Town of Lincoln

2025 Asset Management Plan

This Asset Management Program was prepared by:

Empowering your organization through advanced
asset management, budgeting & GIS solutions

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1 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 asset categories owned by Lincoln total $1.56 billion. 89% of all assets analyzed are in fair or better condition and assessed condition data was available for all road, facility, fleet and equipment as well as bridge 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.

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

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Town's proposed level of service is to maintain the lifecycle activities outlined. The average annual capital needed totals $25.9 million. Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $8.65 million towards capital projects or reserves per year. As a result, the Town is funding 33% of its annual capital requirements to maintain its proposed level of service. This creates a total annual funding deficit of $17.66 million.

Addressing annual infrastructure funding shortfalls is a difficult and long-term endeavour for municipalities. Considering the Town'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 for capital contributions from tax revenues for asset needs, it is recommended the Town review the feasibility of implementing a 2.8% annual increase in revenues over a 15-year phase-in period. Funding scenarios over longer time frames are also presented, which reduces the annual increases.

To close annual deficits for capital contributions from water and sanitary rate revenues for asset needs, it is recommended the Town review the feasibility of implementing a 1.2% annual increase in revenues over a 9-year phase-in period for water from 2030 – 2039 and a 1.2% annual increase for a 4-year period for sanitary from 2030 to 2034 after the implementation of the Financial Plan and Rate Study.

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 Town has developed preliminary risk models which are integrated with its asset register. These models can produce risk matrices that classify assets based on their risk profiles.

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

- Continuous and dedicated improvement to the Town's infrastructure datasets, which form the foundation for all analysis, including financial projections and needs.
- Continuous refinements to the 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 Town has taken important steps in building its asset management program, including developing a more complete and accurate asset register—a substantial initiative. Continuous improvement to this inventory will be essential in maintaining momentum, supporting long-term financial planning, and delivering affordable service levels to the community

2 About this Document

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

2.1 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
Strategic Asset Management Policy	✓		✓	
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				✓

2.2 Scope

The scope of this document is to identify the current practices and strategies that are in place to manage public infrastructure and to make recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Town can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

Asset Category	Source of Funding
Information Technology	Tax Levy
Fleet & Equipment	Tax Levy
Buildings	Tax Levy
Land Improvements	Tax Levy
Bridges & Culverts	Tax Levy
Road Network	Tax Levy
Storm Network	Tax Levy
Sanitary Network	Utility Rates
Water Network	Utility Rates

2.3 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 highly sensitive to several critical data fields, including an asset's estimated useful life, replacement cost, quantity, and in-service date. Inaccuracies 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 isn't possible, historical costs incurred at the time of asset acquisition or construction can be inflated to the present day. This approach 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 attribute data to ensure that asset risk ratings are valid, and assets are properly stratified within the risk breakdown. 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 the Town's primary asset management system.

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

3 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).

This industry standard, defined by the Institute of Asset Management (IAM), emphasizes the alignment between the corporate strategic plan and various asset management documents.

3.1 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.

3.1.1 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 Town has line of sight to achieve their strategic objectives.

3.1.2 Asset Management Policy

An asset management policy represents a statement of the principles guiding the Town’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.

3.1.3 Asset Management Strategy

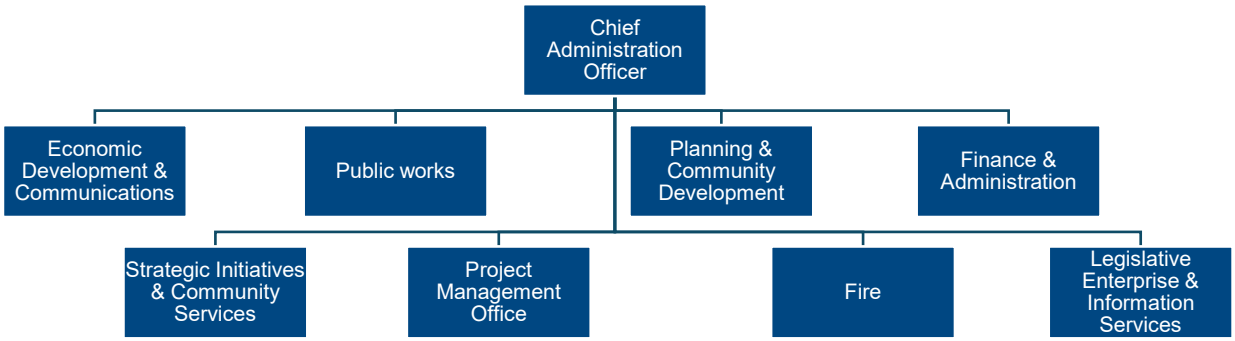
An asset management strategy outlines the translation of organizational objectives into asset management objectives and provides a strategic overview of the activities required to meet these objectives. It provides greater detail than the policy on how the

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

3.2 Governance and Leadership

The figure below shows the current management structure of the organization.

Figure 1 Management Structure



3.3 Key Technical Concepts

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

3.3.1 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.

3.3.2 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 the 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 Town incurred. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

3.3.3 Estimated Useful Life and Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the Town 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.

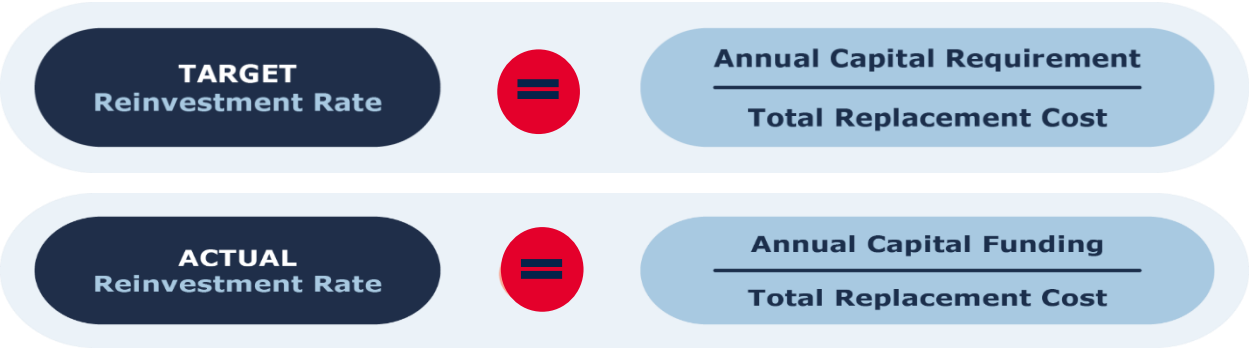
By using an asset's in-service date and its EUL, the Town can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the Town can more accurately forecast when it will require replacement. The SLR is calculated as follows:

Figure 2: Service Life Remaining Calculation

3.3.4 Reinvestment Rate

As assets age and deteriorate, they require additional investment to maintain a state of good repair. The reinvestment of capital funds, through asset renewal or replacement, is necessary to sustain an adequate level of service. The reinvestment rate is a measurement of available or required funding relative to the total replacement cost. By comparing the actual vs. target reinvestment rate the Town can determine the extent of any existing funding gap.

Figure 3 Reinvestment Rate Calculation



3.3.5 Deriving 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 Town's asset portfolio.

The table below outlines the condition rating system used to determine asset conditions. This rating system is aligned with the Canadian Infrastructure Report Card. When assessed condition data is not available, age and EUL are used to approximate asset conditions.

Table 2 Condition Ranges

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

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 K 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.

3.3.6 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 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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Table 3 Examples of Lifecycle Activities

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

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

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

3.3.7 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. 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.

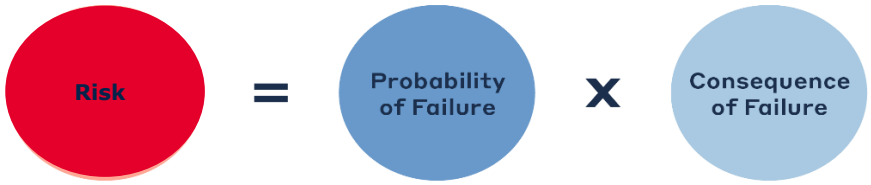
Qualitative Approach to Risk

The qualitative risk assessment involves the documentation of risks to the delivery of services that the municipality 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 4 Asset Risk Formula



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's failure will have on an organization's asset management goals. 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.

3.3.8 Climate Change

The impacts of changing climate are already evident across the country. Environment and Climate Change Canada highlights Canada's changing climate, anticipated impacts, and projections for the future.

Key findings include:

• Canada's climate has warmed and will warm further in the future, driven by human influence. Both past and future warming in Canada is, on average, about double the magnitude of global warming.

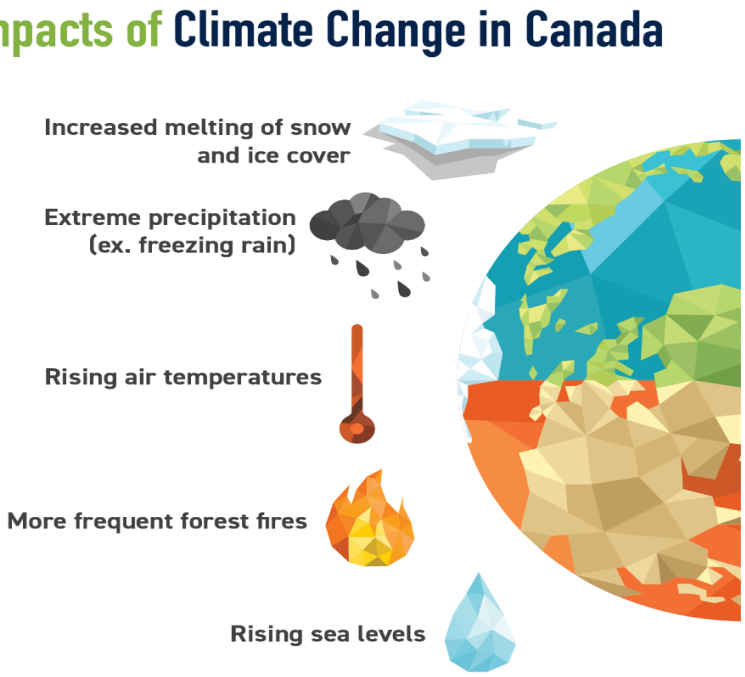
• Precipitation has increased in many parts of Canada, and there has been a shift toward less snowfall and more rainfall. However, reductions in summer rainfall are projected for parts of southern Canada under a high emission scenario toward the late century.

• Temperature extremes have changed in Canada, consistent with the increase in mean temperature. Extreme warm temperatures have become hotter, while extreme cold temperatures have become less cold.

• Increased frequency and severity of extreme weather events (e.g. heat waves, floods, coastal storm surges and droughts), more smog episodes and disease outbreaks, thawing of permafrost, loss of northern sea ice, and rising sea levels.

The Ontario Climate Change Data Portal also modelled wind speeds under RCP 8.5 (a high emissions climate change scenario). Wind speeds will be increasing in the spring

months, which could lead to more frequent and severe storm surges accompanying spring storms.



Climate change continues to put significant pressure on shoreline communities, natural and built infrastructure, and the ecological integrity in the Great Lakes Basin. Usually in winter, when Lake Ontario is ice-covered, especially when there is shore-fast ice, flood risk and damage is significantly reduced. Due to climate change, warmer temperatures reduce the duration and extent of ice cover which, combined with seasonal winds cycles that are highest in winter, increase shoreline impacts. Models indicate a trajectory of climate change for at least the next 20 years – despite efforts to reduce global carbon emissions – which may lead to significant increases in future shoreline flooding and damage during periods of high lake levels.

3.3.9 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 Town 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 the Town'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 Town will need to review the lifecycle costs of growth-related infrastructure, and these costs should be considered in long-term funding strategies.

3.3.10 Levels of Service

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

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

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (roads, water, wastewater, stormwater) the province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For non-core asset categories, the Town has determined the qualitative descriptions that will be used to determine the community level of service provided. These descriptions can be found in the Levels of Service subsection within each asset category.

Technical Levels of Service

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

For core asset categories (roads, water, wastewater, stormwater) the province, through O. Reg. 588/17, has provided technical metrics.

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 Town established current levels of service as well as proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service are realistic and achievable within the timeframe outlined by the Town. They were determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals, and long-term sustainability. The Town will identify a lifecycle management and financial strategy which will allow these targets to be achieved.

Annual Review

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

4 Portfolio Overview

4.1 Community Profile

The Town of Lincoln holds a prominent location in Ontario's Niagara Peninsula. As one of the fastest-growing communities in Niagara, Lincoln is an ideal place to establish or expand a business. Lincoln is a recognized Agricultural Centre of Excellence with thriving agriculture, food and beverage, technology, manufacturing and tourism sectors. Promoting an "Open for Business" message and attracting new investment are key drivers towards economic growth and prosperity in Lincoln.

The Town of Lincoln is made up of several communities and hamlets that together create Lincoln's strong and diverse economy. The eight, and soon to be nine hamlets, possess their own unique identity, making each community their own micro-destination for tourists and residents alike.

Figure 5 A Map of Lincoln

The Town of Lincoln's population increase between 2016 and 2021 exceeded previous growth targets as established in the 2016 Lincoln Official Plan and exceeded overall growth across Niagara Region. The Town is working to provide diverse housing stock

well within the reach of many families so that residents of all backgrounds and lifestyles can find a place to call home within our community.

Lincoln is situated along the QEW and the Niagara Escarpment, with scenic frontage on Lake Ontario. Beamsville serves as the administrative centre and main business area, while other population clusters include Vineland, Jordan, Campden, Rockway, Tintern, and the future Prudhommes development. Lincoln's superior natural beauty features the waterfront and picturesque Jordan Harbour, orchards, vineyards, and conservation areas. Lincoln's highly productive agriculture sector thrives thanks to the region's fertile soil and the temperature moderating effects of Lake Ontario and the Niagara Escarpment. The latter is recognized as an environmentally protected UN World Biosphere Reserve, making the escarpment and the land in its vicinity as internationally significant.

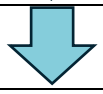
4.2 Inventory & Valuation

The Town'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

4.2.1 State of the Infrastructure

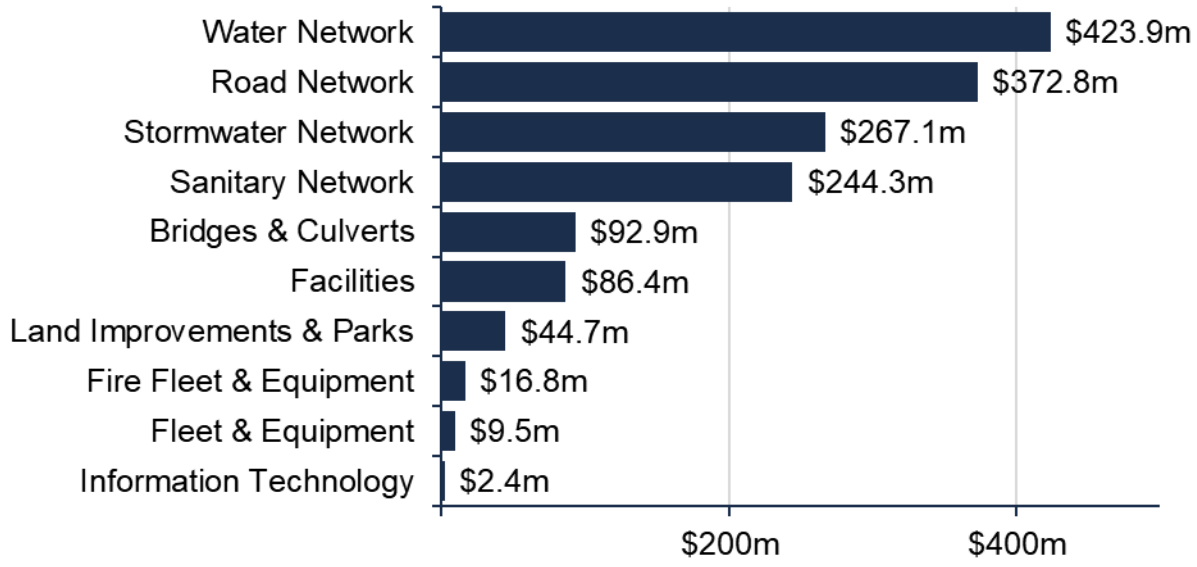
The table below outlines the current state of each asset category as well as shows the current service trend. The service trend arrows show an overall downward trend based on current funding levels and condition declines. The core infrastructure categories of roads, sanitary and stormwater are almost maintaining their services with the water network maintaining the service level historically.

Asset Category	Replacement Cost	Average Asset Condition	Service Trend
Bridges & Culverts	$92,875,400	Good (70%)	
Facilities	$86,391,701	Good (61%)	
Fire Fleet & Equipment	$16,752,200	Fair (57%)	
Fleet & Equipment	$9,499,981	Good (66%)	
Information Technology	$2,419,636	Fair (46%)	
Land Improvements & Parks	$44,704,585	Good (64%)	
Road Network	$372,849,146	Fair (63%)	
Sanitary Network	$244,302,089	Very Good (88%)	
Stormwater Network	$267,087,730	Very Good (92%)	
Water Network	$423,884,136	Very Good (88%)	
Overall	**$1,560,766,603**	**Good (79%)**	

4.2.2 Replacement Cost

All of Lincoln's asset categories have a total replacement cost of $1.56 billion 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 Portfolio Replacement Value



4.3 Condition & Age

The current condition of the assets is central to all asset management planning. Collectively, 89% of assets in Lincoln are in fair or better condition. This estimate relies on both age-based and field condition data.

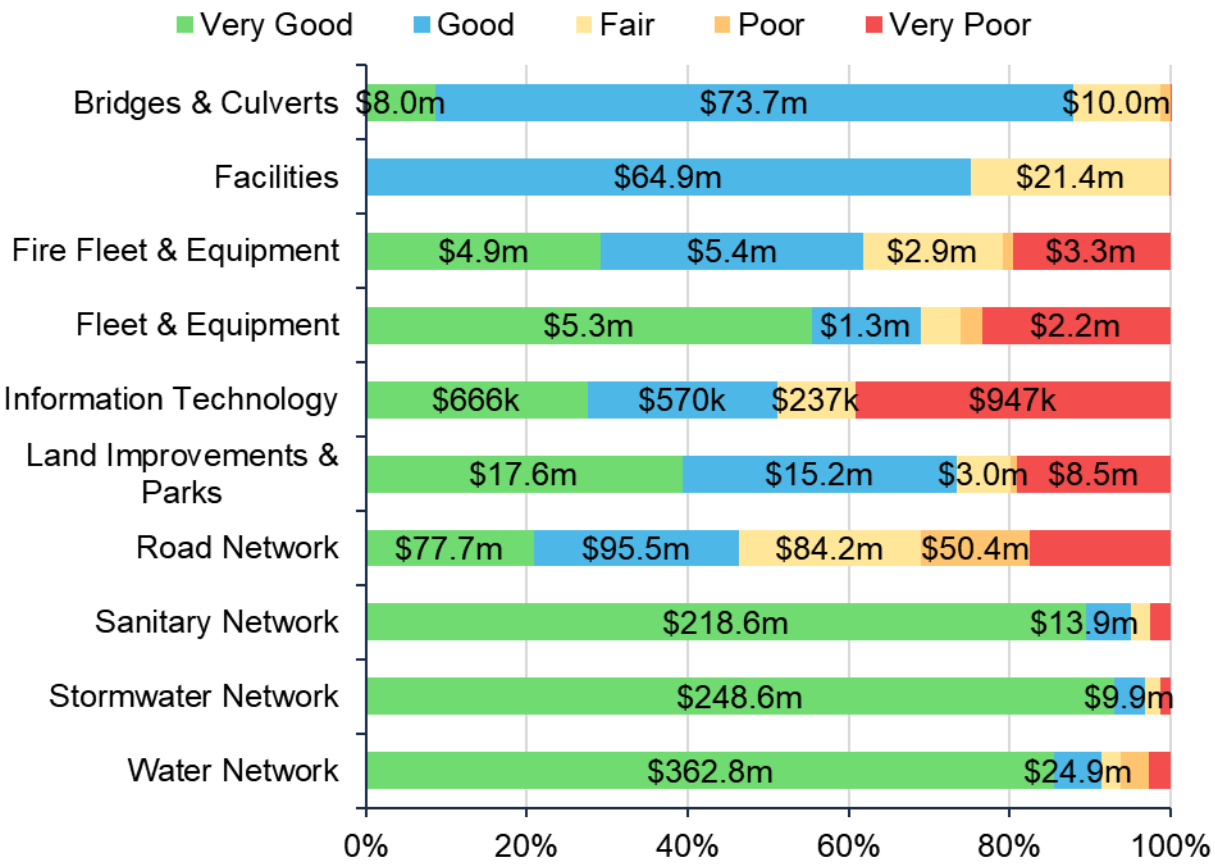
Assessed condition data is available for all roads, bridges and culverts >3m as well as facilities; and fire fleet, for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset 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	2021 Roads Needs Study
Bridges & Culverts	2024 OSIM Bridge Inspections
Facilities	2023 Building Condition Assessment
Fire Fleet & Equipment	2024 Fire Fleet Assessment

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

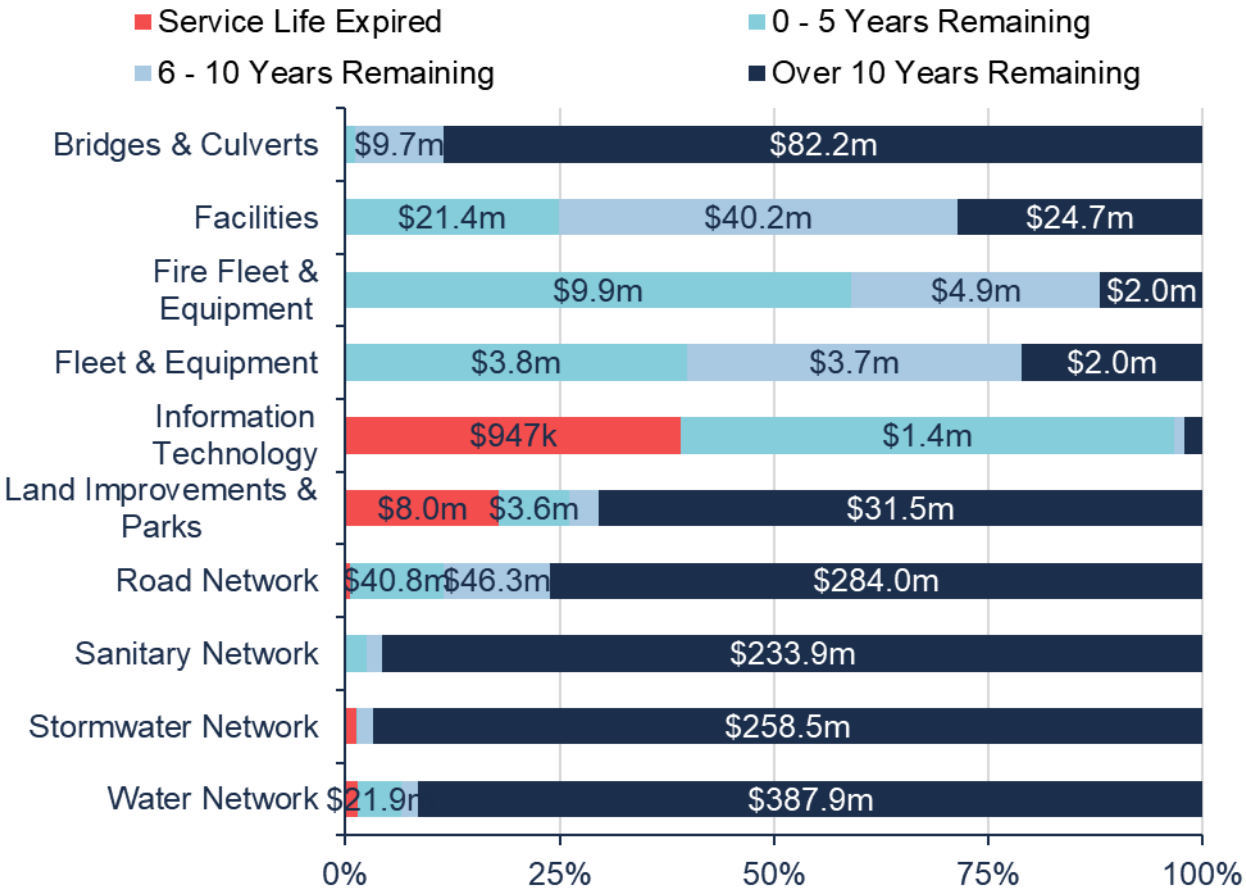
Figure 8 Overall Condition Breakdown by Asset Category



4.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 17% of the Town's assets will require rehabilitation / replacement within the next 10 years. Details of the capital requirements are identified in each asset section.

Figure 9 Overall Service Life Remaining by Asset Category



4.5 Risk and Criticality

4.5.1 Qualitative Risk

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

Organizational Capacity

Staff resources have been focused primarily on accommodating infrastructure requirements. This leaves little time to dedicate towards asset management planning activities such as data refinement and lifecycle strategy development.

Asset Data & Information

There was a lack of confidence in the available inventory data for asset management purposes. Staff have been working on improving the existing asset inventory including consolidating data sources. Staff plan to prioritize data refinement efforts to increase confidence in the accuracy and reliability of asset data and information.

4.5.2 Quantitative Risk

The overall risk breakdown for the Town of Lincoln's asset inventory is portrayed in Figure 10. Each asset category has a breakdown of the attributes used to calculate the asset risk in their associated appendix.

Figure 10 Overall Asset Risk Breakdown

1 - 4 Very Low $797,726,619 (51%)	5 - 7 Low $207,645,697 (13%)	8 - 9 Moderate $34,915,485 (2%)	10 - 14 High $256,352,637 (16%)	15 - 25 Very High $264,126,166 (17%)

Based on replacement cost Lincoln has 17% of their asset portfolio in very high risk. Reviewing the list of very high-risk assets to evaluate how best to mitigate the level of risk the Town is experiencing will help advance Lincoln's asset management program.

4.6 Climate

The Town has completed a Corporate Climate Adaption Plan (CCAP) as a guideline to support and inform climate adaptation at the Corporate municipal level. It outlines how the municipality will adapt its assets, operations, and services to the current and future impacts of climate change. The following climatic threats were identified as top priority for the Town of Lincoln:

- Increased variability in temperature and precipitation
- More frequent and/or severe freezing rain events
- More frequent and/or severe extreme weather events
- More heavy rainfall
- More frequent and/or severe drought events
- More days above 30C

The Town 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 Town of Lincoln may experience the following trends:

Higher Average Annual Temperature

- For the 1971-2000 period, the annual average temperature was 8.6 ºC.
- Under a high emissions scenario, annual average temperatures are projected to be 11.2 ºC for the 2021-2050 period, 13.3.0 ºC for the 2051-2080 period and 15.0 ºC for the last 30 years of this century.

Increase in Total Annual Precipitation

- The average annual precipitation for the 1971-2000 period was 888 mm.
- Under a high emissions scenario, this is projected to be 12% higher for the 2051-2080 period and 15% higher for the last 30 years of this century.

4.7 Growth

Understanding the key drivers of growth and demand will allow the Town 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 Town has a population of approximately 25,719 residents, as per the 2021 Census of Canada with an 8.1% change between 2016 and 2021.

Lincoln's population is forecasted to steadily grow at an annual growth rate of one percent to approximately 32,000 residents by 2041. Similarly, the employment within the Town is also expected to grow at a steady annual rate of one percent to approximately 14,700 jobs in 2041.

4.7.1 Regional Growth

By 2051, the Niagara Region is expected to grow to 694,000 people and 272,000 jobs. The 2022 Niagara Official Plan is a long-range land use planning framework that guides how and where this growth will be accommodated, while also protecting key regional assets.

The Plan supports the creation of sustainable, resilient, and prosperous communities by providing clear direction on a range of critical topics, including:

- Natural Environment
- Climate Change
- Housing
- Employment
- Transportation

To ensure consistent and coordinated growth management across the Region, the policies outlined in the Niagara Official Plan will be integrated into local municipal official plans. These policies serve as a foundation for future community planning and decision-making across Niagara's municipalities.

4.7.2 Lincoln Official Plan (November 2016)

The Town of Lincoln is currently working on updating their official plan in 2025 which bases its projections and goals for growth on Niagara Region's official plan recently approved in November 2022. The Official Plan is the cornerstone document essential for the management of future growth, development, and change in Lincoln.

The Town of Lincoln is aligning its land use plan with updated population and employment growth forecasts to the year 2051, as allocated by the Niagara Official Plan (NOP, 2022). Key initiatives supporting this growth include:

- Intensification and Strategic Growth Areas: In line with the Growth Plan policies, Lincoln is planning to accommodate growth primarily through intensification. This includes the designation of a Strategic Growth Area, which will support higher-density development and efficient use of land.

- Housing Affordability and Diversity: The Town is promoting a more affordable and diverse housing stock by enabling a mix of housing types. This includes supporting Additional Residential Units (second and third units) on existing residential lots, in accordance with recent changes to the Planning Act.
- Protected Major Transit Station Area (PMTSA): A new PMTSA designation is being introduced within the Beamsville GO Secondary Plan area. As a Strategic Growth Area under the Growth Plan and NOP, the Town must define its boundaries, set a minimum density target, and ensure the area is planned to support that target in terms of both population and employment.
- Prudhomme Area Conformity Exercise: Planning work is also underway in the Prudhomme area to revise the layout of low-rise residential and employment blocks. These changes conform to the approved concept plan and Zoning By-law Amendment (2022).

The Town of Lincoln's current Official Plan, approved in November 2016, now requires a comprehensive review to ensure alignment with recent and significant changes to provincial planning policy. Since 2016, the Province of Ontario has introduced numerous updates affecting municipal land use planning, including:

- Amendments to the Planning Act
- Revisions to the Clean Water Act
- Updated versions of the Greenbelt Plan and Niagara Escarpment Plan
- The release of a new Provincial Planning Statement (PPS 2024) in October 2024, which revoked both the Provincial Policy Statement and the Growth Plan

These changes reflect a shift in provincial planning priorities and policy direction. As such, Lincoln must update its Official Plan to ensure consistency with the PPS 2024 and other updated legislation, and to effectively plan for future growth and development in a manner that reflects current provincial objectives and local community needs.

4.7.3 Development Charges Background Study – Consolidated Report

The Town has identified as part of the report developed by Watson & Associates Economists Ltd. Infrastructure projects required to accommodate the growth projected to 2041. The summary table identifies the total additional infrastructure needed to maintain the current level of service of the Town to accommodate that growth.

Table 5 Gross Expenditures over the life of the Development Charges Bylaw

Service	Cost
Stormwater Drainage and Control Services	
• Channels, drainage and ponds	$8,601,400
• Campden Stormwater Drainage	$2,329,000
Wastewater Services	$32,934,789
Water Services	$52,314,829
Services Related to a Highway	
• Roads and Related	$128,696,213
• Public Works (Facility & Fleet)	$47,336,000
Fire Protection Services	$30,609,033
Library Services	$6,499,536
Parks and Recreation Services	$53,652,335
Total	**$362,973,134**

4.8 Levels of Service

The strategic plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element. The long-term community vision statement for the Town is:

A place to grow:

Youth, aging in place, agriculture – growing crops, farming, greenhouse support, business growth, early childhood development (youth), proper planning and growing smart, growing your family here in Lincoln

A place to prosper:

A place for small/medium businesses to succeed, opportunities, job creation, tourism, destination, local markets, festivals, beautification, industrial parks, prosperity, community vibrancy, innovation

A place to belong:

Maintain community feeling, connectedness, more local events, support for families, history and heritage, local markets, local and unique festivals, moving around town, one community

Council priorities are outlined in the following figure.

Figure 11 Council Priorities

The organizational mission is the Town of Lincoln takes pride in delivering municipal services with an efficient, effective, and customer centered approach, resulting in a livable and sustainable community.

Levels of service are a measure of the quality and scope of the services that municipal infrastructure provides to the community. Both quantitative and qualitative metrics are used

4.8.1 Current Levels of Service

To measure the current level of service as a guide to developing and measuring service delivery, service attributes were identified that align staff work practices and with community expectations.

Scope - Is a description of the services being provided and the assets that are utilized to provide the services.

Sustainability – The practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making. This includes:

- Financial Stewardship - The efficient and transparent use of public funds, ensuring that financial strategies support the long-term health and sustainability of municipal assets — reflecting the Town's commitment to fiscal responsibility and good governance.
- Environmental Stewardship - The integration of environmental considerations into asset management and service delivery, promoting actions that protect and sustain natural resources for current and future generations

Responsibility – The obligation and accountability to ensure that assets and services are:

- Safe to operate, minimizing health, safety, and security risks to people and the environment.
- Compliant with all applicable laws, regulations, standards, and guidelines

Resiliency - The capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively. This is supported by:

- Quality - A measure of the overall performance and effectiveness of a service, reflecting how well it meets defined standards and community expectations.
- Reliability - Ensuring that assets are well-maintained and in acceptable condition, enabling services to be delivered consistently with minimal interruptions.
- Availability - Services and infrastructure are operational when needed and accessible to all users, including those with specific needs or limitations.
- Coordination - Fostering collaboration and effective communication between departments, stakeholders, and the community to support responsible, accountable, and transparent asset management and service delivery.
- Connectivity - Maintaining a well-connected and integrated infrastructure network, enabling efficient movement, communication, and access across the community.

All community and technical levels of service are linked to the service attributes and can be found in the appendix for each asset category.

4.8.2 Proposed Levels of Service

Following an evaluation of current practices, community engagement efforts, and asset lifecycle activities, the Town has determined that the current levels of service (LOS) can be defined as an *average condition of good*. Maintaining this standard has been identified as the most appropriate LOS for the community.

A comprehensive assessment process was undertaken to establish proposed levels of service that ensure long-term sustainability and feasibility. The following key principles were integral to the development of the LOS methodology:

Stakeholder Engagement: Engage regularly with community stakeholders to gather feedback, communicate updates, and ensure transparency in decision-making.

Data-Driven Decision Making: Utilize analytics and performance data to guide strategic decisions and target areas for improvement.

Flexibility and Adaptability: Maintain a flexible approach to LOS, allowing for adjustments based on shifting community priorities and emerging needs.

Continuous Improvement: Implement an ongoing review process to refine and enhance the LOS methodology over time.

4.8.3 Scenarios

The scenarios that were used to analyse Lincoln'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 Capital Reinvestment Rate

Purpose: This scenario builds upon the current capital reinvestment rate, where the total amount of investment being made into capital improvements (like replacement or major repairs) remains the same. In this scenario, the focus is on the impact that current investment levels have on the condition of the infrastructure over time.

Key Focus: The annual investment stays constant, and the condition of the infrastructure is evaluated based on that level of reinvestment.

Outcome: This helps to see if the current capital reinvestment rate is enough to maintain the infrastructure in a sustainable way over the long term, or if it's falling short and leading to degradation in condition.

Scenario 2: Current Condition

Purpose: This scenario aims to achieve a specific, target condition level for the infrastructure, where the goal is to maintain the current average condition of the infrastructure in each asset category. By fixing the condition, the model determines what the required annual investment would be to reach and maintain that target.

Key Focus: This scenario focuses on achieving a targeted condition level (current condition) and determining how much investment would be necessary to maintain that condition.

Outcome: This scenario gives insights into how much investment would be needed to keep the infrastructure at its current level.

Scenario 3: Current Lifecycle Activities

Purpose: This scenario examines the current state of the infrastructure based on existing lifecycle practices. It looks at how the infrastructure is currently being maintained, the condition it's in, and projects the amount of annual investment needed to be made in each asset category.

Key Focus: The condition of the infrastructure and the annual investment levels based on currently identified lifecycle activities.

Outcome: This scenario provides a baseline for understanding how the infrastructure is currently being maintained. It helps identify whether there are any gaps between current practices and long-term sustainability goals.

4.8.4 Results

Scenario 1: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was

held, and the condition was determined. The table below summarizes the results of each asset category and overall.

Table 6 Scenario 1 Current Capital Reinvestment Summary

Asset Category	Current Average Condition	Projected Average Condition	Funding Required
Bridges & Culverts	Good (70%)	Very Poor (18%)	$209,314
Facilities	Good (61%)	Very Poor (13%)	$347,004
Fire Fleet & Equipment	Fair (57%)	Very Poor (12%)	$158,809
Fleet & Equipment	Good (66%)	Very Poor (14%)	$101,207
Information Technology	Fair (46%)	Very Poor (11%)	$66,647
Land Improvements & Parks	Good (64%)	Poor (20%)	$178,316
Road Network	Fair (63%)	Fair (54%)	$3,021,572
Stormwater Network	Very Good (92%)	Fair (52%)	$447,039
Sanitary Network	Very Good (88%)	Fair (54%)	$826,276
Water Network	Very Good (88%)	Good (70%)	$3,295,810
Overall	Good (79%)	Fair (52%)	$8,651,994

Scenario 2: Target Current Condition - this scenario utilizes a target of the average condition within each asset category. The condition value was held, and the annual investment was then determined. The table below summarizes the results of each asset category and overall.

Table 7 Scenario 2 Target Current Average Condition Summary

Asset Category	Current Average Condition	Projected Average Condition	Funding Required
Bridges & Culverts	Good (70%)	Good (70%)	$1,513,740
Facilities	Good (61%)	Good (61%)	$2,192,596
Fire Fleet & Equipment	Fair (57%)	Fair (57%)	$809,614
Fleet & Equipment	Good (66%)	Good (66%)	$618,312
Information Technology	Fair (46%)	Fair (46%)	$285,612
Land Improvements & Parks	Good (64%)	Good (64%)	$1,145,652
Road Network	Fair (63%)	Fair (63%)	$5,143,207
Stormwater Network	Very Good (92%)	Good (79%)*	$3,126,867
Sanitary Network	Very Good (88%)	Good (78%)*	$2,647,104
Water Network	Very Good (88%)	Good (79%)*	$5,604,572
Overall	Good (79%)	Good (73%)	$23,087,275

*Note: lifecycle activities will only maintain the infrastructure to the average condition identified.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

The table below summarizes the results of each asset category and overall.

Table 8 Scenario 3 Current Lifecycle Activities Summary

Asset Category	Current Average Condition	Projected Average Condition	Funding Required
Bridges & Culverts	Good (70%)	Good (75%)	$1,939,330
Facilities	Good (61%)	Good (78%)	$2,852,737
Fire Fleet & Equipment	Fair (57%)	Good (77%)	$1,112,576
Fleet & Equipment	Good (66%)	Good (79%)	$752,863
Information Technology	Fair (46%)	Good (74%)	$471,876
Land Improvements & Parks	Good (64%)	Good (76%)	$1,342,354
Road Network	Fair (63%)	Good (73%)	$6,460,875
Stormwater Network	Very Good (92%)	Good (79%)	$3,126,867
Sanitary Network	Very Good (88%)	Good (78%)	$2,647,104
Water Network	Very Good (88%)	Good (79%)	$5,604,572
Overall	Good (79%)	Good (77%)	$26,311,155

4.8.5 Summary

Lincoln is taking a strategic approach to ensure the long-term sustainability of its municipal services by focusing on the condition of the assets that support them. This helps balance service quality with cost-efficiency, avoiding unsustainable over-investment while still meeting community needs.

The Town is also improving the accuracy of its asset management system, which is essential for informed decision-making about capital planning and long-term sustainability.

By targeting Scenario 3, which maintains current lifecycle activities, the Town is setting a prudent long-term financial goal aimed at keeping its infrastructure in good condition.

This approach supports the Town's ability to deliver sustainable and resilient municipal services, while upholding fiscal responsibility and accountability to the community. Maintaining this standard ensures that critical assets continue to perform effectively and efficiently over time, reducing the risk of costly emergency repairs or service disruptions.

5 Financial Management

5.1 Financial Strategy Overview

Each year, the Town of Lincoln 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 the burden on the community.

This financial strategy is designed for the municipality'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 reviewing historical capital expenditures on infrastructure, inclusive of any allocations to reserves for capital purposes.

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

- Revenue from taxation allocated to reserves for capital purposes
- Revenue from water and wastewater rates allocated to capital reserves
- The Canada Community Benefits Fund (CCBF), formerly the Federal Gas Tax Fund
- The Ontario Community Infrastructure Fund (OCIF)

Although provincial and federal infrastructure programs can change with evolving policies, CCBF and OCIF are considered permanent and predictable revenue sources.

Through the development of proposed levels of service the Town of Lincoln has established the long-term target of funding the lifecycle activities

5.1.1Annual Capital Requirements

The annual requirements represent the amount the Town should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability.

As part of its proposed level of service analysis, the Town assessed the annual funding requirements needed to support the full lifecycle of its existing infrastructure. The analysis identified an estimated annual requirement of $26.3 million to sustain infrastructure assets over the long term.

To address this, the Town is recommending Scenario 3, which focuses on maintaining current lifecycle activities. This scenario balances financial feasibility with asset performance, helping to ensure infrastructure remains in Good condition while

supporting sustainable and resilient service delivery. Table 9 outlines the forecasted average annual requirements for existing assets in each asset category to maintain the proposed level of service.

Table 9 Average Annual Capital Requirements

Asset Category	Replacement Cost	Forecasted Annual Capital Requirements
Bridges & Culverts	$92.9m	$1.9m
Facilities	$86.4m	$2.9m
Fire Fleet & Equipment	$16.8m	$1.1m
Fleet & Equipment	$9.5m	$753k
Information Technology	$2.4m	$472k
Land Improvements & Parks	$44.7m	$1.3m
Road Network	$372.8m	$6.5m
Stormwater Network	$267.1m	$3.1m
Tax Funded Total	**$892.6m**	**$18.1m**
Sanitary Network	$244.3m	$2.6m
Water Network	$423.9m	$5.6m
Rate Funded Total	**$668.2m**	**$8.3m**
Overall Total	**$1,560.8m**	**$26.3m**

5.1.2 Current Funding Levels

Table 10 summarizes how current capital funding levels compare with funding required for each asset category. At existing levels, the Town is funding 33% of its forecasted annual capital requirements to maintain the proposed level of service of maintaining current lifecycle activities. This creates a total annual funding deficit of $17.7 million.

Table 10 Current Funding Position vs Required Funding

Asset Category	Forecasted Annual Capital Requirements	Current Available Funding	Annual Deficit
Bridges & Culverts	$2.9m	$266k	$1.7m
Facilities	$1.1m	$391k	$2.5m
Fire Fleet & Equipment	$753k	$152k	$960k
Fleet & Equipment	$472k	$103k	$650k
Information Technology	$1.3m	$65k	$407k
Land Improvements & Parks	$6.5m	$184k	$1.2m
Road Network	$1.9m	$2.9m	$3.5m
Stormwater Network	$3.1m	$428k	$2.7m
Tax Funded Total	**$18.1m**	**$4.5m**	**$13.5m**

Asset Category	Forecasted Annual Capital Requirements	Current Available Funding	Annual Deficit
Sanitary Network	$2.6m	$826k	$2.3m
Water Network	$5.6m	$3.3m	$1.8m
Rate Funded Total	**$8.3m**	**$4.1m**	**$4.1m**
Overall Total	**$26.3m**	**$8.7m**	**$17.7m**

5.1.3 Closing the Gap

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

This section outlines how the Town can close the annual funding deficits using sustainable revenue sources, i.e., property taxation, water & wastewater rates.

Full Funding Requirements

In 2025, Lincoln has an annual tax revenue of $26 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require a 51.7% tax change over time.

To achieve this increase, several scenarios have been developed using phase-in periods ranging from five to twenty 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
51.7%	8.7%	4.3%	2.8%	2.1%

For the water and sanitary rate funding, the water rate revenue in 2025 is estimated to be $8.4 million, while the sanitary is $6.9 million. Without consideration of any other sources of revenue or cost containment strategies, full funding would require a 27.7% water rate change over time according to the asset management system forecast and a 26.4% increase for sanitary.

The water and sanitary financial plan and rate study developed by BMA Management Consulting Inc. in accordance with O.Reg. 453/07, have estimated overall rate increases to 2030.

Table 12 Forecasted Revenues and Expenditures for Water

Water	2025	2026	2027	2028	2029	2030
Total Revenues	$8,404,141	$8,859,996	$9,340,732	$9,847,711	$10,382,372	$10,946,230
Operating Expenses	$2,615,185	$2,722,406	$2,884,468	$2,987,664	$3,094,628	$3,205,500
Regional Expenses	$2,482,070	$2,599,075	$2,721,554	$2,849,759	$2,983,959	$3,124,430
Transfers to Water Capital Reserve	$3,274,139	$3,332,167	$3,528,328	$3,803,871	$4,097,332	$4,409,808
Debt Charges	$32,747	$206,347	$206,381	$206,417	$206,454	$206,492
Total Expenditures	$8,404,141	$8,859,996	$9,340,732	$9,847,711	$10,382,372	$10,946,230
Water Capital to Reserve Change as a % of Rate Revenue	**0.69%**	**2.21%**	**2.95%**	**2.98%**	**3.01%**	**1.2% recommended value to 2039**

The rate study and financial plan only forecasted to 2030, to reach the full funding lifecycle activity funding continuing to increase the capital transfer by 2.8% will reach full funding by 2034 (10-years) or 1.2% will reach full funding by 2039 (15-years)

Table 13 Forecasted Revenues and Expenditures for Sanitary

Sanitary	2025	2026	2027	2028	2029	2030
Total Revenues	$6,900,878	$7,618,533	$8,411,333	$9,204,031	$10,071,844	$11,021,901
Operating Expenses	$870,695	$903,679	$999,393	$1,033,771	$1,069,358	$1,106,194
Regional Expenses	$4,943,906	$5,363,149	$5,817,944	$6,311,305	$6,846,504	$7,427,088
Transfers to Sanitary Capital Reserve	$668,634	$934,062	$1,176,354	$1,441,311	$1,738,339	$2,070,976
Debt Charges	$417,643	$417,643	$417,643	$417,643	$417,643	$417,643
Total Expenditures	$6,900,878	$7,618,533	$8,411,333	$9,204,031	$10,071,844	$11,021,901
Sanitary Capital to Reserve Change as a % of Rate Revenue	**3.85%**	**3.18%**	**3.15%**	**3.23%**	**3.30%**	**%1.2 recommended value to 2034**

The rate study and financial plan forecasted to 2030, to reach the full funding lifecycle activity funding it is necessary to continuing to increase the capital transfer by 1.2% per year and the Town will reach full funding by 2034 (10-years) or 0.6% annually Lincoln will reach full funding by 2039 (15-years).

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.

5.2 Estimated Growth Financial Requirements

The Town's annual net operating costs will increase because of the capital programs proposed under the DC background study. Table 5 outlines the gross project expenses forecasted due to growth in the Town at $362.9 million.

The Town regularly conducts long-term financial analyses of its operating and capital programs to ensure long-term sustainability and affordability in maintaining service levels as the Town grows. This demonstrates the Town's commitment to ensuring the long-term financial sustainability of future capital projects prior to their approval.

5.3 Ten-Year Financial Plan

The Town is working with a clear long-term financial strategy aimed at reaching sustainable funding levels for its infrastructure services in 15-years and with that sustainable level of funding in 2039 the Town is still operating with an infrastructure deficit. The table below show a 10-year capital projection for each asset category with proposed funding.

Table 14 Ten-Year Tax Funded Financial Plan

Asset Category	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Bridges & Culverts	$732k	$1.2m	$881k	$695k	$2.4m	$1.8m	$1.2m	$657k	$3.1m	$4.1m
Facilities	$4.0m	$915k	$297k	$1.0m	$145k	$4.5m	$610k	$745k	$50k	$975k
Fire Fleet & Equipment	$331k	$555k	$650k	$254k	$1.7m	$1.4m	$2.1m	$698k	$5.4m	$322k
Fleet & Equipment	-	$706k	$660k	$730k	$730k	$720k	$751k	$710k	$814k	$1.3m
Information Technology	$344k	$615k	$265k	$550k	$346k	$282k	$287k	$367k	$299k	-
Land Improvements & Parks	$9k	$66k	$69k	$46k	$3.3m	$459k	$9.8m	-	$1.5m	$168k
Road Network	$1.8m	$7.3m	$8.1m	$13.5m	$7.5m	$12.8m	$6.6m	$3.2m	$5.6m	$4.5m
Stormwater Network	$300k	$125k	$360k	$120k	$230k	$960k	$300k	$525k	$300k	$390k
Tax Funded Total	**$7.6m**	**$11.5m**	**$11.3m**	**$17.0m**	**$16.3m**	**$22.9m**	**$21.7m**	**$6.9m**	**$17.0m**	**$11.8m**
Proposed Funding	**$4.5m**	**$5.3m**	**$6.0m**	**$6.8m**	**$7.6m**	**$8.4m**	**$9.2m**	**$10.1m**	**$11.0m**	**$11.9m**

The current 10-year program requires $144 million in funding over its duration, while the proposed available funding is $80.9 million. This indicates that the financial strategy's annual funding targets will not be met within the 10-year period, but the Town is projecting to reach the annual requirement in 15-years. Moreover, the Town will not be able to fully fund the outlined 10-year plan but will need to continue to prioritize projects and infrastructure needs.

For water and sanitary alignment with the Financial Plan and Rate Study report identifies the capital funding available for water and sanitary to 2030, the remaining 4-years is based on the recommended increase to reach full funding for water in 15 years and sanitary in 10-years.

Table 15 Ten-Year Water and Sanitary Rate Funded Financial Plan

Asset Category	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Water Network	$2.9m	$750k	$3.5m	$1.1m	$1.9m	$550k	$1.7m	$2.3m	$300k	$523k
Proposed Funding	**$3.3m**	**$3.3m**	**$3.5m**	**$3.8m**	**$4.1m**	**$4.4m**	**$4.5m**	**$4.7m**	**$4.8m**	**$4.9m**
Sanitary Network	$773k	$990k	$1.2m	$1.1m	$855k	$2.7m	$315k	$290k	$290k	$350k
Proposed Funding	**$669k**	**$934k**	**$1.2m**	**$1.4m**	**$1.7m**	**$2.1m**	**$2.2m**	**$2.3m**	**$2.5m**	**$2.6m**

The current 10-year program for both water and sanitary are fully funded within the 10-year program, however water will not reach full sustainable funding levels until 2039.

6 Recommendations

1. Review feasibility of adopting a full-funding scenario that achieves 100% of average annual requirements as outlined in the proposed levels of service and the financial strategy for all asset categories.This involves:
    - Implementing a 2.8% annual tax increase over a 15-year phase-in period and allocating the full increase in revenue towards capital funding
    - Implementing a 1.2% annual water rate increase over a 9-year phase-in period after the increases identified in the Financial Plan and Rate Study
    - Implementing a 1.2% annual sanitary rate increase over a 4-year phase-in period after the increases identified in the Financial Plan and Rate Study
    - Continued allocation of OCIF and CCBF funding as previously outlined
    - Using risk frameworks and staff judgement to prioritize projects, particularly to aid in elimination of existing infrastructure backlogs

    NOTE: Although it is difficult to capture inflation costs, supply chain issues, and fluctuations in commodity prices will also influence capital expenditures.

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. The annual review requirement in O.reg. 588/17 the Town 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

Appendix A: Road Network

The municipal road allowance, or road right-of-way (ROW), is a network of land owned and operated by the Town and is primarily used for the transportation of people as well as goods and services that are essential to the community's ability to function, grow and prosper. In Lincoln, the ROW network is a two-tier system with the majority of ROW being under the jurisdiction of the Town of Lincoln. However, primary collectors and arterial type road allowances are typically owned and operated by the Niagara Region.

Although most assets within Regional ROW's are under the jurisdiction of the Niagara Region, the Town of Lincoln is still responsible for many assets within these corridors as well. It is important to note that this AMP provides a plan to manage all roadway assets maintained and operated by the Town of Lincoln, regardless of whether they are located within municipal or Regional ROW.

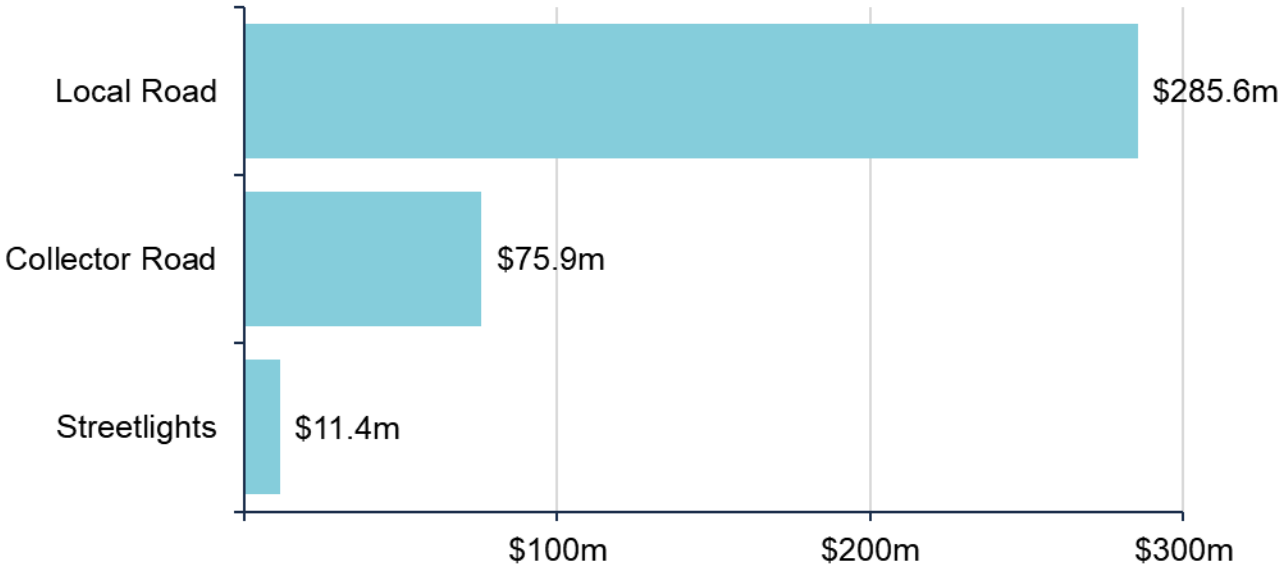
Lincoln's road network comprises a large share of its infrastructure portfolio, with a current replacement cost of $372.8 million, distributed primarily between asphalt and surface treated roads.

The Town also owns and manages other supporting infrastructure and capital assets, including streetlights.

Inventory & Valuation

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

Figure 12 Road Network Replacement Value

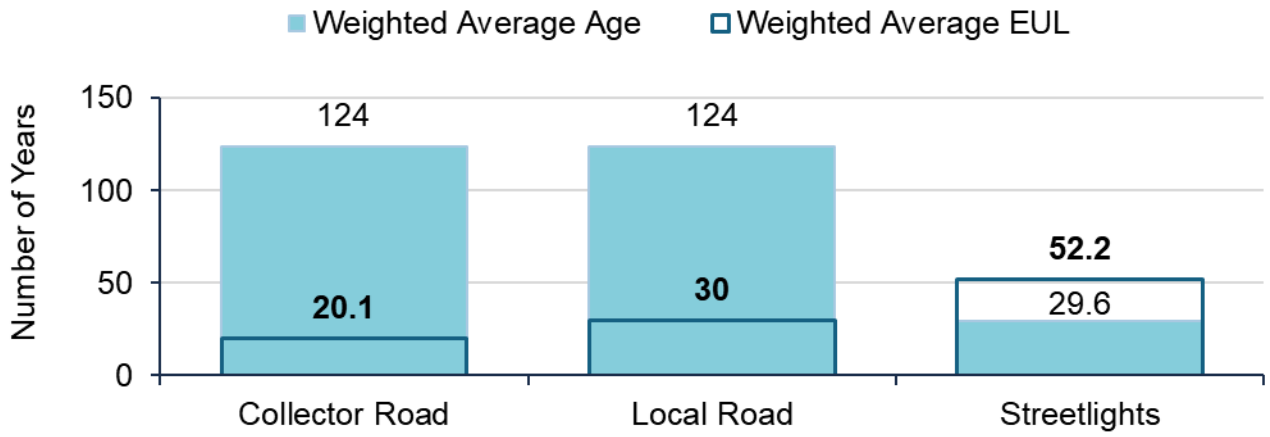


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent realistic capital requirements.

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.

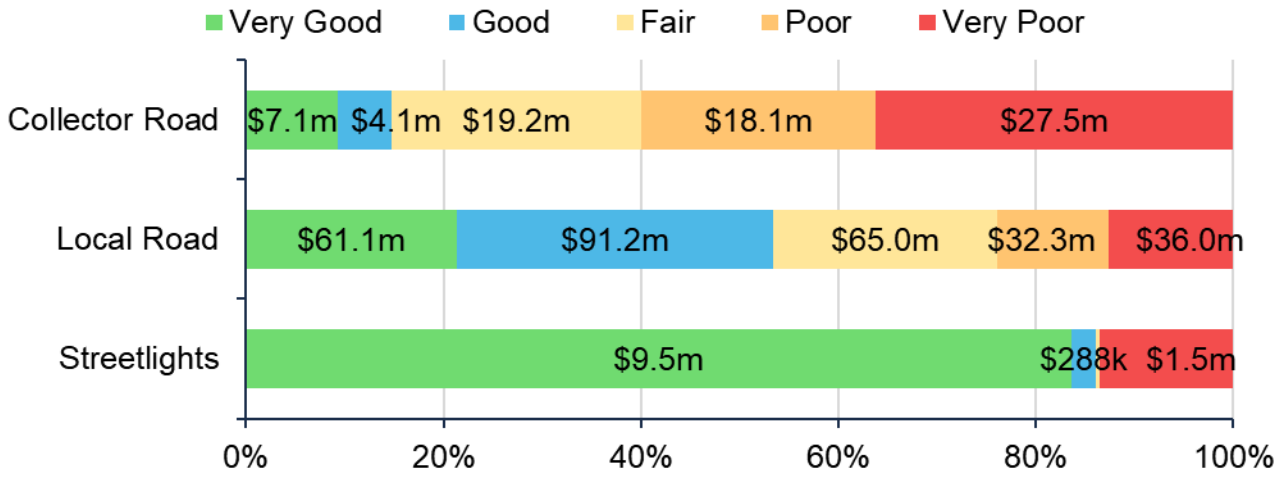
Figure 13 Road Network Average Age vs Average EUL



The analysis shows that, based on in-service dates the roads continue to remain in operation beyond their expected useful life. This is due to the use of field conditions and the lifecycle management strategies currently being utilized which will be outlined in greater detail in a later section.

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

Figure 14 Road Network Condition Breakdown



To ensure that Lincoln's roads continue to provide an acceptable level of service, the Town 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.

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 Town's current approach as part of the Road Needs Study is to measure the Pavement Condition Index (PCI) of the road network approximately every 5 years to evaluate the road condition Staff update the condition of the roads once work is completed.

The following rating criteria is used to determine the current condition of road segments and forecast future capital requirements. The condition scale for roads utilized is the pavement condition index (PCI) range from 0 to 100 from Very Poor to Very Good.

Table 16 Pavement Condition Photo Description

Condition	Photo Description	Rating (PCI Equivalents)
Very Good		85-100
Good		70-85
Fair		55-70
Poor		40-55
Very Poor		0-40

Lifecycle Management Strategy

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

The Town's annual Road Rehabilitation and Resurfacing Program takes a balanced approach to road network maintenance and renewal. The Town employs a strategy of focusing on both "keeping the good roads good" through maintenance while also addressing roads in very poor condition through major rehabilitation work.

Figure 15 Road Network Current Lifecycle Strategy

Maintenance

- deficiency repairs as required from patrols for minimum maintenance standards such as patching, shoulder grading, etc.
- crack sealing

Rehabilitation / Renewal / Replacement

- for asphalt minor resurfacing and major resurfacing
- for surface treated single surface addition and double surface replacement
- streetlights are straight replacement

PCI scores, staff judgment, traffic loads, and the opportunity to bundle projects help inform the optimal lifecycle intervention, ranging from pothole repairs to potential replacements. Lifecycle models used to estimate the savings to annual capital requirement are shown below.

Figure 16 Collector Asphalt Roads (HCB) Road Lifecycle Model

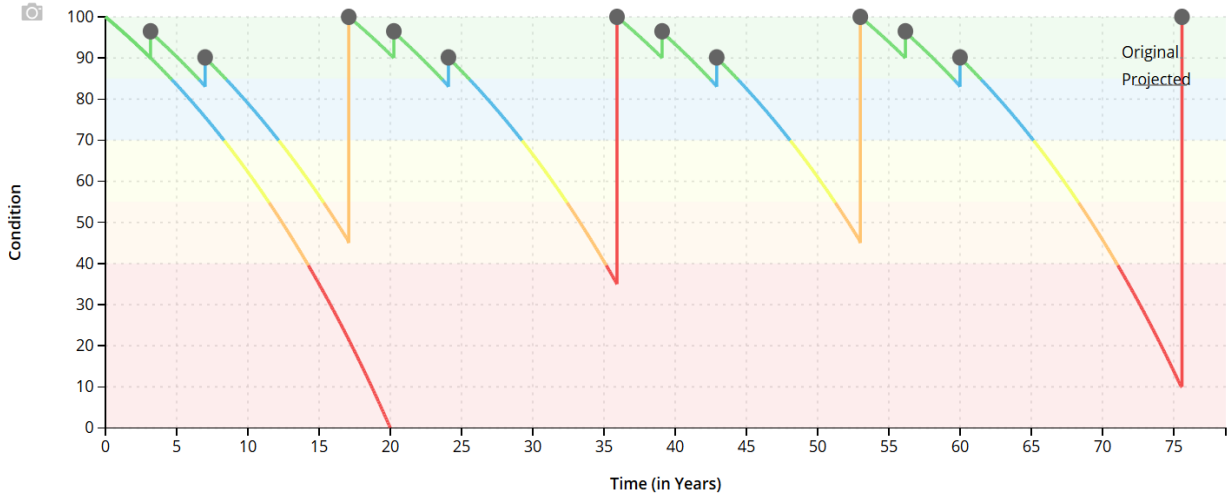


Figure 18

Figure 17 Local Asphalt Roads (HCB) Road Lifecycle Model

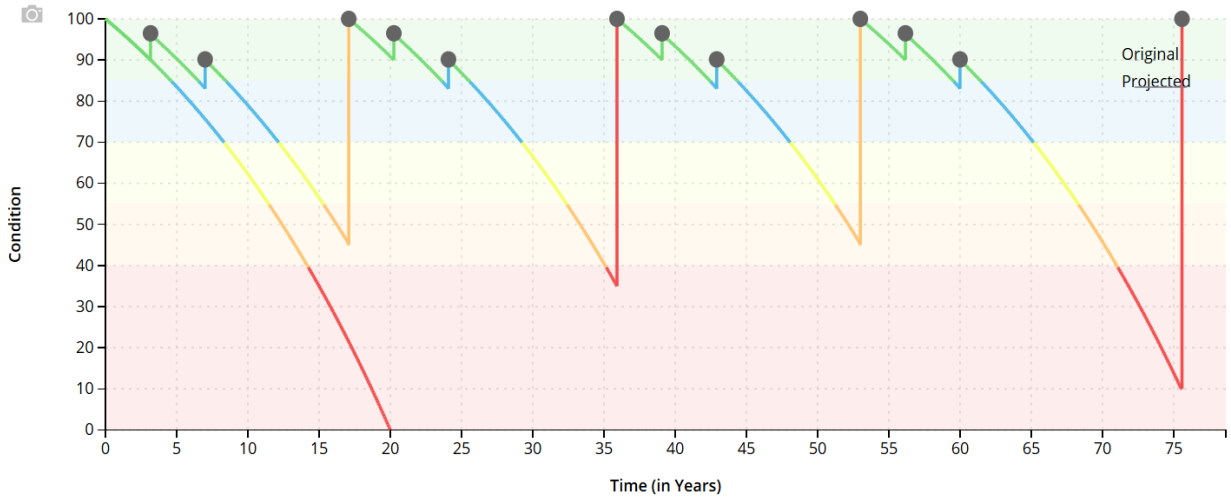
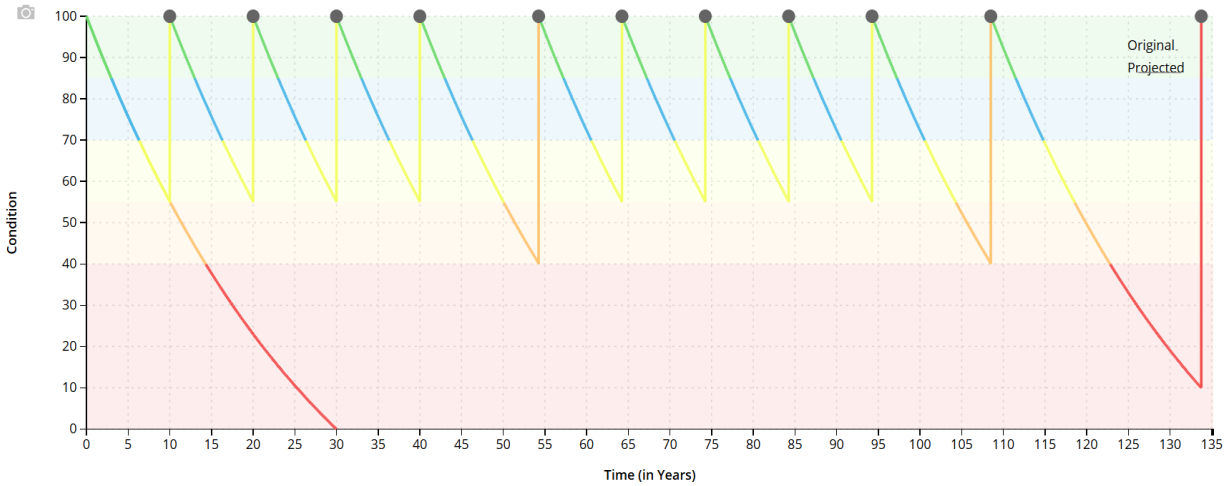


Figure 18 Surface Treatment (LCB) Road Lifecycle Model



For the road network lifecycle management strategies have been developed to identify costs that are realized through strategic rehabilitation and renewal. The development of these strategies allows for a comparison of potential cost avoidance.

The following table compares two scenarios:

Replacement Only Scenario: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.

Lifecycle Strategy Scenario: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required.

Table 17 Road Network Annual Capital Requirement Comparison

Asset Segment	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Collector Roads	$3,783,032	$1,754,465	$2,028,567
Local Roads	$9,517,742	$4,402,434	$5,115,308
Streetlights	$303,976	$303,976	$0
Total	**$13,604,750**	**$6,460,875**	**$7,143,875**

The use of a proactive lifecycle strategy for roads both asphalt and surface treated, leads to a potential annual cost avoidance of approximately $7.1 million. This represents a reduction of the annual capital requirement for the road network of 53%.

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 19 Road Network Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$9,840,850 (3%)	$12,505,560 (3%)	$13,184,820 (4%)	$153,449,116 (41%)	$183,868,800 (49%)

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.

Table 18 Road Network Risk Model Probability of Failure Criteria (Roads and Streetlights)

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 19 Road Risk Model Consequence of Failure Criteria Roads

Criteria	Criteria Weighting	Value/Range	Score	
Surface Type	100%	Surface Treated	2	Minor
		Asphalt	4	Major

Table 20 Road Risk Model Consequence of Failure Criteria Streetlights

Criteria	Criteria Weighting	Value/Range	Score	
Replacement Cost	100%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town'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 Town has selected.

Table 21 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 20 Map of Roads	Scope	Replacement Cost	$372,849,146
			Quantity - kms of local roads	255
			Quantity - kms of collector roads	55
			Quantity - number of lights	3,023
			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)	0.43
			Lane-km of local roads (MMS classes 5 and 6) per land area (km/km2)	0.84
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	0.90
			Average Risk	14.74
			Annual reinvestment	$2,940,651
			(Actual) Capital reinvestment rate	0.79%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	Minimum Maintenance Standards are met	Yes

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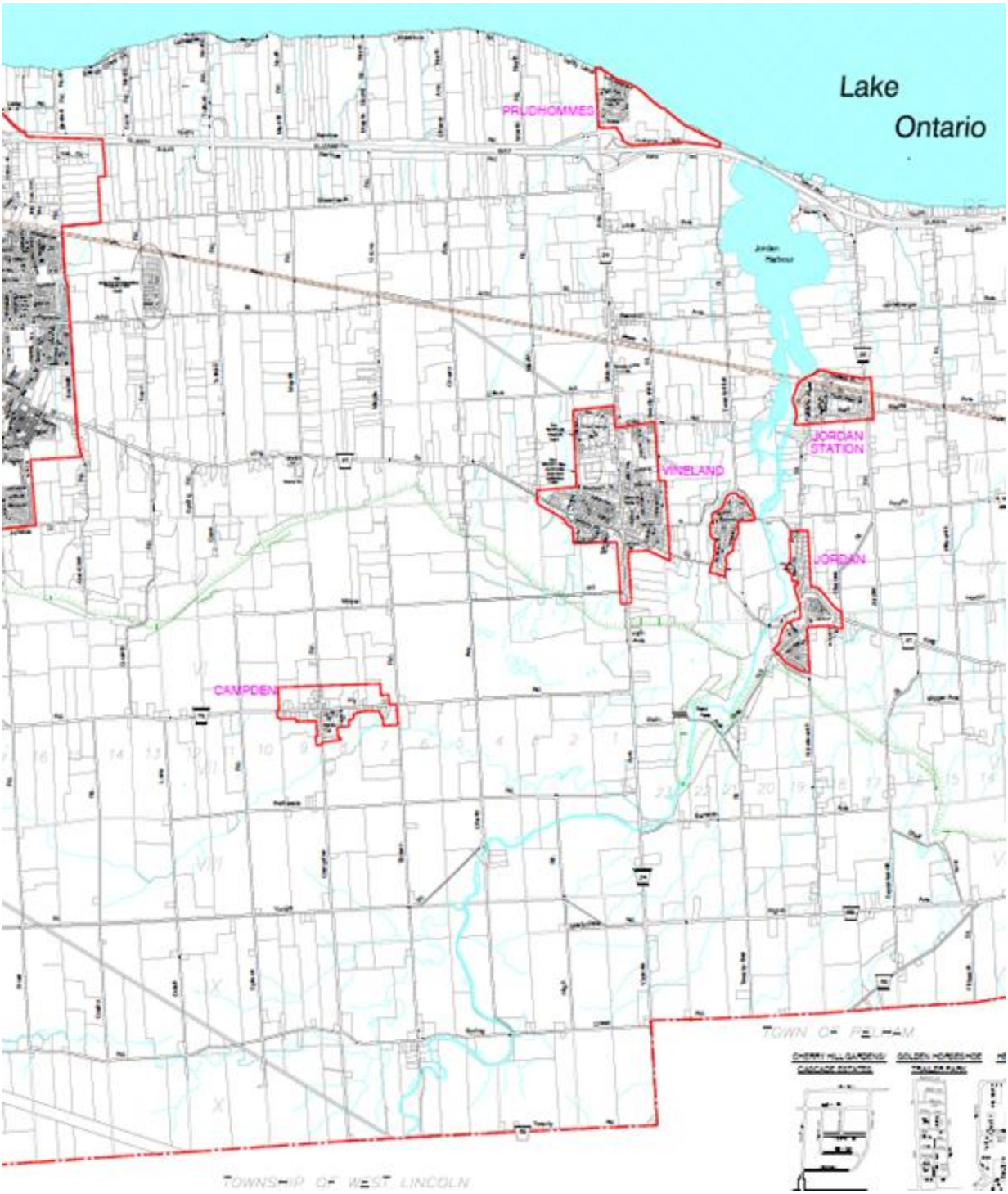
Community LOS		Service Attribute	Technical LOS	
Description or images that illustrate the different levels of road class pavement condition	See Table 16 Pavement Condition Photo Description for the description of road condition	Resiliency	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Collector Roads = Poor (46%) Local Roads = Fair (66%)
			Average Condition	Good (68%)
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			% Risk that is High and Very High	13%
			Average Asset Risk	Very Low
			Capital re-investment rate	0.5%

Figure 20 Map of Roads



Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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. The table below outlines the results for each scenario for the road network.

Scenario 1: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 22 Scenario Results Summary

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$372,849,146	Fair (54%)	$2,940,651
Scenario 2 - Maintain Current Condition	$372,849,146	Fair (63%)	$5,143,207
Scenario 3 – Lifecycle	$372,849,146	Good (73%)	$6,460,875

The proposed level of service recommended for the road network is Scenario 3, which maintains current lifecycle activities.

Appendix B
Bridges & Culverts

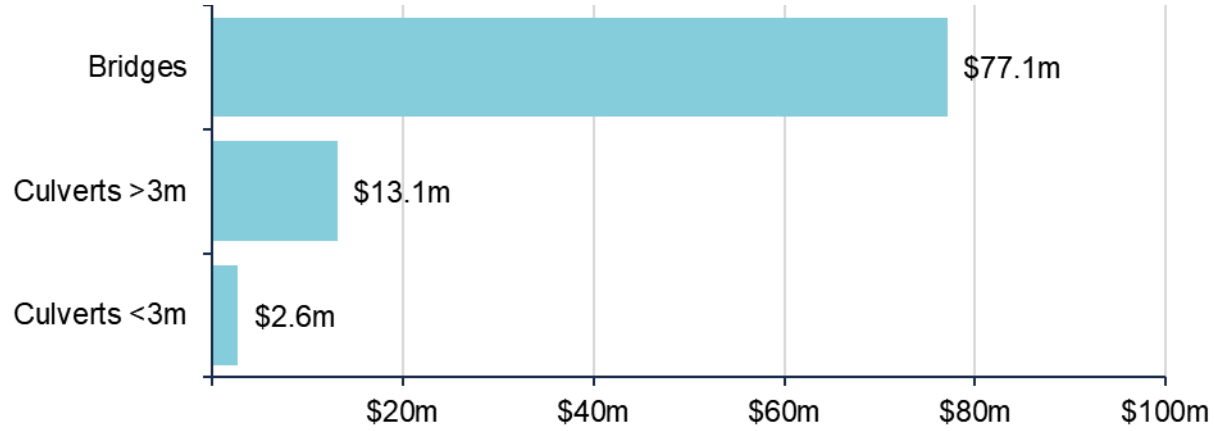
Appendix B Bridges & Culverts

Bridges and culverts represent a critical portion of the transportation system in the Town of Lincoln. This is a combination of bridges, culverts greater than 3m as well as culverts less than 3m.

Inventory & Valuation

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

Figure 21 Bridges & Culverts Replacement Cost

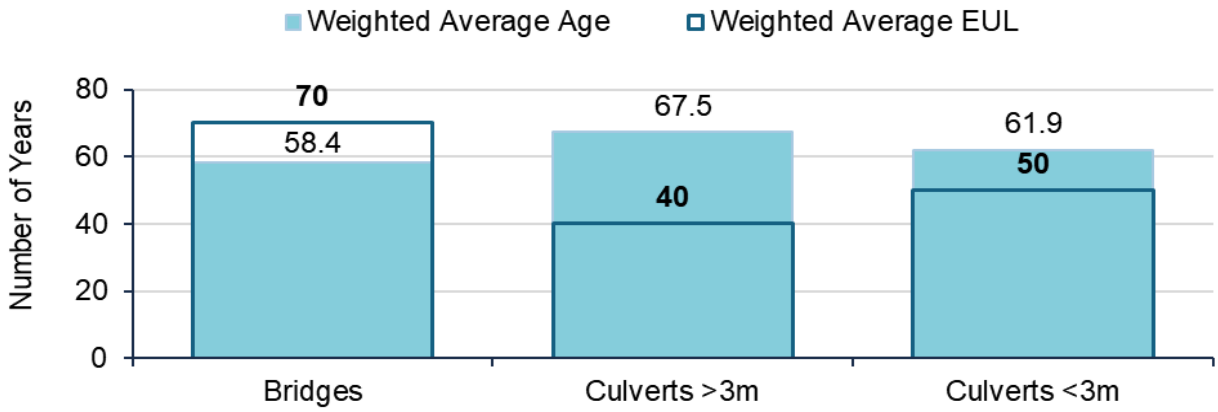


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed. This can be included in the Ontario Structures Inspection Manual (OSIM) inspections as the replacement cost is part of the calculation for the bridge condition index (BCI).

Asset Condition & Age

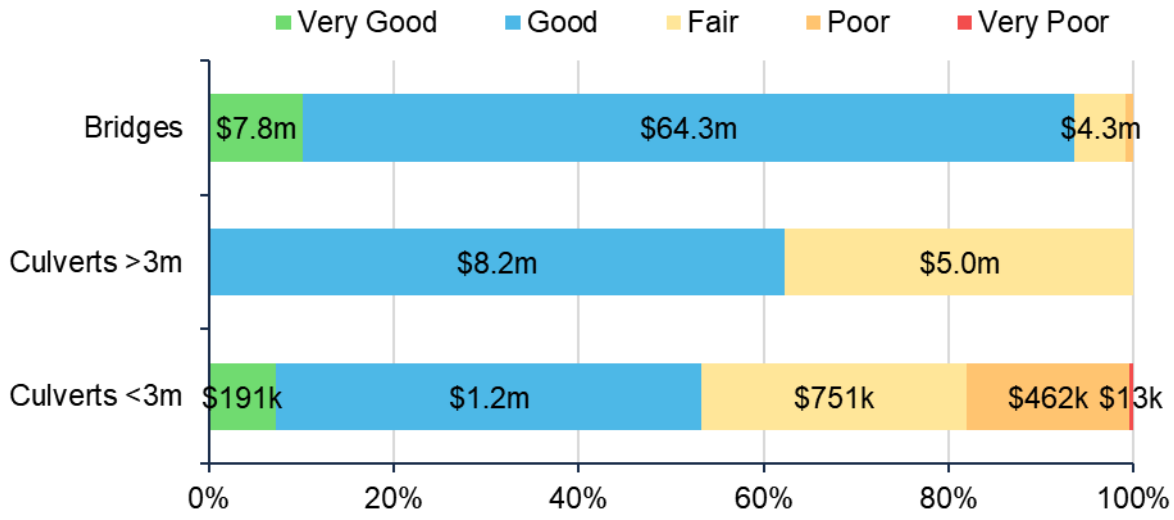
The graph below identifies the average age and the estimated useful life for each asset segment. The values are replacement cost weighted.

Figure 22 Bridges & Culverts 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 23 Bridges & Culverts Condition Breakdown



To ensure that the Town's bridges and culverts continue to provide an acceptable level of service, the staff should monitor the average condition of all assets.

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. Lincoln's current approach is to assess all bridges and culverts >3m every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM). The most recent assessment was completed in 2024 by qualified engineers from ELLIS Engineering Inc. The condition scale for bridges and culverts utilized is from 0 to 100 from Very Poor to Very Good.

Figure 24 Bridges & Culverts Condition Images

Condition	Photo Descrition	Rating (PCI Equivalents)
Very Good		85-100
Good		70-85
Fair		60-70
Poor		30-60
Very Poor	No Photo	0-30

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Figure 25 outlines Lincoln's current lifecycle management strategy.

Figure 25 Bridges & Culverts Current Lifecycle Strategy

Maintenance

- All maintenance and repair activities are driven by the results of inspections competed according to the Ontario Structure Inspection Manual (OSIM) as well as internal staff monitoring

Rehabilitation / Renewal / Replacement

- Replacement occurs when the OSIM inspection recommends it and funding is available

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 26 Bridges & Culverts Risk Breakdown

1 - 4 Very Low $3,475,767 (4%)	5 - 7 Low $21,144,008 (23%)	8 - 9 Moderate $624,000 (<1%)	10 - 14 High $16,523,125 (18%)	15 - 25 Very High $51,108,500 (55%)

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.

Table 23 Bridges & Culverts Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 24 Bridges & Culverts Risk Model Consequence of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	
Replacement Cost	100%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town'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 Town has selected.

Table 25 Bridges & Culverts Current Levels of Service

Community LOS		Service Attribute	Current Technical LOS	
Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges in the Town of Lincoln allow the movement of heavy transport vehicle, motor vehicles, emergency vehicles, pedestrians and cyclists.	Scope	Replacement Cost	$92,875,400
			Quantity (Bridges)	56
			Quantity (Structural Culverts)	14
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	73%
			Average Risk	13.06
			Annual reinvestment	$265,730
			(Actual) Capital reinvestment rate	0.29%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	Average Condition Rating	Good (60)
Description or images of the condition of bridges and culverts and how this would affect the use	See Figure 24 Bridges & Culverts Condition Images	Resiliency	Average bridge condition index value for bridges in the Municipality	Good (72%)
			Average bridge condition index value for structural culverts in the Municipality	Good (63%)
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			Average Condition (Entire Category)	Good (70%)
			% Condition > Fair	99%
			% Condition poor and very poor	1%

54

Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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. The table below outlines the results for each scenario for the municipal bridges and culverts.

Scenario 1: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 26 Bridges & Culverts Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$92,875,400	Very Poor (18%)	$265,730
Scenario 2 - Maintain Current Condition	$92,875,400	Good (70%)	$1,513,740
Scenario 3 – Lifecycle	$92,875,400	Good (75%)	$1,939,330

The proposed level of service recommended for bridges & culverts is Scenario 3, which maintains current lifecycle activities.

Appendix C
Stormwater Network

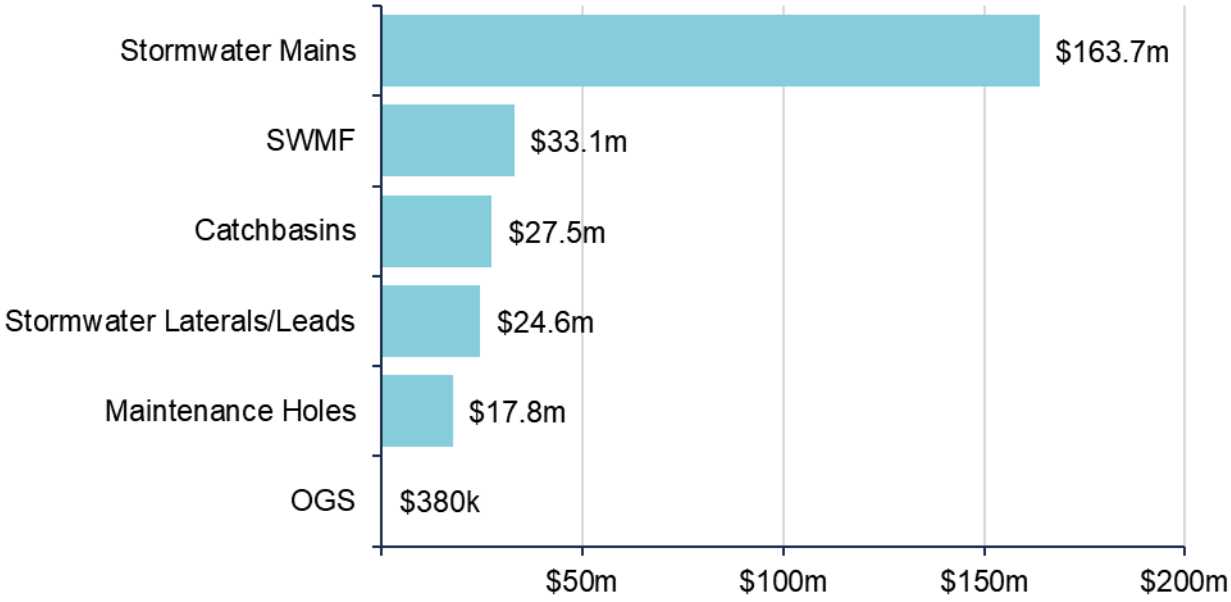
Appendix C: Stormwater Network

The Town is responsible for managing stormwater runoff through creeks, drainage channels and stormwater management facilities, and these are essential to the safe operation of roads. Lincoln owns $267.1 million in stormwater infrastructure.

Asset Inventory & Costs

The figure below displays the replacement cost of each asset segment in the Town's stormwater network inventory.

Figure 27 Stormwater Network Replacement Cost

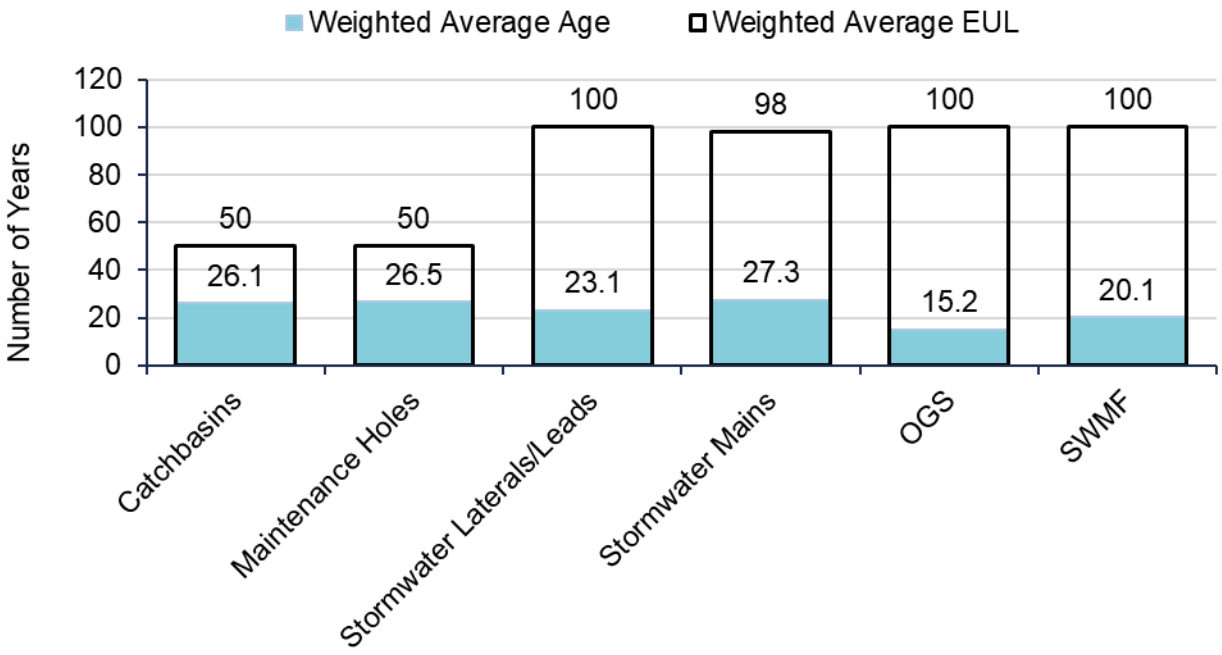


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed.

Asset Condition & Age

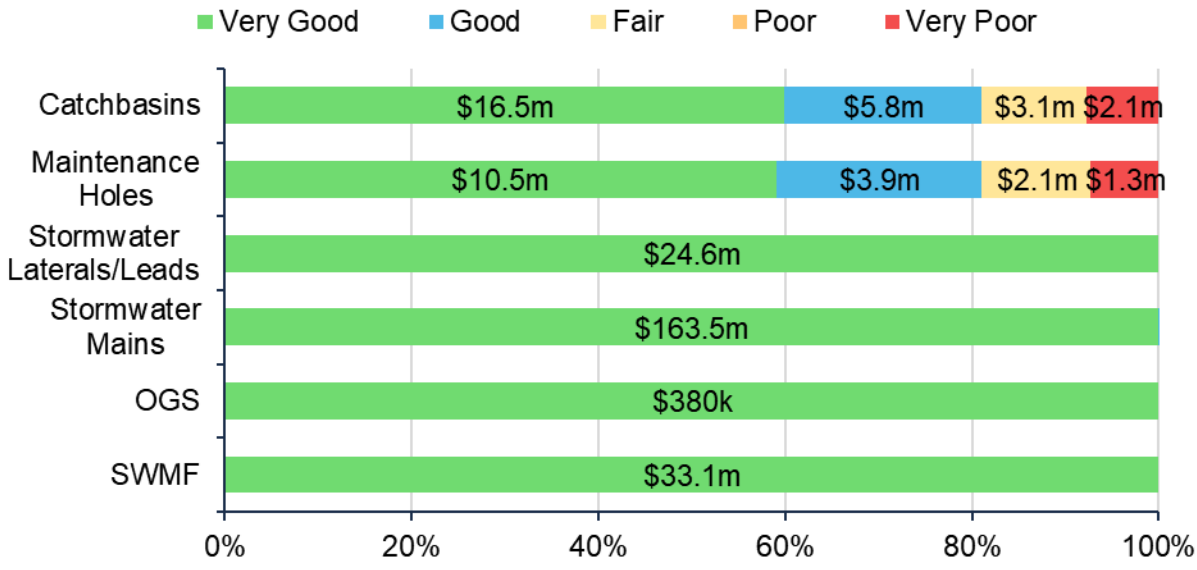
The graph below identifies the average age and the estimated useful life for each asset segment. The values are replacement cost weighted.

Figure 28 Stormwater Network 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 29 Stormwater Network Condition Breakdown



To ensure that the Town's stormwater network assets continue to provide an acceptable level of service, the staff should monitor the average condition of all assets.

Current Approach to Condition Assessment

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

- The Town visually inspects the SWMFs annually as well as OGS's and catch basins
- CCTV program is currently under development

The following rating criteria are used to determine the current condition of stormwater segments and forecast future capital requirements:

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Town's current lifecycle management strategy.

Figure 30 Stormwater Network Current Lifecycle Strategy

Maintenance

- Maintenance activities include catch basin inspections/cleaning on an annual basis.
- SWMF visual inspections are completed annually to determine maintenance needs

Rehabilitation / Renewal / Replacement

- The 2023 SWMF condition assessment will build a 10-year capital plan for ponds.
- The Town will continue to review priority areas to CCTV to gain an understanding of condition to inform future work.

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 31 Stormwater Network Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$184,091,943 (69%)	$79,301,587 (30%)	$267,900 (<1%)	$3,426,300 (1%)	- (0%)

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.

Table 27 Stormwater Network Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 28 Stormwater Network Risk Model Consequence of Failure Criteria (Stormwater Mains)

Criteria	Criteria Weighting	Value/Range	Score	
Diameter	100%	< 225	1	Low
		225-300	2	Minor
		300-450	3	Moderate
		450-750	4	Major
		> 750	5	Severe

Table 29 Stormwater Network Risk Model Consequence of Failure Criteria (Everything except mains)

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Replacement Cost	50%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe
AMP Segment	50%	Stormwater Laterals/Leads	2	Minor
		Catchbasins; Maintenance Holes	2	Moderate
		OGS	4	Major
		SWMF	5	Severe

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

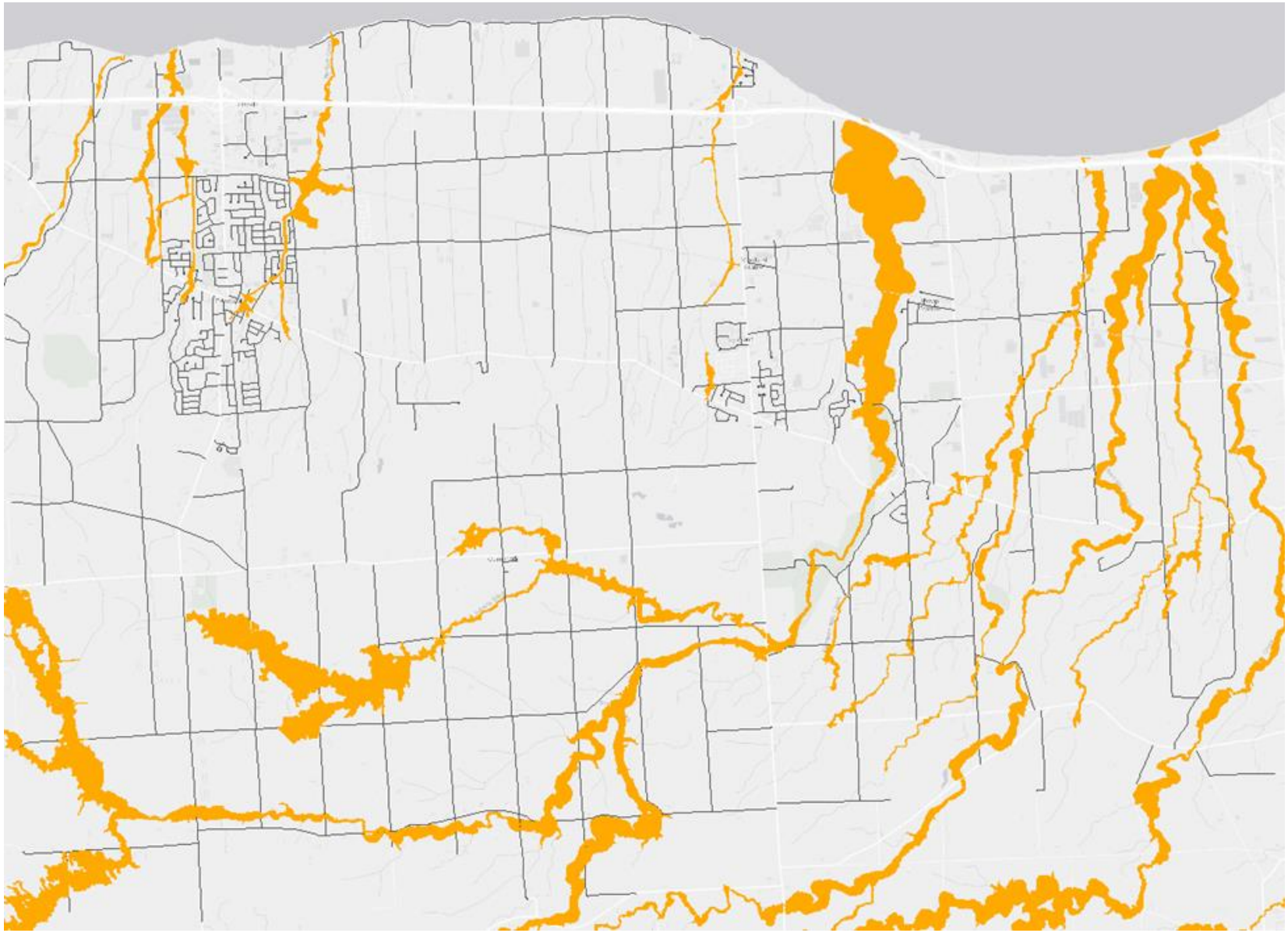
Current Levels of Service

The following table identify the Town's current level of service for the stormwater network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17 and the new CLI-ECA requirements that the Town will be incorporating, as well as any additional performance measures that the Town has selected.

Table 30 Stormwater 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 32 Town of Lincoln Flood Plain Extent Map	Scope	Replacement Cost	$267,087,730
			Quantity (kms of main)	80
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	1%
			Average Risk	3.66
			Annual reinvestment	$428,448
			(Actual) Capital reinvestment rate	0.16%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	MECP Design Guidelines are met for all new installations	Yes
Description or images of the condition of Storm Network Assets	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	Resiliency	% of properties in municipality resilient to a 100-year storm	TBD
			% of the municipal storm sewer management system resilient to a 5-year storm	TBD
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			Average Condition (Entire Category)	Very Good (92%)
			% Condition > Fair	99%
			% Condition poor and very poor	1%

Figure 32 Town of Lincoln Flood Plain Extent Map



Proposed Levels of Service

The scenarios that were used to analyse Lincoln 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. The table below outlines the results for each scenario for the Stormwater Network.

Scenario 1: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 31 Stormwater Network Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$267,087,730	Fair (52%)	$428,448
Scenario 2 - Maintain Current Condition	$267,087,730	Very Good (92%)	$3,126,867
Scenario 3 – Lifecycle	$267,087,730	Good (79%)	$3,126,867

The current condition cannot be maintained with the lifecycle activities as identified. The proposed level of service recommended for the stormwater network is Scenario 3, which maintains current lifecycle activities.

Appendix D
Facilities

Appendix D Facilities

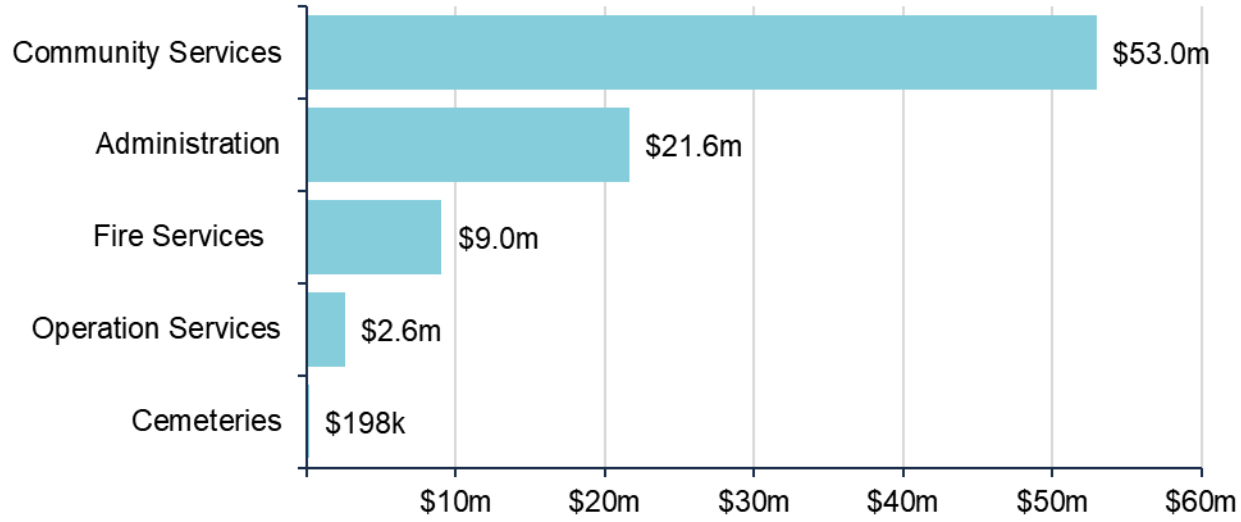
Lincoln owns and maintains several facilities that provide key services to the community. These include:

- Administration
- Cemeteries
- Community Services
- Operation Services
- Fire facilities

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Lincoln's buildings inventory. As the Town has had a componentization of their facilities, their inventory tracks buildings as separate components.

Figure 33 Facilities Replacement Cost

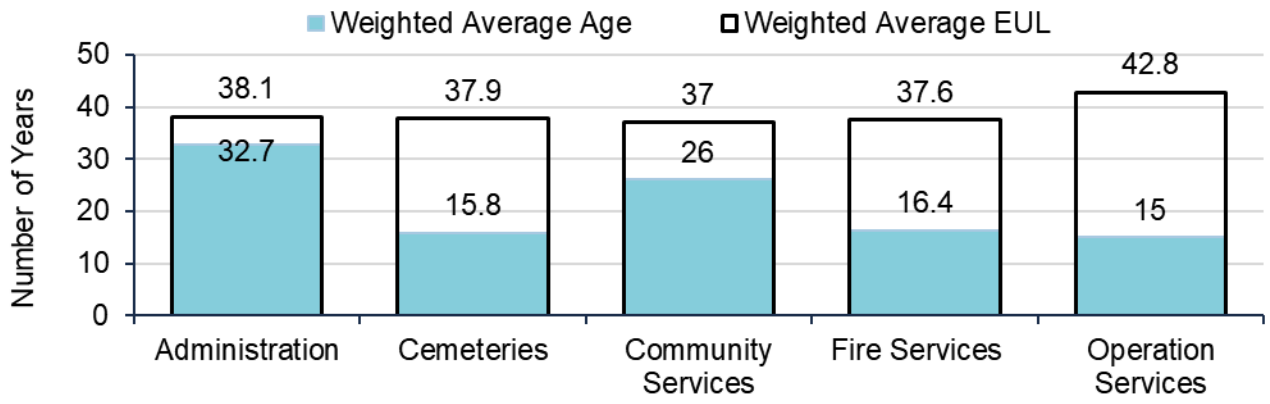


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

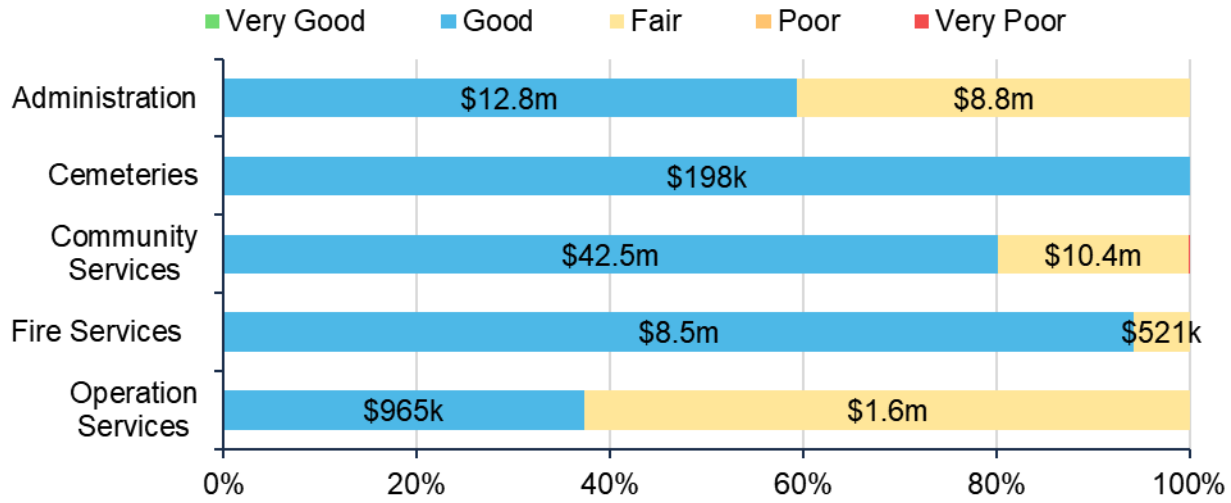
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighed based on replacement cost.

Figure 34 Facilities 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 35 Facilities Condition Breakdown



To ensure that the municipal facilities continue to provide an acceptable level of service, the Town 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 conditions data allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Facilities 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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Town's current lifecycle management strategy.

aFigure 36 Facilities Current Lifecycle Strategy

Maintenance

- Inspection walk through daily
- Fire alarms and generators monthly checks
- Cleaning Services
- HVAC checks

Rehabilitation / Replacement

- Weatherproofing and structural reinforcement
- Modernization
- Rebuilding if can (ie. chiller) otherwise replace at end of life (utilize condition to extend when possible)

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 37 Facilities Risk Breakdown

1 - 4 Very Low $7,551,790 (9%)	5 - 7 Low $33,870,052 (39%)	8 - 9 Moderate $4,930,036 (6%)	10 - 14 High $38,208,341 (44%)	15 - 25 Very High $1,831,483 (2%)

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.

Table 32 Facilities Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 33 Facilities Risk Model Consequence of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	
Replacement Cost	100%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town's current level of service for the municipal 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 Town has selected.

Table 34 Facilities Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by municipal facilities	Facilities are broken into administration, cemeteries, community services, fire services and operation services.	Scope	Replacement Cost	$86,391,701
			Quantity - number of facilities	141
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	46%
			Average Risk	9.47
			Annual reinvestment	$390,886
			(Actual) Capital reinvestment rate	0.45%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	Facility assets comply with accessibility regulations	Priority #1 sites - 90% Priority #2 sites - 80% Priority #3 sites - 50%
Description or images of the condition of facility assets	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	Resiliency	Average Condition	Good (61%)
			% Condition > Fair	100%
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			% Condition poor and very poor	0%

Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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 Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 35 Facilities Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$86,391,701	Very Poor (13%)	$390,886
Scenario 2 - Maintain Current Condition	$86,391,701	Good (61%)	$2,192,596
Scenario 3 – Lifecycle	$86,391,701	Good (78%)	$2,852,737

The proposed level of service recommended for the municipal facilities is Scenario 3, which maintains current lifecycle activities.

Appendix E
Fire Fleet & Equipment

Appendix E: Fire Fleet & Equipment

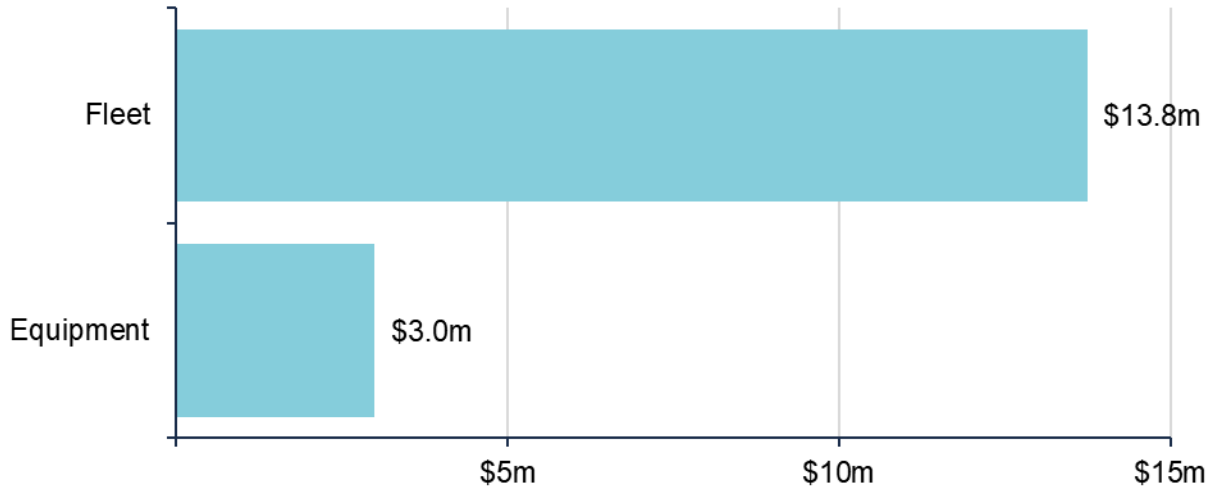
Lincoln Fire Rescue is a composite fire department that relies on four full-time staff and paid on-call volunteer firefighters from the community. The administration of Lincoln Fire Rescue is completed from Fire Station #61 and the service is dispatched from 4 locations throughout the Town. To maintain the quality stewardship of Lincoln's fire services, staff utilize various types of fleet vehicles and equipment.
Examples are:

- Fleet: all apparatus
- Communications: radios
- Personal protective equipment: bunker gear and helmets
- Equipment: hose, self-contained breathing apparatus (SCBA), nozzles, jaws of life and thermal imagers

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Lincoln's fire fleet and equipment inventory.

Figure 38 Fire Fleet & Equipment Replacement Costs

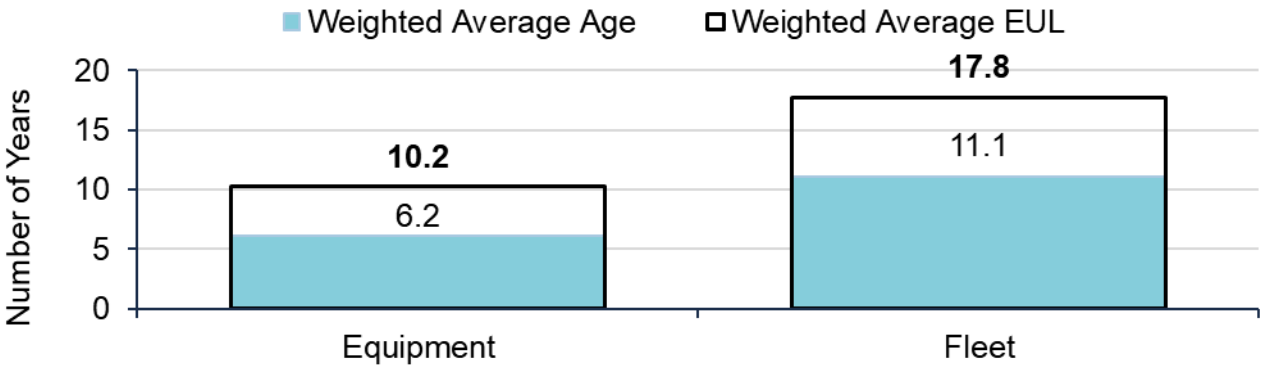


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent capital requirements.

Asset Condition & Age

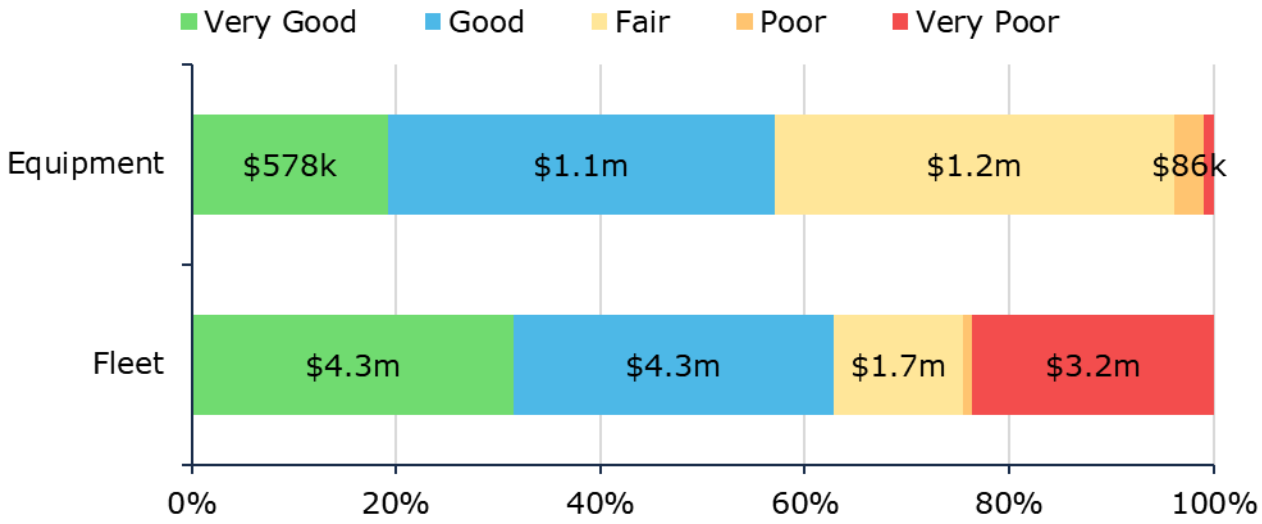
The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighed based on replacement cost.

Figure 39 Fire Fleet & 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 40 Fire Fleet & Equipment Condition Breakdown



To ensure that the Town's fire fleet & equipment continues to provide an acceptable level of service, Lincoln 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 current approach is varied because of the broad range of types of equipment included in this category.

Lifecycle Management Strategy

To ensure that municipal assets are performing as expected and meeting the needs of residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Town's current lifecycle management strategy.

Figure 41 Fire Fleet & Equipment Current Lifecycle Strategy

Maintenance

- Inspection walk around weekly
- Annual Servicing
- Inspections and testing done to manufacturer's recommendations ULC and NFPA requirements, and provincial regulations

Rehabilitation / Replacement

- Replace at end of life, extend items with condition assessments when feasible

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 42 Fire Fleet & Equipment Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$3,747,700 (22%)	$5,663,950 (34%)	$1,122,650 (7%)	$3,237,300 (19%)	$2,980,600 (18%)

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.

Table 36 Fire Fleet & Equipment Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 37 Fire Fleet & Equipment Risk Model Consequence of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	
Replacement Cost	50%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe
Asset-Type	25%	Light-Duty Vehicles	1	Low
		Medium-Duty; Trailers	3	Moderate
		Equipment	4	Major
		Fire Equipment; Heavy-Duty Vehicles; PPE; SCBA; Cylinders; Thermal Imaging	5	Severe
AMP Segment	25%	Administration; Operational Engineering; Bylaw	1	Low
		Community Services	3	Moderate
		Road Services	4	Major
		Environmental Services; Fire Services	5	Severe

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town's current level of service for the fire fleet & equipment. These metrics include the technical and community level of service metrics that the Town has selected.

Table 38 Fire Fleet & Equipment Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by fire fleet & equipment	Fire fleet & equipment assist in public education services, fire safety standards and enforcement as well as emergency response.	Scope	Replacement Cost	$16,752,200
			Quantity - Entire Category(assets)	8,455
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	37%
			Average Risk	9.72
			Annual reinvestment	$152,447
			(Actual) Capital reinvestment rate	0.91%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	% Compliance with all applicable fire services legislation and regulations	100%
			% annual safety inspection MTO mandate	100%
			%compliance with fleet vehicle standards	100%
Description or images of the condition of fire fleet & 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	Resiliency	Average Condition	Fair (57%)
			% Condition > Fair	79%
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			% Condition poor and very poor	21%

Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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 Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 39 Fire Fleet & Equipment Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$16,752,200	Very Poor (12%)	$152,447
Scenario 2 - Maintain Current Condition	$16,752,200	Fair (57%)	$809,614
Scenario 3 – Lifecycle	$16,752,200	Good (77%)	$1,112,576

The proposed level of service recommended for the fire fleet & equipment is Scenario 3, which maintains current lifecycle activities.

Appendix F
Fleet & Equipment

Appendix F: Fleet & Equipment

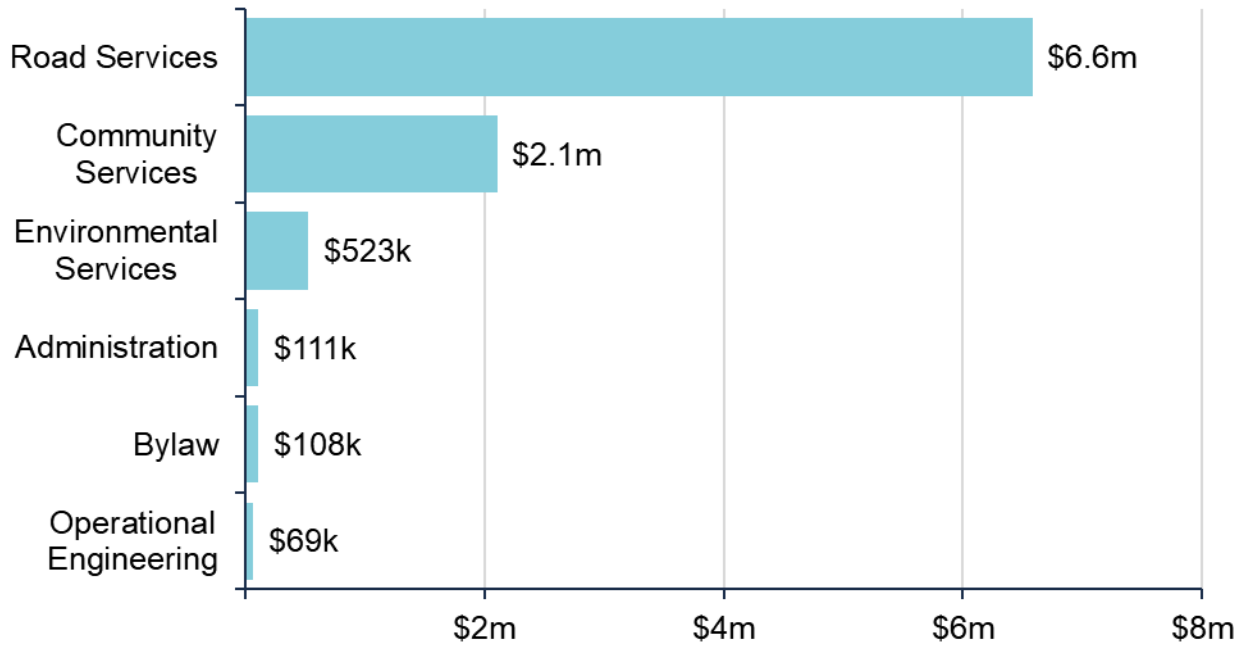
The Fleet Services Division, which is part of the Public Works Department, provides responsive and efficient fleet management services to the Town's internal departments while maximizing safety and environmental sustainability and minimizing lifecycle costs. Fleet Services has an in-house mechanic team that services all equipment from push mowers to snowplows. The Town of Lincoln's fleet services include the following asset types:

- Heavy-duty vehicles
- Medium-duty vehicles
- Light-duty vehicles
- Capital equipment

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Lincoln's fleet and equipment inventory.

Figure 43 Fleet & Equipment Replacement Costs

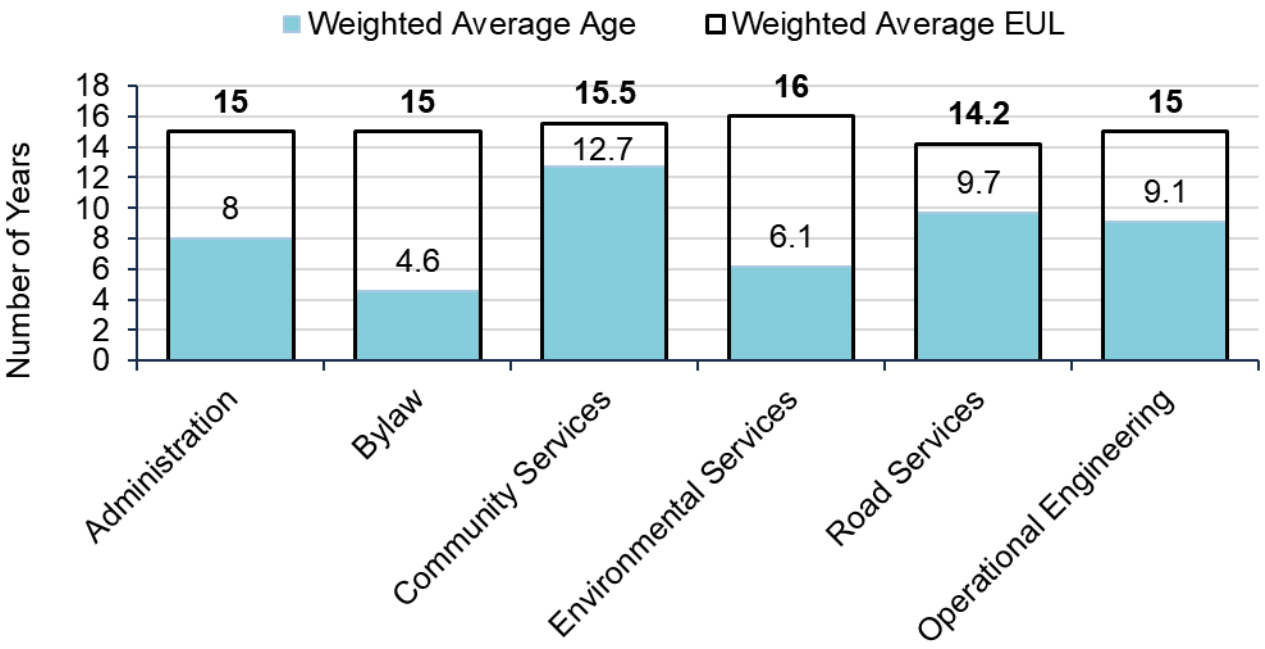


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent capital requirements.

Asset Condition & Age

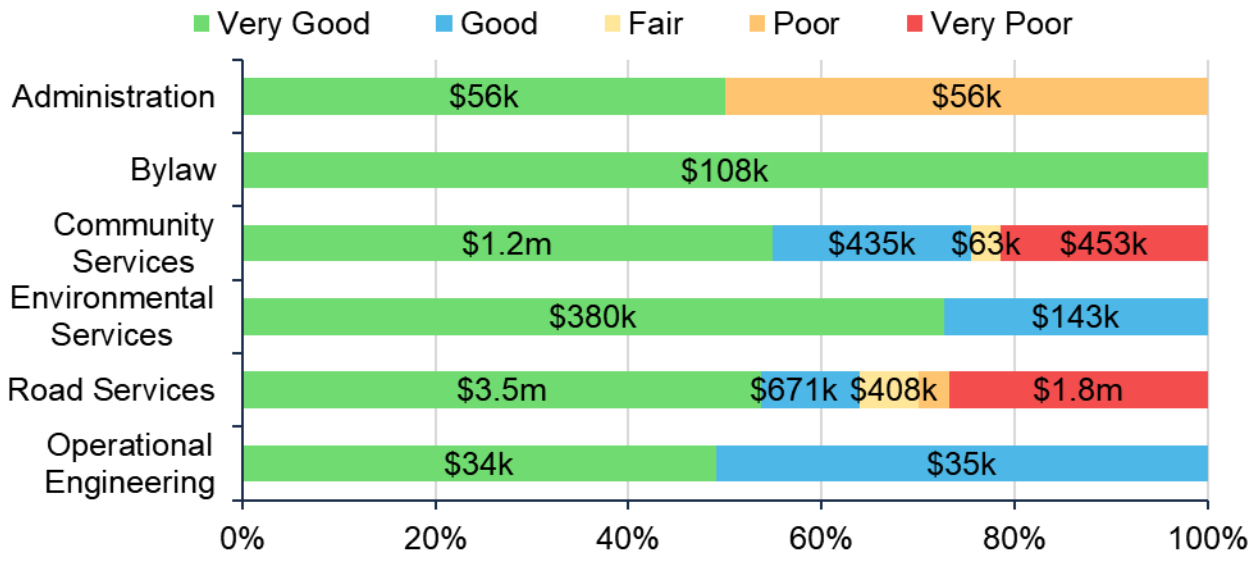
The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighed based on replacement cost.

Figure 44 Fleet & 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 45 Fleet & Equipment Condition Breakdown



To ensure that the Town's fleet & equipment assets continue to provide an acceptable level of service, Lincoln 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 current approach is varied because of the broad range of types of equipment included in this category.

Lifecycle Management Strategy

To ensure that the Town's fleet and equipment are performing as expected and meeting the needs of staff and residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Town's current lifecycle management strategy.

Figure 46 Fleet & Equipment Current Lifecycle Strategy

Maintenance

- Inspection walk around weekly
- Annual Servicing and inspection
- Equipment inspections and testing done to manufacturer's recommendations

Rehabilitation / Replacement

- Replace at end of life, extend items with condition assessments when feasible
- Fleet typically has a 10-year life expectancy

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 47 Fleet & Equipment Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$5,327,734 (56%)	$944,264 (10%)	$536,204 (6%)	$665,522 (7%)	$2,026,258 (21%)

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.

Table 40 Fleet & Equipment Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 41 Fleet & Equipment Risk Model Consequence of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	
Replacement Cost	50%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe
Asset-Type	25%	Light-Duty Vehicles	1	Low
		Medium-Duty; Trailers	3	Moderate
		Equipment	4	Major
		Fire Equipment; Heavy-Duty Vehicles; PPE; SCBA; Cylinders; Thermal Imaging	5	Severe
AMP Segment	25%	Administration; Operational Engineering; Bylaw	1	Low
		Community Services	3	Moderate
		Road Services	4	Major
		Environmental Services; Fire Services	5	Severe

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town's current level of service for the fleet & equipment assets. These metrics include the technical and community level of service metrics that the Town has selected.

Table 42 Fleet & Equipment Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by fleet & equipment	Fleet Services is responsible for driver training, vehicle maintenance, asset management, green fleet initiatives, and licensing of vehicles.	Scope	Replacement Cost	$9,499,981
			Quantity - Entire Category(assets)	100
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	37%
			Average Risk	9.72
			Annual reinvestment	$152,447
			(Actual) Capital reinvestment rate	0.91%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	% annual safety inspection MTO mandate	100%
			%compliance with fleet vehicle standards	100%
Description or images of the condition of fleet & 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	Resiliency	Average Condition	Good (66%)
			% Condition > Fair	74%
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			% Condition poor and very poor	26%

Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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 Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 43 Fleet & Equipment Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$9,499,981	Very Poor (14%)	$103,158
Scenario 2 - Maintain Current Condition	$9,499,981	Good (66%)	$618,312
Scenario 3 – Lifecycle	$9,499,981	Good (79%)	$752,863

The proposed level of service recommended for the fleet & equipment assets is Scenario 3, which maintains current lifecycle activities.

Appendix G
Information Technology

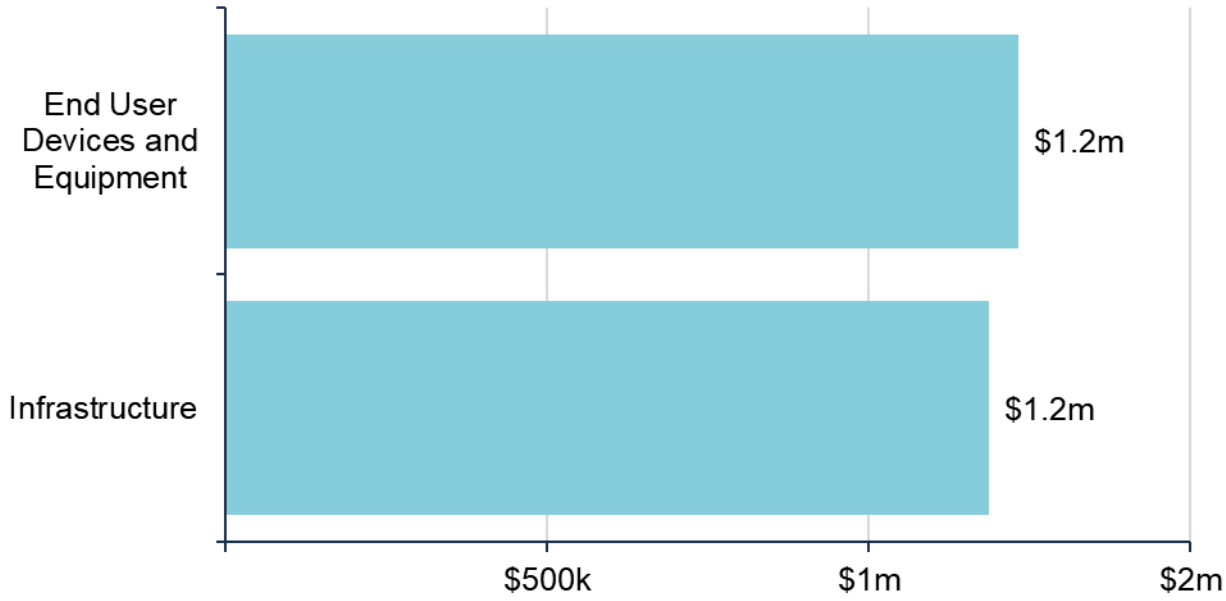
Appendix G: Information Technology

The Enterprise Services Team consists of 4 full-time IT Professionals that are responsible for keeping all devices, infrastructure, and software applications in good working order.

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Lincoln's information technology inventory.

Figure 48 Information Technology Replacement Costs

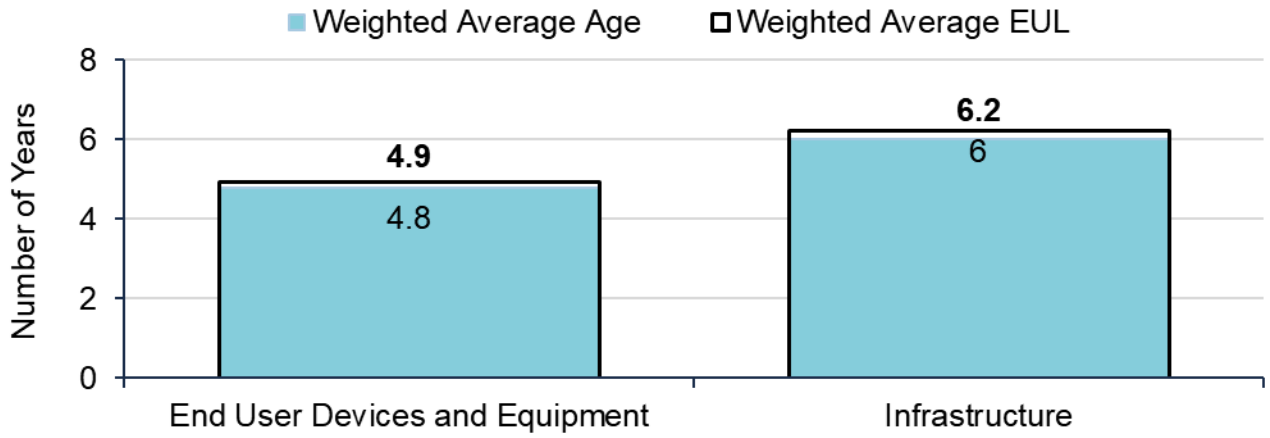


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurately represent capital requirements.

Asset Condition & Age

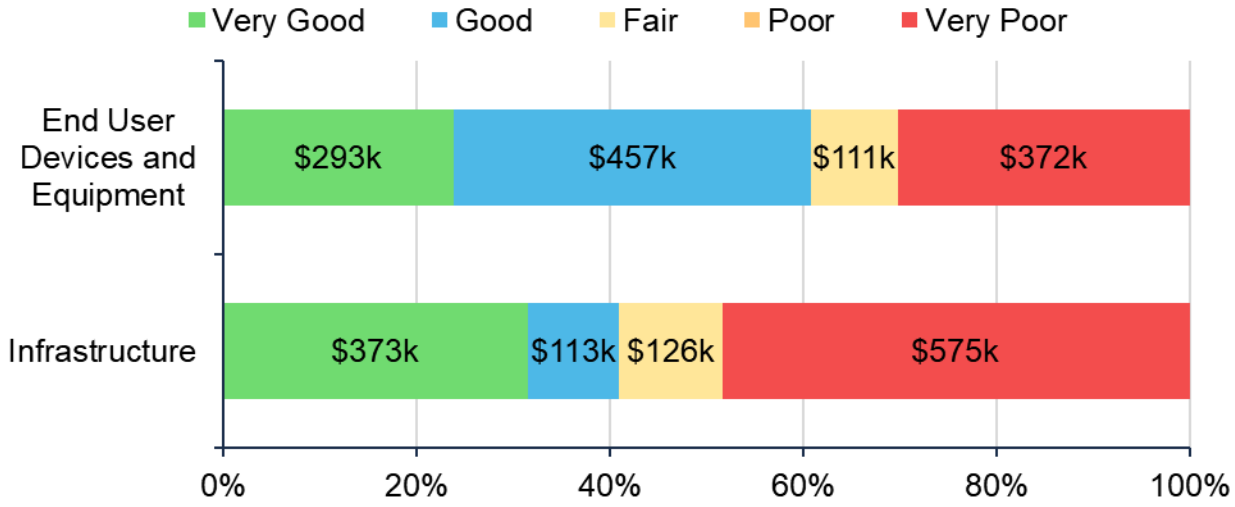
The graph below identifies the average age and the estimated useful life for each asset segment. The values are weighed based on replacement cost.

Figure 49 Information Technology 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 50 Information Technology Condition Breakdown



To ensure that the Town's information technology assets continue to provide an acceptable level of service, Lincoln 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 current approach is varied because of the broad range of types of equipment included in this category.

Lifecycle Management Strategy

To ensure that municipal assets are performing as expected and meeting the needs of residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Information technology assets in terms of end user devices and equipment have a very short lifecycle and as such they are generally replaced at end of life.

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 51 Information Technology Risk Breakdown

1 - 4 Very Low $776,622 (32%)	5 - 7 Low $886,842 (37%)	8 - 9 Moderate $65,593 (3%)	10 - 14 High $427,336 (18%)	15 - 25 Very High $263,243 (11%)

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.

Table 44 Information Technology Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 45 Information Technology Risk Model Consequence of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	
Replacement Cost	50%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe
AMP Segment	50%	End User Devices and Equipment	2	Minor
		Infrastructure	4	Major

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town's current level of service for information technology. These metrics include the technical and community level of service metrics that the Town has selected.

Table 46 Information Technology Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by information technology	Secure, reliable, and affordable infrastructure and end user devices. Effective coordination and secure reliable infrastructure to mitigate cyber attacks environment	Scope	Replacement Cost	$2,419,636
			Quantity - Entire Category(assets)	825
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	29%
			Average Risk	6.97
			Annual reinvestment	$64,657
			(Actual) Capital reinvestment rate	2.67%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	% compliance with MFIPPA	100%
Description or images of the condition of information technology	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	Resiliency	Average Condition	Fair (46%)
			% Condition > Fair	61%
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			% Condition poor and very poor	39%

Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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 Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 47 Information Technology Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$2,419,636	Very Poor (11%)	$64,657
Scenario 2 - Maintain Current Condition	$2,419,636	Fair (46%)	$285,612
Scenario 3 – Lifecycle	$2,419,636	Good (74%)	$471,876

The proposed level of service recommended for the information technology is Scenario 3, which maintains current lifecycle activities.

Appendix H

Land Improvements & Parks

Appendix H Land Improvements & Parks

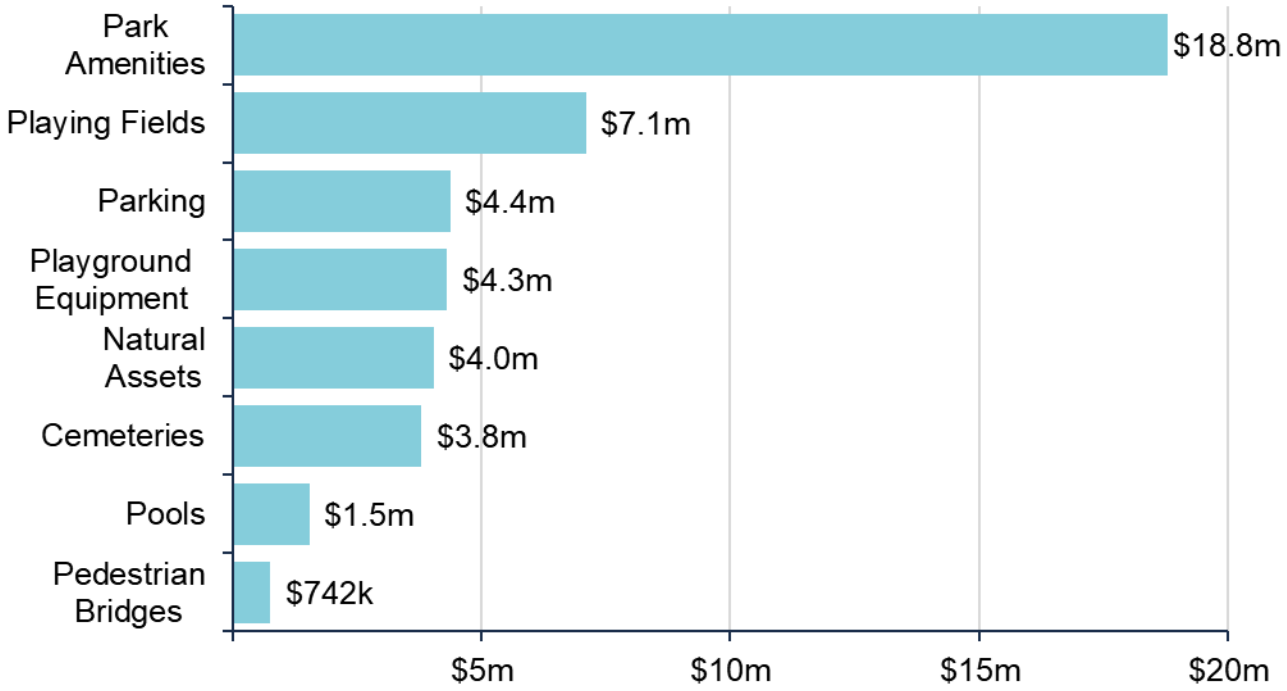
Lincoln owns and maintains several land improvements and parks that provide key services to the community. These include:

- Natural Assets
- Cemeteries
- Park Amenities
- Pedestrian Bridges
- Playground Equipment
- Playing Fields
- Pools

Inventory & Valuation

The graph below displays the total replacement cost of each asset segment in Lincoln's land improvements and parks inventory. There are many different types of segments within this category.

Figure 52 Land Improvements & Parks Replacement Cost

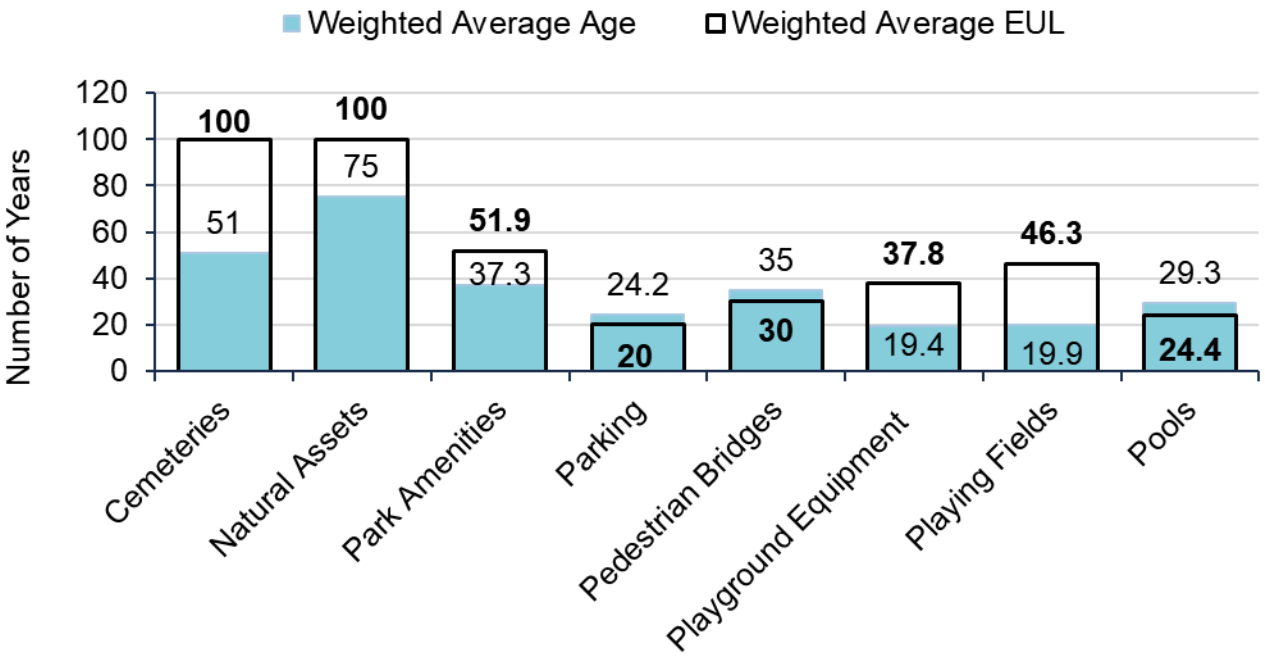


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to represent capital requirements more accurately.

Asset Condition & Age

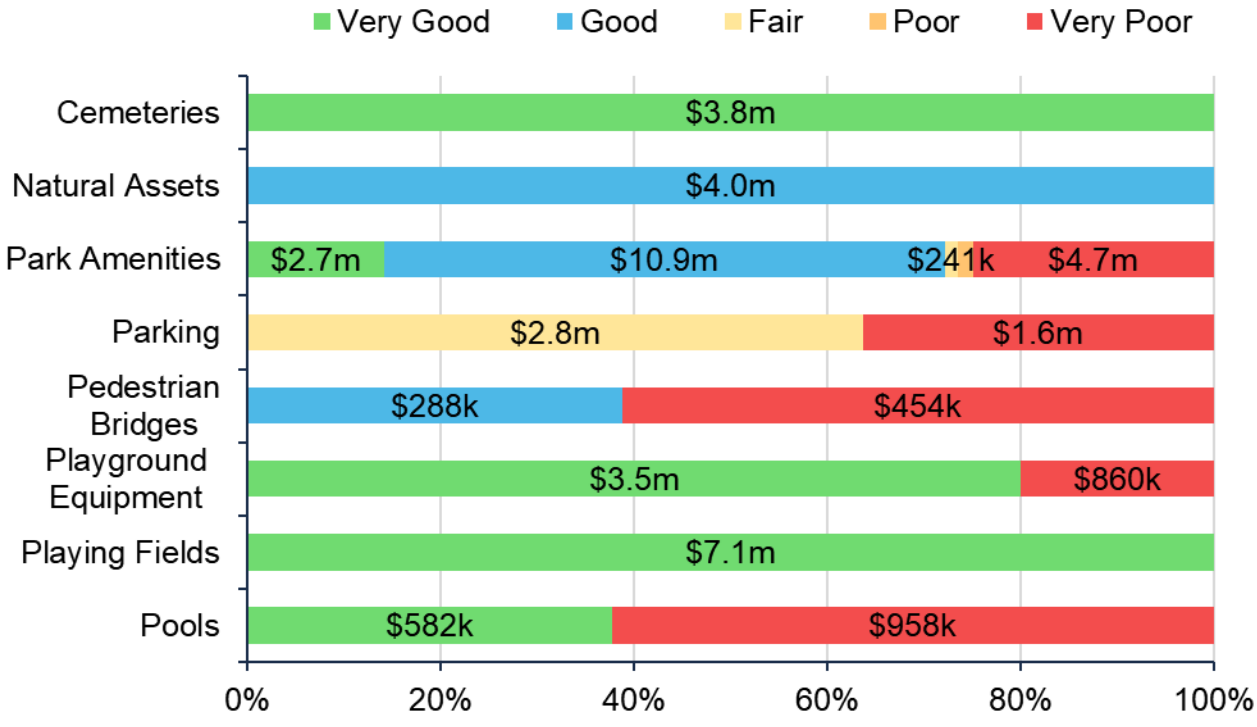
The graph below identifies the average age, and the estimated useful life for each asset segment. The values are weighed based on replacement cost.

Figure 53 Land Improvements & Parks 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 Land Improvements & Parks Condition Breakdown



To ensure that the land improvements and parks continue to provide an acceptable level of service, the Town 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. 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. Land improvements and parks 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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. The following table outlines the Town's current lifecycle management strategy.

Figure 55 Land Improvements & Parks Current Lifecycle Strategy

Maintenance

- Inspections are done daily for pools and splashpads
- Monthly inspections for the majority of park infrastructure

Rehabilitation / Replacement

- Replacement at the end of the lifecycle

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 56 Land Improvements & Parks Risk Breakdown

1 - 4 Very Low	5 - 7 Low	8 - 9 Moderate	10 - 14 High	15 - 25 Very High
$7,966,028 (18%)	$10,914,515 (24%)	- (0%)	$17,388,705 (39%)	$8,435,336 (19%)

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.

Table 48 Land Improvements & Parks Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 49 Land Improvements & Parks Risk Model Consequence of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	
Replacement Cost	100%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town's current level of service for the municipal facilities. These metrics include the technical and community level of service metrics that the Town has selected.

Table 50 Land Improvements & Parks Current Levels of Service

Community LOS		Service Attribute	Technical LOS	
Description of the services provided by land improvements & parks	Land improvement and parks assets are aimed at providing recreational opportunities, promoting community and preserving natural spaces	Scope	Replacement Cost	$44,704,585
			Quantity - number of facilities	3,549
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	58%
			Average Risk	8.97
			Annual reinvestment	$183,931
			(Actual) Capital reinvestment rate	0.41%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	Facility assets comply with accessibility regulations	Priority #1 sites - 90% Priority #2 sites - 80% Priority #3 sites - 50%
Description or images of the condition of land improvements & parks	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	Resiliency	Average Condition	Good (64%)
			% Condition > Fair	80%
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			% Condition poor and very poor	20%

Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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 Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 51 Land Improvements & Parks Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$44,704,585	Poor (20%)	$183,931
Scenario 2 - Maintain Current Condition	$44,704,585	Good (64%)	$1,145,652
Scenario 3 – Lifecycle	$44,704,585	Good (76%)	$1,342,354

The proposed level of service recommended for land improvement and parks is Scenario 3, which maintains current lifecycle activities.

Appendix I
Water Network

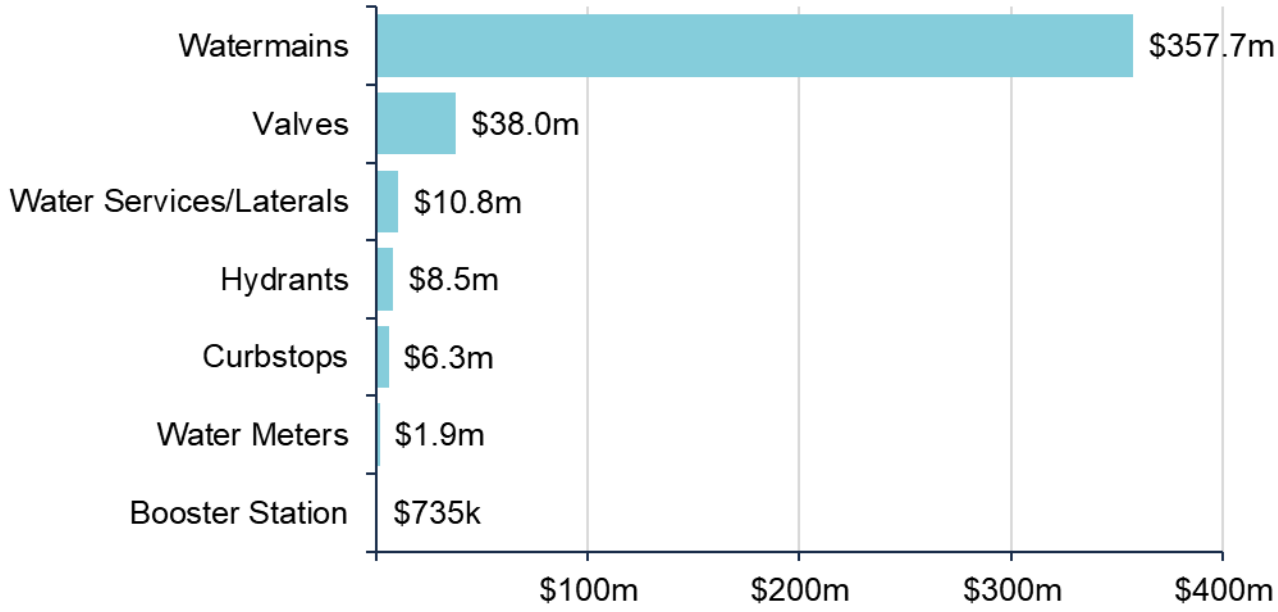
Appendix I Water Network

The water distribution system is part of a network of infrastructure operated by the Town. Supplying clean safe drinking water within the urban boundary, the Town provides services essential to the community's ability to function, grow and prosper. In Lincoln, the water system is a two-tier system with the majority of watermains under the jurisdiction of the Town of Lincoln, which include the Beamsville Water Distribution System and the Jordan-Vineland Water Distribution System. However, large diameter transmission mains, reservoirs and water treatment plants are owned and operated by the Niagara Region.

Inventory & Valuation

The figure below displays the replacement cost of each asset segment in the Town's water network inventory.

Figure 57 Water Network Replacement Cost

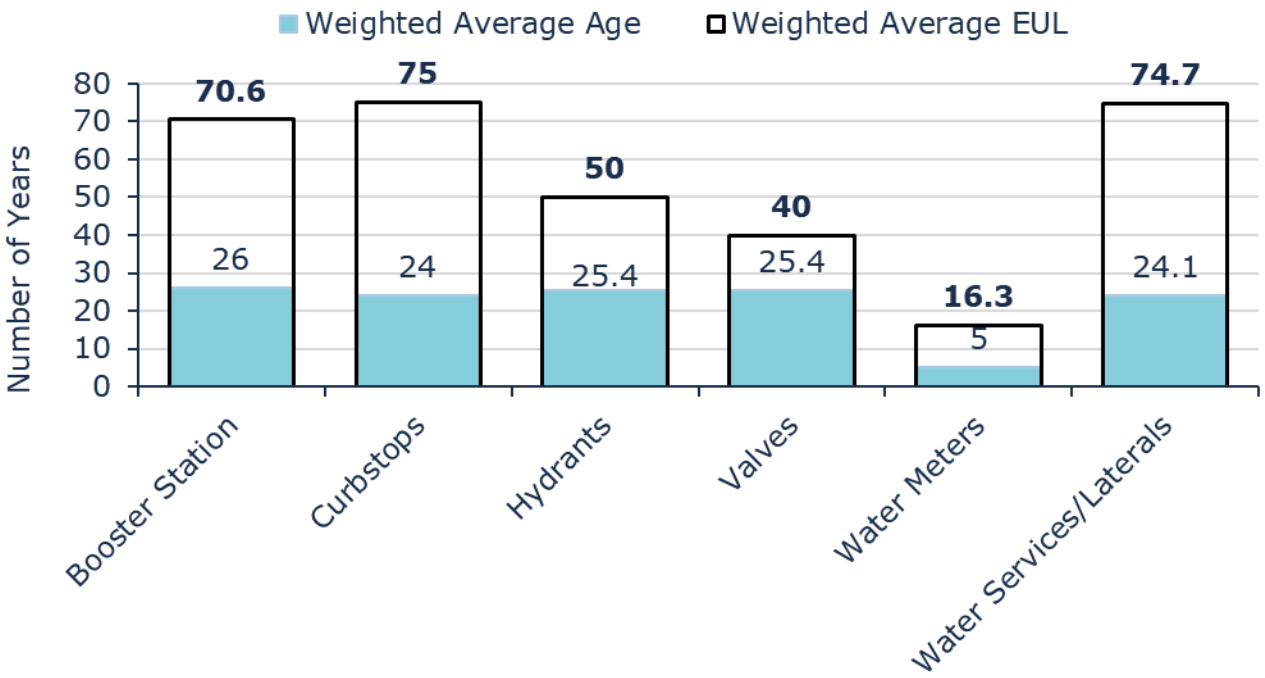


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed.

Asset Condition & Age

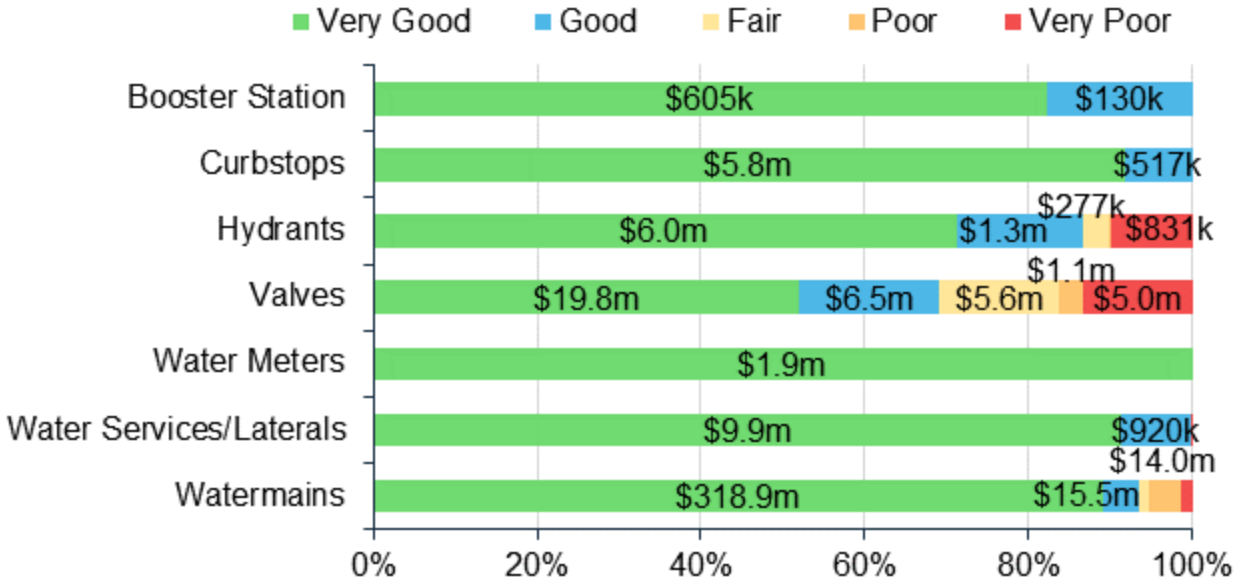
The graph below identifies the average age and the estimated useful life for each asset segment. The values are replacement cost weighted.

Figure 58 Water Network 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 59 Water Network Condition Breakdown



To ensure that the Town's water network continues to provide an acceptable level of service, the staff should monitor the average condition of all assets.

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. Lincoln's current approach is to assess inspect hydrants, valves and booster stations on a regular interval outlined in Figure 60. The condition scale for water network assets is from 0 to 100 from Very Poor to Very Good as shown below.

Table 52 Water Network Condition Ranges

Condition	Rating (PCI Equivalents)
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Figure 60 outlines Lincoln's current lifecycle management strategy.

Figure 60 Water Network Current Lifecycle Strategy

Maintenance

- Leak detection monitoring
- Annual flushing program
- Booster station weekly checks
- Annual valve turning program (including pressure tests for PRVs)

Rehabilitation / Renewal / Replacement

- Replacement occures at the end of life and are extended by condition assessments when availabe
- Align with other infrastructure replacement whenever possible

Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 61 Water Network Risk Breakdown

1 - 4 Very Low $365,673,315 (86%)	5 - 7 Low $24,186,693 (6%)	8 - 9 Moderate $12,978,264 (3%)	10 - 14 High $16,955,701 (4%)	15 - 25 Very High $4,090,162 (<1%)

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.

Table 53 Water Network Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 54 Water Network Risk Model Consequence of Failure Criteria (Water Mains)

Criteria	Criteria Weighting	Value/Range	Score	
Diameter	100%	< 100	1	Low
		200-325	2	Minor
		325-450	3	Moderate
		450-1000	4	Major
		> 1000	5	Severe

Table 55 Water Network Risk Model Consequence of Failure Criteria (Everything except mains)

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Replacement Cost	50%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe
AMP Segment	50%	Curbstops; Water Meters	1	Low
		Water Service/Laterals	3	Moderate
		Bulk Water Station; Hydrants; Valves	4	Major
		Booster Station	5	Severe

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town'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, the Town's DWQMS, as well as any additional performance measures that the Town has selected.

Table 56 Water Network Current Levels of Service

Community LOS		Service Attribute	Current Technical LOS	
Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system.	See Figure 62 Beamsville Water System and Figure 63 Jordan Vineland Water System	Scope	Replacement Cost	$423,884,136
			Quantity (kms of main)	174
Description, which may include maps, of the user groups or areas of the municipality that have fire flow.	See Figure 62 Beamsville Water System and Figure 63 Jordan Vineland Water System		Percentage of properties connected to the municipal water system.	70%
			Percentage of properties where fire flow is available.	100%
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	4%
			Average Risk	3.49
			Annual reinvestment	3,295,810
			(Actual) Capital reinvestment rate	0.78%
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	% compliance with all applicable water quality regulations	100%
Description or images of the condition of water assets	Condition Description • Very Good - Fit for the future • Good - Adequate for now • Fair - Requires attention • Poor - Increased potential of affecting service	Resiliency	The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system.	0%

Community LOS		Service Attribute	Current Technical LOS	
	• Very Poor - Unfit for sustained service		The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system.	TBD
Description of boil water advisories and service interruption.	Water Advisories are related to an adverse test result. All past events have likely been caused by operator errors after completing resampling as per ministry and PH requirements.		# of watermain breaks	6
	Service interruptions are typically related to watermain breaks or construction work that require a section of watermain to be isolated.		% of system with low pressure	0%
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.			Average Condition (Entire Category)	Very Good (88%)
			% Condition > Fair	94%
			% Condition poor and very poor	6%

Figure 62 Beamsville Water System

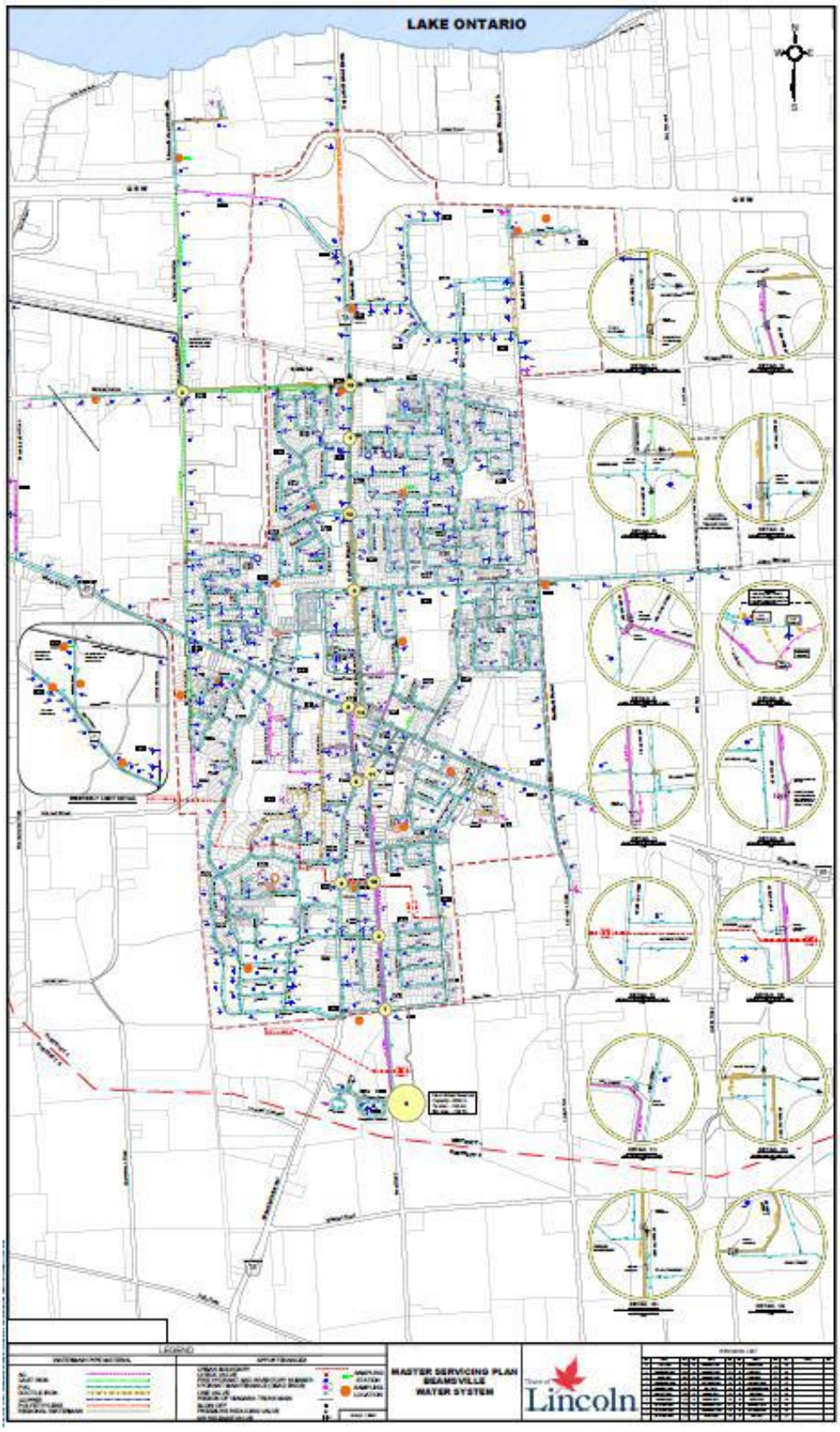
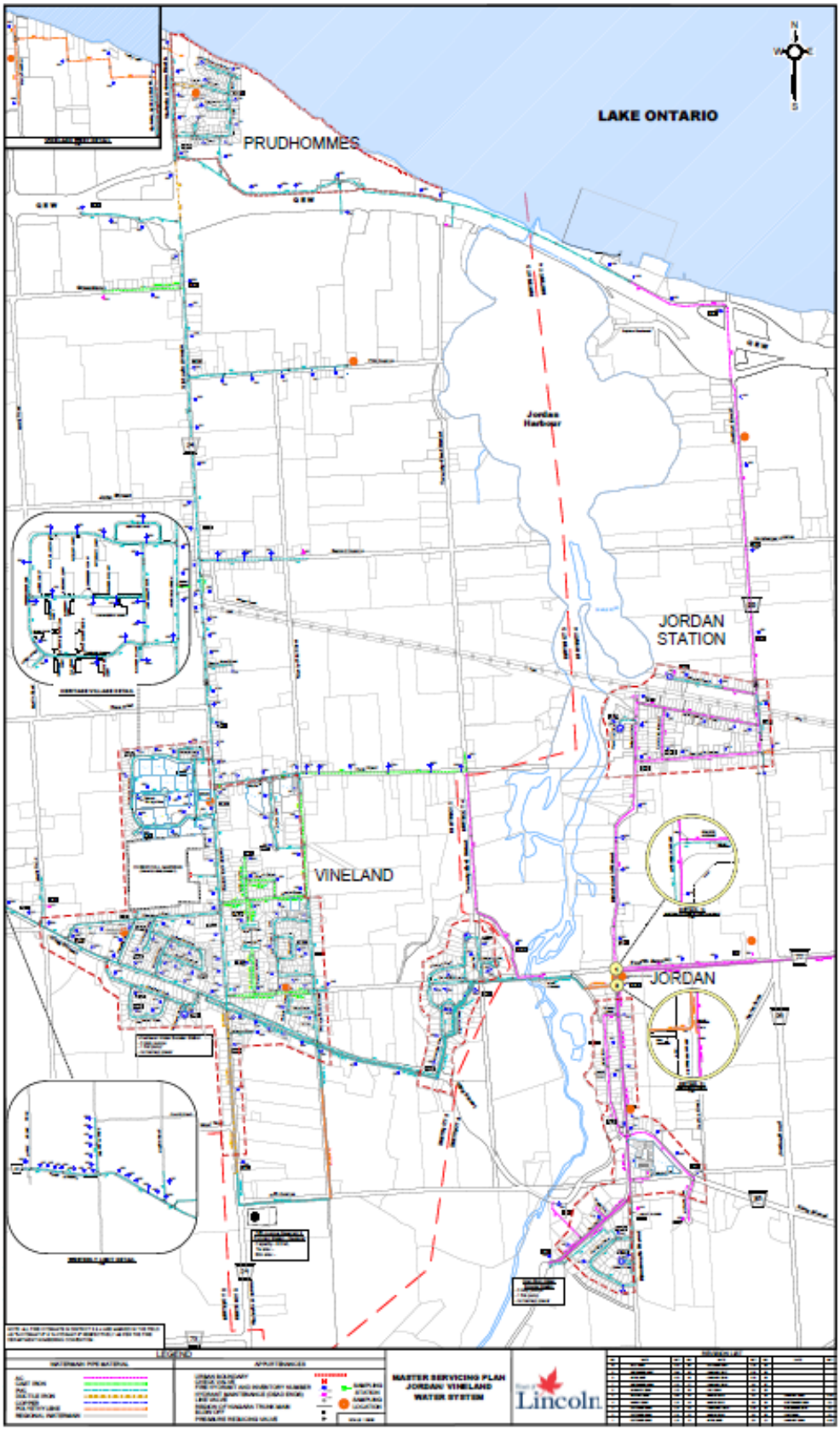


Figure 63 Jordan Vineland Water System



Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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. The table below outlines the results for each scenario for the water network.

Scenario 1: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 57 Water Network Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$423,884,136	Good (70%)	$3,295,810
Scenario 2 - Maintain Current Condition	$423,884,136	Good (79%)	$5,604,572
Scenario 3 – Lifecycle	$423,884,136	Good (79%)	$5,604,572

The proposed level of service recommended for the water network is Scenario 3, which maintains current lifecycle activities.

Appendix J
Sanitary Network

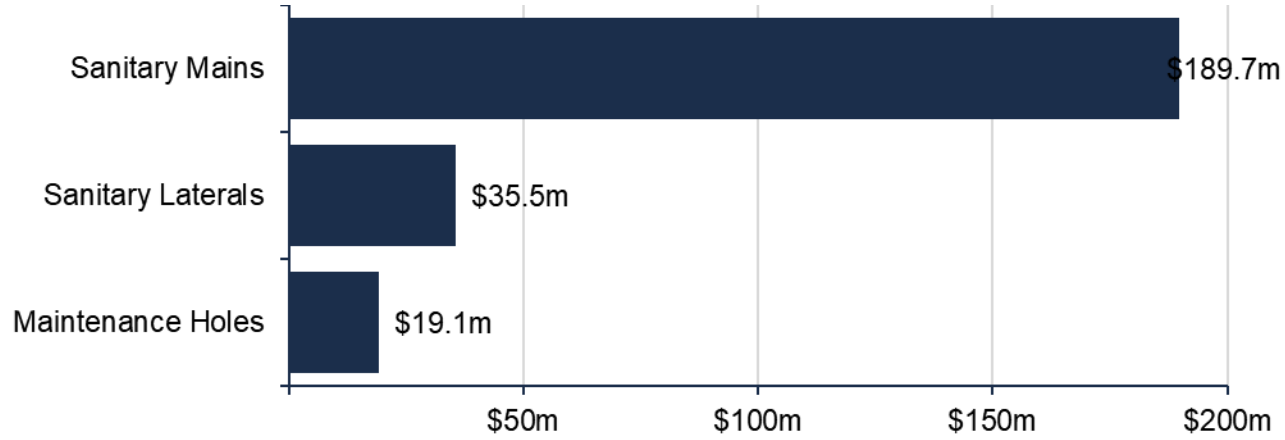
Appendix J Sanitary Network

The sanitary collection system is part of a network of infrastructure operated by the Town. In Lincoln, the sanitary system is a two-tier system with most sanitary mains under the jurisdiction of the Town of Lincoln, which include the Beamsville Sanitary Collection System and the Jordan-Vineland Sanitary Collection System. However, forcemains, sewage pumping stations and sanitary treatment plants are owned and operated by the Niagara Region.

Inventory & Valuation

The figure below displays the replacement cost of each asset segment in the Town's sanitary network inventory.

Figure 64 Sanitary Network Replacement Cost

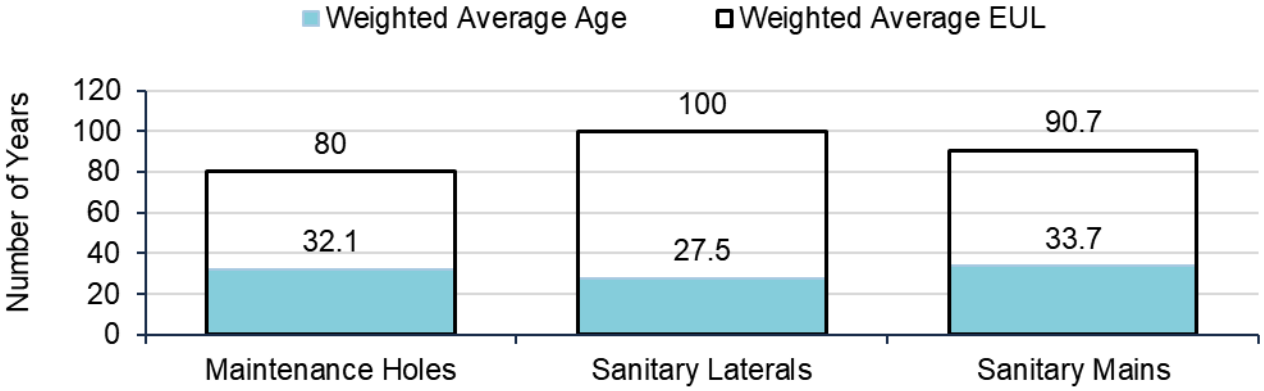


Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed.

Asset Condition & Age

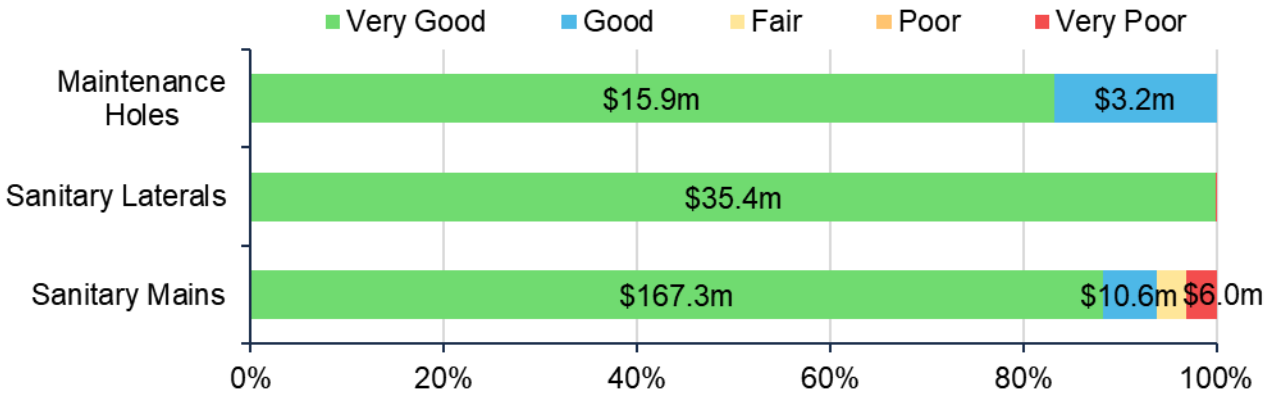
The graph below identifies the average age and the estimated useful life for each asset segment. The values are replacement cost weighted.

Figure 65 Sanitary Network 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 66 Sanitary Network Condition Breakdown



To ensure that the Town's water network continues to provide an acceptable level of service, the staff should monitor the average condition of all assets.

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. Lincoln's current approach is to CCTV sanitary sewers approximately every 5 years in a phased approach. The condition scale for sanitary network assets is from 0 to 100 from Very Poor to Very Good as shown below.

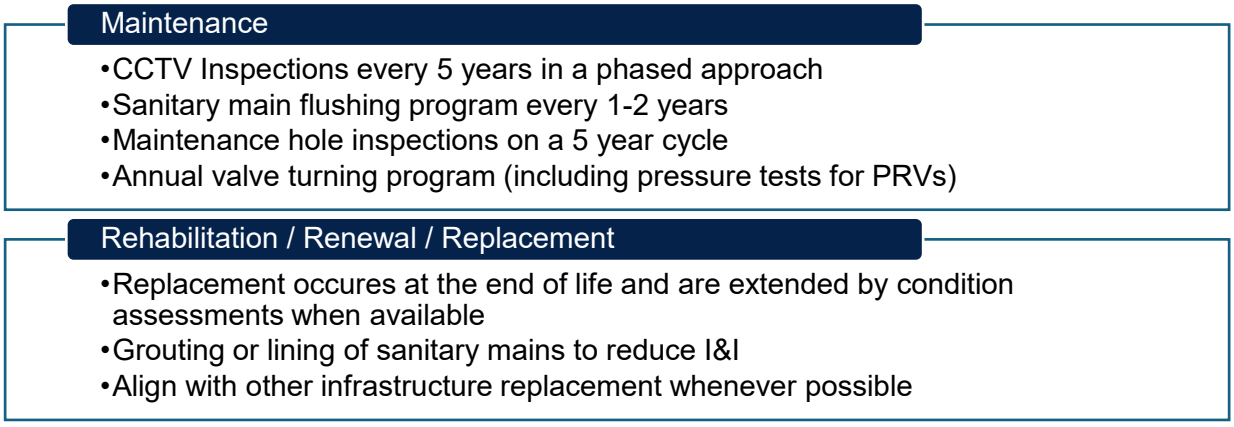
Table 58 Sanitary Condition Ranges

Condition	Rating
Very Good	80-100
Good	60-80
Fair	40-60
Poor	20-40
Very Poor	0-20

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 residents, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Figure 67 outlines Lincoln's current lifecycle management strategy.

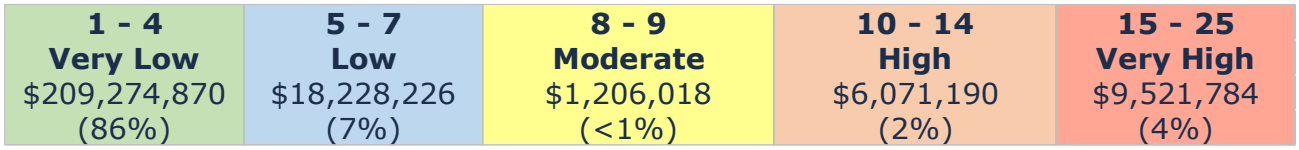
Figure 67 Sanitary Network Current Lifecycle Strategy



Risk & Criticality

The following figure 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. For the criteria used to determine the risk rating of each asset see the tables below.

Figure 68 Sanitary Network Risk Breakdown



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.

Table 59 Sanitary Network Risk Model Probability of Failure Criteria

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Condition	50%	85-100	1	Rare
		70-85	2	Unlikely
		55-70	3	Possible
		40-55	4	Likely
		0-40	5	Almost Certain
Service Life Remaining (%)	50%	>40	1	Rare
		30 - 40	2	Unlikely
		20 - 30	3	Possible
		10 - 20	4	Likely
		0 - 10	5	Almost Certain

Table 60 Sanitary Network Risk Model Consequence of Failure Criteria (Sanitary Mains)

Criteria	Criteria Weighting	Value/Range	Score	
Diameter	100%	< 100	1	Low
		200-325	2	Minor
		325-450	3	Moderate
		450-1000	4	Major
		> 1000	5	Severe

Table 61 Sanitary Network Risk Model Consequence of Failure Criteria (Everything except mains)

Criteria	Criteria Weighting	Value/Range	Score	Score Description
Replacement Cost	50%	< $25,000	1	Low
		$25,000-$150,000	2	Minor
		$150,000-$500,000	3	Moderate
		$500,000-$1,000,000	4	Major
		> $1,000,000	5	Severe
AMP Segment	50%	Sanitary Service/Laterals	3	Moderate
		Maintenance Holes;	4	Major

The identification of critical assets allows the Town 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 Town 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 Town have been developed through engagement with Town staff.

Current Levels of Service

The following tables identify the Town's current level of service for the sanitary network. These metrics include the technical and community level of service metrics that are required as part of O. Reg. 588/17, and the new CLI-ECA requirements that the Town will be incorporating, as well as any additional performance measures that the Town has selected.

Table 62 Sanitary 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 are connected to the municipal wastewater system.	See Figure 69 Beamsville Sanitary System and Figure 70 Jordan Vineland Sanitary System	Scope	Replacement Cost	$244,302,089
			Quantity (kms of main)	92
			Percentage of properties connected to the municipal wastewater system.	71%
Infrastructure will be managed with the practice of meeting present needs without compromising the ability of future generations to meet their own, by prioritizing long-term planning, resource efficiency, and responsible decision-making.		Sustainability	% Risk that is High and Very High	6%
			Average Risk	3.46
			Annual reinvestment	$826,276
			(Actual) Capital reinvestment rate	0.34%
			Operating Budget	$1,195,375
Services will be provided with the obligation and accountability to ensure assets and services are safe to operate and in compliance with all applicable laws, regulations, standards, and guidelines		Responsibility	% compliance with all applicable water quality regulations	100%
Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes.	The Town does not have any combined sewers. Most overflow events from I/I in the system are managed by overflow structures in the Region owned SPSs. The Town manages overflow events immediately upstream of the Bridgeport SPS and the Campden SPS.	Resiliency	Average Condition (Entire Category)	Very Good (88%)

Community LOS		Service Attribute	Technical LOS	
Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches.	There are no overflows that happen in or around beaches. The events that we do have at Bridgeport and Campden are during significant wet weather events. These are rare: Between 2017-20: average 1/year Some damaged cleanouts were in Campden, along with some rehabilitation works on sewers and maintenance holes that addressed both Jordan Station and Campden. At the time of presenting this AMP, the Town also has an approved pilot program for removing private side sources in Jordan Station (sumps, foundation drains, downspout connections and cracks in laterals).		The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	0
				N/A Regional Assets
			The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	
Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.	All stormwater enters as I/I into the system. This can be from cracked pipes, seams in MHs, MH covers, damaged lateral connections, sump pumps and foundation drains (grandfathered) and illegal downspout connections.			
Description of how sanitary sewers in the municipal wastewater	Some sewers have higher levels of I/I in the system area and are prone to surcharging beyond a 2-		% Condition > Fair	98%

Community LOS		Service Attribute	Technical LOS	
system are designed to be resilient to avoid events described in paragraph 3.	year storm. The Town is working to remove sources of I/I to improve system capacity to support growth and a 5-year return storm.			
Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.	The treatment plant is owned by the Region of Niagara. The Region is also responsible for testing.		% Condition poor and very poor	2%
Description or images of the condition of wastewater assets	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		The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	N/A
Services are provided with the capacity to adapt to stressors and recover quickly from challenges, ensuring continuity of services and well-being of the community in the face of adversity. Resiliency means having systems and infrastructure that can withstand disruptions and “bounce back” effectively.				

Figure 69 Beamsville Sanitary System

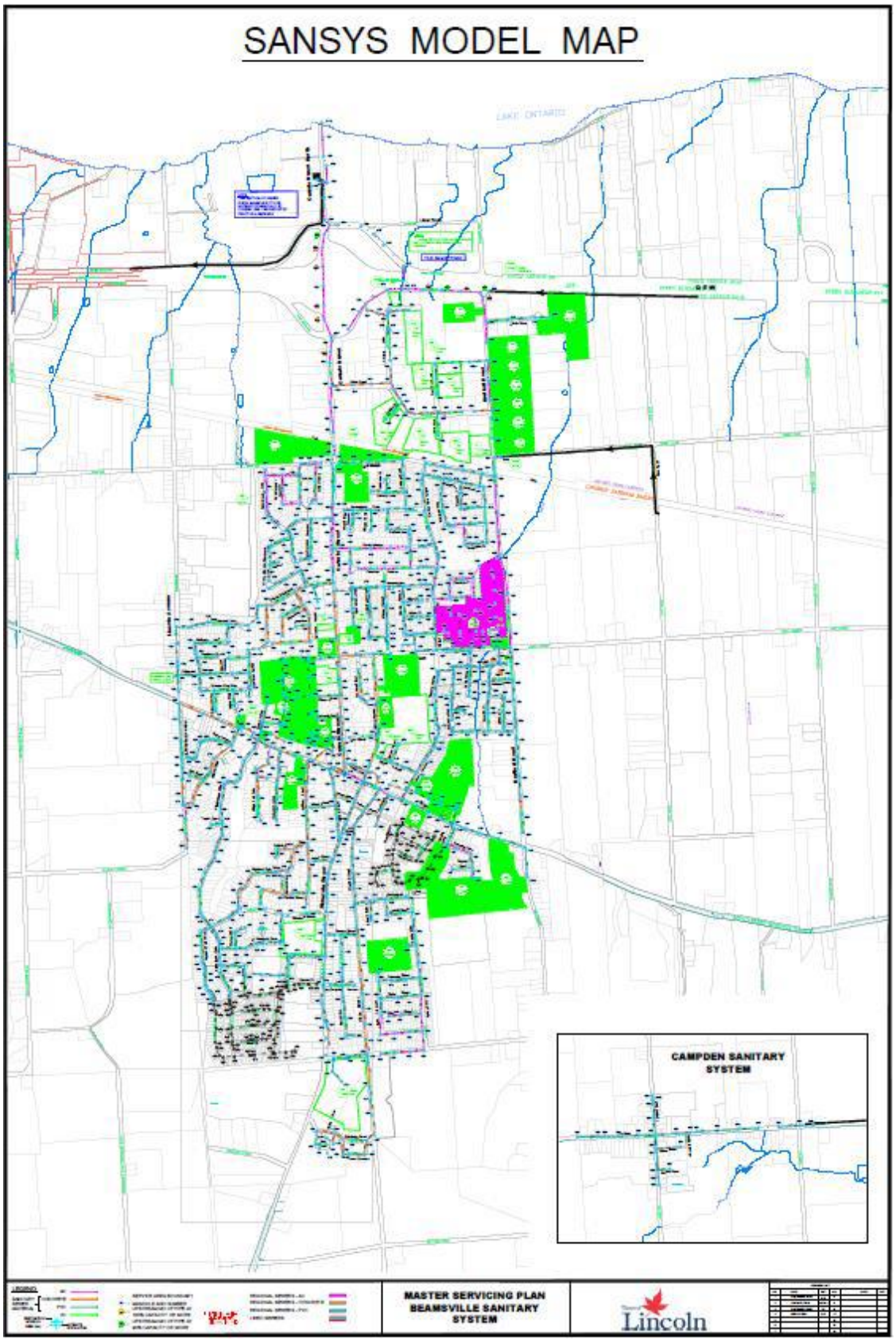
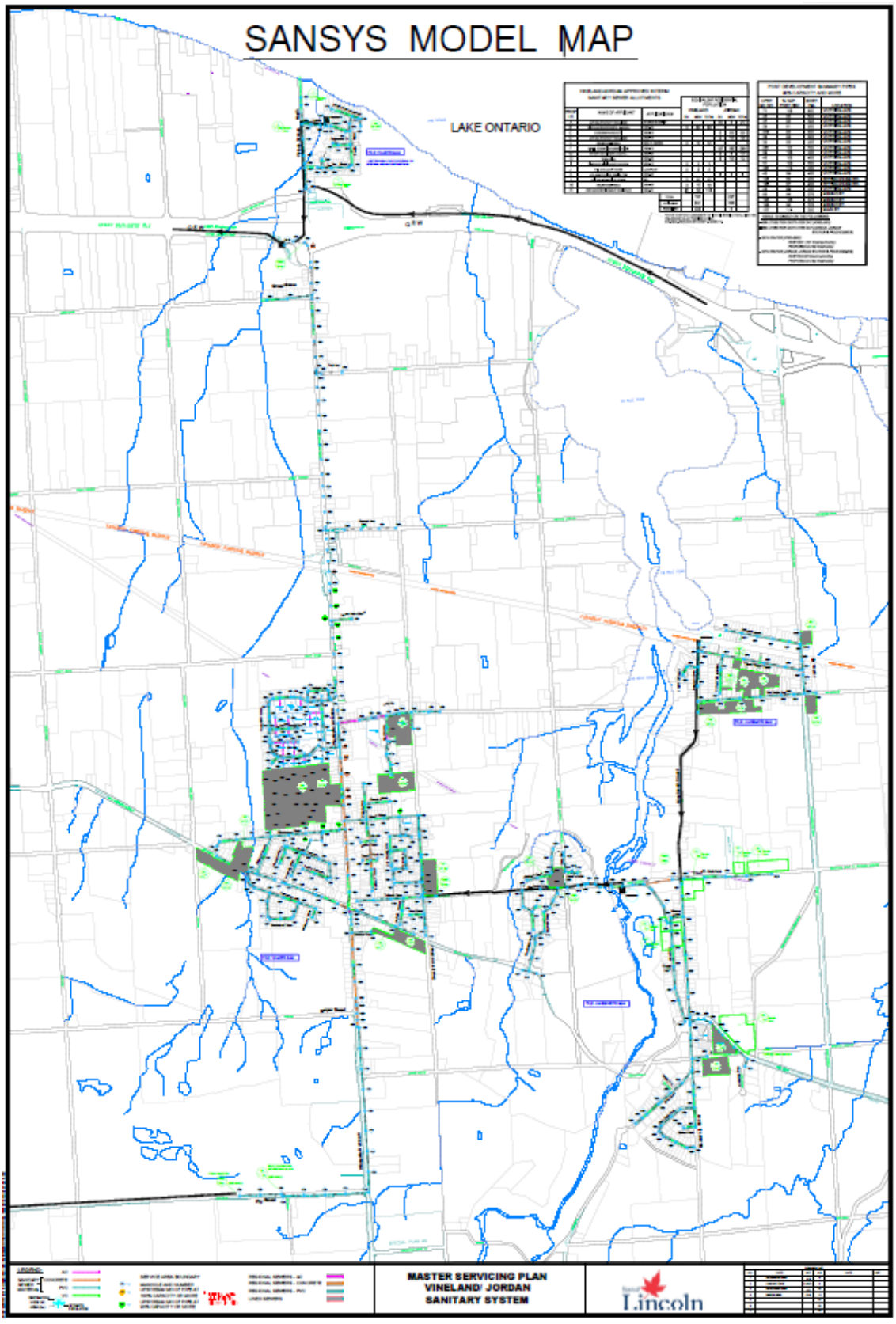


Figure 70 Jordan Vineland Sanitary System



Proposed Levels of Service

The scenarios that were used to analyse Lincoln'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. The table below outlines the results for each scenario for the sanitary network.

Scenario 1: Current Capital Reinvestment Rate - this scenario utilizes the current capital reinvestment within each asset category. The current annual investment was held, and the condition was determined.

Scenario 2: Current Condition - this scenario utilizes a target of current average condition within each asset category. The condition value was held, and the annual investment was then determined.

Scenario 3: Current Lifecycle Activities - this scenario utilizes the current lifecycle activities outlined as current practice within each asset category. The condition and annual investment were then determined.

Table 63 Sanitary Network Scenario Results

Scenarios	Replacement Cost	Average Condition	Annual Capital Reinvestment
Scenario 1 - Current Capital Investment Rate	$244,302,089	Fair (54%)	$826,276
Scenario 2 - Maintain Current Condition	$244,302,089	Very Good (88%)	$2,647,104
Scenario 3 – Lifecycle	$244,302,089	Good (78%)	$2,647,104

The proposed level of service recommended for the sanitary network is Scenario 3, which maintains current lifecycle activities.

Appendix K
Condition Assessment Guidelines

Appendix K 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 conditions.

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 Town'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 Town'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 Town 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 Town 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.

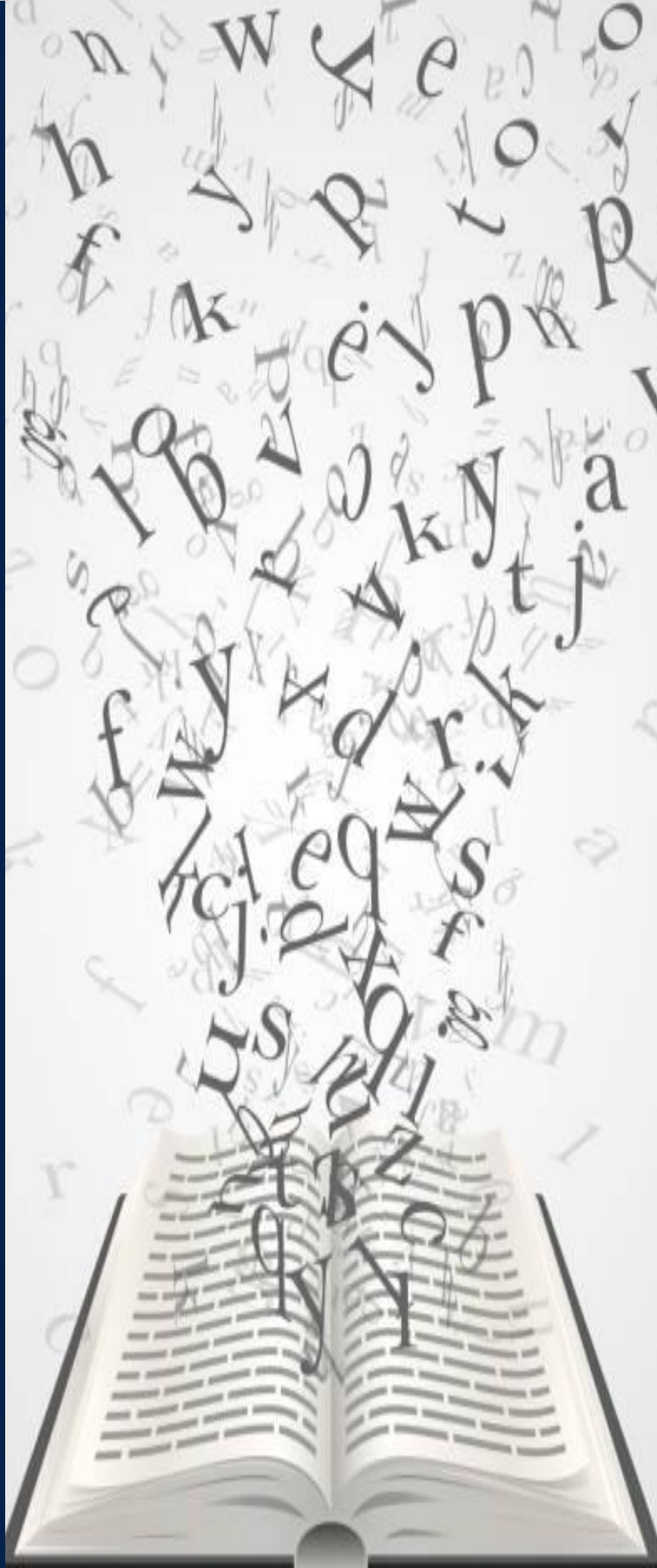
There are many options available to the Town to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

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 Town 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 L
Definition of Key Terms



Appendix L Definition of Key Terms

Term	Definition
Asset Condition Assessment	The process of continuous or periodic inspection, assessment, measurement and interpretation of the resultant data to indicate the condition of a specific asset so as to determine the need for some preventative or remedial action. It is a crucial part of asset management to determine remaining useful life and an assets capability to meet performance requirements.
Asset Register	Record of asset data and information considered worthy of separate identification and accountability.
Backlog	Industry term used to calculate the cost to replace assets that remain in service beyond their estimated useful life.
Community Service Level	A service level that specifies the level of service that is to be provided to the community.
Critical Asset	A critical asset is an asset for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than non-critical assets.
Funding Gap	The difference between; • The amount of funds required annually for satisfactory operation, maintenance & renewal of an asset over the useful life, and • The amount of funds currently being spent on the asset annually
Level of Service (LOS)	Parameters or a combination of parameters, which reflect social, political, environmental and economic outcomes that the organization delivers.
Lifecycle	Stages involved in the management of an asset. These could include acquisition, rehabilitation, replacement, and disposal.
Replacement Value	The cost, in today's dollars, to replace an existing asset with another like asset that performs the same function and purpose.
Risk	A combination of the likelihood and consequence of an unforeseen event occurring.
Target Reinvestment Rate	Annual capital requirement divided by total replacement cost
Technical Service Level	A service level associated with the physical characteristics of an asset.
Upgrade	Is capital works carried out on an existing asset to provide a higher level of service.

Term	Definition
Useful Life	The period over which a depreciable asset is expected to be useful for, or the number of production or similar units (i.e. intervals, cycles) that is expected to be obtained from the asset.