2025 ASSET MANAGEMENT PLAN

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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 balance delivering critical services in a cost-effective manner. This involves the development and implementation of asset management strategies and long-term financial planning.

The overall replacement cost of the assets owned by Tay Township total $394 million. 84% of all assets analyzed are in Fair or better condition and assessed condition data was available for the majority of road, building, bridges & culverts assets. For the remaining 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.Township staff will be undertaking a comprehensive inventory review with conditions assessment updates to the water, wastewater and storm network assets. Completion to align with the rate-study in 2028.

The development of a long-term, sustainable financial strategy requires an analysis of whole lifecycle costs. Using a combination of proactive lifecycle strategies and replacement only strategies to determine the lowest cost option to maintain the current level of service, a sustainable financial plan was developed.

Risk Frameworks and levels of service targets can then be used to prioritize projects and help select the right lifecycle intervention for the right asset at the right time, including replacement or full reconstruction. The Township has developed preliminary risk models which are integrated with the asset register. These models can produce risk matrices that classify assets based on their risk profiles.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs and achieve long-term sustainability the Township's proposed levels of service is to maintain an average condition of Good-60%. The needed average annual capital requirement is $8.08 million. Based on a historical analysis of sustainable capital funding sources, the Township is committing approximately $3.90 million a year. As a result, the Township is funding 48% of its annual capital requirements to maintain an average condition of Good. This creates a total annual funding deficit of $4.2 million.

Addressing annual infrastructure funding shortfalls is a difficult and long-term endeavour for municipalities. Considering the Township's current funding position, it will require many years to reach full funding for current assets. Short phase-in periods to meet these funding targets may place too high a burden on taxpayers too quickly, whereas a phase-in period beyond 20-years may see a continued deterioration of infrastructure, leading to larger backlogs.

To close annual deficits, it is recommended that the Township reviews the feasibility of annually increasing Capital contributions from tax revenue and water & wastewater rates revenue. In order to reach sustainable funding levels, the recommended annual increase is 2.0% for tax funded assets over a 10-year phase-in period and 2.6% for Water & Wastewater assets over a 20-year phase-in period. The increase for Water & Wastewater funding is additional to the annual increases identified in the 2017 Rate-Study, with the potential to be amended once the current Rate-Study is completed in 2028.

Most municipalities in Ontario, and across Canada, continue to struggle with meeting infrastructure demands. This challenge was created over many decade and will take many years to overcome. To this end, several recommendations should be considered, including:

- Continuous and dedicated improvement to the Township's infrastructure datasets, which form the foundation for all analysis, including financial projections and needs.
- Continuous refinements to risk and lifecycle models as additional data becomes available. This will aid in prioritizing projects and creating more strategic long-term capital budgets.
- Continued monitoring of key performance indicators for all infrastructure programs to calibrate levels of service targets annually.

The Township has taken important steps to updating its asset management program, including developing a more complete and accurate asset register, which is a substantial initiative. Continuous improvement to this inventory will be essential in maintaining momentum, supporting log-term financial planning and delivering affordable service levels to the community.

About this Document

The Township's Asset Management Plan was developed in accordance with Ontario Regulation 588/17 ("O. Reg 588/17"). It contains a comprehensive analysis of Tay's infrastructure portfolio. This is a living document that should be updated regularly as additional assets and financial data become available.

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. Along with creating better performing organizations, more livable 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.

Table 1 Ontario Regulation 588/17 Requirements and Reporting Deadlines

Requirement	2019	2022	2024	2025
1. Strategic Asset Management Policy				
2. Asset Management Plans				
State of infrastructure for core assets				
State of infrastructure for all assets				
Current levels of service for core assets				
Current levels of service for all assets				
Proposed levels of service for all assets				
Lifecycle costs associated with current levels of service				
Lifecycle costs associated with proposed levels of service				
Growth impacts				
Financial strategy				

Scope

The scope of this document is to identify the current practices and strategies that are in place to manage the public infrastructure and to make 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 services.

Limitations and Constraints

The asset management program development required substantial effort by staff, it was developed based on best-available data, and is subject to the following broad limitations, constrains, and assumptions:

- The analysis is sensitive to several critical data fields, including an asset's estimated useful life, replacement cost, quantity, and in-service date. Inaccuracies or imprecisions in any of these fields can have substantial and cascading impacts on all reporting and analytics.
- User-defined and unit cost estimates, based typically on staff judgment, recent projects, or established through completion of technical studies, offer the most precise approximations of current replacement costs. When this is not possible, historical costs incurred at the time of asset acquisition or construction can be inflated to the present day. This approach, while sometimes necessary, can produce inaccurate estimates.
- In the absence of condition assessment data, age was used to estimate asset condition ratings. This approach can result in an over- or understatement of asset needs. As a result, financial requirements generated through this approach can differ from those produced by in-field assessments.
- The risk models are designed to support objective project prioritization and selection. However, in addition to the inherent limitations that all models face, they also require availability of important asset attribute data to ensure that asset risk ratings are valid, and assets are properly stratified within the risk matrix. Missing attribute data can misclassify assets.

These limitations have a direct impact on most of the analysis presented, including condition summaries, age profiles, long-term replacement and rehabilitation forecasts, and shorter term, 10-year forecasts that are generated from Citywide, the Township's primary asset management system.

These challenges are quite common and require long-term commitment and sustained effort by staff. As the Township's asset management program evolves and advances, the quality of future AMPs and other core documents that support asset management will continue to increase.

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 goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage the associated risks, while maximizing the value and levels of service the community receives from the asset portfolio.

Lifecycle 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 the broader asset management program. The industry-standard approach and sequence to developing a practical asset management program begins with a Strategic Plan, followed by an Asset Management Policy and an Asset Management Strategy, concluding with an Asset Management Plan (AMP).

Foundational Documents

In the municipal sector 'asset management strategy' and 'asset management plan' are often used interchangeably. Other concepts such as 'asset management framework', 'asset management system', and 'strategic asset management plan' further add to the confusion; lack of consistency in the industry on the purpose and definition of these elements offers little clarity. To make a clear distinction between the policy, strategy, and the plan see the following sections for detailed descriptions of the document types.

Strategic Plan

The strategic plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element. Developing alignment with corporate goals and objectives through service delivery and lifecycle management ensures the Township has line of sight to achieve their strategic objectives.

Asset Management Policy

An asset management policy represents a statement of the principles guiding the Township's approach to asset management activities as well as their commitment. It aligns with the organization and provides clear directions to municipal staff on their roles and responsibilities.

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 Township plans to achieve its asset management objectives through planned activities and decision-making criteria.

Key Technical Concepts

Effective asset management integrates several key components, including data management, lifecycle management, risk management, and levels of service.

Asset Hierarchy and Data Classification

Asset hierarchy illustrates the relationship between individual assets and their components, and a wider, more expansive network and system. How assets are grouped in a hierarchy structure can impact how data is interpreted. Key category details are summarized at the asset segment level.

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. The two methodologies are: 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.

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

Figure 1 Service Life Remaining Calculation

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. The reinvestment rate is calculated as follows:

Figure 2 Target and Actual Reinvestment Calculations

By comparing the actual vs. target reinvestment rate the Township can determine the extent of any existing funding gap.

Asset Condition

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 figure below outlines the condition rating system used to determine asset condition for all assets.

Figure 3 Standard Condition Rating Scale

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 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 J: Condition Assessment Guidelines includes additional information on the role of asset condition data and provides basic guidelines for the development of a condition assessment program.

Lifecycle Management Strategies

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including 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 Figure 4 provides a description of each type of activity and the general difference in cost.

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. 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 the useful life at the lowest total cost of ownership.

Figure 4 Lifecyle Management Typical Interventions

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

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 through qualitative and quantitative methodologies.

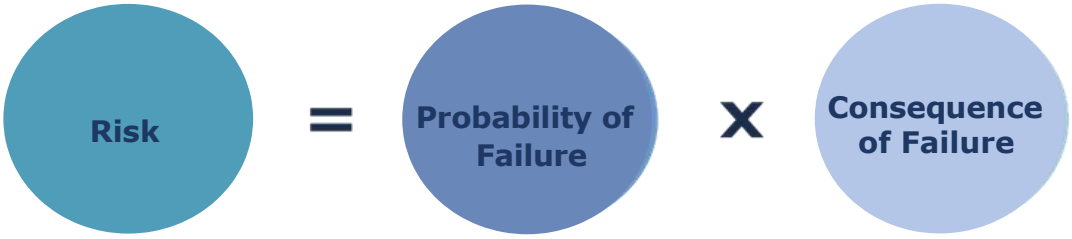
Qualitative Approach to Risk

The qualitative risk assessment involves the documentation of risks to the delivery of services that the Township faces given the current state of the infrastructure and asset management strategies. These risks can be understood as corporate level risks.

Quantitative Approach to Risk

Asset risk is defined using the following formula:

Figure 5 Risk Equation



The probability of failure relates to the likelihood that an asset will fail at a given time. The probability of failure focuses on two highly imperative impacts for risk assessment – structural and functional impacts. Structural impacts are related to the structural aspects of an asset such as load carrying capacity, condition, or breaks; whereas the functional impacts can include parameters, slope, traffic count, and other impacts that can affect the performance of an asset.

The consequence of failure describes the overall effect that an asset failure will have on an organization's asset management goals. The consequences of failure can range from non-eventful to impactful.

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.

Climate Change

Climate change can cause severe impacts on human and natural systems around the world. The effects of climate change include increasing temperatures, higher levels of precipitation, droughts, and extreme weather events. In 2019, Canada's Changing Climate Report (CCCR 2019) was released by Environment and Climate Change Canada (ECCC).

The report revealed that between 1948 and 2016, the average temperature increase across Canada was 1.7°C; moreover, during this period, Northern Canada experienced a 2.3°C increase. The temperature increase in Canada has doubled that of the global average. If emissions are not significantly reduced, the temperature could increase by 6.3°C in Canada by the year 2100 compared to 2005 levels. Observed precipitation changes in Canada include an increase of approximately 20% between 1948 and 2012.

By the late 21st century, the projected increase could reach an additional 24%. During the summer months, some regions in Southern Canada are expected to

experience periods of drought at a higher rate. Extreme weather events and climate conditions are more common across Canada. Recorded events include droughts, flooding, cold extremes, warm extremes, wildfires, and record minimum arctic sea ice extent.

The changing climate poses a significant risk to the Canadian economy, society, environment, and infrastructure. Physical infrastructure is vulnerable to damage and increased wear when exposed to these extreme events and climate variabilities. Canadian municipalities are faced with the responsibility to protect their local economy, citizens, environment, and physical assets. To achieve the sustainable delivery of services, climate change considerations should be incorporated into asset management practices.

Impacts of Growth

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 plan for new infrastructure more effectively, 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.

As growth-related assets are constructed or acquired, they should be integrated into Tay's asset management program. 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, and these costs should be considered in long-term funding strategies.

Provincial Policy Statement

This Provincial Planning Statement provides a framework for achieving sustainable growth and development across Ontario. It emphasizes the strategic alignment of growth of infrastructure planning, supporting long-term asset management by promoting efficient land use and informed decision-making.

Levels of Service

A level of service (LOS) is a measure of the services that Tay is providing to the community and the nature and quality of that service. Within each asset category, 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. 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 LOS is a simple, plain language description or measure of the service that the community receives. For core asset categories, the Province through O.Reg. 588/17, has provided qualitative descriptions that are required. For non-core asset categories, the Township has determined the qualitative descriptions

that will be used. The community LOS can be found in the Levels of Service subsection within each asset category section in the appendix.

Technical Levels of Service

Technical LOS 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 Township's asset management strategies on the physical condition of assets or the quality/capacity of the services they provide. For core asset categories, the Province through O. Reg. 588/17, has provided technical metrics that are required. For non-core asset categories, the Township determined the technical metrics that will be used.

Current and Proposed Levels of Service

In developing an effective asset management plan, it is imperative to establish clear levels of service across key service areas to ensure the efficient and sustainable delivery of municipal services. The Township established current levels of service as well as proposed levels of service, in accordance with O. Reg. 588/17. Proposed levels of service are realistic and achievable within the timeframe outlined by the Township. They were determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals, and long-term sustainability. The Township will identify a lifecycle management and financial strategy which will allow these targets to be achieved.

Annual Review

The annual review must address the Township's progress in implementing its asset management plan, any factors impeding the Township's ability to implement its asset management plan as well as a strategy to address any of the identified factors.

Community Profile

Tay is a township in Central Ontario, Canada, located in Simcoe County in the southern Georgian Bay region. The Township was named in 1822 after a pet dog of Lady Sarah Maitland (1792–1873), wife of Sir Peregrine Maitland, Lieutenant Governor of Upper Canada. Two other adjoining townships were also named for her pet dogs, Tiny and Flos (now Springwater Township).

In 1994, under countywide municipal restructuring, the Villages of Port McNicoll, Victoria Harbour, Waubaushene and Waverley were amalgamated into Tay Township.

Tay is a strong, cohesive rural community. We celebrate and promote our unique history, natural heritage, and recreational amenities as the cornerstone to our quality of life. Our unique villages and towns support a host of events, services and businesses that contribute to growing the local economy and create a unique destination experience for residents and visitors to the community.

Table 2 Tay & Ontario Census Information

Census Characteristic	Tay	Ontario
Population 2021	11,091	14,223,942
Population Change 2016-2021	10.5%	5.8%
Total Private Dwellings	5,301	5,929,250
Population Density	80.5/km2	15.9/km2
Land Area	137.86 km2	892,411.76 km2

Inventory & Valuation

The Township's inventory has an asset hierarchy of categories and segments as outlined below where the dark blue headings are the categories and the listings in grey are the segments.

Figure 6 Asset Hierarchy

State of the Infrastructure

The table below outlines the current state of each asset category, as well as the current service trend. The service trend arrows indicate an overall downward trend, reflecting current funding levels and declining asset conditions.

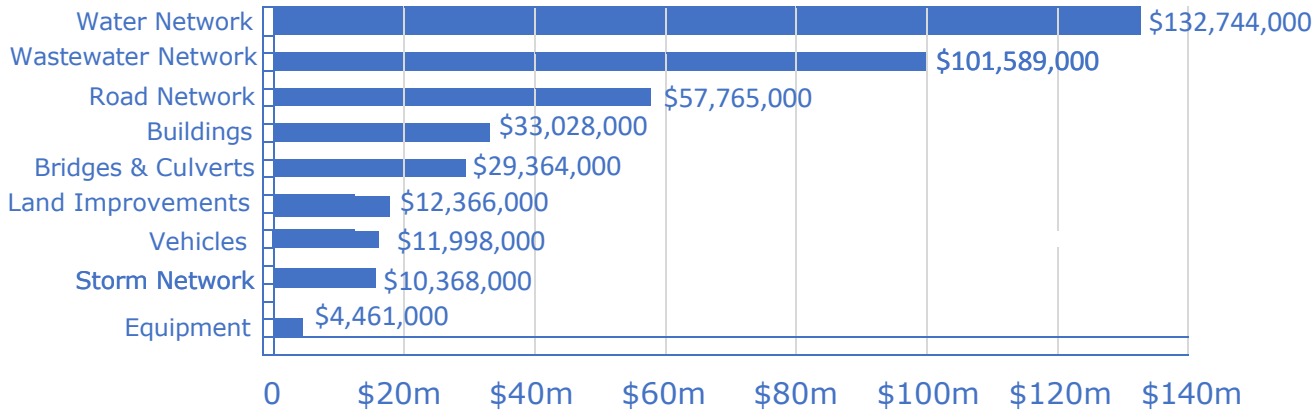
Table 3 Summary of Overall Current State

Asset Category	Replacement Cost	Asset Condition	Service Trend
Road Network	$57,764,692	Good (72%)	↘
Bridges & Culverts	$29,363,888	Fair (59%)	↘
Buildings	$33,027,653	Fair (41%)	↘
Land Improvements	$12,365,602	Good (77%)	↘
Vehicles	$11,997,651	Good (76%)	↘
Equipment	$4,461,439	Good (70%)	↘
Wastewater Network	$101,588,977	Fair (59%)	↘
Storm Network	$10,368,310	Very Good (96%)	↘
Water Network	$132,743,689	Very Good (83%)	↘
Overall	**$393,681,901**	**Good (70%)**	↘

Replacement Cost

All asset categories have a total replacement cost of $394 million based on available inventory data. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects the replacement of historical assets with similar, not necessarily identical, assets available for procurement today.

Figure 7 Summary by Asset Category Replacement Cost Values



Condition & Age

Condition of the Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 84% of assets are in fair or better condition. This estimate relies on both age-based and field condition data.

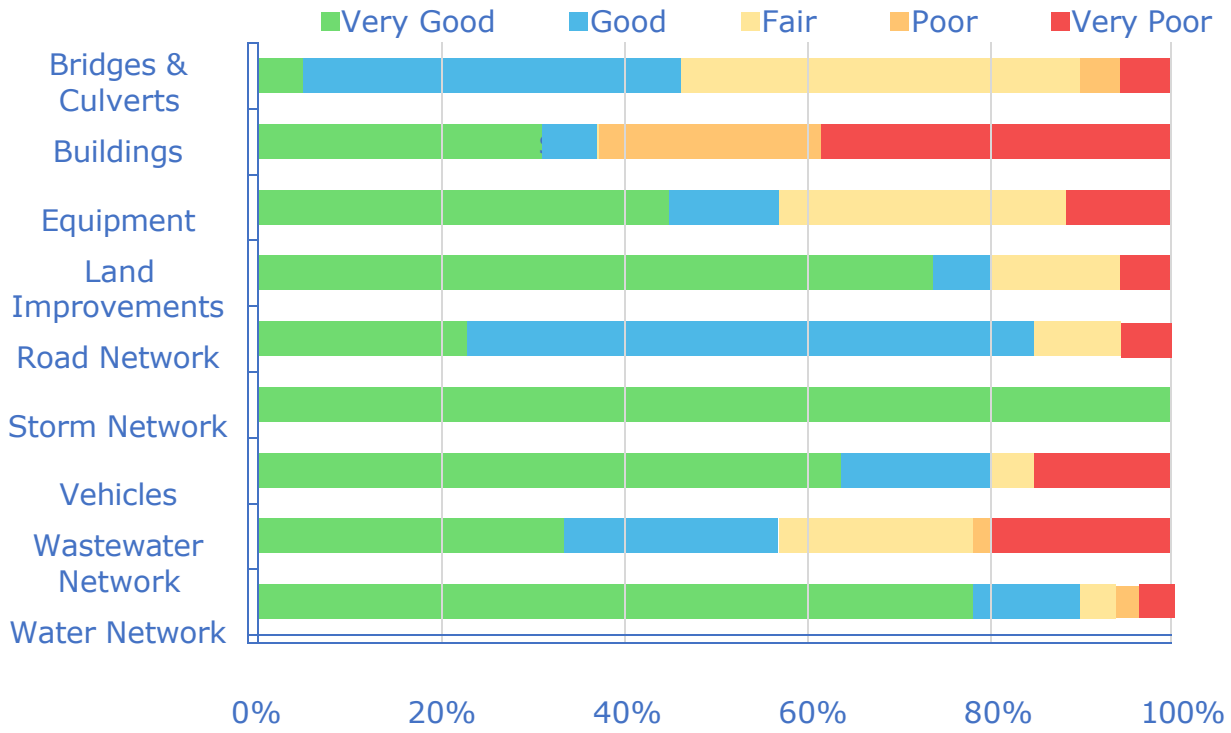
Assessed condition data is available for 31% of the assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data.

Table 4 Assessed Condition Data Sources

Asset Category	Source of Condition Data
Road Network	Staff Assessment
Bridges & Culverts	R.J. Burnside
Buildings	Staff Assessment

The breakdown of the condition of each asset category is shown in the figure below.

Figure 8 Overall Condition Breakdown by Asset Category



Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 31% of the Township's assets will require rehabilitation / replacement within the next 10 years. Details of the capital requirements are identified in each asset section.

Risk & Criticality

Qualitative Risk

The Township has noted key trends, challenges, and risks to service delivery that they are currently facing.

Capital Funding Strategies

Major capital rehabilitation and replacement projects are often entirely dependent on the availability of grant funding opportunities. When grants are not available, rehabilitation and replacement projects are often deferred.

Climate Change & Extreme Weather

Asset deterioration is accelerated due to extreme weather, which in some cases can cause unexpected failures. Freeze-thaw cycles, ice jams, and surface flooding from extreme rainfall have been experienced by the Township in recent years. These events make long-term planning difficult and can result in a lower level of service.

Asset Data & Information

There is a lack of confidence in the available inventory data and condition data. Staff have been prioritizing data refinement efforts to increase the accuracy and reliability of asset data and information. Staff find it a continuous challenge to dedicate resources and time towards data collection and condition assessments to ensure that condition and asset attribute data is regularly reviewed and updated.

Quantitative Risk

The overall asset risk breakdown for the Township's asset inventory is portrayed in the figure below.

Figure 9 Overall Asset Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$136,927,005 (35%)	$99,485,096 (26%)	$34,442,206 (9%)	$44,507,385 (12%)	$70,793,176 (18%)

Reviewing the list of very high-risk assets to evaluate how best to mitigate the level of risk the Township is experiencing and will help to advance the asset management program.

Climate & Growth

Tay Climate Profile

The Township of Tay is in southern Ontario on the shores of Georgian Bay. The Township is expected to experience notable effects of climate change which include higher average annual temperatures, an increase in total annual precipitation, and an increase in the frequency and severity of extreme events. According to Climatedata.ca – a collaboration supported by Environment and Climate Change Canada (ECCC) – the Township was not included in the data however, Port McNicoll was the data referenced as what trends the Township may experience. The following are the trends identified:

Higher Average Annual Temperature:

- Between the years 1981 and 2010 the annual average temperature was 6.8ºC
- Under a high emissions scenario, the annual average temperatures are projected to increase by 1.9 ºC by the year 2050 and by 5.3 ºC by the end of the century.

Increase in Total Annual Precipitation:

- Average annual precipitation for the 1951-1980 period was 939 mm.
- Under a high emissions scenario, Tay is projected to experience a 7% increase in precipitation by the year 2050 and a 15% increase by the end of the century.

Increase in Frequency of Extreme Weather Events:

- It is expected that the frequency and severity of extreme weather events will change.

Integration Climate change and Asset Management

Asset management practices aim to deliver sustainable service delivery - the delivery of services to residents today without compromising the services and well-being of future residents. Climate change threatens sustainable service delivery by reducing the useful life of an asset and increasing the risk of asset failure. Desired levels of service can be more difficult to achieve because of climate change impacts such as flooding, high heat, drought, and more frequent and intense storms.

To achieve the sustainable delivery of services, climate change considerations should be incorporated into asset management practices. The integration of asset management and climate change adaptation observes industry's best practices and enables the development of a holistic approach to risk management.

Impacts of Growth

Understanding the key drivers of growth and demand will allow the Township to plan for new infrastructure effectively, 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.

The Official Plan of the Township of Tay

The Official Plan of the Township of Tay is a fundamental policy document that sets out the vision, goals, objectives, and land use policies to guide growth and development over a 20 to 25-year horizon. It ensures that future development occurs in an orderly, sustainable, and fiscally responsible manner.

The current Official Plan was adopted by Council on July 8, 1998, and subsequently approved by the Ministry of Municipal Affairs on February 23, 1999. It remains the guiding document for planning decisions in the Township. Official Plan updates are to be completed 2025.

The Plan serves as:

- A visionary document promoting Tay as a "community of communities."
- A policy guide for land use decisions made by Council and the Committee of Adjustment.
- A framework for both public and private sector development, outlining land use designations and principles.
- A tool to ensure that growth is timed and serviced appropriately, avoiding financial strain on municipal resources.
- A planning framework for subdivisions, zoning by-laws, holding zones, and land conveyances.
- A strategy to support established settlement areas, providing for infrastructure and services.
- A means to interpret and implement Provincial legislation, including the Provincial Policy Statement and the County of Simcoe Official Plan, in a way that reflects local needs and authority.

The Official Plan is a legally binding document that influences daily planning decisions. It enables the Township to manage land use effectively, protect community character, and respond to emerging challenges while aligning with broader regional and provincial planning frameworks.

Development Charges Background Study

In 2023, the Township of Tay engaged Hemson Consulting Ltd. to prepare a Development Charges Background Study in accordance with the Development Charges Act, 1997 (DCA) and Ontario Regulation 82/98. These regulations empower Ontario municipalities to recover growth-related capital costs from new development and redevelopment through Development Charges (DCs).

The study serves as a foundational document for passing a new DC bylaw, ensuring compliance with legislative requirements and supporting growth in a fiscally responsible way. Forecasts for the 2024–2033 period indicate a rise in demand for all Township services due to projected population and employment growth.

To meet this demand, the study identifies net capital costs that are directly attributable to anticipated development. These costs are allocated between residential and non-residential development categories, based on their respective contributions to service demand. This allocation ensures a fair and equitable approach to funding infrastructure and public services necessary to accommodate

Over the past 15 years, the Township of Tay has experienced accelerating population and household growth, particularly between the 2016 and 2021 Census periods.

- Population Growth: The Township's population increased from approximately 9,740 in 2008 to an estimated 11,250 in 2024, representing a 15% overall growth.
- Household Growth: The number of occupied private dwelling units grew from roughly 3,880 in 2008 to 4,650 in 2023, an increase of 20% over the period.

The difference between the growth rates for population and dwellings is attributed to a decline in average household size, reflecting broader demographic trends such as aging populations, smaller family units, and lifestyle shifts.

This historical growth underscores the Township's need to plan for continued residential and non-residential development by investing in infrastructure and services. The Development Charges Background Study builds on this context to project future needs and allocate growth-related capital costs fairly, ensuring the Township remains fiscally sustainable while accommodating growth.

By implementing development charges, the Township aims to:

- Ensure growth pays for growth.
- Maintain financial sustainability.
- Support the provision of essential infrastructure.
- Align with the legislative framework set by the DCA and O. Reg. 82/98.

Table 5 Summary of Residential and Non-residential Development Forecast

Growth Forecast	2023 Estimate	DC Planning Period 2024-2033	
		Growth	Total at 2033
Residential			
Total Occupied Dwellings	4,653	552	5,205
Total Population	11,246	722	11,968
Non-Residential			
Employment	1,267	266	1,533

Impact of Growth on Lifecycle Activities

Planning for forecasted population growth may require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they will be integrated into the Township's asset management program.

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.

Levels of Service

The Township of Tay adopted a Strategic Plan for 2019–2022 to guide Council and staff in making informed decisions that reflect the priorities of the community. The Plan was developed following public engagement and staff collaboration and outlines a shared vision for the Township's future through focused, strategic action.

The Township of Tay is a community that is active, open, proud, and resilient. These four pillars define the direction of the Plan and guide municipal priorities and initiatives.

Council and staff identified four strategic themes to support this vision and address the current and future needs of residents and businesses:

Tay Active – Encourage healthy lifestyles by supporting recreation, mobility, and services for youth and seniors.

Tay Open – Promote transparency, enhance communication, and encourage civic engagement through improved access to information and services.

Tay Proud – Foster a strong sense of community identity by investing in cultural, historical, and recreational assets and beautifying public spaces.

Tay Resilient – Strengthen long-term sustainability through effective governance, infrastructure renewal, environmental responsibility, and economic development. On March 22, 2023, the Council reaffirmed the 7 priorities as they remain relevant and thus will continue to be the focus for the 2023-2026 term.

Vision – The Township of Tay is a strong, cohesive rural community. We celebrate and promote our unique history, natural heritage, and recreational amenities as the cornerstone to our quality of life. Our unique villages and towns support a host of events, services and businesses that contribute to growing the local economy and create a unique destination experience for residents and visitors to the community.
Mission – The Township of Tay is committed to delivering responsive and cost-effective municipal services and infrastructure that provide for the long-term economic, social and environmental well-being of our residents and community.

The alignment of the Township of Tay's Strategic Plan with its levels of service is essential to ensuring that municipal operations and infrastructure investments support the long-term goals and priorities of the community. By integrating strategic objectives with defined service standards, the Township can:

- Ensure consistent and measurable service delivery across all departments.
- Allocate resources efficiently to areas of highest community impact.
- Support growth management and development in a way that maintains or enhances quality of life.
- Promote accountability and transparency in decision-making.
- Enable proactive planning for infrastructure renewal and expansion.

This alignment helps the Township remain responsive to changing needs while staying focused on delivering the outcomes that matter most to residents.

Community Engagement

It is considered best practice for municipalities across Canada to conduct periodic resident satisfaction surveys to inform service delivery and strategic planning. The Township is committed to providing accessible and inclusive opportunities for all residents to engage in Township operations and collaborative initiatives. As part of the development of the asset management program, the Township undertook a community engagement survey to gather input from residents. This process was designed to ensure the community's needs, values, and priorities would be reflected.

Key Findings

The public engagement survey highlighted several areas where the Township's service delivery meets community expectations. Winter maintenance and the Tay Shore Trail received particularly strong satisfaction ratings. Residents noted effective snow removal in many rural areas and appreciated the accessibility of trails for year-round use. These services were frequently recognized as assets that enhance daily life and seasonal recreation across the Township.

Bridges, parks, and trail infrastructure also performed well in terms of community satisfaction. Many residents felt that these services are being maintained to a good standard, with the majority indicating that they either meet or exceed expectations. Parks and natural areas were seen as important to community well-being and environmental quality, while the Tay Shore Trail continues to be a valued recreational amenity for all ages. While the survey surfaced helpful suggestions for improvement in areas like drainage, roads, and recreational facilities, the feedback overall reflects a strong appreciation for the Township's efforts to maintain essential services. These results affirm that residents recognize and value the services they rely on most, and they provide a constructive foundation for enhancing service delivery as the community continues to grow and evolve.

Current Levels of Service

The Township has defined their current levels of service for each infrastructure category by breaking it down into 3 service attributes affordable, reliable and sustainable. Each of these attributes are defined as follows:

Affordable – Is a description of how the Township will ensure services are financially affordable to the community.

Reliable – Is a description of how the Township will ensure consistent and dependable service delivery through condition monitoring of infrastructure assets.

Sustainable – Is a description of how the Township will ensure long-term sustainability and is measured utilizing risk.

Based on an analysis of each asset category the current level of service is provided in each asset section. All the community and technical levels of service will be directly linked to the service attributes for each asset category outlined in the appendix.

Proposed Levels of Service

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Township. They were determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals, and long-term sustainability.

The following four scenarios have been considered for establishing target levels of service for all asset categories. This methodology provides a consistent, structured approach.

Scenarios

The scenarios that were used to analyze Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on. Each scenario was then evaluated based on its financial impact on the Township, the resulting overall asset condition, and any anticipated risks associated with the outcomes.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.

Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.

Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.

Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

Results

The Township of Tay is taking a strategic, data-driven approach to ensure the long-term sustainability of its municipal services. By placing a strong emphasis on the condition of infrastructure assets, the Township is working to strike a thoughtful balance between service quality and cost-efficiency, thereby avoiding both over-investment and the risks associated with premature asset failure. The following sections outline the results of each scenario.

Scenario 1: Current Lifecycle Activities

This scenario utilizes the current lifecycle activities outlined as current practice within each asset category.

Table 6 Scenario 1 Current Lifecycle Activities Summary

Asset Category	Current Average Condition	Projected Average Condition	Annual Funding Required
Road Network	Good (72%)	Good (71%)	$1,807,743
Bridges & Culverts	Fair (59%)	Good (78%)	$888,187
Buildings	Fair (41%)	Good (79%)	$745,399
Land Improvements	Good (77%)	Good (79%)	$417,298
Vehicles	Good (76%)	Very Good (80%)	$842,710
Equipment	Good (70%)	Very Good (81%)	$408,283
Storm Network	Very Good (96%)	Good (79%)	$103,683
Wastewater Network	Fair (59%)	Good (78%)	$2,797,269
Water Network	Very Good (83%)	Good (79%)	$2,416,038
Overall	**Good (70%)**	**Good (78%)**	**$10,426,610**

While Scenario 1 ensures a strong state of asset health and minimizes service disruptions, it represents a cost-intensive approach to asset management.

Scenario 2: Current Capital Reinvestment Rate

This scenario utilizes the current average capital reinvestment within each asset category.

Table 7 Scenario 2 Current Capital Reinvestment Summary

Asset Category	Current Average Condition	Projected Average Condition	Funding Required
Road Network	Good (72%)	Fair (40%)	$936,485
Bridges & Culverts	Fair (59%)	Poor (21%)	$186,599
Buildings	Fair (41%)	Very Poor (13%)	$164,140
Land Improvements	Good (77%)	Fair (47%)	$227,885
Vehicles	Good (76%)	Poor (31%)	$366,153
Equipment	Good (70%)	Very Poor (16%)	$78,605
Storm Network	Very Good (96%)	Fair (59%)	$21,277
Wastewater Network	Fair (59%)	Poor (29%)	$681,998
Water Network	Very Good (83%)	Fair (54%)	$1,238,716
Overall	**Good (70%)**	**Poor (38%)**	**$3,901,859**

Maintaining this underfunded investment strategy is not sustainable and will ultimately fail to support the delivery of adequate services to the community.

Scenario 3: Maintain Current Average Condition

This scenario maintains the current average condition of each asset category.

Table 8 Scenario 3 Current Average Condition Summary

Asset Category	Current Average Condition	Projected Average Condition	Funding Required
Road Network	Good (72%)	Good (72%)	$1,807,743
Bridges & Culverts	Fair (59%)	Fair (59%)	$825,604
Buildings	Fair (41%)	Fair (41%)	$418,673
Land Improvements	Good (77%)	Good (77%)	$404,722
Vehicles	Good (76%)	Good (76%)	$818,748
Equipment	Good (70%)	Good (70%)	$354,461
Storm Network	Very Good (96%)	Very Good (96%)	$103,683
Wastewater Network	Fair (59%)	Fair (59%)	$2,077,169
Water Network	Very Good (83%)	Very Good (83%)	$2,416,038
Overall	**Good (70%)**	**Good (70%)**	**$9,226,840**

This scenario allows the Township to minimize long-term risks associated with asset deterioration, while ensuring that service levels remain acceptable.

Scenario 4: Target Average Condition Good

This scenario utilizes the target average condition of Good at 60% for each asset category.

Table 9 Scenario 4 Target Average Condition Summary

Asset Category	Current Average Condition	Projected Average Condition	Funding Required
Road Network	Good (72%)	Good (60%)	$1,488,465
Bridges & Culverts	Fair (59%)	Good (60%)	$825,604
Buildings	Fair (41%)	Good (60%)	$664,976
Land Improvements	Good (77%)	Good (60%)	$350,208
Vehicles	Good (76%)	Good (60%)	$637,038
Equipment	Good (70%)	Good (60%)	$293,252
Storm Network	Very Good (96%)	Good (60%)	$67,587
Wastewater Network	Fair (59%)	Good (60%)	$2,178,217
Water Network	Very Good (83%)	Good (60%)	$1,580,485
Overall	**Good (70%)**	**Good (60%)**	**$8,085,832**

This represents a balanced approach that maintains infrastructure in a state of good repair.

Summary (Scenario 4)

Tay Township is making significant strides in improving the accuracy of its asset management system, which is crucial for better decision-making regarding capital requirements and long-term sustainability.

As part of this improved asset management framework, the Township is targeting an average asset condition of Good (approximately 60%). This strategic target has enabled a reduction in the target annual capital requirements by approximately 22% compared to the lifecycle scenario 1, positioning the Township to reach a sustainable funding level more quickly, while continuing to deliver reliable services that meet the evolving needs of the community.

With respect to water and wastewater infrastructure, the Township will be undertaking a comprehensive inventory review,with condition assessments and rate study are planned, completion anticipated by 2028. The results of these assessments will be incorporated into the Township's asset management program and used to inform updated levels of service and future capital planning.

Financial Management

Each year, the Township makes important investments in its infrastructure's maintenance, renewal, rehabilitation, and replacement to ensure assets remain in a state of good repair. However, spending needs typically exceed fiscal capacity. In fact, most municipalities continue to struggle with annual infrastructure deficits. Achieving full-funding for infrastructure programs will take many years and should be phased-in gradually to reduce burden on the community.

Financial Strategy Overview

This financial strategy is designed for the Township's existing asset portfolio and is premised on two key inputs: the average annual capital requirements and the average annual funding typically available for capital purposes. The annual requirements are based on the replacement cost of assets and their serviceable life, and where available, lifecycle modeling. This figure is calculated for each individual asset and aggregated to develop category-level values.

The annual funding typically available is determined by averaging historical capital expenditures on infrastructure, inclusive of any allocations to reserves for capital purposes. For Tay, the proposed spending of 2025 values were used to project available funding.

Only reliable and predictable sources of funding are used to benchmark funds that may be available on any given year. The funding sources include:

- Revenue from taxation allocated to reserves for capital purposes.
- The Canada Community Benefits Fund (CCBF)
- The Ontario Community Infrastructure Fund (OCIF)

Although provincial and federal infrastructure programs can change with evolving policy, CCBF and OCIF are considered as permanent and predictable.

Annual Capital 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.

The table below outlines the total average annual capital requirements for existing assets in each asset category. Based on the proposed levels of service selected to maintain an average condition of Good at 60% for all asset categories.

Table 10 Average Annual Capital Requirements

Asset Category	Replacement Cost	Funding Required
Road Network	$57,764,692	$1,488,465
Bridges & Culverts	$29,363,888	$825,604
Buildings	$33,027,653	$664,976
Land Improvements	$12,365,602	$350,208
Vehicles	$11,997,651	$637,038
Equipment	$4,461,439	$293,252
Storm Network	$10,368,310	$67,587
Wastewater Network	$101,588,977	$2,178,217
Water Network	$132,743,689	$1,580,485
Overall	**$393,681,901**	**$8,085,832**

Current Funding Levels

At existing levels, the Township is funding 48% of its annual capital requirements for all infrastructure analyzed for Scenario 4, a target average condition of Good. This creates a total annual funding deficit of $4.2 million. Table 10 summarizes how current capital funding levels compare with funding required for each asset category.

Table 10 Current Funding Position vs Required Funding

Asset Category	Annual Capital Requirements	Annual Funding Available	Annual Infrastructure Deficit
Road Network	$1,488,465	$936,485	$551,980
Bridges & Culverts	$825,604	$186,599	$639,004
Buildings	$664,976	$164,140	$500,836
Land Improvements	$350,208	$227,885	$122,323
Vehicles	$637,038	$366,153	$270,885
Equipment	$293,252	$78,605	$214,647
Storm Network	$67,587	$21,277	$46,310
Wastewater Network	$2,178,217	$681,998	$1,496,219
Water Network	$1,580,485	$1,238,716	$341,769
Overall	**$8,085,832**	**$3,901,859**	**$4,183,973**

Closing the Gap

Eliminating annual infrastructure funding shortfalls is a difficult and long-term endeavor for municipalities. Considering the Township's current funding position, it will require many years to reach full funding for current assets.

This section outlines how the Township of Tay can close the annual funding deficits using own-source revenue streams, i.e., property taxation and without the use of additional debt for existing assets.

Full Funding Requirements

In 2025, Tay will have an approximate annual tax revenue of $11,548,722. Without consideration of any other sources of revenue or cost containment strategies, full funding would require a 20.3% tax change.

To achieve this increase, several scenarios have been developed using phase-in periods ranging from 5 to 20 years. Shorter phase-in periods may place too high a burden on taxpayers, whereas a phase-in period beyond 20 years may see a continued deterioration of infrastructure, leading to larger backlogs.

Table 11 Phasing in Annual Tax Increases

Total % Increase Needed in Annual Property Taxation Revenues	Phase-in Period			
	5 Years	10 Years	15 Years	20 Years
20.3%	3.8%	2.0%	1.2%	0.9%

For the water rate funding, the water rate revenue in 2025 is estimated to be $3.1 million. Without consideration of any other sources of revenue or cost containment strategies, full funding would require a 10.9% water rate change over time according to the asset management system forecast.

Table 11 Phasing in Annual Water Rate Increases

Total % Increase Needed in Annual Water User-Rate Revenues	Phase-in Period			
	5 Years	10 Years	15 Years	20 Years
10.9%	2.1%	1.0%	0.7%	0.5%

For the wastewater rate funding, the sanitary rate funding is estimated to be $2.8 million. Without consideration of any other sources of revenue or cost containment strategies, full funding would require a 52.7% wastewater rate change over time according to the asset management system.

Table 11 Phasing in Annual Tax Increases

Total % Increase Needed in Annual Wastewater User-Rate Revenues	Phase-in Period			
	5 Years	10 Years	15 Years	20 Years
52.7%	8.8%	4.3%	2.9%	2.1%

Funding 100% of annual capital requirements ensures that major capital events, including replacements, are completed as required. Under this scenario, projects are unlikely to be deferred to future years. This delivers the chosen proposed level of service for the community.

Ten-Year Financial Plan

The Township is working with a clear long-term financial strategy aimed at reaching sustainable funding levels for its infrastructure services in 10-years and with that sustainable level of funding in 2034 the Township is still operating with an infrastructure deficit. The table below shows a 10-year capital projection for each asset category, maintaining levels of service at Good-60%.

Table 12 Ten-Year Financial Plan-Scenario 4

Asset Category	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Road Network	$585k	$726k	$173k	$367k	$959k	$1.6m	$1.8m	$2.3m	$2.0m	$1.3m
Bridges & Culverts	-	$3.6m	$2.7m	$1.4m	-	$1.2m	$1.2m	-	-	$4.6m
Buildings	$7.0m	$5.3m	-	-	-	-	-	-	-	$798k
Land Improvements	-	-	-	-	-	-	$536k	$490k	$496k	$452k
Vehicles	-	-	-	-	$416k	$589k	$1.4m	$359k	$1.9m	$392k
Equipment	-	$428k	$803k	-	$365k	-	$204k	$194k	$266k	$252k
Storm Network	-	-	-	-	-	-	-	-	-	-
Wastewater Network	$588k	$6.7m	-	-	$1.3m	$6.0m	$746k	$5.4m	$1.7m	$1.4m
Water Network	-	-	-	-	-	-	-	-	-	-
Overall Tax Funded Total	**$7.6m**	**$10.0m**	**$3.7m**	**$1.7m**	**$1.7m**	**$3.5m**	**$5.2m**	**$3.3m**	**$4.6m**	**$7.8m**
Overall Rate Funded Total	**$588k**	**$6.7m**	-	-	**$1.3m**	**$6.0m**	**$746k**	**$5.4m**	**$1.7m**	**$1.4m**

The current 10-year program, based off of Scenario 4 funding requirements, has a tax funding requirement of $49.2 million over the ten years, while proposed available funding level will be $31 million. There will still be a need to continue with current practices of prioritizing and deferring projects, unless the Township decides to utilize debt funding or is successful in obtaining one-time grants. With respect to water and wastewater infrastructure, the Township will be undertaking a comprehensive inventory review and rate study, with completion anticipated by 2028. The results of these assessments will be incorporated into the Township's asset management program and used to inform updated levels of service and future capital planning.

Recommendations

Financial Strategies

Review feasibility of adopting a full-funding scenario that achieves 100% of average annual requirements for the asset categories analyzed. This involves:

- Implementing a 2.0% annual increase in contributions for tax-funded assets over the 10 -year phase-in period.
- Continued allocation of CCBF & OCIF funding as previously outlined.
- Consider implementing a 2.6% rate increase for water and wastewater rate funded assets over the 20-year phase-in period. This increase is additional to the annual increases identified in the 2017 rate study. With the potential to be amended once current rate study is completed in 2028.

Asset Data

1. A full inventory review and alignment with construction drawings and the GIS system for the storm, water and wastewater systems.
2. Continuously review, refine, and calibrate lifecycle and risk profiles to better reflect actual practices and improve capital projections. In particular:
   - the timing of various lifecycle events, the triggers for treatment, anticipated impacts of each treatment, and costs
   - the various attributes used to estimate the likelihood and consequence of asset failures, and their respective weightings.
3. Asset management planning is highly sensitive to replacement costs. Periodically update replacement costs based on recent projects, invoices, or estimates, as well as condition assessments, or any other technical reports and studies. Accurately estimating the replacement cost of like-for-like assets can be challenging. Staff judgment and historical data can help attenuate extreme and temporary fluctuations in cost estimates and keep them realistic.

Risk and Levels of Service

1. Risk models and matrices can play an important role in identifying high-value assets, and developing an action plan which may include repair, rehabilitation, replacement, or further evaluation through updated condition assessments. As a result, project selection and the development of multi-year capital plans can become more strategic and objective.
2. The annual review requirement in O.reg. 588/17 the Township must address their progress in implementing its asset management plan, any factors impeding the ability to implement its asset management plan as well as a strategy to address any of the identified factors.

Appendix A: Road Network

State of the Infrastructure

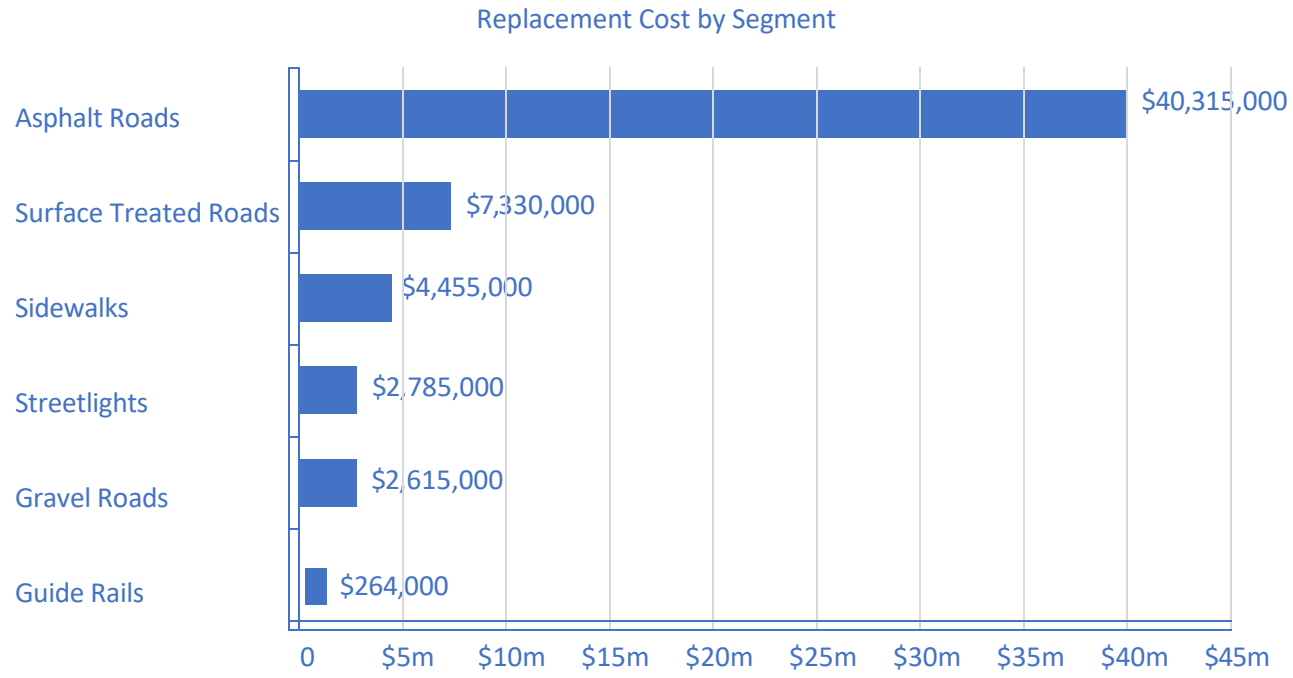
The road network is a critical component of the provision of safe and efficient transportation services and represents the highest value asset category in the Township's tax funded asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure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

The Township's roads and sidewalks are maintained by the Operations Department who is also responsible for winter ice control and snow clearing/removal operations of Township roads.

Inventory & Valuation

The figure below displays the replacement cost of each asset segment in the Township's Road inventory.

Figure 10 Road Network Replacement Value

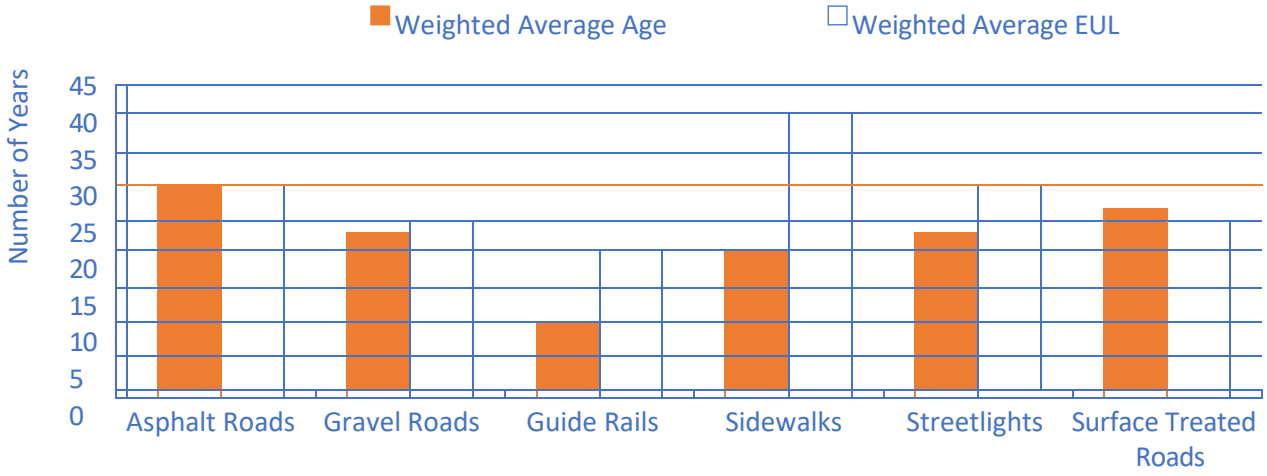


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

Asset Condition & Age

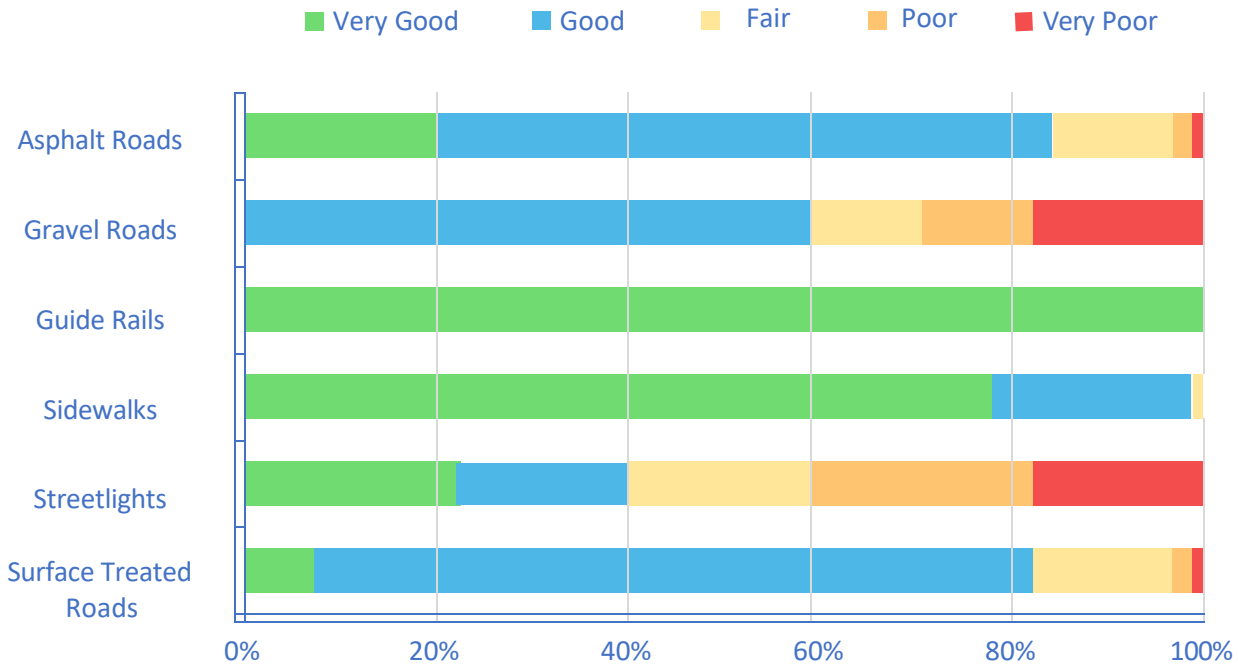
The graph below identifies the average age, and the estimated useful life for each asset segment. It is all weighted by replacement cost.

Figure 11 Road Network Average Age vs Average EUL



The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

Figure 12 Road Network Condition Breakdown



To ensure that the Township's roads continue 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 roads.

Each asset's estimated useful life should also 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.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is the roads are assessed by staff internally to set priorities based on the current state.

The condition scale for roads utilized is from 0 to 100 from Very Poor to Very Good.

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 lifecycle strategies have been developed as a proactive approach to managing the lifecycle of Township owned 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.

Figure 13 Roads Current Lifecycle Strategy

Maintenance and Rehabilitation

Regular inspections, along with mill & pave, double surface treatment, and adding 50-75mm of gravel for asphalt, surface treated, and gravel roads respectively.

Replacement

Road replacement prioritization is determined by consideration of growth, risk, condition, health, and safety, and social impact. Replacement entails full reconstruction.

Table 13 Asphalt Roads Lifecycle Events

Asphalt Roads		
Event Name	**Event Class**	**Event Trigger**
Mill & Pave	Rehabilitation	45 to 55 Condition
Full Reconstruction	Replacement	0 to 20 Condition

Figure 14 Asphalt Roads Lifecycle Model

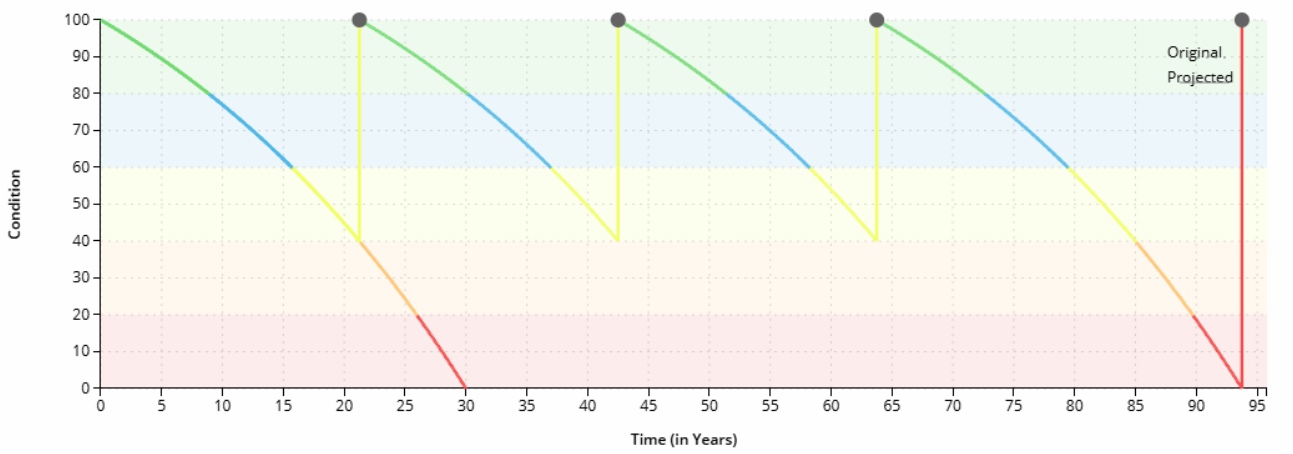


Table 14 Surface Treated Roads Lifecycle Events

Surface Treated Roads		
Event Name	**Event Class**	**Event Trigger**
Double Surface Treatment (DST)	Rehabilitation	20 to 30 Condition
Full Reconstruction	Replacement	0 to 20 Condition

Figure 15 Surface Treated Roads Lifecycle Model

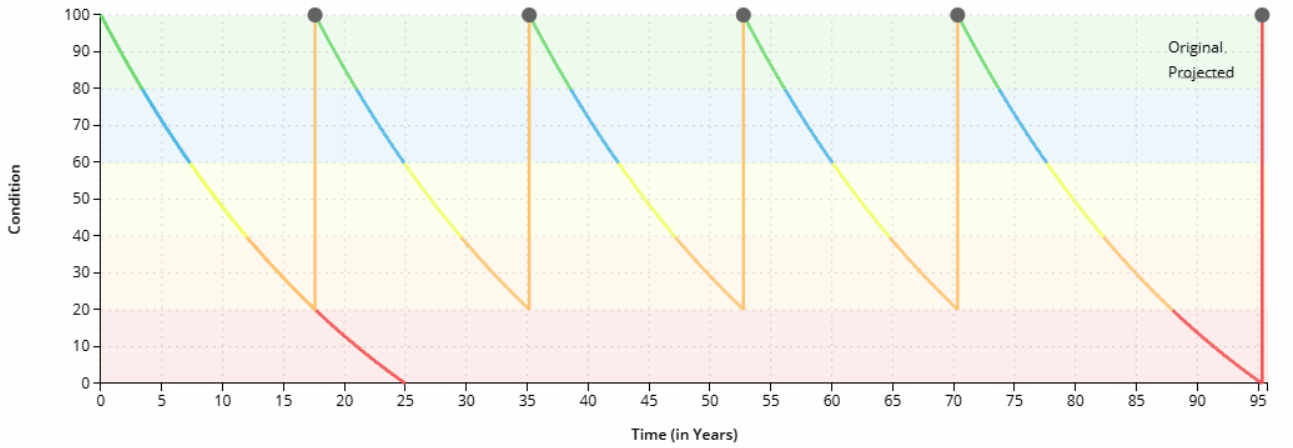
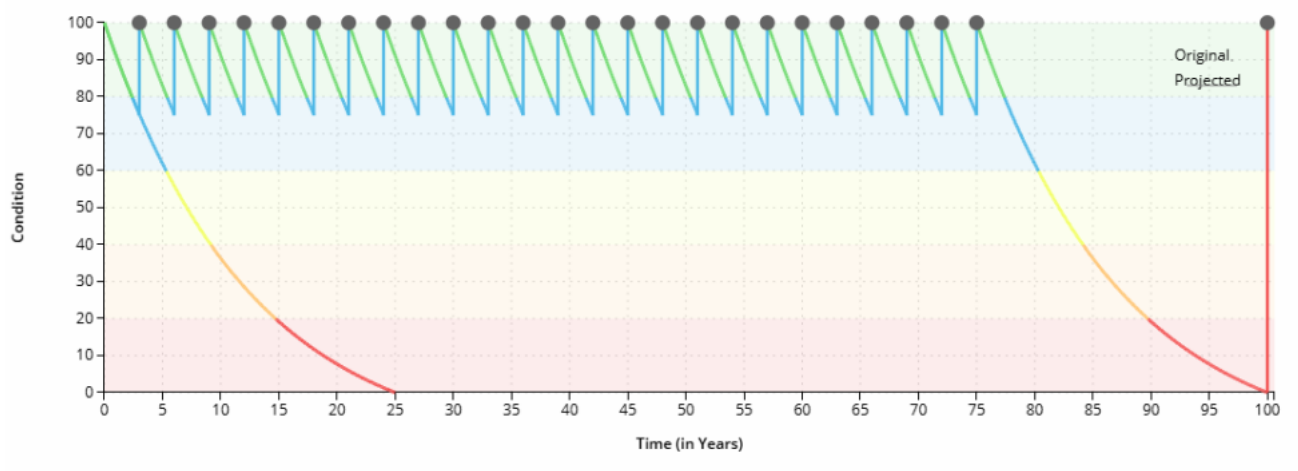


Table 15 Gravel Roads Lifecycle Events

Gravel Roads		
Event Name	**Event Class**	**Event Trigger**
50-75mm of Gravel Added	Rehabilitation	75 to 80 Condition Repeat every 3 years
Full Reconstruction	Replacement	0 to 20 Condition

Figure 16 Gravel Roads Lifecycle Model



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 available inventory data. See Appendix K: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

Figure 17 Road Network Risk Matrix

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$27,021,758 (50%)	$9,092,233 (17%)	$5,427,080 (10%)	$9,992,396 (19%)	$2,289,983 (4%)

This is a high-level model developed by municipal staff and it should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

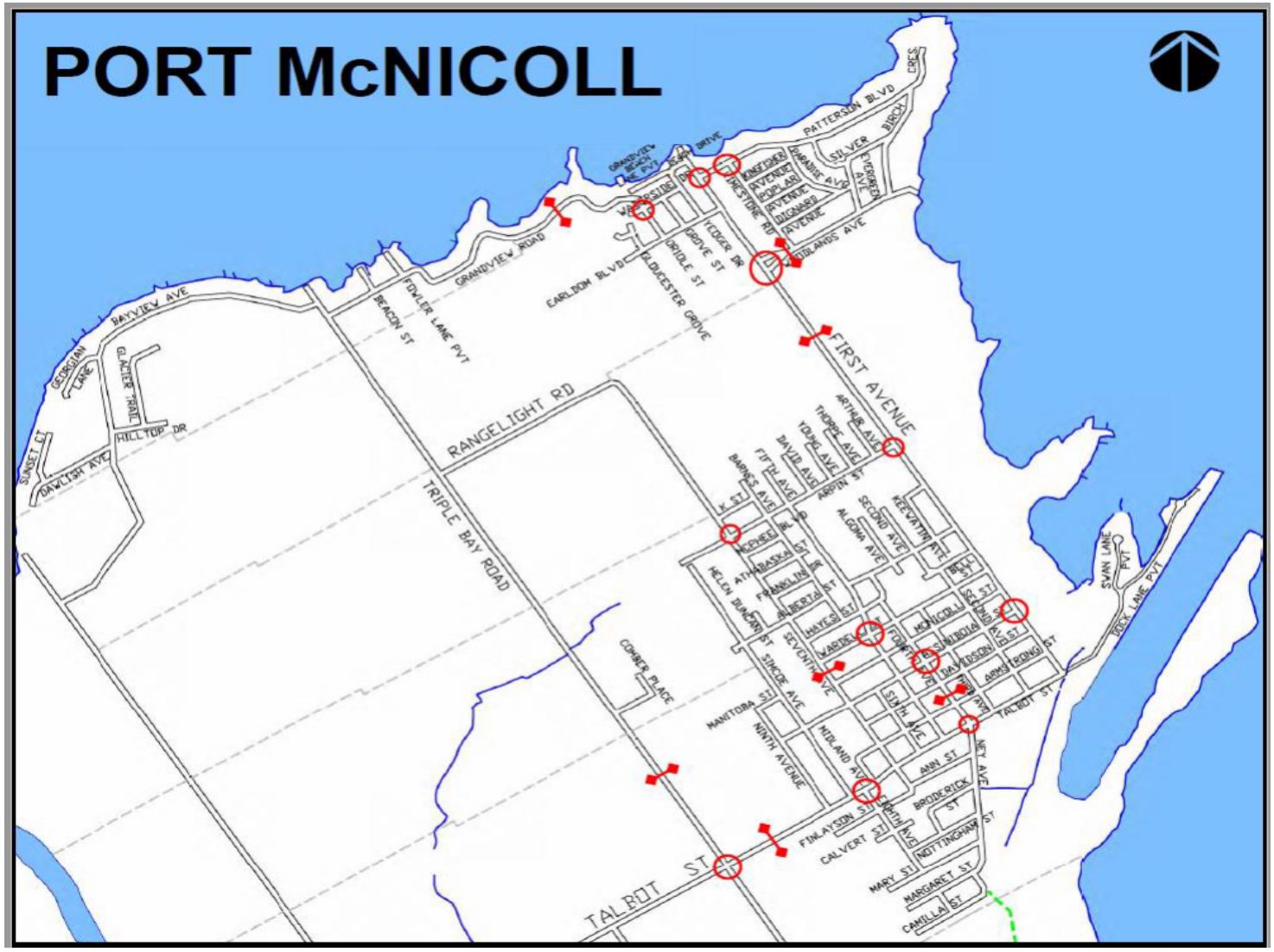
Current Levels of Service

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.

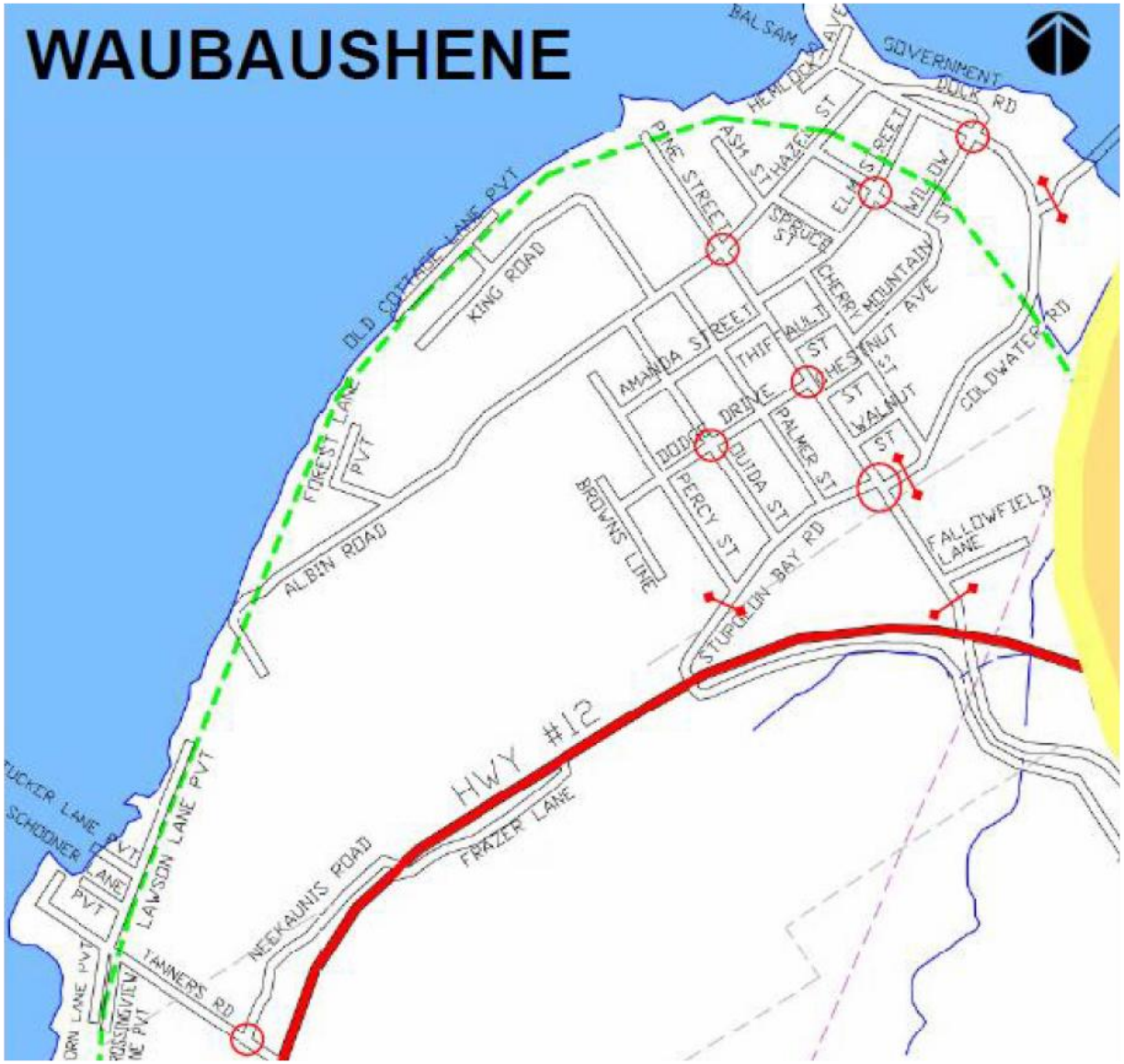
Table 16 Road Network Current Level of Service

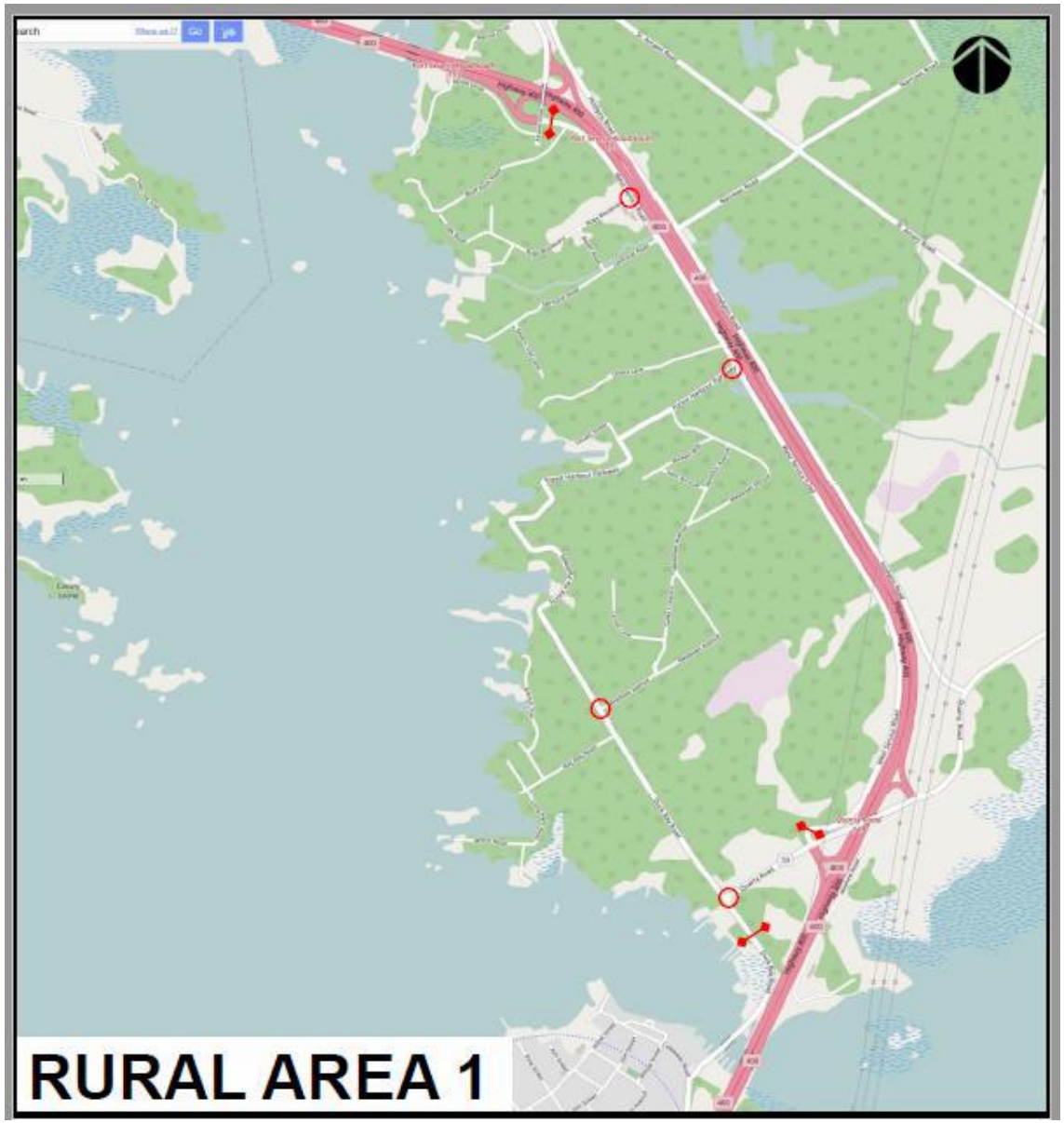
Community LOS		Service Attribute	Technical LOS	
Description, which may include maps, of the road network in the municipality and its level of connectivity	See Figure 18 Maps of Roads	Sustainable	% Risk that is High and Very High	23%
			Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km2)	0
			Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km2)	0
			Lane-km of local roads (MMS classes 5 and 6) per land area (km/km2)	0.001
		Affordable	Replacement Cost	$57,764,692
			Annual reinvestment	$936,485
			Capital reinvestment rate	1.62%
Description or images that illustrate the different levels of road class pavement condition	The Township staff provide surface condition with a rating as follows: 0 – 20 Very Poor 20 – 40 Poor 40 – 60 Fair 60 – 80 Good 80 – 100 Very Good	Reliable	Average pavement condition index for paved roads in the municipality	Good (74%)
			Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Fair (54%)
			Average Condition	Good (72%)
			% Condition > Fair	94%
			% Condition poor and very poor	6%

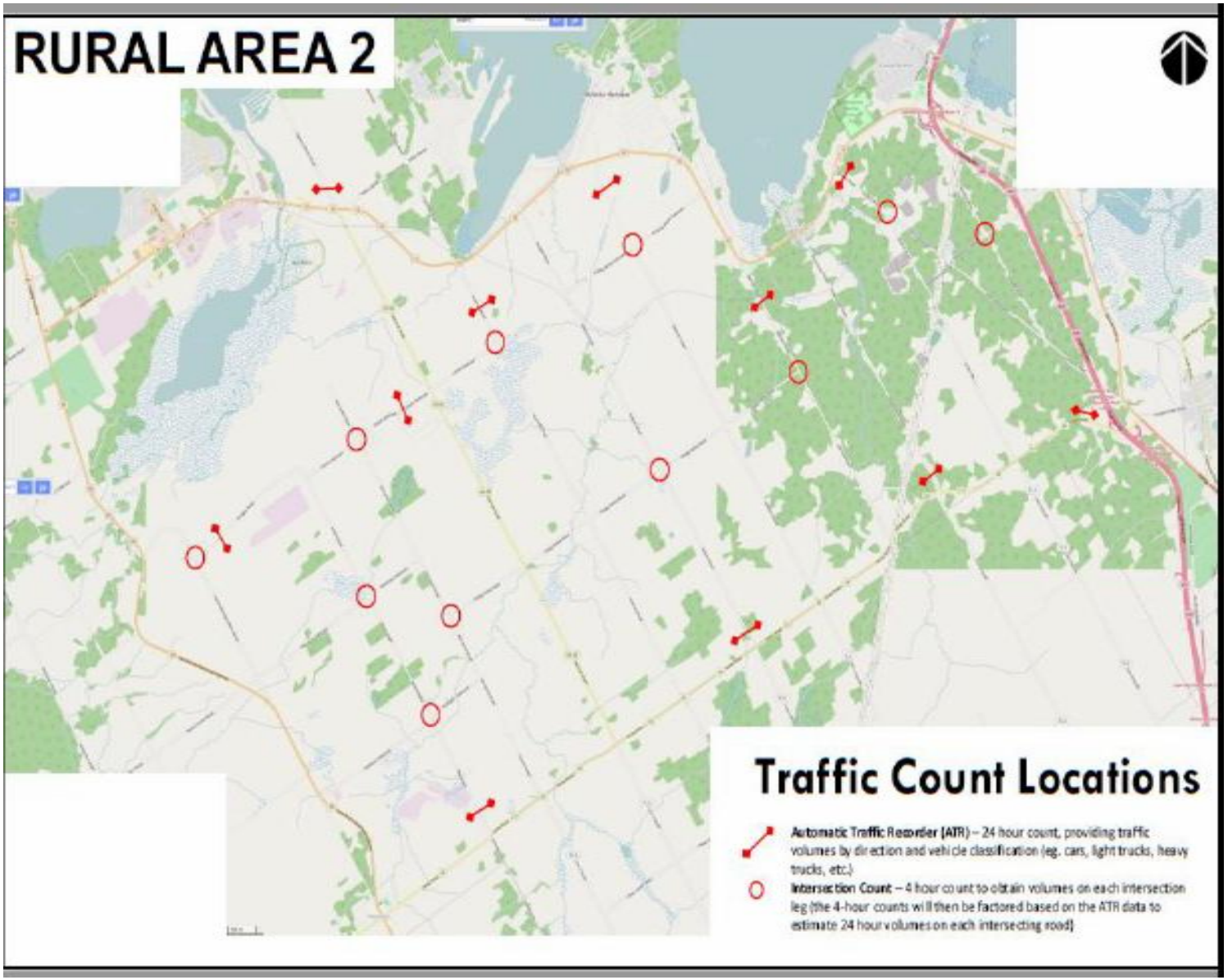
Figure 18 Maps of Roads




VICTORIA
HARBOUR
ROBINS POINT ROAD
HIGHWAY 12


WAUBAUSHENE
BALSAM AVE
GOVERNMENT DOCK RD
HEMLOCK ST
ASH ST
HAZEL ST
ELM ST
WILLOW ST
PINE STREET
SPRUCE ST
CHERRY MOUNTAIN AVE
OLD COTTAGE LANE PVT
KING ROAD
AMANDA STREET
THIRD AVE
HESTNUT ST
WALNUT ST
COLDWATER RD
FOREST LANE PVT
ALBIN ROAD
DODDS DRIVE
PALMER ST
DUDA ST
PERCY ST
BROWNS LINE
STUPICH BAY RD
FALLOWFIELD LANE
HWY #12
FRAZER LANE
NEEKAUNIS ROAD
TANNERS RD
LAWSON LANE PVT
PVT


RURAL AREA 1


RURAL AREA 2
Traffic Count Locations
Automatic Traffic Recorder (ATR) – 24 hour count, providing traffic volumes by direction and vehicle classification (eg. cars, light trucks, heavy trucks, etc.)
Intersection Count – 4 hour count to obtain volumes on each intersection leg (the 4-hour counts will then be factored based on the ATR data to estimate 24 hour volumes on each intersecting road)

Proposed Levels of Service

The road network has been in field inspected by staff in 2024 as well as the assets have been better aligned with the road segments intersection to intersection.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the Road Network.

Table 17 Scenario Results Summary

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$55,149,548	Good (71%)	$1,807,743
Scenario 2 - Current Capital Investment Rate	$55,149,548	Fair (40%)	$936,485
Scenario 3 - Maintain Current Condition	$55,149,548	Good (72%)	$1,807,743
Scenario 4 - Maintain Condition Target	$55,149,548	Good (60%)	$1,488,465

Gravel roads are not included in this forecast as they are managed through the operations and considered to never need replacement due to the preventative maintenance activities performed.

The recommended scenario for the road network is Scenario 4 maintain a target average condition of Good.

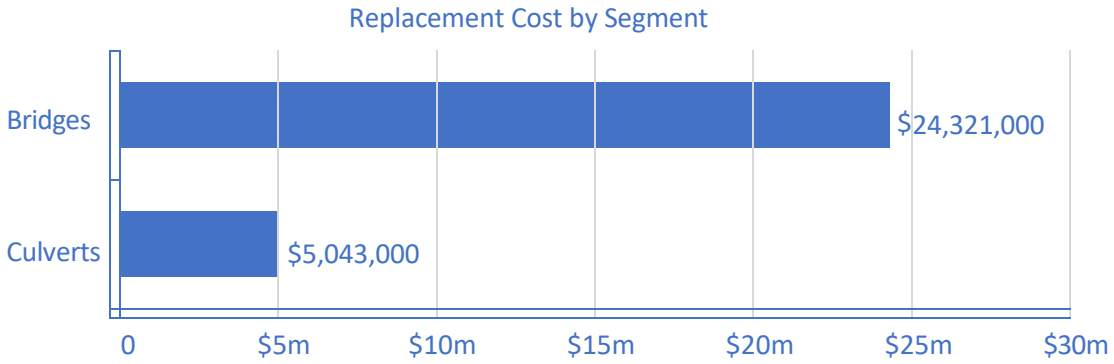
Appendix B: Bridges & Culverts

The Township owns 9 bridges and 6 culverts. Bridges are further categorized as either road bridges or trail bridges, and the asset inventory includes 6 road bridges that are used by motorized vehicles and 3 trail bridges only accessible to non-motorized vehicles or foot traffic.

Inventory & Valuation

The figure below displays the replacement cost of each asset segment in the Township's bridges and culverts inventory.

Figure 19 B&C Replacement Cost

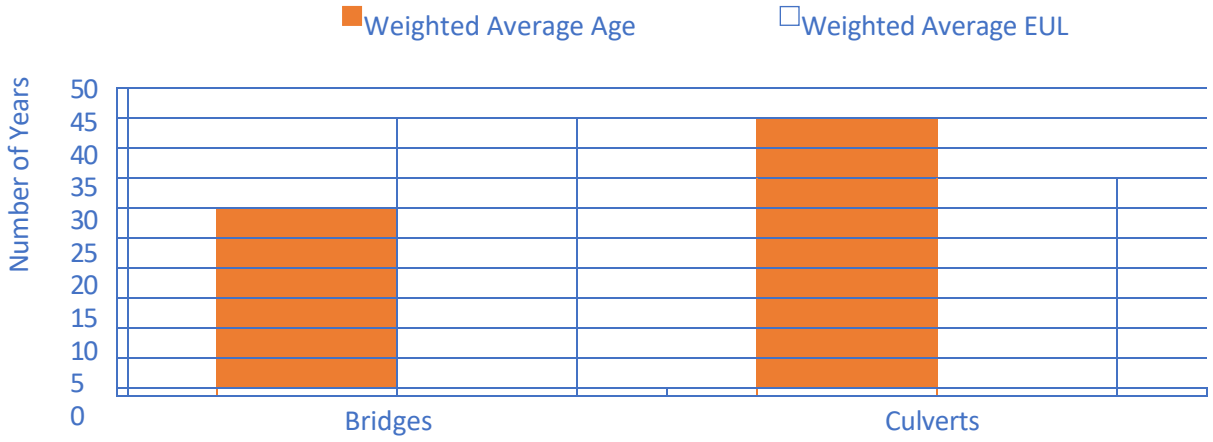


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed.

Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

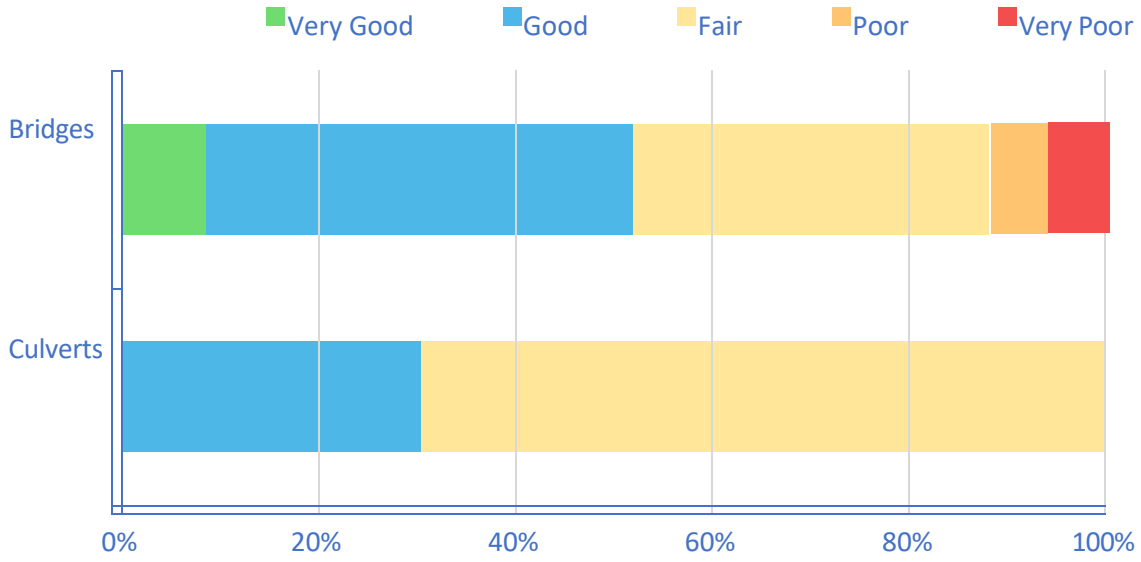
Figure 20 B&C Average Age vs Average EUL



The Bridge Code includes theoretical useful lives by structure type. With proper maintenance, the anticipated service life of a bridge is 75 years, and a culvert is between 35-50 years. For the purposes of asset management, we have assumed a

50-year life for road bridges and culverts, and a 75-year life for trail bridges. The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

Figure 21 B&C Condition Breakdown



To ensure that the Township's bridges & culverts continue to provide an acceptable level of service, staff should monitor the average condition. If the average condition declines, the Township 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 and culverts.

Each asset's Estimated Useful Life should also 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.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Tay's current approach is to assess all bridges and culverts with a span greater than or equal to 3 meters every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM).

The condition scale for bridges and culverts utilized is from 0 to 100 from Very Poor to Very Good. See the following images as examples of bridges in good condition as well as culverts in Fair condition.

Figure 22 OSIM Bridges & Culverts Map

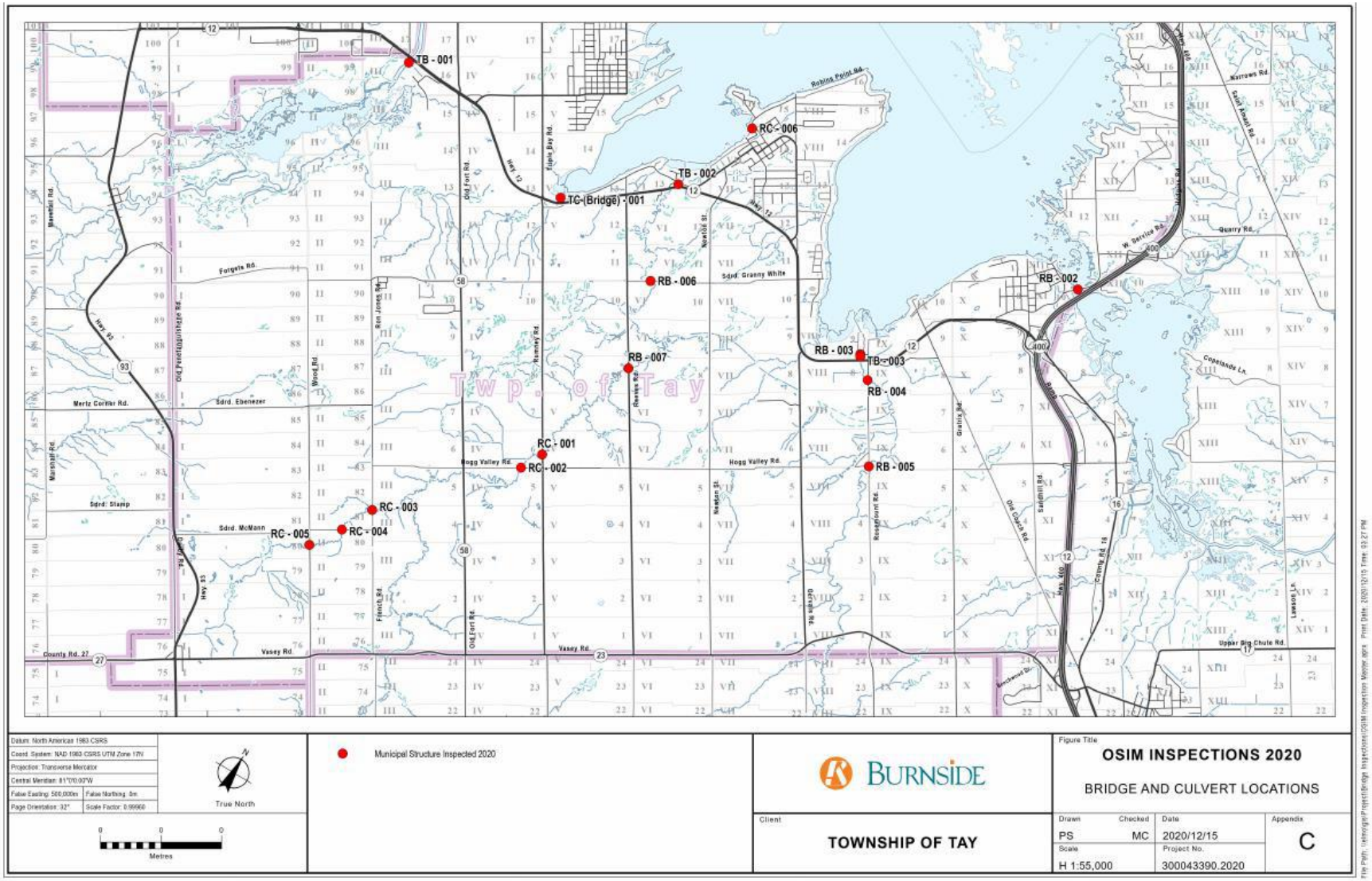


Figure 23 Bridges and Culverts Condition Images

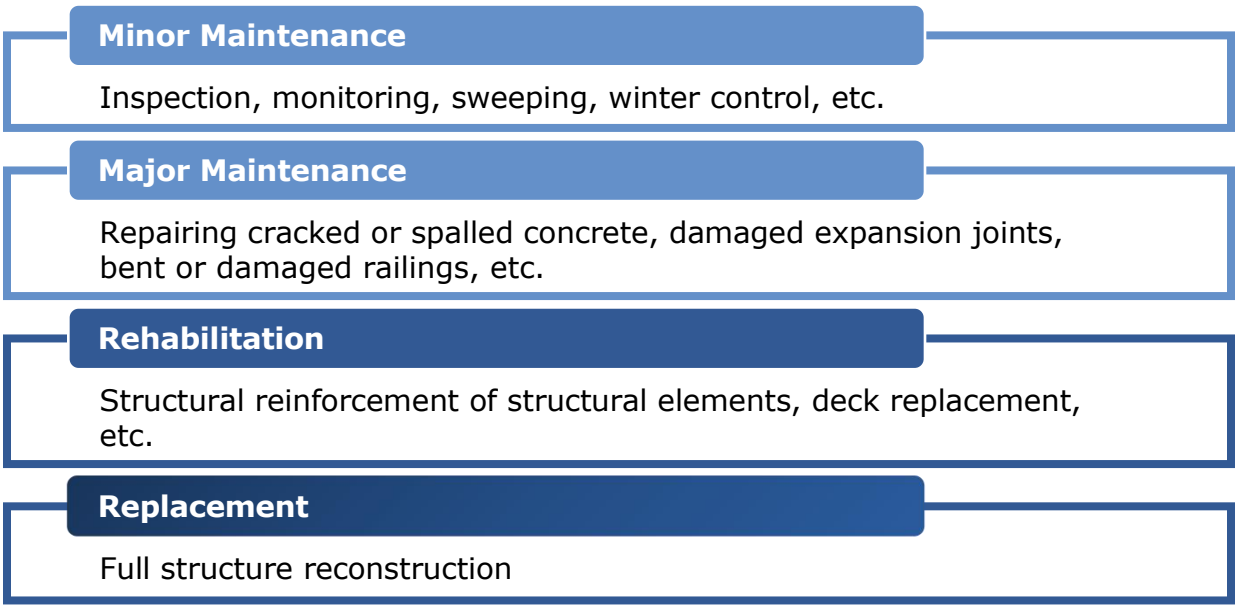
Image of a Bridge in Good Condition

Image of a Culvert in Fair Condition

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. Figure 24 outlines the current lifecycle management strategy.

Figure 24 B&C Current Lifecycle Strategy



Risk & Criticality

The 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 available inventory data. See Appendix K: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

This is a high-level model developed by municipal staff and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

Figure 25 B&C Risk Matrix

1 - 4 Very Low - (0%)	5 - 7 Low $1,663,688 (6%)	8 - 9 Moderate $10,971,310 (37%)	10 - 14 High $7,922,566 (27%)	15 - 25 Very High $8,806,324 (30%)

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

The following tables identify the Township's current level of service for the municipal 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.

Table 19 B&C Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	Bridges and culverts are a key component of the municipal transportation network.		% Risk that is High and Very High	57%
		Sustainable	% of bridges in the Municipality with loading or dimensional restrictions	0%
		Affordable	Replacement Cost	$29,363,888
			Annual reinvestment	$888,187
			Capital reinvestment rate	3.02%
Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Figure 23 Bridges and Culverts Condition Images	Reliable	Average bridge condition index value for bridges in the Municipality	Good (60%)
			Average bridge condition index value for structural culverts in the Municipality	Fair (56%)
			Average Condition	Good (69%)
			% Condition > Fair	90%
			% Condition poor and very poor	10%

Proposed Levels of Service

The scenarios that were used to analyse Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the municipal bridges and culverts.

Table 20 Bridges & Culverts Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$29,363,888	Good (78%)	$888,187
Scenario 2 - Current Capital Investment Rate	$29,363,888	Poor (21%)	$186,599
Scenario 3 - Maintain Current Condition	$29,363,888	Fair (59%)	$825,604
Scenario 4 - Maintain Condition Target	$29,363,888	Good (60%)	$825,604

The recommended scenario for bridges and culverts is Scenario 4 maintain a target average condition of Good.

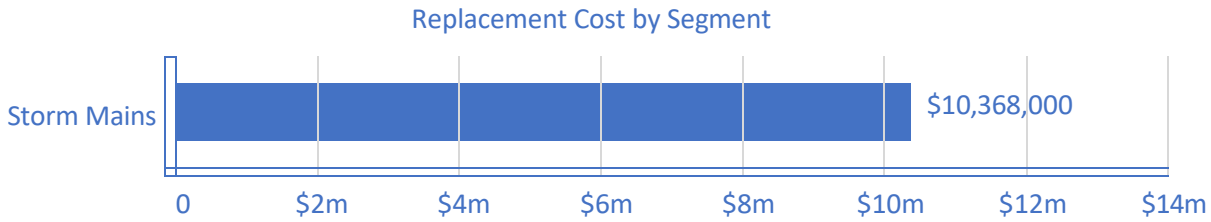
Appendix C: Storm Network

The Township is responsible for owning and maintaining a storm system in the community which is generally made up of storm mains, catch basins, and manholes.

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Tay's Storm network inventory.

Figure 26 Storm Network Replacement Cost

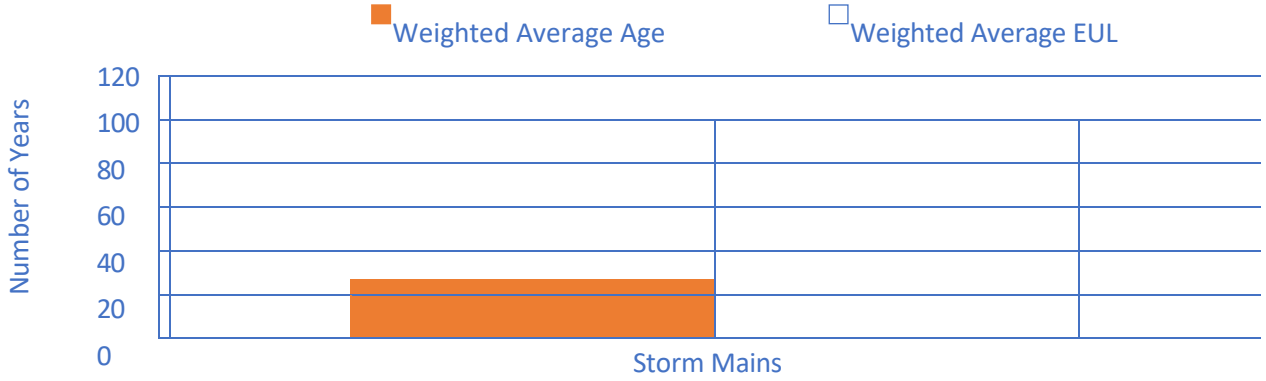


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

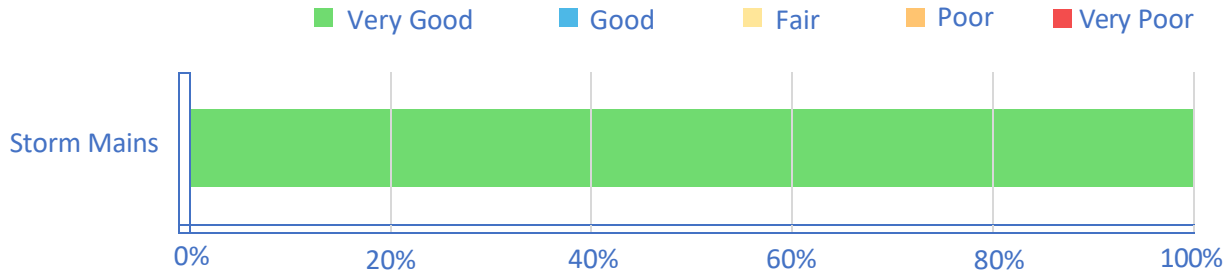
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 27 Storm Network Average Age vs Average EUL



The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

Figure 28 Storm Network Condition Breakdown



To ensure that the municipal Storm network continue 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 assets. Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is that assets currently only get assessed if in line with a road project or an issue has occurred.

Lifecycle Management Strategy

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.

Figure 29 Storm Network Current Lifecycle Strategy

Minor Maintenance

Inspection, monitoring, cleaning and flushing, zoom camera and CCTV inspections, etc.

Major Maintenance

Repairing manholes and replacing small sections of pipe, etc.

Rehabilitation

Structural lining of pipesare cost effective and may extend the useful life upto 75 or more years.

Replacement

Pipe replacement

Risk & Criticality

The 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 available inventory data. See Appendix K: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

Figure 30 Storm Network Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$10,368,310 (100%)	- (0%)	- (0%)	- (0%)	- (0%)

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

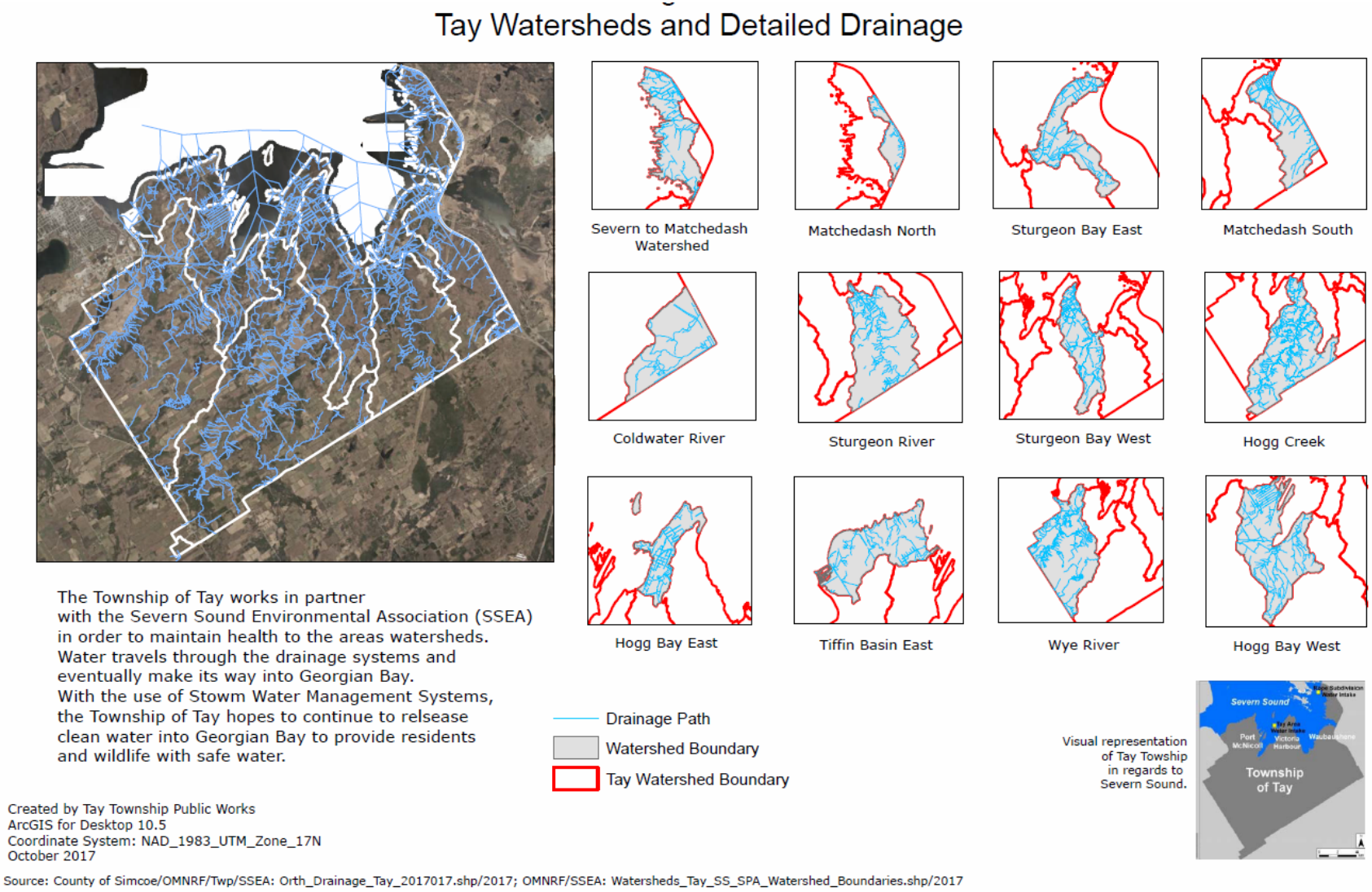
Current Levels of Service

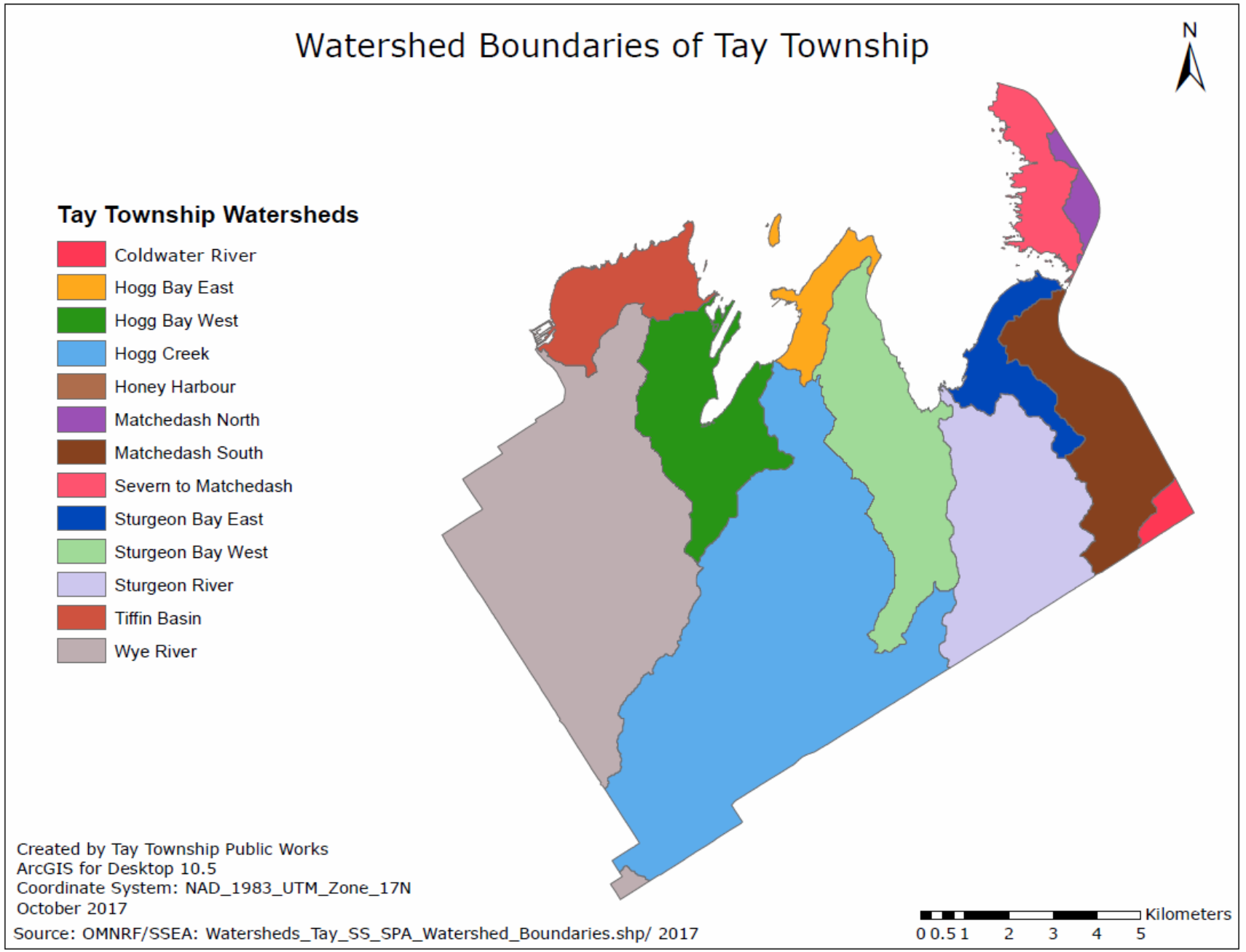
The following tables identify the Township's current level of service for the Storm Network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected.

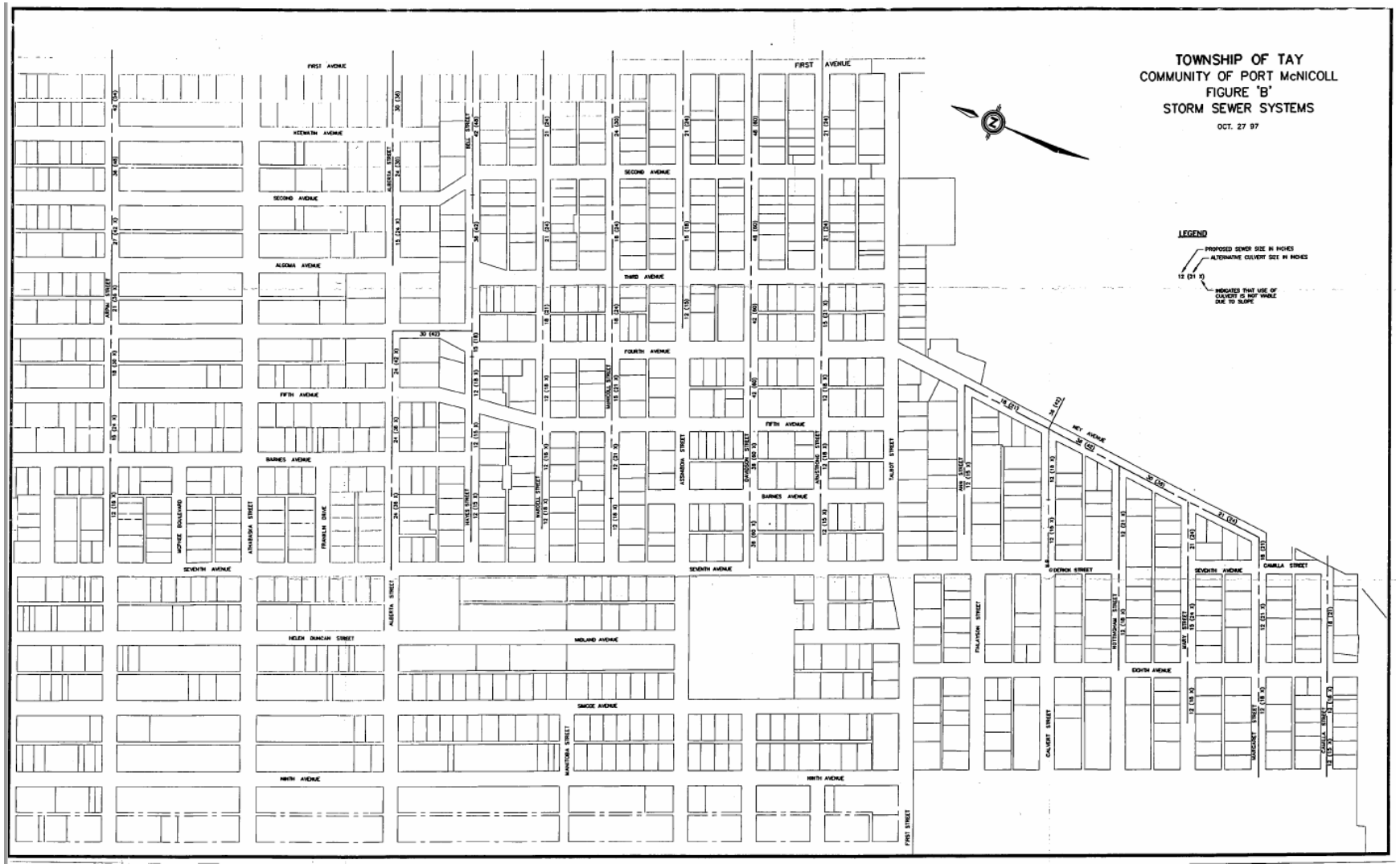
Table 22 Storm Network Current Levels of Service

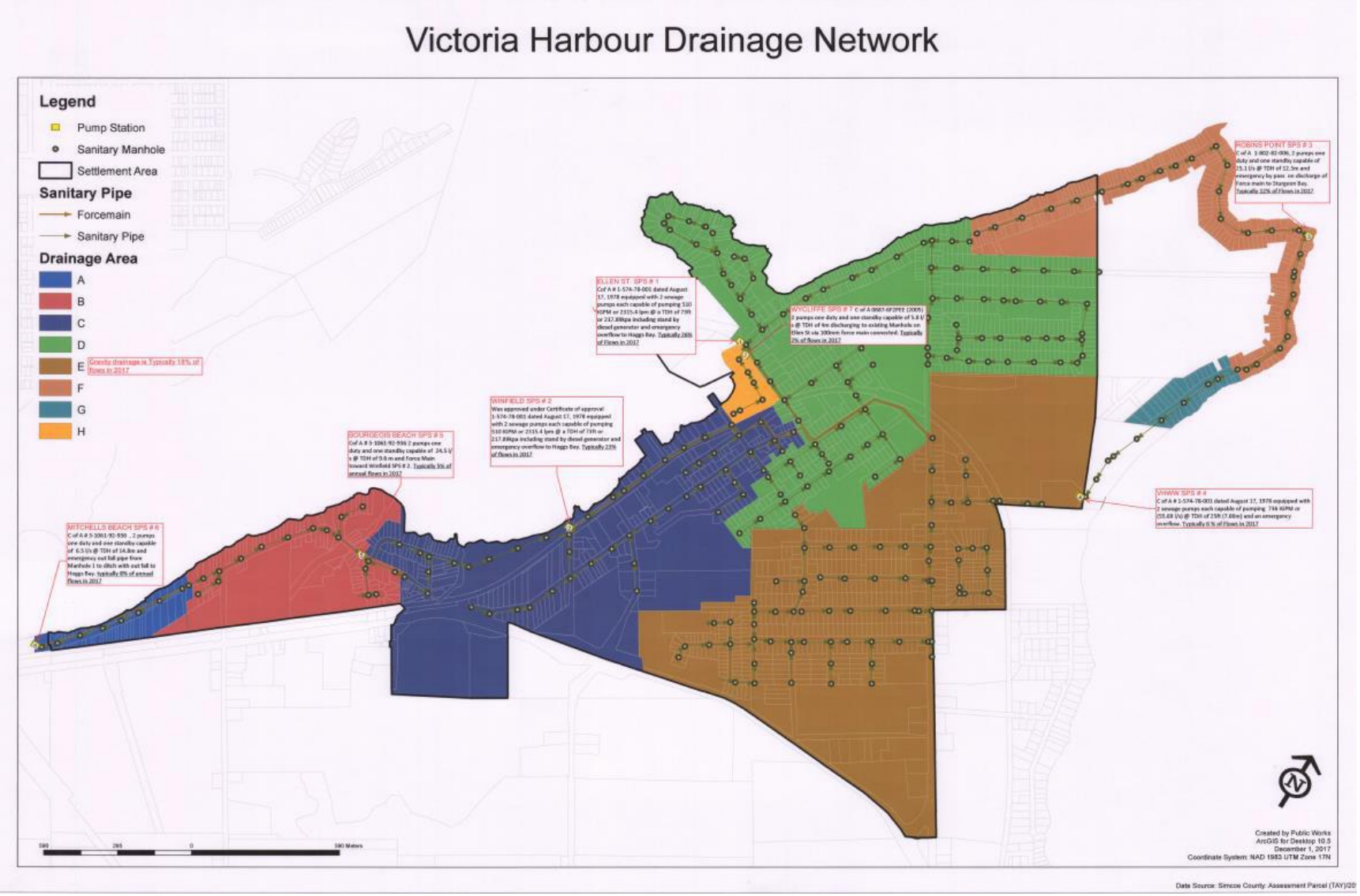
Community LOS		Service Attribute	Technical LOS	
Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal storm sewer system	See Figure 31 Maps of Storm Network	Sustainable	% Risk that is High and Very High	0%
			% of properties in municipality resilient to a 100-year storm	40%
			% of the municipal storm sewer management system resilient to a 5-year storm	65%
		Affordable	Replacement Cost	$10,368,310
			Annual reinvestment	$103,683
			Capital reinvestment rate	1.00%
Description of the condition of the storm network	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Reliable	Average Condition	Very Good (96%)
			% Condition > Fair	100%
			% Condition poor and very poor	0%

Figure 31 Maps of Storm Network




Watershed Boundaries of Tay Township
N
Tay Township Watersheds
Coldwater River
Hogg Bay East
Hogg Bay West
Hogg Creek
Honey Harbour
Matchedash North
Matchedash South
Severn to Matchedash
Sturgeon Bay East
Sturgeon Bay West
Sturgeon River
Tiffin Basin
Wye River
Created by Tay Township Public Works
ArcGIS for Desktop 10.5
Coordinate System: NAD_1983_UTM_Zone_17N
October 2017
Source: OMNRF/SSEA: Watersheds_Tay_SS_SPA_Watershed_Boundaries.shp/ 2017
Kilometers
0 0.5 1 2 3 4 5


TOWNSHIP OF TAY
COMMUNITY OF PORT McNICOLL
FIGURE 'B'
STORM SEWER SYSTEMS
OCT. 27 97
LEGEND
PROPOSED SEWER SIZE IN INCHES
ALTERNATIVE CULVERT SIZE IN INCHES
INDICATES THAT USE OF CULVERT IS NOT VIABLE DUE TO SLOPE
FIRST AVENUE
SECOND AVENUE
THIRD AVENUE
FOURTH AVENUE
FIFTH AVENUE
SEVENTH AVENUE
EIGHTH AVENUE
NINTH AVENUE
HEWITT AVENUE
ALGOMA AVENUE
BARNES AVENUE
HELEN DUNCAN STREET
MIDLAND AVENUE
SIMCOE AVENUE
HEY AVENUE
CAMILLA STREET
ALBERTA STREET
ARRAN STREET
ALGOMA STREET
HOPPER BOULEVARD
ATHABASKA STREET
FRANKLIN DRIVE
HAYES STREET
MANITOBA STREET
ASSINIBOIA STREET
BANDON STREET
ANNA STREET
TALBOT STREET
PALMERSON STREET
NOTTINGHAM STREET
MARY STREET
CALVERT STREET
FIRS STREET
CODRICK STREET


Victoria Harbour Drainage Network
Legend
Pump Station
Sanitary Manhole
Settlement Area
Sanitary Pipe
Forcemain
Sanitary Pipe
Drainage Area
A
B
C
D
E
F
G
H
Gravity drainage is Typically 18% of flows in 2017
ROBINS POINT SPS # 3
ELLEN ST. SPS # 1
WYCLIFFE SPS # 7
WINFIELD SPS # 2
BOURDEOIS BEACH SPS # 5
MITCHELLS BEACH SPS # 6
VHWW SPS # 4
Created by Public Works
ArcGIS for Desktop 10.5
December 1, 2017
Coordinate System: NAD 1983 UTM Zone 17N
Data Source: Simcoe County: Assessment Parcel (TAY)(20

Proposed Levels of Service

The scenarios that were used to analyse Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the Storm Network.

Table 23 Storm Network Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$10,368,310	Good (79%)	$103,683
Scenario 2 - Current Capital Investment Rate	$10,368,310	Fair (59%)	$21,277
Scenario 3 - Maintain Current Condition	$10,368,310	Very Good (96%)	Current Lifecycles don't maintain average condition over the scenario
Scenario 4 Maintain Condition Target	$10,368,310	Good (60%)	$67,587

The recommended scenario for the storm network is Scenario 4 maintain a target average condition of Good.

Appendix D: Buildings

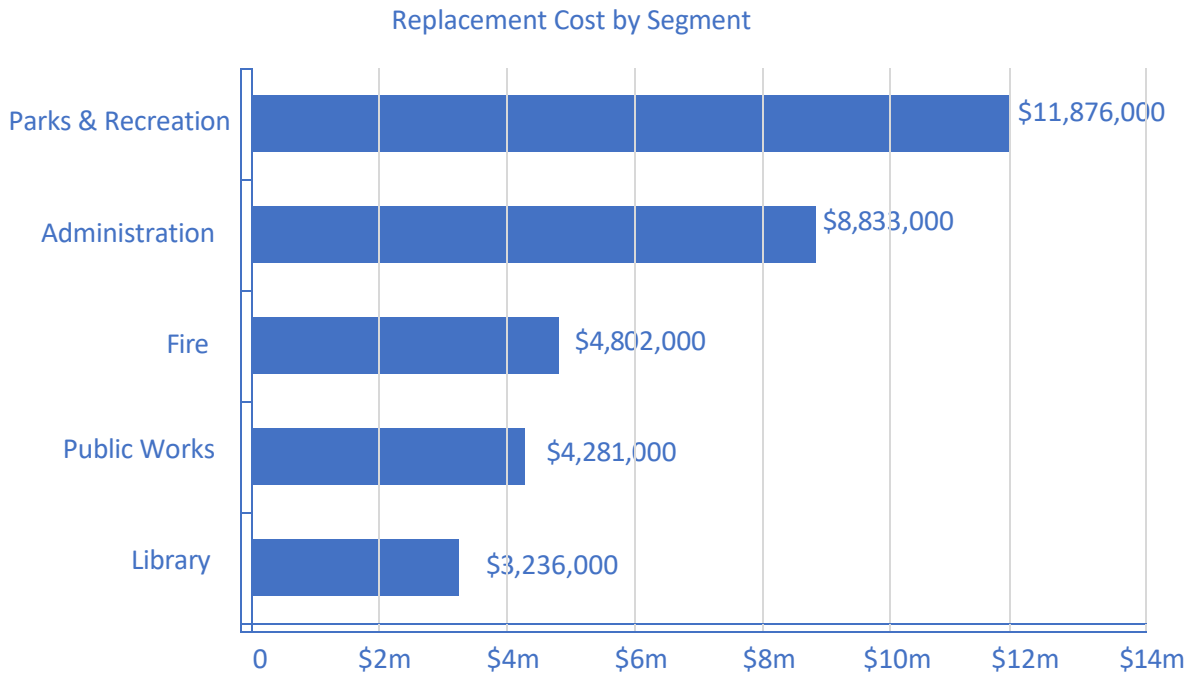
The Township of Tay owns and maintains several facilities and recreation centers that provide key services to the community. These include:

- Administrative office and libraries
- Fire stations
- Public works garages and storage sheds
- Rinks, and community centers

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Tay's buildings inventory. As the Township has not had a complete componentization of their buildings their inventory tracks buildings as a main asset with some small as replaced componentization.

Figure 32 Buildings Replacement Cost

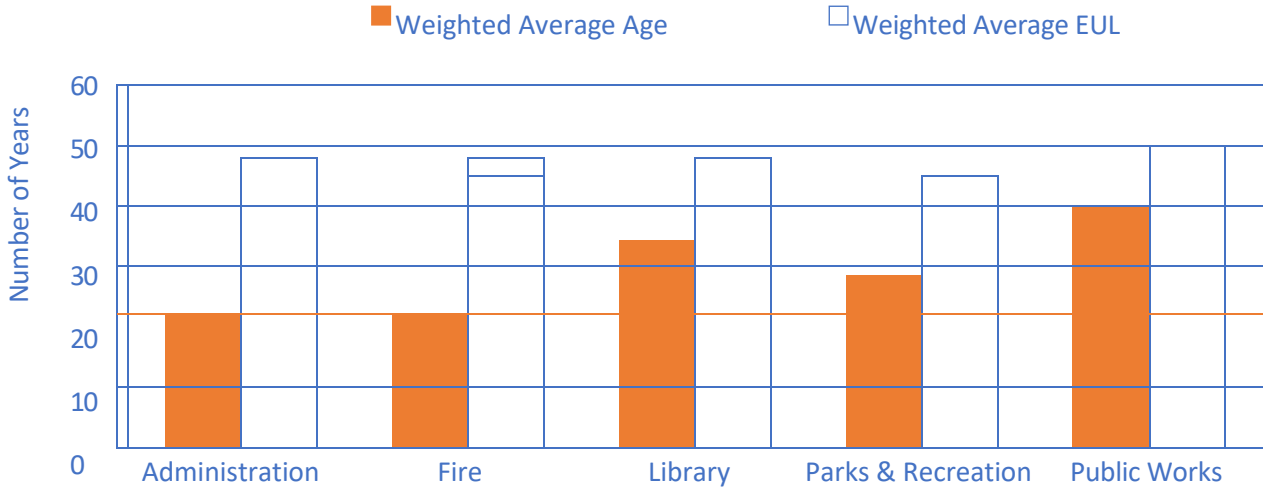


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

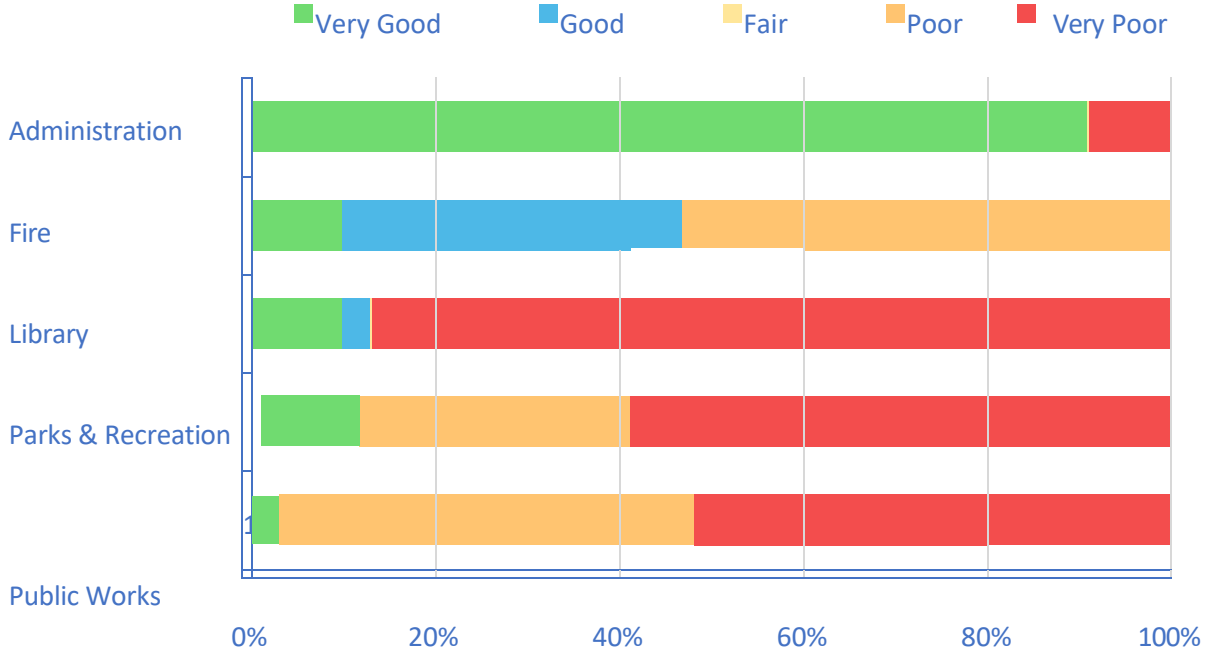
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 33 Buildings Average Age vs Average EUL



The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

Figure 34 Buildings Condition Breakdown



To ensure that the municipal buildings continue 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 buildings.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Buildings are repaired as required based on deficiencies identified by outside experts, staff, or residents.

Lifecycle Management Strategy

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.

Figure 35 Buildings Current Lifecycle Strategy

Maintenance/Rehabilitation

Municipal buildings are subject to regular inspections to identify health & safety requirements
Maintenance of buildings is dealt with on a case-by-case basis

Replacement

Assessments are completed strategically as buildings approach their end-of-life to determine whether replacement or rehabilitation is appropriate

Risk & Criticality

The 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 available inventory data. See Appendix K: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

Figure 36 Buildings Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$1,722,023 (5%)	$9,090,824 (28%)	$1,543,084 (5%)	$10,535,047 (32%)	$10,032,005 (30%)

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific

lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

The following tables identify the Township's current level of service for the municipal Buildings. 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.

Table 24 Buildings Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by municipal buildings	The facilities provided by municipal buildings are: • administrative offices • fire stations • public works garages and storage sheds • an arena, rinks, and community centres	Sustainable	% Risk that is High and Very High	62%
		Affordable	Replacement Cost	$33,027,653
			Annual reinvestment	$164,140
			Capital reinvestment rate	0.50%
Description of the condition of municipal buildings	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Reliable	Average Condition	Fair (41%)
			% Condition > Fair	37%
			% Condition poor and very poor	63%

Proposed Levels of Service

The scenarios that were used to analyse Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the municipal buildings.

Table 25 Buildings Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$33,027,653	Good (79%)	$745,399
Scenario 2 - Current Capital Investment Rate	$33,027,653	Very Poor (13%)	$164,140
Scenario 3 - Maintain Current Condition	$33,027,653	Fair (41%)	$418,673
Scenario 4 - Maintain Condition Target	$33,027,653	Good (60%)	$664,976

The recommended scenario for the municipal buildings is Scenario 4 maintain a target average condition of Good.

Appendix E: Land Improvements

The Township of Tay owns and maintains many types of land improvements that provide key services to the community. These include:

- Playground structures
- Parking lots
- Park Lighting
- General site improvements

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Tay's Land Improvements inventory.

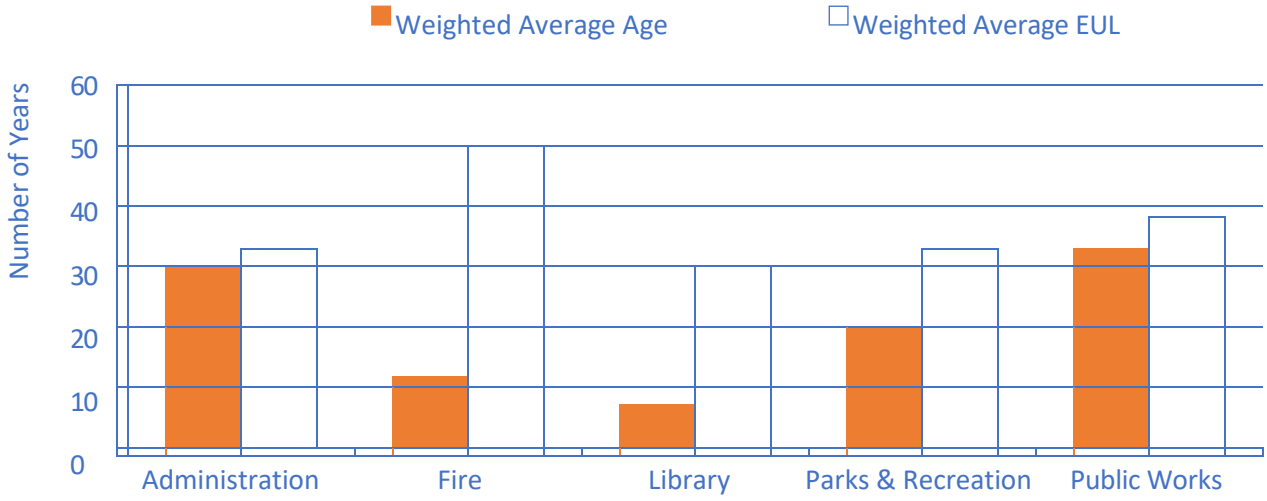
Figure 37 Land Improvements Replacement Cost

Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

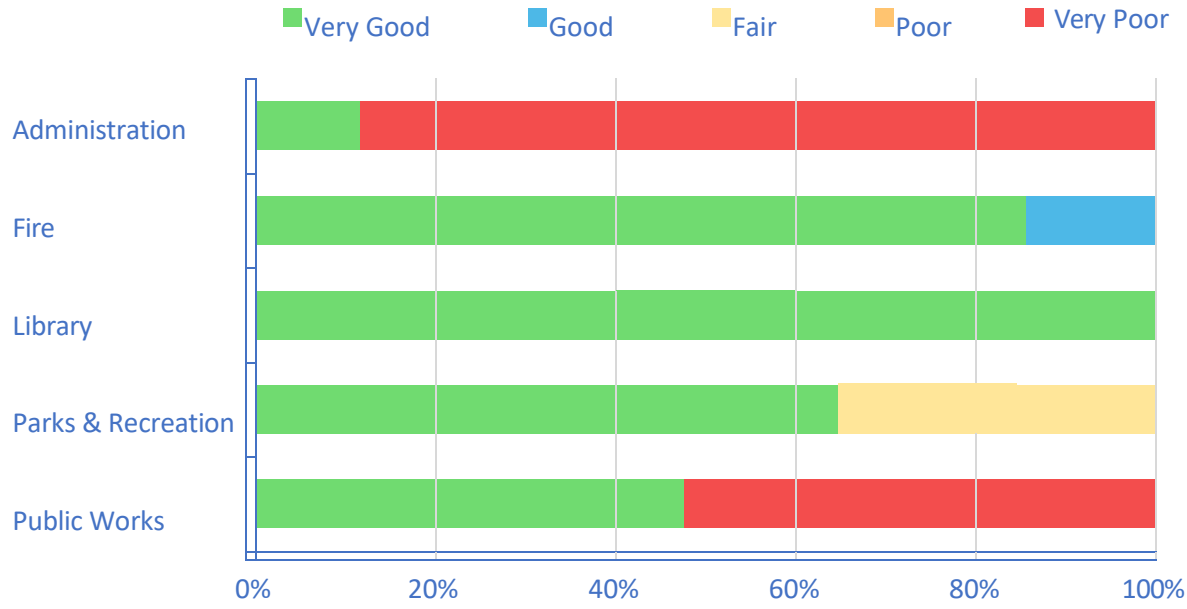
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 38 Land Improvements Average Age vs Average EUL



The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

Figure 39 Land Improvements Condition Breakdown



To ensure that the Township's land improvements continue 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 assets.

Each asset's estimated useful life should also 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.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is to conduct inspections; however, the types of assets have very different characteristics and as such are monitored accordingly.

Lifecycle Management Strategy

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.

Figure 40 Land Improvements Current Lifecycle Strategy

Maintenance, Rehabilitation & Replacement
Assessments, repairs and replacements are completed as identified.

Risk & Criticality

The 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 available inventory data. See Appendix K: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

Figure 41 Land Improvements Risk Matrix

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$2,638,365 (24%)	$5,135,090 (47%)	$606,478 (6%)	$218,741 (2%)	$2,237,383 (21%)

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

The following tables identify the Township's current level of service for the Land Improvements facilities. 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.

Table 27 Land Improvements Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by municipal land improvements	The types of land improvements that provide key services to the community are: • playground structures • parking lots • park lighting • general site improvements	Sustainable	% Risk that is High and Very High	23%
		Affordable	Replacement Cost	$12,365,602
			Annual reinvestment	$227,885
			Capital reinvestment rate	1.84%
Description of the condition of land improvements	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Reliable	Average Condition	Good (77%)
			% Condition > Fair	94%
			% Condition poor and very poor	6%

Proposed Levels of Service

The scenarios that were used to analyse Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the land improvements.

Table 28 Land Improvements Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$12,365,602	Good (79%)	$417,298
Scenario 2 - Current Capital Investment Rate	$12,365,602	Fair (47%)	$227,885
Scenario 3 - Maintain Current Condition	$12,365,602	Good (77%)	$404,722
Scenario 4 - Maintain Condition Target	$12,365,602	Good (60%)	$350,208

The recommended scenario for land improvements is Scenario 4 maintain a target average condition of Good.

Appendix F: Vehicles

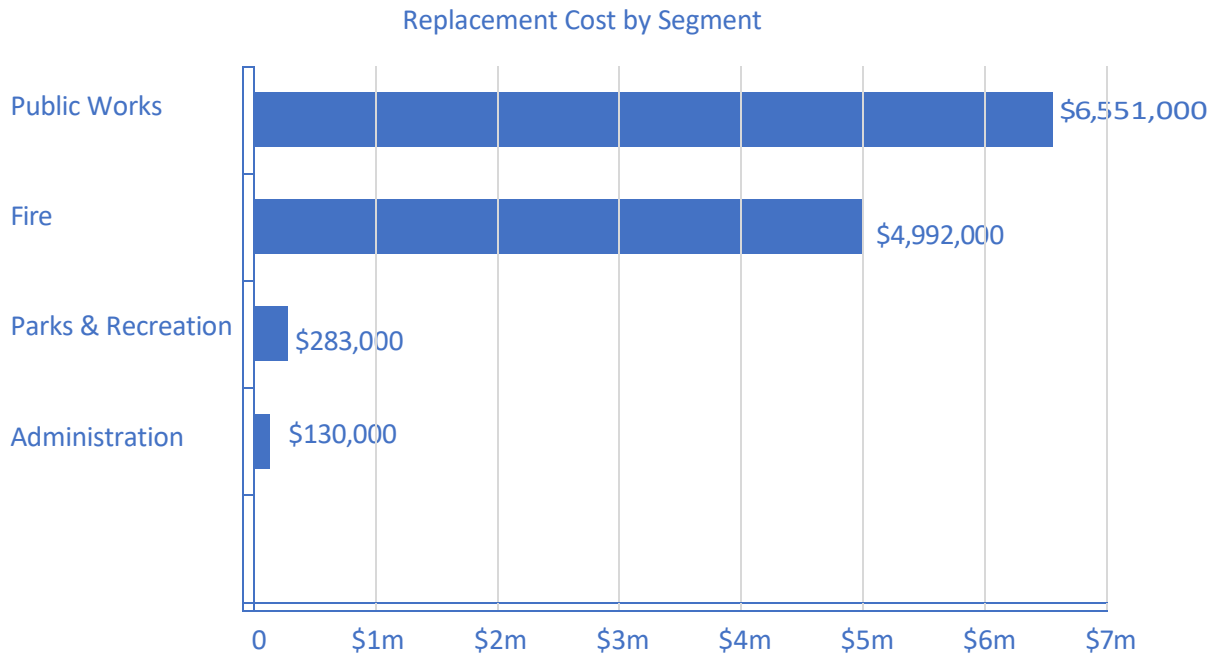
Vehicles allow staff to efficiently deliver municipal services and personnel. Municipal vehicles are used to support several service areas, including:

- Tandem axle trucks for winter control activities
- Fire rescue vehicles to provide emergency services
- Trucks/vehicles to support the maintenance and services of all departments

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the vehicle inventory.

Figure 42 Vehicle Replacement Costs

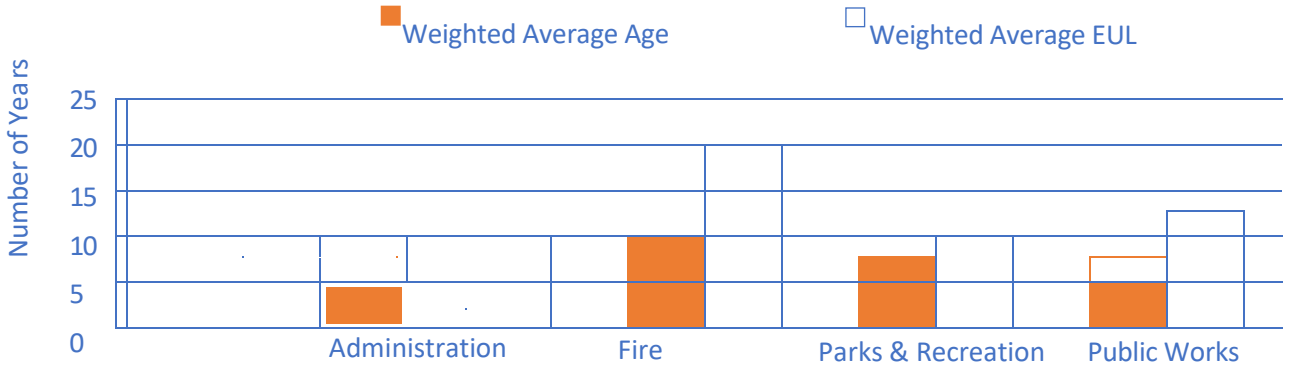


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

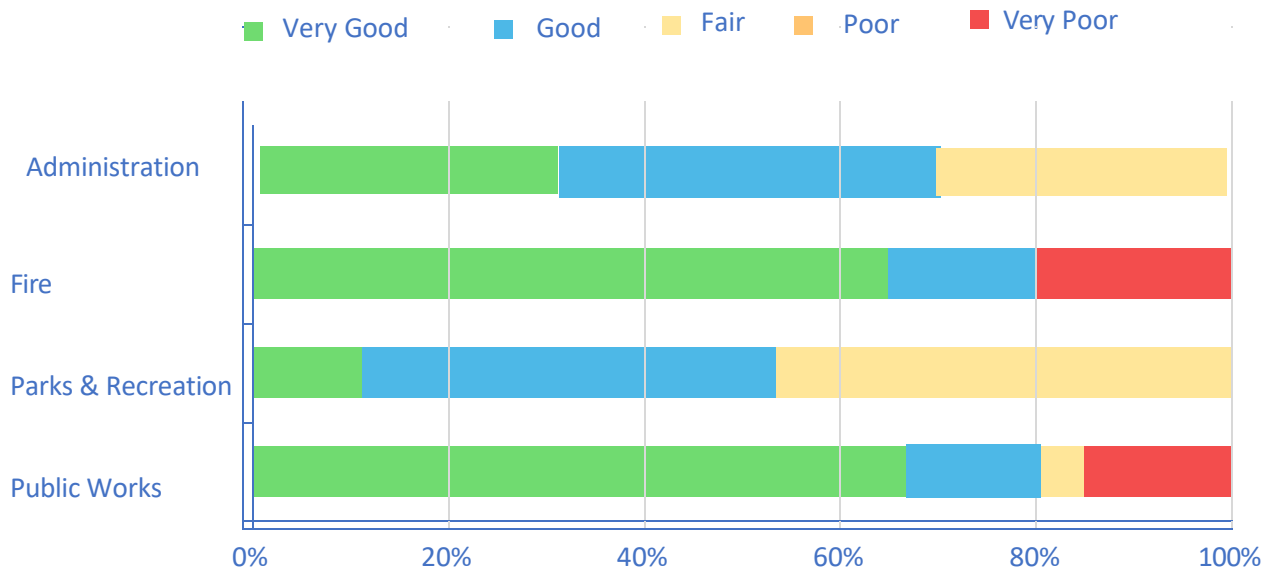
Figure 43 Vehicles Average Age vs Average EUL



Each asset's estimated useful life should also 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.

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

Figure 44 Vehicles Condition Breakdown



To ensure that the Township's vehicles continue 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 vehicles.

Each asset's estimated useful life should also 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.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is staff complete regular visual inspections of vehicles to ensure they are in state of adequate repair prior to operation.

Lifecycle Management Strategy

The condition or performance of assets will deteriorate over time. To ensure vehicles are performing as expected, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

Figure 45 Vehicles Current Lifecycle Strategy

Maintenance / Rehabilitation

Visual inspections completed and documented daily
Every 4-7000km includes an inspection and oil changed

Replacement

Vehicle replacements are based on age, usage and annual repair costs are all considered when determining appropriate treatment options

Risk & Criticality

The 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 available inventory data. See Appendix K: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

Figure 46 Vehicles Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$836,831 (7%)	$7,523,195 (63%)	$416,132 (3%)	$1,246,189 (10%)	$1,885,950 (16%)

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific

lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

The following tables identify the Township's current level of service for the Township owned vehicles. 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.

Table 30 Vehicles Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by municipal vehicles	Municipal vehicles are used to support several areas, including: • tandem axle trucks for winter control activities • fire rescue vehicles to provide emergency services • pick-up trucks to support the maintenance of all departments	Sustainable	% Risk that is High and Very High	26%
		Affordable	Replacement Cost	$11,997,651
			Annual reinvestment	$842,710
			Capital reinvestment rate	7.02%
Description of the condition of vehicles	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Reliable	Average Condition	Good (76%)
			% Condition > Fair	84%
			% Condition poor and very poor	16%

Proposed Levels of Service

The scenarios that were used to analyse Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the vehicles.

Table 31 Vehicles Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$11,997,651	Very Good (80%)	$842,710
Scenario 2 - Current Capital Investment Rate	$11,997,651	Poor (31%)	$366,153
Scenario 3 - Maintain Current Condition	$11,997,651	Good (76%)	$818,748
Scenario 4 - Maintain Condition Target	$11,997,651	Good (60%)	$637,038

The recommended scenario for vehicles is Scenario 4 maintain a target average condition of Good.

Appendix G: Equipment

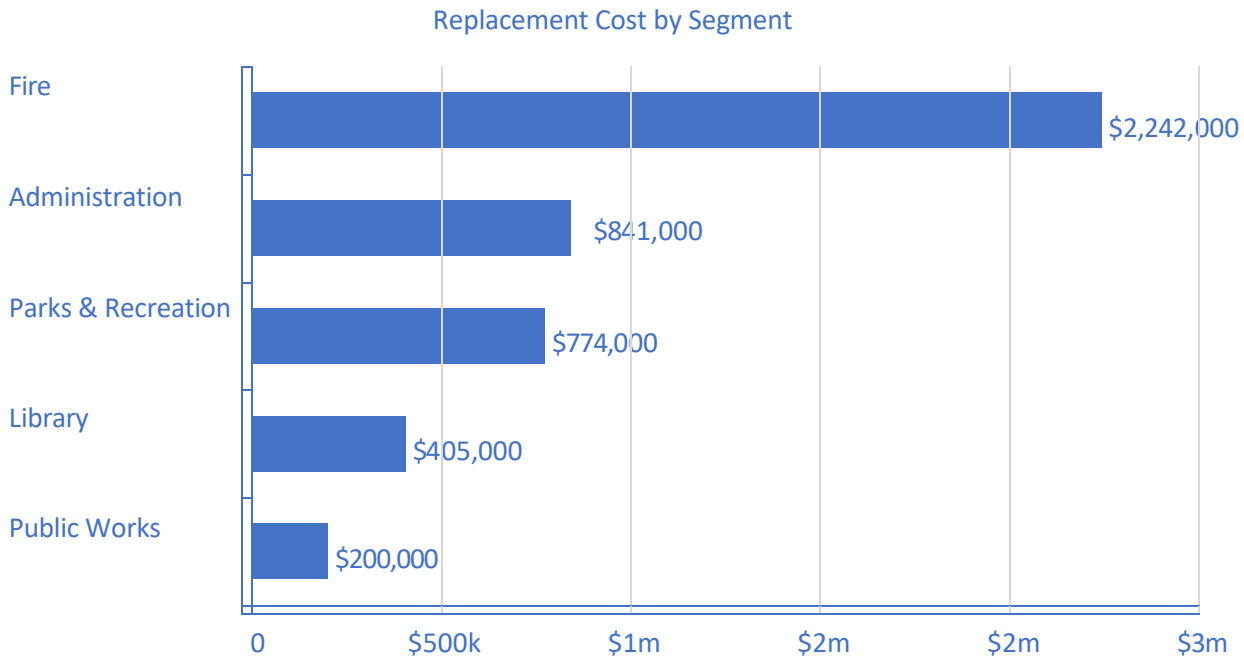
To maintain the quality stewardship of Tay's infrastructure and support the delivery of services, the Township owns various types of equipment. This includes:

- Computer hardware, software, and phone systems to support all Township services
- Landscaping equipment to maintain public parks
- Fire equipment to support the delivery of emergency services
- Equipment to enable the provision of recreational services

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in the Tay's Equipment inventory.

Figure 47 Equipment Replacement Costs

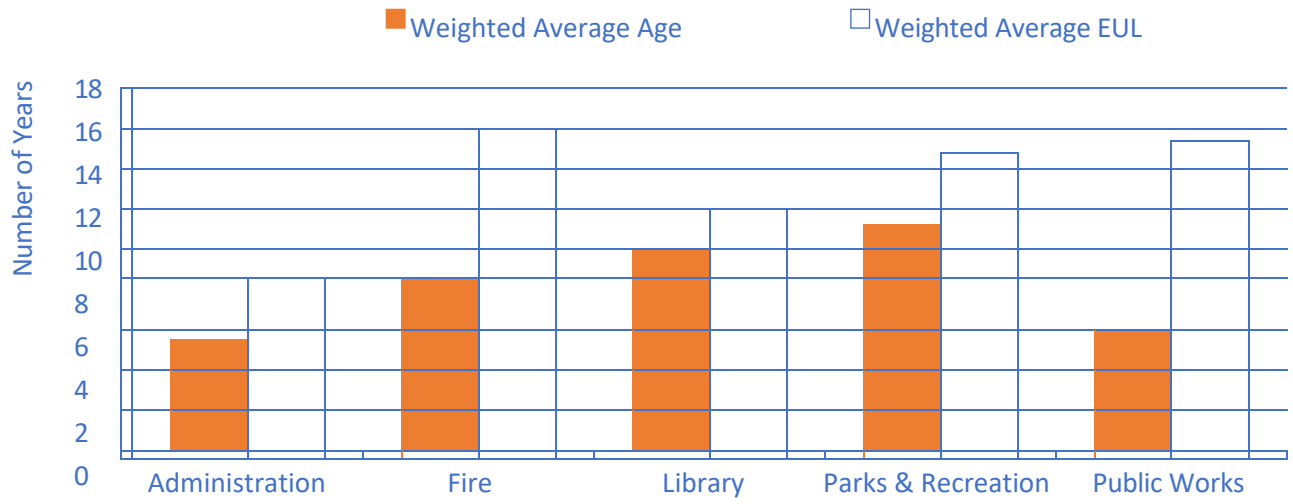


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent capital requirements.

Asset Condition & Age

The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

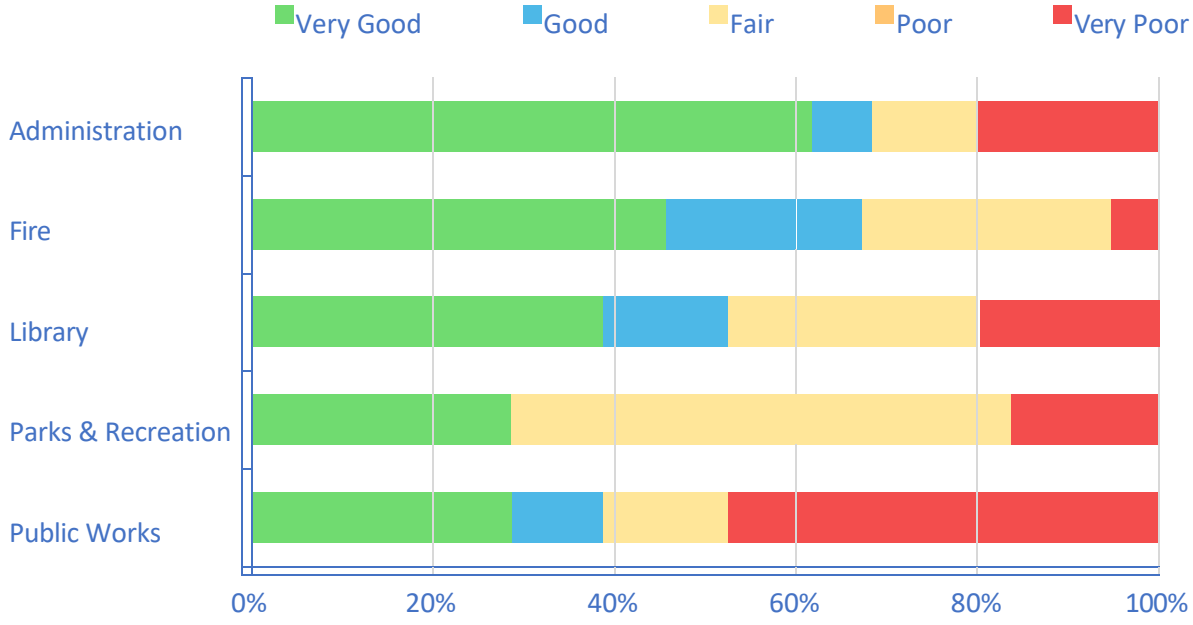
Figure 48 Equipment Average Age vs Average EUL



Each asset's estimated useful life should also 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.

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale.

Figure 49 Equipment Condition Breakdown



To ensure that the Township's Equipment continues to provide an acceptable level of service, Tay should continue to monitor the average condition. 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.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is with the broad range of types of equipment included in this category, there are some types with very established assessments (i.e. Fire Equipment) but also many don't have any assessment procedures.

Lifecycle Management Strategy

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

Figure 50 Equipment Current Lifecycle Strategy

Maintenance / Rehabilitation

Maintenance program varies by department
Fire equipment is subject to a much more rigorous inspection and maintenance program compared to most other departments
Equipment is maintained according to manufacturer recommended actions and supplemented by the expertise of municipal staff

Replacement

The replacement of machinery and equipment depends on deficiencies identified

Risk & Criticality

The 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 available inventory data. See Appendix K: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

Figure 51 Equipment Risk Matrix

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$2,309,495 (50%)	$710,804 (16%)	$102,032 (2%)	$494,107 (11%)	$957,229 (21%)

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

The following tables identify the Township's current level of service for the municipal owned Equipment assets. 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.

Table 33 Equipment Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by municipal machinery and equipment	Township of Tay owns and employs various types of machinery and equipment, this includes: • computer hardware, software, and phone systems to support all Township services • landscaping equipment to maintain public parks • fire equipment to support the delivery of emergency services • equipment to enable the provision of recreational services	Sustainable	% Risk that is High and Very High	32%
		Affordable	Replacement Cost	$4,461,439
			Annual reinvestment	$408,283
			Capital reinvestment rate	9.15%
Description of the condition of machinery and equipment	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Reliable	Average Condition	Good (70%)
			% Condition > Fair	88%
			% Condition poor and very poor	12%

Proposed Levels of Service

The scenarios that were used to analyse Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the equipment assets.

Table 34 Equipment Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$4,461,439	Very Good (81%)	$408,283
Scenario 2 - Current Capital Investment Rate	$4,461,439	Very Poor (16%)	$78,605
Scenario 3 - Maintain Current Condition	$4,461,439	Good (70%)	$354,461
Scenario 4 - Maintain Condition Target	$4,461,439	Good (60%)	$293,252

The recommended scenario for the equipment assets is Scenario 4 maintain a target average condition of Good.

Appendix H: Water Network

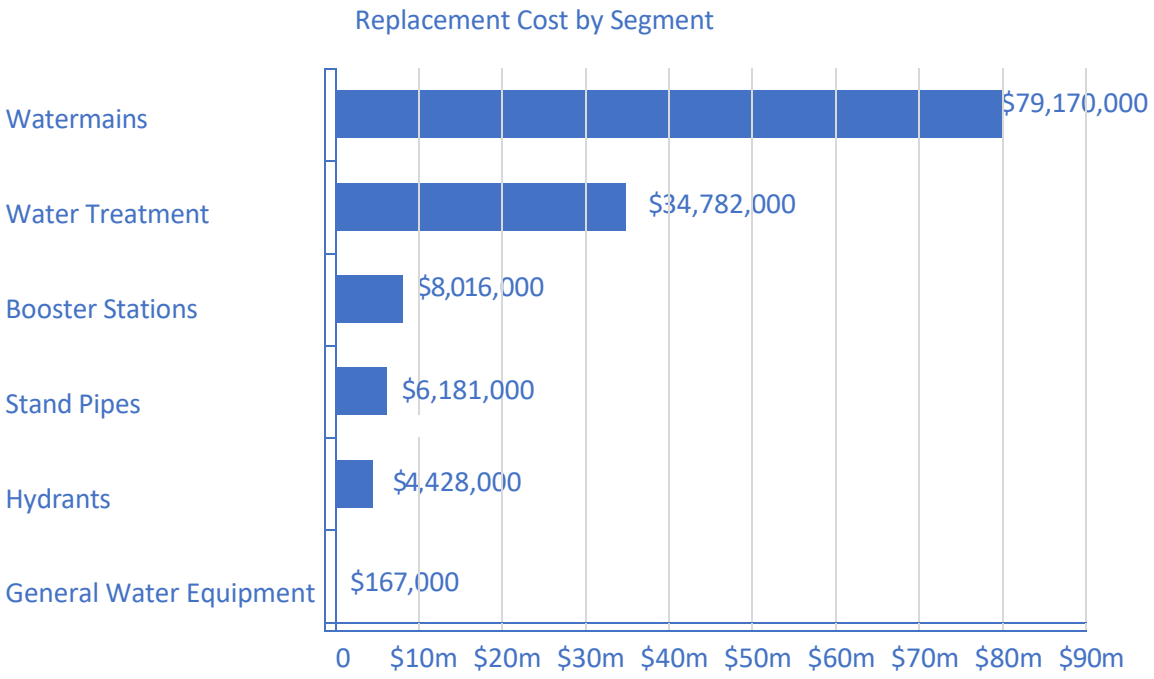
The water network provided by the Township is overseen by the Ontario Clean Water Agency (OCWA). The public works department works with OCWA to ensure the responsible management for the following:

- Water Treatment Plant
- Distribution System
- Booster Stations
- Water Storage Tank

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Tay's water network inventory.

Figure 52 Water Network Replacement Cost

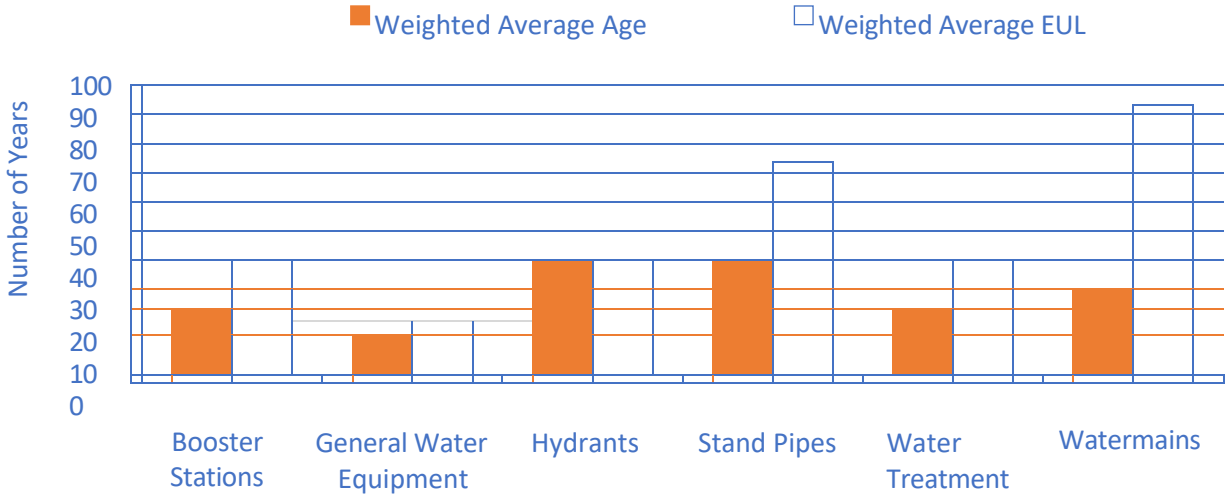


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

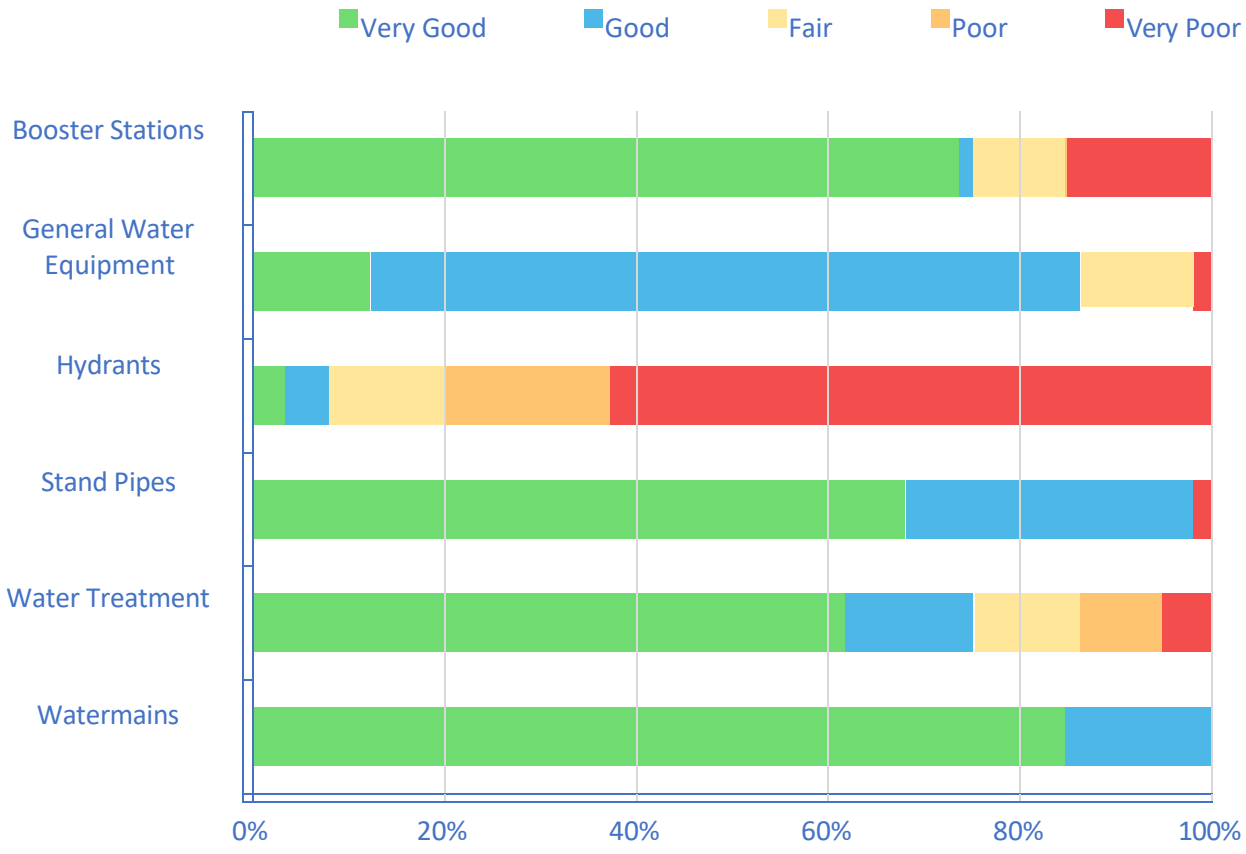
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 53 Water Network Average Age vs Average EUL



The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

Figure 54 Water Network Condition Breakdown



To ensure that the Township's 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 the lifecycle management strategy to determine what combination of activities is required to increase the overall condition of the water network.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

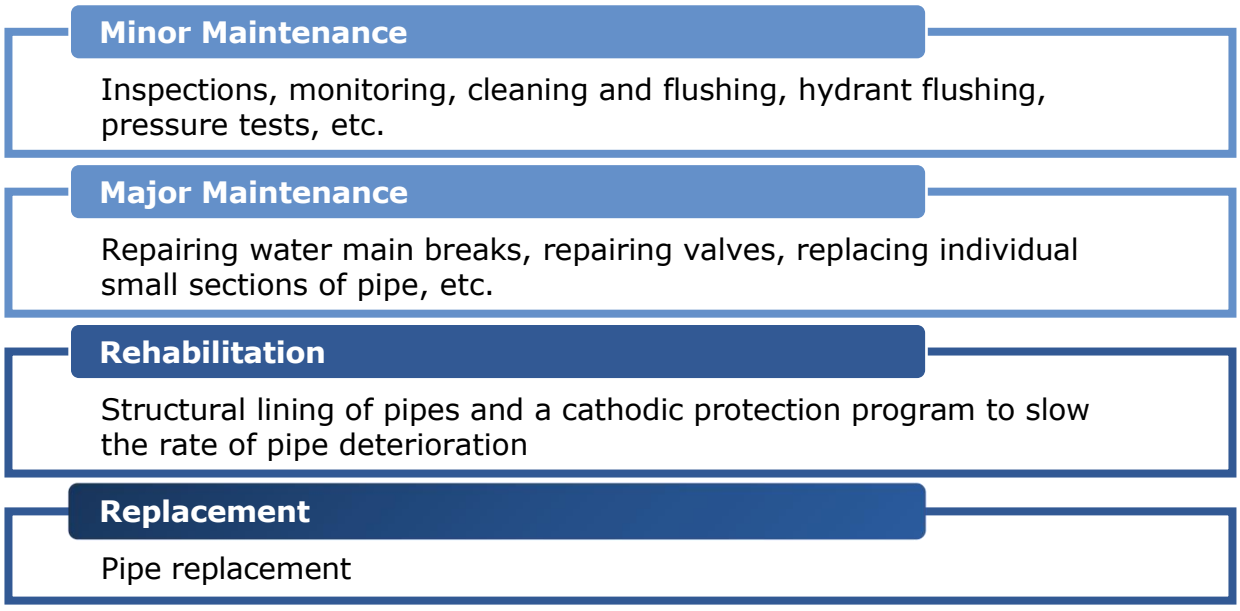
Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is for watermains staff rely on the age, material, and break history to estimate the condition of water mains

Lifecycle Management Strategy

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.

Figure 55 Water Network Current Lifecycle Strategy



Risk & Criticality

The 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 available inventory data. See Appendix K: Risk Rating Criteria for the criteria used to determine the risk rating of each asset.

Figure 56 Water Network Risk Breakdown

1 - 4	5 - 7	8 - 9	10 - 14	15 - 25
Very Low	**Low**	**Moderate**	**High**	**Very High**
$77,029,619	$34,108,650	$1,030,485	$7,054,282	$11,946,082
(59%)	(26%)	(<1%)	(5%)	(9%)

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

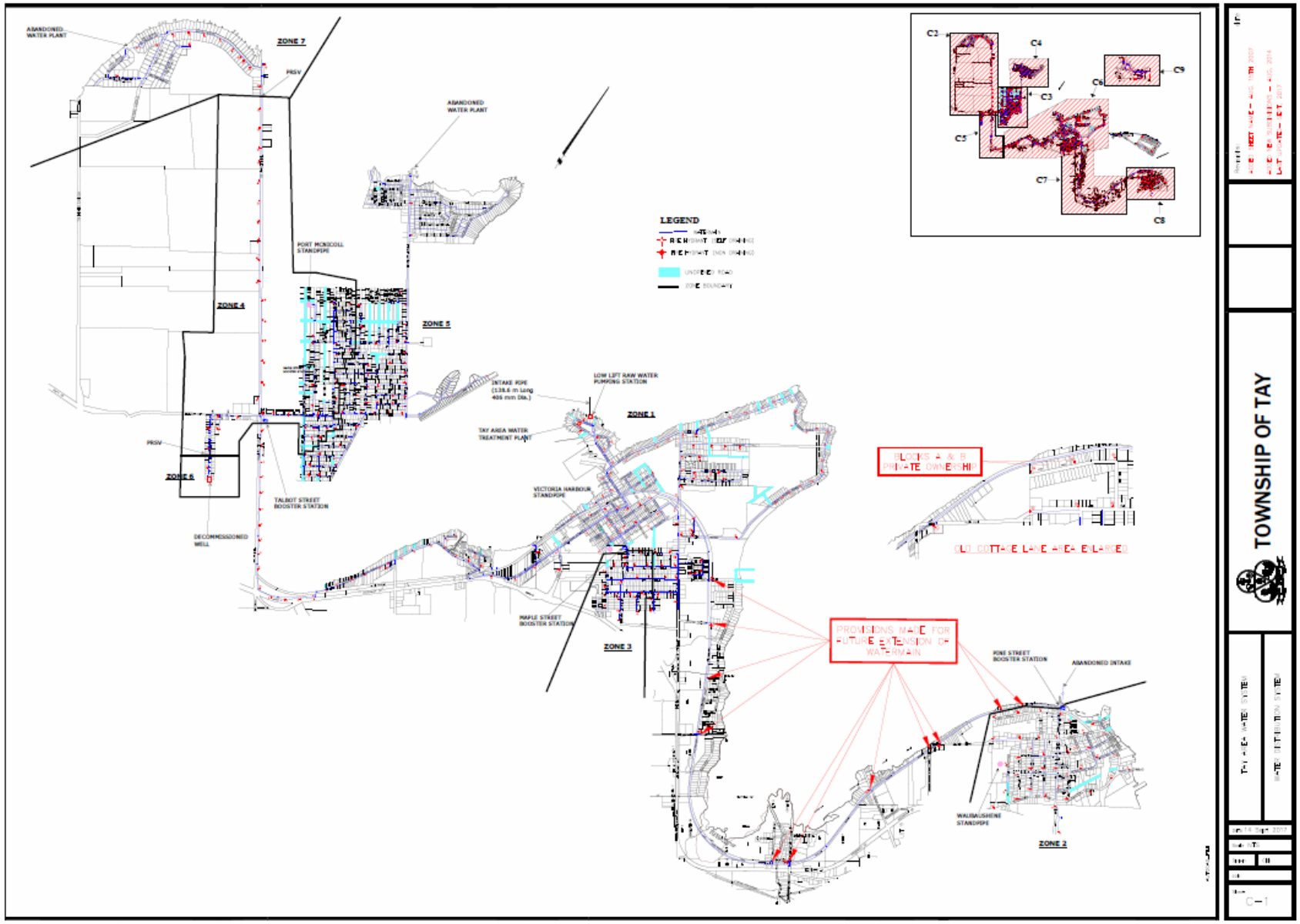
Current Levels of Service

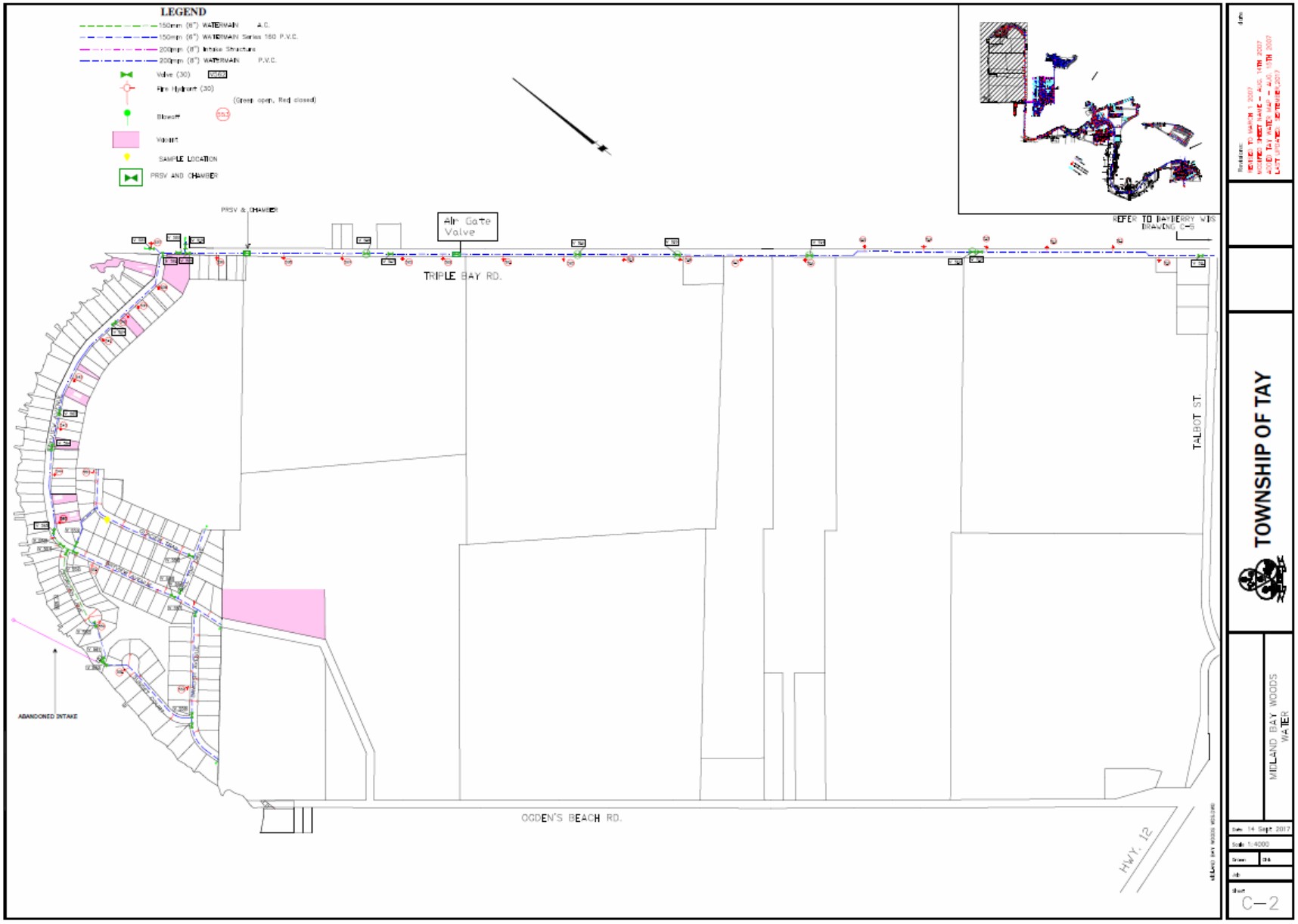
The following tables identify the Township's current level of service for the Water Network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected.

Table 36 Water Network Current Levels of Service

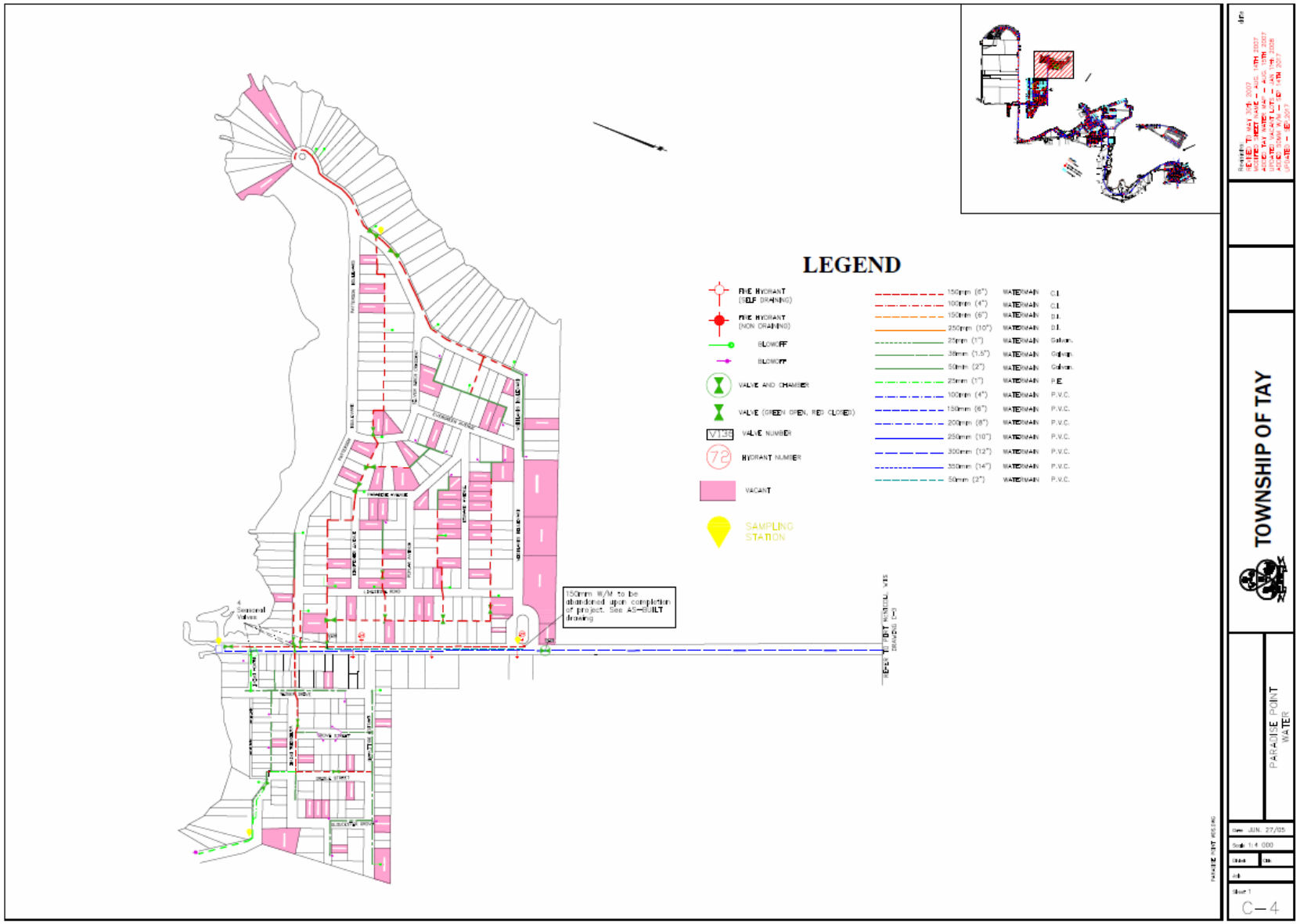
Community LOS		Service Attribute	Technical LOS	
Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Figure 57 Maps of Water Network	Sustainable	% Risk that is High and Very High	14%
			% of properties connected to the municipal water system	58%
			% of properties where fire flow is available	50%
Description of boil water advisories and service interruptions	3 boil water advisories and 1 service interruptions in 2024	Reliable	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	4
			# of connection-days per year where water is not available to water main breaks compared to the total number of properties connected to the municipal water system	5
Description of the condition of the water network	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	Reliable	Average Condition	Very Good (83%)
			% Condition > Fair	94%
			% Condition poor and very poor	6%
Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Figure 57 Maps of Water Network	Affordable	Replacement Cost	$132,743,689
			Annual reinvestment	$1,238,716
			Capital reinvestment rate	0.93%

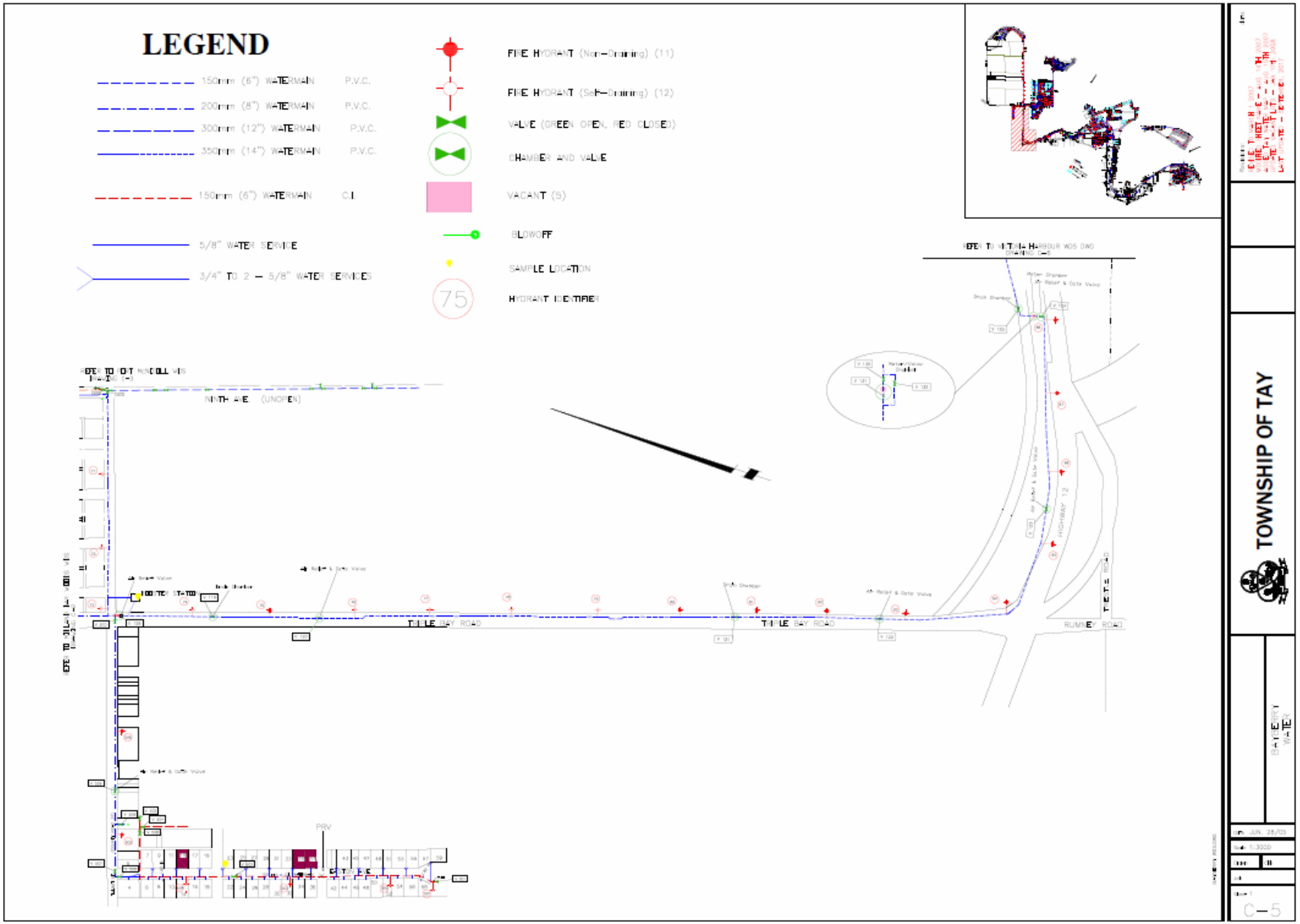
Figure 57 Maps of Water Network

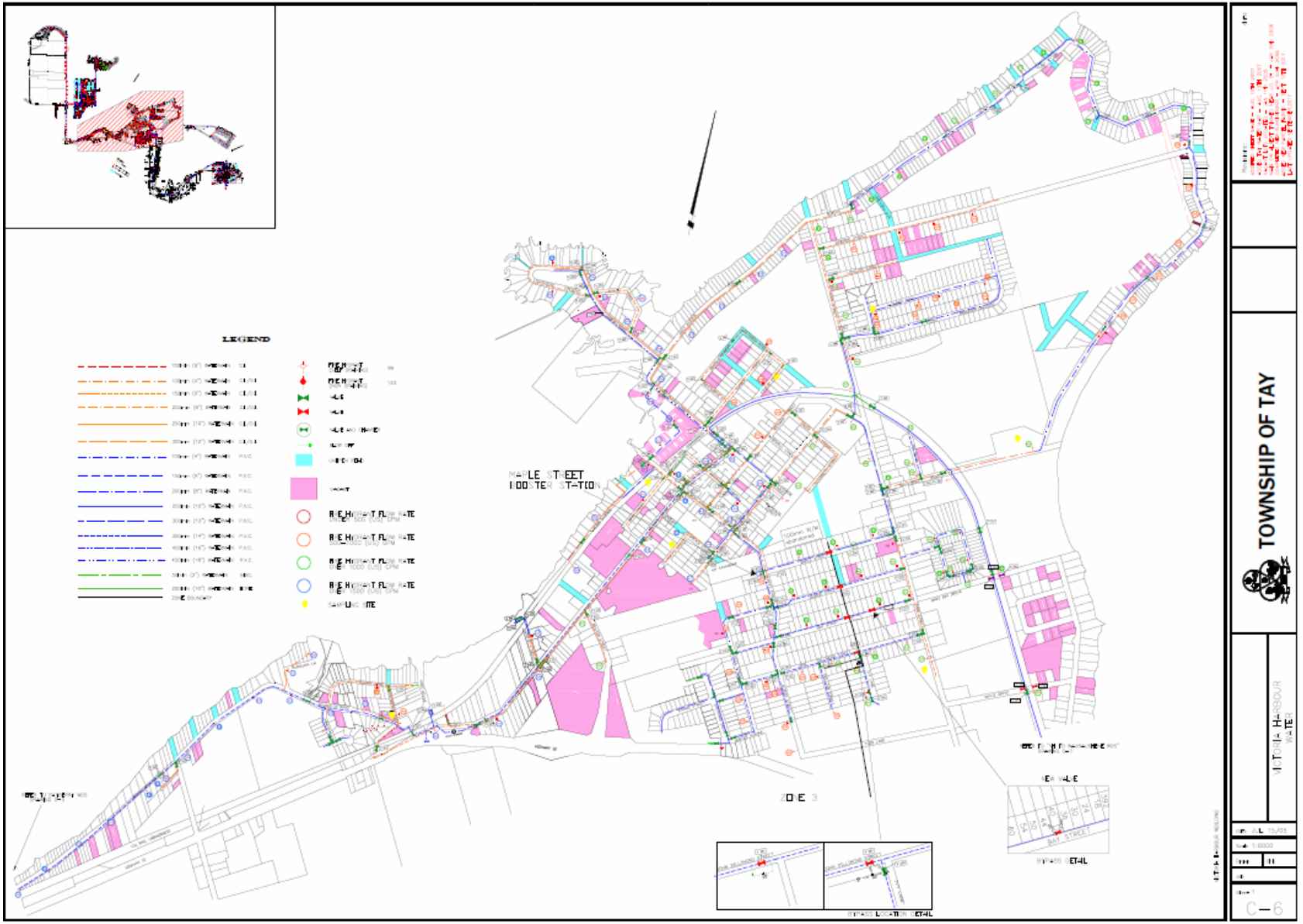


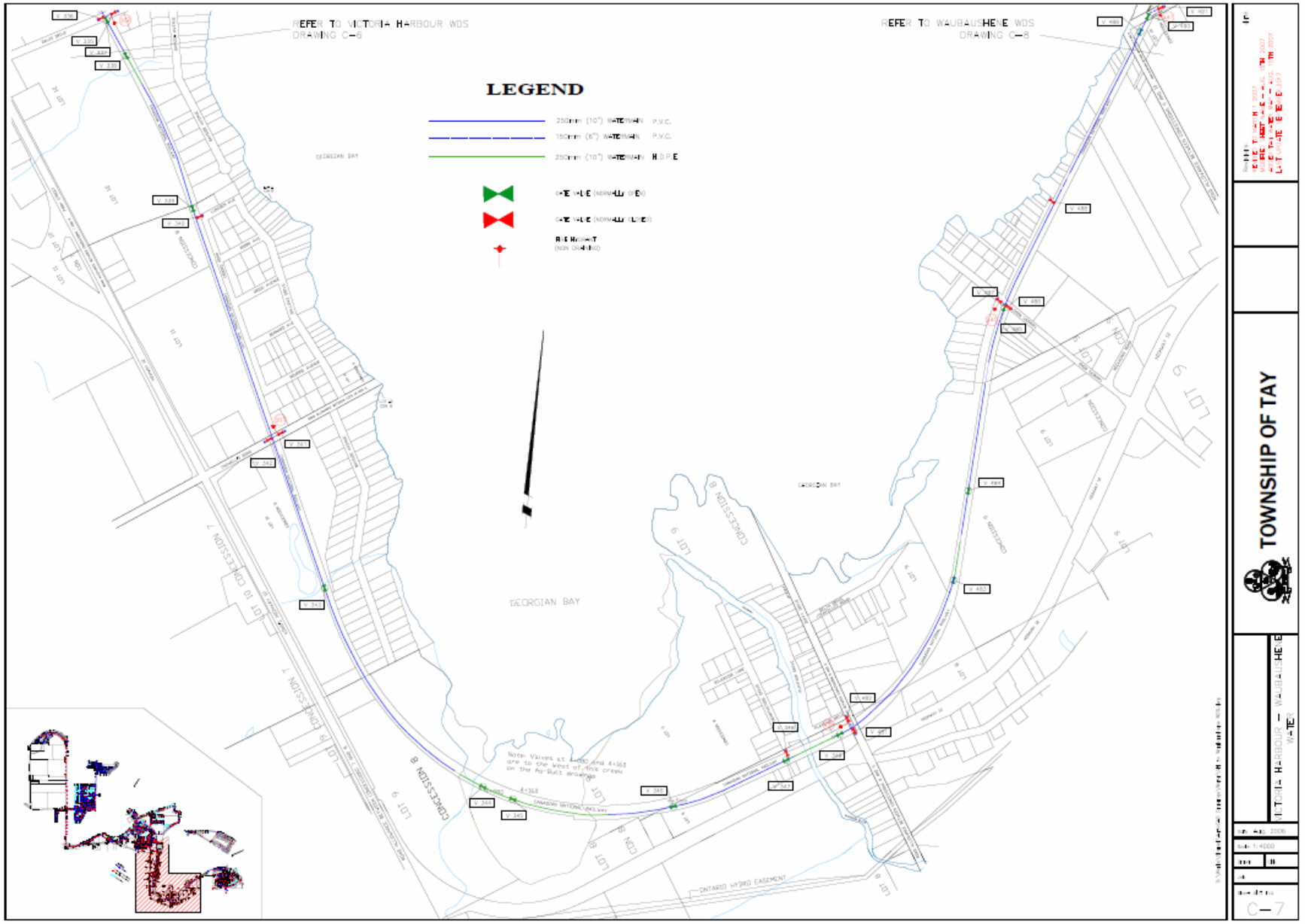

LEGEND
150mm (6") WATERMAIN A.C.
150mm (6") WATERMAIN Series 160 P.V.C.
200mm (8") Intake Structure
200mm (8") WATERMAIN P.V.C.
Valve (30)
Fire Hydrant (30)
(Green open, Red closed)
Blowoff
Valve
SAMPLE LOCATION
PRSV AND CHAMBER
PRSV & CHAMBER
Air Gate Valve
TRIPLE BAY RD.
REFER TO BAYBERRY WTR DRAWING C-3
TALBOT ST.
ABANDONED INTAKE
OGDEN'S BEACH RD.
HWY. 12
TOWNSHIP OF TAY
MIDLAND BAY WOODS WATER
C-2

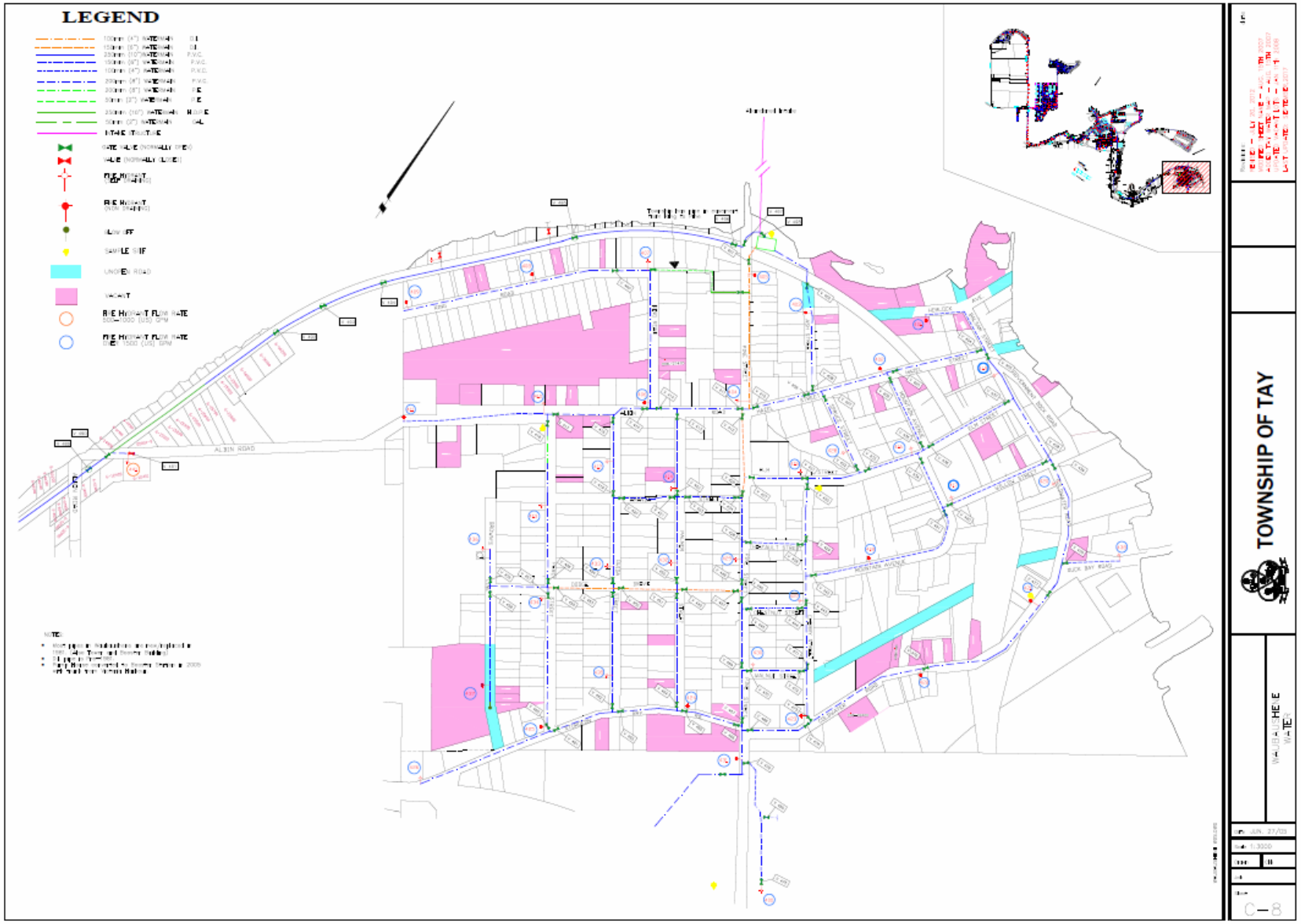

UNOPEN ROAD
VACANT


LEGEND
FIRE HYDRANT (SELF DRAINING)
FIRE HYDRANT (NON DRAINING)
BLOWOFF
BLOWOFF
VALVE AND CHAMBER
VALVE (GREEN OPEN, RED CLOSED)
V138
VALVE NUMBER
72
HYDRANT NUMBER
VACANT
SAMPLING STATION
150mm (6") WATERMAIN C.I.
100mm (4") WATERMAIN C.I.
150mm (6") WATERMAIN D.I.
250mm (10") WATERMAIN D.I.
25mm (1") WATERMAIN Galvan.
38mm (1.5") WATERMAIN Galvan.
50mm (2") WATERMAIN Galvan.
25mm (1") WATERMAIN P.E.
100mm (4") WATERMAIN P.V.C.
150mm (6") WATERMAIN P.V.C.
200mm (8") WATERMAIN P.V.C.
250mm (10") WATERMAIN P.V.C.
300mm (12") WATERMAIN P.V.C.
350mm (14") WATERMAIN P.V.C.
50mm (2") WATERMAIN P.V.C.
150mm W/M to be abandoned upon completion of project. See AS-BUILT drawing
Seasonal Valves
TOWNSHIP OF TAY
PARADISE POINT WATER
C-4


LEGEND
150mm (6") WATERMAIN P.V.C.
200mm (8") WATERMAIN P.V.C.
300mm (12") WATERMAIN P.V.C.
350mm (14") WATERMAIN P.V.C.
150mm (6") WATERMAIN C.I.
5/8" WATER SERVICE
3/4" TO 2 - 5/8" WATER SERVICES
FIRE HYDRANT (Non-Draining) (11)
FIRE HYDRANT (Self-Draining) (12)
VALVE (GREEN OPEN, RED CLOSED)
CHAMBER AND VALVE
VACANT (5)
BLOWOFF
SAMPLE LOCATION
75
HYDRANT IDENTIFIER
NINTH AVE. (UNOPEN)
TIMLE BAY ROAD
TIMLE BAY ROAD
RUMNEY ROAD
HIGHWAY 12
PRV
TOWNSHIP OF TAY
C-5


LEGEND
TOWNSHIP OF TAY
ZONE 3
C-6


REFER TO VICTORIA HARBOUR WDS
DRAWING C-6
REFER TO WAUBAUSHENE WDS
DRAWING C-8
LEGEND
250mm (10") WATERMAIN P.V.C.
150mm (8") WATERMAIN P.V.C.
250mm (10") WATERMAIN H.D.P.E
GATE VALVE (NORMALLY OPEN)
GATE VALVE (NORMALLY CLOSED)
FIRE HYDRANT
(NON DRAINING)
GEORGIAN BAY
CONCESSION 7
CONCESSION 8
CONCESSION 9
CONCESSION 10
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
ONTARIO HYDRO EASEMENT
TOWNSHIP OF TAY
VICTORIA HARBOUR - WAUBAUSHENE
WATER
C-7


LEGEND
TOWNSHIP OF TAY
ALBIN ROAD


BLUFF POINT ROAD
CHRISTIE DR.
OAK ROAD
RUTA ROAD
ROPE BOULEVARD
BOOTH ROAD
WEST SERVICE ROAD
GERHARDT ROAD
SUNVIEW LANE
TOWNSHIP OF TAY
ROPE SUBDIVISION
WATER DISTRIBUTION SYSTEM

Proposed Levels of Service

The scenarios that were used to analyze Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the water network.

Table 37 Water Network Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$132,743,689	Good (79%)	$2,416,038
Scenario 2 - Current Capital Investment Rate	$132,743,689	Fair (54%)	$1,238,716
Scenario 3 - Maintain Current Condition	$132,743,689	Very Good (83%)	Current Lifecycles don't maintain average condition over the scenario
Scenario 4 ¯ Maintain Condition Target	$132,743,689	Good (60%)	$1,580,485

The recommended scenario for the water network is Scenario 4 maintain a target average condition of Good.

Appendix I: Wastewater Network

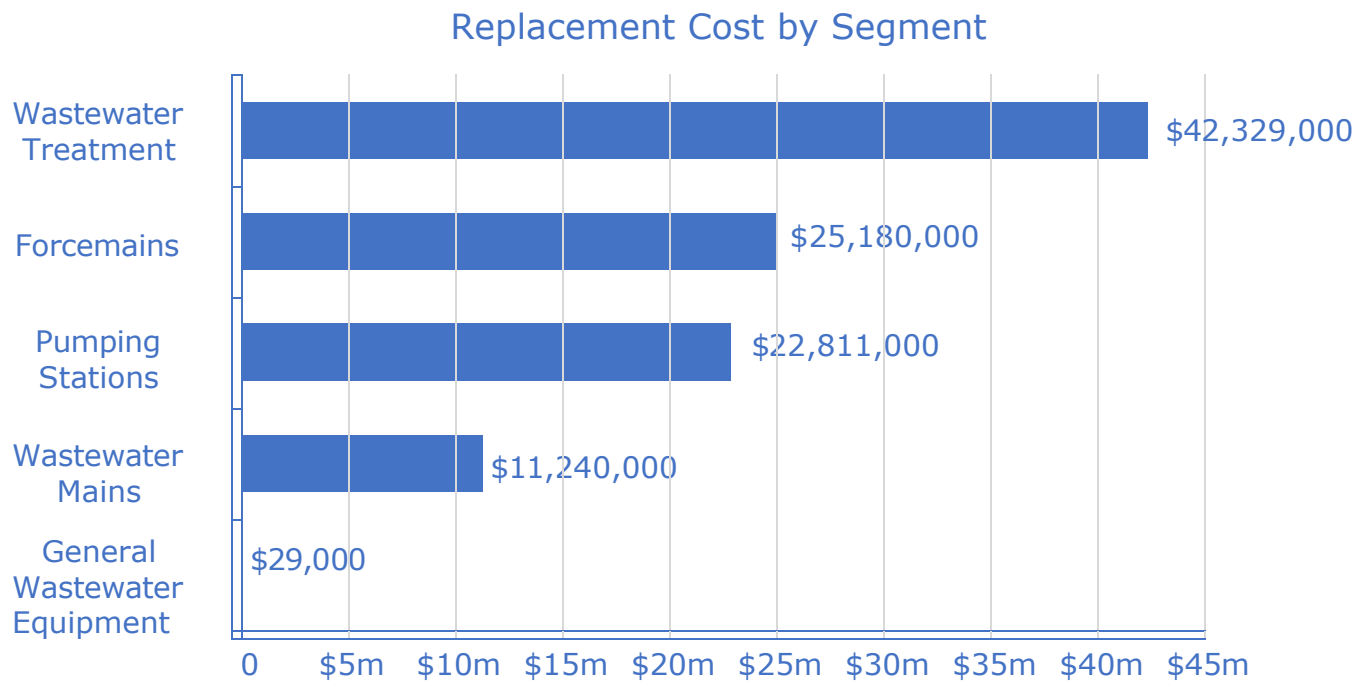
The Wastewater Network provided by the Township are overseen by the public works department with OCWA (Ontario Clean Water Agency). The department is responsible for the following:

- Treatment Plants
- Pumping stations
- Sanitary collection system

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Tay's Wastewater Network inventory.

Figure 58 Wastewater Network Replacement Cost

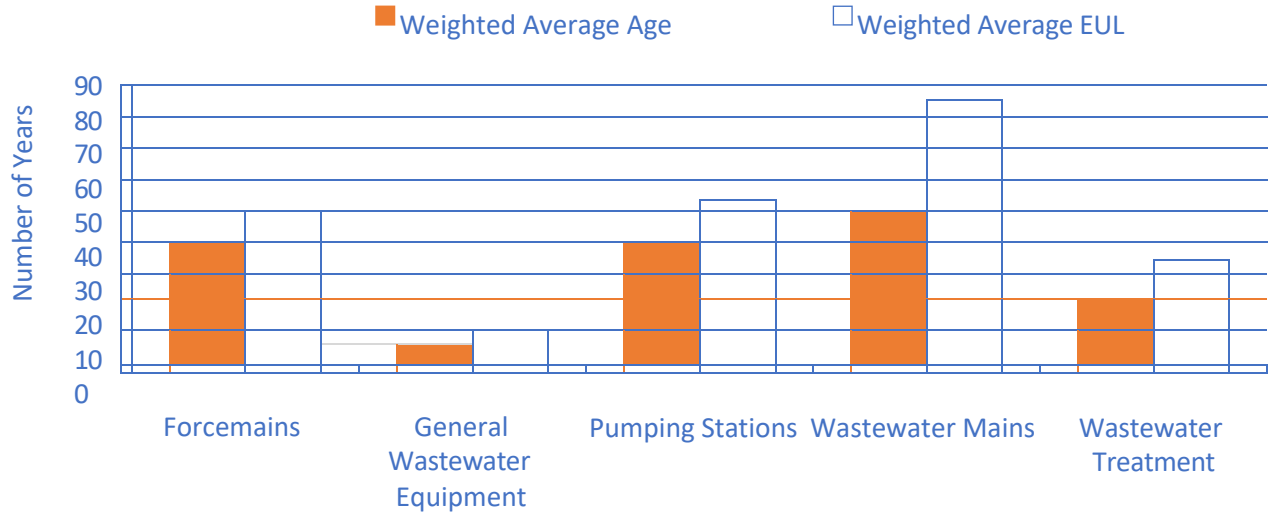


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

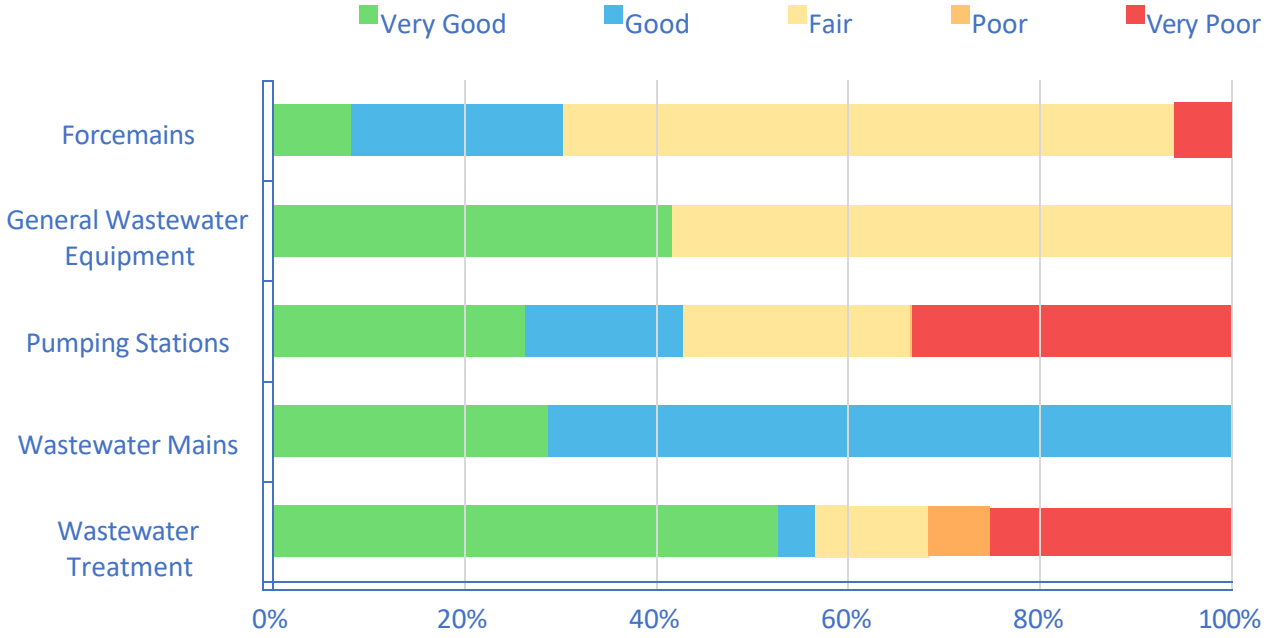
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighted based on replacement cost.

Figure 59 Wastewater Network Average Age vs Average EUL



The graph below visually illustrates the average condition for each asset segment on a very good to very poor.

Figure 60 Wastewater Network Condition Breakdown



To ensure that the Township's Wastewater 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 activities is required to increase the overall condition of the Wastewater Network.

Each asset's estimated useful life should also be reviewed to determine whether adjustments need to be made to better align with the observed service life.

Current Approach to Condition Assessment

Accurate and reliable condition data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The Township's current approach is to have OCWA manages all condition assessments and make recommendations. The rating criteria used to determine the current condition of sewer network assets and forecast future capital requirements is the same as other categories 0-100.

Lifecycle Management Strategy

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.

Figure 61 Wastewater Network Current Lifecycle Strategy

Minor Maintenance

Inspections, monitoring, cleaning and flushing, zoom camera,and CCTV inspections, etc.

Major Maintenance

Repairing manholes and replacing small sections of pipe

Rehabilitation

Structural lining of pipes and are cost effective and may extend the useful life upto 75 or more years

Replacement

Pipe replacement

Risk & Criticality

The 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 available inventory data. See Appendix K: Risk Rating Criteria used to determine the risk rating of each asset.

Figure 62 Wastewater Network Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$15,000,605 (15%)	$32,160,612 (32%)	$14,345,605 (14%)	$7,044,058 (7%)	$32,638,220 (32%)

This is a high-level model that has been developed based on information currently available and should be reviewed and adjusted to reflect an evolving understanding of both the probability and consequences of asset failure.

The identification of critical assets allows the Township to determine risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Levels of Service

The framework created by the Township for levels of service is a valuable tool for assessing and managing the performance of their assets and/or services provided by their assets. Proposed levels of service for the Township have been developed through engagement with Township staff.

Current Levels of Service

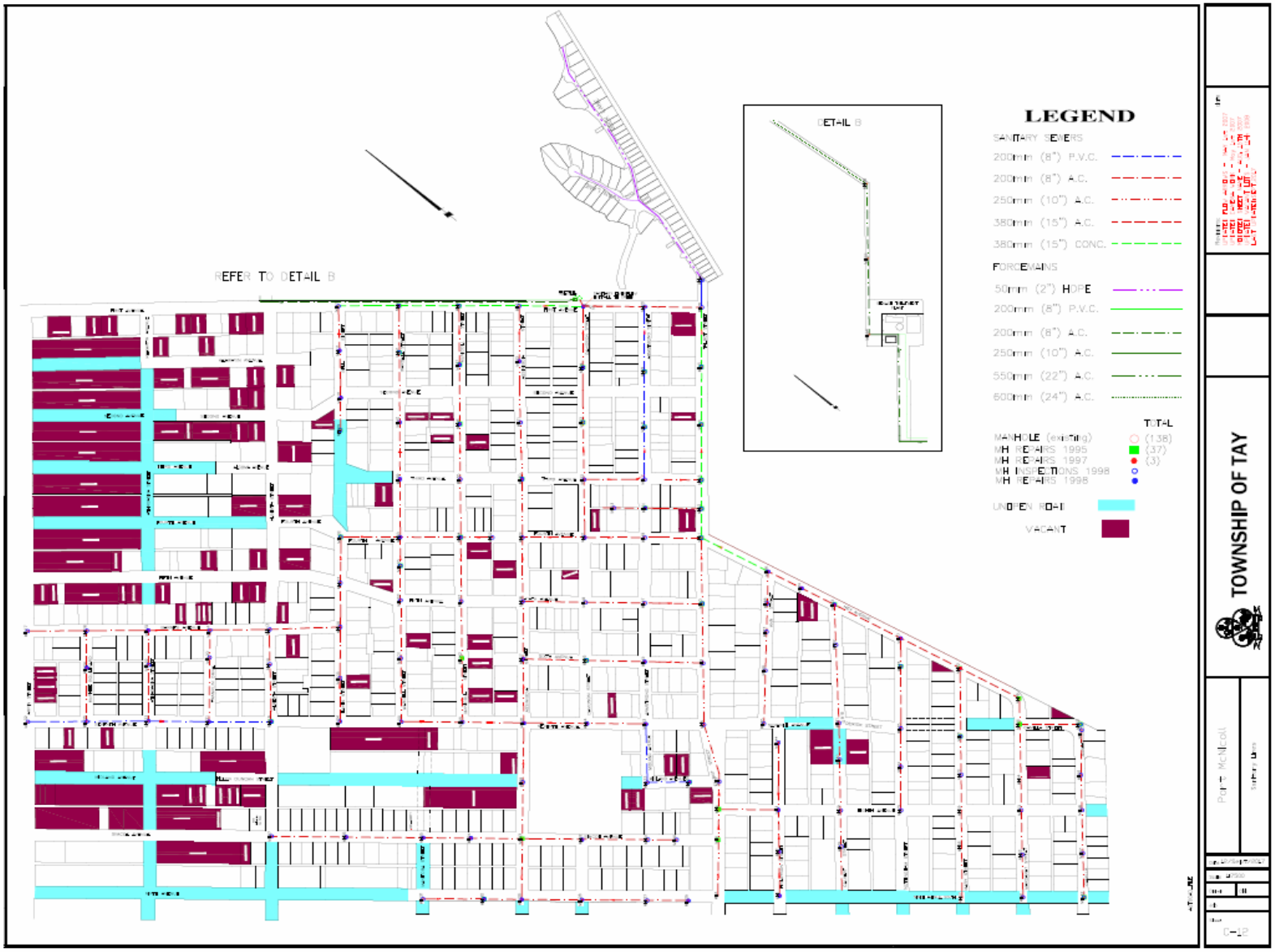
The following tables identify the Township's current level of service for the Wastewater Network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 as well as any additional performance measures that the Township has selected.

Table 39 Wastewater Network Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorus and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.	Sustainable	% Risk that is High and Very High	39%
			% of properties connected to the municipal wastewater system	41%
Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Figure 63 Maps of Wastewater Network	Affordable	Replacement Cost	$101,588,977
			Annual reinvestment	$681,998
			Capital reinvestment rate	0.67%
Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into wastewater network due to cracks in wastewater mains or through indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, wastewater mains may experience a volume of water and sewage that exceeds its designed capacity.	Reliable	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	3 days
Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to	The Township follows a series of design standards that integrate servicing requirements and land use considerations when constructing or replacing		# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal	0

stormwater infiltration	wastewater mains.	wastewater system	
Description of the condition of the wastewater network	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service • Very Poor - Unfit for sustained service	# of effluent violations per year due to wastewater discharge compared to the discharge compared to the total number of properties connected to the municipal wastewater system	0
		Average Condition % Condition > Fair	Fair (59%)
		% Condition poor and very poor	79%
			21%

Figure 63 Maps of Wastewater Network




LEGEND
SANITARY SEWERS
FORCEMAINS
MANHOLE INSPECTED 1997
MANHOLE REPAIRED 1997
MANHOLE INSPECTED 1998
MANHOLE REPAIRED 1998
MANHOLE (324) 1998
MANHOLE INSPECTED 1999
MANHOLE REPAIRED 1999
STURGEON POINT
SUNSET BEACH
ROBINS POINT
BERGIE POINT
GEORGIAN BAY
McKENZIE BEACH
OLD VILLAGE BOUNDARY
STURGEON BAY
HOGG BAY
DAVIS BRYDE
TOWNSHIP OF TAY
VICTORIA HARBOUR SANITARY
C—13

Proposed Levels of Service

The scenarios that were used to analyse Tay's inventory were run for 100-years to ensure all the lifecycles were included at least once. They are also all based on the data available in the asset management system which outlines estimated useful life and condition as well as replacement costs which all the results are based on.

Scenario 1: Current Lifecycle Activities - This scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The average condition and average annual investment were then determined.
Scenario 2: Current Capital Reinvestment Rate - This scenario utilizes the current capital reinvestment within each asset category. The current annual investment was maintained, and the average condition was determined.
Scenario 3: Maintain Current Average Condition - This scenario utilizes the current average condition of each asset category. The condition value was maintained, and the risk average annual investment was then determined.
Scenario 4: Target Average Condition Good - This scenario utilizes a target average condition of Good (at 60%) for each asset category. The condition value was maintained, and the average annual investment was then determined.

The table below outlines the results for each scenario for the wastewater network.

Table 40 Wastewater Network Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 – Lifecycle	$101,588,977	Good (78%)	$2,797,269
Scenario 2 - Current Capital Investment Rate	$101,588,977	Poor (29%)	$681,998
Scenario 3 - Maintain Current Condition	$101,588,977	Fair (59%)	$2,077,169
Scenario 4 - Maintain Condition Target	$101,588,977	Good (60%)	$2,178,217

The recommended scenario for the wastewater network is Scenario 4 maintain a target average condition of Good.

Appendix J: 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:

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

Appendix K: Risk Rating Criteria

General Risk Definitions

Risk	Integrating a risk management framework into your asset management program requires the translation of risk potential into a quantifiable format. This will allow you to compare and analyze individual assets across your entire asset portfolio. Asset risk is typically defined using the following formula: Risk = Probability of Failure (POF) x Consequence of Failure (COF)
Probability of Failure (POF)	The probability of failure relates to the likelihood that an asset will fail at a given time. The current physical condition and service life remaining are two commonly used risk parameters in determining this likelihood.
POF - Structural	The likelihood of asset failure due to aspects of an asset such as load carrying capacity, condition or breaks
POF - Functional	The likelihood of asset failure due to its performance
POF - Range	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
Consequences of Failure (COF)	The consequence of failure describes the overall effect that an asset's failure will have on an organization's asset management goals. Consequences of failure can range from non-eventful to impactful: a small diameter water main break in a subdivision may cause several rate payers to be without water service for a short time. However, a larger trunk water main may break outside a hospital, leading to significantly higher consequences.
COF - Economic	The monetary consequences of asset failure for the organization and its customers
COF - Social	The consequences of asset failure on the social dimensions of the community
COF - Environmental	The consequence of asset failure on an asset's surrounding environment
COF - Operational	The consequence of asset failure on the Town's day-to-day operations
COF - Health & safety	The consequence of asset failure on the health and well-being of the community
COF - Strategic	The consequence of asset failure on strategic planning
COF - Range	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe

Risk Frameworks – General

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
General / Corporate		COF	Economic	100%	Replacement Cost	100%	0 - 25,000 25,000 - 50,000 50,000 - 100,000 100,000 - 250,000 >250,000	1 - Insignificant 2 - Minor 3 - Moderate 4 - Major 5 - Severe
		POF	Structural	60%	Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 30 - 39 20 - 29 10 - 19 0 - 9	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Risk Frameworks – Road Network

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Road Network	Roads	COF	Economic	100%	AMP Segment (Surface Type)	100%	Gravel Surface Treatment Asphalt	2 - Minor 3 - Moderate 4 - Major
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 30 - 39 20 - 29 10 - 19 0 - 9	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain

Risk Frameworks – Storm Network/Water Network/Wastewater Network

Asset Category	Asset Segment	Risk Criteria	Criteria	Weighting (%)	Sub-Criteria	Weighting (%)	Value/Range	Score
Stormwater Network / Water Network / Wastewater Network	Mains / Pipes	COF	Economic	70%	Diameter	100%	<=100 >100 - < 300 >=300 - <400 >=400 - <700 >700	- Insignificant - Minor - Moderate - Major - Severe
			Operational	30%	Segment	100%	Mains & Storm Mains Watermains Force mains	2 - Minor 3 – Moderate 4 - Major
		POF	Structural	60%	Assessed Condition	100%	80 - 100 60 - 79 40 - 59 20 - 39 0 - 19	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain
			Functional	40%	Service Life Remaining	100%	> 40 30 - 39 20 - 29 10 - 19 0 - 9	1 - Rare 2 - Unlikely 3 - Possible 4 - Likely 5 - Almost Certain