2024

ASSET MANAGEMENT PLAN

WASTEWATER COLLECTION SYSTEM

The TOWNSHIP of MALAHIDE

A proud tradition, a bright future.

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Definitions, Abbreviations, and Acronyms

ULR	Useful Life Remaining
IJPA	Infrastructure for Jobs and Prosperity Act
KPI	Key Performance Indicator
LOS	Levels of Service
SCADA	Supervisory Control and Data Acquisition System
SFD	Single Family Dwelling
kWh	Kilowatt-hour

The preparation of this project was carried out with assistance from the Government of Canada and the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

INTRODUCTION

OVERVIEW

The main objective of an asset management plan is to use a municipality's best available information to develop a comprehensive long-term plan for capital assets. In addition, the plan should provide a sufficiently documented framework that will enable continuous improvement and updates of the plan, to ensure its relevancy over the long-term. The Township's goals and objectives with respect to asset management are identified in the Township's Strategic Asset Management Policy.

A major theme within that policy is for the Township's physical assets to be managed in a manner that will support the sustainable provision of municipal services to Township residents. Through the implementation of the asset management plan, the Township's practice should evolve to provide services at levels proposed within this document. Moreover, infrastructure and other capital assets should be maintained at condition levels that provide a safe and functional environment for its residents. Therefore, the asset management plan, and the progress with respect to its implementation, will be evaluated based on the Township's ability to meet these goals and objectives.

The following assets are included in this asset management plan:

- Collection Mains;
- Manholes;
- Force Mains;
- Pump Stations; and
- SCADA

LEGISLATIVE CONTEXT

ASSET MANAGEMENT

Asset management planning in Ontario has evolved significantly over the past decade. Before 2009, capital assets were recorded by municipalities as expenditures in the year of acquisition or construction. The long-term issue with this approach was the lack of a capital asset inventory, both in the municipality's accounting system and financial statements. As a result of revisions to section 3150 of the Public Sector Accounting Board handbook, effective for the 2009 fiscal year, municipalities were required to capitalize tangible capital assets, thus creating an inventory of assets.

In 2012, the province launched the Municipal Infrastructure Strategy. As part of that initiative, municipalities and local service boards seeking provincial funding were required to demonstrate how any proposed project fits within a detailed asset management plan. In addition, asset management plans encompassing all municipal assets needed to be prepared by the end of 2016 to meet Federal Gas Tax agreement requirements. To assist in defining the components of an asset management plan, the Province produced a document entitled Building Together: Guide for Municipal Asset Management Plans. This guide documented the components, information, and analysis that were required to be included in municipal asset management plans under this initiative. The province's Infrastructure for Jobs and Prosperity Act, 2015 (IJPA) was proclaimed on May 1, 2016. This legislation detailed principles for evidence-based and sustainable long-term infrastructure planning. IJPA also gave the province the authority to guide municipal asset management planning by way of regulation.

In late 2017, the province introduced O. Reg. 588/17 under IJPA. The intent of O. Reg. 588/17 is to establish a standard format for municipal asset management plans. Specifically, the regulations require that asset management plans be developed that define the current and proposed levels of service, identify the lifecycle activities that would be undertaken to achieve these levels of service, and provide a financial strategy to support the levels of service and lifecycle activities. This plan has been developed to address the requirements of O. Reg. 588/17 utilizing the best information available to the Township at this time.

Watson & Associates Economists Ltd. (Watson) was retained by the Township of Malahide (Township) in 2018 to update the Township's Strategic Asset Management Policy and Asset Management Plan (dated November 29, 2013). In 2022, Township Staff undertook an update of the Watson plan (dated February 20, 2019), ensuring the Township's asset management practices were compliant with Ontario Regulation 588/17.

Due July 1, 2024, O. Reg. 588/17 requires municipal asset management plans to be updated for all capitalized assets. This update should include updated asset inventories, current levels of service, lifecycle activities, and funding strategies. This plan will be a tool for Township staff and Council to use during various decision-making processes, including the annual budgeting and future capital grant applications. This plan will serve as a road map for sustainable infrastructure planning going forward. With this current update to the asset management plan, the intent is to continue compliance with Ontario Regulation 588/17.

WASTEWATER

The Ontario Water Resources Act focuses on both groundwater and surface water throughout the province. The Water Resources Act regulates sewage disposal and “sewage works” and prohibits the discharge of polluting materials that may impair water quality.

The Environmental Protection Act is the primary pollution control legislation in Ontario and can be used interchangeably with the Water Resources Act. The legislation prohibits discharge of any contaminants in to the environment that cause or are likely to cause adverse effects. Amounts of approved contaminants must not exceed limits prescribed by the regulations. The Act also requires that spills of pollutants are reported and cleaned up promptly. The Environmental Protection Act also has the authority to establish liability on the party at fault. One section of the Act imposes a duty on corporate officers and directors to take all reasonable care to prevent the corporation from causing or permitting unlawful discharges of contaminants into the natural environment.

Ontario’s Environmental Assessment Act generally requires an environmental assessment of any major public or designated private undertaking in order to determine the ecological, cultural, economic and social impact of the project. The Act also establishes a “Class Environmental Assessment” process for planning certain municipal projects. Municipal projects that may be affected include municipal road, water, and sewage and storm water projects. For wastewater projects, the purpose of the municipal class environmental assessment is to ensure that projects will be "undertaken to address problems affecting the operation and efficiency of existing systems, to accommodate future growth of communities, or to address water source contamination problems". The municipal Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA) replaces the numerous pipe-by-pipe Environmental Compliance Approvals (ECAs) that were previously required for components of municipal sewage collection systems under the Environmental Assessment Act. This approval applies to all the sewage works components of a municipal sewage collection system and includes any new sewage works that may be added to the system and any alterations to structures or equipment within the system.

The Sustainable Water and Sewage Systems Act outlines the framework for implementing full cost accounting to ensure long term sustainability of municipal water supplies. The Act requires municipalities to assess the costs of water and to develop plans to charge appropriate rates and generate sufficient revenue to finance capital and operating costs of sewer and water systems.

PLAN DEVELOPMENT

The asset management plan was developed using a program that leverages the Township's asset management principles as identified within its strategic asset management policy, capital asset database information, and staff input in identifying current and proposed levels of service, as informed by the Council, as well as proposed asset management strategies.

The development of the Township's asset management plan is based on the steps summarized below:

Inventory	Compile available information pertaining to the Township's capital assets to be included in the plan, including attributes such as size/material type, useful life, age, accounting valuation and current valuation. Update current valuation, where required, using benchmark costing data or applicable inflationary indices.
State of Local Infrastructure	Define and assess the state of local infrastructure through current asset conditions, based on a combination of Township staff input, existing asset reports, and an asset age-based condition analysis.
Levels of Service	Define and document current levels of service, as well as proposed levels of service, based on discussions with Township Council and staff, and consideration of various background reports.
Lifecycle Activities	Develop a strategy that provides for the activities required to sustain the levels of service discussed above. The strategy summarizes these activities in the forecast of annual capital and operating expenditures required to achieve these level of service outcomes.
Financing Strategy	Develop a financing strategy to support the lifecycle management strategy. The funding strategy informs how the capital and operating expenses arising from the asset management strategy will be funded over the forecast period, and may be accommodated in the annual budget process.
Document	Document the comprehensive Asset Management Plan in a formal report to inform future decision-making and to communicate planning to municipal stakeholders.
Publish	Make the Asset Management Plan and all relevant background information and reports available to the public. The Asset Management Plan, Strategic Asset Management Policy, and relevant reports to Council will be available on the Township's website, in addition to all background information made available upon request.

STATE OF LOCAL INFRASTRUCTURE

This is an analysis of the Township's assets, the current service levels provided by those assets, and the service levels the Township intends to deliver into the future. O. Reg. 588/17 requires that for each asset category included in the asset management plan, the following information must be identified:

- Summary of the assets;
- Replacement cost of the assets;
- Average age of the assets (it is noted that the Regulation specifically requires average age to be determined by assessing the age of asset components);
- Information available on condition of assets; and
- Approach to condition assessments (based on recognized and generally accepted good engineering practices where appropriate)

LEVELS OF SERVICE

Asset management plans must identify the current levels of service being provided for each asset category by July 1st, 2024 per O. Reg. 588/17. For core municipal infrastructure assets (Bridges and Culverts, Roads, Wastewater, and Water), both the qualitative descriptions pertaining to community levels of service, and metrics pertaining to technical levels of service, are prescribed by O. Reg. 588/17. Current community and technical levels of service are based on data from the 2023 data collection period.

Proposed levels of service will need to be identified for each asset category by July 1st, 2025 per O. Reg 588/17. The proposed service levels will require a detailed explanation of why they are appropriate, give options with associated risks in regards to long-term sustainability, explain why they differ from current service levels and whether they are achievable and affordable. The proposed service levels for each asset category have not been included in this version of the plan, to be identified in future versions to maintain compliance with O. Reg. 588/17.

LIFECYCLE MANAGEMENT

Lifecycle management strategies are required to maintain the current and proposed levels of service. A lifecycle management strategy identifies the recommended lifecycle activities required to achieve desired levels of service. Lifecycle activities are the specified actions that can be performed on assets in order to increase service level and extend service life. These actions can be carried out on a planned schedule in a prescriptive manner, or through a reactionary approach where the treatments are only carried out when specified conditions are met. O. Reg. 588/17 requires that all potential lifecycle

activity options be presented, with the aim of analyzing these options in search of identifying the set of lifecycle activities that can be undertaken at the lowest cost to maintain current levels of service or to provide proposed levels of service.

Asset management plans must include a 10-year capital plan that forecasts the lifecycle activities resulting from the lifecycle management strategy. What follows are the lifecycle management strategies for all asset classes contained within this asset management plan, with each section focusing on an individual asset category. Although a considerable amount of effort has been spent on developing lifecycle management strategies informed by observed asset conditions, there are still some assets for which the lifecycle management strategy is age-based. The expenditure forecasts resulting from the lifecycle management strategies for each asset category are also included and have been developed for a 20-year forecast period.

FUNDING STRATEGY

A funding strategy should sustainably fund the lifecycle management strategies of an asset. The funding strategy contained herein focuses on examining how the Township can fund the lifecycle activities required to maintain its assets at the current and/or proposed levels of service. The strategies presented are a suggested approach which should be examined and re-evaluated during the annual budgeting processes to ensure the sustainability of the Township's financial position as it relates to its assets.

O. Reg. 588/17 requires a 10-year capital plan that forecasts the costs of implementing the lifecycle management strategy and the lifecycle activities required therein. The funding strategy in this asset management plan has been developed for a 20-year forecast period, where adequate data allowed, to enable the Township to evaluate the sustainability of its assets over a longer-term horizon. The funding strategy forecast (including both expenditure and revenue sources) was prepared consistent with the Township's departmental budget structure so that it can be used in conjunction with the annual budget process. Various financing options, including reserve funds, debt, and grants were considered. The recommended financing strategy identifies rehabilitation and replacement activities required over the forecast period.

GROWTH

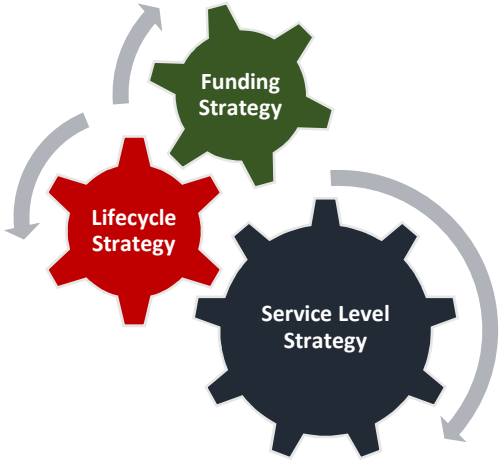
For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, assumptions need to be made regarding future changes in population and how those changes will affect asset lifecycle activities required to maintain current levels of service. The 2021 population estimate of the Township of Malahide, as reported by Statistics Canada, was 9,308. This represents an increase of

0.2% from the previous census estimate in 2016. Assuming that growth remains at this level for the next ten years, the current lifecycle activities outlined in this report will remain sufficient to maintain the current levels of service.

MAINTENANCE AND INTEGRATION

It should be noted, that while this report covers a forecast period of 20 years, the full lifecycle of the Township's assets was considered in the calculations. In this context, the asset management plan should be updated as the strategic priorities and capital needs of the Township change. This can be accomplished in conjunction with specific legislative requirements (i.e. 5-year review of asset management plan under Infrastructure for Jobs and Prosperity Act), as well as the Township's annual budget process. Further integration into other Township financial/planning documents would assist in ensuring the ongoing accuracy of the asset management plan, as well as the integrated financial/planning documents. The asset management plan has been developed to allow linkages to a number of strategic documents, as identified in the Township's Strategic Asset Management Policy. Township staff have the tools available to perform updates to the asset management plan as necessary.

In the future, the asset management plan will continue to be updated by Township staff to more closely integrate with other studies and reports pertaining to Township assets. For example, the strategies identified in this asset management plan should be updated to include the biennial OSIM and Road Needs Study reports. When updating the asset management plan, it should be noted that the state of local infrastructure, proposed levels of service, lifecycle management strategy, and financing strategy are integrated and impact each other. For example, the financing strategy outlines how the asset management strategy will be funded. The lifecycle management strategy illustrates the costs required to maintain expected levels of service at a sustainable level. The proposed levels of service component summarize and link each service area to specific assets contained in the state of local infrastructure section and thus determines how these assets will be used to provide expected service levels.



WASTEWATER COLLECTION SYSTEM

STATE OF LOCAL INFRASTRUCTURE

ASSET CLASS SUMMARY

The Township currently owns and manages 7.5 kilometres of wastewater collection mains, 3.6 Kilometres of wastewater force mains (including 4 air release chambers), 2 Pump Stations, and 80 manholes, with a 2023 total replacement value totaling approximately $15 million. The collected wastewater is pumped to a wastewater treatment facility owned by the Town of Aylmer. Table 1 provides a summary of count, age, and replacement value for the current wastewater collection system assets. The oldest average age of the Township's wastewater collection system belongs to the collection mains, averaging 24 years, while the youngest average age belongs to the pump stations, averaging 8 years. Figure 1 maps the wastewater collection system to visualize the Township's current asset network.

Table 1

Wastewater Collection System Infrastructure Summary

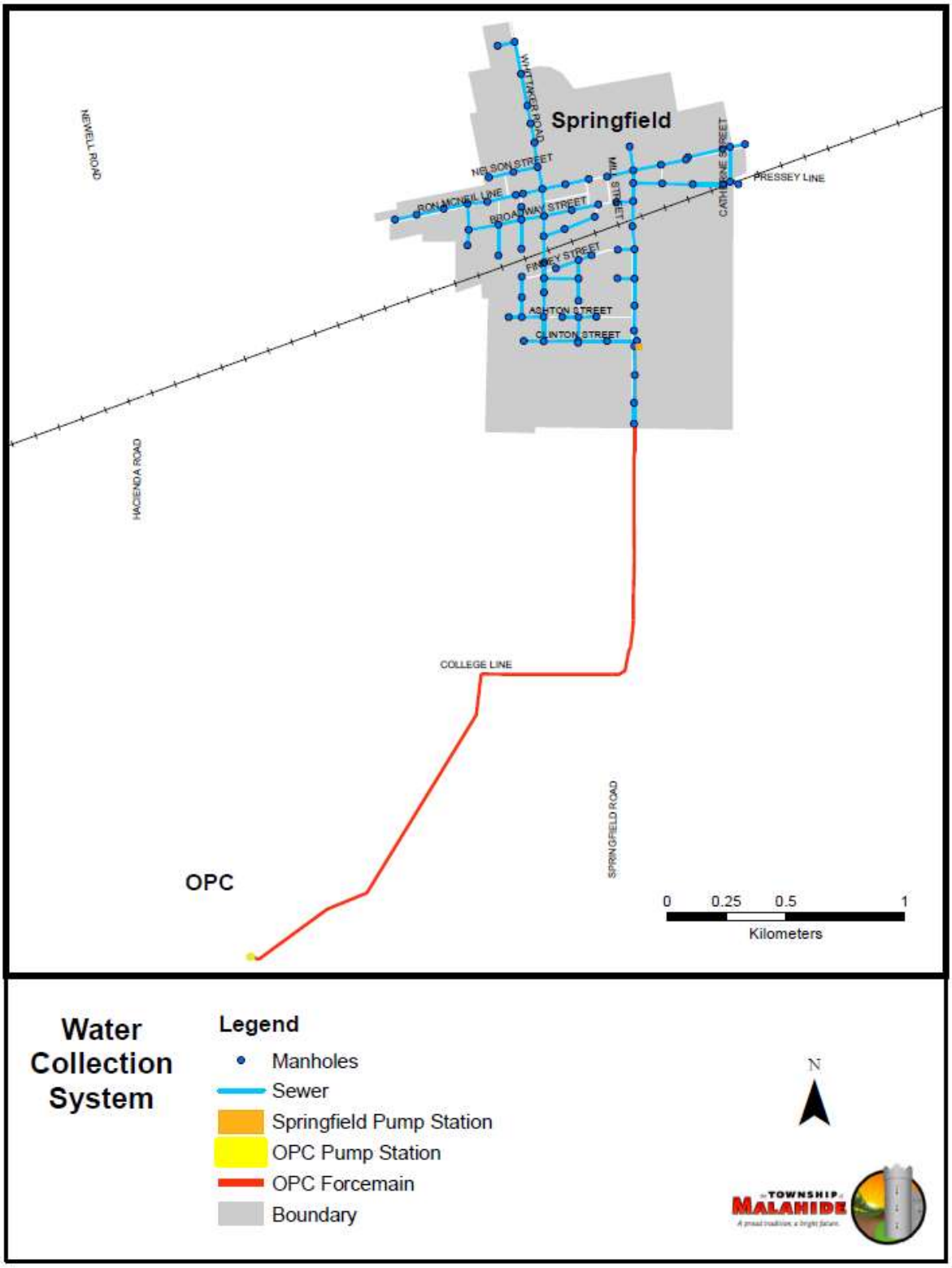
Type	Quantity	Average Age	Replacement Cost (2023 $)
Collection Mains	7.5 km	24	$5,598,837
Manholes	80 units	19	$1,713,960
Pump Stations	2 stations	9	$4,795,454
Force Mains	3.6 km	11	$2,814,066
SCADA	2 Sites	4	$115,413
TOTAL			$15,037,730

ASSET CLASS PERFORMANCE

The performance of the wastewater asset class is currently tracked by energy consumption at the Springfield Pump Station. In 2023, the hydro used by the pump station was approximately 27,357 kWh. This represents a 7% decrease in hydro consumption from 29,407 kWh in 2022.

Figure 1

Wastewater Collection System Map



CONDITION

The Township Staff assessed the condition of the wastewater collection system, applying a condition state for the percentage of useful life remaining for assets. The percentage of useful life remaining is based on a predetermined useful life for collection mains, force mains, manholes, and the pump station components. To better communicate the condition of the wastewater collection system, the numeric condition ratings have been segmented into qualitative condition states as summarized in Figure 2.

Figure 2

Wastewater System Condition States Defined with Respect to Useful Life

Table 2 examines the average condition rating of wastewater collection system. The average condition of the assets comes from the percentage of useful life remaining, and is identified for each wastewater asset category. Figure 3 displays the condition ratings within each wastewater asset category. The only category with elements falling below a "Fair" condition state rating are found within the Springfield Pump Station.

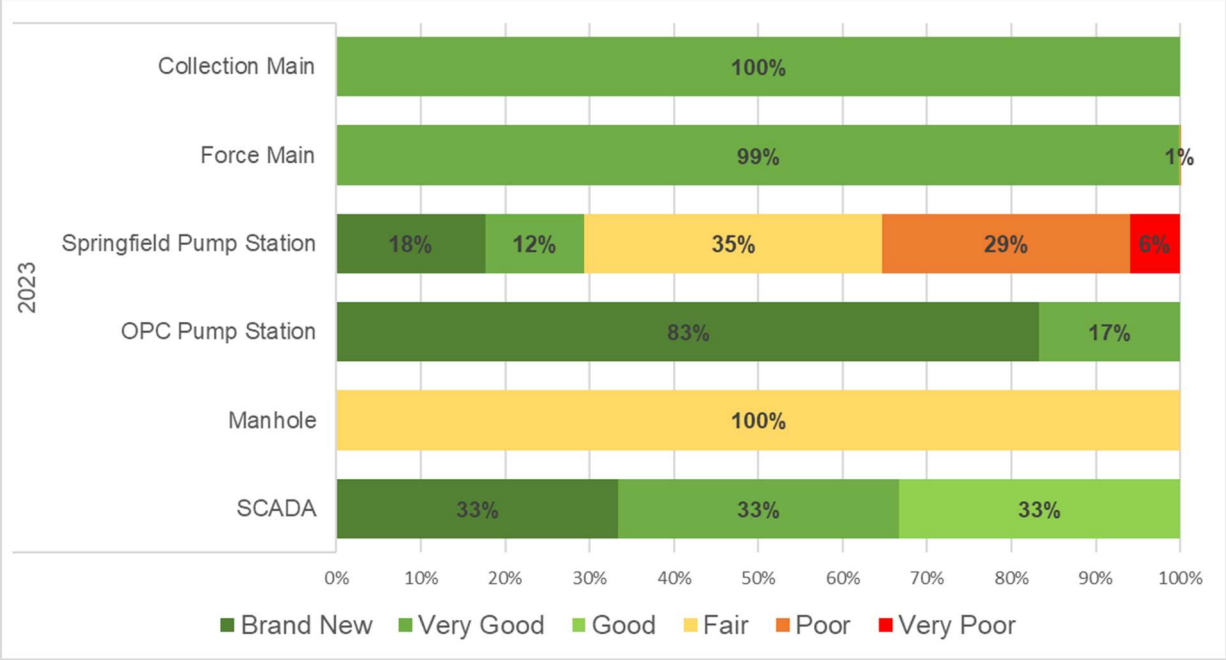
Table 2

Wastewater System Condition Analysis

Type	Quantity	Average % of Useful Life Remaining (ULR)	Average Condition State
Collection Mains	7.2 km	76	Very Good
Force Mains	3.6 km	72	Very Good
Pump Stations	2	62	Good
Manholes	80	43	Fair
SCADA	2 Sites	75	Very Good

Figure 3

Wastewater System Asset Component Condition States



LEVELS OF SERVICE

CURRENT LEVELS OF SERVICE

The levels of service currently provided by the Township's wastewater collection system is, in part, a result of the state of local infrastructure identified above. A level of service analysis defines the current levels of service and enables the Township to periodically evaluate these service levels. Wastewater collection system assets have prescribed levels of service reporting requirements under O. Reg. 588/17. These requirements include levels of service reporting from two different levels, i.e. community levels of service and technical levels of service. Community levels of service objectives describe service levels in terms that customers understand and reflect their scope and quality expectations of the wastewater collection system. Technical levels of service describe the scope and quality of assets through performance measures that can be quantified, evaluated, and detail how effectively a municipality provides services. The Township has also set performance measures for levels of service beyond the requirements under regulation. Table 3 presents the current levels of service, as set by the Township, or as mandated by O. Reg. 588/17, indicated by an asterisk.

Table 3

Wastewater Collection System - Current Levels of Service (2023)

COMMUNITY LEVELS OF SERVICE	TECHNICAL LEVELS OF SERVICE
Wastewater collection pipes are in a "Very Good" condition state on average.	Average network pipe condition: **URL 75**
Pump stations are in a "Good" condition station on average.  (OPC Pump Station, Hacienda Rd)	Average pump station condition: **URL 62**

Areas connected to the wastewater collection system include: The village of Springfield Ontario Police College	Percentage of total number of properties connected to the community's wastewater system:* **9%**
There were no incidents of sewer overflows that took place in 2023.	Total number of incidents and volume of combined sewer flows exceeding system capacity (overflows):* **0 Overflows**
There were no incidents of basement back-ups that took place in 2023.	Total number of connection-days per year due to basement back-ups:* **0 Back-Ups**

LIFECYCLE MANAGEMENT

LIFECYCLE ACTIVITIES

This section will detail the lifecycle activities (capital treatments) as prescribed by Township staff. The treatments that the Township currently employs in the management of its wastewater collection system include:

- Rehabilitation – Replacement of Critical Asset Components; and
- Reconstruction – Replacement of Asset.

Table 4 details the costs for the lifecycle activities listed above. These costs are presented as a percentage of estimated replacement cost or as flat rates per treatment.

Rehabilitation of the components of a force main includes the replacement of the four air release valves, as well as sections of pipe. Rehabilitation of the components of a pump station include replacement of pumps, pipes, electrical, valves, vents, meters, generators, and structural components. Rehabilitation of SCADA includes the upgrade of software and the replacement of servers, PLCs and cabinets. The full replacement of an asset is the costliest treatment and therefore is only recommended after all other rehabilitation treatments have been exhausted.

Table 4

Water Distribution System Treatment Costs

Treatment	Applies To	Cost (%)
Rehabilitation (Component Replacement)	Pump Stations, Force mains, SCADA	100% of Component Cost

Replacement	All (excluding SCADA)	100% of Replacement Cost

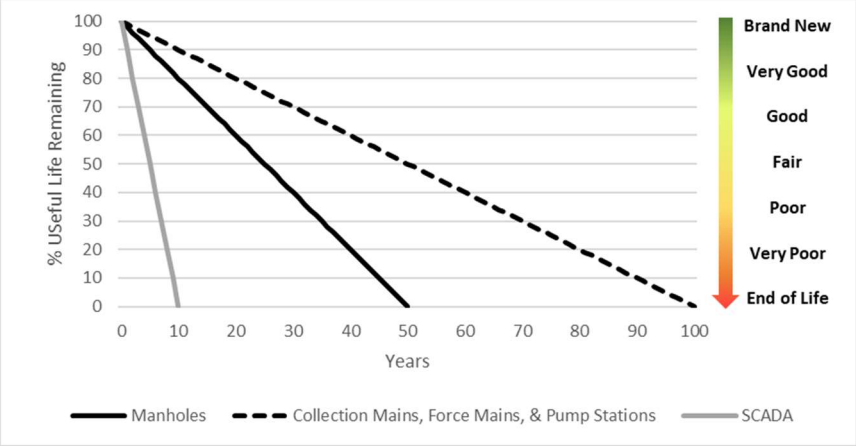
DEGRADATION PROFILES

Assets deteriorate over time, eventually reaching a point where they have no remaining service life left. However, the path each asset takes in reaching its end of life differs, even for assets of the same type. A condition rating identifies where along the path any particular asset lays, or in other words, how long an asset has left before it reaches its end of life. Therefore, condition and service life are linked, and can be plotted graphically to visually represent the degradation curve of an asset.

Figure 4 presents the degradation profile of wastewater assets that has been developed based on a straight-line approach per manufacturer recommendations. Through the process of conducting condition assessments, the Township will be able to collect data to further refine the degradation profile.

Figure 4

Collection and Force Main Degradation Profile



DECISION CRITERIA

Table 5 presents the decision criteria—developed through discussions amongst Township staff—for triggering specific wastewater collection asset treatments. When the decision criteria for a given asset are met, the corresponding treatment is eligible to be applied. When a treatment is applied, the percentage of useful life remaining of the asset is improved by the amount specified in the “Gain to Condition” column, but not to exceed the amount listed in the “Maximum Threshold” column.

Table 5

Wastewater Collection System Treatment Decision Criteria

Asset Type	Treatment	%ULR Range	Gain to Condition	Maximum Threshold
Collection Mains	Replacement	20-0	+100	100
Force Mains	Rehabilitation	95-34	+1	96
	Replacement	34-0	+100	100
Manholes	Replacement	20-0	+100	100
SCADA	Rehabilitation	20-0	+100	100
Pump Stations	Rehabilitation	75-45	+10	85
	Replacement	20-0	+100	100

EXPECTED LIFECYCLE AND ASSOCIATED RISK

Combining the treatments, degradation profiles, and decision criteria presented herein results in a complete lifecycle management strategy. Figure 5 and 6 present illustrative examples of the expected lifecycles for wastewater collection mains and manholes, respectively. Figure 7, 8 and 9 present the expected lifecycles for the component-based force main, pump stations, and SCADA system. The dashed, vertical lines represent points of intervention in the representative asset's expected life. The lifecycle path of the asset is represented by the solid lines, following the degradation profile presented above. Finally, the dotted line demonstrates the expected lifecycle of an asset were it to not receive any treatments over the course of its service life.

In addition to the age-based approach to condition assessments, enhanced reviews will be conducted on assets as they approach the forecasted treatment/replacement periods. The enhanced reviews will consider the condition of individual asset components as well as environmental factors, and other risks. Reviewing these associated risks will ensure that the recommended treatment or replacement period reflects all elements of the asset and the level of service it provides. As the individual asset's condition is degraded over time, the timing of the eventual replacement could vary significantly from one asset to another due to unique internal and environmental factors. For example, if the environment in which a collection main resides causes it to degrade faster or slower than the expected average, then the eventual replacement may be different than an average age-based approach. Collection main conditions are monitored on a regular basis with a flushing and camera review being done on a four-year basis.

The lifecycle strategy for wastewater collection mains and manholes is a replacement prior to the asset degrading to a point where the risk of failure becomes statistically more likely to occur. For example, a collection main will continue to degrade from a ULR of

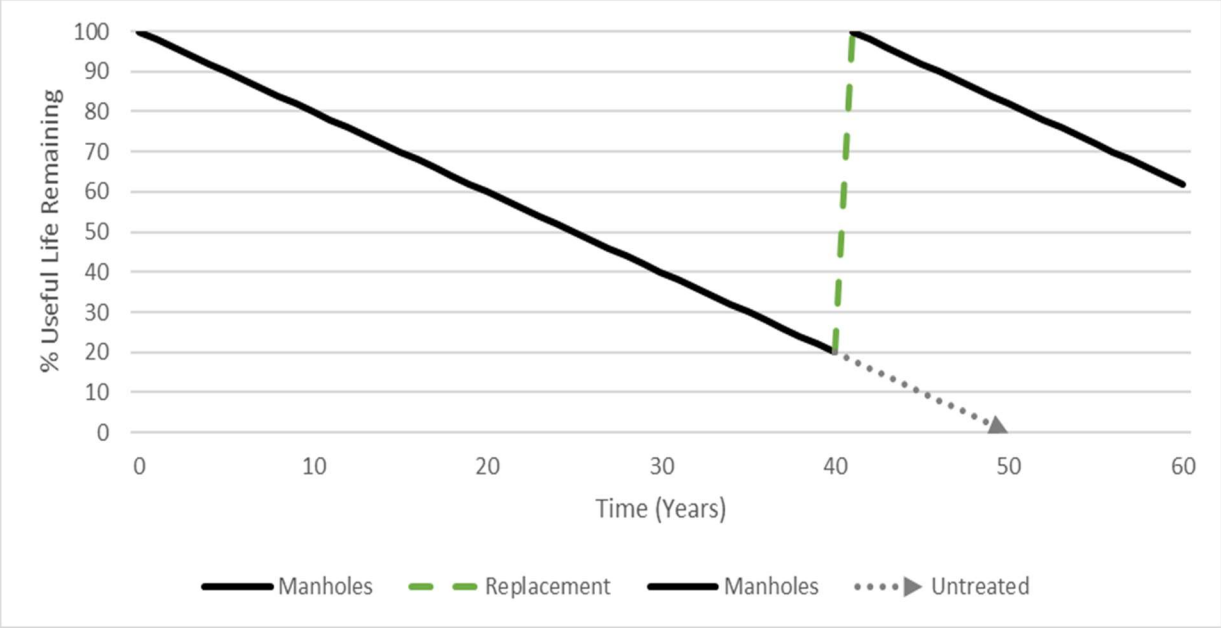
100% to a ULR of 20% at which time it will be triggered for replacement. If the replacement does not occur, the water main will continue to degrade from the URL of 20% to the URL of 0% in a condition state of “very poor”. Collection mains are triggered for replacement at 20% useful life remaining to minimize the risk of failure which could cause a moderate threat to public safety.

Figure 5

Lifecycle Strategy – Wastewater Collection Mains

Figure 6

Lifecycle Strategy – Manholes



The lifecycle strategies for force mains, pump stations, and SCADA will be to address individual components of the asset in a combination of rehabilitation and replacement strategy. If budgetary constraints prevent a component replacement from occurring as it becomes due, the asset will continue to degrade to a point that it needs to be replaced. Individual components will have specific replacement schedules and contribute to an overall asset condition. Ensuring these schedules are adhered to will result in the overall asset continuing to provide current levels of service and will minimize the risk of failure.

For example, the force main will continue to degrade from a ULR of 100% to a ULR of 40% at which time it will be triggered for replacement. If the replacement does not occur, the water main will continue to degrade from the URL of 34% to the URL of 18%, in a condition state of “poor”, then from the URL of 18% to 0%, in a condition state of “very poor”. Force mains are triggered for replacement at 34%, prior to entering a state of “Poor” condition to minimize the risk of failure which could cause a significant threat to public safety.

Figure 7

Lifecycle Strategy – Force Mains

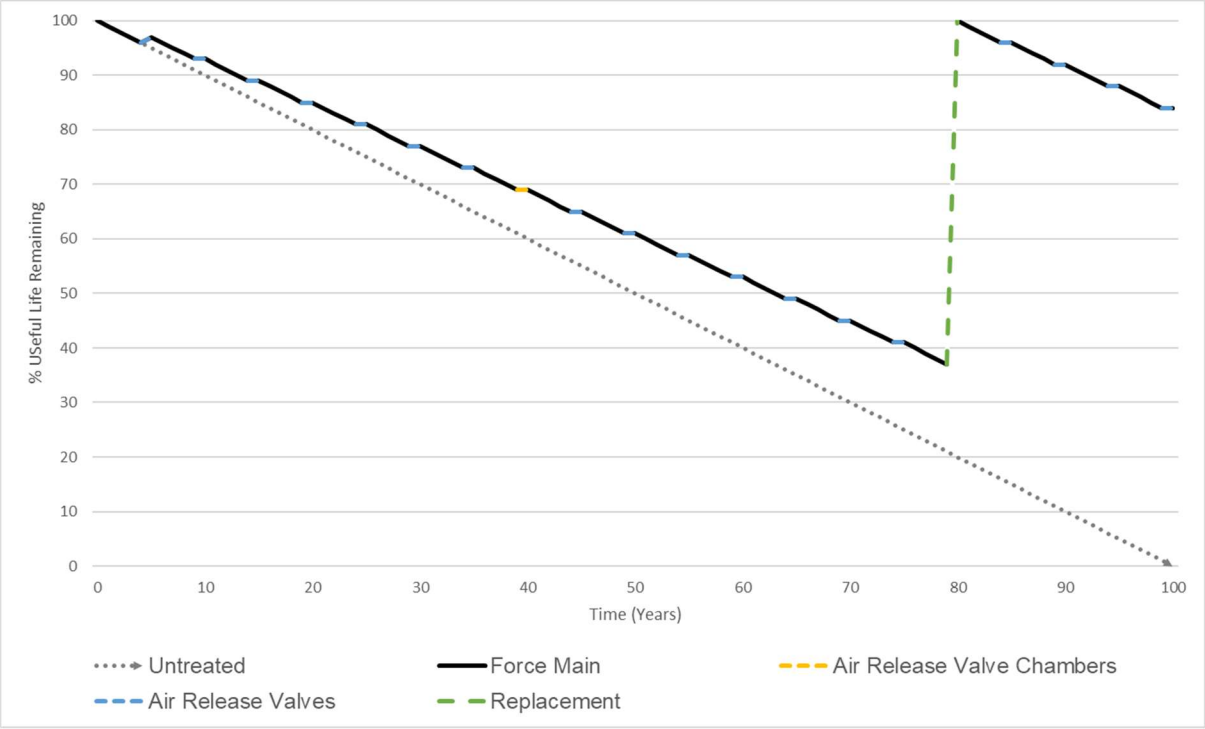


Figure 8

Lifecycle Strategy – Pump Stations

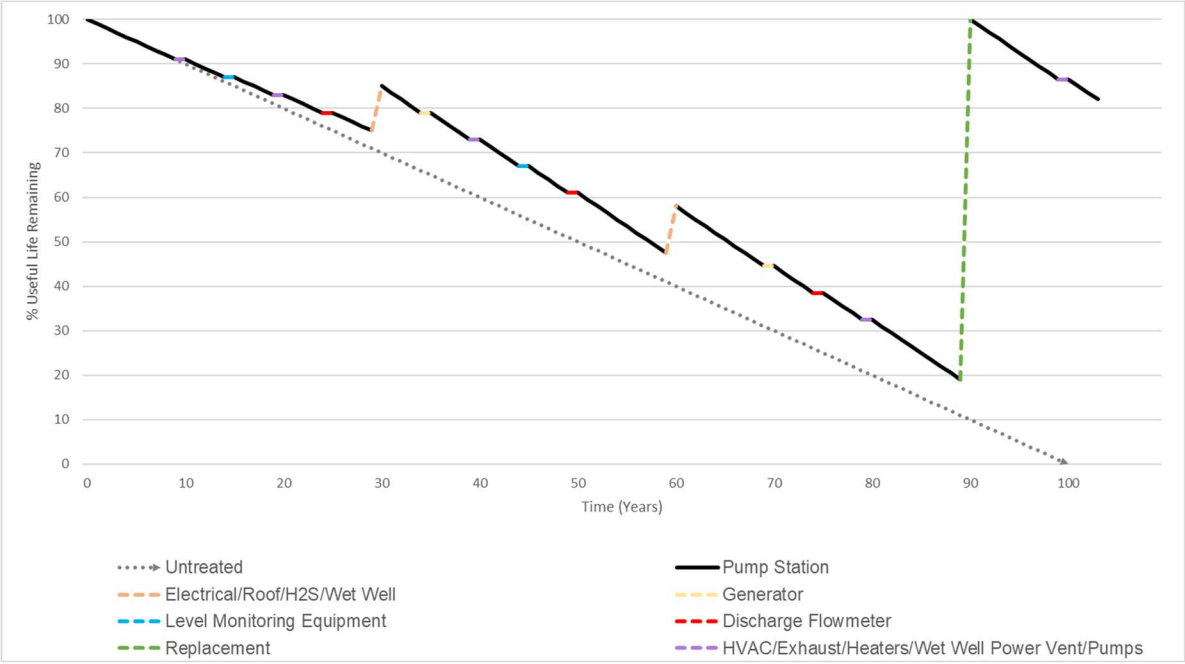
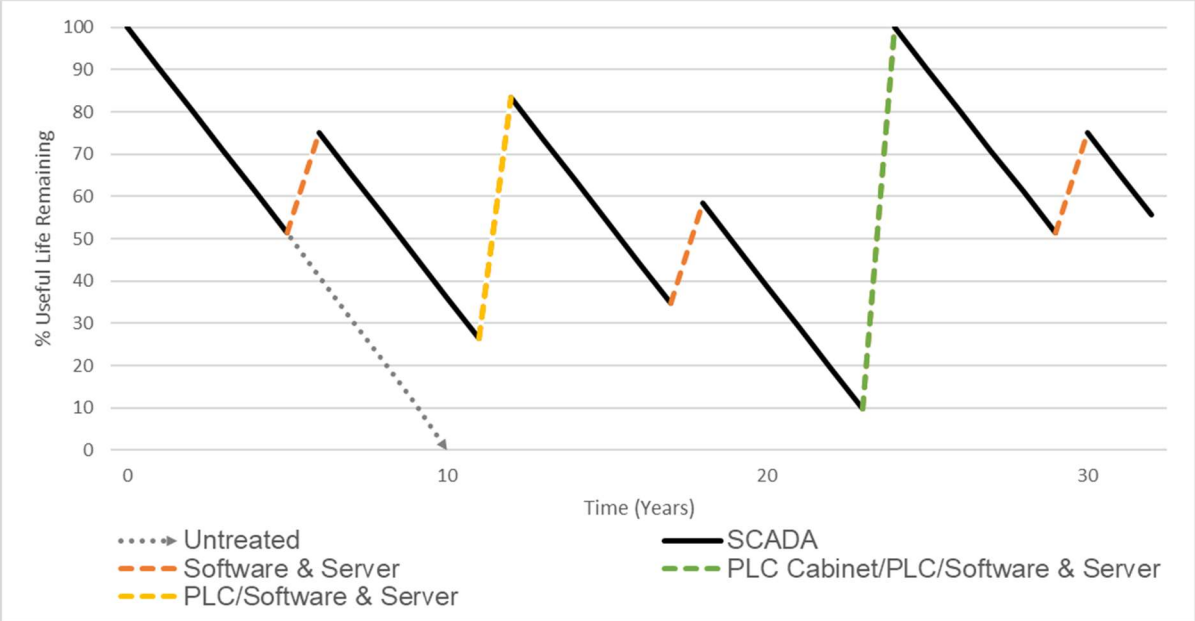


Figure 9

Lifecycle Strategy – SCADA



NETWORK FORECASTS

NETWORK COST FORECAST

The lifecycle replacement activities planned for current guiderail assets are projected to cost approximately $4,648,147 over the 20-year forecast period.

Figure 10 presents the 20-year expenditure forecast that results from following the lifecycle management strategy detailed above. This forecast illustrates the annual expenditures without any consideration to budgetary constraints. Over the 20-year forecast period, the average annual expenditure would be approximately $232,407.

The expenditure forecast includes a capital inflation factor of 3.5% annually, which aligns closely with the historical 20-year annual average rate of inflation as witnessed in Statistics Canada's Building Construction Price Index. The forecast also includes a 20% estimated cost for engineering, environmental assessments, and geotechnical studies, etc., for major projects.

Figure 10

Wastewater Collection System Expenditure Forecast

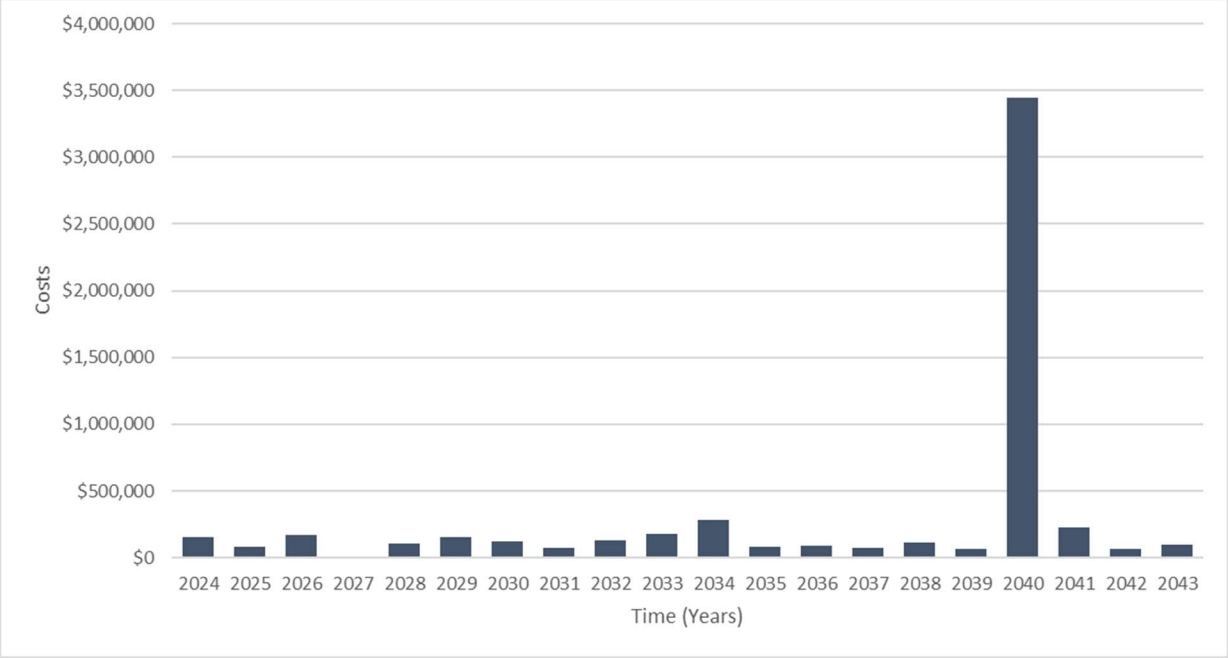


Table 6 details the capital expenditure forecast for wastewater collection system assets over the 20-year forecast period. This itemized expenditure forecast is based on the current lifecycle activities identified this plan.

Table 6

Wastewater Collection System Expenditure Forecast ($)

Assets	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Manholes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,037,552	-	-	-
Collection Mains	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Force Main	5,500	5,693	5,892	-	6,311	6,532	6,761	6,998	-	7,496	7,758	8,030	8,311	-	8,903	9,214	9,537	158,470	-	10,574
Springfield P.S.	82,800	17,213	88,697	-	31,807	94,152	-	10,579	7,300	112,848	147,016	-	23,459	13,872	-	-	-	14,923	10,297	29,847
OPC P.S.	10,000	-	-	-	-	-	58,612	-	-	-	-	19,424	-	-	-	-	344,823	-	-	-
SCADA	-	-	20,001	-	-	-	-	-	47,142	-	71,081	-	-	-	30,222	-	-	-	-	-
Misc. Studies	-	-	-	-	15,000	-	-	-	22,500	-	-	-	-	-	15,000	-	-	-	-	-
Total	**98,300**	**22,905**	**114,590**	**-**	**53,118**	**100,684**	**65,373**	**17,577**	**76,942**	**120,344**	**225,856**	**27,454**	**31,770**	**13,872**	**54,125**	**9,214**	**3,391,912**	**173,393**	**10,297**	**40,421**

CONDITION FORCASTS

Figure 11 displays the average annual condition forecast for wastewater collection mains that results from implementing the lifecycle activities as set forth in the lifecycle management strategy. The average condition trend is expected to move from a “Very Good” condition states to a “Good” condition state by the end of the forecast period. There are no forecasted lifecycle activity costs during the forecasted 20-year period.

Figure 11

Condition Forecast - Wastewater Collection Mains

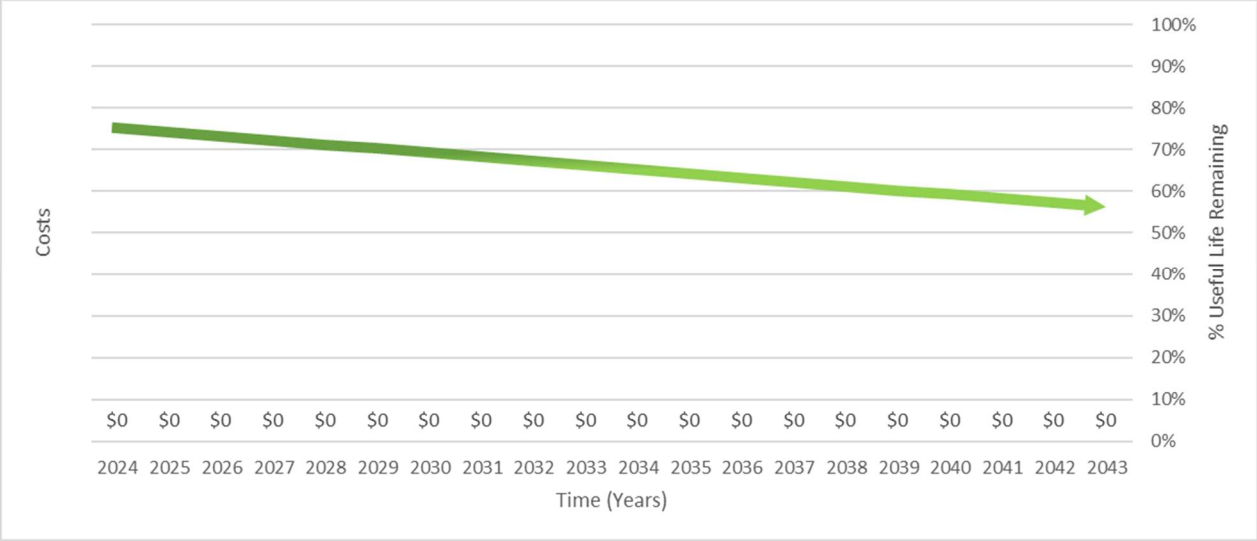


Figure 12 displays the average annual condition forecast for manholes that results from executing the lifecycle activities as set forth in the lifecycle management strategy. The average condition trend is expected to move from a “Fair” condition state to a “Poor” condition state by 2040, at which time manhole assets will be triggered for replacement.

Figure 12

Condition Forecast - Manholes

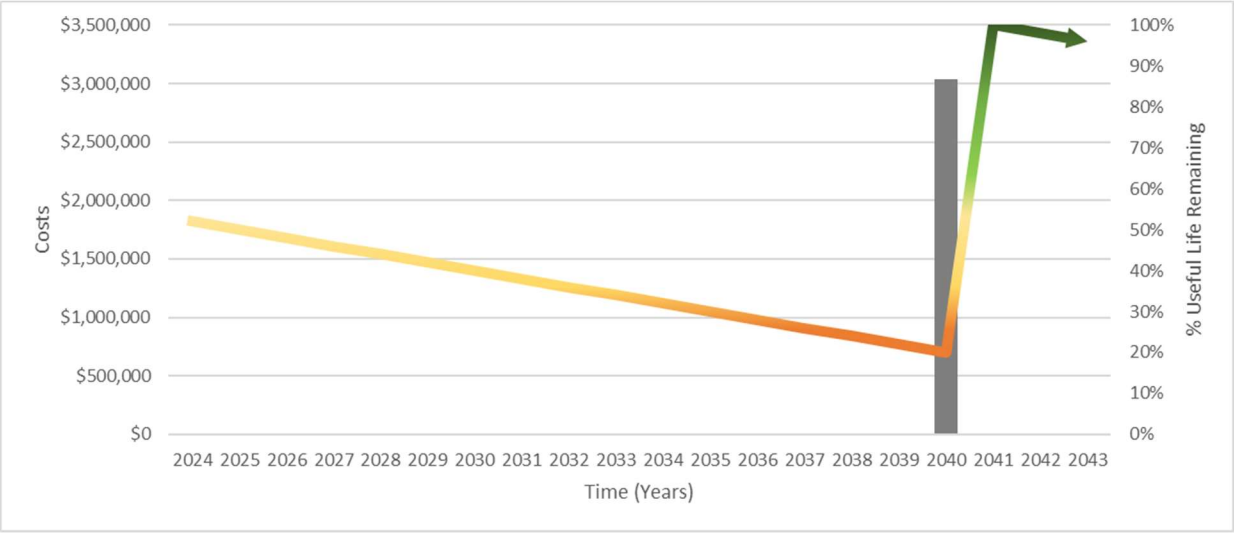


Figure 13 displays the average annual condition forecast for force mains that results from implementing the lifecycle activities as set forth in the lifecycle management strategy. The average condition trend of force main assets is expected to move from a “Very Good” condition states to a “Good” condition state by the end of the forecast period. There are no forecasted lifecycle activity costs during the forecasted 20-year period.

Figure 13

Condition Forecast - Force Mains

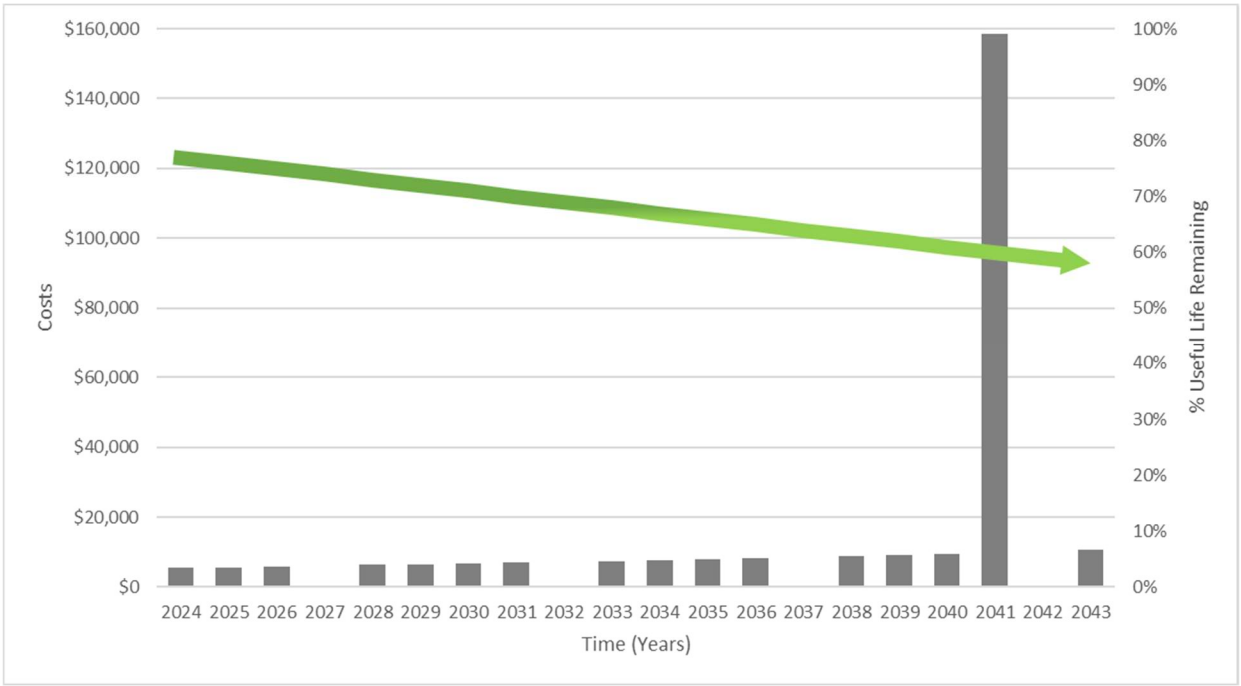


Figure 14 displays the average annual condition forecast for the pump stations that results from executing the lifecycle activities as set forth in the lifecycle management strategy. The average condition trend of the OPC Pump Station is expected to move from a “Good” condition state to a “Fair” condition state by 2040, at which time a component-based rehabilitation will be triggered, resulting in a increase to the overall condition. The average condition trend of the Springfield Pump Station is expected to move from a “Fair” condition state to a “Good” condition state as component-based rehabilitations occur throughout the 20-year forecast period.

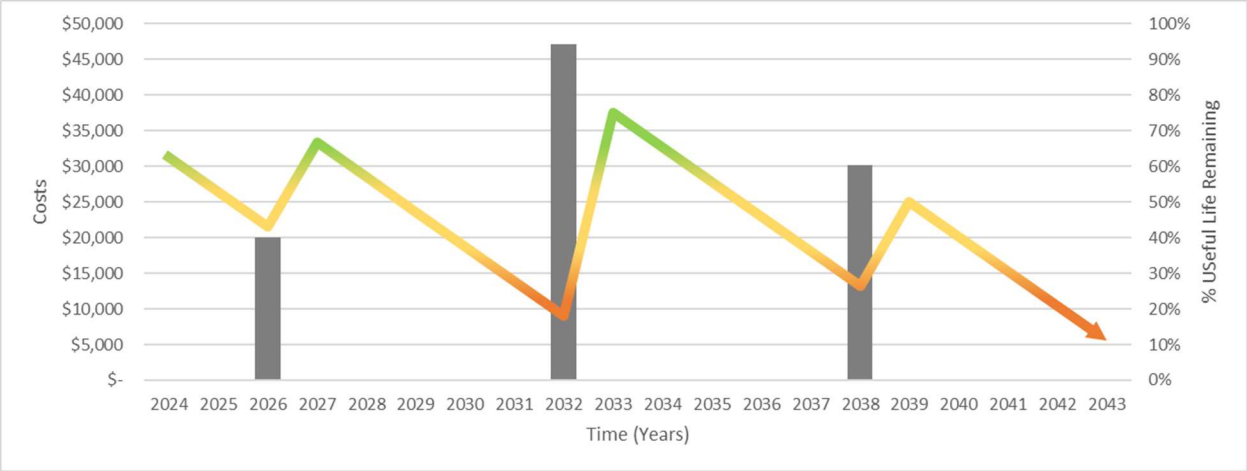
Figure 14

Condition Forecast – Pump Stations

Figure 15 displays the average annual condition forecast for the SCADA network that results from executing the lifecycle activities as set forth in the lifecycle management strategy. The average condition trend of the SCADA network is expected to move from a "Poor" condition state to a "Good" condition state as component-based rehabilitations occur throughout the 20-year forecast period.

Figure 15

Condition Forecast – SCADA



FUNDING STRATEGY

FUNDING SOURCES

The following summarizes the recommended strategies to fund the asset lifecycle costs identified for the wastewater collection system assets. These funding forecasts were based on the funding sources identified in the Township's 2024 budget. Table 7 presents these funding strategies.

The lifecycle costs required to sustain established levels of service are being funded through reserves. The Township will be dependent upon maintaining healthy capital reserves/reserve funds in order to provide the remainder of the required lifecycle funding over the forecast period. This will require the adjustment of amounts being transferred to these capital reserves during the annual budget process. Provincial/Federal grant funding has not been included in the forecast for wastewater works as there are no available grants at this time, and debt financing is not required, the financing strategy does not include debt financing over the forecast period.

Table 7

Wastewater Collection System Funding Forecast ($Millions)

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Total Capital Costs	$0.09M	$0.02M	$0.11M	-	$0.05M	$0.10M	$0.06M	$0.02M	$0.07M	$0.12M	$0.23M	$0.03M	$0.03M	$0.01M	$0.05M	$0.01M	$3.39M	$0.17M	$0.01M	$0.04M
% Grant Funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Debt Funding	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Reserve Funding	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Reserve Balance	$1.10M	$1.32M	$1.48M	$1.77M	$2.04M	$2.29M	$2.60M	$2.99M	$3.34M	$3.68M	$3.93M	$4.42M	$4.94M	$5.52M	$6.10M	$6.78M	$3.89M	$4.25M	$4.82M	$5.39M
Operating Costs	$0.21M	$0.21M	$0.22M	$0.22M	$0.23M	$0.23M	$0.24M	$0.25M	$0.26M	$0.26M	$0.27M	$0.28M	$0.29M	$0.30M	$0.31M	$0.31M	$0.32M	$0.33M	$0.34M	$0.35M
Revenue	$0.37M	$0.38M	$0.39M	$0.41M	$0.42M	$0.43M	$0.45M	$0.46M	$0.47M	$0.48M	$0.49M	$0.50M	$0.52M	$0.53M	$0.54M	$0.56M	$0.57M	$0.59M	$0.60M	$0.62M
Transfer to Reserves	$0.16M	$0.16M	$0.17M	$0.18M	$0.19M	$0.20M	$0.20M	$0.21M	$0.21M	$0.22M	$0.22M	$0.23M	$0.23M	$0.23M	$0.24M	$0.24M	$0.25M	$0.25M	$0.26M	$0.26M
User Fee Impact	3.9%	3.4%	3.5%	3.4%	3.5%	3.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%

FUNDING SHORTFALL

This funding strategy has been developed to be fully funded by reserves, and therefore no funding shortfall has been identified. However, this means that if identified user fee increases are not implemented at expected amounts then shortfalls may present themselves if current service levels are maintained.

USER FEE IMPACT

While the annual funding requirement may fluctuate, it is important for the Township to implement a consistent, yet increasing, annual investment in capital so that the excess annual funds can accrue in capital reserve funds. In 2022, an in-depth analysis of user fees was completed by Watson & Associates Economists Ltd. The adopted report has guided the asset management plan for the wastewater collection systems.

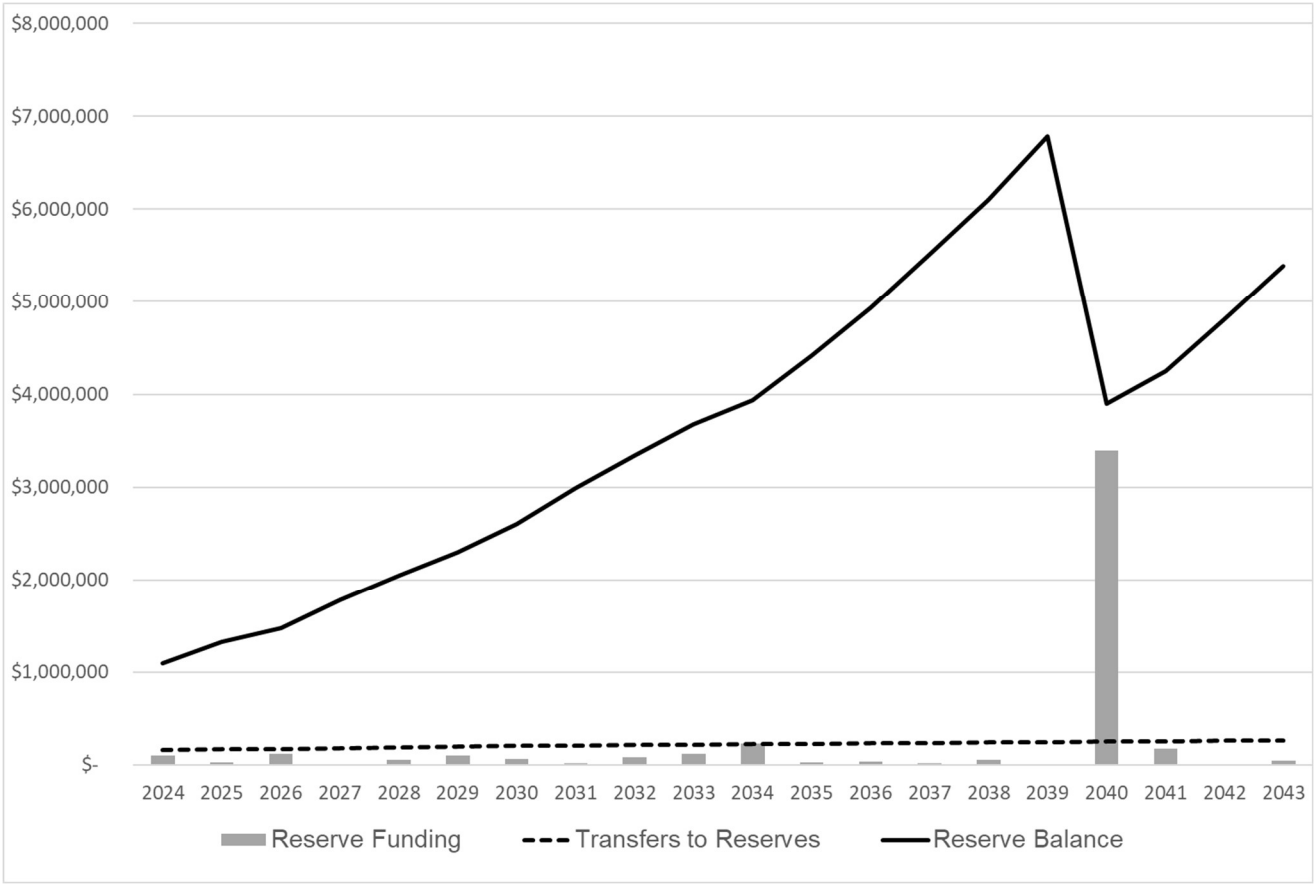
A 3.5% annual increase in fixed user fee rates was recommended by the Wastewater Rate Study 2022, for the forecast period of 2022-2032. The funding strategy identified in Table 7 presents a 20-year funding forecast that is based solely on capital reserves. As such, it is recommended that the same annual increase of 3.5% as proposed in the Wastewater Rate Study 2022, be decreased to 2.5% over the 20-year forecast period. This will allow the Township of Malahide to maintain the reserves necessary to fund wastewater collection system asset lifecycle activities and maintain current service levels.

FUNDING STRATEGY

Figure 16 presents the 20-year funding strategy for the expenditure forecast detailed above. The lifecycle rehabilitation and renewal activities planned for the wastewater collection system are projected to cost, on average, approximately $232,407 per year over the forecast period. The funding strategy for these costs is to finance from reserves. There will be an annual increase to the transfer to reserves from operating for the reserve balance to sufficiently fund the forecasted expenditures.

Reserve investments are projected to earn an additional 7% in investment interest annually, increasing the overall reserve balance and contributing to future infrastructure projects.

Figure 16
Wastewater Collection System Funding Strategy



RECOMMENDATIONS

CURRENT CONSIDERATIONS

The following recommendations have been provided for consideration:

- That the Township of Malahide Asset Management Plan be received and approved by Council;
- That consideration of this Asset Management Plan be made as part of the annual budgeting process to ensure sufficient capital funds are available to fund the Asset Management Plan; and
- That this Asset Management plan be updated as needed over time to reflect the current priorities of the Township.

Substantial investment in capital will be required over the forecast period, and through the recommendations provided in the funding strategy, proactive steps would be taken to sustainably fund the Township's network of assets.

Funding has been recommended to meet the annual lifecycle funding target, which identifies the long-term annual investment level necessary to meet the current levels of service. This funding takes the form of transfers to capital reserves, and is reflected in the sizeable positive balances reached in the final years of the forecast period.

FUTURE IMPROVEMENTS

Areas of future enhancement to the Township's asset management plan have been noted, and a summary of these improvements has been listed below:

- Levels of Service - Images that illustrate the different condition states of assets can be helpful in communicating levels of service to stakeholders. A number of representative condition sample images could be provided for each Asset Class. The Township should seek to provide additional images in future iterations of this asset management plan.

- Proposed Levels of Service – This plan only includes an analysis of the current levels of service being provided by the municipal wastewater collection system. In future versions of this plan, proposed level of service options should be included along with an explanation of why they would be appropriate for the municipality, and an examination of the funding levels that would be required to implement them.

- Wastewater Condition Assessments: The condition assessment of wastewater assets was largely based on age-based degradation models. Future improvements to these plans should include a more detailed condition review and inspection program. More detail regarding condition assessments is especially important for assets that have been componentized. Componentized assets require an enhanced level of review of the costs of lifecycle activities required by individual components, not currently tracked separately.

- Age-Based Assets – Modified Remaining Useful Life: The lifecycle needs for a number of the Township's asset categories and are currently assessed based on asset age. In the future, it would be beneficial for the Township to assign a remaining useful life to these various assets, based on observed condition and performance. This would enable the Township to more accurately plan for required interventions, such as replacements, based on observed asset characteristics.

- Growth-Related Capital: This plan does not currently include the costs associated with the lifecycle activities and maintenance of expansionary capital. Future updates to this plan should incorporate the expected costs of the acquisition, rehabilitation, and replacement of these assets to more fully explore the sustainability of the Township's network of assets. Examining these growth-related capital needs and their impacts on the financing strategy will provide for a comprehensive assessment of the sustainability of the Township's overall asset management system.