May 2020

The Asset Management Plan for the Township of East Zorra-Tavistock

PSD RESEARCH CONSULTING SOFTWARE

Key Statistics

$63.0 million Replacement cost of asset portfolio (Incl. Road Network, Bridges & Culverts, Stormwater Network)	**$1.6 million** Annual capital requirement
2.53% Target average annual infrastructure reinvestment rate	**2.10%** Actual average annual infrastructure reinvestment rate
88% Percentage of assets in fair or better condition	**60%** Percentage of assets with assessed condition
39% Portion of total infrastructure funding that comes from the Gas Tax	**$198,000** Projected annual cost avoidance for roads through proactive lifecycle management
83% Percentage of annual infrastructure funding needs currently being met	**10 years** Recommended timeframe for eliminating annual infrastructure deficit

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Executive Summary

Municipal infrastructure provides the foundation for the economic, social and environmental health and growth of a community through the delivery of services. The goal of asset management is to deliver an adequate level of service in the most cost-effective manner. This involves the development and implementation of asset management strategies and long-term financial planning.

All municipalities in Ontario are required to complete an asset management plan (AMP) in accordance with Ontario Regulation 588/17 (O. Reg. 588/17). This AMP outlines the current state of asset management planning in the Township of East Zorra-Tavistock. It identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Township can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP includes the following asset categories:

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Storm Water Network	

The overall replacement cost of the asset categories included in this AMP totals $63 million. 88% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 60% of assets. For the remaining 35% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP has used a combination of proactive lifecycle strategies (roads, bridges & culverts) and replacement only strategies (storm network) to determine the lowest cost option to maintain the current level of service.

To meet capital replacement and rehabilitation needs for existing infrastructure and achieve long-term sustainability, the Township's average annual capital requirement totals $1.59 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $1.32 million towards capital projects per year from sustainable revenue sources. As a result, there is currently an annual funding gap of $270,000.

A financial strategy was developed to address the annual capital funding gap. The following table identifies the total and average annual tax/rate change required to eliminate the Township's infrastructure deficit:

Funding Source	Years Until Full Funding	Total Tax/Rate Change	Average Annual Tax/Rate Change
Tax-Funded Assets	10 Years	2.2%	0.2%

With the development of this AMP the Township has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2021. By July 1, 2023 the AMP must include all non-core asset categories (machinery & equipment, vehicles, buildings & facilities etc.). Additional requirements concerning proposed levels of service and growth that must be met by July 1, 2024.

This AMP represents a snapshot in time and is based on the best available processes, data, and information at the Township. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources. Several recommendations have been developed to guide the continuous refinement of the Township's asset management program. These include:

a) asset inventory data review and validation
b) the formalization of condition assessment strategies
c) the implementation of risk-based decision-making as part of asset management planning and budgeting
d) the continuous review, development and implementation of optimal lifecycle management strategies
e) the identification of proposed levels of service

The evaluation of the above items and further development of a data-driven, best-practice approach to asset management is recommended to ensure the Township is providing optimal value through its management of infrastructure and delivery of services.

AM Program Recommendations

The following table provides a summarized list of recommendations to further the development of the Township's asset management program. A more detailed description of each recommendation can be found within the appropriate Asset Category in **Section 4** of the AMP.

Asset Category	Recommendation Category	Recommendation
Road Network	Asset Inventory/Data Refinement	Verify Inventory Data
		Document Completed Lifecycle Activities
	Condition Assessment Strategies	Complete a Network-Wide Assessment
		Develop a Condition Assessment Program
	Lifecycle Management Strategies	Use Condition Data to Determine Strategy
		Update Lifecycle Strategy
		Review Capital Requirements Annually
	Levels of Service	Identify Additional LOS Metrics
		Measure LOS Annually
		Identify Proposed LOS
Bridges & Culverts	Asset Inventory/Data Refinement	Asset Inventory Validation
		Update Replacement Costs (Unit Costs)
	Risk Management Strategies	Review High Risk Assets
	Levels of Service	Identify Additional LOS Metrics
		Measure LOS Annually
		Identify Proposed LOS
Storm Water Network	Asset Inventory/Data Refinement	Create Asset Naming Conventions
		Close Attribute Data Gaps
		Cross-reference with GIS
	Condition Assessment Strategies	Complete Network-Wide Assessments
	Levels of Service	Identify Additional LOS Metrics
		Measure LOS Annually
		Identify Proposed LOS

Asset management is an ongoing practice that requires dedicated time and resources across all departments. The above recommendations include many key activities designed to enhance the accuracy and reliability of asset management planning.

However, it is far from a comprehensive list of all activities required to manage a municipal asset management program. Timelines, resources and effort for the above recommendations and all regular asset management activities should be reviewed regularly. Roles and responsibilities should be clearly defined and delegated to assigned resources to ensure that the Township's asset management program is progressing towards its strategic goals and objectives.

1 Introduction & Context

Key Insights

- The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio

- The Township's asset management policy provides clear direction to staff on their roles and responsibilities regarding asset management

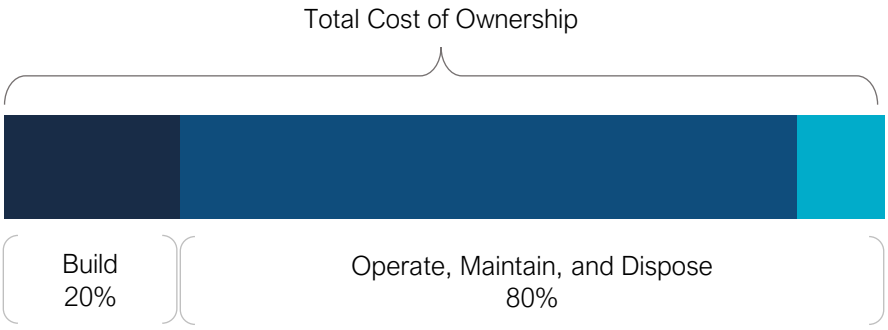
- An asset management plan is a living document that should be updated regularly to inform long-term planning

- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2021 and 2024

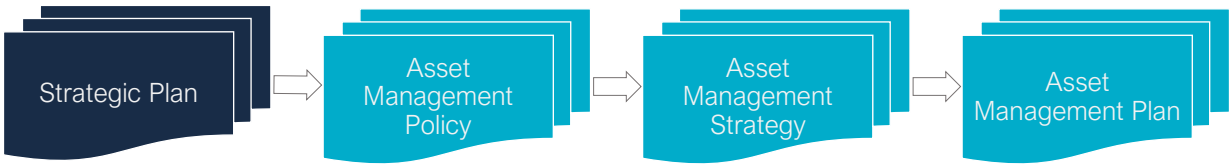
1.1 An Overview of Asset Management

Municipalities are responsible for managing and maintaining a broad portfolio of infrastructure assets to deliver services to the community. The intent of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value ratepayers receive from the asset portfolio.

The acquisition of capital assets accounts for only 10-20% of their total cost of ownership. The remaining 80-90% comes from operations and maintenance. This AMP focuses its analysis on the capital costs to maintain, rehabilitate and replace existing municipal infrastructure assets.



These costs can span decades, requiring planning and foresight to ensure financial responsibility is spread equitably across generations. An asset management plan is critical to this planning, and an essential element of broader asset management program. The diagram below depicts an industry-standard approach and sequence to developing a practical asset management program.



The diagram, adopted from the Institute of Asset Management (IAM), illustrates the concept of 'line of sight', or alignment between the corporate strategic plan and various asset management documents. The strategic plan has a direct, and cascading impact on asset management planning and reporting.

1.1.1 Asset Management Policy

An asset management policy represents a statement of the principles guiding the municipality's approach to asset management activities. It aligns with the organizational strategic plan and provides clear direction to municipal staff on their roles and responsibilities as part of the asset management program.

The Township and adopted an asset management policy on June 13, 2019 through Report #CAO2019-05. Staff worked collaboratively with PSD and are satisfied that the policy reflects a broad-based approach to Asset Management that East-Zorra Tavistock can embrace and take forward.

1.1.2 Asset Management Strategy

An asset management strategy outlines the translation of organizational objectives into asset management objectives and provides a strategic overview of the activities required to meet these objectives. It provides greater detail than the policy on how the municipality plans to achieve asset management objectives through planned activities and decision-making criteria.

The Township's Asset Management Policy contains many of the key components of an asset management strategy and may be expanded on in future revisions or as part of a separate strategic document.

1.1.3 Asset Management Plan

The asset management plan (AMP) presents the outcomes of the municipality's asset management program and identifies the resource requirements needed to achieve a defined level of service. The AMP typically includes the following content:

- State of Infrastructure
- Asset Management Strategies
- Levels of Service
- Financial Strategies

The AMP is a living document that should be updated regularly as additional asset and financial data becomes available. This will allow the municipality to re-evaluate the state of infrastructure and identify how the organization's asset management and financial strategies are progressing.

1.2 Key Concepts in Asset Management

Effective asset management integrates several key components, including lifecycle management, risk management, and levels of service. These concepts are applied throughout this asset management plan and are described below in greater detail.

1.2.1 Lifecycle Management Strategies

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. Asset deterioration has a negative effect on the ability of an asset to fulfill its intended function, and may be characterized by increased cost, risk and even service disruption.

To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation and replacement. The following table provides a description of each type of activity and the general difference in cost.

Lifecycle Activity	Description	Example (Roads)	Cost
Maintenance	Activities that prevent defects or deteriorations from occurring	Crack Seal	$
Rehabilitation/ Renewal	Activities that rectify defects or deficiencies that are already present and may be affecting asset performance	Mill & Re-surface	$$
Replacement/ Reconstruction	Asset end-of-life activities that often involve the complete replacement of assets	Full Reconstruction	$$$

Depending on initial lifecycle management strategies, asset performance can be sustained through a combination of maintenance and rehabilitation, but at some point, replacement is required. Understanding what effect these activities will have on the lifecycle of an asset, and their cost, will enable staff to make better recommendations.

The Township's approach to lifecycle management is described within each asset category outlined in this AMP. Developing and implementing a proactive lifecycle strategy will help staff to determine which activities to perform on an asset and when they should be performed to maximize useful life at the lowest total cost of ownership.

1.2.2 Risk Management Strategies

Municipalities generally take a 'worst-first' approach to infrastructure spending. Rather than prioritizing assets based on their importance to service delivery, assets in the worst condition are fixed first, regardless of their criticality. However, not all assets are created equal. Some are more important than others, and their failure or disrepair poses more risk to the community than that of others. For example, a road with a high volume of traffic that provides access to critical services poses a higher risk than a low volume rural road. These high-value assets should receive funding before others.

By identifying the various impacts of asset failure and the likelihood that it will fail, risk management strategies can identify critical assets, and determine where maintenance efforts, and spending, should be focused.

This AMP includes a high-level evaluation of asset risk and criticality. Each asset has been assigned a probability of failure score and consequence of failure score based on available asset data. These risk scores can be used to prioritize maintenance, rehabilitation and replacement strategies for critical assets.

1.2.3 Levels of Service

A level of service (LOS) is a measure of what the Township is providing to the community and the nature and quality of that service. Within each asset category in this AMP, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured as data is available.

These measures include a combination of those that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the Township as worth measuring and evaluating. The Township measures the level of service provided at two levels: Community Levels of Service, and Technical Levels of Service.

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For non-core asset categories, the Township has determined the qualitative descriptions that will be used to determine the community level of service provided. These descriptions can be found in the Levels of Service subsection within each asset category.

Technical Levels of Service

Technical levels of service are a measure of key technical attributes of the service being provided to the community. These include mostly quantitative measures and tend to reflect the impact of the municipality's asset management strategies on the physical condition of assets or the quality/capacity of the services they provide.

For core asset categories (Roads, Bridges & Culverts, Stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP. For non-core asset categories, the Township has determined the technical metrics that will be used to determine the technical level of service provided. These metrics can be found in the Levels of Service subsection within each asset category.

Current and Proposed Levels of Service

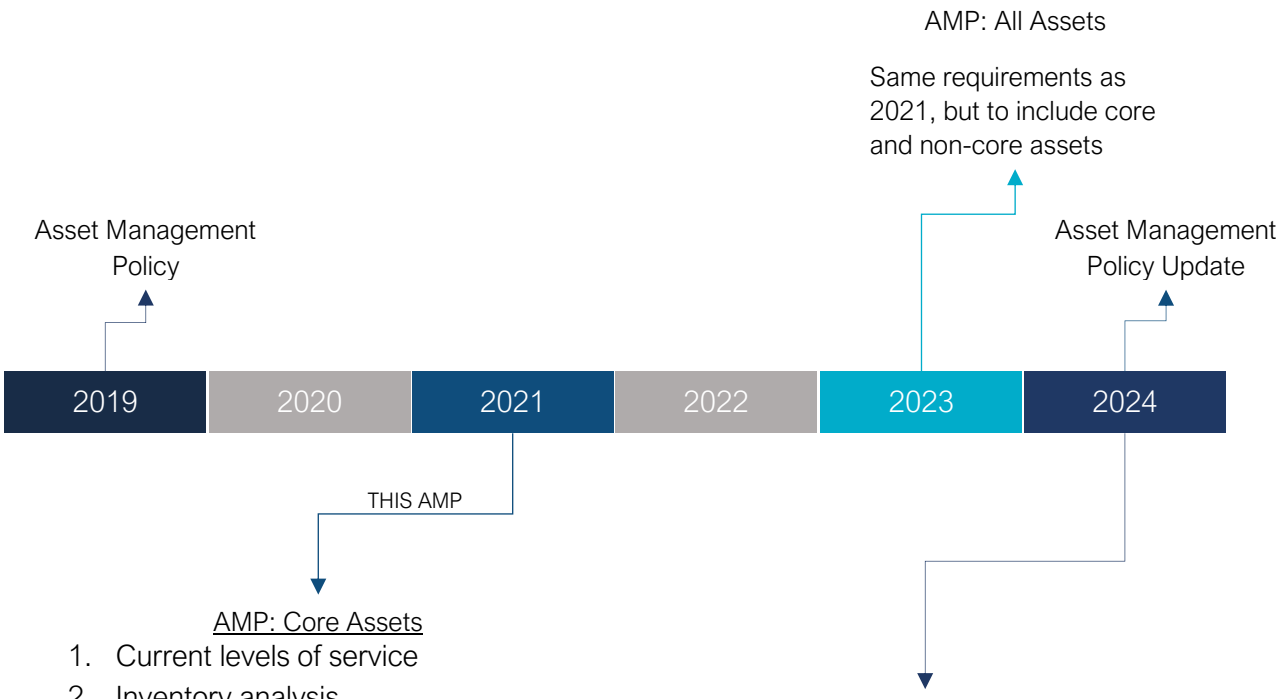
This AMP focuses on measuring the current level of service provided to the community. Once current levels of service have been measured, the Township plans to establish proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Township. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability. Once proposed levels of service have been established, and prior to July 2024, the Township must identify a lifecycle management and financial strategy which allows these targets to be achieved.

1.3 Ontario Regulation 588/17

As part of the *Infrastructure for Jobs and Prosperity Act, 2015*, the Ontario government introduced Regulation 588/17 - Asset Management Planning for Municipal Infrastructure (O. Reg 588/17). Along with creating better performing organizations, more liveable and sustainable communities, the regulation is a key, mandated driver of asset management planning and reporting. It places substantial emphasis on current and proposed levels of service and the lifecycle costs incurred in delivering them.

The diagram below outlines key reporting requirements under O. Reg 588/17 and the associated timelines.



AMP: Core Assets

1. Current levels of service
2. Inventory analysis
3. Lifecycle activities to sustain LOS
4. Cost of lifecycle activities
5. Population and employment forecasts
6. Discussion of growth impacts

AMP: All Assets

1. Proposed levels of service for next 10 years
2. Updated inventory analysis
3. Lifecycle management strategy
4. Financial strategy and addressing shortfalls
5. Discussion of how growth assumptions impacted lifecycle and financial strategy

1.3.1 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2021. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Requirement	O. Reg. Section	AMP Section Reference	Status
Summary of assets in each category	S.5(2), 3(i)	4.1.1 – 4.3.1	Complete
Replacement cost of assets in each category	S.5(2), 3(ii)	4.1.1 – 4.3.1	Complete
Average age of assets in each category	S.5(2), 3(iii)	4.3.3 – 4.3.3	Complete
Condition of core assets in each category	S.5(2), 3(iv)	4.1.2 – 4.3.2	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2), 3(v)	4.1.2 – 4.3.2	Complete
Current levels of service in each category	S.5(2), 1(i-ii)	4.1.6 – 4.3.6	Complete
Current performance measures in each category	S.5(2), 2	4.1.6 – 4.3.6	Complete
Lifecycle activities needed to maintain current levels of service for 10 years	S.5(2), 4	4.1.4 – 4.3.4	Complete
Costs of providing lifecycle activities for 10 years	S.5(2), 4	Appendix A	Complete
Growth assumptions	S.5(2), 5(i-ii) S.5(2), 6(i-vi)	Section 5	Complete

2 Scope and Methodology

Key Insights

- This asset management plan includes 3 asset categories
- The source and recency of replacement costs impacts the accuracy and reliability of asset portfolio valuation
- Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life

2.1 Assets categories included in this AMP

This asset management plan for the Township of East Zorra-Tavistock is produced in compliance with Ontario Regulation 588/17. The July 2021 deadline under the regulation—the first of three AMPs—requires analysis of only core assets (Roads, Bridges & Culverts, and Stormwater). Oxford County is responsible for providing Water and Wastewater services.

The AMP summarizes the state of the infrastructure for the Township's asset portfolio, establishes current levels of service and the associated technical and customer oriented key performance indicators (KPIs), outlines lifecycle strategies for optimal asset management and performance, and provides financial strategies to reach sustainability for the asset categories listed below.

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Storm Water Network	

2.2 Deriving Replacement Costs

There are a range of methods to determine the replacement cost of an asset, and some are more accurate and reliable than others. This AMP relies on two methodologies:

- User-Defined Cost and Cost/Unit: Based on costs provided by municipal staff which could include average costs from recent contracts; data from engineering reports and assessments; staff estimates based on knowledge and experience
- Cost Inflation/CPI Tables: Historical cost of the asset is inflated based on Consumer Price Index or Non-Residential Building Construction Price Index

User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs. Cost inflation is typically used in the absence of reliable replacement cost data. It is a reliable method for recently purchased and/or constructed assets where the total cost is reflective of the actual costs that the Township incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

2.3 Estimated Useful Life and Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the Township expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset in this AMP was assigned according to the knowledge and expertise of municipal staff and supplemented by existing industry standards when necessary.

By using an asset's in-service data and its EUL, the Township can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the Township can more accurately forecast when it will require replacement. The SLR is calculated as follows:

$$Service\ Life\ Remaining\ (SLR) = In\ Service\ Date + Estimated\ Useful\ Life (EUL) - Current\ Year$$

2.4 Reinvestment Rate

As assets age and deteriorate they require additional investment to maintain a state of good repair. The reinvestment of capital funds, through asset renewal or replacement, is necessary to sustain an adequate level of service. The reinvestment rate is a measurement of available or required funding relative to the total replacement cost.

By comparing the actual vs. target reinvestment rate the Township can determine the extent of any existing funding gap. The reinvestment rate is calculated as follows:

$$Target\ Reinvestment\ Rate = \frac{Annual\ Capital\ Requirement}{Total\ Replacement\ Cost}$$

$$Actual\ Reinvestment\ Rate = \frac{Annual\ Capital\ Funding}{Total\ Replacement\ Cost}$$

2.5 Deriving Asset Condition

An incomplete or limited understanding of asset condition can mislead long-term planning and decision-making. Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life.

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the Township's asset portfolio. The table below outlines the condition rating system used in this AMP to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. When assessed condition data is not available, service life remaining is used to approximate asset condition.

Condition	Description	Criteria	Service Life Remaining (%)
Very Good	Fit for the future	Well maintained, good condition, new or recently rehabilitated	80-100
Good	Adequate for now	Acceptable, generally approaching mid-stage of expected service life	60-80
Fair	Requires attention	Signs of deterioration, some elements exhibit significant deficiencies	40-60
Poor	Increasing potential of affecting service	Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration	20-40
Very Poor	Unfit for sustained service	Near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable	0-20

The analysis in this AMP is based on assessed condition data only as available. In the absence of assessed condition data, asset age is used as a proxy to determine asset condition. Appendix D includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

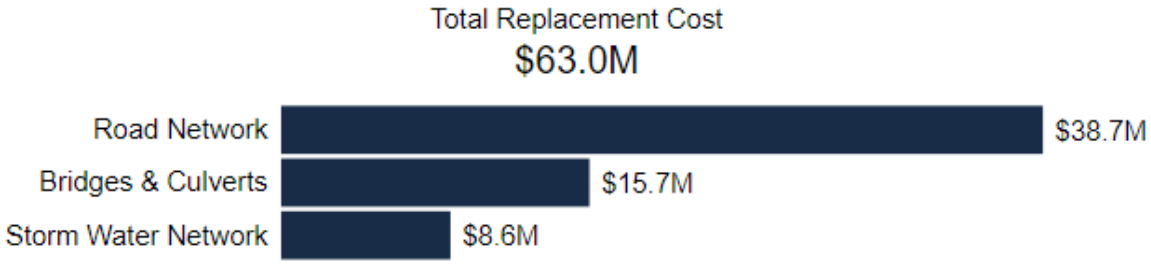
3 Portfolio Overview

Key Insights

- The total replacement cost of the Township's core asset portfolio is $63 million
- The Township's target re-investment rate is 2.53%, and the actual re-investment rate is 2.10%, contributing to an expanding infrastructure deficit
- 88% of all assets are in fair or better condition
- Average annual capital requirements total $1.6 million per year across all asset categories included in this AMP

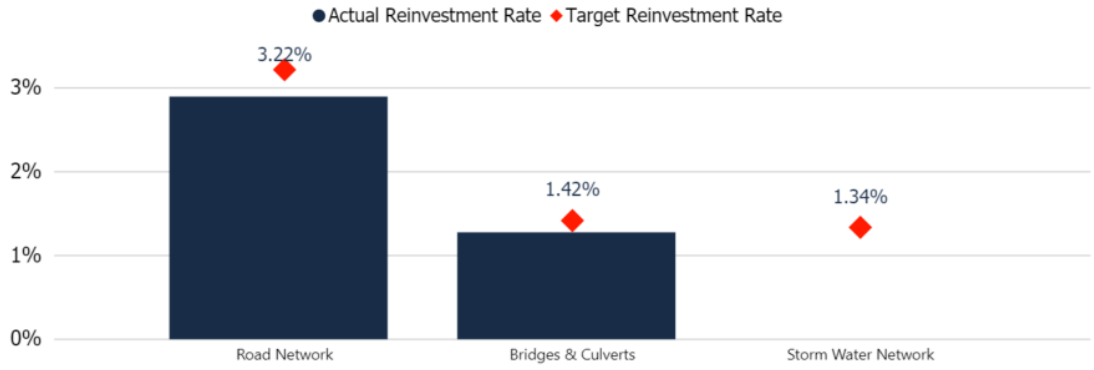
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $63 million. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of assets with a new modern equivalent.



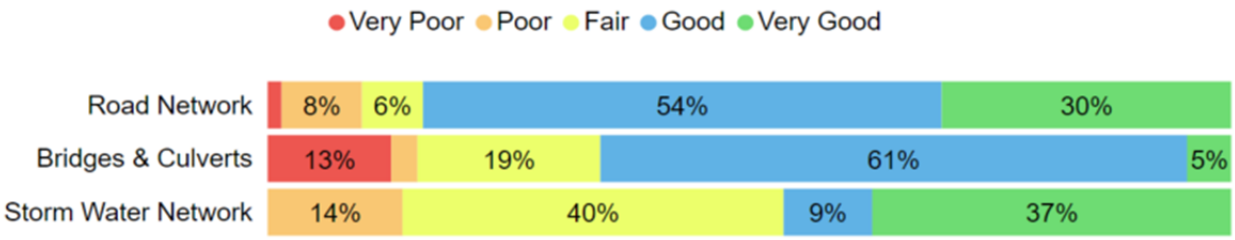
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately $1.6 million annually, for a target reinvestment rate of 2.53%. Actual annual spending on infrastructure from sustainable revenue sources totals approximately $1.3 million, for an actual reinvestment rate of 2.10%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 88% of assets in East Zorra-Tavistock are in fair or better condition. This estimate relies on both age-based and field condition data.

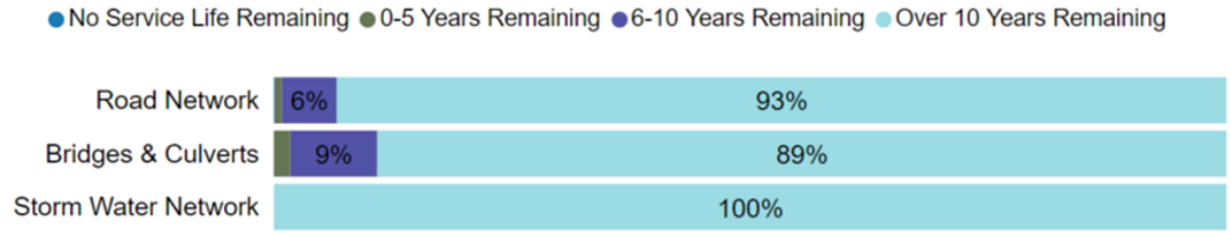


This AMP relies on assessed condition data for 60% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Paved Roads	56%	2014 Public Works Assessments
	Road Culverts	94%	2008 Assessments
Bridges & Culverts	Bridges	98%	2017 OSIM Report
	Structural Culverts	98%	2017 OSIM Report
Storm Water Network	All	27%	Previous Staff Assessments

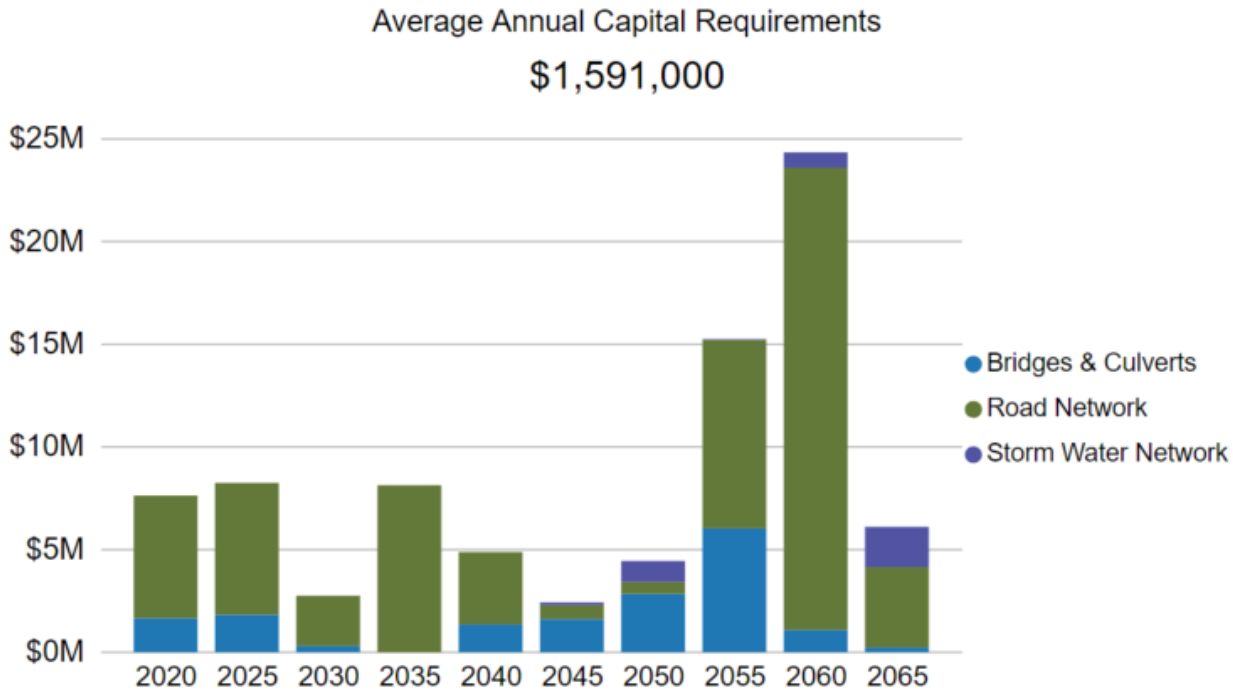
3.4 Service Life Remaining

The following visual depicts the Service Life Remaining across each asset category. Capital requirements over the next 10 years are identified in Appendix A.



3.5 Forecasted Capital Requirements

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Township can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 50 years.



4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $63 million
- 88% of tax-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for tax-funded assets is approximately $1.6 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

4.1 Road Network

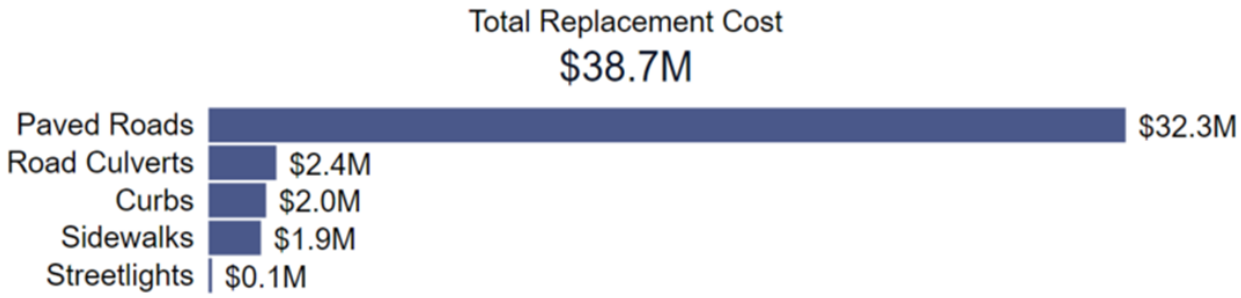
The Road Network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Township's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including sidewalks, road culverts and streetlights.

The Public Works Department is responsible for all Township roads. Staff strive to keep the roadways in good repair to ensure the safety of residents and the travelling public. Level of service objectives for the Township Roads & Public Works Department have been documented in By-law # 2004-18 and all subsequent amendments.

4.1.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Road Network inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Paved Roads	77,774 Length (m)	Cost/Unit	$32,270,633
Road Culverts	12,932 Length (m)	CPI Tables	$2,396,685
Sidewalks	23,173 Length (m)	Cost/Unit	$1,853,800
Streetlights	482 Quantity	Cost/Unit	$128,800[1]
Curbs	27,132 Length (m)	Cost/Unit	$2,034,906
Gravel Roads	157,007 Length (m)	Not Planned for Replacement	
			$38,684,824

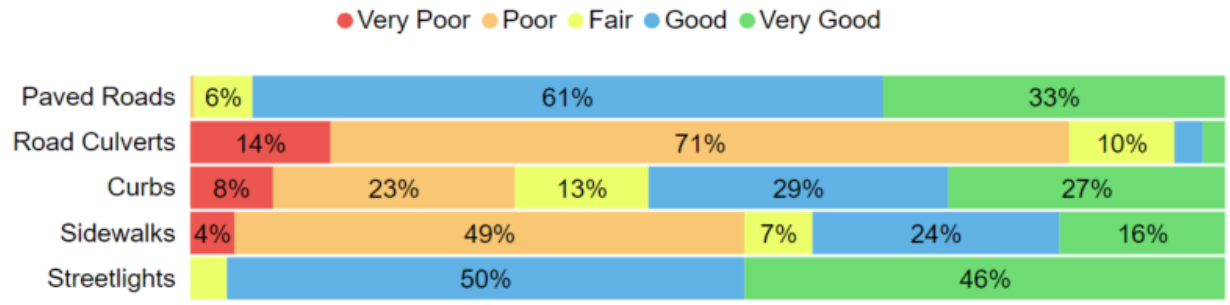


[1] The quantity of streetlights has been recently reviewed and the total has increased. Replacement costs are currently under review and are expected to increase in the next iteration of the Township's AMP.

4.1.2 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Paved Roads	78%	Good	56% Assessed
Road Culverts	35%	Poor	94% Assessed
Sidewalks	57%	Fair	Age-based
Streetlights	87%	Very Good	Age-based
Curbs	67%	Good	Age-based
	74%	**Good**	**52% Assessed**



Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

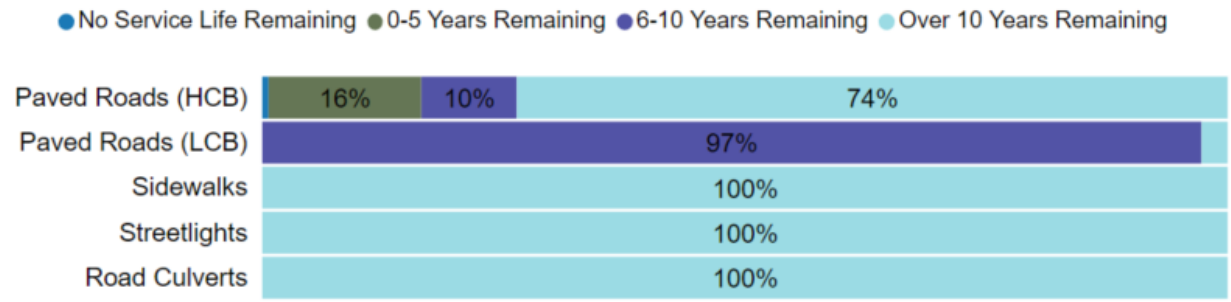
- Staff regularly monitor the condition of municipal roads through visual inspections and informal condition assessment methods
- A Road Needs Study, completed by an external assessor, is on the radar of municipal staff who are planning to have one completed every 5 years

4.1.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Road Network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Paved Roads	25 years	14.6	16.8
Road Culverts	20-100 years	22.3	16.3
Sidewalks	25-50 years	25.7	23.5
Streetlights	20 years	3.8	16.2
Curbs	20-50 years	18.7	30.3
		21.5	**13.2**



Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.4 Lifecycle Management Strategy

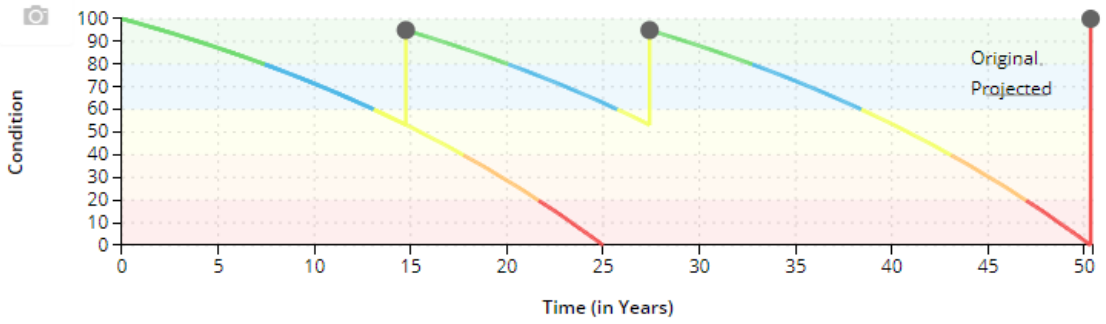
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

The following table outlines the Township's current lifecycle management strategy:

Activity Type	Description of Current Strategy
Opertations & Maintenance	• O&M activities are identified based on data from regular road patrols • **Paved Roads**: crack sealing, fibre-mat surface treatments, pothole patching, shouldering • **Gravel Roads:** re-gravelling (50% of network per year) and dust control
Renewal & Rehabilitation	• Road rehabilitation strategies are based on the results of road patrols and the identification of the deficiencies and/or the condition of each road • Mill & Pave is the primary rehabilitation method used for roads
Replacement	• Capital planning horizon includes 10 year projections with 5-years of named road projects • Staff work with the County to coordinate projects where water/wastewater work is required

The following lifecycle strategy has been developed as a proactive approach to managing the lifecycle of paved roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost.

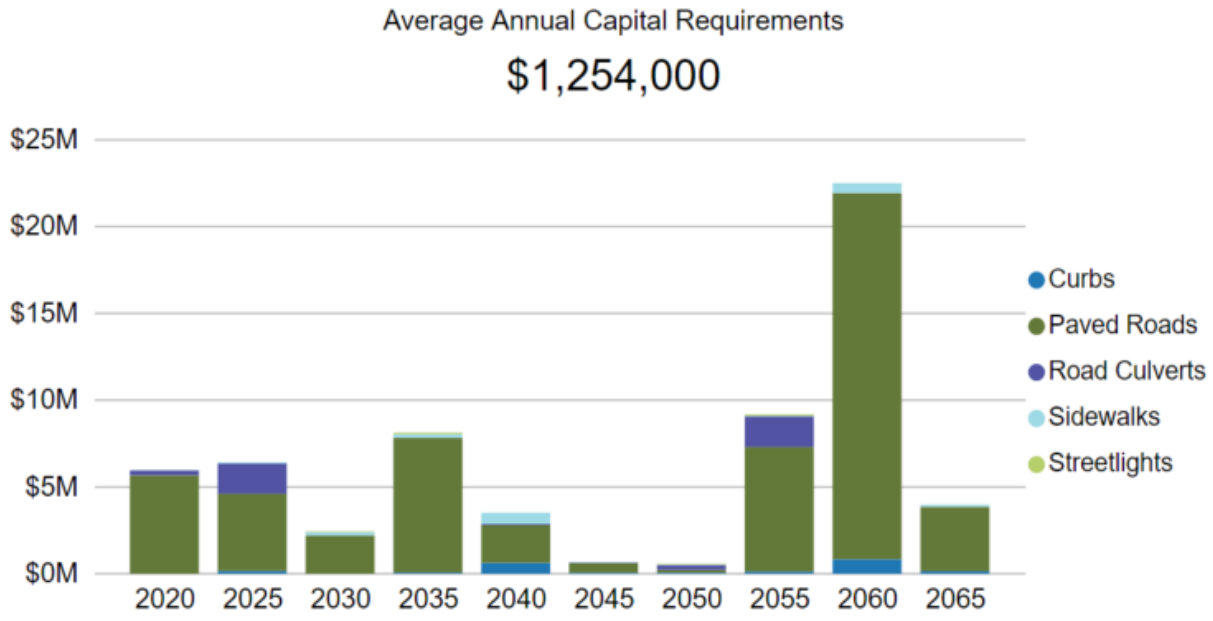
Paved Roads		
Event Name	Event Class	Event Trigger
Surface Treatment	Rehabilitation	~15 Years
Mill & Pave	Rehabilitation	~27 Years
Full Reconstruction	Replacement	~50 Years



Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for paved roads, and assuming the end-of-life replacement of all other assets in this category, the following graph forecasts capital requirements for the Road Network.

The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs to meet future capital needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for Paved Roads. See Appendix C for the criteria used to determine the risk rating of each asset.

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Paved Roads	Maria Street	12 - High
Paved Roads	Valleyfield Drive	12 - High
Paved Roads	Adam Street	12 - High
Paved Roads	William Street S	12 - High

4.1.6 Levels of Service

The following tables identify the Township's current level of service for the Road Network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected for this AMP.

Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by the Road Network.

Service Attribute	Qualitative Description	Current LOS (2018)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix B
Quality	Description or images that illustrate the different levels of road class pavement condition	See Appendix B

Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by the Road Network.

Service Attribute	Technical Metric	Current LOS (2018)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0.21
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	1.59
Quality	Average pavement condition index for paved roads in the municipality	78 - Good
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Good
Performance	Capital reinvestment rate	2.83%

4.1.7 Recommendations

Asset Inventory/Data Refinement

- Verify Inventory Data - Verify quantity and costs for Streetlights in the Township's asset inventory.
- Document Completed Lifecycle Activities - Ensure that completed asset rehabilitation and replacement activities are reflected in the asset inventory as completed (e.g. additions, disposals, condition assessments).

Condition Assessment Strategies

- Complete a Network-Wide Assessment - Paved roads were last assessed in 2014 and would benefit from a new network-wide survey of condition to inform both short-term operating plans and long-term capital plans.
- Develop a Condition Assessment Program - Develop a formal condition assessment program using a combination of external consultants and internal staff as appropriate.

Lifecycle Management Strategies

- Use Condition Data to Determine Strategy - Determining the optimal lifecycle strategy for each road first requires an updated condition assessment and analysis of pavement distresses that need to be addressed.
- Update Lifecycle Strategy - Update lifecycle strategies for paved roads as needed, according to staff's evolving understanding of EULs, deterioration rates, and the cost-effectiveness of various lifecycle activities.
- Review Capital Requirements Annually - Review average annual capital requirements regularly to ensure financial strategy aligns with project cost requirements.

Levels of Service

- Identify Additional LOS Metrics - Identify additional metrics beyond the requirements in O. Reg. 588/17 that measure the current level of service provided.
- Measure LOS Annually - Measure levels of service on an annual basis to allow for trend analysis and inform capital planning/budgeting activities.
- Identify Proposed LOS - Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

4.2 Bridges & Culverts

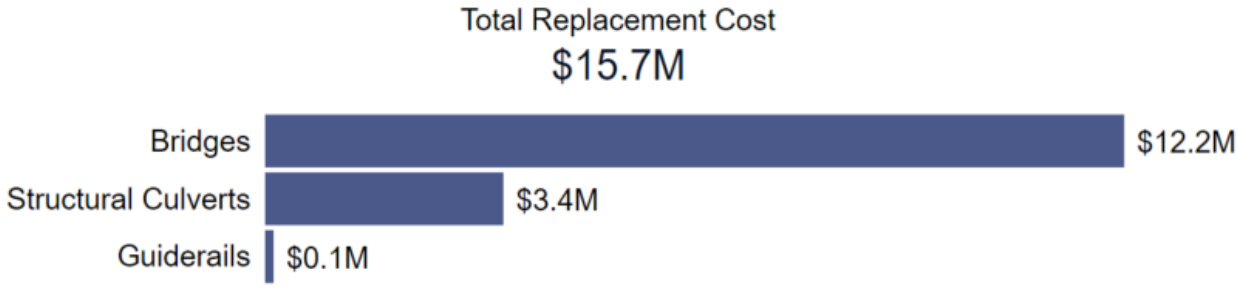
Bridges & Culverts represent a critical portion of the transportation services provided to the community. The Department of Public Works is responsible for the maintenance of all bridges and culverts located across municipal roads with the goal of keeping structures in an adequate state of repair and minimizing service disruptions. The major objectives for bridge maintenance are:

- To provide safety to the user through preventative maintenance
- To protect the investment in structures
- To extend the useful life span of the structure
- To maintain the aesthetic appearance of the municipality

4.2.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Bridges & Culverts inventory.

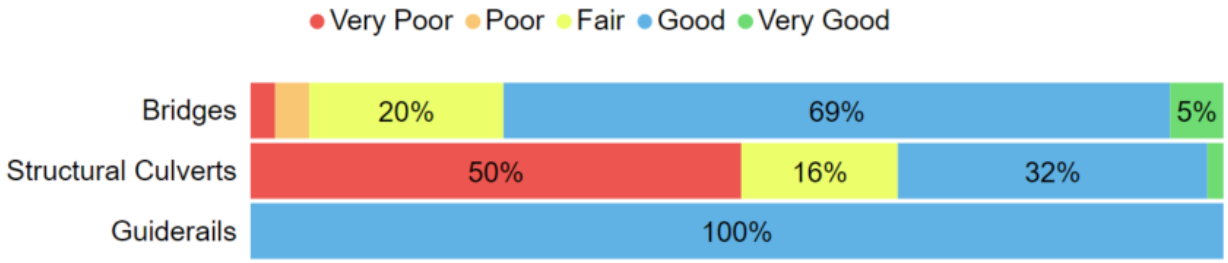
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	32	CPI Tables	$12,164,046
Guiderails	6	CPI Tables	$123,463
Structural Culverts	18	50% CPI Tables 50% User-Defined Cost	$3,376,055
			$15,663,564



4.2.2 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Bridges	75%	Good	98% Assessed
Guiderails	90%	Very Good	Age-based
Structural Culverts	57%	Fair	98% Assessed
	71%	**Good**	**97% Assessed**



To ensure that the Township's Bridges & Culverts continues to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation, and replacement activities is required to increase the overall condition of the Bridges & Culverts.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Condition assessments of all bridges and culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM)
- The OSIM Report provides a Bridge Condition Index (BCI) rating for each structure, recommended lifecycle activities and an updated replacement value

4.2.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Bridges & Culverts assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Bridges	75 years	43.2	55.4
Guiderails	40 years	4.1	35.9
Structural Culverts	100 years	41.5	63.9
		38.4	**56.1**

Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.2.4 Lifecycle Management Strategy

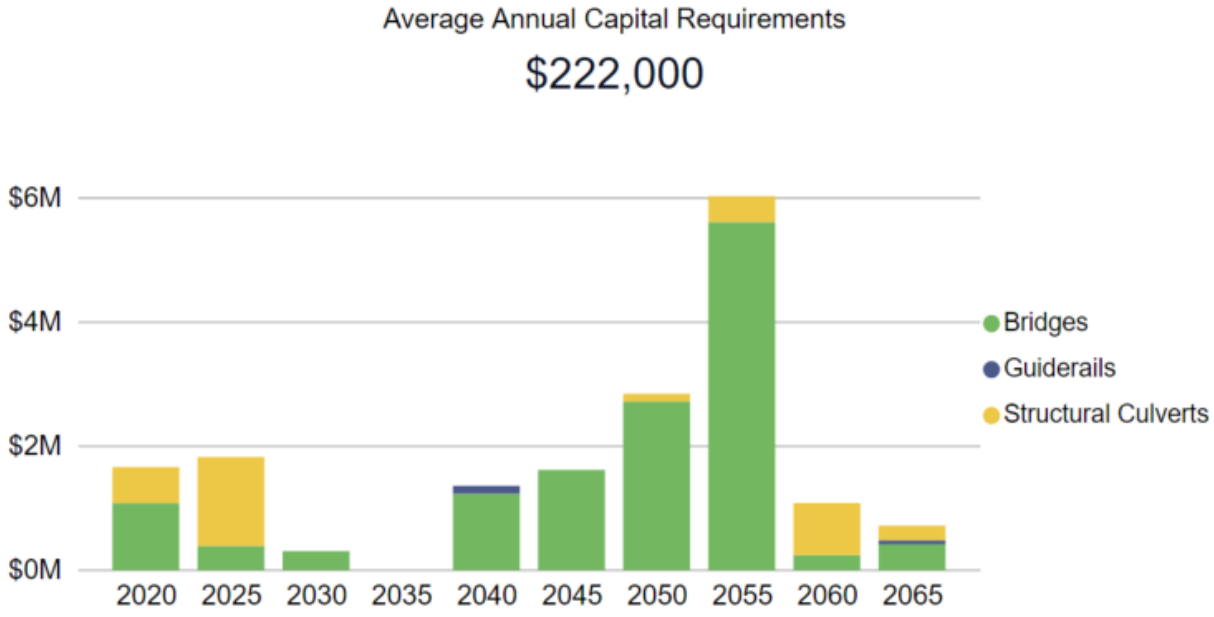
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Operations & Maintenance	• Recommended O&M activities are provided every 2 years as part of the OSIM Inspection Reports
Rehabilitation & Replacement	• Capital rehabilitation events and replacement events are identified in the OSIM Inspection Reports and is used to inform short-term planning/budgeting

Forecasted Capital Requirements

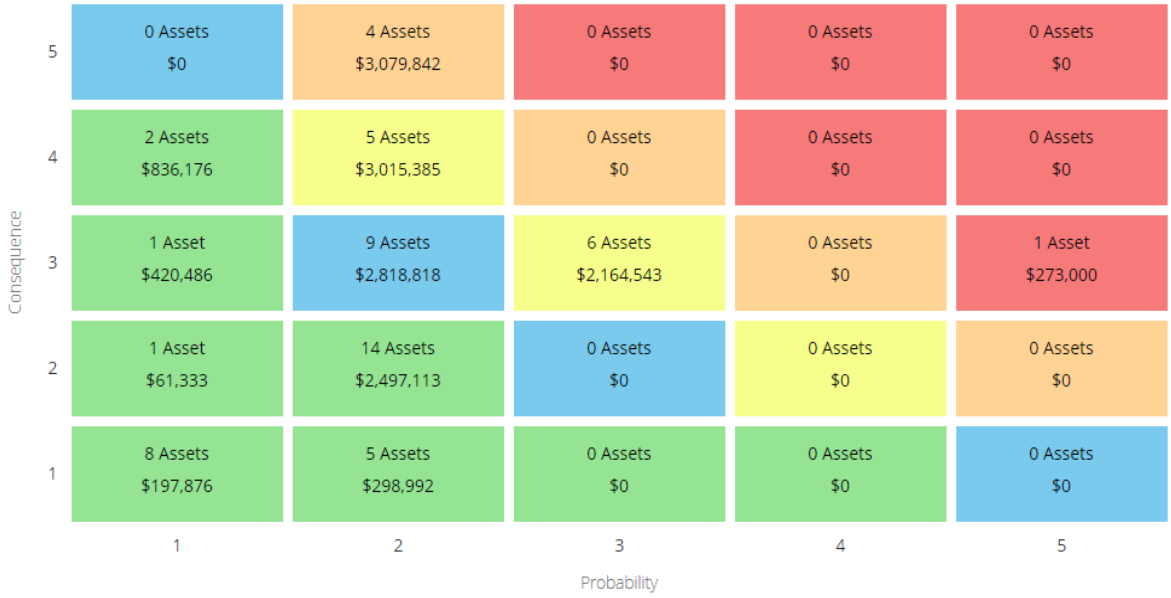
The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.2.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.



Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Structural Culverts	Culvert 2021 (13th Line – William St. to Maplewood)	15 - Very High
Bridges	Bridge 16 (16th Line – Cassel to 8)	10 - High
Bridges	Bridge 14 (16th Line – Cassel to 8)	10 - High
Bridges	Bridge 8 (14th Line – Maplewood to Cassel)	10 - High
Structural Culverts	Culvert 2036 (Maplewood 18 to 5)	10 - High
Bridges	Bridge 12 (15th Line - Maplewood to Cassel)	9 - Moderate
Structural Culverts	Culvert 2012 (11th Line - Perth-Oxford to Maplewood)	9 - Moderate
Structural Culverts	Culvert 2034 (Cassel - 13 to 14)	9 - Moderate
Bridges	Bridge 1 (10th Line - Braemar to 33)	9 - Moderate
Structural Culverts	Culvert 2008 (10th Line - 33 to 17)	9 - Moderate

4.2.6 Levels of Service

The following tables identify the Township's current level of service for Bridges & Culverts. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected for this AMP.

Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by Bridges & Culverts.

Service Attribute	Qualitative Description	Current LOS (2018)
Scope	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. None of the municipality's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Quality	Description of the condition of bridges & culverts and how this would affect use of the bridges & culverts	2017 OSIM Inspection Report: • Most structures require some level of maintenance type work or minor repairs in an urgent or less than one year timeframe. • 23 Structures have been identified as requiring rehabilitation in 1-5 years. If carried out within the suggested timeframe, they will defer the structures from degrading to a point of requiring costly major rehabilitations or replacement • 1 culvert should be considered for replacement in 1-5 years; and 4 in 6-10 years • 4 structures require rehabilitation work within 6-10 years

Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by Bridges & Culverts.

Service Attribute	Technical Metric	Current LOS (2018)
Scope	% of bridges in the Township with loading or dimensional restrictions	0%
Quality	Average bridge condition index value for bridges in the Township	75 (CityWide)
	Average bridge condition index value for structural culverts in the Township	57 (CityWide)
Performance	Capital re-investment rate	1.28%

4.2.7 Recommendations

Asset Inventory/Data Refinement

- Asset Inventory Validation - Continue to review and validate inventory data, assessed condition data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2 years.
- Updated Replacement Costs (Unit Costs) - Update structure-specific replacement costs as part of the Township's next OSIM Inspection Report. The replacement cost for most structures in this AMP are based on the historical inflation of previous costs.

Risk Management Strategies

- Review High Risk Assets - Review of high-risk assets and determine appropriate risk mitigation strategies (e.g. inspection, rehabilitation, replacement, closure). There are 5 structures with a High or Very High risk rating based on their current condition and projected replacement cost.

Levels of Service

- Identify Additional LOS Metrics - Identify additional metrics beyond the requirements in O. Reg. 588/17 that measure the current level of service provided.
- Measure LOS Annually - Measure levels of service on an annual basis to allow for trend analysis and inform capital planning/budgeting activities.
- Identify Proposed LOS - Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

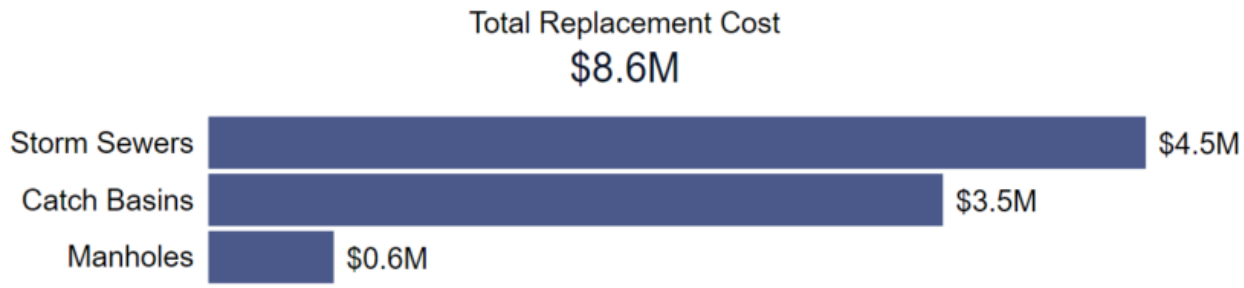
4.3 Storm Water Network

The Township is responsible for owning and maintaining a Storm Water Network that consists of catch basins, manholes and storm sewers. The current design standard requires that the minor local drainage systems must be able to convey a 1:5 year storm and the trunk storm sewers must be designed to convey a 1:10 year storm.

4.3.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Township's Storm Water Network inventory.

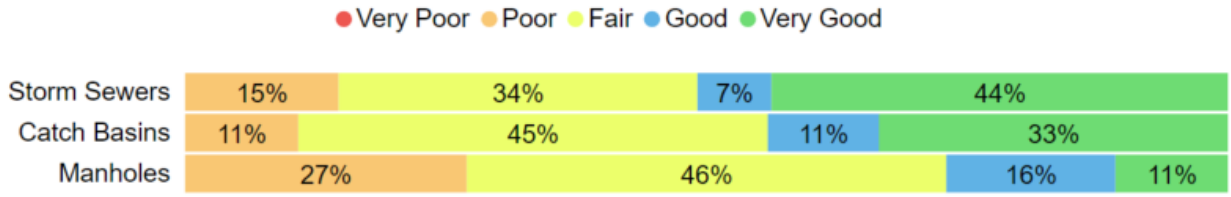
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Catch Basins	469 Quantity	Cost/Unit	$3,517,500
Manholes	74 Quantity	Cost/Unit	$601,250
Storm Sewers	13,828 Length (m)	52% CPI 48% Cost/Unit	$4,488,879
			$8,607,629



4.3.2 Asset Condition

The table below identifies the current average condition and source of available condition data for each asset segment. The Average Condition (%) is a weighted value based on replacement cost.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Catch Basins	71%	Good	67% Assessed
Manholes	62%	Fair	Age-based
Storm Sewers	73%	Good	Age-based
	71%	**Good**	**27% Assessed**



To ensure that the Township's Storm Water Network continues to provide an acceptable level of service, the Township should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the Storm Water Network.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- There are no formal condition assessment programs in place for the Storm Water Network
- As the Township refines the available asset inventory for the Storm Water Network a regular assessment cycle should be established

4.3.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Storm Water Network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Catch Basins	75 years	27.7	47.3
Manholes	75 years	29.0	45.9
Storm Sewers	75 years	28.3	46.7
		24.1	**46.8**

Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.3.4 Lifecycle Management Strategy

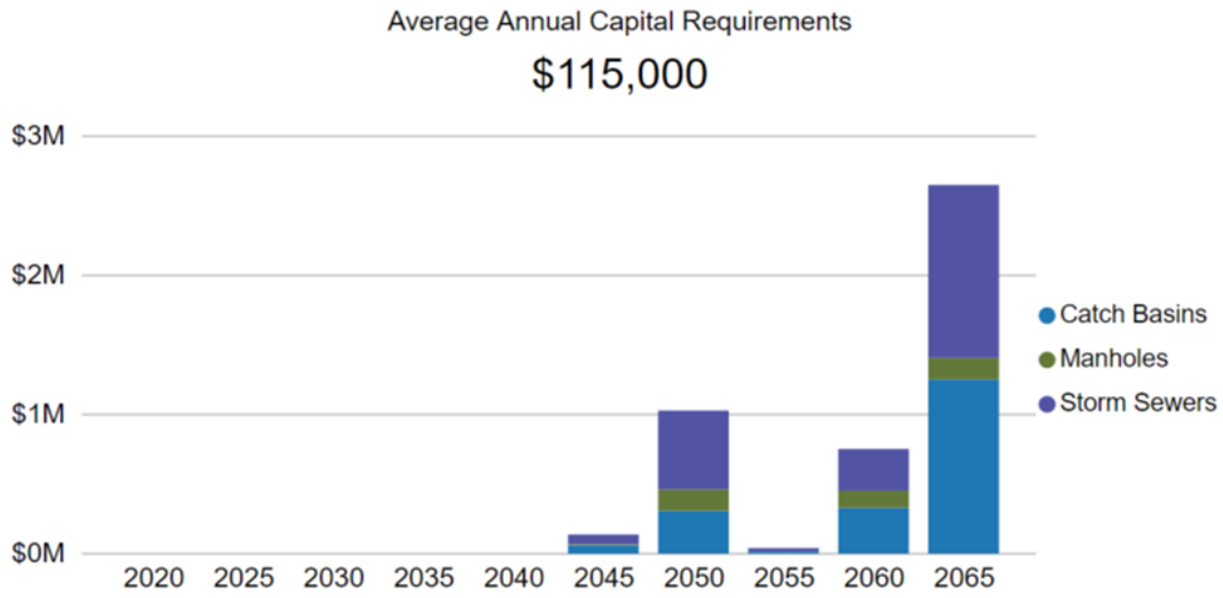
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

The following table outlines the Township's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Operations & Maintenance	• Catch basin cleaning occurs annually across the entire network; deficincies are noted and repairs ocmpleted as necessary
Rehabilitation & Replacement	• Any required replacement is completed in coordination with road work • The capacity of the stormwater network is being upgraded gradually according to the Township's Master Storm System Drainage Plan

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.3.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2018 inventory data. See Appendix C for the criteria used to determine the risk rating of each asset.

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Import ID (CityWide)	Risk Rating
Storm Sewers	STRMRSS010-3034	9 - Moderate
Storm Sewers	STRMRSS001-3020	9 - Moderate
Storm Sewers	STRMRSS008-3034	9 - Moderate
Storm Sewers	STRMRSS010-3020	9 - Moderate
Storm Sewers	STRMRSS003-3020	9 - Moderate
Storm Sewers	STRMRSS007-3020	9 - Moderate
Storm Sewers	STRMRSS009-3034	9 - Moderate
Storm Sewers	STRMRSS006-3020	9 - Moderate
Storm Sewers	STRMRSS006-3034	9 - Moderate
Storm Sewers	STRMRSS007-3034	9 - Moderate

4.3.6 Levels of Service

The following tables identify the Township's current level of service for Storm Water Network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected for this AMP.

Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by Storm Water Network.

Service Attribute	Qualitative Description	Current LOS (2018)
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	See Appendix B

Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by the Storm Water Network.

Service Attribute	Technical Metric	Current LOS (2018)
Scope	% of properties in municipality resilient to a 100-year storm	TBD[2]
	% of the municipal stormwater management system resilient to a 5-year storm	100%
Performance	Capital reinvestment rate	1.45%

[2] Municipal servicing standards require that major storm system components (open channels, creeks, roadways, swales and/or boulevards) are designed to accommodate a 1:100 year storm. Minor systems and trunk sewers are required to be designed to accommodate up to a 1:10 year storm. There is insufficient data/information available currently to determine the % of properties resilient to a 100-year storm.

4.3.7 Recommendations

Asset Inventory/Data Refinement

- Create Asset Naming Conventions - The Township's storm network inventory includes unique identifier values (e.g. STRMRSS010-3034), but lacks adequate naming conventions (e.g. Name, Node From/Node To). A standardized naming/classification system should be developed to allow for additional analysis.
- Close Attribute Data Gaps - About half of the Town's storm sewers do not have a pipe diameter listed in the asset inventory
- Cross-reference with GIS - Identify if a GIS inventory is available at the County to cross-refence with the Township's current asset inventory. Complete data reconciliation activities as necessary

Condition Assessment Strategies

- Complete Network-Wide Assessment - The development of a comprehensive inventory should be accompanied by a system-wide assessment of the condition of all assets in the Storm Water Network through CCTV inspections.

Levels of Service

- Identify Additional LOS Metrics - Identify additional metrics beyond the requirements in O. Reg. 588/17 that measure the current level of service provided.
- Measure LOS Annually - Measure levels of service on an annual basis to allow for trend analysis and inform capital planning/budgeting activities.
- Identify Proposed LOS - Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

5 Impacts of Growth

Key Insights

- Understanding the key drivers of growth and demand will allow the Township to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure

- The Township is forecast to experience residential and employment growth and may require additional land and infrastructure to accommodate that growth

- The costs of growth should be considered in long-term funding strategies that are designed to maintain or increase the current level of service

5.1 Description of Growth Assumptions

The demand for infrastructure and services will change over time based on a combination of internal and external factors. Understanding the key drivers of growth and demand will allow the Township to more effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

5.1.1 Oxford County - Phase 1 Comprehensive Review Study (2019)

Oxford County recently undertook a Phase 1 Comprehensive Review Study prepared by Hemson Consulting Ltd. that includes updated municipal growth forecasts and land need analysis. The purpose of the study was to provide up to date growth forecast and land supply information to inform the County's growth management policies and various other County and Area Municipal projects and initiatives.

All eight Area Municipalities in the County are forecast to experience residential and employment growth, and some are expected to require additional land to accommodate that growth. The following tables illustrate the population, household and employment forecasts for East Zorra-Tavistock between 2016-2046.

Forecast Type	2016	2021	2026	2031	2036	2041	2046	Growth 2016-2046
Total Population	7,330	7,940	8,420	8,930	9,450	9,940	10,400	**3,070**
Total Occupied Households	2,710	2,990	3,210	3,440	3,660	3,840	4,020	**1,310**
Total Employment	2,800	2,950	3,020	3,100	3,200	3,320	3,450	**520**

5.2 Impact of Growth on Lifecycle Activities

By July 1, 2024 the Township's asset management plan must include a discussion of how the assumptions regarding future changes in population and economic activity informed the preparation of the lifecycle management and financial strategy.

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they should be integrated into the Township's AMP. While the addition of residential units will add to the existing assessment base and offset some of the costs associated with growth, the Township will need to review the lifecycle costs of growth-related infrastructure. These costs should be considered in long-term funding strategies that are designed to, at a minimum, maintain the current level of service.

6 Financial Strategy

Key Insights

- The Township is committing approximately $1,321,000 towards capital projects per year from sustainable revenue sources for the asset categories in this AMP

- Given the annual capital requirement of $1,591,000, there is currently a funding gap of $270,000 annually

- For tax-funded assets, we recommend increasing tax revenues by 0.2% each year for the next 10 years to achieve a sustainable level of funding

6.1 Financial Strategy Overview

For an asset management plan to be effective and meaningful, it must be integrated with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow Township of East Zorra-Tavistock to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, and projected growth requirements.

This report develops such a financial plan by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following components:

1. The financial requirements for:
    a. Existing assets
    b. Existing service levels
    c. Requirements of contemplated changes in service levels (none identified for this plan)
    d. Requirements of anticipated growth (none identified for this plan)
2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt
    e. Development charges
3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods
4. Use of Senior Government Funds:
    a. Gas tax
    b. Annual grants

Note: Periodic grants are normally not included due to Provincial requirements for firm commitments. However, if moving a specific project forward is wholly dependent on receiving a one-time grant, the replacement cost included in the financial strategy is the net of such grant being received.

If the financial plan component results in a funding shortfall, the Province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, the Province may evaluate a Township's approach to the following:

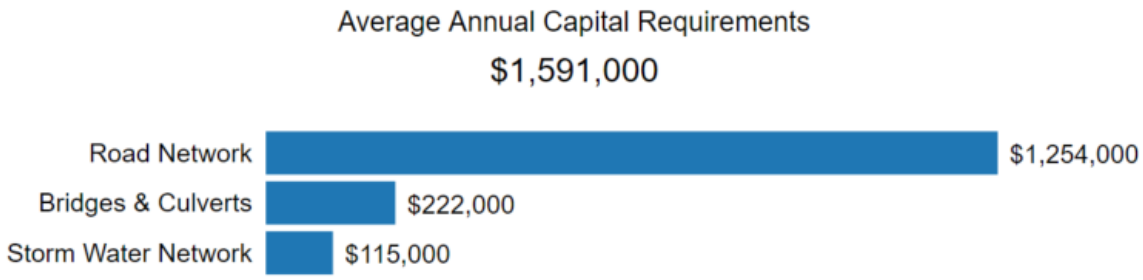
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.
2. All asset management and financial strategies have been considered. For example:

a. If a zero-debt policy is in place, is it warranted? If not the use of debt should be considered.
b. Do user fees reflect the cost of the applicable service? If not, increased user fees should be considered.

6.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Township must allocate approximately $1.6 million annually to address capital requirements for the assets included in this AMP.



For the Storm Water Network, annual requirements have been calculated based on a "replacement only" scenario, in which capital costs are only incurred at the construction and replacement of each asset.

For Bridges & Culverts we identified lifecycle costs informed by the most recent OSIM Inspection Report received by the Township. This includes capital rehabilitation events that are recommended over the next 10 years in addition to projections regrading the remaining life, and eventual replacement of these structures.

For the Road Network, a lifecycle management strategy has been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Township's roads. The development of this strategy allows for a comparison of potential cost avoidance if the strategy were to be implemented across all municipal roads. The following table compares two scenarios for the Road Network:

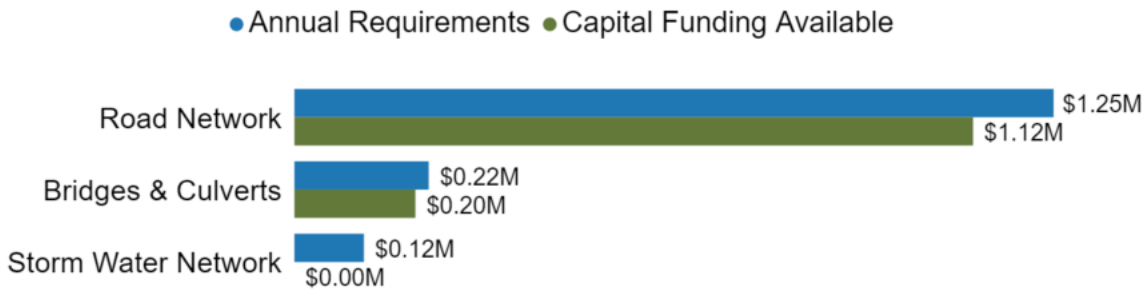
1. Replacement Only Scenario: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. Lifecycle Strategy Scenario: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required.

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$1,452,000	$1,254,000	$198,000

The implementation of a proactive lifecycle strategy for roads leads to a potential cost avoidance of $198,000 and reduces the overall annual capital requirements for the Road Network by 14%. As this is the lowest cost option available to the Township, we have used this annual requirement in the development of the financial strategy.

Annual Funding Available

Based on a review of sustainable capital funding sources, the Township is committing approximately $1,321,000 towards capital projects in the asset categories included in this AMP in 2020. This total does not include capital funding through non-sustainable revenue sources (one-time grants, debt etc.). Given the annual capital requirement of $1,591,000, there is currently a funding gap of $270,000 annually.



6.2 Funding Objective

We have developed scenarios that would enable East Zorra-Tavistock to achieve full funding within 1 to 20 years for the following assets:

1. **Tax Funded Assets:** Road Network, Bridges & Culverts, Storm Water Network

Note: For the purposes of this AMP, we have excluded gravel roads since they are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they can theoretically have a limitless service life.

For each scenario developed we have included strategies, where applicable, regarding the use of cost containment and funding opportunities.

6.3 Financial Profile: Tax Funded Assets

6.3.1 Current Funding Position

The following tables show, by asset category, East Zorra-Tavistock's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Asset Category	Avg. Annual Requirement	Annual Funding Available			Annual Deficit (Surplus)
		Taxes	Gas Tax	Total Available	
Road Network	1,254,000	605,000	516,000	1,121,000	133,000
Bridges & Culverts	222,000	200,000	0	200,000	22,000
Storm Water Network	115,000	0	0	0	115,000
	1,591,000	**805,000**	**516,000**	**1,321,000**	**270,000**

The average annual investment requirement for the above categories is $1,591,000. Annual revenue currently allocated to these assets for capital purposes is $1,321,000 leaving an annual deficit of $270,000. Put differently, these infrastructure categories are currently funded at 83% of their long-term requirements.

6.3.2 Full Funding Requirements

In 2020, Township of East Zorra-Tavistock has annual tax revenues of $6,151,000. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	2.2%
Bridges & Culverts	0.4%
Storm Water Network	1.9%
	4.5%

The following changes in costs and/or revenues over the next number of years should also be considered in the financial strategy:

a) East Zorra-Tavistock's debt payments for these asset categories will be decreasing by $45,000 over the next 5 years and by $132,000 over the next 10 years. Although not shown in the table, debt payment decreases will be $132,000 and $132,000 over the next 15 and 20 years respectively.

Our recommendations include capturing the above changes and allocating them to the infrastructure deficit outlined above. The table below outlines this concept and presents several options:

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	270,000	270,000	270,000	270,000	270,000	270,000	270,000	270,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-45,000	-132,000	-177,000	-177,000
Resulting Infrastructure Deficit:	**270,000**	**270,000**	**270,000**	**270,000**	**225,000**	**138,000**	**93,000**	**93,000**
Tax Increase Required	4.4%	4.4%	4.4%	4.4%	3.7%	2.2%	1.5%	1.5%
Annually:	**0.9%**	**0.4%**	**0.3%**	**0.2%**	**0.7%**	**0.2%**	**0.1%**	**0.1%**

6.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 10-year option. This involves full funding being achieved over 10 years by:

a) when realized, reallocating the debt cost reductions of $132,000 to the infrastructure deficit as outlined above.
b) increasing tax revenues by 0.2% each year for the next 10 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
c) allocating the current gas tax revenue as outlined previously.
d) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
e) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place.
2. We realize that raising tax revenues for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 10 years and provides financial sustainability over the period modeled, the recommendations do require prioritizing capital projects to fit the resulting annual funding available. Current data shows a pent-up investment demand of $41,000 for the Road Network, $0 for Bridges & Culverts, and $0 for the Storm Water Network.

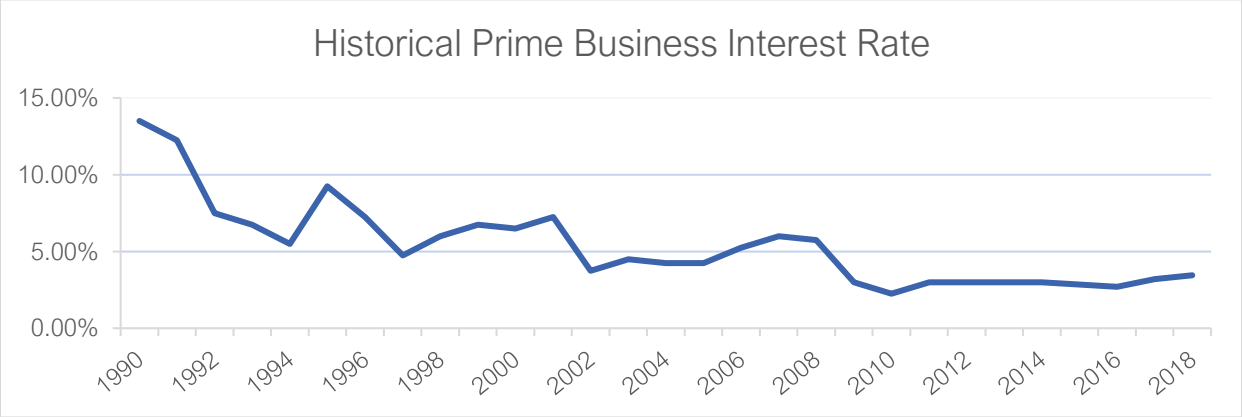
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

6.5 Use of Debt

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[3] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

Interest Rate	Number of Years Financed					
	5	10	15	20	25	30
7.0%	22%	42%	65%	89%	115%	142%
6.5%	20%	39%	60%	82%	105%	130%
6.0%	19%	36%	54%	74%	96%	118%
5.5%	17%	33%	49%	67%	86%	106%
5.0%	15%	30%	45%	60%	77%	95%
4.5%	14%	26%	40%	54%	69%	84%
4.0%	12%	23%	35%	47%	60%	73%
3.5%	11%	20%	30%	41%	52%	63%
3.0%	9%	17%	26%	34%	44%	53%
2.5%	8%	14%	21%	28%	36%	43%
2.0%	6%	11%	17%	22%	28%	34%
1.5%	5%	8%	12%	16%	21%	25%
1.0%	3%	6%	8%	11%	14%	16%
0.5%	2%	3%	4%	5%	7%	8%
0.0%	0%	0%	0%	0%	0%	0%

It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:



[3] Current municipal Infrastructure Ontario rates for 15-year money is 3.2%.

A change in 15-year rates from 3% to 6% would change the premium from 26% to 54%. Such a change would have a significant impact on a financial plan.

The following tables outline how East Zorra-Tavistock has historically used debt for investing in the asset categories as listed. There is currently $802,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $132,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2015	2016	2017	2018	2019
Road Network	937,000	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0
Storm Water Network	0	0	0	0	0	0
	937,000	**0**	**0**	**0**	**0**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	177,000	177,000	177,000	132,000	132,000	132,000	0
Bridges & Culverts	0	0	0	0	0	0	0
Storm Water Network	0	0	0	0	0	0	0
	177,000	**177,000**	**177,000**	**132,000**	**132,000**	**132,000**	**0**

The revenue options outlined in this plan allow East Zorra-Tavistock to fully fund its long-term infrastructure requirements without further use of debt.

6.6 Use of Reserves

6.6.1 Available Reserves

Reserves play a critical role in long-term financial planning. The benefits of having reserves available for infrastructure planning include:

a) the ability to stabilize tax rates when dealing with variable and sometimes uncontrollable factors
b) financing one-time or short-term investments
c) accumulating the funding for significant future infrastructure investments
d) managing the use of debt
e) normalizing infrastructure funding requirement

By asset category, the table below outlines the details of the reserves currently available to East Zorra-Tavistock.

Asset Category	Balance at December 31, 2019
Road Network	1,701,000
Bridges & Culverts	0
Storm Water Network	376,000
	2,077,000

There is considerable debate in the municipal sector as to the appropriate level of reserves that a Township should have on hand. There is no clear guideline that has gained wide acceptance. Factors that municipalities should take into account when determining their capital reserve requirements include:

a) breadth of services provided
b) age and condition of infrastructure
c) use and level of debt
d) economic conditions and outlook
e) internal reserve and debt policies.

These reserves are available for use by applicable asset categories during the phase-in period to full funding. This coupled with East Zorra-Tavistock's judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short- to medium-term.

6.6.2 Recommendation

In 2024, Ontario Regulation 588/17 will require East Zorra-Tavistock to integrate proposed levels of service for all asset categories in its asset management plan update. We recommend that future planning should reflect adjustments to service levels and their impacts on reserve balances.

7 Appendices

Key Insights

- Appendix A identifies projected 10-year capital requirements for each asset category
- Appendix B includes several maps that have been used to visualize the current community level of service
- Appendix C identifies the criteria used to calculate risk for each asset category
- Appendix D provides additional guidance on the development of a condition assessment program

Appendix A: 10-Year Capital Requirements

The following tables identify the capital cost requirements for each of the next 10 years in order to meet projected capital requirements and maintain the current level of service.

Road Network											
Asset Segment	Backlog	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Paved Roads	$0	$111,000	$487,350	$127,050	$176,550	$799,064	$4,081,827	$1,786,763	$668,250	$1,142,202	$769,200
Road Culverts	$41,035	$0	$0	$0	$1,861	$280,490	$0	$0	$0	$0	$21,380
Sidewalks	$0	$0	$10,800	$0	$0	$0	$0	$3,040	$30,000	$0	$30,160
Streetlights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Curbs	$0	$0	$0	$0	$0	$0	$0	$0	$39,219	$0	$61,914
	$41,035	**$111,000**	**$498,150**	**$127,050**	**$178,411**	**$1,079,554**	**$4,081,827**	**$1,789,803**	**$737,469**	**$1,142,202**	**$882,654**

Bridges & Culverts											
Asset Segment	Backlog	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Bridges	$0	$0	$0	$0	$1,081,800	$0	$0	$0	$392,400	$0	$0
Guiderails	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Structural Culverts	$0	$0	$0	$0	$582,100	$0	$0	$0	$1,433,000	$0	$0
	$0	**$0**	**$0**	**$0**	**$1,663,900**	**$0**	**$0**	**$0**	**$1,825,400**	**$0**	**$0**

Storm Water Network											
Asset Segment	Backlog	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Catch Basins	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Sewers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

All Asset Categories											
Asset Segment	Backlog	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Road Network	$41,035	$111,000	$498,150	$127,050	$178,411	$1,079,554	$4,081,827	$1,789,803	$737,469	$1,142,202	$882,654
Bridges & Culverts	$0	$0	$0	$0	$1,663,900	$0	$0	$0	$1,825,400	$0	$0
Storm Water Network	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$41,035	**$111,000**	**$498,150**	**$127,050**	**$1,842,311**	**$1,079,554**	**$4,081,827**	**$1,789,803**	**$2,562,869**	**$1,142,202**	**$882,654**

Appendix B: Level of Service Maps

TOWNSHIP OF EAST ZORRA-TAVISTOCK

TOWNSHIP OF PERTH EAST
TOWNSHIP OF WILMOT
TOWNSHIP OF ZORRA
TOWNSHIP OF BLANDFORD-BLENHEIM
TOWNSHIP OF SOUTH-WEST OXFORD
EAST ZORRA
TAVISTOCK
HICKSON
CASSEL
STRATHALLAN
BRAEMAR
HUNTINGFORD
INNERKIP
CITY OF WOODSTOCK
NORTH OXFORD
PERTH-OXFORD ROAD
SIDEROAD
OXFORD ROAD #8
OXFORD ROAD #33
OXFORD ROAD #17
OXFORD ROAD #4
OXFORD ROAD 29
HIGHWAY #59
10TH LINE
11TH LINE
13TH LINE
14TH LINE
15TH LINE
16TH LINE
17TH LINE
18TH LINE
19TH LINE
ZORRA / EAST ZORRA-TAVISTOCK LINE
Thames
Mud Creek
Phelan
Gordon Pittock Reservoir
CPR
CNR
VALLEYFIELD DR
LOVEYS STREET EAST
LOVEYS STREET WEST
KING STREET
JOHN STREET
CRESCENT
TAVISTOCK PUBLIC SCHOOL
PERTH-OXFORD RD
HOPE STREET EAST
HOPE STREET WEST
DECEW ST E
DECEW ST W
ADAM STREET
WOODSTOCK STREET S
WETTLAUFER ST
WILLIAM STREET SOUTH
MAPLE ST
MALCOLM ST
STEWART ST
LIEBLER ST
DIETRICH ROAD
JACOB STREET W
JACOB STREET E
HENRY ST
QUEEN ST
VICTORIA STREET
FREDERICK STREET
HENDERSHOT ST
RUDY AVENUE
ROTH ST
FUHR STREET
HOMEWOOD AVE W
OAKRIDGE AVENUE
PARK AVENUE
OXFORD ROAD No. 33
OXFORD ROAD No. 8
OXFORD ROAD No. 29
CURRAH LANE
ALMA STREET
KING STREET
QUEEN STREET
SCOTT STREET
BLANDFORD STREET
TRANSFER AVENUE
VERONICA ST
YOUNG STREET
OLIVER STREET
MAIN STREET
GEORGE STREET
TOWNSHIP ROAD 6
Trout Lake
CITY OF WOODSTOCK
Gordon Pittock Reservoir

LEGEND

- 73 ROAD IDENTIFICATION NUMBER
- 6957 MUNICIPAL ADDRESS RANGES
- 2 COUNTY ROAD
- 401 PROVINCIAL ROAD
- TOWNSHIP ROAD
- HIGHWAY
- COUNTY ROAD
- PARCEL FABRIC
- TOWNSHIP LOT LINES
- RAILROAD
- MUNICIPAL LIMITS
- HISTORIC TOWNSHIP LIMITS
- DRAINAGE
- PUBLIC WORKS FACILITY
- CHURCH
- SCHOOL
- LIBRARY
- FIRE HALL
- POLICE STATION
- VILLAGE
- SETTLEMENTS AND RURAL CLUSTERS

1,000 500 0 1,000 2,000 3,000
Meters

OxfordCounty
growing stronger...together
Produced By The Department of Corporate Services
Information Systems ©2011

FIGURE 5

TOWNSHIP OF EAST ZORRA-TAVISTOCK
TAVISTOCK MASTER STORM SYSTEM DRAINAGE PLAN

MINOR STORM SYSTEM CAPACITY ANALYSIS

SUMMARY OF PIPE CAPACITY (POST TAVISTOCK MUNICIPAL DRAIN 2006)

EXTERNAL A

25 ha EXTERNAL AREA, SCENARIO INCLUDES RUNOFF FROM AN ESTIMATED 6.7 ha EXTERNAL AREA WITHIN A 10 MINUTE TIME OF CONCENTRATION WITH RUNOFF COEFFICIENT C=0.35.

EXTERNAL B

SCENARIO INCLUDES RUNOFF FROM AN ESTIMATED 5.0 ha EXTERNAL AREA CONTRIBUTING WITHIN A 20 MINUTE TIME OF CONCENTRATION WITH RUNOFF COEFFICIENT C=0.30

EXTERNAL C SCENARIO ASSUMES RUNOFF FROM THIS AREA IS INTERCEPTED, REDIRECTED AND/OR CONTROLLED, AND THEREFORE NO EXTERNAL RUNOFF FROM THIS AREA IS INCLUDED IN CAPACITY CALCULATIONS

EXTERNAL D

SCENARIO INCLUDES RUNOFF FROM AN ESTIMATED 4.0 ha EXTERNAL AREA CONTRIBUTING WITHIN A 10 MINUTE TIME OF CONCENTRATION WITH RUNOFF COEFFICIENT C=0.25

Legend

- MANHOLE LOCATION
- MANHOLE CATCHBASIN OR CATCHBASIN LOCATION
- CATCHBASIN LOCATION
- (45) STRUCTURE NUMBER
- FLOW DIRECTION
- EXTERNAL FLOWS
- PROPERTY FABRIC
- DRAINAGE AREA
- PROPOSED TAVISTOCK MUNICIPAL DRAIN 2006 (BY DIETRICH ENGINEERING)

STORM SEWER CAPACITY

"COLLECTOR" SEWER CAPACITY ANALYZED BASED ON THE 1:5 YEAR STORM.
"TRUNK" SEWER CAPACITY ANALYZED BASED ON THE 1:10 YEAR STORM.

"COLLECTOR" STORM SEWERS 1:5 YEAR STORM

- SUFFICIENT CAPACITY TO CONVEY DESIGN STORM FLOWS
- INSUFFICIENT CAPACITY TO CONVEY DESIGN STORM FLOWS
- NO DATA

"TRUNK" STORM SEWERS 1:10 YEAR STORM

- SUFFICIENT CAPACITY TO CONVEY DESIGN STORM FLOWS
- INSUFFICIENT CAPACITY TO CONVEY DESIGN STORM FLOWS

FOR CAPACITY ANALYSIS CALCULATIONS, REFER TO "STORM SEWER CAPACITY CHECK", BURNSIDE FILE 11487 STM design check sheet TAVISTOCK.xls.

Sources:

Lot Fabric provided by Township of East Zorra-Tavistock

N

0 20 40 60 80 100 120 140 160 180 200
Meters

1: 2000
May 2007
Project Number: MSZ11487

Prepared by: B. Berry, C. Reynolds Verified by: J. Phillips

BURNSIDE

REVISION #: 1 MSZ11487-CAPACITY SCENARIO.DWG

FIGURE 6

TOWNSHIP OF EAST ZORRA-TAVISTOCK TAVISTOCK MASTER STORM SYSTEM DRAINAGE PLAN

EXISTING MAJOR OVERLAND FLOW ROUTE

Legend

- MANHOLE LOCATION
- MANHOLE CATCHBASIN OR CATCHBASIN LOCATION
- CATCHBASIN LOCATION
- STRUCTURE NUMBER
- FLOW DIRECTION
- EXTERNAL FLOWS
- PROPERTY FABRIC
- DRAINAGE AREA
- STORM SEWER NETWORK

SURFACE FLOW

- DEFINED ROUTE
- IMPROVEMENTS REQUIRED
- NO DEFINED ROUTE

N

0 20 40 60 80 100 120 140 160 180 200

Meters

1: 2000
June 2007
Project Number: MSZ11487

Prepared by: B. Berry, C. Reynolds Verified by: J. Gravel

BURNSIDE

REVISION #: 1

MSZ11487-SURFACE FLOW.DWG

Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
All	Condition	100	80-100	1
			60-80	2
			40-60	3
			20-40	4
			0-20	5

Consequence of Failure

Asset Category	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Roads)	Roadside Environment (50%)	Urban	4
		Rural	2
	Surface Type (50%)	4" HTAP	4
		2" HTAP	2
Bridges & Culverts	Replacement Cost (100%)	$750,000+	5
		$500,000-$750,000	4
		$250,000-$500,000	3
		$100,000-$250,000	2
		$0-$100,000	1
Storm Water Network (Mains)	Diameter (70%)	750mm-825mm	5
		525mm-600mm	4
		450mm-525mm	3
		250mm-400mm	2
		0mm-200mm	1
	Replacement Cost (30&)	$250,000-$500,000	5
		$125,000-$250,000	4
		$50,000-$125,000	3
		$0-$50,000	2
		$250,000-$500,000	1

Appendix D: Condition Assessment Guidelines

The foundation of good asset management practice is accurate and reliable data on the current condition of infrastructure. Assessing the condition of an asset at a single point in time allows staff to have a better understanding of the probability of asset failure due to deteriorating condition.

Condition data is vital to the development of data-driven asset management strategies. Without accurate and reliable asset data, there may be little confidence in asset management decision-making which can lead to premature asset failure, service disruption and suboptimal investment strategies. To prevent these outcomes, the Township's condition assessment strategy should outline several key considerations, including:

- The role of asset condition data in decision-making
- Guidelines for the collection of asset condition data
- A schedule for how regularly asset condition data should be collected

Role of Asset Condition Data

The goal of collecting asset condition data is to ensure that data is available to inform maintenance and renewal programs required to meet the desired level of service. Accurate and reliable condition data allows municipal staff to determine the remaining service life of assets, and identify the most cost-effective approach to deterioration, whether it involves extending the life of the asset through remedial efforts or determining that replacement is required to avoid asset failure.

In addition to the optimization of lifecycle management strategies, asset condition data also impacts the Township's risk management and financial strategies. Assessed condition is a key variable in the determination of an asset's probability of failure. With a strong understanding of the probability of failure across the entire asset portfolio, the Township can develop strategies to mitigate both the probability and consequences of asset failure and service disruption. Furthermore, with condition-based determinations of future capital expenditures, the Township can develop long-term financial strategies with higher accuracy and reliability.

Guidelines for Condition Assessment

Whether completed by external consultants or internal staff, condition assessments should be completed in a structured and repeatable fashion, according to consistent and objective assessment criteria. Without proper guidelines for the completion of condition assessments there can be little confidence in the validity of condition data and asset management strategies based on this data.

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that should be used and the assets that require a discrete

condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project. There are many options available to the Township to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

Developing a Condition Assessment Schedule

Condition assessments and general data collection can be both time-consuming and resource-intensive. It is not necessarily an effective strategy to collect assessed condition data across the entire asset inventory. Instead, the Township should prioritize the collection of assessed condition data based on the anticipated value of this data in decision-making. The International Infrastructure Management Manual (IIMM) identifies four key criteria to consider when making this determination:

1. Relevance: every data item must have a direct influence on the output that is required
2. Appropriateness: the volume of data and the frequency of updating should align with the stage in the assets life and the service being provided
3. Reliability: the data should be sufficiently accurate, have sufficient spatial coverage and be appropriately complete and current
4. Affordability: the data should be affordable to collect and maintain