

ASSET MANAGEMENT PLAN

TOWNSHIP OF WARWICK

FINAL June 2024



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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 Township of Warwick staff in the various service areas who participated in facility tours, information gathering and 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 Township of Warwick.

We acknowledge that the Township of Warwick is located on the traditional lands of the Anishnabe as well as the many Indigenous nations in Ontario whose footsteps have marked them for centuries. We also wish to acknowledge that we are situated on Treaty 29 and Treaty 25 territories signed by Chippewa Chiefs and offer our respect and gratitude for these lands.

Warwick Township Council and staff will strive to educate residents about our history through programming and events. We pledge to our First Nations neighbours that we will not tolerate systemic racism and commit to advancing reconciliation by building trusting relationships and fostering ideas for future consultation and partnership opportunities.



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 Township's mission:

Mission

The Township of Warwick fosters responsible financial and environmental stewardship as the foundation of a vibrant community, meeting the needs of residents of all ages and abilities today and into the future.

The asset management plan is integrated with the Township's Strategic Plan (2023-2026) to support the desired service outcomes and the Township's vision:

Vision

The Township of Warwick is an empowering community that provides residents with the services and amenities they need, while providing abundant opportunities for growth.

The Township's Strategic Asset Management Policy includes six guiding principles:

- Service delivery
- Long-term sustainability and resilience
- Holistic 'big picture' approach
- Fiscal responsibility and asset management decision-making
- Innovation and continual improvement

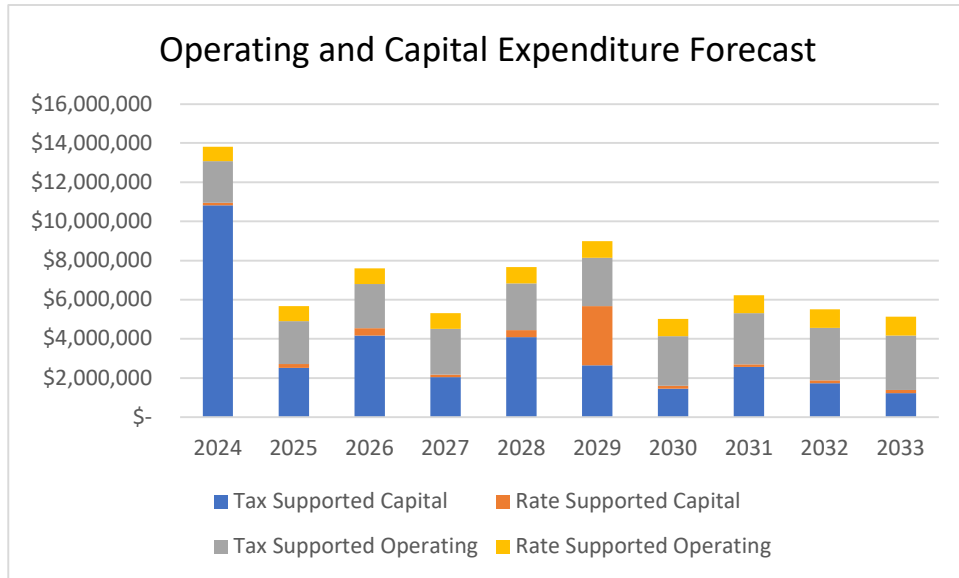
This asset management plan has been developed to support these principles and address the July 1, 2024 and July 1, 2025 requirements of O. Reg. 588/17. It utilizes the best information available to the Township at this time and advances asset management maturity through a diligent process.

The plan includes all Township assets. As detailed in the following table, the Township's infrastructure has a replacement value of approximately **\$317.2** Million and the overall condition is **Good**.

Asset Class	Replacement Cost (2024\$)	Condition
Roads	\$141,079,620	Good
Bridges and culverts	\$27,175,000	Good
Water	\$46,747,035	Good
Wastewater	\$24,441,576	Fair
Stormwater	\$15,961,323	Fair
Buildings	\$43,496,233	Good
Land improvements	\$5,265,606	Poor
Fleet	\$10,776,720	Poor
Machinery & Equipment	\$2,252,230	Fair
Total:	\$317,195,343	Good Overall

Level of service is a key component of asset management decision-making that describes the planned outcome from the use of the Township’s assets, from a customer and technical performance perspective. The Township’s current and proposed level of service statements describe the asset outputs that the Township 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 Township’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 chart summarizes the total operating and capital lifecycle expenditure forecast for the next ten years, separated between tax-supported expenditures and rate-supported expenditures.



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 and the funding surplus for rate-supported assets.

10-Year Funding Analysis	
Tax-Supported Assets	
Funding Need	\$33,223,535
Funding Available	\$29,600,000
Funding Gap	\$3,623,535
Rate-Supported Assets	
Funding Need	\$4,839,000
Funding Available	\$7,507,000
Funding Surplus	\$2,668,000

The funding gap identified for tax-supported assets is based on current levels of own-source revenues. Projected future increases of own-source funding are expected to be sufficient to fully address the identified funding gap.

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. It is also recommended that the 5% annual rate increase for both the water and wastewater systems be continued to prepare for the increased long-term lifecycle cost projections.

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 Township 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 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 Township 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	Warwick 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 Township.
2. People setting the strategic goals of the Township can see how their decisions change how infrastructure is managed. Asset Management at the Township enables this line of sight, connecting the service outcomes down to the assets that support them.

3.5 Strategic Alignment

The Township’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 Township.

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

Document Title	Date
Capital and Operating Budget	2022, 2023 & 2024
Water/Sewer Rates By-Law	Effective 2024
20-year Capital Expenditure Forecast	2023
Reserve Balance Summary	2023
Watford Wastewater Lagoons Operations Report – Fourth Quarter 2023	2023
Township of Warwick Distribution System Operations Report – Fourth Quarter 2023	2023
Strategic Plan and Balanced Scorecard	2023
Development Charges Background Study	2022
Official Plan	2010 (updated 2021)
Watford Urban Area Sanitary Sewer Study	2021
Parks, Recreation, Tourism and Culture Master Plan	2021
10-Year Water Master Plan – Fire Flow Data	2021
Strategic Asset Management Policy	2019
Water and Wastewater Rate Study	2019
Water Ontario Regulation 453/07 Financial Plan	2019
Fire Master Plan	2017

Infracore 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 Township 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: <ul style="list-style-type: none"> • Current levels of service • State of local infrastructure • Lifecycle activities and costs • Growth impacts 	Asset management plan for all assets with the following <i>additional</i> scope: <ul style="list-style-type: none"> • 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 Township of Warwick is a lower tier municipality located within the County of Lambton. 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 Township. Ownership and responsibility for each asset class are summarized in the following table.

Asset Class	Asset Ownership & Responsibility	
	Township of Warwick	County of Lambton
Roads	Local roads	County roads
Bridges and Culverts	Local road bridges and culverts	County road bridges and culverts
Water	Drinking water supplied by Lambton Area Water Supply System (LAWSS)	
Wastewater	All wastewater assets	None
Stormwater	Point assets and local road storm sewers	County road storm sewers

Buildings	Township buildings	County buildings, including waste management facilities
Land Improvements	Township land improvements	County land improvements
Fleet	Township fleet	County fleet
Machinery & Equipment	Township machinery and equipment	County machinery and equipment

As noted above, drinking water is provided to the Township by the Lambton Area Water Supply System (LAWSS). LAWSS is jointly owned by the Township of Warwick and five other local municipalities. In 2012, LAWSS entered a 20-year contract with Ontario Clean Water Agency to operate and maintain the facilities owned by LAWSS.

Of note, Highway 402 is the responsibility of the Province with the exception of fire services which are provided by the Township.

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 Township has, what condition they are in, and what they are worth.
Levels of Service	How the Township'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 Township 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 Township.

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 Township assets. The assets are categorized as follows.

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

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

- **Land Improvements:** this category includes parks and features such as trees, natural drainage features and parkland.
- **Buildings:** this category includes site features such as natural drainage features, engineered drainage and trees.

Over time, the Township 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 Township'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 Township 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 few years, the inflation rate has been significant and has resulted in a large increase in the value of the Township's assets since the date of the previous asset management plan.

5.2.1 Roads

The Township's road network consists of gravel roads and paved roads, as well as related right-of-way infrastructure including road signs, guardrails, sidewalks, culverts and streetlights.

Asset	Quantity	Average Age (years)	Replacement Cost
Gravel roads	131.8 km	66.5	\$19,886,589
Paved roads			
Surface	87.6 km	23.4	\$97,936,592
Base	87.6 km	26.7	\$18,240,963
Road signs and guardrails	5	12.0	\$152,912
Sidewalks	12.532 km	29.0	\$3,670,866
Culverts	5	4.0	\$16,446
Streetlights	434	19.8	\$1,175,252
Total:			\$141,079,620

5.2.2 Bridges and Culverts

The Township has jurisdiction over a total of 11 bridges and 48 culverts that are more than 3 meters in length. Structure types include concrete rigid frames, concrete box culverts, corrugated steel pipe arches, corrugated steel round pipe, precast hollow core prestressed, concrete deck on steel beams and concrete slab on steel girders.

Asset	Quantity	Average Age (years)	Replacement Cost
Bridges	11	52.7	\$10,940,000
Culverts	48	31.2	\$16,235,000
Total:			\$27,175,000

5.2.3 Water

Lambton Area Water Supply System (LAWSS) supplies drinking water to the Township. Ontario Clean Water Agency (OCWA) inspects, operates and maintains the Township's drinking water distribution system. Township water assets include hydrants, valves, water equipment and watermains.

Asset	Quantity	Average Age (years)	Replacement Cost
Hydrants & valves	121	34.7	\$732,104
Water equipment	4	5.0	\$134,892
Watermains	98,350 m	32.6	\$45,880,039
		Total:	\$46,747,035

5.2.4 Wastewater

OCWA inspects, operates and maintains the Township's wastewater collection and treatment system. Township water assets include sewage lagoons, manholes, sanitary equipment and sanitary sewer mains.

Asset	Quantity	Average Age (years)	Replacement Cost
Lagoons	3	11.5	\$3,022,800
Manholes	245	39.6	\$2,425,500
Sanitary equipment	8	13.1	\$1,475,449
Sanitary mains	15,948 m	44.9	\$17,517,828
		Total:	\$24,441,576

5.2.5 Stormwater

The Township's stormwater management system provides for conveyance and control of stormwater. Stormwater conveyance assets include storm mains, manholes and catchbasins. Control assets include stormwater management ponds.

Asset	Quantity	Average Age (years)	Replacement Cost
Catchbasins	142	19.4	\$562,320
Manholes	97	34.9	\$1,019,700
Storm mains	16,811 m	43.5	\$14,277,120
Stormwater management ponds	1	13.0	\$102,183
Total:			\$15,961,323

5.2.6 Buildings

The Township's buildings, their age and replacement cost are summarized in the following table. Of note, the salt shed building is planned to be retired and replaced in 2024. As such, the building's age is considered to be zero and the replacement cost is the anticipated construction cost of the new building.

Building Name	Building Age (years)	Replacement Cost
Watford Arena	52	\$13,142,183
BMX Park Building	12	\$76,829
East Lambton Community Centre (ELCC)	3	\$13,000,000
Watford Museum	139	\$1,065,125
Public Works Office and Garage	42	\$2,469,195
Salt Shed	0	\$1,300,000
Warwick Soccer Club	15	\$762,030
Warwick Ball Park	57	\$745,800
Warwick Community Centre	11	\$2,334,930
Warwick Fire Station	71	\$980,758
Watford Cemetery	53	\$124,348
Watford Fire Station	111	\$2,642,004
Watford Public Works Garage	57	\$687,193
Watford Library	139	\$1,352,908

Watford Park	39	\$2,773,980
Chemical Treatment Lagoon Buildings	13	\$135,457
Sewage Pumping Station	13	\$282,140
Auto Sampler Building	13	\$20,500
Booster Pump Station	5	\$900,851
	Total:	\$43,496,233

5.2.7 Land Improvements

Land improvements include lighting and fencing, parking lots, parks and features, playgrounds and splash pads, and sports structures.

Asset	Quantity	Average Age (years)	Replacement Cost
Lighting & Fencing	15	19.1	\$1,478,553
Parking lots	12	37.6	\$1,347,966
Parks & Features	4	21.8	\$605,031
Playgrounds & Splash pads	3	16.6	\$376,200
Sports structures	8	10.9	\$1,457,856
	Total:		\$5,265,606

5.2.8 Fleet

Fleet assets are utilized by Protection Services, Recreation Services and Transportation Services. The fleet includes tandem axle trucks used for winter maintenance, pick-up trucks used for parks and road maintenance, and fire department vehicles used to provide emergency services. Protection Services fleet replacement costs have increased significantly over the past few years. As such, the replacement costs have been updated based on recently published purchase prices of similar vehicles.

Asset	Quantity	Average Age (years)	Replacement Cost
Protection Services	6	16.2	\$5,700,000
Recreation Services	6	7.0	\$304,920
Transportation Services	16	9.9	\$4,771,800
Total:			\$10,776,720

5.2.9 Machinery & Equipment

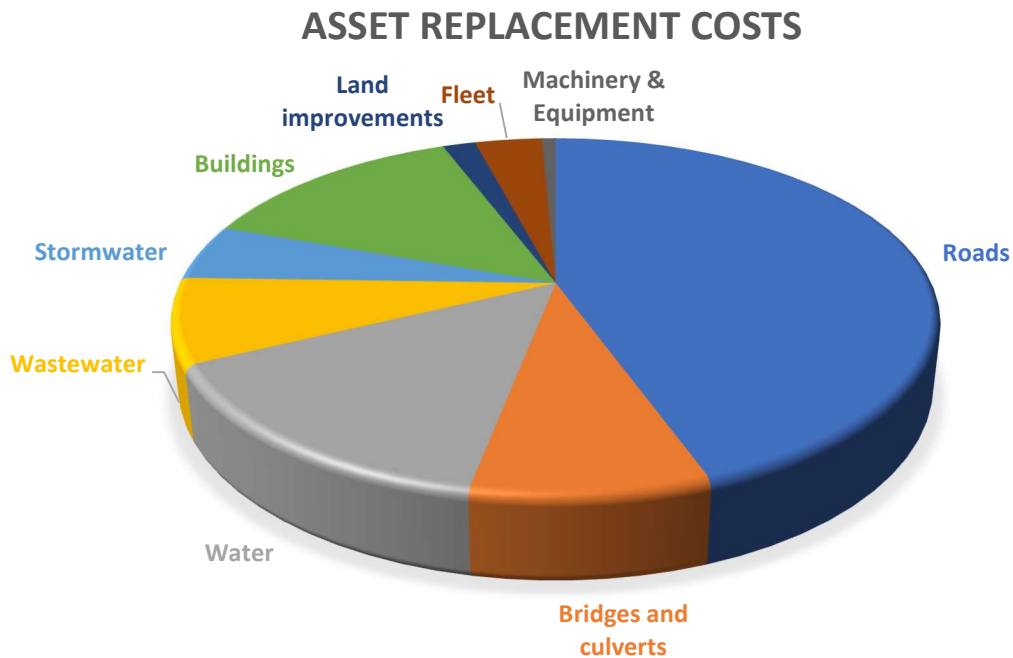
Machinery and equipment assets are utilized by Protection Services, Recreation Services and Transportation Services. Examples of machinery and equipment include computers and other information technology equipment, exercise equipment, landscaping tools and equipment, and fire/life safety equipment.

Asset	Quantity	Average Age (years)	Replacement Cost
Protection services	18	16.7	\$279,865
Recreation services	38	9.1	\$1,481,112
Transportation services	8	8.0	\$491,253
Total:			\$2,252,230

5.2.10 Asset Replacement Cost Summary

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

Asset Class	Replacement Cost (2024\$)
Roads	\$141,079,620
Bridges and culverts	\$27,175,000
Water	\$46,747,035
Wastewater	\$24,441,576
Stormwater	\$15,961,323
Buildings	\$43,496,233
Land improvements	\$5,265,606
Fleet	\$10,776,720
Machinery & Equipment	\$2,252,230
Total:	\$317,195,343



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 Township 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 Township 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

* Limited condition information is included in a report prepared by Spriet Associates titled *Watford Urban Area Sanitary Sewer Study 2021*. The report assesses sewer capacity to accommodate growth, and also provides an estimated repair cost of \$46,000 to address observed calcite deposits. The report does not provide condition ratings for the sanitary sewer network; therefore age will be used as a determinant of condition.

The following report sections provide detailed information regarding the condition of each asset class. Using a weighted average, the overall condition of the Township’s assets falls within the ‘**Good**’ category.

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	Gravel Road Study	Spriet Associates	2020
	Paved Road Study	Spriet Associates	2021
Bridges and culverts	Ontario Structure Inspection Manual (OSIM) Report	Spriet Associates	2023
Buildings	Building Condition Assessments	Infralevel Inc.	2024

5.3.1.1 Roads

Detailed road condition data is included in the Paved Road Study and Gravel Road Study prepared by Spriet Associates. Condition ratings from the Spriet reports have been mapped to the condition grading methodology of the asset management plan as follows.

Condition Grading	Condition Description	Pavement Condition Index
Very Good	No noticeable defects	80 – 100
Good	Minor deterioration	70 – 79
Fair	Deterioration evident, function is affected	60 – 69
Poor	Serious deterioration, function is inadequate	50 – 59
Very Poor	No longer functional, general or complete failure	< 50

Paved roads are in good condition overall, with an average pavement condition index of 73. Gravel roads are also in good condition overall, with an average pavement condition index of 79. The percentage of paved and gravel 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	Very Good	20%	Good (73)
	Good	48%	
	Fair	23%	
	Poor	7%	
	Very Poor	2%	
Gravel Roads	Very Good	50%	Good (79)
	Good	33%	
	Fair	10%	
	Poor	3%	
	Very Poor	4%	

5.3.1.2 Bridges and Culverts

The condition of Township bridges and culverts was assessed in a report titled ‘Bridge and Culvert – 2023 Inspection and Assessment Report’ by Spriet Associates. 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 condition index ratings from the Spriet report have been mapped to the condition grading methodology of the asset management plan as follows.

Condition Grading	Condition Description	Bridge Condition Index
Very Good	Minimal short-term work required	80 – 100
Good	Some maintenance required	70 – 79
Fair	Repair or renewal work is required in the short term	60 – 69
Poor	Major renewal work is required in the short term	50 – 59
Very Poor	Nearing the end of its service life, load limits may be required	< 50

The Spriet report assigned a Bridge Condition Index (BCI) score to each bridge and culvert. The average condition and the percentage of bridges and culverts in each condition grading category are summarized in the following table. 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	39%	Good (77%)
	Good	38%	
	Fair	14%	
	Poor	9%	
	Very Poor	0%	
Culverts	Very Good	40%	Good (77%)
	Good	29%	
	Fair	16%	
	Poor	5%	
	Very Poor	10%	

5.3.1.3 Buildings

Comprehensive condition assessments are typically performed on a five-year cycle and additional interim assessments are completed as required. Infracore completed Building Condition Assessments for all Township facilities in 2024.

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.

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

Condition ratings from the Infracore 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	91 – 100
Good	Some maintenance and renewal required	81 – 90
Fair	Moderate level of wear and tear	71 – 80
Poor	Building requires significant repair and renewal	51 – 70
Very Poor	Major deferred maintenance impacts building operations and user experience	< 51

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

Building Name	Facility Condition Index (%)
Watford Arena	Fair (79%)
BMX Park Building	Very Good (98%)
East Lambton Community Centre (ELCC)	Very Good (100%)
Watford Museum	Fair (73%)
Public Works Office and Garage	Fair (79%)
Salt Shed (new structure)	Very Good (100%)
Warwick Soccer Club	Very Good (97%)
Warwick Ball Park	Poor (51%)
Warwick Community Centre	Very Good (96%)
Warwick Fire Station	Fair (72%)
Watford Cemetery	Very Poor (28%)
Watford Fire Station	Poor (58%)
Watford Public Works Garage	Poor (65%)
Watford Library	Good (81%)
Watford Park	Good (90%)
Chemical Treatment Lagoon Buildings	Very Good (100%)

Sewage Pumping Station	Very Good (100%)
Auto Sampler Building	Very Good (100%)
Booster Pump Station	Very Good (100%)

Township buildings are in good condition overall. The average Facility Condition Index is 86; this is a weighted value based on replacement cost. The average facility condition index and the percentage of buildings in each condition grading category are summarized in the following table:

Asset	Condition Grading	% of Assets	Average Facility Condition Index
Buildings	Very Good	46%	Good (88%)
	Good	39%	
	Fair	6%	
	Poor	8%	
	Very Poor	1%	

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

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 (%)
Road signs and guardrails	25	12	Fair	54
Sidewalks	35	29	Poor	30
Culverts	50	4	Very Good	92
Streetlights	40	20	Fair	50

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 – Miscellaneous Assets	Very Good	13%	Poor (36%)
	Good	10%	
	Fair	22%	
	Poor	24%	
	Very Poor	31%	

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 & valves	40 - 80	34.7	Poor	25
Water equipment	10	5.0	Fair	50
Watermains	80 - 100	32.6	Good	66

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	5%	Good (65%)
	Good	85%	
	Fair	2%	
	Poor	1%	
	Very Poor	7%	

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 (%)
Lagoons	20 - 75	11.5	Good	78
Manholes	60	39.6	Poor	34
Sanitary equipment	25 - 35	13.1	Fair	48
Sanitary Mains	80 – 100	44.9	Fair	55

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	10%	Fair (55%)
	Good	21%	
	Fair	62%	
	Poor	2%	
	Very Poor	5%	

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.

Asset	Expected Useful Life (years)	Average Age (years)	Condition Grading	Average Condition (%)
Catchbasins	60	19.4	Good	68
Manholes	60	34.9	Fair	48
Storm mains	85	43.5	Fair	49
Stormwater management ponds	75	13.0	Very Good	83

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	21%	Fair (50%)
	Good	27%	
	Fair	13%	
	Poor	14%	
	Very Poor	25%	

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 (%)
Lighting & Fencing	20 – 50	19.1	Poor	35%
Parking lots	30	37.6	Fair	43%
Parks & Features	25 - 100	21.8	Poor	39%
Playgrounds & Splash pads	15 - 25	16.6	Poor	20%
Sports structures	7 - 30	10.9	Fair	56%

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	25%	Poor (36%)
	Good	1%	
	Fair	27%	
	Poor	4%	
	Very Poor	43%	

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 (%)
Protection Services	10 - 25	16.2	Poor	29%
Recreation Services	12 - 15	7.0	Fair	45%
Transportation Services	10 – 20	9.9	Poor	38%

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	2%	Poor (32%)
	Good	12%	
	Fair	36%	
	Poor	20%	
	Very Poor	30%	

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 (%)
Protection services	10 – 25	16.7	Poor	21%
Recreation services	10 – 50	9.1	Fair	58%
Transportation services	15 – 50	8.0	Good	68%

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 (56%)
	Good	39%	
	Fair	2%	
	Poor	13%	
	Very Poor	19%	

5.3.3 Asset Condition Summary

A summary of average condition for each asset class is provided in the following table:

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

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 Township's current level of service statements describe the asset outputs that the Township 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 Township staff or are prescribed metrics included in O. Reg. 588/17.

In addition to the measures required by O. Reg. 588/17, the Township has developed other foundational asset service measures which assist the Township 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 Township 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 Township will continue to develop and refine service levels, performance measurements and targets. The Township 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 Township; proposed levels of service address these changes.

6.2 Proposed Levels of Service

The Township is evolving over time and resident needs and expectations also change due to numerous internal and external factors. Strategic corporate documents such as the Strategic Plan, 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 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 Township’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 Township.

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 A
Quality	Images that illustrate the different levels of road class pavement condition	Refer to images in Appendix A

Service Attribute	Technical Levels of Service	Current Performance
Scope	Lane kilometres of arterial roads per Township land area	0 lane km/km ²
	Lane kilometres of collector roads per Township land area	0 lane km/km ²
	Lane kilometres of local roads per Township land area	1.51 lane km/km ²
Quality	Average pavement condition index for paved roads	Good (73)
	Average surface condition for unpaved roads	Good (79)
	Centreline kilometres of paved roads with pavement condition index less than 50	1.4
	Centreline kilometres of gravel roads with Average Annual Daily Traffic count over 100 and surface condition less than 50	0

Service Attribute	Proposed Levels of Service	Performance Target
Quality	% of paved roadway assets in fair or better condition	85%
	% of gravel roadway assets in fair or better condition	85%

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 A
	Images of the condition of culverts and how this affects use	Refer to images in Appendix A

Service Attribute	Technical Levels of Service	Current Performance
Scope	Percentage of bridges with loading or dimensional restrictions	2%
Quality	Average bridge condition index for bridges	77
	Average bridge condition index for structural culverts	77

Service Attribute	Proposed Levels of Service	Performance Target
Quality	% of bridges in fair or better condition	80%
	% of culverts in fair or better condition	80%

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 A

Service Attribute	Technical Levels of Service	Current Performance
Scope	Percentage of properties that are resilient to a 100-year storm	0
	Percentage of the stormwater management system resilient to a 5-year storm	1%; system is mainly designed for a 2-year storm

Service Attribute	Proposed Levels of Service	Performance Target
Quality	CCTV condition inspection program	Completion every 10 years

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 A
	Maps of areas that have fire flow	Refer to maps in Appendix A
Reliability	Description of boil water advisories and service interruptions	The Township is committed to ensuring a consistent supply of safe drinking water. The Township'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 Township 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	79.6%
	Percentage of properties with available fire flow	69.3%
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	1

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 A
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 Township 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 Township 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	Township 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	50%
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.	0
	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.	0.005
	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	0.52
	Number of fire stations per 1,000 residents	0.52
Reliability	Description of backup power provisions	Emergency generators are provided at the Watford Arena and ELCC, Watford Fire Station, Warwick Fire Station, Booster Pumping Station, Public Works Office and Garage and Sewage Pumping Station
	Description of activities undertaken to plan for climate change impacts	Planning for climate change is a key component of the Township's Strategic Plan and was incorporated into the 2024 Building Condition Assessment project

Service Attribute	Technical Levels of Service	Current Performance
Scope	Number of capital projects identified that will have climate change considerations included in the scope of work	10
Quality	Average facility condition index (FCI)	80%

Service Attribute	Proposed Levels of Service	Performance Target
Quality	% of buildings in fair condition or better	85%
Environment	Reduce energy consumption in public and recreation facilities	2% annual reduction
Resilience	% of buildings with climate change adaptation projects identified	50%

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	0.79
	Number of soccer pitches per 1,000 residents	1.05
	Number of parks	6
	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 and area of parkland per 1,000 residents	13.8 hectares (3.5 hectares per 1,000 residents)
	Number of trees planted in 2023	20

Service Attribute	Proposed Levels of Service	Performance Target
Environmental	Annual tree planting	Plant 100 trees in the next 10 years

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	28
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 beyond their expected useful life	18%

Service Attribute	Proposed Levels of Service	Performance Target
Reliability	% of fleet within expected useful life	> 70%

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 Township provides indoor and outdoor fitness equipment for resident use

Service Attribute	Technical Levels of Service	Current Performance
Quality	Average condition of assets	Fair (56%)

Service Attribute	Proposed Levels of Service	Performance Target
Quality	% of machinery and equipment in fair condition or better	70%

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 Township'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 Township 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 Township 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 Township 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 Township 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 Township 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 Township is 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

Warwick's infrastructure is aging, requiring increased levels of investment to keep it in 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. Impacts of COVID-19 on the economy will have a long-term effect on financial sustainability.



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 Township 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 Township to consider climate change in the development of its asset management policy and asset management plan. In order to improve the maturity of its asset management program, the Township contracted Infracore to inspect all municipal facilities and prepare a climate change adaptation plan including recommendations and costs to adapt Township facilities for climate change considerations over the long term. The associated costs of the work have been included in the building condition assessments, which in turn have been included in the lifecycle costs included in this asset management plan. Climate change performance metrics have also been included in the proposed levels of service outlined herein. This represents a significant step forward for the municipality in advancing its asset management maturity. The recommendations made in the climate change adaptation plan are as follows.

Climate Change Adaptation Actions for Municipal Facilities:

- Rising extreme and average summer temperatures strain the cooling systems provided in Township 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.
- When designing new or replacement cooling systems, include increased demand associated with future higher temperatures.
- 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 Township may consider designating central facilities for use as community cooling stations. Facilities utilized by vulnerable populations may be prioritized, including the library and community centres.

- 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, as was recently completed at the Warwick Community Centre.
- Install lightning protection systems. Although difficult to predict, lightning strikes may become more frequent in the future. This could damage electrical systems in buildings and potentially cause power outages. Critical buildings should be prepared for extended power outages in the future. This is particularly important for facilities that are designated for use as emergency shelters or gathering locations.
- 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. 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.
- Extreme heat can lead to increased deterioration and wear on hardscaping. Continue to inspect parking lots and hardscaping regularly to identify heat-related deterioration and complete repairs early on to avoid further degradation and higher repair costs.
- Monitor internal drainage systems in facilities and prepare for a projected increase in precipitation events.
- Increase the capacity of the storm sewer system through the lifecycle replacement process and as part of the design process for new developments.
- Store electrical and mechanical equipment above grade where possible to avoid damage from flooding.

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 Township 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 Township 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
	Paved roads	3
	Subgrade	3
	Road signs and guardrails	2
	Sidewalks	2
	Culverts	2
	Streetlights	3
Bridges & Culverts	Bridges	4
	Culverts	4
Stormwater	Catchbasins	2
	Manholes	3
	Storm mains	3
	Stormwater management ponds	3
Water	Hydrants & valves	4 (hydrants) 3 (valves)
	Water equipment	2
	Watermains	3
Wastewater	Lagoons	4
	Manholes	3
	Sanitary equipment	3
	Sanitary Mains	4
Buildings	All Township facilities	1 - 4
Land Improvements	Lighting & Fencing	2
	Parking lots	2

	Parks & Features	2
	Playgrounds & Splash pads	2
	Sports structures	2
Fleet	Protection Services	4
	Recreation Services	2
	Transportation Services	3
Machinery & Equipment	Protection Services	4
	Recreation Services	2
	Transportation Services	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 2024 dollar value.

Likelihood	Consequence				
	1 Negligible	2 Minor	3 Moderate	4 Major	5 Catastrophic
5 Almost Certain	1 asset \$134,591	65 assets \$4,037,622	190 assets \$12,164,819	73 assets \$3,653,017	0 assets \$0
4 Regular	0 assets \$0	27 assets \$2,008,823	122 assets \$13,458,352	11 assets \$6,488,460	0 assets \$0
3 Possible	1 asset \$1,152,859	47 assets \$16,992,522	108 assets \$30,960,841	176 assets \$19,645,826	0 assets \$0
2 Unlikely	0 assets \$0	24 assets \$5,701,074	472 assets \$97,780,833	59 assets \$13,574,705	0 assets \$0
1 Rare	1 asset \$83,157	106 assets \$22,859,841	267 assets \$34,319,756	36 assets \$13,736,467	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 Township 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 Township 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 or very high risk, include the following:

Asset Class	High Priority Projects	Replacement/Project Cost
Roads	Various road safety items and rehabilitation of deteriorated paved and gravel roads, as outlined in the Road Study reports	\$1,348,550
Bridges & Culverts	Various repairs to address safety issues as outlined in the OSIM report	\$1,875,000
Water	Repair/replacement of aged fire hydrants and fire hydrant leads	\$3,401,618
Wastewater	Replacement of aged manholes	\$1,257,300
Stormwater	Replacement of aged stormwater mains and manholes	\$4,042,752
Buildings	Repair of critical facilities, including fire stations	\$615,000
Land improvements	None	-
Fleet	Replacement of aged fire and roads vehicles	\$4,829,200
Machinery & Equipment	Replacement of aged fire department and roads equipment	\$272,843

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. For example, aged stormwater mains and manholes have a high priority replacement value of over \$4M. Completion of CCTV condition assessment of the storm sewer system is likely to reveal that only a portion of the network requires attention in the short term.

Lifecycle Activity Categories

Lifecycle Activity Options and Risks

Asset Class Lifecycle Strategies

- Operating Budget

Asset Class Lifecycle Strategies

- Capital Budget

LIFECYCLE MANAGEMENT STRATEGY



8. Lifecycle Management Strategy

8.1 Lifecycle Activity Categories

The Township'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 Township 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 Township 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 Township 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 Township's proposed levels of service. This information is included in the following sections.

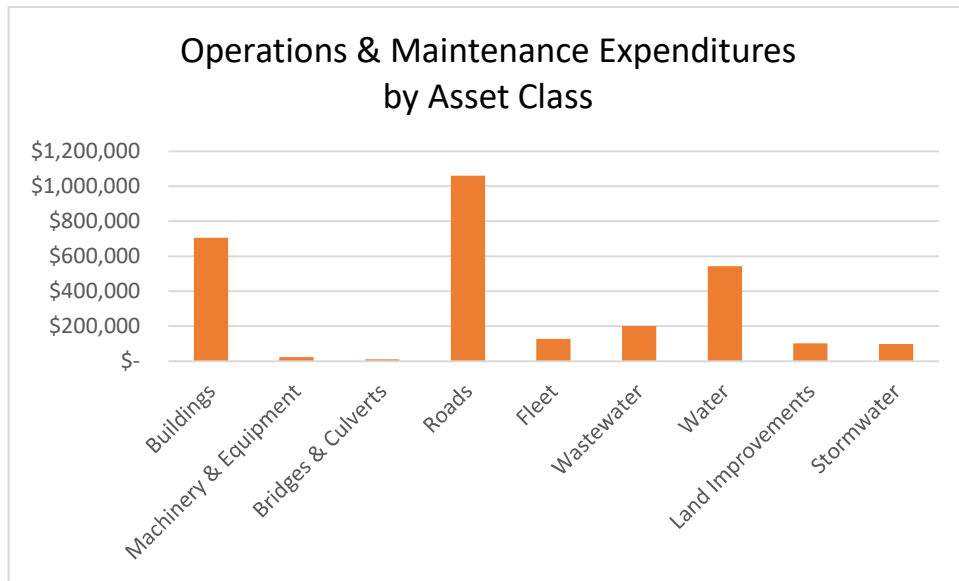
8.3 Asset Class Lifecycle Strategies – Operating Budget

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 Township’s 2024 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 2024 operating expenditures related to asset management.

Asset Class	2024 Asset Management Operating Expenditure
Roads	\$1,060,508
Bridges & Culverts	\$9,201
Stormwater	\$98,141
Water	\$541,849
Wastewater	\$199,860
Buildings	\$706,119
Land Improvements	\$102,268
Fleet	\$126,971
Machinery & Equipment	\$23,420
Total	\$2,868,336



It is understood that the Township’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 increased planting of trees. The cost of this initiative is estimated at \$5,000 annually, which can be accommodated within the existing operating budget and planned increases over the next 10 years.

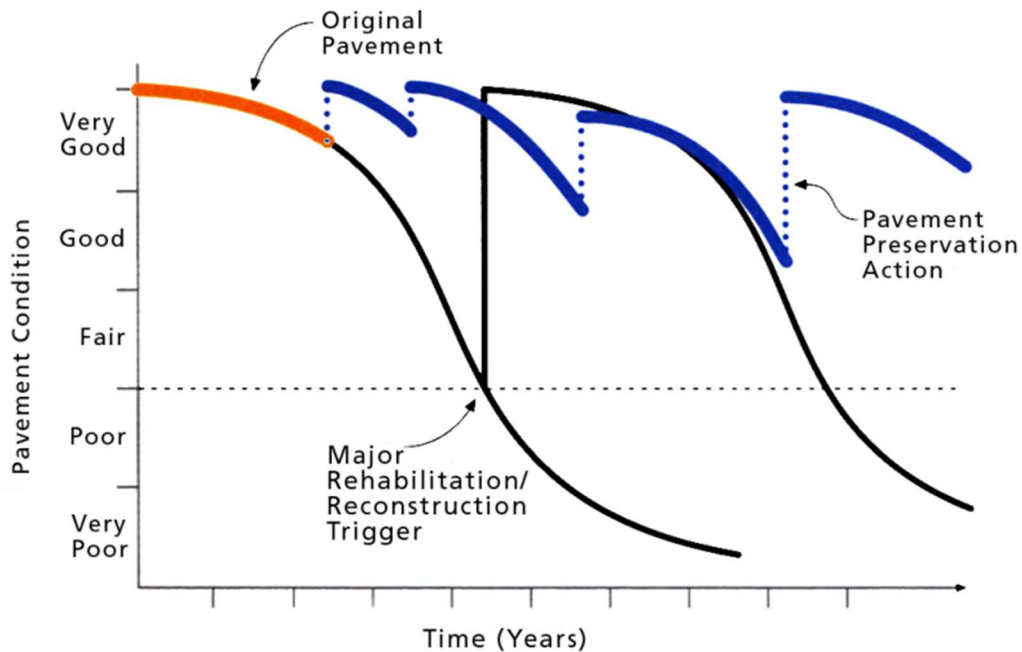
8.4 Asset Class Lifecycle Strategies – Capital Budget

The capital budget includes tax-supported and rate-supported expenditures required to rehabilitate, renew and replace Township 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

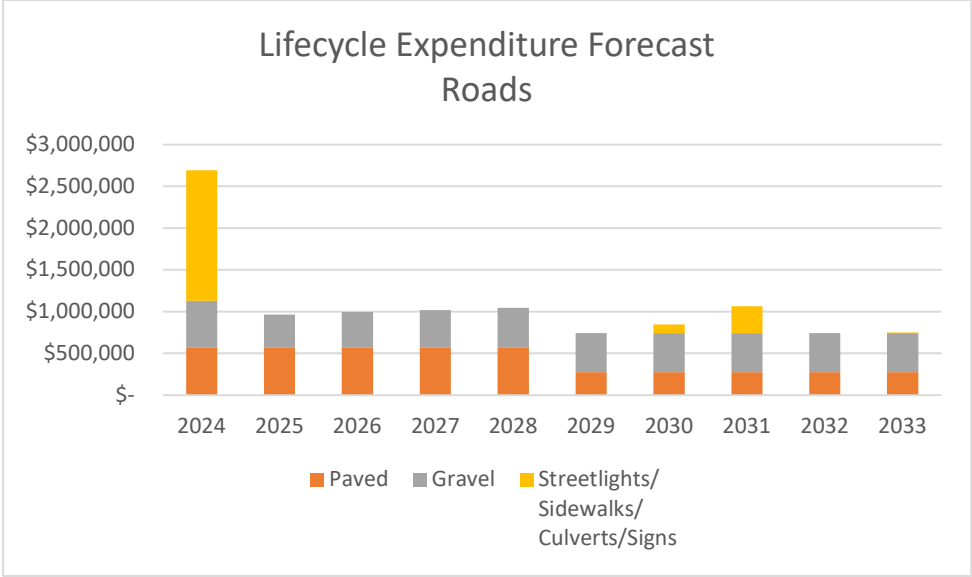
The Township undertakes the following lifecycle activities to maintain the current levels of service related to road assets:

Asset	Lifecycle Activity	Description
Paved roads	Maintenance	Crack sealing, overlay, pothole filling, patch repairs
	Rehabilitation	Surface treatment, 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, Sidewalks, Culverts, Signs & Guardrails	Maintenance	Reflectivity testing, cleaning, debris clean out/flushing
	Rehabilitation	Component replacement, localized repair
	Replacement	Full replacement

The gravel road study prepared by Spriet Associates identifies that 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 Township's paved and gravel roads, and other transportation assets, at their current levels of service. Costs are based on information included in the Paved Road Study and Gravel Road Study, and for other transportation assets, from the Town's asset management software.



The average annual expenditure for road assets over the next 10 years is \$1,086,612.

Proposed levels of service for roads include metrics for the percentage of assets in fair condition or better. 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 paved and gravel road condition assessments.

8.4.2 Bridges and Culverts

8.4.2.1 Lifecycle Management Activities

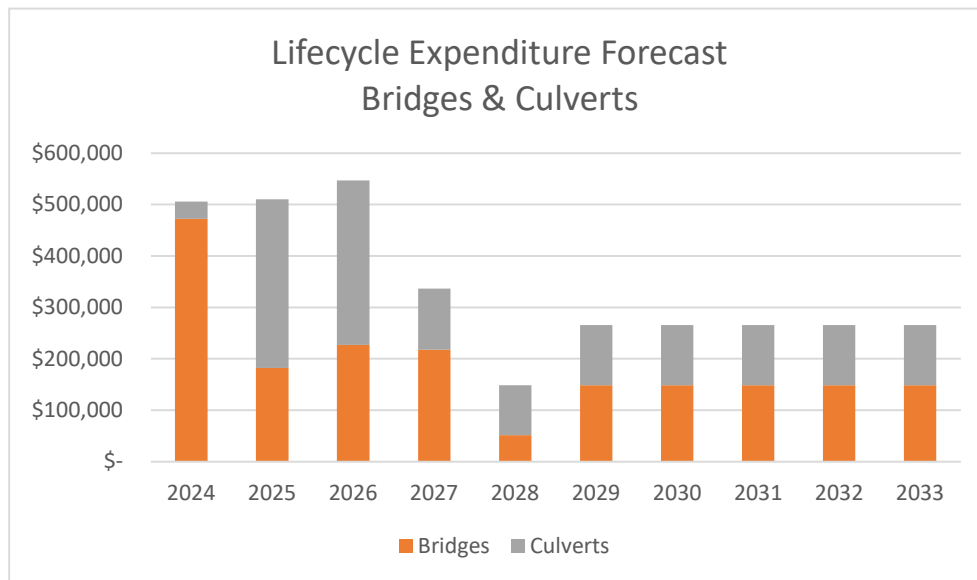
The Township undertakes the following lifecycle activities to maintain the current levels of service related to bridge and culvert assets:

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, 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 Township's bridges and culverts at their current levels of service. Costs are obtained from the most recent OSIM report. The report presents short term costs in specific years from year 1 to year 5, whereas longer term costs are lumped into a 'year 6 to year 10' category. The longer-term costs have been spread evenly over these years.



The average annual expenditure for bridges and culverts over the next 10-years is \$337,710.

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

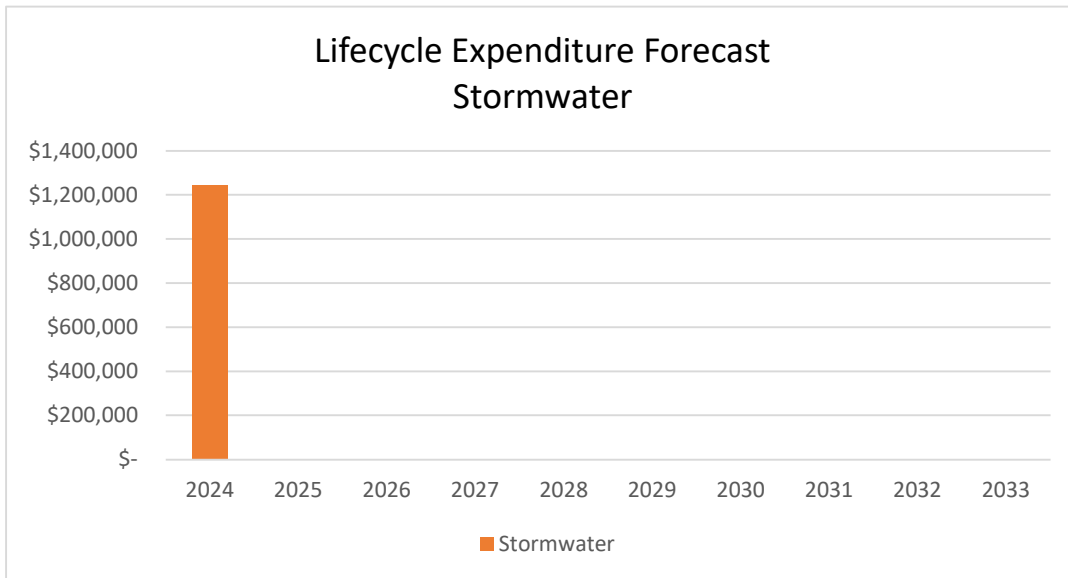
8.4.3.1 Lifecycle Management Activities

The Township 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	CCTV inspections, storm main flushing, catchbasin cleanout
	Rehabilitation	Concrete repairs
	Replacement	End of life replacement
Stormwater management ponds	Maintenance	Outlet cleaning, vegetation removal
	Rehabilitation	Pond dredging/cleanout
	Replacement	Not typically required

8.4.3.2 Lifecycle Expenditure Forecast

The ten-year lifecycle expenditure forecast for stormwater assets is summarized in the following figure. It provides an estimate of the costs associated with maintaining all of the Township's stormwater assets at their current levels of service. Costs are obtained from the Township's asset management software. The projection reflects backlog work in 2024 and future needs for the relatively new infrastructure residing beyond the 10-year forecast.



The average annual expenditure for stormwater assets over the next 10-years is \$127,128.

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

8.4.4 Water

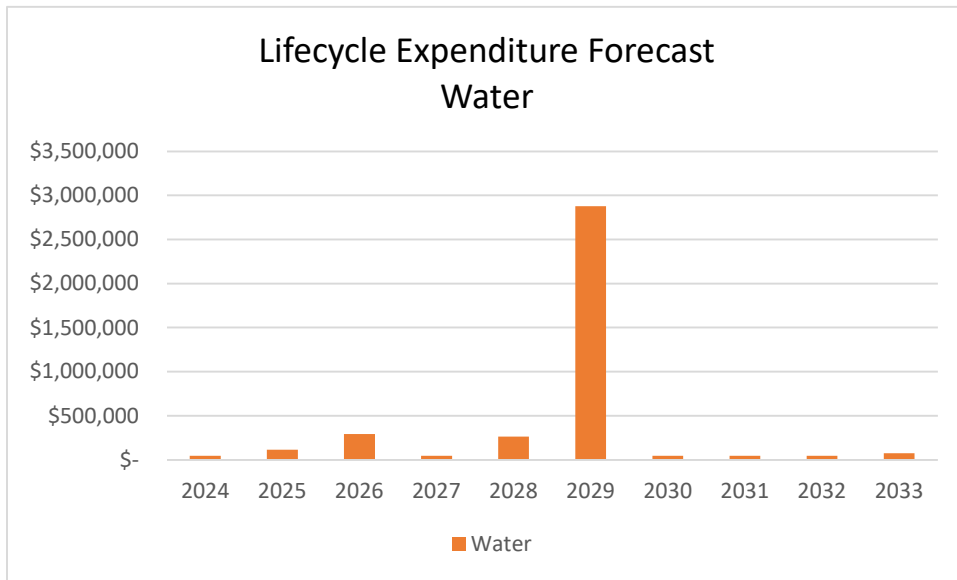
8.4.4.1 Lifecycle Management Activities

The Township undertakes the following lifecycle activities to maintain the current levels of service related to water assets:

Asset	Lifecycle Activity	Description
Hydrants, valves & equipment	Maintenance	Valve turning, hydrant flushing
	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

8.4.4.2 Lifecycle Expenditure Forecast

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



The average annual expenditure for water assets over the next 10-years is \$384,986.

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

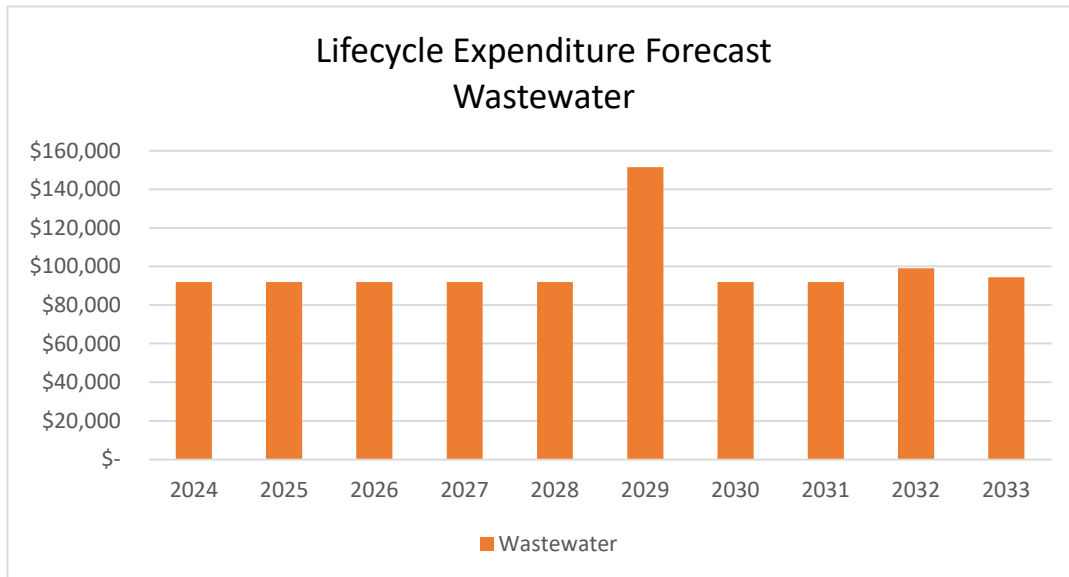
8.4.5.1 Lifecycle Management Activities

The Township undertakes the following lifecycle activities to maintain the current levels of service related to wastewater assets:

Asset	Lifecycle Activity	Description
Lagoons	Maintenance	Inspection, grit removal, embankment maintenance, removal of material from inlets and outlets
	Rehabilitation	Sludge removal
	Replacement	Replacement of lagoons and appurtenances
Manholes, equipment & 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 provides an estimate of the costs associated with maintaining all of the Township’s wastewater assets at their current levels of service. Costs are obtained from the Township’s asset management software.



The average annual expenditure for wastewater assets over the next 10-years is \$98,896.

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

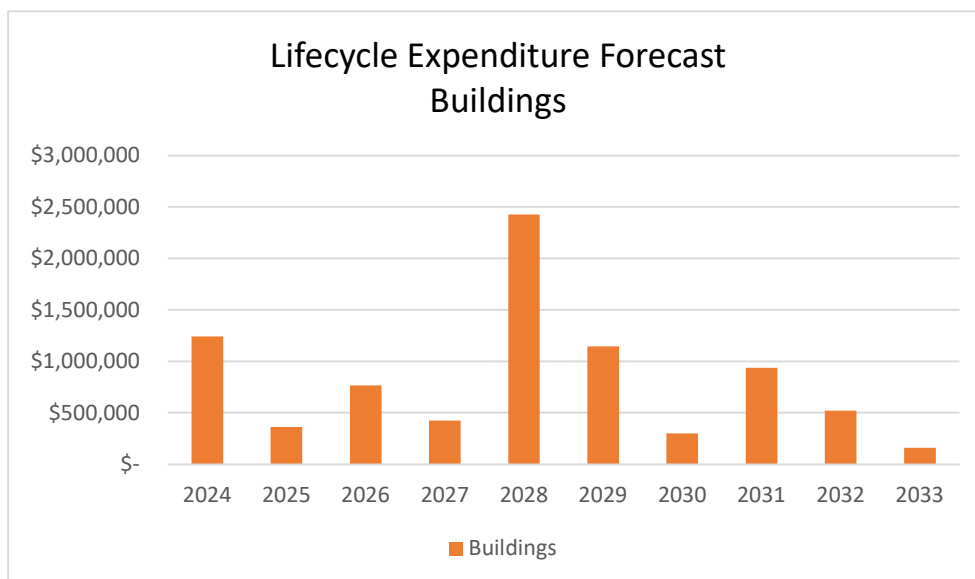
8.4.6.1 Lifecycle Management Activities

The Township 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 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 Township’s building assets at their current levels of service. Costs are obtained from the 2024 Infralevel Building Condition Assessment reports.



The average annual expenditure for building assets over the next 10-years is \$827,483.

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

8.4.7 Land Improvements

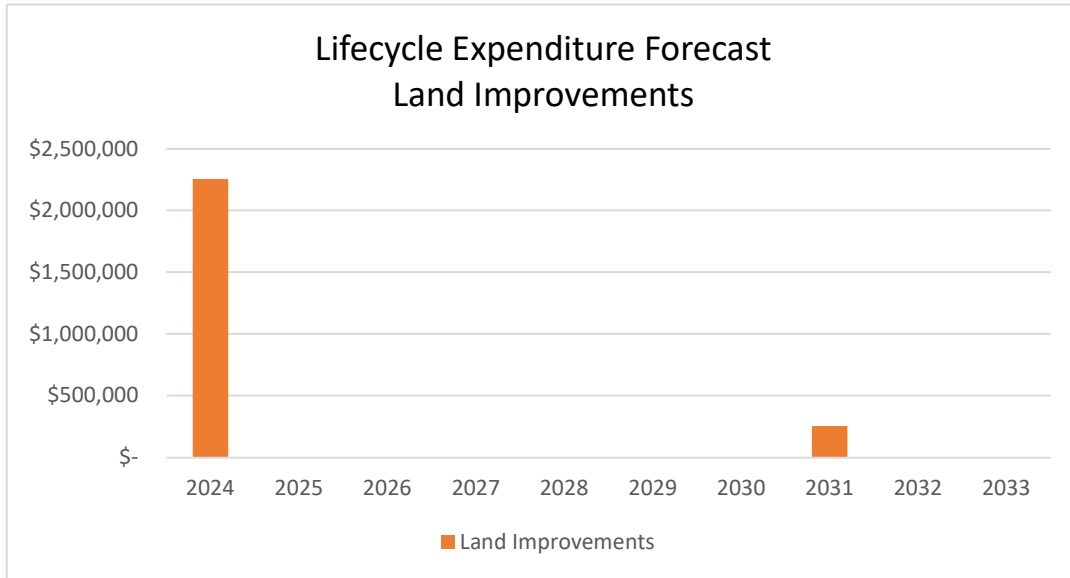
8.4.7.1 Lifecycle Management Activities

The Township 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 & sports structures	Maintenance	Inspections, flushing, cleaning, minor repairs
	Rehabilitation	Park component replacements, major splash pad repairs and upgrades, major repair or partial replacement of sports structures
	Replacement	Full replacement of play structures, splash pads and water infrastructure, replacement of sports structures
Lighting, fencing & parking lots	Maintenance	Inspections, pothole patching, bulb replacements, minor fencing repairs
	Rehabilitation	Localized pavement replacement, lighting fixture replacement, fencing section replacement
	Replacement	Full replacement of light poles and fixtures, fencing replacement, repaving of parking lots

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 Township’s land improvement assets at their current levels of service. Costs are obtained from the Township’s asset management software.



The average annual expenditure for land improvement assets over the next 10-years is \$251,055. The chart portrays significant backlog work required in the short term.

Proposed levels of service for land improvement assets include annual tree planting targets. The associated costs will be included in the operating budget and do not impact the capital expenditure forecast.

8.4.8 Fleet

8.4.8.1 Lifecycle Management Activities

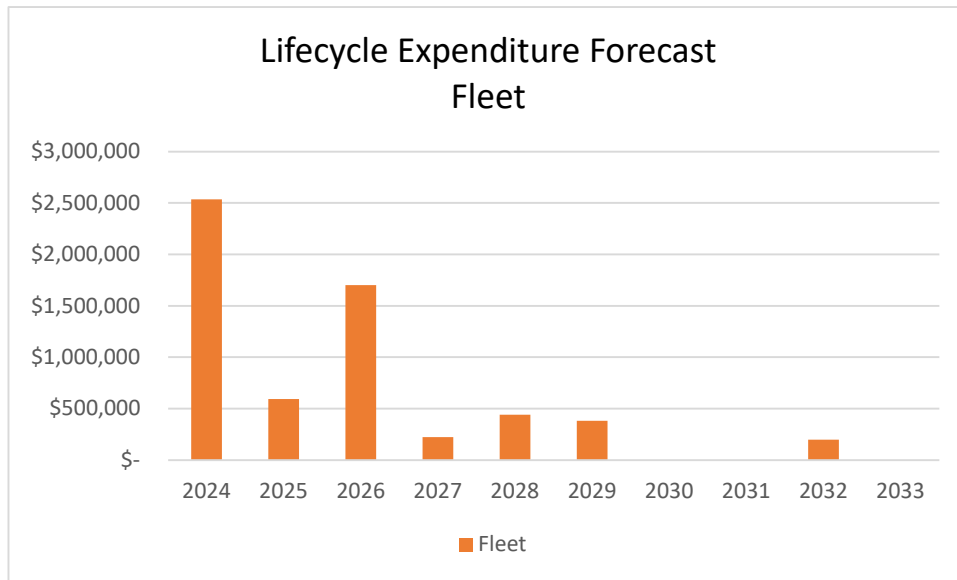
The Township undertakes the following lifecycle activities to maintain the current levels of service related to fleet assets:

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 Township's fleet

assets at their current levels of service. Costs are obtained from the Township’s asset management software.



The average annual expenditure for fleet assets over the next 10-years is \$607,660.

Proposed levels of service for fleet assets include a target to maintain at least 70% 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

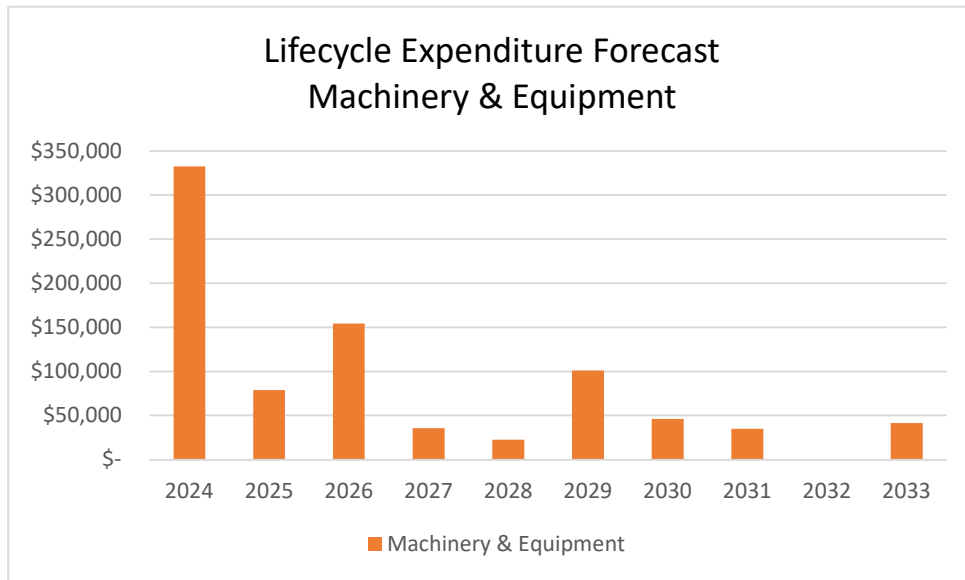
The Township undertakes the following lifecycle activities to maintain the current levels of service related to machinery and equipment assets:

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 Township’s machinery and equipment assets at their current levels of service. Costs are obtained from the Township’s asset management software.

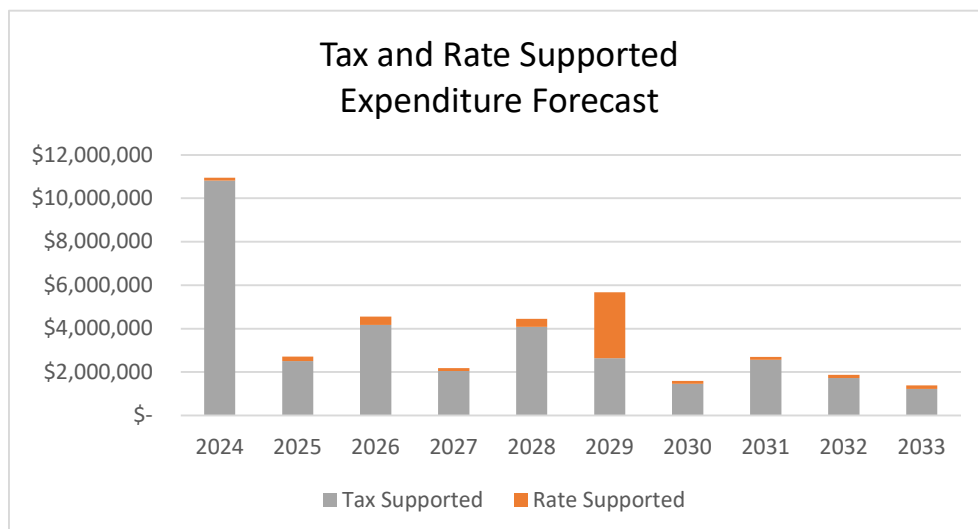


The average annual expenditure for machinery and equipment assets over the next 10-years is \$84,705.

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 Township. 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 documented in the Township's Development Charge (DC) Background Study, dated December 2022, and Official Plan, dated 2021 (office consolidation). Future population and employment growth is quantified and projected as follows.

Population Growth

As of mid-2022, the Township population was approximately 3,622. The Town's DC Background Study projects a population of 4,331 in 2032 and 4,787 in 2036.

Employment Growth

The DC Background Study indicates that total employment for the Township is anticipated to reach approximately 1,905 by 2031 and 2,120 by 2036. This represents an employment increase of approximately 355 for the period between 2021 and 2031, and 570 for the period between 2021 and 2036.

The demand on the Township'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 Township'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 Township'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 Township'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 Township'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 Township 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 Township'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 Township'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 Township 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 provides a framework through which the Township can strive to achieve long-term financial sustainability. The strategy strives to maintain a balance between three pillars: financial sustainability, financial vulnerability and financial flexibility. Asset Management supports all three pillars of the strategy.



Financial Sustainability

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



Financial Vulnerability

The degree to which the Township 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 Township’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:

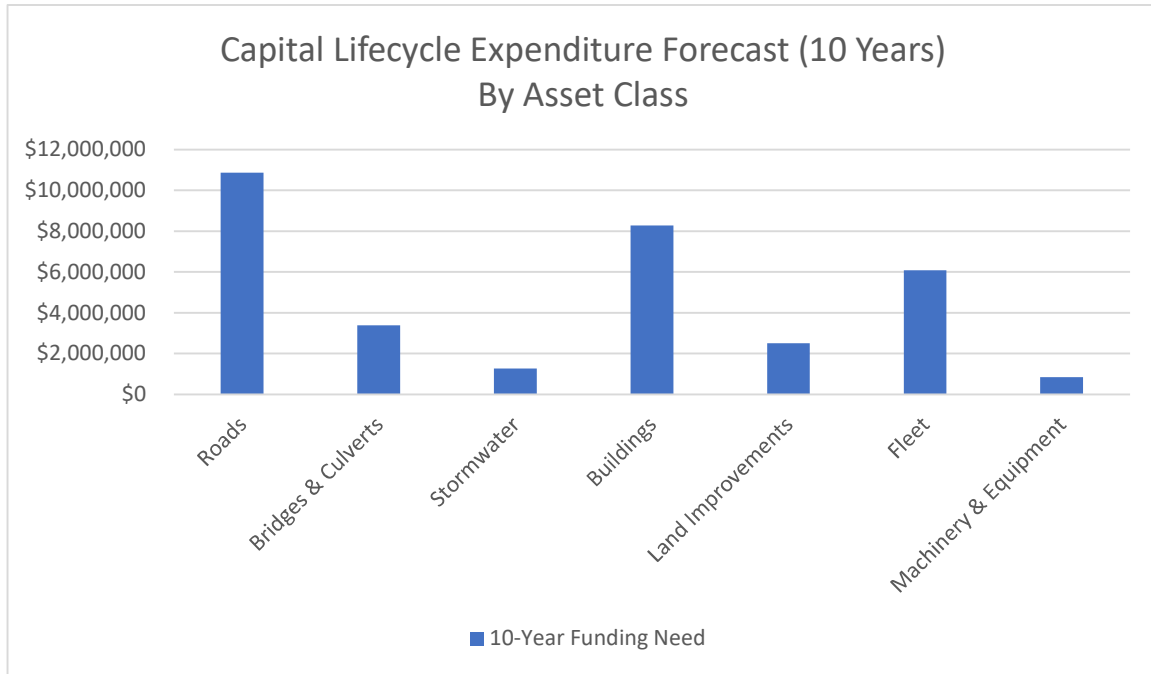
Funding Sources	
Taxation	Facility rentals
Payments in lieu of taxation	Wind turbine and landfill fees
User fees	Cemetery fees
Grants	Development Charges
Investment and interest income	Miscellaneous items

Over the 10-year evaluation period, these funding sources are anticipated to provide, in a sustainable manner, a total of \$29,600,000 for tax-supported asset management funding purposes.

10.1.2 Funding Needs

The following table and chart summarize the Township’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	\$10,866,124
Bridges & Culverts	\$3,377,100
Stormwater	\$1,271,282
Buildings	\$8,274,828
Land improvements	\$2,510,549
Fleet	\$6,076,600
Machinery & Equipment	\$847,052
Total Funding Need	\$33,223,535



10.1.3 Funding Gap

Analysis of the Township’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	\$33,223,535
Funding Available	\$29,600,000
Funding Gap	\$3,623,535

The identified funding gap is \$3,623,535 over the next ten years; or \$362,353 per year. In comparison to funding gaps identified by similar municipalities in Ontario, this gap is considered quite small.

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:

- **Own-Source Revenue Growth:** The funding gap identified for tax-supported assets is based on current levels of own-source revenues, however growth is

expected from taxation and other sources. Implementation of a 1% or 2% infrastructure levy may also be considered.

- **Reserve Funds:** Reserves related to asset management, such as the Capital Projects Reserve and Drainage Reserve, have been built up over time and represent an appropriate source of funding to address the gap.
- **User Fees and Charges:** The Township imposes user fees and charges for specific services and facilities, such as waste collection, recreation programs, and permits. These fees can be structured 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 Township 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. 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 Township 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 entails interest costs and repayment obligations, and the current rate environment is less favourable than recent years.
- **Asset Monetization and Leasing:** The Township 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 other initiatives that can be undertaken that seek to minimize the funding gap as opposed to funding its full amount. These include:

- **Implement Operational Efficiencies:** Identify opportunities to improve operational efficiencies within the municipality to generate cost savings and/or additional revenue streams. 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 Township'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

Although infrastructure levies and borrowing can be implemented relatively quickly and effectively to bridge the funding gap, the use of these tools is generally minimized where possible at a time of affordability challenges for residents and in a fairly high interest rate environment. Increased user fees pose a similar concern to affordability.

Asset monetization and grant increases can inject one-time funding helpful in decreasing the funding gap, however these are unpredictable opportunities that are difficult to budget for with certainty.

The Capital Projects reserve fund has a current balance of approximately \$2.9M and is a potential source to bridge the identified funding gap, however maintaining and growing this reserve is considered good practice and represents pro-active planning in preparation for future strategic projects.

Assessment of projected own-source revenue growth over the 10-year evaluation period indicates that sufficient revenues will be generated to fully address the identified funding gap. To minimize reliance on these funds, 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 connections and lagoon land rental income.

Based on the Township’s Water and Wastewater Rate Study report, The Township has budgeted for a 5% annual rate increase for both the water and wastewater systems from 2019 to 2029. The 5% increase has been extended from 2029 to 2033 for the purposes of the evaluation period utilized in this asset management plan.

Over the 10-year evaluation period, the water and wastewater funding sources are anticipated to provide, in a sustainable manner, a total of approximately \$7,500,000 for rate-supported asset management funding purposes.

10.2.2 Funding Gap/Surplus

Analysis of the Township’s asset lifecycle needs over the next 10 years, in comparison with the available capital funding, provides an indication of the annual funding gap (or surplus) for rate-supported assets.

Item	Asset Class	Amount
10-Year Funding Need	Water	\$3,850,000
	Wastewater	\$989,000
	Total	\$4,839,000
10-Year Revenue	Water	\$6,075,000
	Wastewater	\$1,432,000
	Total	\$7,507,000
10-Year Funding Surplus		\$2,668,000

As indicated in the table above, the total asset lifecycle needs for water and wastewater infrastructure for the next 10 years is \$4,839,000. Based on the \$7,507,000 revenue availability, this represents a funding surplus of \$266,800 annually.

10.2.3 Long-Term Funding Needs

The Town’s asset management software provides a long-term assessment of the Township’s water and wastewater funding needs. These needs are higher in the long-term because the Township’s water and wastewater infrastructure is relatively new compared to its expected useful life, and does not require extensive replacement in the next 10 years. The following table outlines the long-term funding requirements for these assets.

Asset Class	Long-Term Funding Needs (Annual)
Water	\$609,950
Wastewater	\$331,533
Total	\$941,483

Assuming a requirement to begin budgeting for these long-term funding needs after the 10-year evaluation period utilized for this plan, the Township’s projected rate funded revenue has been projected for the year 2034; it is estimated at \$942,688, slightly higher than the identified long-term funding needs outlined in the table above.

It is recommended that the annual funding surplus identified over the 10-year evaluation period be contributed to water/wastewater reserves. It is also recommended that the 5% annual increase for both the water and wastewater systems be continued to prepare for the increased long-term cost projections.

Strategies

Initiatives

ADVANCING ASSET MANAGEMENT MATURITY



11. Advancing Asset Management Maturity

The Township's asset management program is guided by industry best practices and regulatory requirements. As the Township 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 Township's asset management program has matured significantly over the past several years. Further development of the following strategies will assist the Township 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 Township 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 Township 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 township 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 Township 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 Township's asset management maturity:

- The Township 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 Township 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 Town has proactively completed a Climate Change Adaptation Plan for all of its municipal facilities. It is recommended that the plan be extended to include the remaining asset classes.
- 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 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 Township 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 time, 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 Township's high-level strategic objectives and detailed day-to-day activities, carried out by the Township'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.

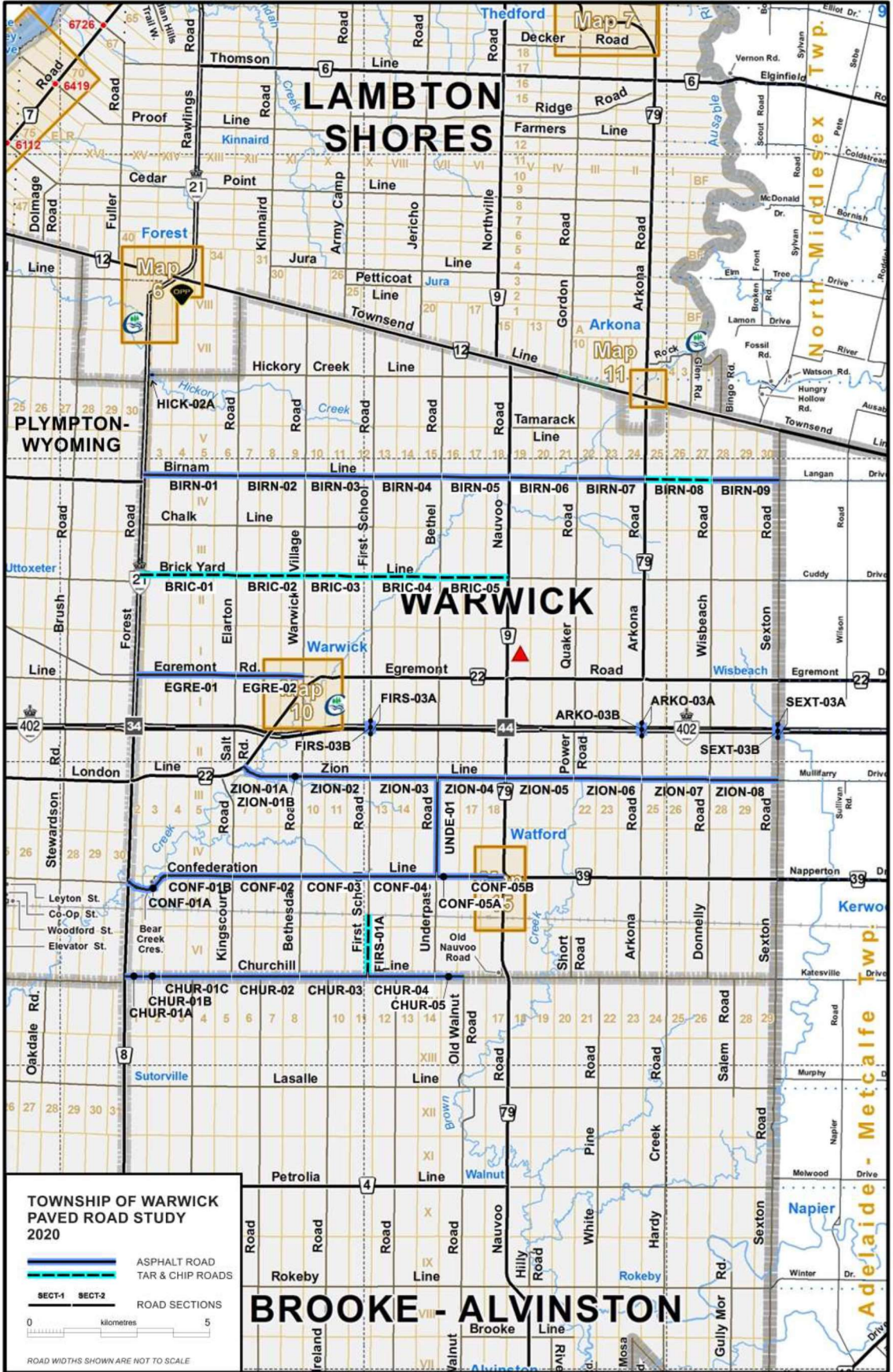
Risk - The effect of uncertainty on objectives. Risk is often expressed as the consequences of an event in combination with the associated likelihood of that event occurring.

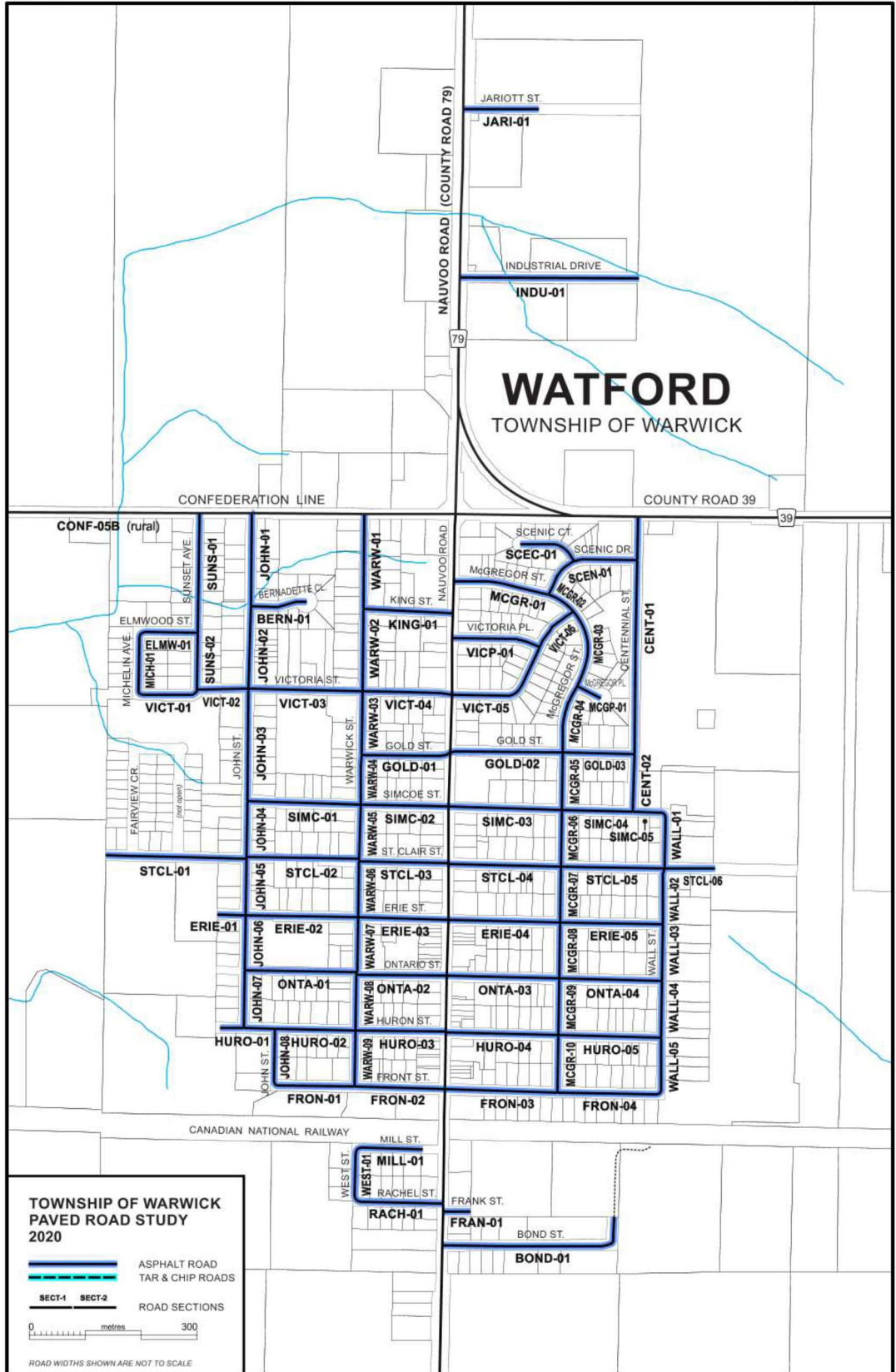
Service life - The period that an asset provides an acceptable level of service. The economic service life is defined as the period when the present worth of the future maintenance costs are equal to the present worth of its replacement.

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

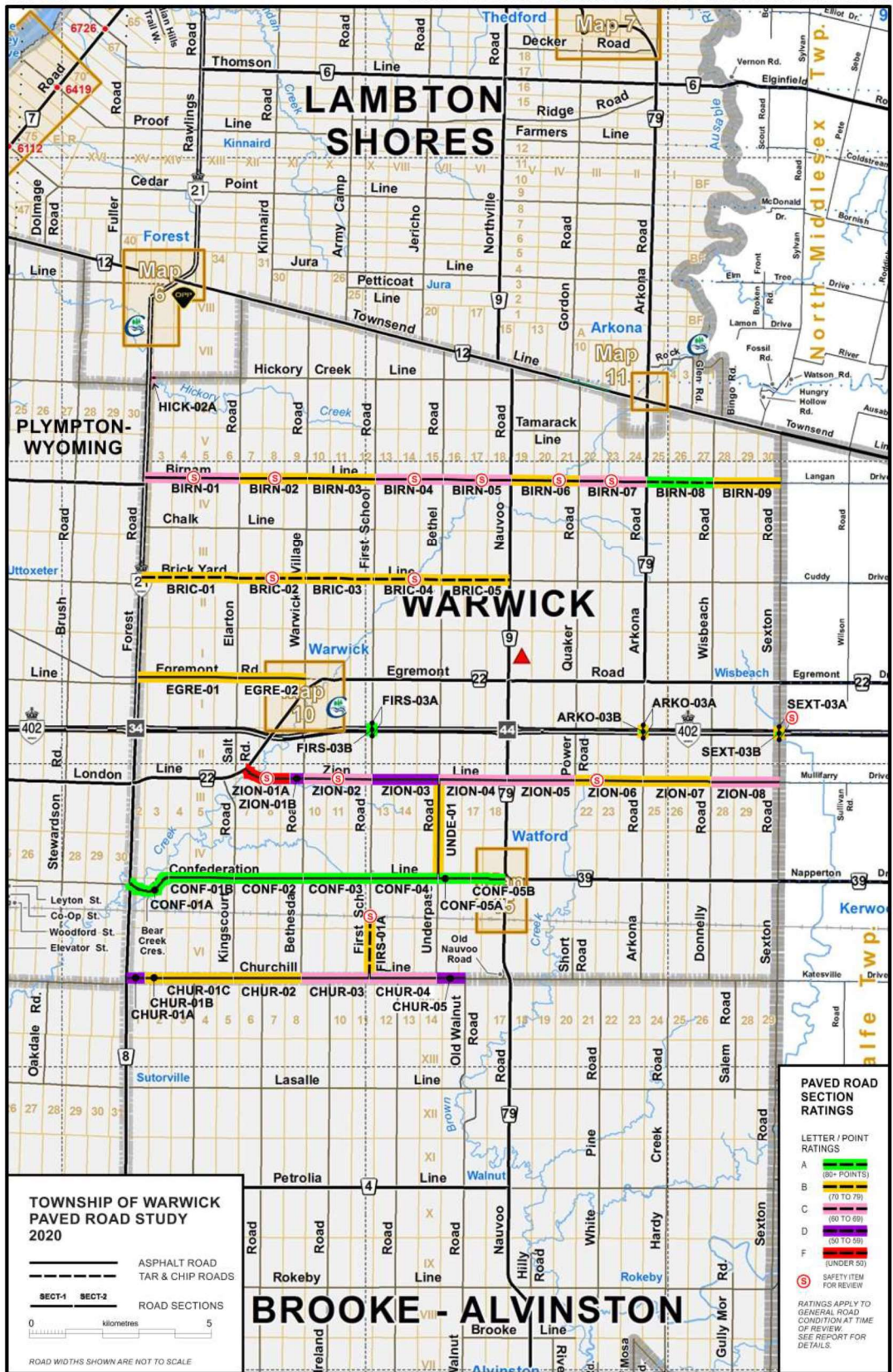
Appendix B

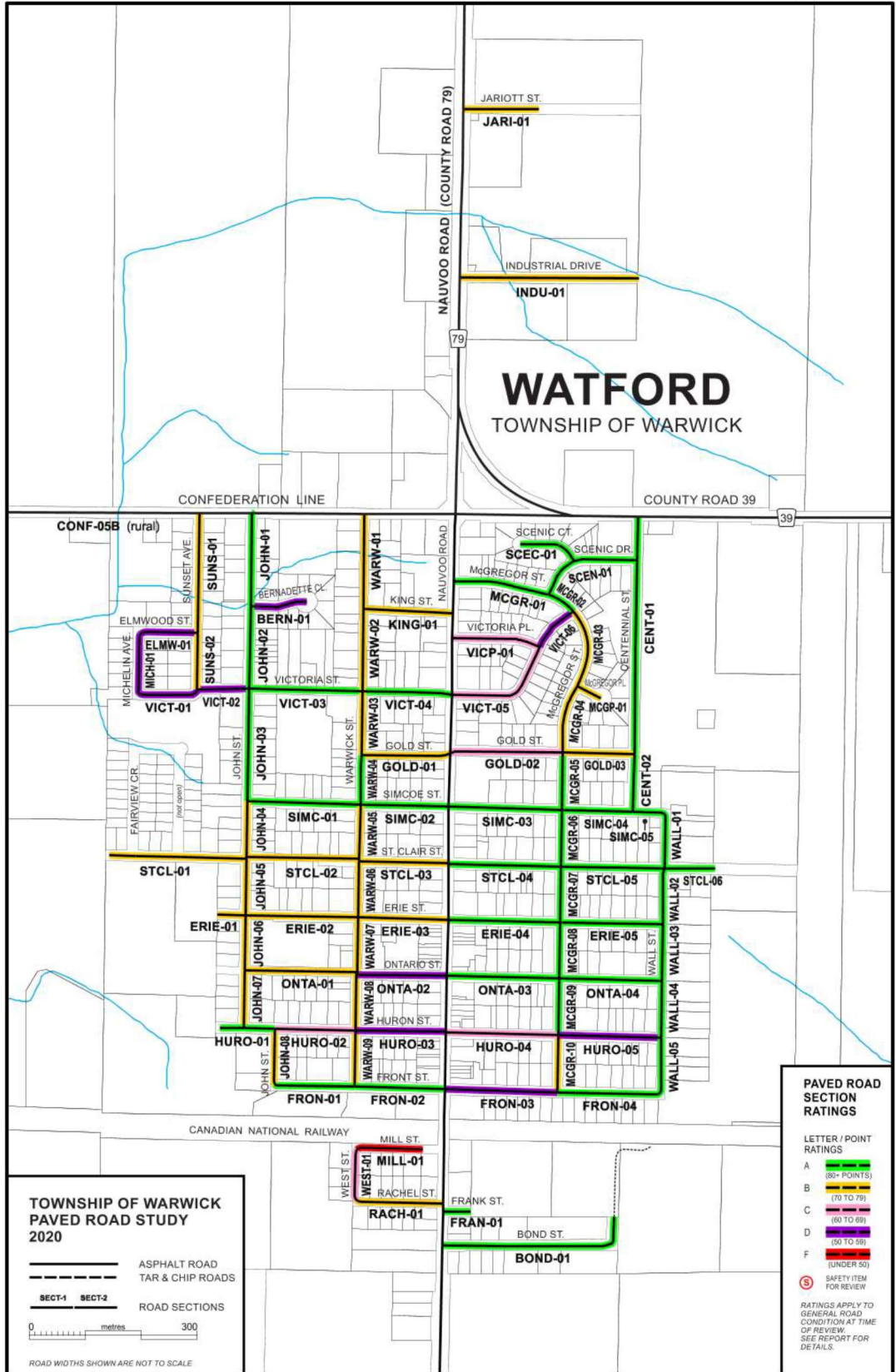
Mapping

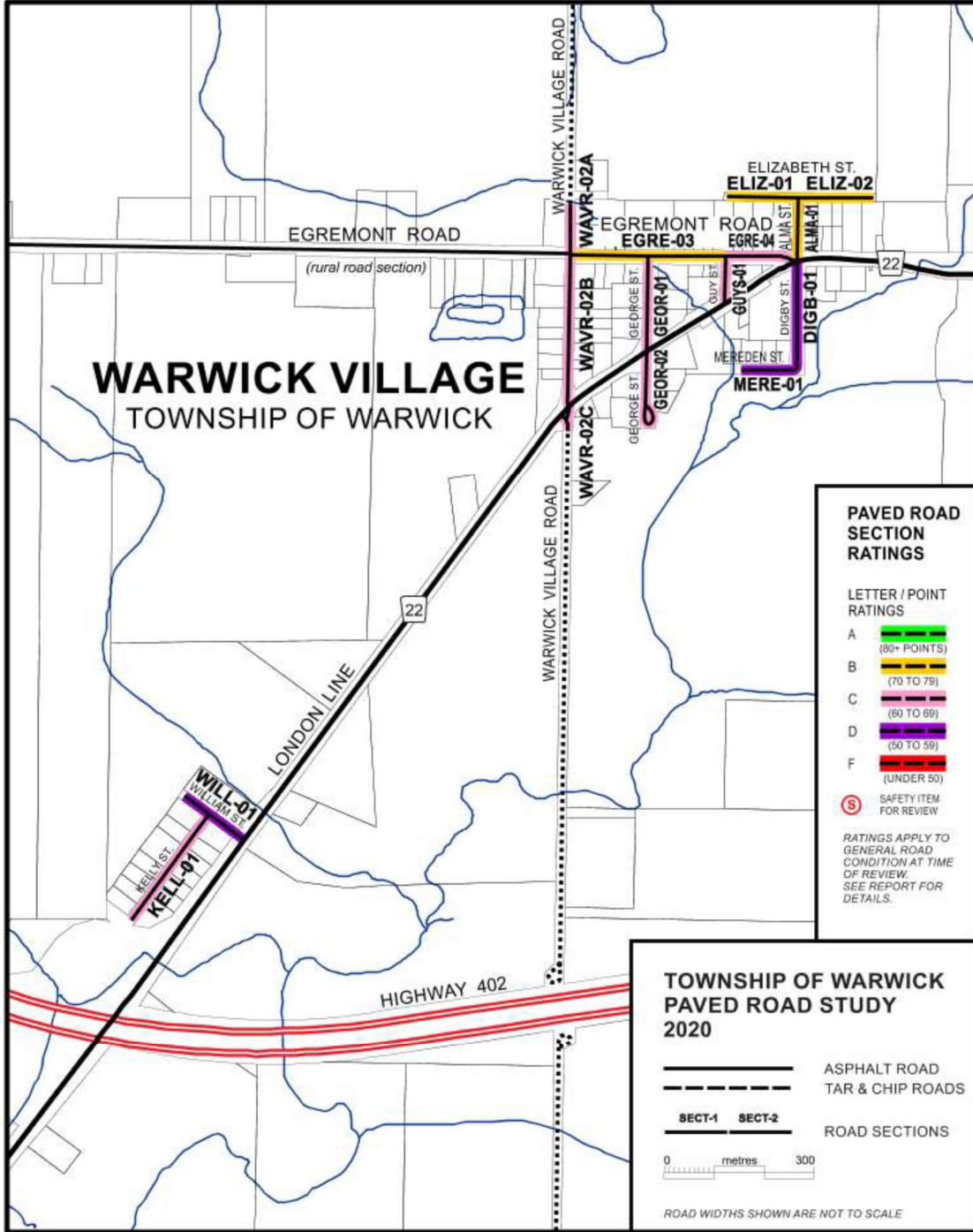












Road Condition Images



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

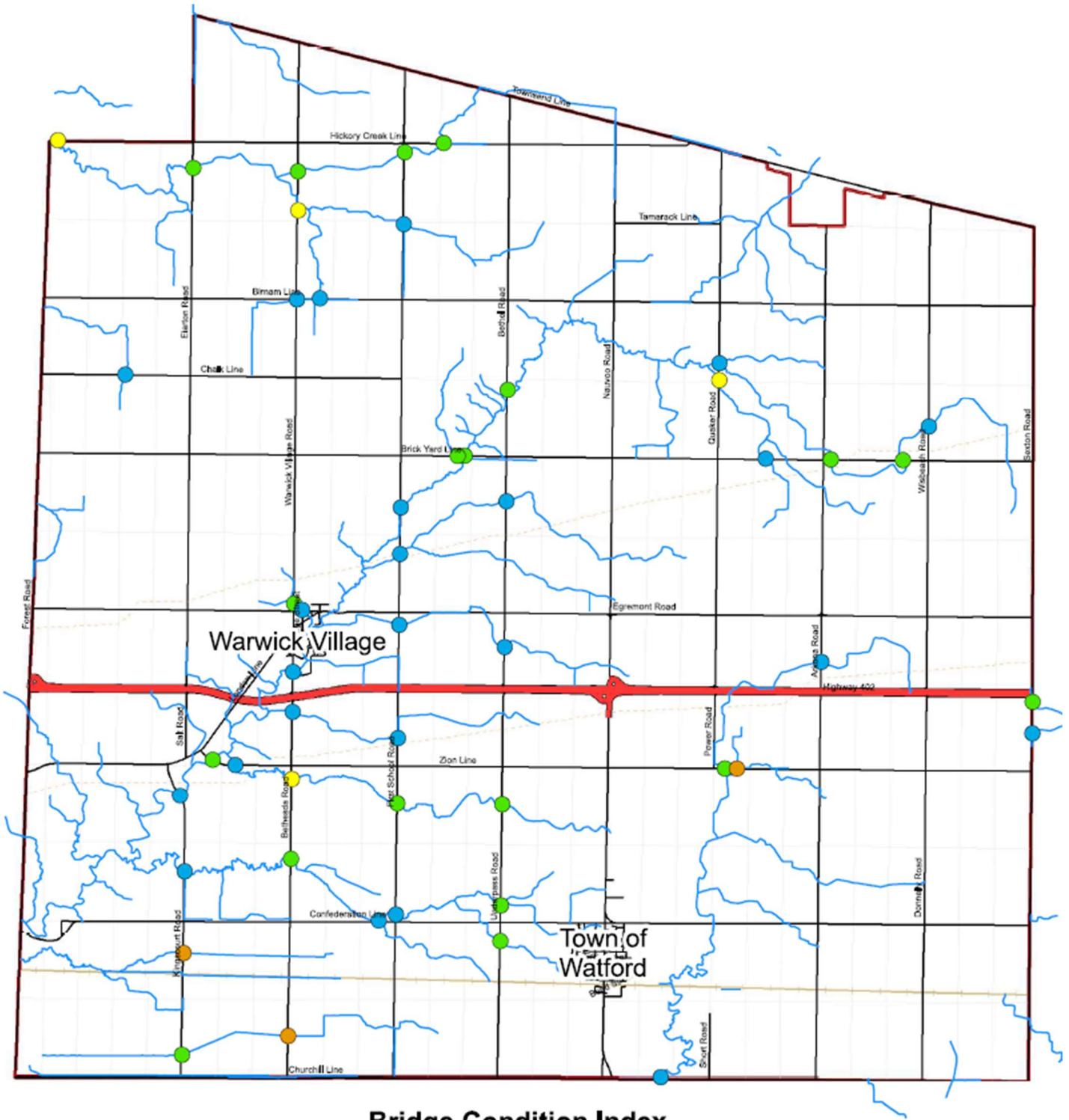


Asphalt (left) and gravel (right) roads in **Poor** condition – serious deterioration, function is inadequate



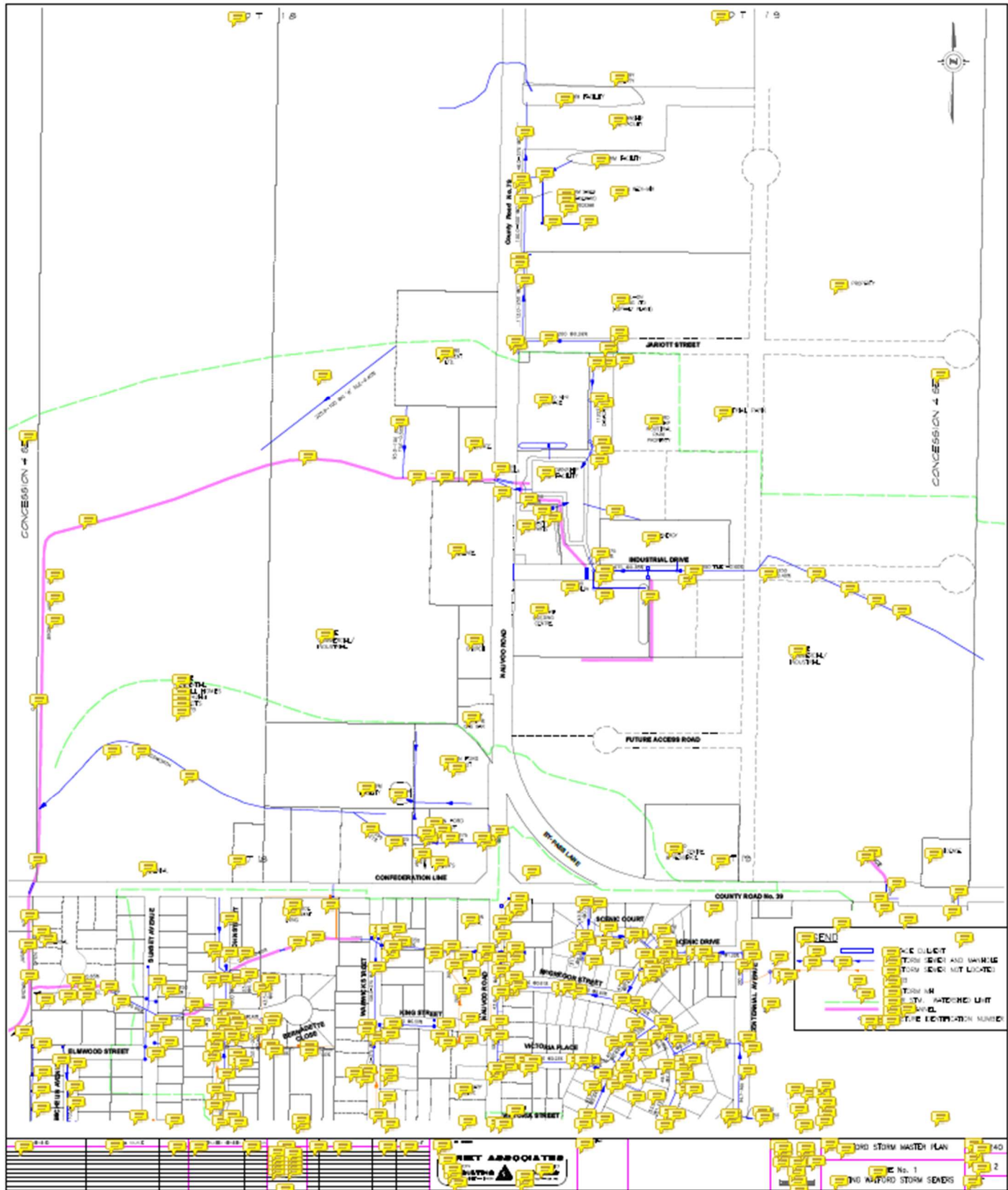
Asphalt (left) and gravel (right) roads in **Very Poor** condition – no longer functional, general or complete failure

Bridge Conditions

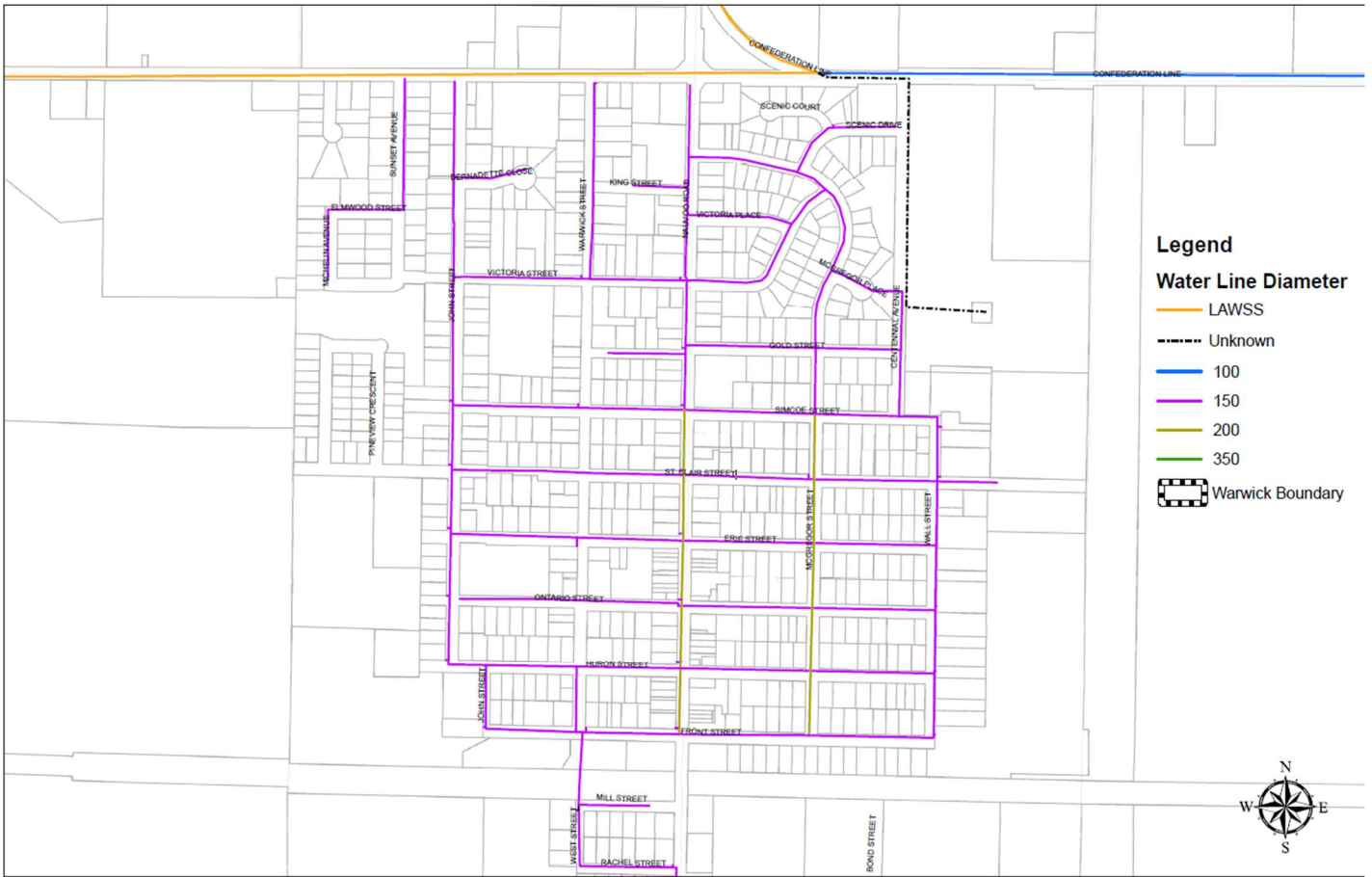


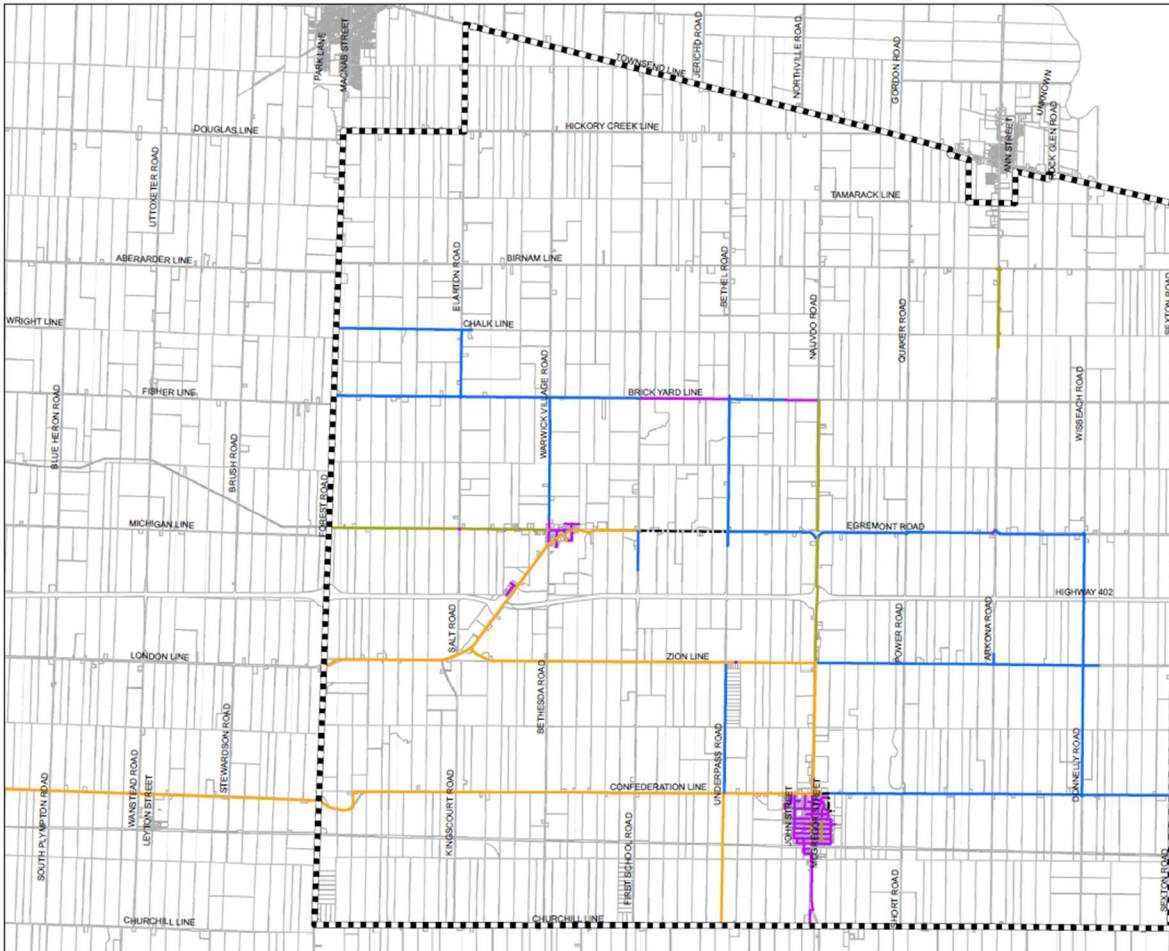
Bridge Condition Index

- Very Poor
- Poor
- Fair
- Good
- Very Good



Water Infrastructure

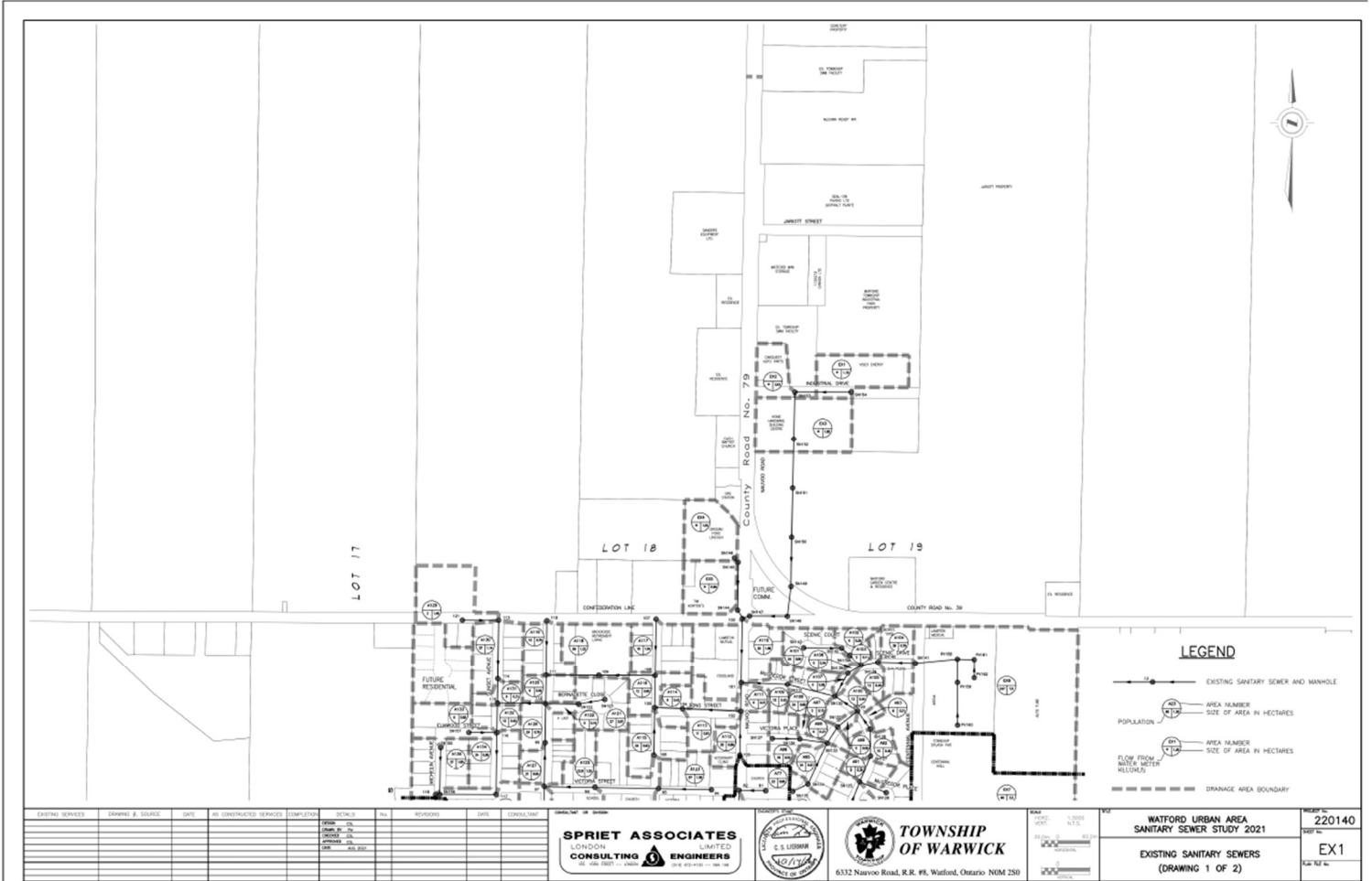


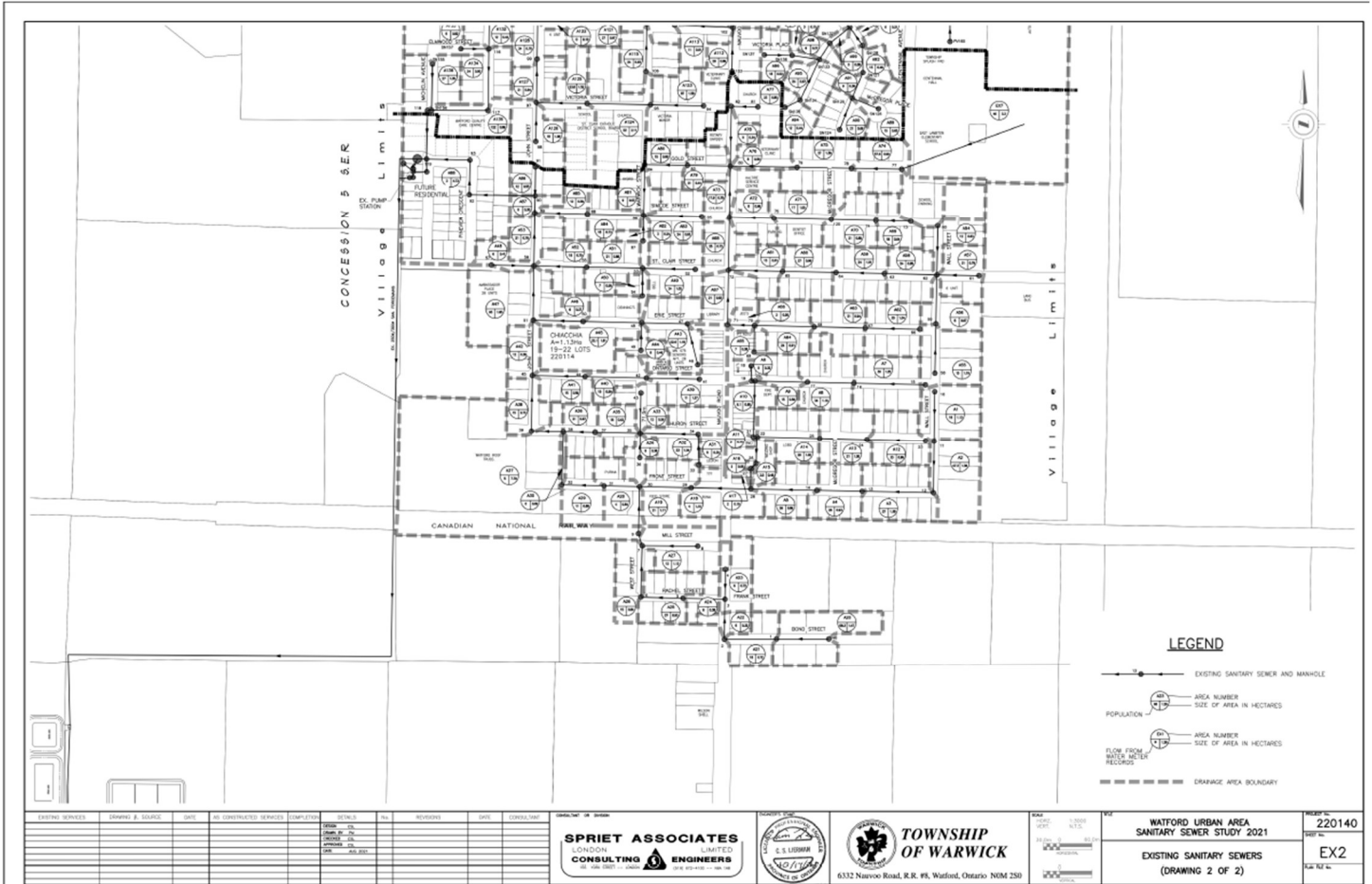


- Legend**
- Water Line Diameter**
- LAWSS
 - - - - Unknown
 - 100
 - 150
 - 200
 - 350
 - ▬▬▬▬ Warwick Boundary



Sanitary Sewers





EXISTING SERVICES	DRAWING & SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETED	DETAILS	NO.	REVISIONS	DATE	CONSULTANT

SPRIET ASSOCIATES
LONDON
CONSULTING ENGINEERS



TOWNSHIP OF WARWICK
6332 Navroo Road, R.R. #1, Watford, Ontario N1M 2S0



**WATFORD URBAN AREA
SANITARY SEWER STUDY 2021**
EXISTING SANITARY SEWERS
(DRAWING 2 OF 2)

PROJECT NO. 220140
DRAWING NO. EX2
SCALE 1:1000

*

Appendix C
Risk-Based Prioritization

High Priority Projects/Replacements Based on Risk Assessment Results

Asset Class	Project Name	Project/ Replacement Cost
Roads - Gravel	Signage improvements and culvert marker installations to address safety items	\$ 15,750
	Bethel Road from Highway 402 to Egremont (1,300 meters)	\$ 175,000
	Elarton Road from Highway 402 to Egremont (1,360 meters)	\$ 140,000
	Hickory Creek Line from Nauvoo to Townsend (1,320 meters)	\$ 149,100
	Salt Road from London Line to Highway 402 (1,150 meters)	\$ 168,000
Roads - Paved	Overlay, crack sealing and various other safety-related repairs	\$ 555,300
	Zion Line from London Line to end of 50km/hr zone (1,300 meters)	\$ 112,900
	Mill Street from west limit to end (111 meters)	\$ 32,500
Bridges & Culverts	Install steel beam guiderails, end markers, signs and delineators	\$ 528,500
	Replace Structure #4 (warwick Village Road)	\$ 285,000
	Replace Structure #46 (Zion Line)	\$ 420,000
	Replace Structure #57 (Kingscourt Road)	\$ 150,000
	Replace Structure #59 (Bethesda Road)	\$ 140,000
	Rehabilitate Structure #1 (Hickory Creek Line)	\$ 175,500
	Rehabilitate Structure #40 (Bethesda Road)	\$ 79,500
	Rehabilitate Structure #53 (First School Road)	\$ 68,500
Water	Replace aged hydrants and hydrant leads	\$ 518,691
	Replace aged watermains	\$ 2,882,927
Wastewater	Replace aged wastewater manholes	\$ 1,257,300
Stormwater	Replace aged stormwater mains and manholes	\$ 4,042,752
Buildings	Various repairs to high consequence buildings - refer to Building Condition Assessment Reports	\$ 615,000
Fleet	Replace fire rescue vans	\$ 1,400,000
	Replace aged vehicles (2007 Volvo, 2011 Silverado, 2010 Volvo, 2011 Freightliner, 2014 Ford, Fire Department Pumper/Tankers))	\$ 3,429,200
Machinery & Equipment	Replace aged Watford and Warwick Fire Department Equipment	\$ 223,161
	Replace aged Roads Equipment	\$ 49,682

Appendix D
10-Year Financial Forecast

Tax Supported Funding Analysis

Asset Class	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
Paved Roads	\$ 564,260	\$ 564,260	\$ 564,260	\$ 564,260	\$ 564,260	\$ 274,860	\$ 274,860	\$ 274,860	\$ 274,860	\$ 274,860	\$ 4,195,600
Gravel Roads	\$ 565,200	\$ 401,400	\$ 430,600	\$ 455,400	\$ 481,100	\$ 469,200	\$ 467,150	\$ 467,150	\$ 467,150	\$ 467,150	\$ 4,671,500
Sidewalks/Streetlights/Signs/Culverts	\$ 1,563,028	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 104,544	\$ 322,542	\$ -	\$ 8,910	\$ 1,999,024
Roads (sub-total)	\$ 2,692,488	\$ 965,660	\$ 994,860	\$ 1,019,660	\$ 1,045,360	\$ 744,060	\$ 846,554	\$ 1,064,552	\$ 742,010	\$ 750,920	\$10,866,124
Bridges and culverts	\$ 505,700	\$ 510,000	\$ 547,000	\$ 336,400	\$ 148,500	\$ 265,900	\$ 265,900	\$ 265,900	\$ 265,900	\$ 265,900	\$ 3,377,100
Stormwater	\$ 1,248,782	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 1,271,282
Buildings	\$ 1,240,700	\$ 360,500	\$ 766,500	\$ 422,712	\$ 2,425,500	\$ 1,144,042	\$ 299,874	\$ 936,000	\$ 519,500	\$ 159,500	\$ 8,274,828
Land improvements	\$ 2,256,573	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 253,976	\$ -	\$ -	\$ 2,510,549
Fleet	\$ 2,535,200	\$ 594,000	\$ 1,700,000	\$ 224,400	\$ 442,200	\$ 382,800	\$ -	\$ -	\$ 198,000	\$ -	\$ 6,076,600
Machinery & Equipment	\$ 332,376	\$ 78,817	\$ 154,202	\$ 35,765	\$ 22,497	\$ 100,897	\$ 46,200	\$ 34,917	\$ -	\$ 41,381	\$ 847,052
Total Funding Requirement	\$10,811,819	\$ 2,511,477	\$ 4,165,062	\$ 2,041,437	\$ 4,086,557	\$ 2,640,199	\$ 1,461,028	\$ 2,557,845	\$ 1,727,910	\$ 1,220,201	\$33,223,535
Funding Available	\$ 2,200,000	\$ 2,200,000	\$ 2,650,000	\$ 2,650,000	\$ 2,650,000	\$ 3,450,000	\$ 3,450,000	\$ 3,450,000	\$ 3,450,000	\$ 3,450,000	\$29,600,000
Tax Funding Gap	\$ 8,611,819	\$ 311,477	\$ 1,515,062	-\$ 608,563	\$ 1,436,557	-\$ 809,801	-\$ 1,988,972	-\$ 892,155	-\$ 1,722,090	-\$ 2,229,799	\$ 3,623,535

Average Annual Tax Funding Gap: \$ 362,353

Rate Supported Funding Analysis

Asset Class	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
Water - Replacement	\$ -	\$ 69,300	\$ 247,500	\$ -	\$ 220,909	\$ 2,832,447	\$ -	\$ -	\$ -	\$ 29,700	\$ 3,399,856
Water - Repair & Rehab	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 45,000	\$ 450,000
Total Water Funding Requirement	\$ 45,000	\$ 114,300	\$ 292,500	\$ 45,000	\$ 265,909	\$ 2,877,447	\$ 45,000	\$ 45,000	\$ 45,000	\$ 74,700	\$ 3,849,856
Water Rate Revenue	\$ 957,211	\$ 1,005,072	\$ 1,055,325	\$ 1,108,092	\$ 1,163,496	\$ 1,221,671	\$ 1,282,755	\$ 1,346,893	\$ 1,414,237	\$ 1,484,949	\$ 12,039,701
Water Misc. Revenue	\$ 58,450	\$ 58,450	\$ 58,450	\$ 58,450	\$ 58,450	\$ 58,450	\$ 58,450	\$ 58,450	\$ 58,450	\$ 58,450	\$ 584,500
Transfer to Water Operations	\$ 520,661	\$ 546,694	\$ 574,029	\$ 602,730	\$ 632,867	\$ 664,510	\$ 697,736	\$ 732,622	\$ 769,253	\$ 807,716	\$ 6,548,818
Total Water Revenue	\$ 495,000	\$ 516,828	\$ 539,746	\$ 563,812	\$ 589,079	\$ 615,611	\$ 643,469	\$ 672,720	\$ 703,434	\$ 735,683	\$ 6,075,383
Water Funding Gap (Surplus)	-\$ 450,000	-\$ 402,528	-\$ 247,246	-\$ 518,812	-\$ 323,170	\$ 2,261,836	-\$ 598,469	-\$ 627,720	-\$ 658,434	-\$ 660,983	-\$ 2,225,527
Wastewater - Replacement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 59,400	\$ -	\$ -	\$ 7,080	\$ 2,475	\$ 68,955
Wastewater - Repair & Rehab	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 920,000
Total Wastewater Funding Requirement	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 92,000	\$ 151,400	\$ 92,000	\$ 92,000	\$ 99,080	\$ 94,475	\$ 988,955
Wastewater Rate Revenue	\$ 465,843	\$ 489,135	\$ 513,592	\$ 539,271	\$ 566,235	\$ 594,547	\$ 624,274	\$ 655,488	\$ 688,262	\$ 722,675	\$ 5,859,322
Wastewater Misc. Revenue	\$ 51,475	\$ 51,475	\$ 51,475	\$ 51,475	\$ 51,475	\$ 51,475	\$ 51,475	\$ 51,475	\$ 51,475	\$ 51,475	\$ 514,750
Transfer to Wastewater Operations	\$ 392,890	\$ 412,535	\$ 433,161	\$ 454,819	\$ 477,560	\$ 501,438	\$ 526,510	\$ 552,836	\$ 580,477	\$ 609,501	\$ 4,941,728
Total Wastewater Revenue	\$ 124,428	\$ 128,076	\$ 131,906	\$ 135,927	\$ 140,150	\$ 144,584	\$ 149,239	\$ 154,127	\$ 159,260	\$ 164,649	\$ 1,432,344
Wastewater Funding Gap (Surplus)	-\$ 32,428	-\$ 36,076	-\$ 39,906	-\$ 43,927	-\$ 48,150	\$ 6,816	-\$ 57,239	-\$ 62,127	-\$ 60,180	-\$ 70,174	-\$ 443,389
Rate Funding Gap (Surplus)	-\$ 482,428	-\$ 438,603	-\$ 287,152	-\$ 562,739	-\$ 371,320	\$ 2,268,652	-\$ 655,708	-\$ 689,847	-\$ 718,614	-\$ 731,157	-\$ 2,668,916

Average Annual Rate Funding Gap (Surplus): **-\$ 266,892**