on the operating budget was completed to determine the adequacy of funding and the potential need to increase the operating budget over the 10-year period over which proposed levels of service are phased in. The only proposed level of service that impacts the operating budget is the implementation of CCTV inspection programs for stormwater mains and sanitary mains. The cost of this initiative can be accommodated within the existing operating budget and planned increases over the next 10 years.

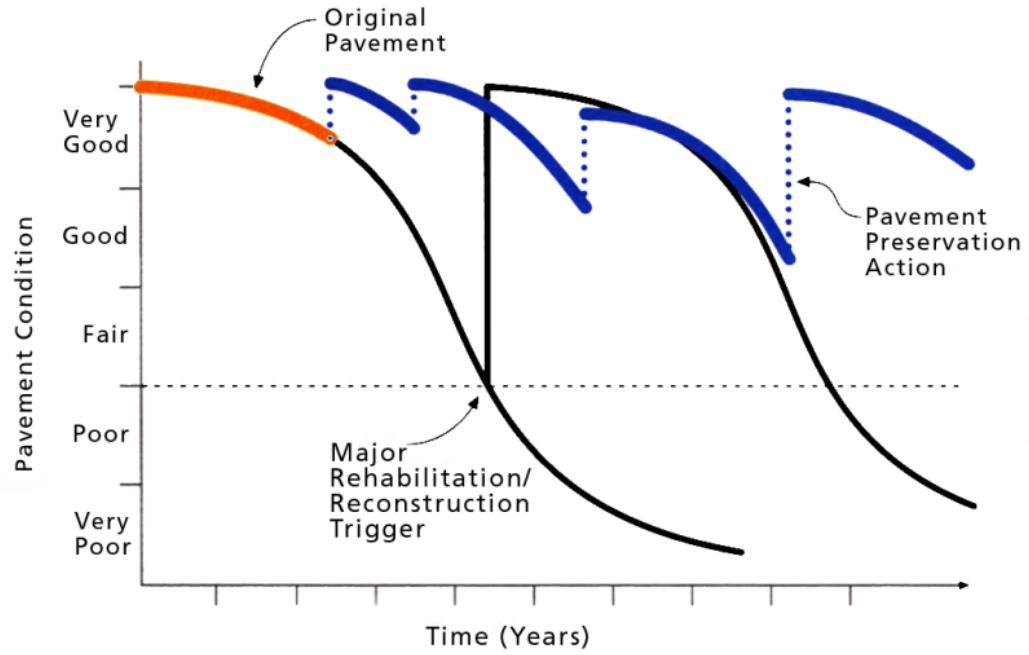
8.4 Asset Class Lifecycle Strategies – Capital Budget

The capital budget includes tax-supported and rate-supported expenditures required to rehabilitate, renew and replace Municipality assets, as detailed in the following report sections.

8.4.1 Roads

8.4.1.1 Lifecycle Model

For illustration purposes, a typical lifecycle model for the management of road pavements is provided below.



Inspection, operation and maintenance activities typically occur throughout the life of the asset. They ensure that the asset is functioning as intended and is safe for users.

Early life interventions like crack sealing, minor repairs and minor resurfacing over a localized area or small section of pavement are some of the treatment options considered when an asset is in the first quarter of its life.

Mid-life intervention activities are considered when an asset is in the second or third quarter of its life. For road pavement assets, these interventions would include larger section resurfacing and full roadway rehabilitation. These actions reset the degradation curve.

As indicated in the lifecycle model above, later life intervention activities such as reconstruction can be deferred significantly through diligent rehabilitation. In some cases, reconstruction is only considered for road widening, underground infrastructure replacement or change of use.

8.4.1.2 Lifecycle Management Activities

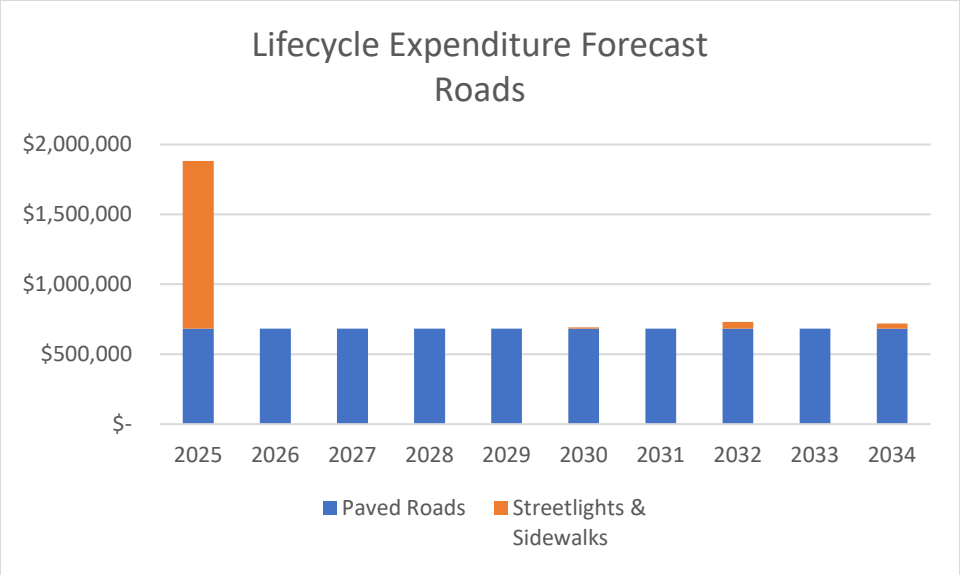
The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to road assets:

Asset	Lifecycle Activity	Description
Paved roads (concrete, hot mix, tar and chip)	Maintenance	Crack sealing, overlay, pothole filling, patch repairs
	Rehabilitation	Surface treatment (tar and chip), single/double mill and pave, pulverize and pave
	Replacement	Road reconstruction, including full granular replacement
Gravel roads	Maintenance	Localized repair, dust suppression
	Rehabilitation	Gravel top-up and grading
	Upgrade	Surface treatment, asphalt treatment and gravel road reconstruction and widening
Streetlights and Sidewalks	Maintenance	Cleaning, grinding, luminaire replacement
	Rehabilitation	Component replacement, localized concrete repair
	Replacement	Full replacement

Site-specific restoration such as gravel top-up and grading is much less costly than upgrading a road from gravel to asphalt or surface treated. Similarly, for asphalt paved roads, maintenance and rehabilitation works are more cost effective than full replacement. Therefore, maintenance and rehabilitation activities are preferred as the methodology to maintain the current levels of service for the lowest cost.

8.4.1.3 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for roads is summarized in the following figure. It provides an estimate of the costs associated with maintaining all of the Municipality's roads, and other transportation assets (streetlights and sidewalks), at their current levels of service. Road costs are based on information included in the Burnside Road Needs Study, and for other transportation assets, from the Municipality's asset management software. Of note, the Municipality funds gravel road lifecycle costs from the operating budget.



The average annual expenditure for road assets over the next 10 years is $812,229.

Proposed levels of service for roads include metrics for the percentage of assets in various conditions. The proposed levels of service do not impact the lifecycle expenditure forecast, as the proposed performance levels will be met through the completion of the lifecycle activities identified through the detailed road condition assessments.

8.4.2 Bridges and Culverts

8.4.2.1 Lifecycle Management Activities

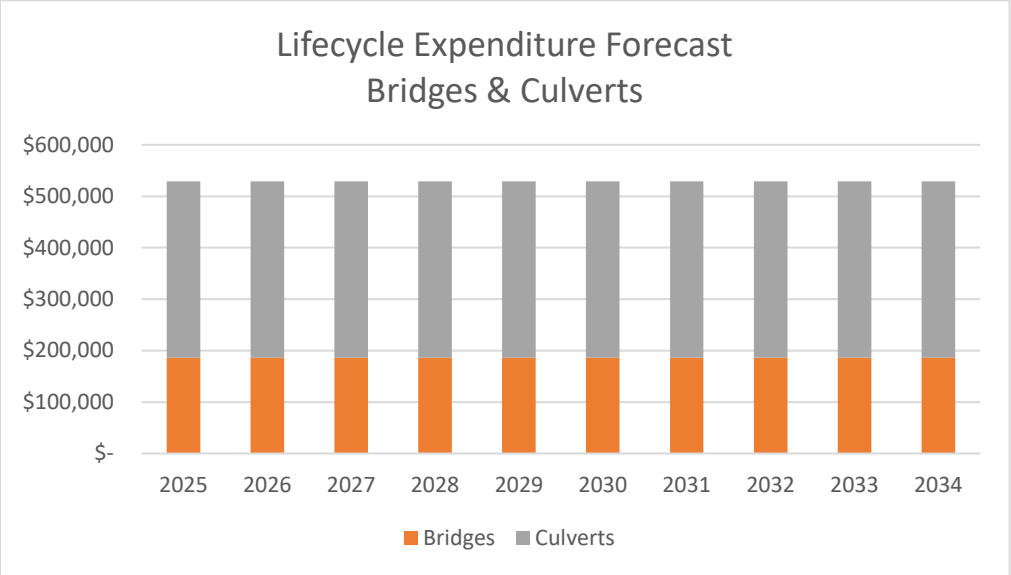
The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to bridge and culvert assets.

Asset	Lifecycle Activity	Description
Bridges	Maintenance	Erosion protection, joint cleaning, end treatment repairs
	Rehabilitation	Concrete repairs, road surface repaving
	Replacement	Full bridge removal and replacement
Culverts	Maintenance	Vegetation removal, clean-out
	Rehabilitation	Lining, concrete repairs, partial replacement
	Replacement	Full culvert replacement

The maintenance and rehabilitation activities outlined above represent an efficient means of minimizing the cost of ownership over the life of the assets.

8.4.2.2 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for bridges and culverts is summarized in the following figure. It provides an estimate of the costs associated with maintaining all of the Municipality's bridges and culverts at their current levels of service. Costs are obtained from the most recent OSIM report.



The average annual expenditure for bridges and culverts over the next 10-years is $528,740.

Proposed levels of service for bridges and culverts include metrics for the percentage of assets in fair condition or better. The proposed levels of service do not impact the lifecycle expenditure forecast.

8.4.3 Stormwater

8.4.3.1 Lifecycle Management Activities

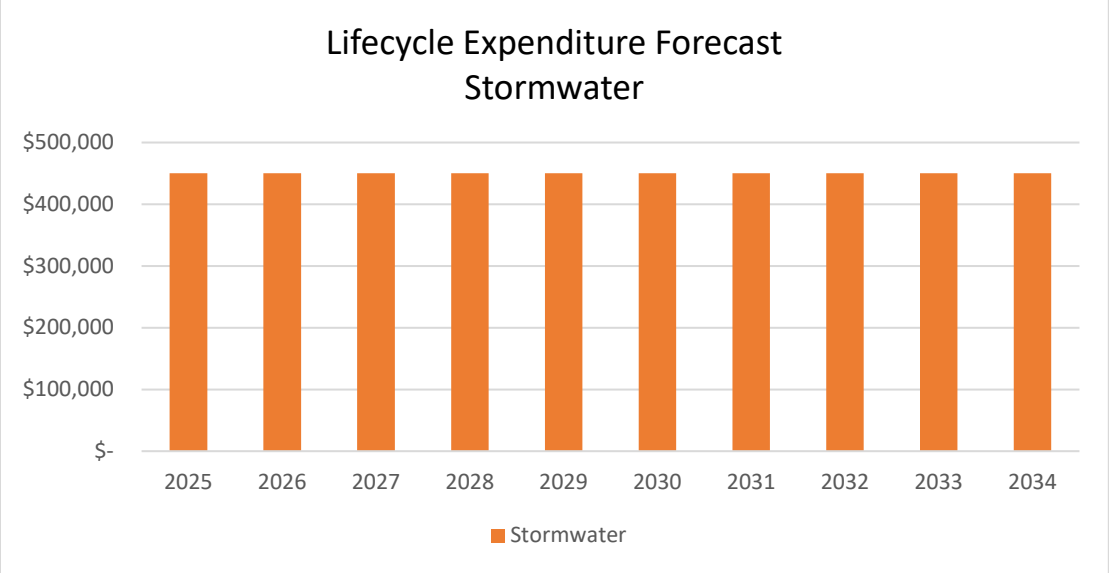
The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to stormwater assets.

Asset	Lifecycle Activity	Description
Catchbasins, manholes & storm mains	Maintenance	Storm main flushing, catchbasin cleanout, condition inspections
	Rehabilitation	Concrete repairs, parging, lining
	Replacement	End of life replacement or upsizing replacement for improved functionality

8.4.3.2 Lifecycle Expenditure Forecast

The stormwater infrastructure was constructed between 1972 and 2016. Based on an expected useful life of 80 years, significant capital replacement costs due to condition are not anticipated during the 10-year capital forecast.

However, the Wardsville Storm Sewer Study report indicates that some of the existing storm sewers are undersized, and additional storm sewers are required to manage flooding concerns. The costs associated with the replacement of undersized storm sewers and construction of new storm sewers, as identified in the proposed levels of service, are included in the lifecycle expenditure forecast.



The average annual expenditure for stormwater assets over the next 10-years is $450,000.

Proposed levels of service for stormwater assets include the completion of CCTV condition assessments on a 10-year cycle, and improvement of the Wardsville storm sewer system for increased storm resiliency. The associated costs have been included in the lifecycle expenditure forecast.

8.4.4 Water

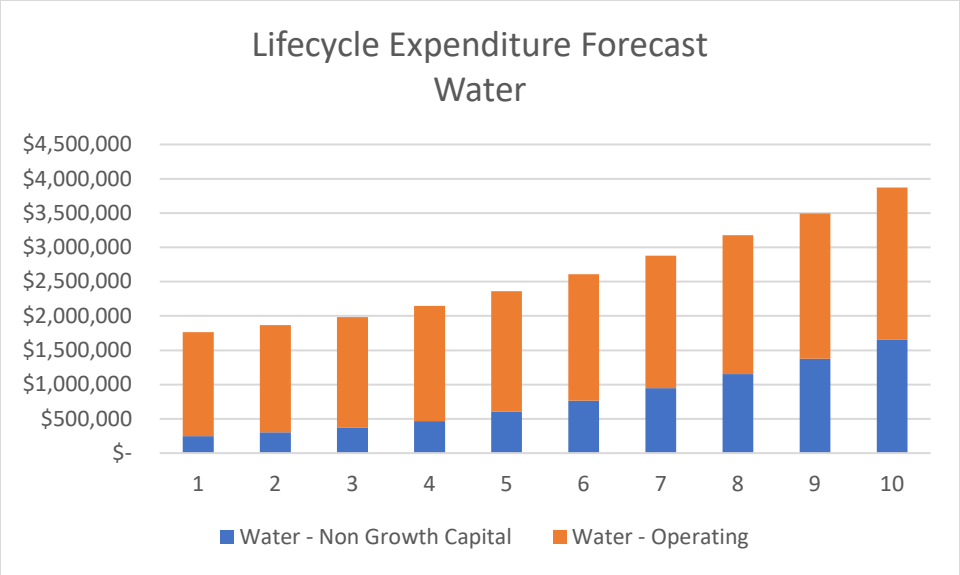
8.4.4.1 Lifecycle Management Activities

The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to water assets.

Asset	Lifecycle Activity	Description
Hydrants	Maintenance	Flushing, flow testing, lubrication, winterization
	Rehabilitation	Component repair and replacement
	Replacement	Full asset replacement
Watermains	Maintenance	Flushing, water quality testing, pressure testing
	Rehabilitation	Swabbing, relining, localized repair/replacement
	Replacement	Full replacement for end of life or upsizing, coordinated with road and water projects
Water buildings and equipment	Maintenance	Repair valves, motors, pumps; building maintenance
	Rehabilitation	Overhaul equipment, replace building components
	Replacement	Replacement of buildings and equipment

8.4.4.2 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for water assets is summarized in the following figure. It includes only non-growth capital expenditures; growth related capital expenditures are addressed through Development Charge funding. The figure also includes operating expenses, which must be taken into account to ensure the water program is fully funded. Costs are obtained from the Municipality's budget and the Water and Wastewater Rate Study report.



The average annual expenditure for water assets over the next 10-years is $788,486 for capital and $1,827,035 for operating.

Proposed levels of service for water assets include metrics for the number of drinking water non-compliances. The proposed levels of service do not impact the lifecycle expenditure forecast.

8.4.5 Wastewater

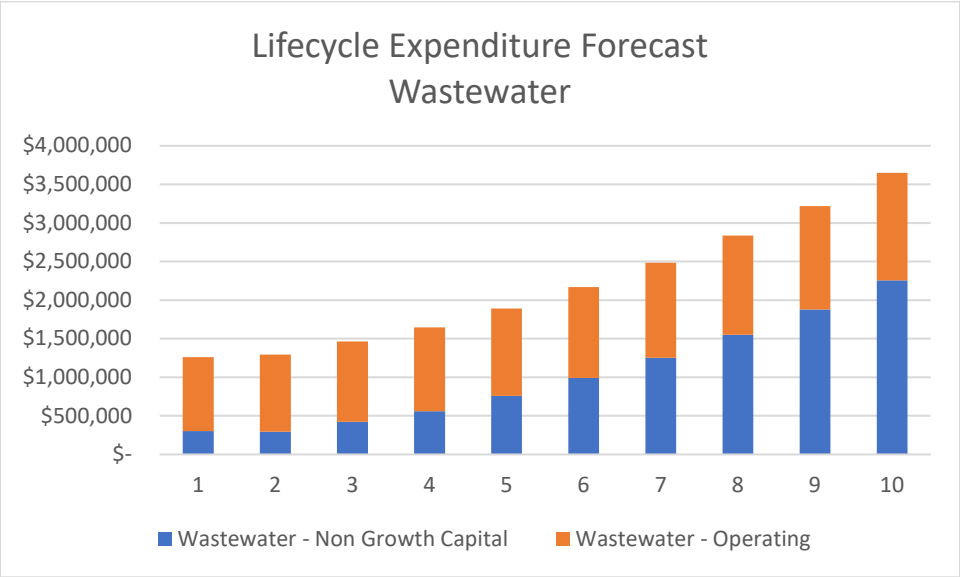
8.4.5.1 Lifecycle Management Activities

The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to wastewater assets.

Asset	Lifecycle Activity	Description
Lagoons, storage tanks, lift stations, pumping stations, treatment plants	Maintenance	Inspection, grit removal, embankment maintenance, removal of material from inlets and outlets, pump maintenance
	Rehabilitation	Sludge removal, component replacement
	Replacement	Replacement of assets
Sanitary mains	Maintenance	CCTV inspection, flushing
	Rehabilitation	Localized main and lateral repairs, concrete manhole repairs
	Replacement	Full replacement for end of life or upsizing, coordinated with road and water projects

8.4.5.2 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for wastewater assets is summarized in the following figure. It includes only non-growth capital expenditures; growth related capital expenditures are addressed through Development Charge funding. The figure also includes operating expenses, which must be taken into account to ensure the wastewater program is fully funded. Costs are obtained from the Municipality's budget and the Water and Wastewater Rate Study report.



The average annual expenditure for water assets over the next 10-years is $1,026,616 for capital and $1,164,702 for operating.

Proposed levels of service for wastewater assets include the implementation of a CCTV condition assessment program to include the assessment of all wastewater mains on a 10-year cycle. The associated costs have been included in the lifecycle expenditure forecast.

8.4.6 Buildings

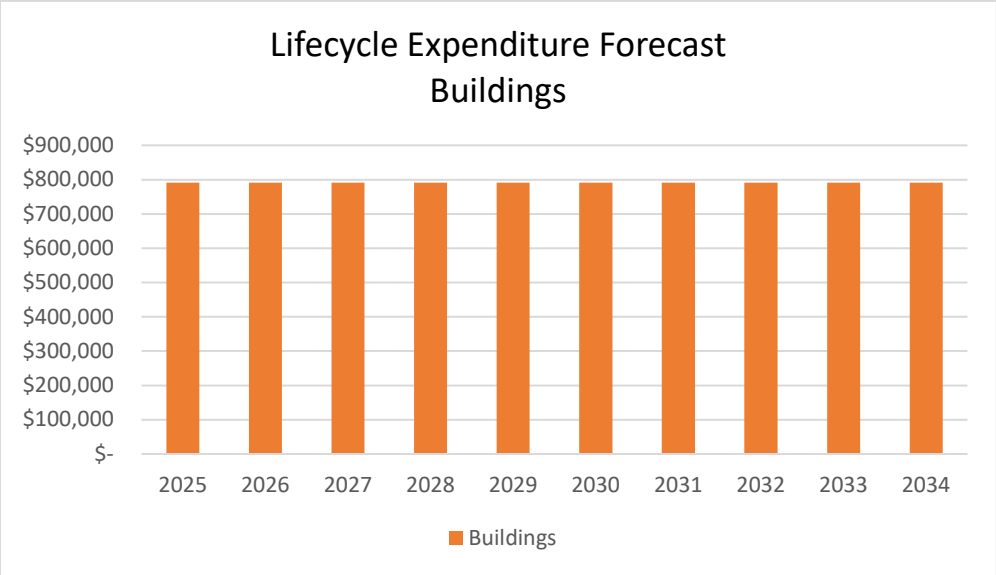
8.4.6.1 Lifecycle Management Activities

The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to its building assets.

Asset	Lifecycle Activity	Description
Buildings	Maintenance	Inspections, cleaning, equipment maintenance, minor repairs and component replacements
	Rehabilitation	Mid-life renewal of facilities and major overhauls and modernization of equipment, such as roof replacement, HVAC replacement, window and door replacement
	Replacement	Building demolition and construction of a new facility, often driven by functionality requirements

8.4.6.2 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for building assets is summarized in the following figure. It provides an estimate of the costs associated with maintaining all of the Municipality's building assets at their current levels of service. Costs are based on an industry standard annual reinvestment rate.



The average annual expenditure for building assets over the next 10-years is $790,843, representing an annual reinvestment rate of approximately 1.8%.

Proposed levels of service for building assets include condition metrics and energy reduction targets. The associated costs have been included in the lifecycle expenditure forecast.

8.4.7 Land Improvements

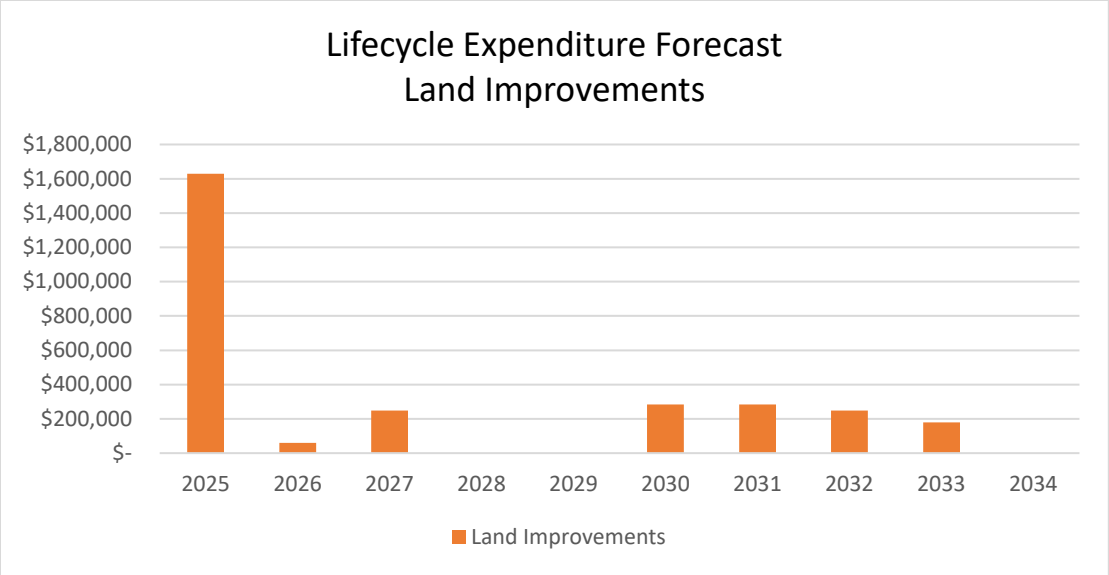
8.4.7.1 Lifecycle Management Activities

The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to land improvement assets.

Asset	Lifecycle Activity	Description
Parks, playgrounds, splash pads & parking lots	Maintenance	Inspections, flushing, cleaning, minor repairs
	Rehabilitation	Park component replacements, major splash pad repairs and upgrades, major repair or partial replacement of structures
	Replacement	Full replacement of play structures, splash pads and water infrastructure, replacement of sports structures
Furniture & fixtures	Maintenance	Inspections, cleaning, painting, minor repairs
	Rehabilitation	Surface renewal, structural repairs, retrofitting
	Replacement	Full replacement of furniture, garbage containers, solar panels, etc.
Landfills	Maintenance	Leachate collection and treatment, stormwater management, pest and litter control
	Rehabilitation	Leachate and gas system improvements
	Replacement	Site repurposing, new site development

8.4.7.2 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for land improvements is summarized in the following figure. It provides an estimate of the costs associated with maintaining all of the Municipality's land improvement assets at their current levels of service. Costs are obtained from the Municipality's asset management software.



The average annual expenditure for land improvement assets over the next 10 years is $293,226. The chart portrays significant backlog work required in the short term.

Proposed levels of service for land improvement assets include reaching compliance with accessibility requirements for playgrounds. The associated costs of achieving compliance when playgrounds are replaced, are included in the lifecycle costs.

8.4.8 Fleet

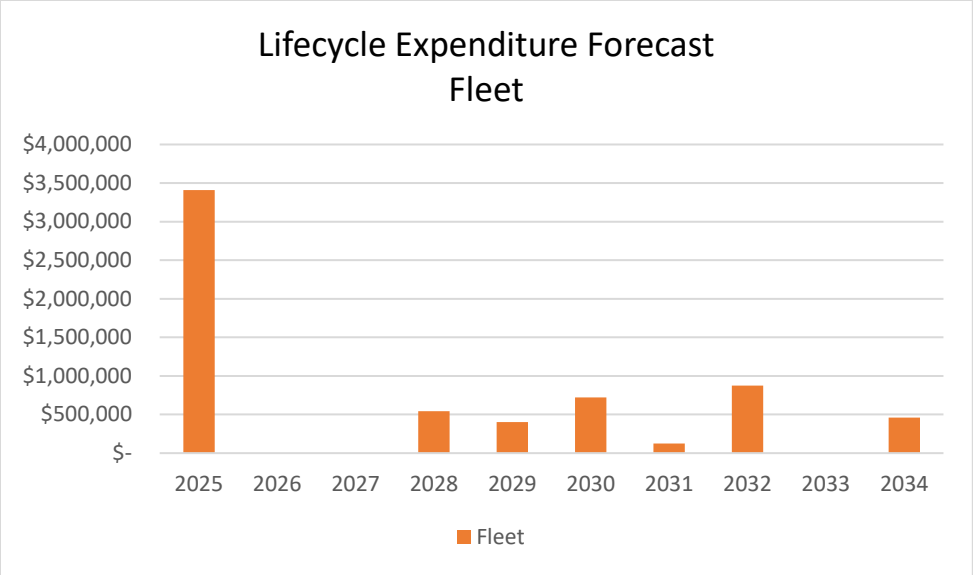
8.4.8.1 Lifecycle Management Activities

The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to fleet assets.

Asset	Lifecycle Activity	Description
Fleet	Maintenance	Inspections, regulatory maintenance, oil change, tire rotation
	Rehabilitation	Collision repair, component replacement such as breaks, transmission and shocks
	Replacement	Sale of vehicle and replacement with new vehicle

8.4.8.2 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for fleet is summarized in the following figure. It provides an estimate of the costs associated with maintaining all of the Municipality's fleet assets at their current levels of service. Costs are obtained from the Municipality's asset management software.



The average annual expenditure for fleet assets over the next 10-years is $653,506.

Proposed levels of service for fleet assets include a target to maintain at least 90% of the fleet within its expected useful life. The associated costs have been included in the lifecycle expenditure forecast.

8.4.9 Machinery & Equipment

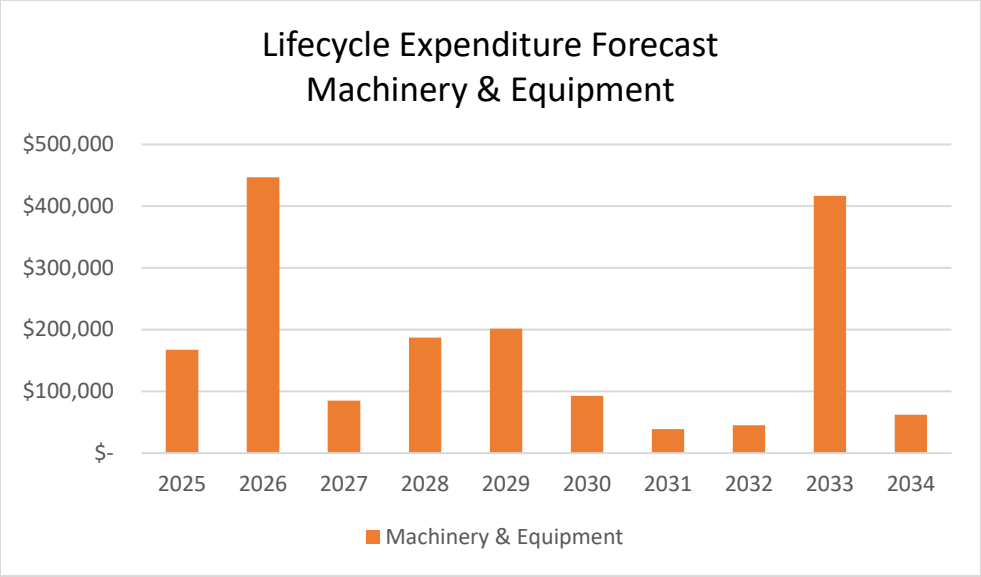
8.4.9.1 Lifecycle Management Activities

The Municipality undertakes the following lifecycle activities to maintain the current levels of service related to machinery and equipment assets.

Asset	Lifecycle Activity	Description
Machinery & equipment	Maintenance	Inspection, cleaning, minor repairs
	Rehabilitation	Major repair or component replacement
	Replacement	Full replacement of machinery and equipment

8.4.9.2 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for machinery and equipment is summarized in the following figure. It provides an estimate of the costs associated with maintaining all of the Municipality's machinery and equipment assets at their current levels of service. Costs are obtained from the Municipality's asset management software.

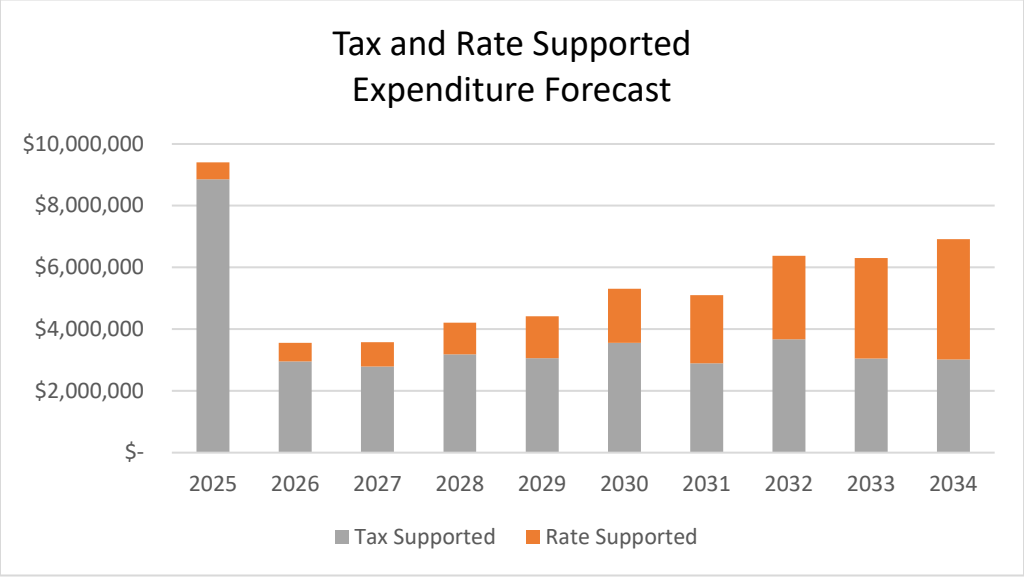


The average annual expenditure for machinery and equipment assets over the next 10-years is $174,325.

Proposed levels of service for machinery and equipment assets include metrics for the percentage of assets in fair condition or better. The associated costs have been included in the lifecycle expenditure forecast.

8.4.10 Total Capital Expenditure Forecast

The following chart summarizes the total capital expenditures forecast for the next ten years, broken out between tax-supported expenditures and rate-supported expenditures. Of note, there is a backlog of capital requirements in year one of the evaluation period.



Impact of Growth on Lifecycle Activities

Impact of Growth on the Financial Strategy

Growth Management Plan

GROWTH IMPACTS

9. Growth Impacts

Future growth and development have the potential to contribute to a more economically vibrant, healthy and sustainable municipality. However, there is an impact on both capital and operating expenditures as growth continues, since population growth changes demographics and expectations, demand, and usage of infrastructure. Planning for growth is primarily addressed in the Municipality's Development Charge (DC) Background Study, which is currently underway, the Official Plan, dated 2024 (office consolidation) and the 2023 County of Middlesex Official Plan.

At the time of the 2021 Census, the Municipality's population was 5,893. This includes 2,185 residents living in Glencoe, and the remainder living in Wardsville and several other smaller hamlets in the rural areas of the Municipality.

The County of Middlesex Official Plan projects a 2046 population, under the middle growth scenario, of 6,400 including Census undercount (or 6,200 excluding the Census undercount).

The demand on the Municipality's infrastructure assets will change over time based on several contributing internal and external factors, including growth. One effect that growth will have on the Municipality's assets is increased demand resulting in higher usage and accelerated deterioration of some existing assets. Planning for population growth may require expansion of the infrastructure network (e.g., roadway widening, sewer system expansion and upsizing, etc.) to ensure the appropriate levels of service can be maintained. Additionally, as the asset portfolio increases in size and value due to the assumption of new developments, maintenance and renewal of the new assets will require more resources including operations, maintenance and rehabilitation.

9.1 Impact of Growth on Lifecycle Activities

The assumptions regarding future changes in population and economic activity inform the Municipality's lifecycle management strategy. The following table summarizes the anticipated impacts of growth on the lifecycle activity categories previously identified in Section 8.

Lifecycle Activity	Growth Impacts
Acquisition	Growth triggers the expansion of municipal services, which requires additional asset acquisition activities. Funding for acquisition is commonly achieved through development charges and direct developer contributions.
Operations & Maintenance	Once acquired or assumed, new assets that accommodate growth require standard O&M activities to ensure longevity. A growth factor is typically applied to the current O&M lifecycle costs to plan for expected growth.
Rehabilitation	Frequency of use of assets will increase and will require either enhanced or more frequent rehabilitation. With increased usage, some assets are more prone than others to accelerated degradation.
Replacement	The effects of growth may impact the timing of implementing replacement activities for some assets. For example, increased wear and tear on equipment that is utilized until failure may shorten the lifecycle of the asset.
Disposal	Disposal costs are relatively minor in relation to the other lifecycle activities, with costs likely to increase consistent with the Municipality's growth factor.
Non-infrastructure Solutions	With growth there will be increased requirement for, and benefit derived from, non-infrastructure solutions such as education, usage management and master planning.

9.2 Impact of Growth on the Financial Strategy

Population and economic growth impact lifecycle management activities as noted above, which must be factored into the Municipality's financial strategy. In terms of operating budget impacts, increased revenue from taxation, user fees and other sources is assumed to adequately address the increased costs of infrastructure operations and maintenance.

The impacts of growth on the capital budget are partially addressed through the DC Background Study, which identifies numerous projects to add new assets, expand or replace facilities, improve roadway intersections, add new sanitary sewers and upsize watermains.

9.3 Growth Management Plan

The Municipality actively manages growth through various processes including the preparation of a DC background study, departmental master plans, annual capital and operating budgets, and the Official Plan.

The following recommendations are made to enhance the maturity of the Municipality's growth management planning, and further develop a strategic framework that guides growth and development in a sustainable and organized manner.

- The effectiveness of lifecycle activities should be monitored and analysed to ensure that rehabilitation and replacement activities are timed in an optimized manner. Timing may change based on increased usage associated with population growth.
- Complete and update departmental master plans on a regular basis to ensure growth projections are accommodated and founded on current data.
- Monitor the changing demographics of residents over time and plan for the associated changes in demand for infrastructure. Seek user input through public consultation, surveys or other means.
- Monitor the advancement of technology to leverage new technologies that support lifecycle management and the efficient and effective delivery of services.
- Continue to incorporate the most up-to-date growth projections in the Municipality's financial strategy to ensure change is managed proactively and in a financially sustainable manner.
- Options for achieving the current and proposed levels of service may change as the Municipality grows. Complete a regular review of lifecycle activities to ensure the lifecycle management program achieves the desired levels of service at the lowest cost.

Tax-Supported Assets

Rate-Supported Assets

FINANCIAL STRATEGY

10. Financial Strategy

The financing strategy outlines the recommended use of various funding sources to finance the asset management strategy and levels of service recommendations. The strategy is separated for tax-supported assets and rate-supported assets.

The financing strategy establishes a comprehensive framework to guide the Municipality toward achieving long-term financial sustainability. It seeks to maintain an appropriate balance among three key pillars: financial sustainability, financial vulnerability, and financial flexibility. Effective asset management practices are integral to supporting and strengthening each of these pillars, ensuring that the Municipality can continue to deliver reliable services while responsibly managing financial risks and opportunities.

Financial Sustainability

The Municipality's ability to provide and maintain planned service levels and infrastructure assets without unplanned increases in rates or disruptive cuts to services.

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Financial Vulnerability

The degree to which the Municipality is dependent on external funding sources that it cannot control; it is the level of risk that could impact the ability to meet existing financial obligations and commitments, including the delivery of services.

Financial Flexibility

The Municipality's ability to change either debt levels or taxes and utility rates to meet financial obligations and ensure intergenerational equity.

10.1 Tax-Supported Assets

10.1.1 Funding Sources

The funding sources included in the financial strategy for tax-supported assets include the following.

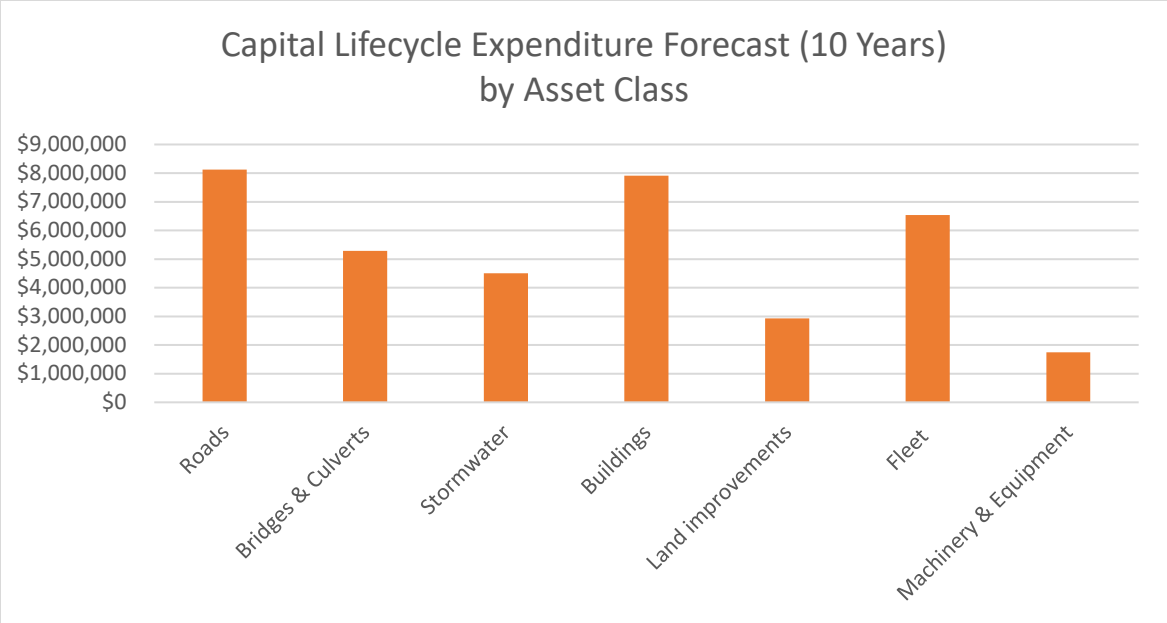
Funding Sources	
Taxation	Facility rentals
Payments in lieu of taxation	Solar panel revenue
User fees	Cemetery fees
Grants	Planning and zoning fees
Investment, interest and penalties	Parking fines
Licenses and permits	Miscellaneous items

Over the 10-year evaluation period, these funding sources are anticipated to provide, in a sustainable manner, a total of $31,583,610 for tax-supported asset management funding purposes.

10.1.2 Funding Needs

The following table and chart summarize the Municipality's asset lifecycle funding needs for tax-supported assets over the next 10 years, as determined by the Lifecycle Management Strategy.

Asset Class	10-Year Funding Need
Roads (inc. sidewalks and streetlights)	$8,122,287
Bridges & Culverts	$5,287,400
Stormwater	$4,500,000
Buildings	$7,908,430
Land improvements	$2,932,260
Fleet	$6,535,061
Machinery & Equipment	$1,743,252
Total Funding Need	**$37,028,689**



10.1.3 Funding Gap

Analysis of the Municipality's asset lifecycle needs over the next 10 years, in comparison with the available capital funding, provides an indication of the annual funding gap for tax-supported assets.

10-Year Funding Gap	
Funding Need	$37,028,689
Funding Available	$31,583,610
Funding Gap	**$5,445,079**

The identified funding gap is $5,445,079 over the next ten years; or $544,508 per year. In comparison to funding gaps identified by similar municipalities in Ontario, this gap is relatively small.

Without proactive funding measures, the funding gap will result in further asset deterioration, service level declines, and increased long-term costs.

10.1.4 Options to Bridge the Funding Gap

There are several options available for funding the infrastructure gap for tax-supported assets. These options can be categorized into various sources of revenue and financing mechanisms, including:

- **Infrastructure Levy**: The implementation of a dedicated infrastructure levy may be considered as a strategic measure to establish a stable, predictable, and

sustainable source of annual funding exclusively earmarked for the renewal, rehabilitation, and replacement of municipal infrastructure assets. Utilizing such a levy demonstrates a proactive commitment to long-term asset stewardship, helps mitigate the growing infrastructure funding gap, and ensures that critical investments in the Municipality's core assets are made in a timely and fiscally responsible manner.

- **Reserve Funds**: Reserves related to asset management, such as the Public Works Equipment Replacement Reserve and the Facility Department Reserve, have been built up over time and represent an appropriate source of funding to address the gap. It is important to balance the need to fund large infrastructure projects, but also build reserves in preparation for unplanned events.

- **User Fees and Charges**: The Municipality imposes user fees and charges for specific services, such as facility rentals, recreation programs, and permits. These fees can be structured and increased to cover the costs of providing the services and generate revenue to support infrastructure maintenance and improvements. Implementation of a stormwater charge may be considered as a means of providing dedicated funding for stormwater assets.

- **Grants and Federal Funding**: The Municipality receives various grants from upper levels of government. These grants are typically earmarked for specific types of infrastructure projects, such as transportation improvements or recreation facility renewal. In some cases, large infrastructure projects such as stormwater system upgrades in Wardsville, may be deferred until a grant can be secured to fund the project.

  Securing additional grants and external funding can help alleviate the financial burden on municipalities and support critical infrastructure investments. Although every effort should be made to increase grant funding as a means of reducing the infrastructure gap, increased grant funding has significant uncertainty and as such, it is not prudent to budget for potential increases.

- **Borrowing and Debt Financing**: The Municipality can issue bonds, debentures, or other forms of debt to finance infrastructure projects. Debt financing allows municipalities to spread the cost of infrastructure investments over time and leverage future revenue streams to fund projects upfront. However, borrowing is not a sustainable primary funding strategy. It creates future financial burdens, limits flexibility, and risks unfairly shifting costs to future taxpayers.

- **Asset Monetization and Leasing**: The Municipality may explore opportunities to monetize or lease existing infrastructure assets to generate revenue. This may include selling surplus property, leasing municipal facilities to private operators, or

entering into long-term lease agreements for infrastructure assets. Asset monetization can provide an immediate infusion of funds and unlock the value of underutilized assets, however implications for service delivery and public ownership must be considered.

There are additional initiatives that can be undertaken that seek to minimize the funding gap as opposed to increasing revenues to fund its full amount. These include:

- **Implement Operational Efficiencies**: Identify opportunities to improve operational efficiencies within the municipality to generate cost savings. This may include streamlining administrative processes, optimizing resource allocation, renegotiating contracts with vendors, and implementing technology solutions to automate tasks and reduce operational expenses. By maximizing efficiency, the municipality can free up resources to allocate towards addressing the funding gap.

- **Enhance Asset Condition Data**: Invest in improving asset condition data collection, analysis, and management systems. By enhancing the accuracy and reliability of asset condition data, the municipality can make more informed decisions about asset maintenance, rehabilitation, and replacement, ultimately optimizing asset lifecycle management and minimizing long-term costs. The use of age as a proxy for the condition of underground infrastructure such as storm sewer mains, often results in overstated investment projections and a larger funding gap than actual condition data may justify.

- **Apply Risk-Based Prioritization**: The risk assessment completed as part of this asset management plan identifies high risk assets and prioritizes projects accordingly. By comparing the risk rating of each asset to the Municipality's risk tolerance level, opportunities may be identified to adjust lifecycle activities for low-risk assets with relatively high tolerance levels for risk.

10.1.5 Funding Recommendations

The Municipality's 2025 budget included a total tax increase of 5.08%, including a dedicated capital contribution of $238,247. This represents a capital levy of 3.3%.

It is recommended that the Municipality continue to budget for a capital levy in an ongoing manner, the magnitude of which may be determined as part of the annual budget process. The following table provides a summary of the revenue generated over time by different levels of capital levies.

Timeframe	2% Capital Levy	2.5% Capital Levy	3% Capital Levy
10 years	$2.7M	$3.3M	$4.0M
20 years	$8.0M	$10.3M	$12.8M

Continuation of the capital levy provides the following benefits:

- **Stable and Predictable Funding**: A capital levy creates a dedicated, predictable revenue stream specifically earmarked for infrastructure projects. Unlike one-time grants or uncertain transfers from higher levels of government, a capital levy provides a consistent source of funding each year.

- **Preservation of Credit Rating**: By avoiding additional borrowing, the Municipality can maintain or improve their credit rating. This may reduce the cost of future borrowing if needed for emergencies or larger capital projects.

- **Fair Distribution of Costs**: By implementing a capital levy, the cost of maintaining and upgrading infrastructure is spread more equitably across current taxpayers, rather than shifting the financial burden to future generations through borrowing. This ensures that those benefiting from infrastructure improvements help pay for them.

- **Improved Asset Management**: The predictable nature of a capital levy encourages the Municipality to continually advance asset management practices, ensuring infrastructure is maintained, rehabilitated and replaced efficiently.

To minimize reliance on the capital levy, the following actions are recommended:

- Implement operational efficiencies and enhance condition data, as noted above.
- Transfer any annual operating surpluses to capital reserves.
- Enhance operations and maintenance activities to extend the useful life of assets and decrease overall lifecycle expenditures.
- Seek additional grant funding where possible.
- Consider the implementation of a stormwater charge to fully fund stormwater assets, thus minimizing the funding gap.

10.2 Rate-Supported Assets

10.2.1 Funding Sources

The primary funding source for water and wastewater infrastructure is the utility rate charged to customers based on a fixed rate and the volume of consumption. Secondary funding sources include miscellaneous fees for services such as service connections.

Based on the Municipality's Water and Wastewater Rate Study, The Municipality has planned for a 5% annual increase for water billing from 2025 to 2033. The 5% increase

has been extended to 2034 for the purposes of the evaluation period utilized in this asset management plan.

Various wastewater rate increase options are provided in the Water and Wastewater Rate Study report. For the asset management plan, a blended 10% annual wastewater rate increase has been applied from 2026 to 2029, followed by 5% increases from 2030 to 2034.

Over the 10-year evaluation period, the water and wastewater funding sources are anticipated to provide, in a sustainable manner, a total of approximately $50,467,535 for rate-supported asset management funding purposes.

10.2.2 Funding Gap/Surplus

Analysis of the Municipality's asset lifecycle needs over the next 10 years, in comparison with the available capital funding, provides an indication of the annual funding surplus for rate-supported assets.

Item	Asset Class	Amount
10-Year Funding Need	Water	$26,155,208
	Wastewater	$21,913,182
	Total	**$48,068,390**
10-Year Revenue	Water	$28,056,896
	Wastewater	$22,410,639
	Total	**$50,467,535**
10-Year Funding Surplus		**$2,399,145**

As indicated in the table above, the total asset lifecycle funding need for water and wastewater infrastructure for the next 10 years is $48,068,390. Based on the $50,467,535 revenue availability, this represents a funding surplus of $2,399,145 over 10 years, or $239,915 annually.

It is recommended that the annual funding surplus identified over the 10-year evaluation period be contributed to water/wastewater reserves. Over time, if the Municipality is able to grow its reserves, there may be an opportunity to lessen future rate increases.

Strategies

Initiatives

ADVANCING ASSET MANAGEMENT MATURITY

11. Advancing Asset Management Maturity

The Municipality's asset management program is guided by industry best practices and regulatory requirements. As the Municipality strives to optimize the management of its infrastructure assets and ensure long-term sustainability, it is imperative to continually advance asset management maturity across all departments and functions. This section outlines the key strategies and initiatives aimed at enhancing asset management practices and increasing maturity levels within the municipality.

11.1 Strategies

The Municipality's asset management program has matured over the past several years. Further development of the following strategies will assist the Municipality in maturing its asset management program.

- **Establishment of Clear Governance Structure**: Effective asset management begins with clear governance structures that define roles, responsibilities, and decision-making processes. The Municipality is committed to establishing and maintaining a robust governance framework that aligns asset management activities with organizational goals and objectives. This includes defining accountability structures, establishing performance metrics, and fostering a culture of transparency and accountability.

- **Integration of Asset Management Principles into Planning Processes**: Asset management principles are integrated into all phases of the planning process, from strategic planning to capital budgeting and project prioritization. By aligning infrastructure investment decisions with asset management objectives, the Municipality ensures that resources are allocated efficiently to address the most critical needs and maximize the lifespan of assets.

- **Capacity Building and Training**: Building internal capacity and fostering a culture of continuous learning are essential for advancing asset management maturity. The Municipality is committed to providing training and professional development opportunities for staff at all levels to enhance their asset management knowledge and skills. This includes workshops, seminars, certifications, and knowledge-sharing initiatives to empower staff with the tools and resources needed to effectively manage assets.

- **Engagement and Collaboration**: Asset management is a collaborative effort that requires engagement and collaboration across departments, disciplines, and stakeholders. The Municipality actively engages with internal and external stakeholders to solicit input, share best practices, and foster partnerships that enhance asset management effectiveness. This includes regular communication,

stakeholder consultations, and participation in municipal networks and associations.

11.2 Initiatives

Improving asset management maturity requires a holistic approach that involves various initiatives aimed at enhancing processes, systems, skills, and collaboration within a municipality. Several initiatives have been identified through the completion of this asset management plan that will advance the Municipality's asset management maturity.

- The Municipality has invested in condition assessments for its facilities, roads, bridges and large culverts. The condition data for these assets contributes significantly to the completion of a robust asset management plan. Condition assessments are recommended to be completed for the remaining assets where practical, with priority placed on stormwater and sanitary sewer mains through the use of CCTV inspections. This will allow for informed lifecycle renewal decision making and decreased risk of service failures.
- Flooding events and climate change trends highlight the importance of municipal stormwater management infrastructure. It is recommended that the Municipality consider the implementation of a stormwater charge that will incentivize best practices, distribute costs equitably, provide predictable and sustainable funding to stormwater infrastructure and eliminate the funding gap for this service area.
- The Municipality has an opportunity to proactively complete a Climate Change Adaptation Plan for all of its municipal facilities, and for other asset classes where applicable. Completing a Climate Change Adaptation Plan significantly strengthens a municipality's asset management maturity by embedding climate risk considerations into long-term infrastructure planning and decision-making, as increasingly expected under provincial regulations and best practices. A comprehensive adaptation plan enables municipalities to better understand, assess, and manage the growing impacts of climate change on municipal assets - a key element of moving from basic asset management practices to more advanced, integrated approaches.
- Update the data register with the current list of assets and associated data sets such as replacement value in current dollars. Conduct periodic reviews of asset inventories to identify redundant, underutilized, or non-essential assets.
- Implement performance monitoring systems to track the condition, performance, and service levels (current and proposed) of infrastructure assets over time.
- Incorporate the risk management framework into future budgets and master planning processes.

Appendix A

Definitions

Asset - An item, thing or entity that has potential or actual value to an organization. The value can be tangible or intangible, financial or nonfinancial, and includes consideration of risks and liabilities.

Asset management - The combination of management, financial, economic, engineering, operational and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.

Asset management plan - A plan developed for the management of one or more infrastructure assets that combines multidisciplinary management techniques (including technical and financial) over the life cycle of the asset in the most cost-effective manner to provide a specified level of service. A significant component of the plan is a long-term cash flow projection for the activities.

Asset management policy - A high-level statement of an organization's principles and approach to asset management.

Asset management strategy - A strategy for asset management covering the development and implementation of plans and programs for asset creation, operation, maintenance, rehabilitation/replacement, disposal, and performance monitoring to ensure that the desired levels of service and other operational objectives are achieved at optimum cost.

Asset register - A table which documents assets owned by the Municipality and the required attributes that support asset management decision making. It contains pertinent details about each fixed asset and is used to track information such as replacement value, age, location, condition, criticality rating, etc.

Consequence of failure - The outcome or impact of an asset failing its condition or capacity targeted level of service.

Customer levels of service - Measures that are expressed in non-technical terms that describe the general public's understanding of services being provided by municipal infrastructure.

Expected Useful Life - The estimated amount of team, typically in years, that an asset is expected to maintain its performance or function.

Levels of service - The defined service quality for a particular activity or service area against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability, and cost.

Lifecycle costing - A method of expressing cost, in which both capital costs and operations and maintenance costs are considered, to compare alternatives. Present worth is one way to express life cycle costs. The present worth represents the current investment that would have to be made at a specific discount (or interest) rate to pay for the initial and future cost of the works.

Lifecycle models - Mathematical, statistical and logistic models of planned actions as well as the behaviour or deterioration of assets over time. They are used to forecast required asset lifecycle activities and their impacts on levels of service, risk and funding levels.

Likelihood of failure - The likelihood or probability of an asset failing to meet its targeted levels of service.

Line of sight - The connection between the Municipality's high-level strategic objectives and detailed day-to-day activities, carried out by the Municipality's staff, programs and assets. It clearly illustrates how organizational objectives link to day-to-day activities.

Rehabilitation - Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification. Generally involves repairing the asset to deliver its original level of service without resorting to significant upgrading or renewal, using available techniques and standards.

Replacement - The complete replacement of an asset that has reached the end of its service life, to provide an alternative that satisfies a targeted level of service.

Reinvestment - Funds allocated to capital projects that are rebuilding the existing municipal infrastructure asset base. New capacities and operations are excluded from infrastructure reinvestment decisions.

Risk - The effect of uncertainty on objectives. Risk is often expressed as the consequences of an event in combination with the associated likelihood of that event occurring.

Service life - The period that an asset provides an acceptable level of service. The economic service life is defined as the period when the present worth of the future maintenance costs are equal to the present worth of its replacement.

Technical levels of service - Technical measures applied against assets and overall systems that define the performance requirements to support customer levels of service. The are used to determine which criteria will be used to drive business decisions.

Appendix B

Mapping

Road Condition Images

Asphalt (left) and gravel (right) roads in **Very Good** condition – no noticeable defects

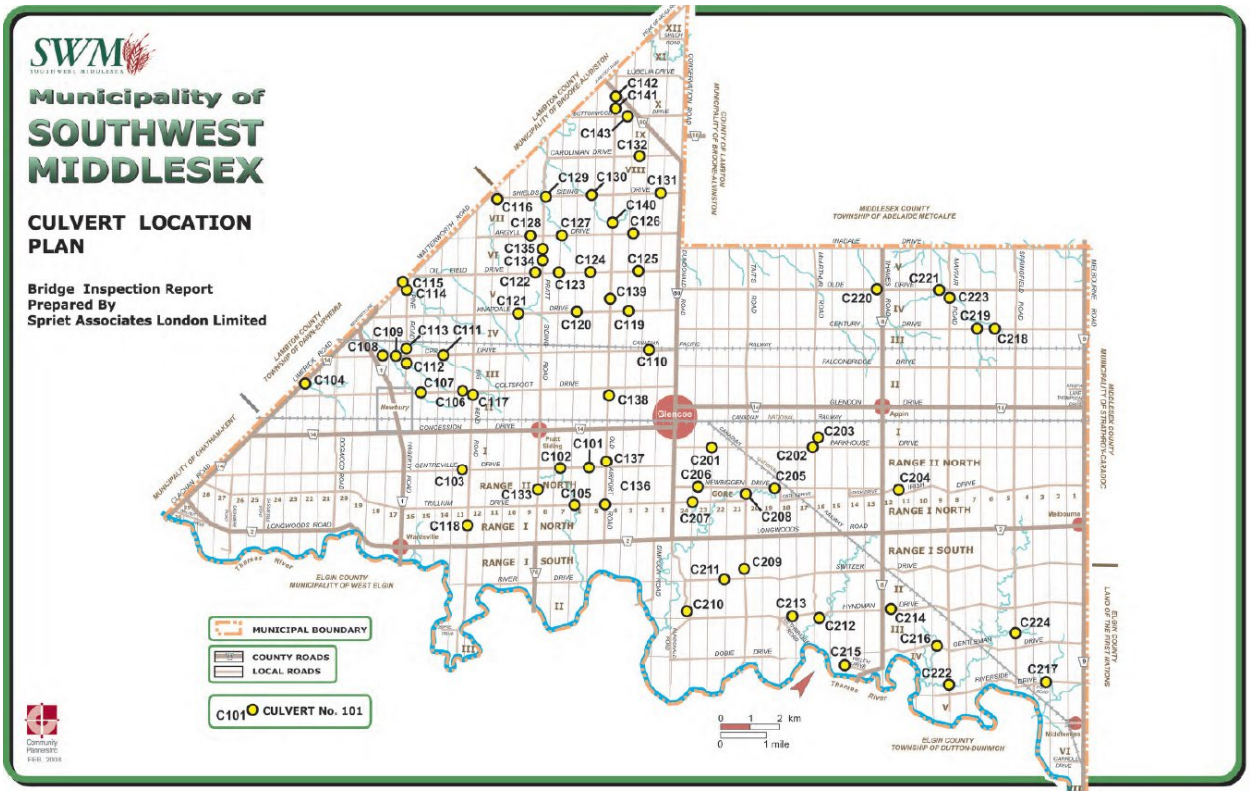
Asphalt (left) and gravel (right) roads in **Good** condition – minor deterioration


Asphalt (left) and gravel (right) roads in **Fair** condition – deterioration evident, function is affected

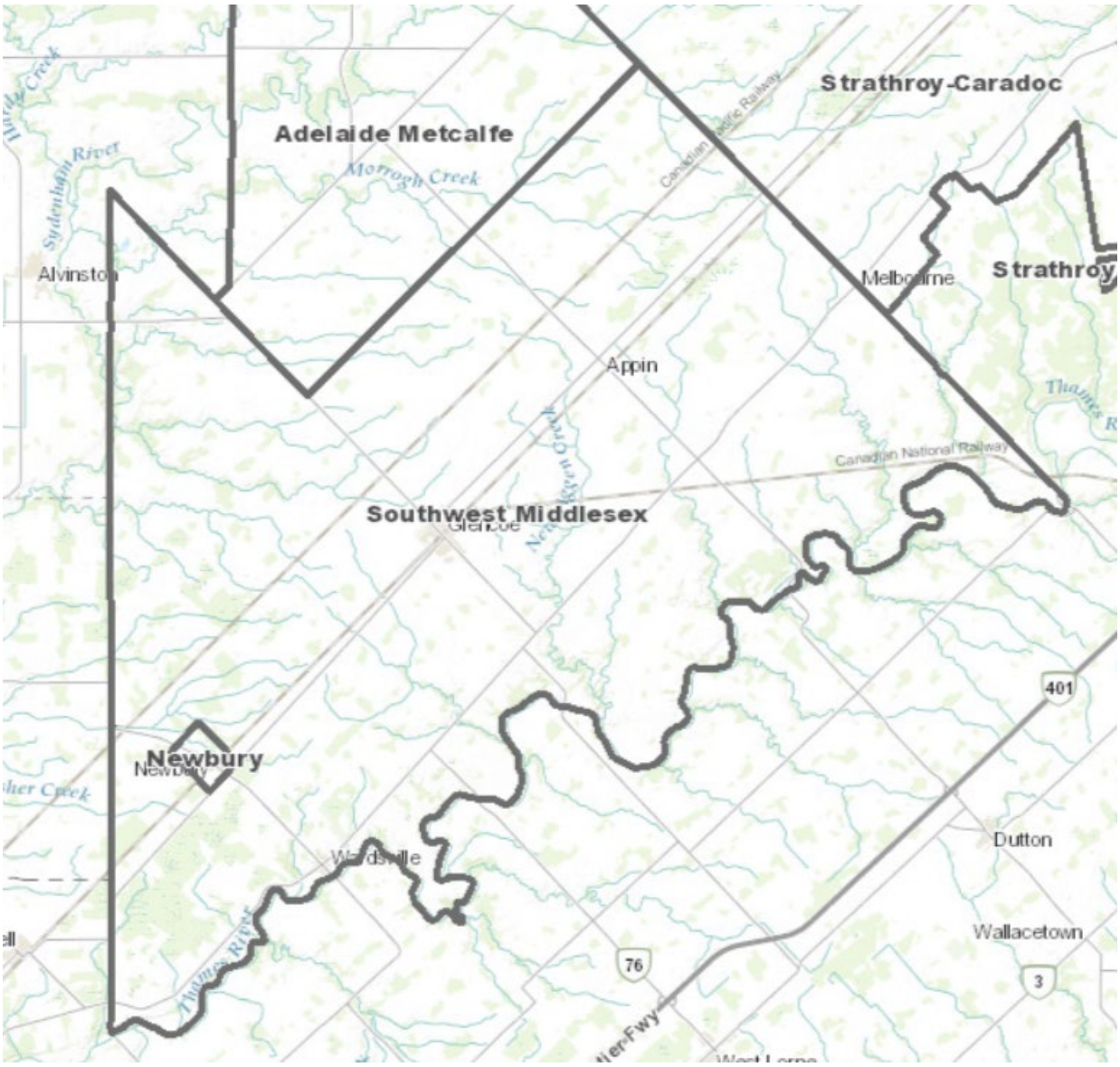

Asphalt (left) and gravel (right) roads in **Poor** condition – serious deterioration, function is inadequate

Asphalt (left) and gravel (right) roads in **Very Poor** condition – no longer functional, general or complete failure

Bridge & Culvert Maps



Road Network



Municipal boundary

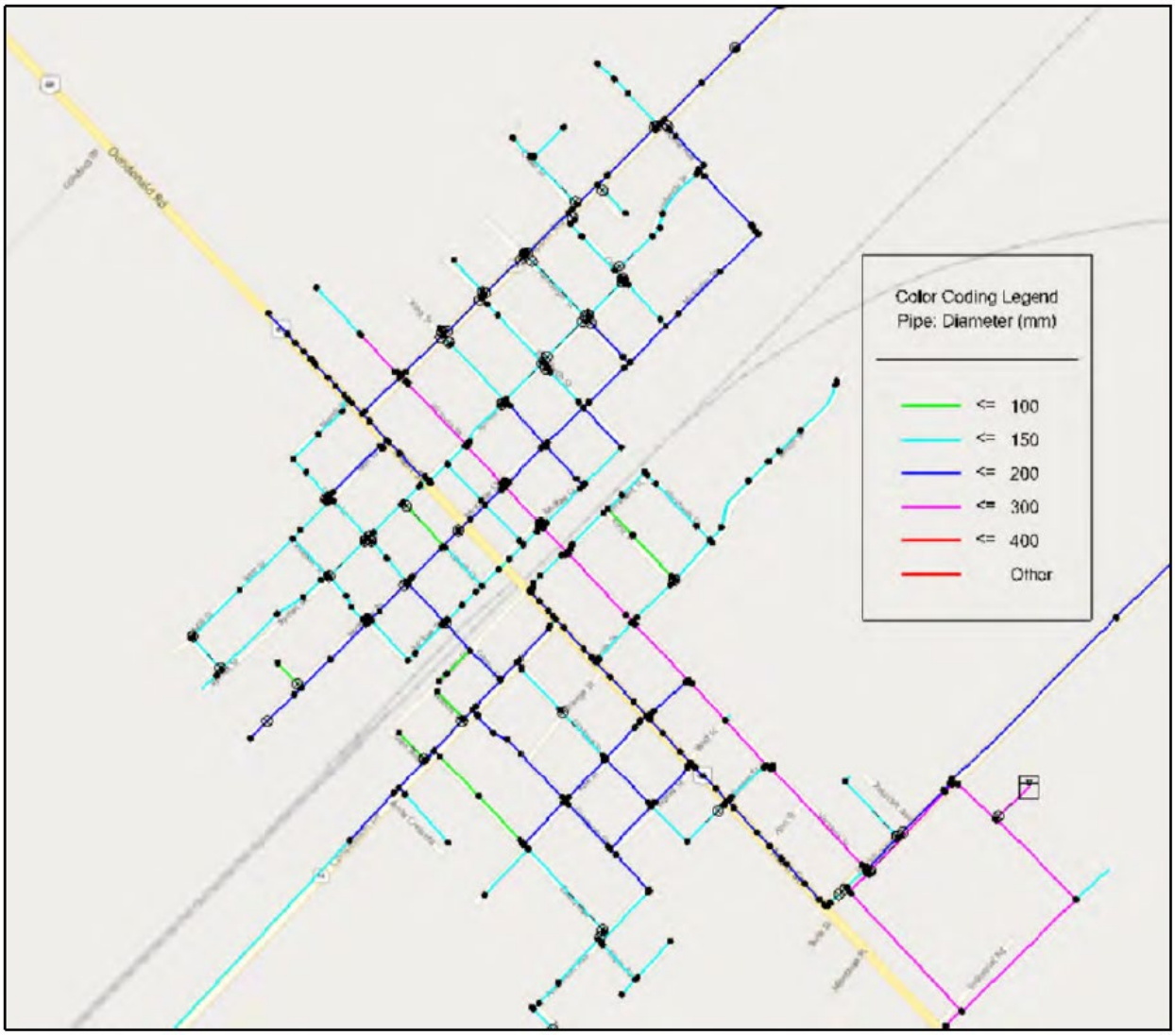
Village of Glencoe

Storm Sewers

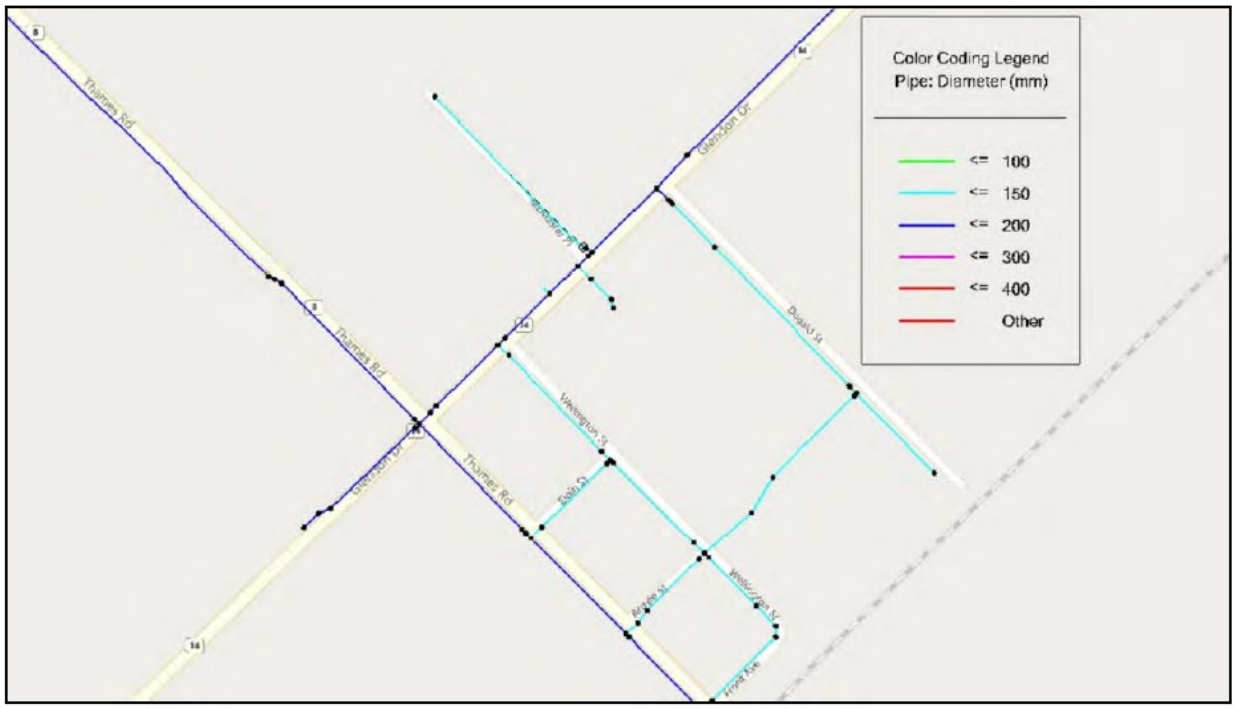
Wardsville Watershed

Water Network

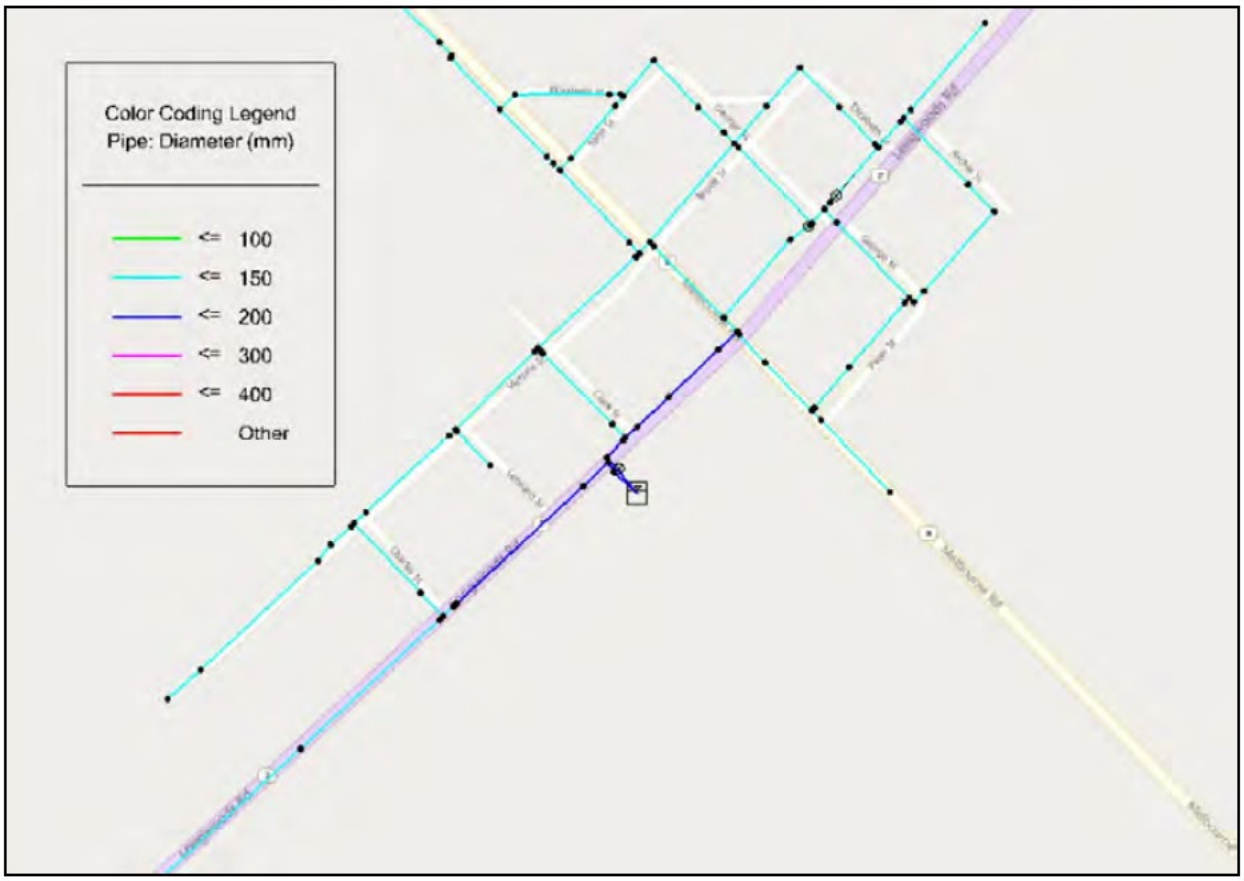
Village of Wardsville



Village of Glencoe

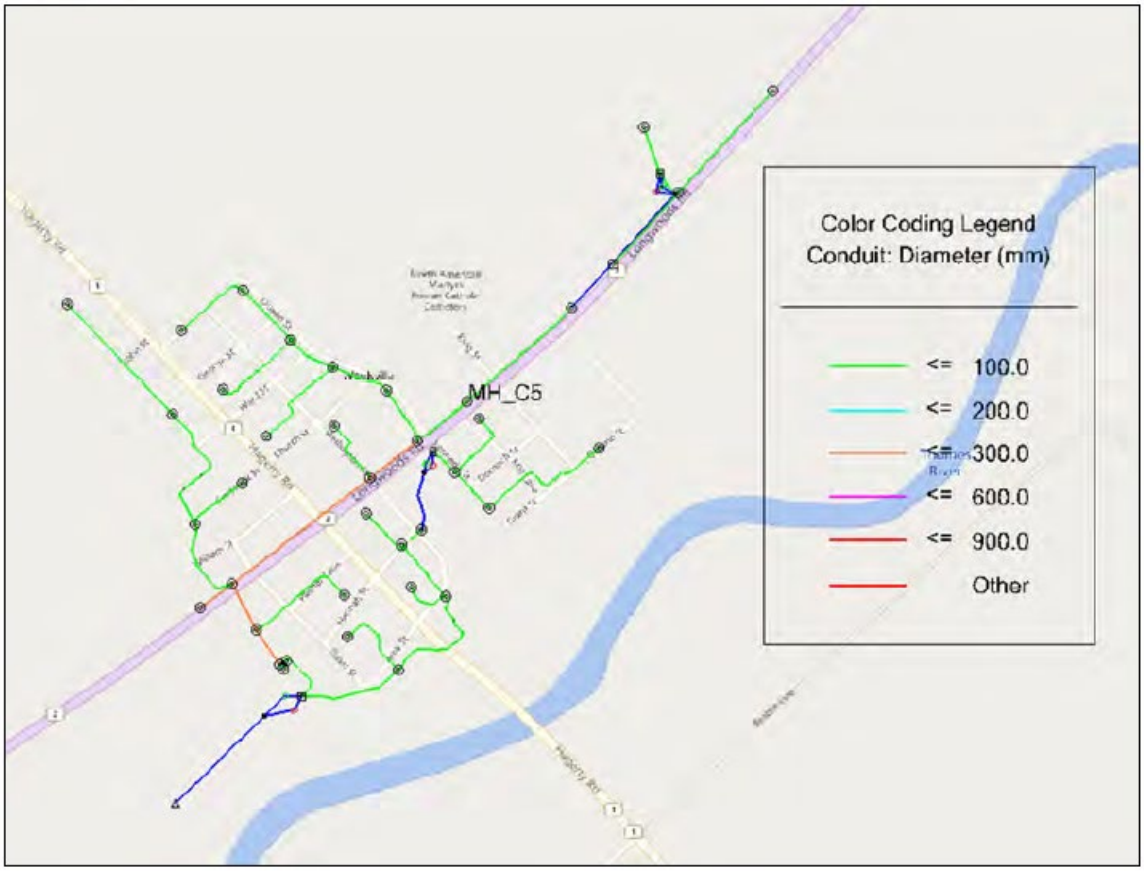


Village of Appin

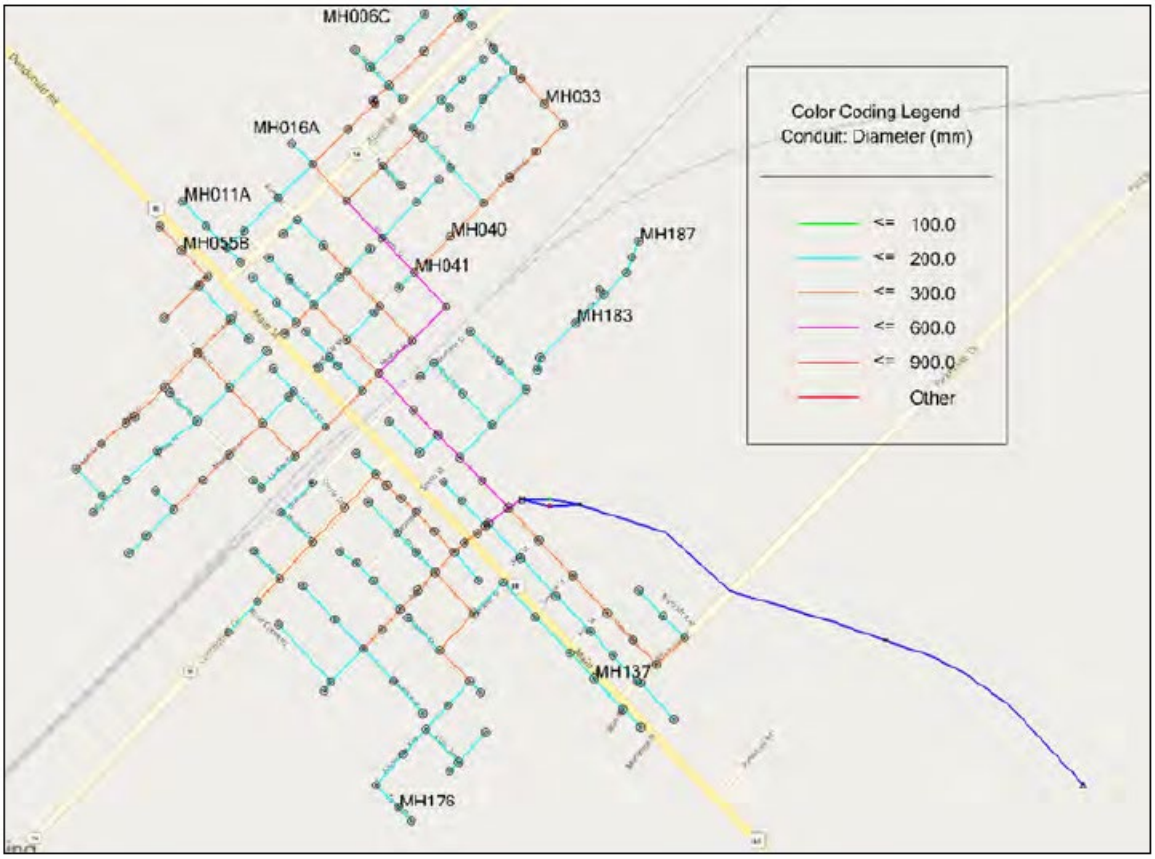


Village of Melbourne

Sanitary Sewer Network



Village of Wardsville



Village of Glencoe

Appendix C

Risk-Based Prioritization

High Priority Projects/Replacements Based on Risk Assessment Results

Asset Class	Project Name	Project/ Replacement Cost
Roads	N/A	
Bridges & Culverts	Bridge 204 - repair erosion and enclose ditch	$ 80,000
	Culvert 109A - replace structure	$ 165,000
	Culvert 113 - replace structure	$ 175,000
	Culvert 116 - repair loose triple cable	$ 3,000
	Culvert 125 - repair erosion on southeast corner	$ 13,000
	Culvert 133 - replace structure with metal pipe	$ 135,000
	Culvert 210 - replace structure	$ 224,000
Water	Replace aged hydrants	$ 85,773
	Replace/rehabilitate aged water treatment plant	$ 1,244,939
Wastewater	Replace PFJ Pump Station	$ 35,597
Stormwater	N/A	
Buildings	Replace/rehabilitate aged fire station	$ 2,836,443
	Replace/rehabilitate aged OPP station	$ 254,410
Land Improvements	Rehabilitation of aged landfills	$ 1,080,273
Fleet	Replace fire engine	$ 869,847
Machinery & Equipment	Replace aged Fire Department equipment	$ 143,002

Appendix D

10-Year Financial Forecast

Tax Supported Funding Analysis

Asset Class	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
Gravel Roads (included in operating budget)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
Hardtop Roads (hot mix, tar & chip, concrete)	$ 682,906	$ 682,906	$ 682,906	$ 682,906	$ 682,906	$ 682,906	$ 682,906	$ 682,906	$ 682,906	$ 682,906	**$ 6,829,063**
Streetlights	$ 96,343	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**$ 96,343**
Sidewalks	$ 1,103,451	$ -	$ -	$ -	$ -	$ 8,568	$ -	$ 48,143	$ -	$ 36,719	**$ 1,196,881**
Bridges	$ 185,920	$ 185,920	$ 185,920	$ 185,920	$ 185,920	$ 185,920	$ 185,920	$ 185,920	$ 185,920	$ 185,920	**$ 1,859,200**
Culverts	$ 342,820	$ 342,820	$ 342,820	$ 342,820	$ 342,820	$ 342,820	$ 342,820	$ 342,820	$ 342,820	$ 342,820	**$ 3,428,200**
Stormwater	$ 450,000	$ 450,000	$ 450,000	$ 450,000	$ 450,000	$ 450,000	$ 450,000	$ 450,000	$ 450,000	$ 450,000	**$ 4,500,000**
Buildings	$ 790,843	$ 790,843	$ 7 Chart Area	790,843	$ 790,843	$ 790,843	$ 790,843	$ 790,843	$ 790,843	$ 790,843	**$ 7,908,430**
Land improvements	$ 1,628,456	$ 59,600	$ 248,910	$ -	$ -	$ 283,968	$ 282,852	$ 248,910	$ 179,564	$ -	**$ 2,932,260**
Fleet	$ 3,408,108	$ -	$ -	$ 543,969	$ 401,468	$ 719,820	$ 124,362	$ 875,220	$ -	$ 462,114	**$ 6,535,061**
Machinery & Equipment	$ 167,407	$ 446,906	$ 84,856	$ 187,205	$ 201,474	$ 92,604	$ 38,822	$ 45,256	$ 416,643	$ 62,078	**$ 1,743,252**
Total Funding Needs	**$ 8,856,254**	**$2,958,996**	**$2,786,255**	**$ 3,183,663**	**$3,055,431**	**$ 3,557,449**	**$2,898,525**	**$ 3,670,019**	**$ 3,048,696**	**$3,013,400**	**$37,028,689**
Funding Available	**$ 3,158,361**	**$3,158,361**	**$3,158,361**	**$ 3,158,361**	**$3,158,361**	**$ 3,158,361**	**$3,158,361**	**$ 3,158,361**	**$ 3,158,361**	**$3,158,361**	**$31,583,610**
Tax Funding Gap	**$ 5,697,893**	**-$ 199,365**	**-$ 372,106**	**$ 25,302**	**-$ 102,930**	**$ 399,088**	**-$ 259,836**	**$ 511,658**	**-$ 109,665**	**-$ 144,961**	**$ 5,445,079**

Average Annual Tax Funding Gap: $ 544,508

Rate Supported Funding Analysis

Water											
Item	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**Total**
Funding Needs - Non-growth Capital	$ 249,025	$ 302,450	$ 369,563	$ 466,592	$ 604,505	$ 766,591	$ 947,656	$ 1,153,220	$ 1,375,117	$1,650,140	**$ 7,884,859**
Funding Needs - Operating	$ 1,514,002	$1,562,263	$1,615,460	$ 1,680,647	$1,758,069	$ 1,841,745	$1,930,521	$ 2,024,106	$ 2,120,867	$2,222,669	**$18,270,349**
Total Water Funding Needs	**$ 1,763,027**	**$1,864,713**	**$1,985,023**	**$ 2,147,239**	**$2,362,574**	**$ 2,608,336**	**$2,878,177**	**$ 3,177,326**	**$ 3,495,984**	**$3,872,809**	**$26,155,208**
Water Volume Forecast	287,578	291,538	297,478	309,358	327,178	346,978	367,768	389,548	411,328	433,108	**3,461,860**
Water Customers	1,771	1,795	1,831	1,903	2,011	2,131	2,257	2,389	2,521	2,653	-
Cost per Cubic Meter	$2.61	$2.74	$2.88	$3.02	$3.17	$3.33	$3.50	$3.68	$3.86	$4.05	-
Volume Revenue	$ 750,579	$ 798,814	$ 856,737	$ 934,261	$1,037,154	$ 1,155,437	$1,287,188	$ 1,433,537	$ 1,587,726	$1,755,387	**$11,596,819**
Base Rate per Customer	$ 442.93	$ 465.08	$ 488.33	$ 512.75	$ 538.38	$ 565.30	$ 593.57	$ 623.25	$ 654.41	$ 687.13	**$ 5,571.13**
Base Rate Revenue	$ 784,429	$ 834,812	$ 894,133	$ 975,757	$1,082,691	$ 1,204,662	$1,339,684	$ 1,488,937	$ 1,649,766	$1,822,955	**$12,077,826**
Total Volume & Base Revenue	$ 1,535,008	$1,633,626	$1,750,869	$ 1,910,018	$2,119,845	$ 2,360,098	$2,626,872	$ 2,922,474	$ 3,237,492	$3,578,342	**$23,674,645**
Other Revenue	$ 348,409	$ 365,829	$ 384,121	$ 403,327	$ 423,493	$ 444,668	$ 466,901	$ 490,246	$ 514,759	$ 540,497	**$ 4,382,251**
Rate Increase	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	-
Total Water Revenue	**$ 1,883,417**	**$1,999,456**	**$2,134,990**	**$ 2,313,345**	**$2,543,338**	**$ 2,804,766**	**$3,093,774**	**$ 3,412,720**	**$ 3,752,251**	**$4,118,839**	**$28,056,896**
Water Funding Gap (Surplus)	**($120,390)**	**($134,743)**	**($149,967)**	**($166,106)**	**($180,764)**	**($196,430)**	**($215,597)**	**($235,394)**	**($256,267)**	**($246,030)**	**($1,901,688)**

Rate Supported Funding Analysis

Wastewater											
Item	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**Total**
Funding Needs - Non-Growth Capital - Glencoe	$ 301,350	$ 292,955	$ 400,851	$ 515,365	$ 684,236	$ 884,858	$ 1,112,441	$ 1,369,381	$ 1,649,563	$ 1,979,476	**$ 9,190,476**
Funding Needs - Non-Growth Capital - Wardsville	$ -	$ -	$ 20,836	$ 45,411	$ 73,621	$ 105,472	$ 141,764	$ 183,048	$ 229,787	$ 275,744	**$ 1,075,683**
Funding Needs - Operating - Glencoe	$ 659,500	$ 688,700	$ 719,300	$ 751,400	$ 785,000	$ 820,100	$ 856,800	$ 895,400	$ 935,700	$ 982,485	**$ 8,094,385**
Funding Needs - Operating - Wardsville	$ 300,900	$ 311,900	$ 323,300	$ 335,200	$ 347,500	$ 360,400	$ 373,900	$ 387,700	$ 401,900	$ 409,938	**$ 3,552,638**
Total Wastewater Funding Needs	**$ 1,261,750**	**$ 1,293,555**	**$ 1,464,287**	**$ 1,647,376**	**$ 1,890,357**	**$ 2,170,830**	**$ 2,484,905**	**$ 2,835,529**	**$ 3,216,950**	**$ 3,647,643**	**$ 21,913,182**
Glencoe Customers	1,062	1,086	1,122	1,194	1,302	1,422	1,548	1,680	1,812	1,944	-
Glencoe Cost per Customer	$ 823.59	$ 905.95	$ 996.54	$ 1,096.20	$ 1,205.82	$ 1,266.11	$ 1,329.41	$ 1,395.89	$ 1,465.68	$ 1,538.96	-
Glencoe Revenue	$ 874,653	$ 983,861	$ 1,118,122	$ 1,308,861	$ 1,569,975	$ 1,800,407	$ 2,057,934	$ 2,345,087	$ 2,655,811	$ 2,991,745	**$17,706,455**
Wardsville Customers	188	190	192	194	196	198	200	202	204	206	-
Wardsville Cost per Customer	$ 997.91	$ 1,097.70	$ 1,207.47	$ 1,328.22	$ 1,461.04	$ 1,534.09	$ 1,610.80	$ 1,691.34	$ 1,775.90	$ 1,864.70	-
Wardsville Revenue	$ 187,607	$ 208,563	$ 231,834	$ 257,674	$ 286,364	$ 303,750	$ 322,159	$ 341,650	$ 362,284	$ 384,128	**$2,886,015**
Other Revenue	$ 144,553	$ 151,780	$ 159,369	$ 167,338	$ 175,705	$ 184,490	$ 193,714	$ 203,400	$ 213,570	$ 224,249	**$1,818,169**
Rate Increase	15%	10%	10%	10%	10%	5%	5%	5%	5%	5%	-
Total Wastewater Revenue	**$ 1,206,812**	**$ 1,344,204**	**$ 1,509,326**	**$ 1,733,873**	**$ 2,032,044**	**$ 2,288,647**	**$ 2,573,807**	**$ 2,890,137**	**$ 3,231,666**	**$ 3,600,122**	**$ 22,410,639**
Wastewater Funding Gap (Surplus)	**$54,938**	**($50,649)**	**($45,039)**	**($86,497)**	**($141,687)**	**($117,817)**	**($88,902)**	**($54,608)**	**($14,716)**	**$47,521**	**($497,457)**
Rate Funding Gap (surplus) - Water & Wastewater	**($65,452)**	**($185,392)**	**($195,006)**	**($252,603)**	**($322,451)**	**($314,247)**	**($304,499)**	**($290,002)**	**($270,982)**	**($198,508)**	**($2,399,145)**

Average Annual Rate Funding Gap (Surplus): **($239,914)**

Appendix E

Summary of Recommendations

1. Asset Condition Assessments

Complete asset condition assessments on a regular basis to ensure timely identification of deterioration, inform evidence-based maintenance and rehabilitation strategies, optimize lifecycle costs, support risk-informed decision-making, and uphold the safety, reliability, and long-term sustainability of municipal infrastructure.

2. Climate Change Planning

Complete and implement a climate change mitigation and adaptation plan to enhance community resilience to climate-related risks, protect critical infrastructure and natural ecosystems, and support a sustainable transition to a climate-resilient future.

3. Asset Registry Maintenance

Regularly update the asset registry to maintain accurate and current data on asset inventory, location, condition, and valuation; support informed capital planning and budgeting; ensure compliance with regulatory and reporting requirements; and enhance the Municipality's ability to deliver reliable, cost-effective, and sustainable infrastructure services to the community.

4. Risk Management

Formally incorporate risk-based decision making into the annual budget process to prioritize investments based on the likelihood and consequences of asset failure and ensure that the Municipality can proactively manage infrastructure risks while delivering consistent, sustainable levels of service.

5. Stormwater Funding

Implement a stormwater charge to establish a dedicated and sustainable funding mechanism for the maintenance, renewal, and capacity improvements for stormwater infrastructure assets.

6. Growth Management

Monitor and analyze the effectiveness of lifecycle activities to ensure that rehabilitation and replacement activities are timed in an optimized manner. Timing may change based on increased usage associated with population growth.

Complete and update departmental master plans on a regular basis to ensure growth projections are accommodated and founded on current data.

Monitor the changing demographics of residents over time and plan for the associated changes in demand for infrastructure. Seek user input through public consultation, surveys or other means.

Monitor the advancement of technology to leverage new technologies that support lifecycle management and the efficient and effective delivery of services.

Continue to incorporate the most up-to-date growth projections in the Municipality's financial strategy to ensure change is managed proactively and in a financially sustainable manner.

Options for achieving the current and proposed levels of service may change as the Municipality grows. Complete a regular review of lifecycle activities to ensure the lifecycle management program achieves the desired levels of service at the lowest cost.

7. Bridge the Funding Gap

Continue to budget for a capital levy in an ongoing manner to ensure a stable, predictable source of funding for infrastructure renewal and replacement, support long-term financial sustainability, and bridge the infrastructure funding gap in a diligent manner.

8. Build Reserves

Contribute any annual funding surplus to capital reserves to enhance the Municipality's financial capacity to address future infrastructure needs, support long-term capital planning and mitigate the impact of unexpected expenditures. This is prudent for both tax-supported and rate-supported assets.

9. Establish Clear Governance Structure

Establish and maintain a robust governance framework that aligns asset management activities with organizational goals and objectives. This includes defining accountability structures, establishing performance metrics, and fostering a culture of transparency and accountability.

10. Asset Management Integration

Integrate asset management principles into all phases of the planning process, from strategic planning to capital budgeting and project prioritization. By aligning infrastructure investment decisions with asset management objectives, the Municipality ensures that resources are allocated efficiently to address the most critical needs and maximize the lifespan of assets.

11. Capacity Building and Training

Build internal capacity and foster a culture of continuous learning to advance asset management maturity. Provide training and professional development opportunities for staff at all levels to enhance their asset management knowledge and skills.

12. Engagement and Collaboration

Engage with internal and external stakeholders to solicit input, share best practices, and foster partnerships that enhance asset management effectiveness.