Municipality of Northern Bruce Peninsula

Asset Management Plan for Rate-Supported Assets

2023 Update

AMP Issue and Revision Record					
Rev. No.	Date	Prepared by:	Reviewed by:	Approved by:	Rev. Description
1	January 8, 2024	Nick Larson, OCWA	Jason Younker, OCWA	Nick Larson, OCWA	Draft

Executive Summary

Asset Portfolio

The scope of this AMP includes all rate-supported assets. The infrastructure portfolio has an estimated replacement value of approximately $31 million in five (5) asset groups.
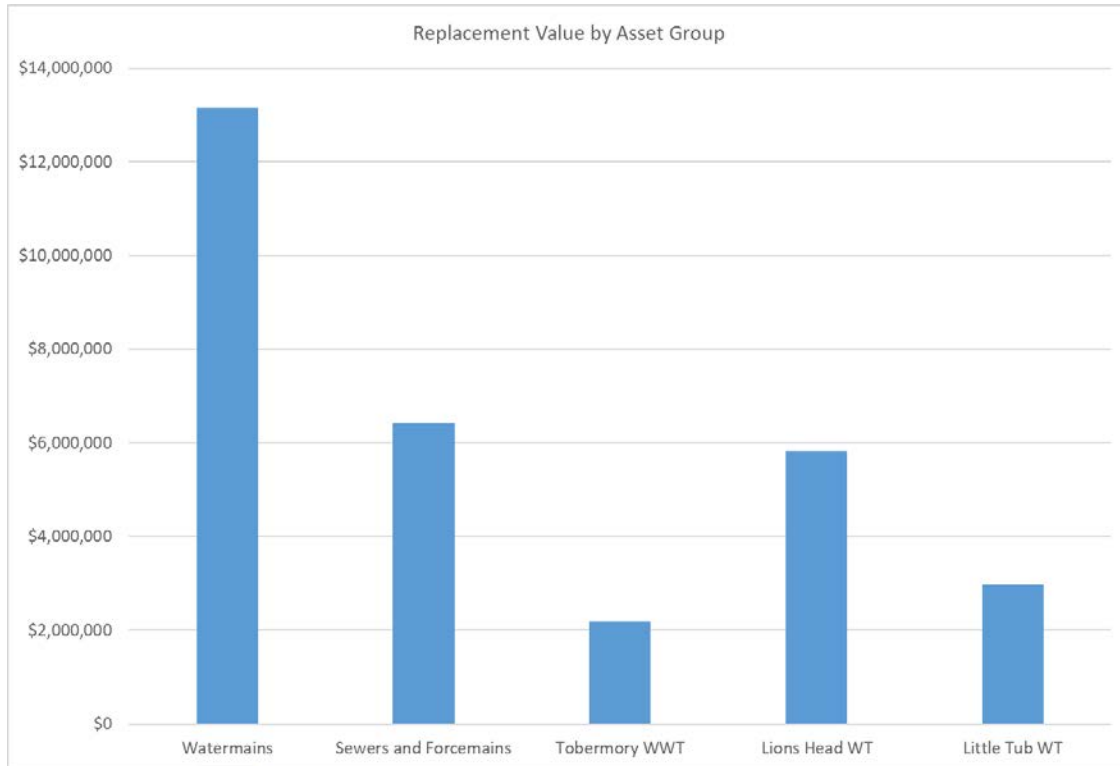
Figure ES1: Asset Portfolio Summary

Note: Actual costing values are subject to market forces at the time of infrastructure construction / improvement activity, above values are based on historical averages and industry standards.

Current Asset Performance

The best available asset information combines with the judgement of subject matter experts to establish the current performance of each of the individual asset records represented in the asset portfolio. The performance of individual assets aggregates to present the performance distribution of each asset group. Table ES1 and Figure ES2 presents the current asset performance results.
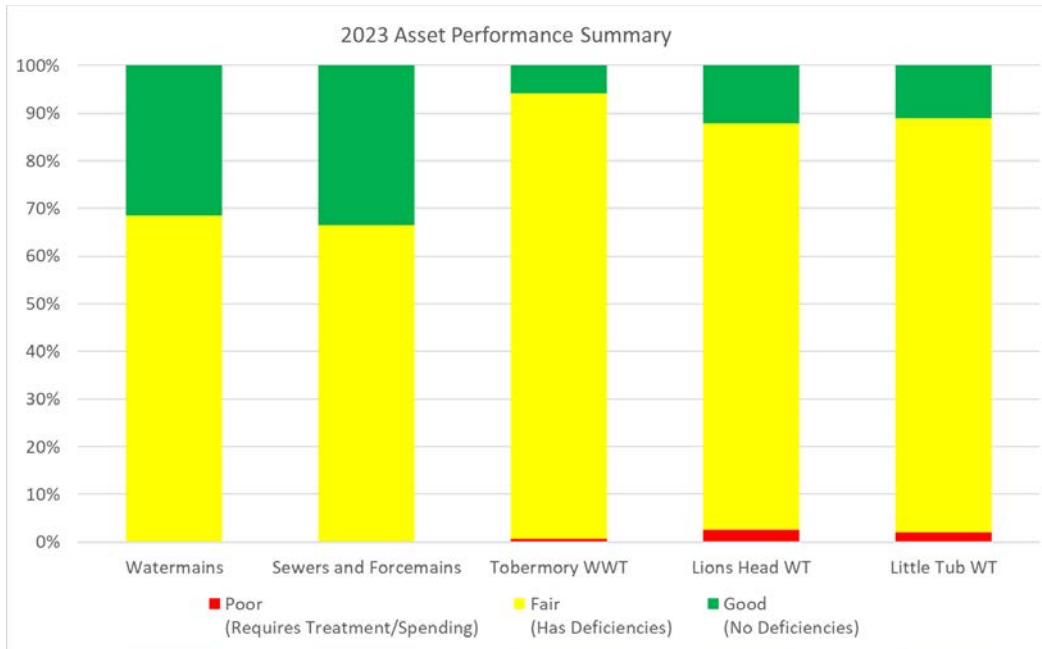
*Figure ES2: Current Asset Performance Distribution by Asset Group*

The total replacement cost of the assets in the poor performance category is of approximately $225,000, which represents approximately 1% of the total asset portfolio. The spending required to restore these assets to the good performance category is not necessarily equal to the replacement costs, since some assets only require rehabilitation while others require replacement with a more expensive asset.

Table ES3: Current Asset Performance by Replacement Value and Asset Group

	Asset Performance Distribution by Replacement Cost			
	Good (No Deficiencies)	Fair (Has Deficiencies)	Poor (Requires Treatment/Spending)	Total
Watermains	$4,142,400	$9,013,200	$0	**$13,155,600**
Sewers and Forcemains	$2,147,384	$4,264,273	$0	**$6,411,657**
Tobermory WWT	$127,400	$2,035,426	$14,947	**$2,177,773**
Lions Head WT	$709,626	$4,964,051	$147,442	**$5,821,119**
Little Tub WT	$330,900	$2,588,138	$61,578	**$2,980,616**
Total	**$7,457,710**	**$22,865,088**	**$223,967**	**$30,546,765**

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Spending Forecast

Figure ES3 summarizes the spending forecast results. An average of $260,000 per year over the long term is required to achieve asset performance requirements. There is an ongoing Environmental Assessment that is will affect the long-term investment plans for the Municipalities water and wastewater infrastructure. Therefore, there is a high degree of uncertainty with respect to the 6 to 25 year forecast period.
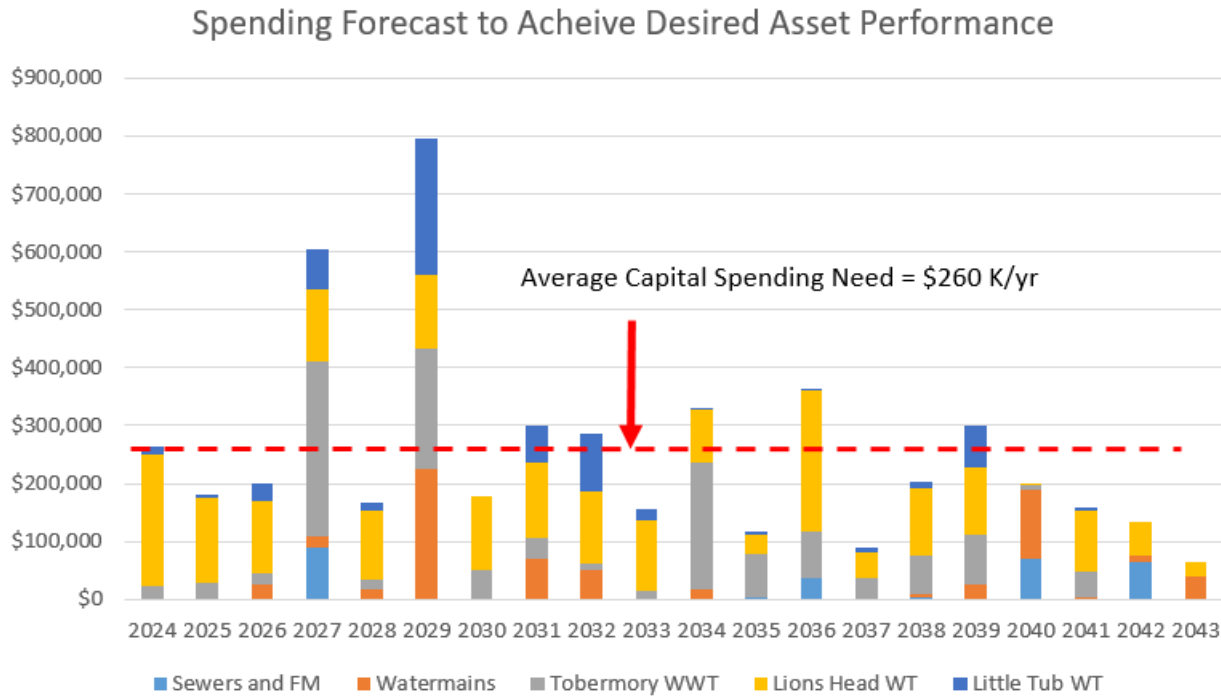
Figure ES3: Spending Forecast Summary

Financial Strategy

The objective of the Municipality's financing strategy should be to maximize new assessment growth at the lowest real cost impact to ratepayers (i.e. maximize real revenue growth through expanded customer base and minimize rate increases). This would prioritize the following options:

1. Provincial/Federal Government Specific Grants

2. Internal Financing using Reserves

3. Debt

4. Development Charges

5. Rate Increases

Future budgets will present the optimal balance of the available financing options to fund the Municipality's infrastructure program.

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1 INTRODUCTION

1.1 Overview

This Asset Management Plan (AMP) builds a structured relationship between infrastructure spending and asset performance. Periodic (annual) updates ensure it reflects changing circumstances and actively supports infrastructure decision-making processes.

1.2 Defining Asset Performance

The definition of Asset Performance is "the ability of an asset to fulfill the organization's objectives or requirements".

The performance of an asset directly relates to the level of service it provides:

- An asset in the good performance category is meeting expectations (i.e. providing an appropriate level of service); and

- An asset in the poor performance category is not meeting expectations (i.e. not providing an appropriate level of service), and requires spending to have it meet expectations.

The unique circumstances of each asset establish its performance expectations (i.e., what it is, what it does, what happens if it fails, etc.).

1.3 Provincial Asset Management Planning Requirements

The Province of Ontario developed Regulation 588/17 under the Infrastructure for Jobs and Prosperity Act (2015). The following points summarize the requirements of O.Reg. 588/17:

- An AM policy is required to articulate specific principles and commitments that will guide decisions around when, why and how money is spent on the Municipality's infrastructure assets. The Policy is required by July 1, 2019. The Municipality successfully adopted their AM Policy in 2019.

- By July 1, 2022 the AMP will be required to establish the spending that is required **to maintain current** asset performance expectations for water, wastewater, stormwater, roads and bridges.

- By July 1, 2024 the AMP will be required to establish the spending that is required to **maintain current** asset performance expectations for all asset groups.

- By July 1, 2025 the AMP will be required to establish the spending that is required to **achieve desired** asset performance expectations, and the financial strategy to fund the required spending.

1.4 AMP Development Approach

This AMP aligns with the international standard for infrastructure asset management (ISO 55000) and Ontario Regulation 588/17. The development of this AMP leverages the best available asset and financial information, staff input, subject matter expert professional judgement, and AM best practices, to complete the following steps:

1. Develop a complete listing of infrastructure assets to be included in the AMP.

2. Assess the current performance of the assets based on existing information.

3. Prepare an asset lifecycle management strategy (i.e. spending plan) to achieve desired asset current performance expectations.

4. Prepare a financing strategy to fund the necessary expenditures.

1.5 Updating the Asset Management Plan

A periodic update to the AMP ensures it reflects the latest information and responds to evolving asset performance expectations. Ideally, this update occurs annually in conjunction with budget processes, or more frequently if required. It is noted that the

1.6 Asset Management Plan Scope

This AMP includes all of the assets in the Municipality funded via water and wastewater rates. Section 2 summarizes the infrastructure portfolio.

1.7 Growth Planning

Northern Bruce Peninsula is in the midst of refreshing their strategic planning processes. The growth estimates provided in Table 1 are part of the draft ongoing Environmental Assessment, and are therefore subject to change. However, they currently provide the best estimate of growth in the community.

Table 1: Northern Bruce Peninsula Population History

YEAR	POPULATION*
Existing	4,600
Near-Term (5 Years)	5,000
Mid-Term (10 Years)	5,300
Long-Term (20 Years)	5,900

*From Memorandum from WSP inc. to OCWA, dated December 6, 2022.

2   OVERVIEW OF ASSET PORTFOLIO

The rate-supported infrastructure portfolio has an estimated replacement value of approximately $31 million.   Detailed asset inventories are included in Appendix B.
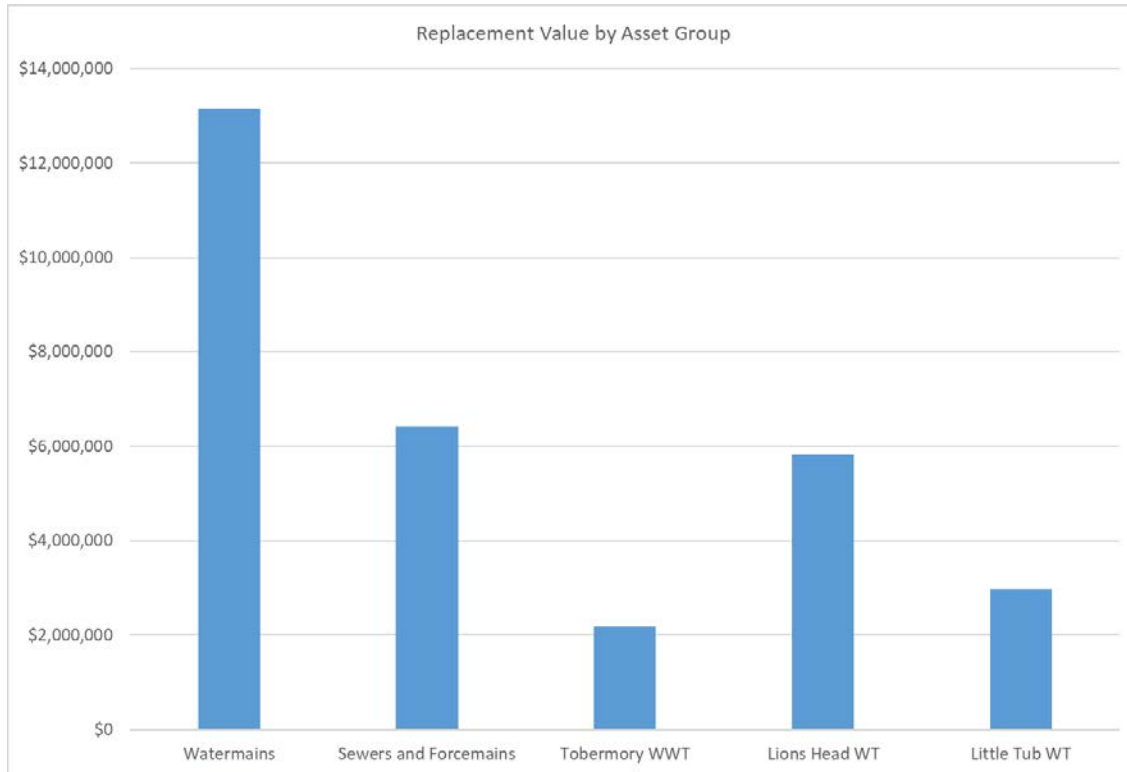
Figure 2: Northern Bruce Peninsula's Rate-Supported Infrastructure Portfolio

Note: Actual costing values are subject to market forces at the time of infrastructure construction / improvement activity, above values are based on historical averages and industry standards.

3   ASSET PERFORMANCE ASSESSMENT

3.1   Measuring Asset Performance

Performance assessment information is available from a range of activities and sources. Examples of performance assessment activities include:

- Quarterly, semi-annual or annual visual inspections.

- Contracted technical experts to complete tests, take measurements, etc.

- Performance data from various process instrumentation equipment.

The performance information comes from a variety of sources, ranging from sophisticated technologies to investigate the assets to visual observations from qualified professionals. All asset performance data combines with the professional judgment of subject matter experts to establish the current performance of each asset as defined in Table 2 below.

Table 1 : Asset Performance Rating Descriptions

PERFORMANCE CATEGORY	DESCRIPTION	STATE OF ASSET
Good	Asset performance meets or exceeds its objectives/requirements.	No Deficiencies
Fair	Asset performance is nearing the point where it will not meet its objectives/requirements.	Has Deficiencies
Poor	Asset performance is not meeting its objectives/requirements.	Requires Treatment (Spending)

3.2   Current Asset Performance

Figure 2 and Table 3 provide the current performance distribution of each asset group.   Note that the spending required to restore these assets to the good performance category is not equal to the replacement costs, since some assets only require rehabilitation while others require replacement with a more expensive asset.

The performance category of each asset updates on a continual basis to reflect actual spending on assets, new asset data, and changing asset performance objectives or requirements.

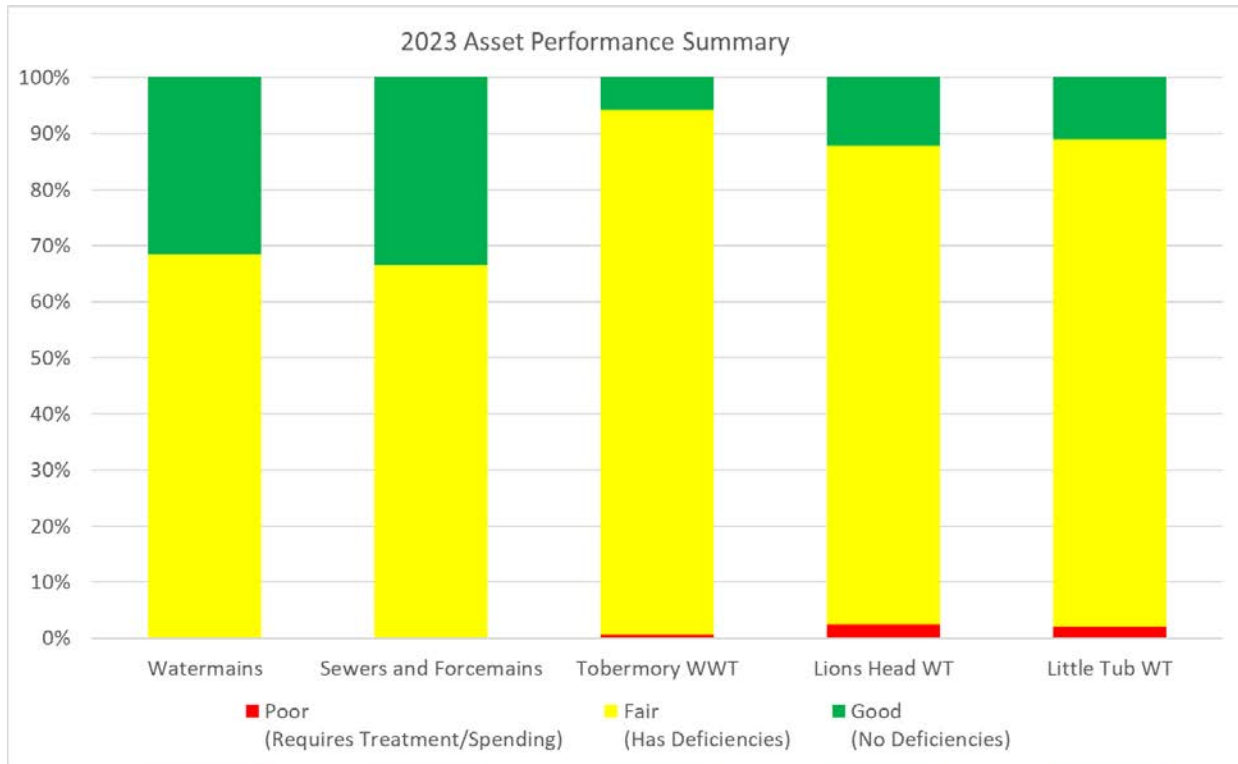Detailed performance metrics are provided in Appendix A.

Figure 3: Current Asset Performance Distribution by Asset Group

Table 3: Current Asset Performance by Replacement Value and Asset Group

	Asset Performance Distribution by Replacement Cost			
	Good (No Deficiencies)	Fair (Has Deficiencies)	Poor (Requires Treatment/Spending)	Total
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4   ASSET LIFECYCLE MANAGEMENT

4.1   Asset Lifecycle Activities Overview

Table 4 provides an overview of typical asset lifecycle activities applied to infrastructure systems. The spending forecasts in this section represent a combination of major maintenance, rehabilitation and replacement treatments. Appendix C contains the detailed spending plan.

Table 2 : Typical Asset Lifecycle Activities

LIFECYCLE ACTIVITY	DESCRIPTION
Operational	Operational activities, routine preventative maintenance, studies on asset performance
(Major) Maintenance	More significant repairs to maintain asset performance
Rehabilitation	Significant project, typically costing between 30% and 70% of asset replacement value.
Replacement	Significant project resulting in an asset that meets top industry and community expectations.
New Asset	Construction or purchase of new assets that results in net growth of the asset inventory and an enhancement in service levels provided to the community.

4.2   Spending and Performance Forecast Approach

The analysis approach involves connecting real planned projects against specific assets where feasible and iteratively adjusting annual spending levels until the forecasted performance distribution will be relatively stable (i.e. the proportion of the asset network in the poor performance category is consistent).

For example, Figure 3 shows a scenario where there is not sufficient spending, resulting in the proportion of assets in the poor performance category increase from 5% in 2021 to 90% in 2040, and a declining trend in the Network Average performance index. This indicates that additional spending is required. Analysis updates continue to achieve a suitable performance forecast.

Figure 4: Sample Performance Forecast
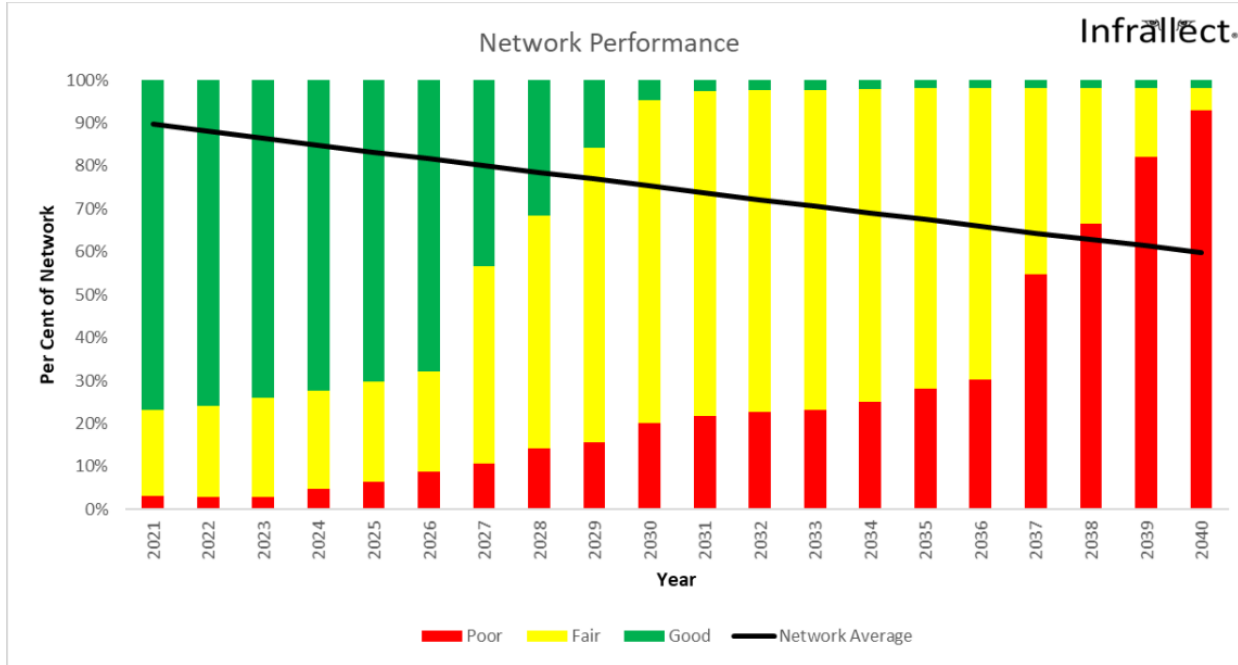
4.3   Spending and Performance Forecast Results

Figures 5 to Figure 9 provide the performance and spending forecast. Appendix C provides the detailed planned program.

Figure 5: Lions Head Water System Performance Forecast

Desired Performance Forecast	
Spending Plan to Achieve Desired Performance Forecast	 • $110k/yr long term average spend
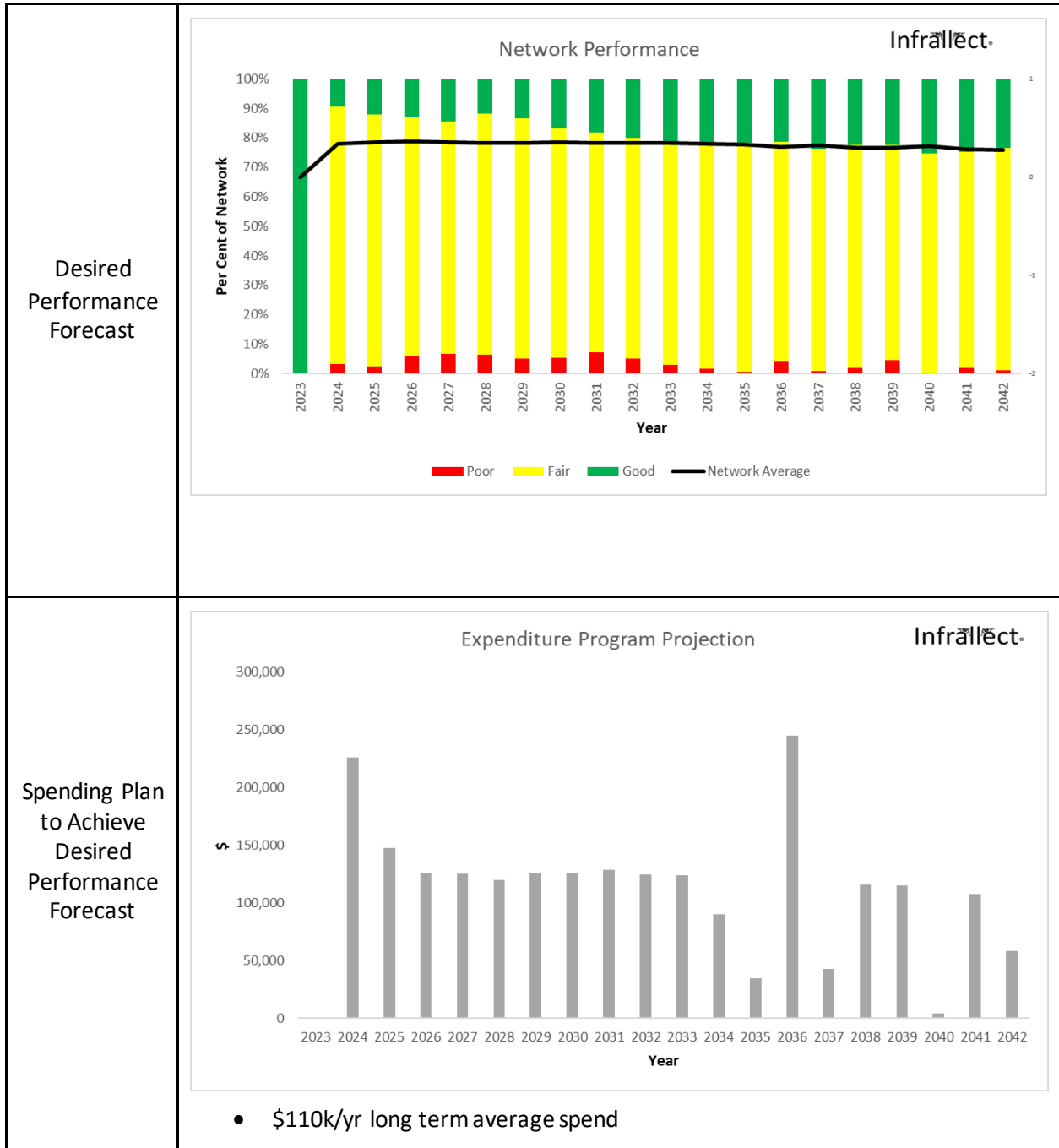
Figure 6: Tobermory Wastewater System Performance Forecast

Desired Performance Forecast	
Spending Plan to Achieve Desired Performance Forecast
• $70k/yr long term average spend
• 2027 and 2029 large expenditures mainly due to filter rebuilds and part replacement
• 2034 large expenditure mainly due to generator rebuild
• Ongoing Environmental Assessment is liekyl ro reuslt in substantial changes to Tobermory wastewater system and therefore the 6+ year forecast has a high degree of uncertainty |

Figure 7: Little Tub and Ancillary Water Systems Performance Forecast

Desired Performance Forecast	
Spending Plan to Achieve Desired Performance Forecast

- $40k/yr long term average
- 2028 large expendiutre maily due to generator replacement
- Ongoing Environmental Assessment is liekyl ro reuslt in substantial changes to Little Tub WTP and therefore the 6+ year forecast has a high degree of uncertainty |
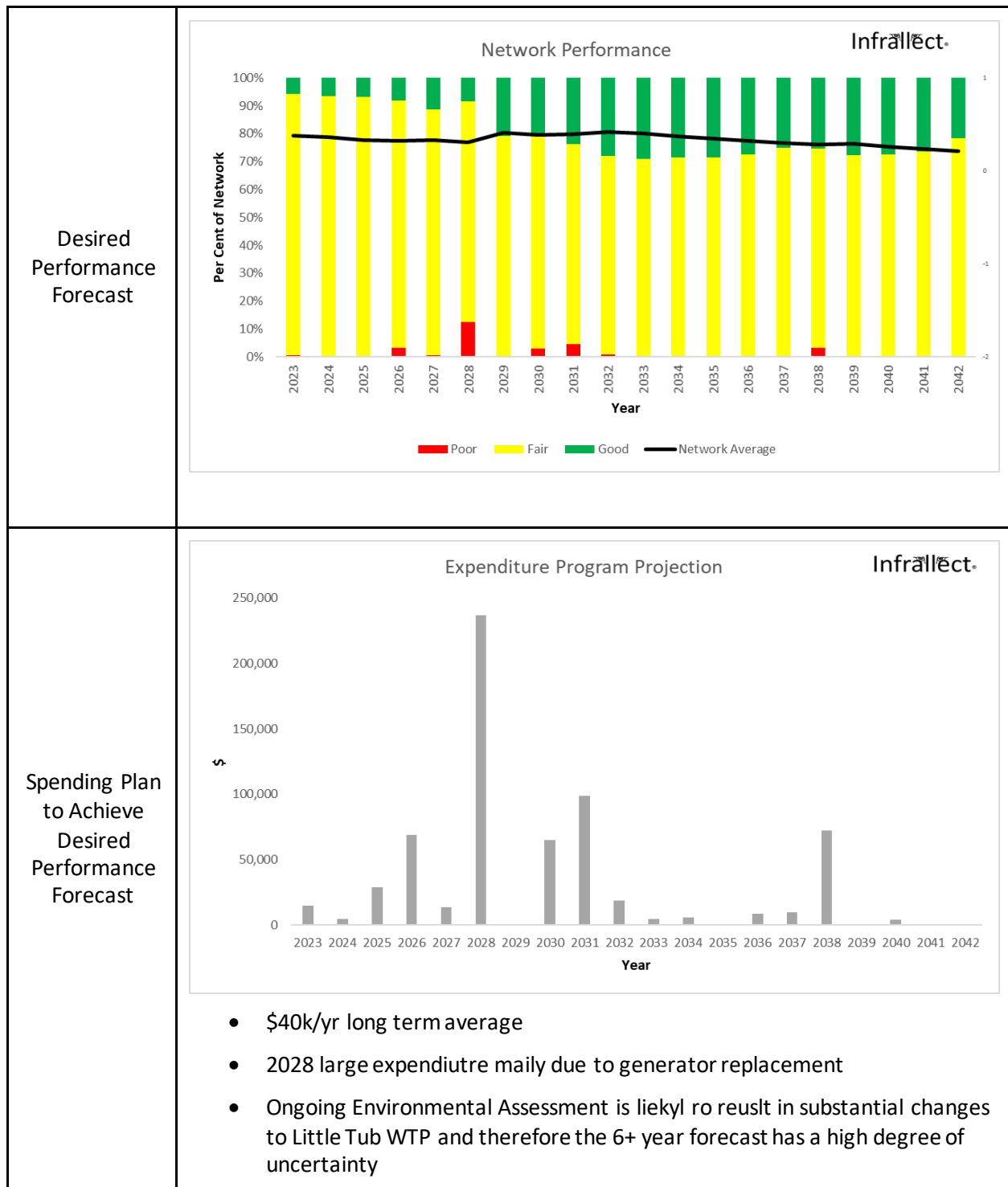
Figure 8: Watermain Performance Forecast

Desired Performance Forecast	
Spending Plan to Achieve Desired Performance Forecast	 • $35k/yr long term average
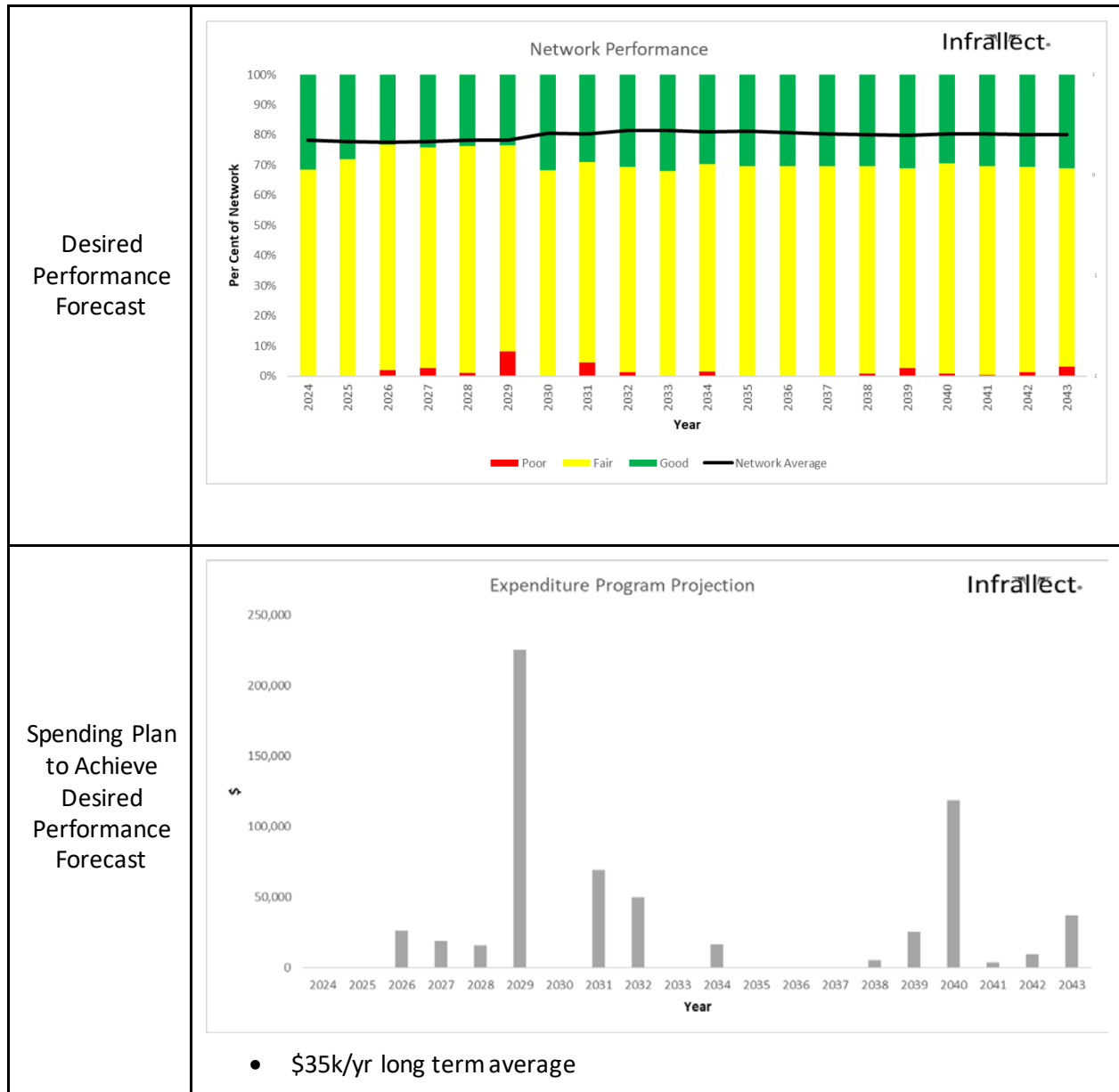
Figure 9: Sewers and Forcemains Performance Forecast

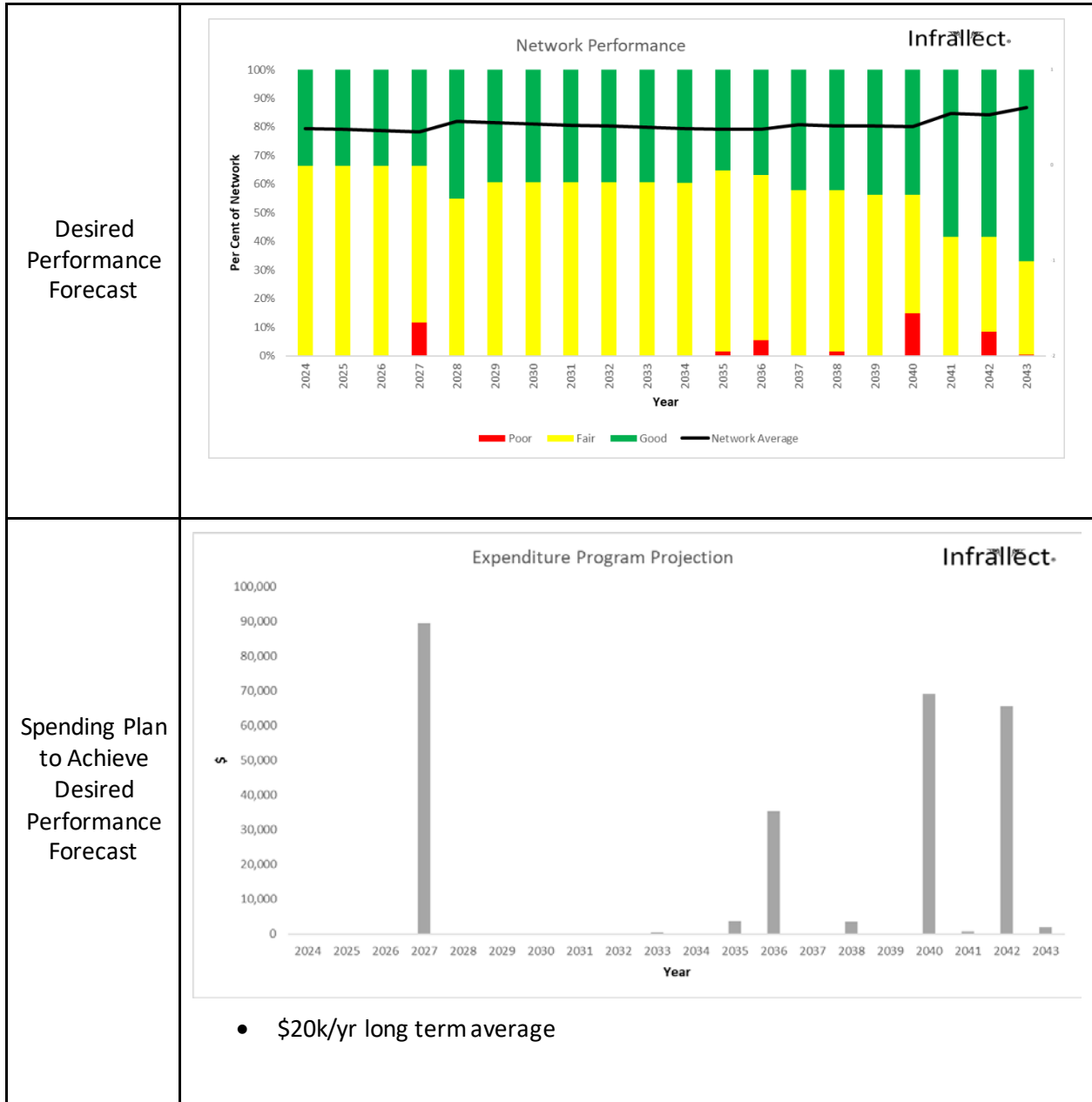|	
Desired Performance Forecast	
Spending Plan to Achieve Desired Performance Forecast	• $20k/yr long term average

Figure 10 summarizes the combined spending forecast. An average of $260,000 per year over the long term is required to achieve the Municipality's desired asset performance expectations. The detailed planned program is provided in Appendix C.
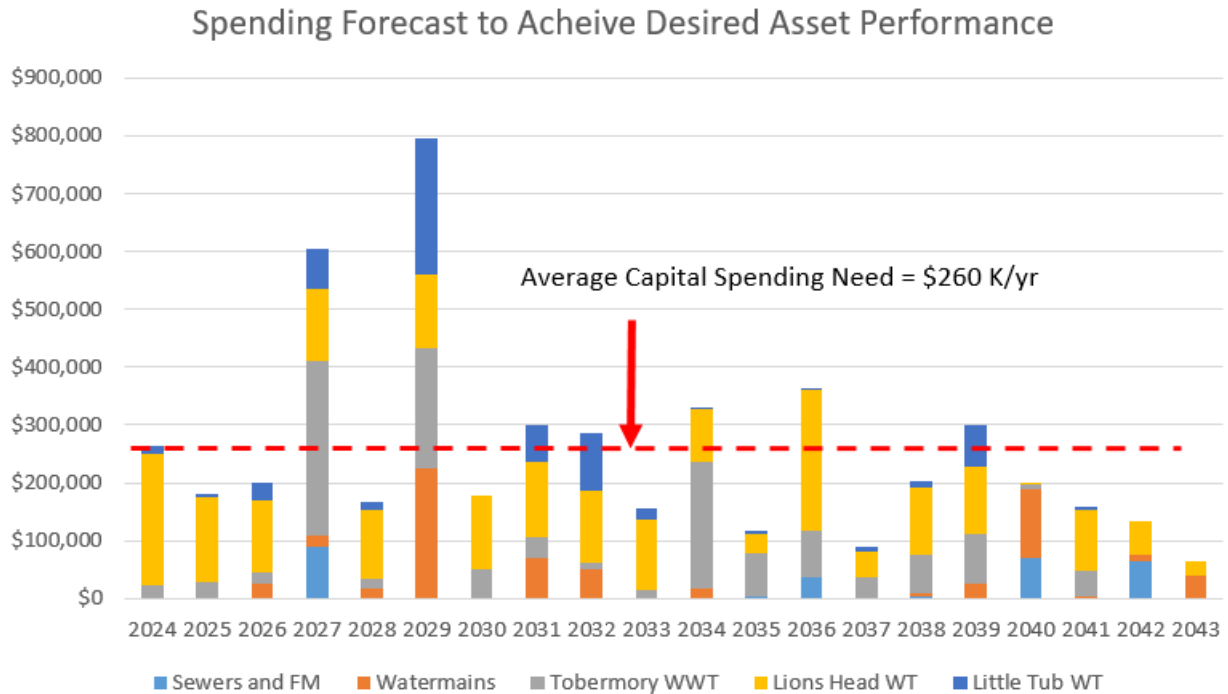

Figure 10: Combined Expenditure Forecast to Achieve Desired Asset Performance

4.4 Funding Gap Summary

The ongoing Environmental Assessment for the water and wastewater systems is liekyl ro reuslt in substantial changes to the water and wasteater systems in the Municipality. The infrastructure plan produced through EA is necessary in order to effectly establish the spenidng needs and evaluation the funding gap. At this point, the Municipaliti is able to fund the necessary expenditures forecast in the next 5 years.

4.5 Risk Management

The approach to managing risk in this AMP is to consider the overall criticality of each asset related to the role it plays in providing services to the community (by understanding the required performance of each asset based on its location, function, size, etc.). This understanding establishes when an asset is not meeting its objectives or requirements based on the available technical performance indicators and subject matter expert judgement. Assets that are more critical have higher performance expectations, while less critical assets have lower performance expectations.

4.6 Managing Climate Change

The expected impacts of climate change have been considered and included throughout the analysis used to inform this AMP. This includes consideration of climate change when establishing the current performance category of an asset, forecasting the deterioration rate of an asset, or establishing the lifecycle activities completed on an asset.

The most prominent climate factors affecting the Municipality's wastewater infrastructure are severe wet weather events and prolonged periods of heat or drought. The climate factors discussed are referenced to the Climate Atlas of Canada[1], an online tool to learn about the impacts of climate change in the area for different scenarios.

- *Climate Factor 1 - Severe Wet Weather Events*

  Severe wet weather events put added strain on stormwater systems or bridges/culverts. At this point, this climate factor is not causing any specific performance deficiencies. Heavy rain days are projected to increase 4.7 days/year 5.5 days/year by 2050. The Municipality should continue to monitor the impacts of severe wet weather events on the stormwater and bridges/culverts.

- *Climate Factor 2 – Periods of Prolonged Heat or Drought*

  This climate factor can lead to an increased risk of forest fires. Based on the climate model of Climate Atlas of Canada, the number of heat waves increases from 0.1 heatwaves/year to 0.8 heat waves/year, and the average length of heatwave will increase from 0.4 days to 1.9 days, by 2050. The Municipality should continue to monitor the impacts of periods of prolonged heat or drought on the forest fire risk. It is noted that at this point, the number of drought days is not a climate factor that is available in the Climate Atlas.

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[1] https://climateatlas.ca/map/canada/hwlen_2030_45#z=9&lat=44.83&lng=-81.46&grid50k=041H03

5   FINANCING STRATEGY

The objective of the Municipality's financing strategy should be to maximize new assessment growth at the lowest real cost impact to ratepayers (i.e. maximize real revenue growth through expanded customer base and minimize rate increases). This would prioritize the following options:

1. Provincial/Federal Government Specific Grants

2. Internal Financing using Reserves

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4. Development Charges

5. Rate Increases

Future budgets will present the optimal balance of the available financing options to fund the Municipality's infrastructure program.

6   DISCUSSION AND NEXT STEPS

This AMP represents the tactical output of a corporate management system. The corporate management system is the series of interconnected processes that work together to realize value from assets. This AMP uses the best available asset and financial information. The AMP is a living document that requires periodic updates to reflect new information and changing community priorities.

6.1   Monitoring Asset Performance

Moving forward, Provincial Regulation requires the Municipality to provide an annual update on the progress of the AMP. The practical steps to complete these activities are as follows:

1. Each year, update the asset inventory with the best available asset data. This adds/removes assets as appropriate.

2. Each year, update current asset performance based on the best available information.

3. Each year, update the spending analysis to record completed spending, and to connect planned spending to assets or asset networks.

These three steps enable updates the forecast performance versus spending analysis. Over time, the Municipality will be able to see connections between the changing performance distribution and annual spending levels. This will increase the confidence of the Municipality's AMPs each year.

6.2   Roadmap for Enhancing Asset Management Processes

The following points provide a roadmap to enhance asset management planning processes in the Municipality:

1. Continue to maintain the inventory of all assets owned. Asset inventories should be comprehensive of all assets in an asset network.

2. Continue to strengthen the connection between actual or planned spending and specific assets (or asset networks). This will provide greater line of sight from the current or planned spending and the resulting performance improvement in an asset or asset network.

3. Continue to strengthen the quality of asset-centric performance indicator data that is available to measure the current performance of assets and asset networks.

4. Engage the community to understand their current perspective on the performance of assets and asset networks. This understanding calibrates the current performance of the asset networks and prioritizes the allocation of funding to improve the performance of asset networks relative to community expectations.