


# Town of East Gwillimbury
# 2025 Corporate Asset Management Plan

This Asset Management Plan was prepared by:




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

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# Executive Summary

The Institute of Asset Management (IAM) defines asset management as "the balancing of costs, opportunities and risks against the desired performance of assets to achieve an organization's objective". This involves the development and implementation of asset management strategies and long-term financial planning.

The 2025 Asset Management Plan (AMP) was developed to comply with the July 1, 2025 milestone of Ontario Regulation (O. Reg.) 588/17 and further build upon the findings of the 2024 AMP. To align with the requirements of the July 1, 2025 O. Reg. 588/17 milestone, this AMP reports on the proposed levels of service (PLOS) and the financial investments required to achieve them..

The overall replacement cost of East Gwillimbury asset categories total $2.93 billion. 93% of all assets analyzed have a fair or better condition rating. Condition data is frequently collected by staff and third-party consultants through field inspections or desktop assessments. Collection methodologies vary greatly for each asset segment. As such, staff must develop standards to convert annual deficiency reports and inspection data to condition ratings suitable for asset management reporting.

In addition to annual needs, there is an infrastructure backlog of $39 million, reflecting an $11.5 million reduction from the backlog reported in the 2024 AMP. Backlog represents the estimated cost to replace assets that have exceeded their estimated useful life. Some backlog results from strategic deferrals, as diligent maintenance often keeps assets in good condition longer. Regular condition assessments are essential for refining replacement plans and backlog estimates.

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 of East Gwillimbury has developed risk models which are integrated with its asset register and produce risk matrices that classify assets based on their risk profiles.

This Asset Management Plan will provide the following:

- An update to the 2024 Asset Management Plan, including the total replacement cost and average condition of core and non-core assets
- An overview of levels of service and the recommended proposed levels of service
- A Financial Strategy that will enable EG to meet the recommended proposed level of service.

East Gwillimbury 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.

# 1 About this Document

The Town of East Gwillimbury Asset Management Plan (AMP) was developed by PSD Citywide Ltd., and in consultation with Town staff. The AMP meets Ontario Regulation 588/17 ("O. Reg 588/17") requirements and 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.

## 1.1 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.

*Table 1 Ontario Regulation 588/17 Requirements and Reporting Deadlines*

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

## 1.2 Limitations and Constraints

The Asset Management Program development required substantial staff effort, was developed based on best-available data, and is subject to the following broad limitations, constraints, and assumptions:

- The analysis is sensitive to several critical data fields, including an asset's estimated useful life, replacement cost, quantity, and in-service date.

Inaccuracies or imprecisions in any of these fields can have substantial and cascading impacts on all reporting and analytics.

- User-defined and unit cost estimates, based typically on staff judgment, recent projects, or established through completion of technical studies, offer the most precise approximations of current replacement costs. When this isn't possible, historical costs incurred at the time of asset acquisition or construction can be inflated to the present day. This approach, while sometimes necessary, can produce inaccurate estimates.
- In the absence of condition assessment data that meets the assessment methodology, age was used to estimate asset condition ratings. This approach can result in an over- or understatement of asset needs. This is most prevalent on assets with a long service life and minimal degradation, such as watermains, not including appurtenances (hydrants, valves, etc.) which are inspected annually, at a minimum. As a result, financial requirements generated through this approach can differ from those produced by staff.
- The risk models outlined in section 2.2.7 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 detailed asset data to ensure 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 Citywide, the Town's primary asset management system.

These challenges are quite common among municipalities and require long-term commitment and sustained effort to overcome. 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.

## 1.3 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.

*Table 2 Listing of Asset Categories and the Funding Source*

| Asset Category | Source of Funding |
|---|---|
| Road Network | Tax Levy |
| Bridges & Culverts | Tax Levy |
| Facilities | Tax Levy |
| Land Improvements | Tax Levy |
| Machinery & Equipment | Tax Levy |
| Vehicles | Tax Levy |
| Stormwater Network | Tax Levy |
| Water Network | User Rates |
| Wastewater Network | User Rates |

# 2 Asset Management Overview

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, and 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 AMP 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 Corporate Strategic Plan, followed by a Strategic Asset Management Policy and an Asset Management Roadmap, 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. The strategic plan has a direct, and cascading impact on asset management planning and reporting.

## 2.1 Foundational Documents

### 2.1.1 Corporate Strategic Plan

The Council approved Strategic Plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element aligned with priorities such as Quality Programs and Service, Complete Communities, and a Culture of Municipal Excellence. At the beginning of each term, Council holds strategic planning exercises and discussions to identify major initiatives and administrative improvements it wishes to achieve during its term. Staff then identify the scope, resources, timing & other logistical matters associated with proposed initiatives. The Strategic Plan 2022-2026 was used in preparation of this AMP.

### 2.1.2 Strategic Asset Management Policy

A Strategic Asset Management Policy represents a statement of the principles guiding a municipality's approach to asset management activities. It aligns with the Council approved strategic plan and provides clear direction to municipal staff on their roles and responsibilities related to the asset management program.

The Town of East Gwillimbury adopted Policy No. 20-300-CP-001 "Strategic Asset Management Policy" on August 13, 2019, in accordance with Ontario Regulation 588/17. Council approved an updated Strategic Asset Management Policy in 2024. The policy defines a corporate-wide asset management program that will promote "the adoption of industry best practices, continuous improvement protocols and lifecycle and risk management of all municipal infrastructure assets, with the goal of achieving the lowest total cost of ownership while meeting desired levels of service."

The policy also stipulates the need to develop an Asset Management Plan in accordance with Ontario Regulation 588/17 requirements. The Town must demonstrate an organization-wide commitment to good stewardship of municipal assets and to improve accountability and transparency to the community through the adoption of asset management practices.

The Town of East Gwillimbury additionally adopted Procedure No. 20-300-OP-002 "Strategic Asset Management Procedures" on August 13, 2019. This procedure defines the wide range of duties, responsibilities, and actions required to support the Town's asset management program.

### 2.1.3 Asset Management Roadmap

An Asset Management Roadmap 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 East Gwillimbury plans to achieve its asset management objectives through planned activities and decision-making criteria.

### 2.1.4 Asset Management Plan

The Asset Management Plan is often identified as a key output within the strategy. The AMP has a sharp focus on the current state of the Town's asset portfolio, and its approach to managing and funding individual service areas or asset groups. It is tactical in nature and provides a snapshot in time.

## 2.2 Key Technical Concepts

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

### 2.2.1 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 filtered and interpreted. Assets were structured to support meaningful, efficient reporting and analysis. Key category details are summarized at the asset segment level. The core and non-core assets are comprised of:

| Core Assets | Non-Core Assets |
|---|---|
| Bridges and Culverts | Facilities |
| Road Network<br>• Roads, Sidewalks, Streetlights | Land Improvements<br>• Parks, Trails, Signs, Fences, Seating, Playgrounds |
| Stormwater Network<br>• Storm Sewers, Manholes, Catch Basins, Driveway Culverts, Ponds | Machinery and Equipment<br>• Backhoe, Bunker Gear, Computer Hardware, Generator, Library Print Material, Trailers |
| Wastewater Network<br>• Sewers, Manholes, Service Connections, Pumping Stations | Vehicles |
| Water Network<br>• Watermains, Valves, Chambers, Hydrants, Meters, Service Connections | |

To facilitate the analysis for this AMP, asset categories have been segmented by service area to provide clearer insights into the specific funding needs of each area. Appendices B through J detail the analysis by service area.

### 2.2.2 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 (original purchase price) of the asset is inflated based on Consumer Price Index or Non-Residential Building Construction Price Index.

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

### 2.2.3 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 assets will require replacement.

### 2.2.4 Reinvestment Rate

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

### 2.2.5 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.

The Town follows the Canadian Infrastructure Report Card, a 5-tier approach to assessing asset condition: Very Good, Good, Fair, Poor, Very Poor. Table 3 presents a summary of the Town's condition rating criteria.

*Table 3: Condition Rating Criteria*

| Condition | Range (%) | Description | Criteria |
|---|---|---|---|
| Very Good | 80-100 | Fit for the future | Well maintained, good condition, new or recently rehabilitated |
| Good | 60-79 | Adequate for now | Acceptable, generally approaching mid-stage of expected service life |
| Fair | 40-59 | Requires attention | Signs of deterioration, some elements exhibit significant deficiencies |
| Poor | 20-39 | Increasing potential of affecting service | Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration |
| Very Poor | 0-19 | Unfit for sustained service | Near or beyond expected service life, widespread signs of advanced deterioration, some assets may be unusable |

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the municipality's asset portfolio. The analysis is based on assessed condition data (only as available). In the absence of assessed condition data, asset age is used to determine asset condition

### 2.2.6 Lifecycle Management Strategies

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

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

There are several field intervention activities that are available to extend the life of an asset. These activities can be generally placed into one of three categories: maintenance, rehabilitation, and replacement.

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 the effect these activities will have on the lifecycle of an asset, and their cost, will enable staff to make better recommendations.

Figure 1 provides a description of each type of activity, the general difference in cost, and typical risks associated with each.

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

*Figure 1 Lifecyle Management Typical Interventions*

**Maintenance**

- General level of cost is **$**
- All actions necessary for retaining an asset as near as practicable to its original condition,but excluding rehabilitation or renewal. Maintenance does not increase the service potential of the asset or keep it in its original condition;
- It slows down deterioration and delays when rehabilitation or replacement is necessary.

**Rehabilitation / Renewal**

- General level of cost is **$$$**
- Works to rebuild or replace parts or components of an asset, to restore it to a required functional condition and extend its life, which may incorporate some modification.
- Generally involves repairing the asset to deliver its original level of service (i.e. milling and paving of roads) without resorting to significant upgrading or replacement, using available techniques and standards.

**Replacement**

- General level of cost is **$$$$$**
- The complete replacement of an asset that has reached the end of its life, so as to provide a similar, or agreed alternative, level of service.
- Existing asset disposal is generally included

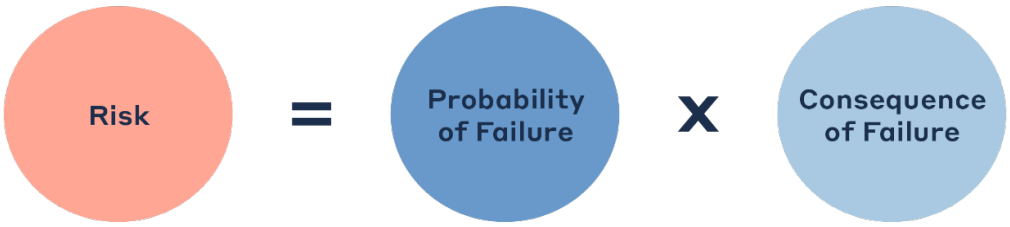
### 2.2.7 Risk Management

Municipalities generally take a 'worst-first' approach to infrastructure spending. Rather than prioritizing assets based on their importance to delivery service, 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.

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 quantitative and qualitative methodologies.

### Quantitative Approach to Risk

Asset risk is defined using the following 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 failure will have on an organization's asset management goals. The consequences of failure can range from non-eventful to impactful. The consequence of failure parameters aims to align with the triple bottom line approach – economic, social, environmental – to risk management as well as other fields including operational, health and safety, and strategic.

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.

### Qualitative Approach to Risk

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

## 2.2.8 Levels of Service Definition

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 metrics include the technical and community level of service metrics that are required as part of Ontario Regulation 588/17 as well as additional performance measures that the Town has selected.

## Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (roads, bridges and culverts, water, wastewater, stormwater) the province, through O. Reg. 588/17, has provided qualitative descriptions that are required. 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 in the Appendix B through J.

## 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, bridges and culverts, water, wastewater, stormwater) the province, through O. Reg. 588/17, has provided technical metrics that are required. For non-core asset categories, the Town has determined the technical metrics that will be used to determine the technical level of service provided. These metrics can be found in the Levels of Service subsection within each asset category in the Appendix B through J.

## 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. Proposed levels of service are realistic and achievable within the timeframe outlined by the Town.

In accordance with Ontario Regulation 588/17, this AMP identifies proposed levels of service over a 10-year period that considers,

a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals, and long-term sustainability.

## Annual Review

In accordance with Ontario Regulation 588/17, the annual review of the plan is required to be completed by July 1 of each year. 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.

### 2.2.9 Climate Change

Climate change can cause severe impacts on human and natural systems around the world. The effects of climate change include increasing temperatures, higher levels of precipitation, droughts, and extreme weather events.

In 2019, Environment and Climate Change Canada (ECCC) released Canada's Changing Climate Report (CCCR 2019). Based on this report and by analyzing local data, in 2024, EG staff, with the collaboration of the Ontario Resource Centre on Climate Adaptation, developed an East Gwillimbury Climate Science Report. This report analyzed two future climate scenarios and made projections based on the analysis of 30 years of weather information in the area (1971 – 2000). According to this report, East Gwillimbury's annual average temperature will increase from 6.7°C to 7.8°C between 2021 and 2025, and 9.8°C by the end of the century in a low carbon scenario. If emissions are not dramatically reduced, meaning a high carbon scenario, the annual average temperatures could be 9.2°C by mid-century, and 11.4°C by the end of the century. Disaggregating the analysis by seasons and daily temperatures, these temperature changes mean warmer summers and winters and significantly more frequent and longer heat waves.

In terms of precipitation, the same report suggests an increase in annual precipitation of 6% and 8% by mid to end century in a low carbon scenario, and 11% and 13% for mid to end century in a high carbon scenario for the Town of East Gwillimbury. By analyzing the number of days with short but intense precipitation, the increase ranges between 10% and 18% by mid to end century for both scenarios.

The changing climate poses a significant risk to the Canadian economy, society, environment, and infrastructure. The impacts on infrastructure are often a result of climate-related extremes such as droughts, floods, higher frequency of freeze-thaw cycles, extended periods of high temperatures, high winds, and wildfires. Physical infrastructure is vulnerable to damage and increased wear when exposed to these extreme events and climate variabilities. Canadian municipalities are faced with the responsibility to protect their local economy, citizens, environment, and physical assets.

# 3 Asset Portfolio

## 3.1 Community Profile

The Town of East Gwillimbury is in the Regional Municipality of York and is part of the Greater Toronto Area. East Gwillimbury is within the Lake Simcoe watershed with the East Holland River running directly through Town. The region has a diverse and vibrant environment making it a centre for tourism and recreation and a beautiful place to live.

The region was initially established in the 1800s as part of the greater Toronto settling area. The Township and villages that made up the region experienced moderate growth as a centre for transportation (particularly river transportation) and agriculture; however, the area became a notable community independent of the major city nearby. The bulk of the early settlement in East Gwillimbury was concentrated in the communities of Sharon, Mt. Albert and Queensville.

By 1850, East Gwillimbury was incorporated as a town. Today, it remains a blend of urban and rural life with strong ties to the Greater Toronto area.

*Table 4 Census Data from Statistics Canada of East Gwillimbury and Ontario*

| Census Characteristic | Town of East Gwillimbury | Ontario |
|---|---|---|
| Population 2021 | 34,637 | 14,223,942 |
| Population Change 2016-2021 | 44.4% | 5.8 |
| Total Private Dwellings | 11,869 | 5,929,250 |
| Population Density | 141.4/km$^2$ | 15.9/km$^2$ |
| Land Area | 244.91 km$^2$ | 892,411.76 km$^2$ |

Like many municipalities in the greater Toronto area, the Town of East Gwillimbury is experiencing significant growth. Historically, the Town had experienced population growth slightly above the national average, however, from 2016 to 2021, the population increased at approximately 8.5 times the national average and was deemed the fastest growing municipality in Canada according to the 2021 Census.

### 3.1.1 Climate Profile

The Town of East Gwillimbury is part of the Greater Toronto Area in Southern Ontario within Lake Simcoe watershed along the East Holland River. 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. The impacts of climate change are noted in section 2.2.9.

### 3.1.2 Integrating Climate Change

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

East Gwillimbury's Environmental Strategy is a robust set of actions that support the municipality's commitment to protect and restore the natural environment as the municipality grows. The Environmental Strategy has thematic areas of focus that help to consistently illustrate the Town's approach to advancing their environmental stewardship. The five thematic areas are land, water, air, biodiversity and empowerment.

These areas were used to develop a road map outlining the Town's successes and future steps forward. By focusing further on four categories: Policy, Legislation, Operations and Events and Education, the action plan provides a comprehensive view of the environmental initiatives in East Gwillimbury.

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

The Town has defined five vulnerability events and assessed the impact each would have on all municipal infrastructure. The events are as follows:

#### Extreme Rainfall

This is defined as heavy rainfall of greater than 100mm in 24 hours. High-intensity storm events are expected to occur more frequently.

#### Extreme Snowstorms

A blizzard with wind speeds at or above 56km/h causing blowing snow conditions where visibility is reduced, and snowdrifts accumulate.

#### Extreme Freeze/Thaw

This is defined as an increased number of freeze thaw cycles annually. More extreme swing between temperature highs and lows over the winter season.

#### Extreme Winds

Maximum hourly wind speeds are increased annually. An increase in the number of days with wind gusts exceeding 100km/hour is expected.

### Extreme Heat

It is expected that there will be an increased number and length of heat waves (3 or more days above 30°C). An increased maximum daily and hourly temperature is expected.

The impact was then used to calculate the probability of asset failure on each asset. See section 3.6 Risk Management for more details.

## 3.2 State of the Infrastructure

East Gwillimbury's core infrastructure is relatively new and has long-estimated useful lives. Much of this infrastructure has been added in response to recent growth and is currently in very good condition. In contrast, the Town's non-core assets have shorter estimated useful lives and are generally in fair condition.

Table 5 summarizes the Town's asset portfolio within the scope of this AMP, which has a current replacement value of $2.9 billion. It includes both core assets—such as roads, bridges, culverts, stormwater, water, and wastewater—and non-core assets, including facilities, land improvements, vehicles, machinery and equipment. The table provides an overview of these assets' estimated replacement costs and their average condition ratings. This information helps assess infrastructure performance and guide maintenance, renewal, and investment decisions.

*Table 5 Summary of Infrastructure, Replacement Cost and Average Condition by Asset Category*

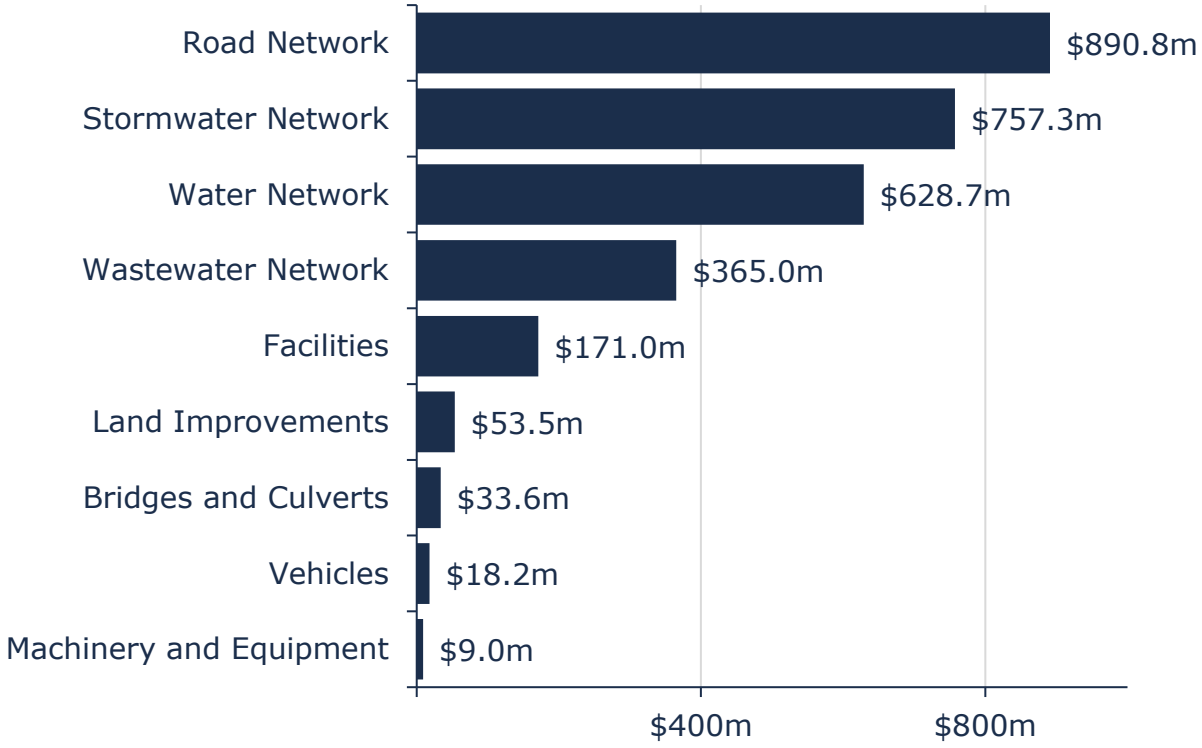
| Asset Category | Replacement Cost | Asset Condition |
|---|---|---|
| Road Network | $890,767,250 | Good (70%) |
| Bridges and Culverts | $33,564,215 | Good (75%) |
| Stormwater Network | $757,320,680 | Very Good (93%) |
| Facilities | $171,018,557 | Good (69%) |
| Land Improvements | $53,453,630 | Very Good (84%) |
| Vehicles | $18,180,935 | Fair (47%) |
| Machinery and Equipment | $9,045,398 | Fair (44%) |
| Water Network | $628,741,977 | Very Good (87%) |
| Wastewater Network | $365,034,868 | Very Good (92%) |
| **Overall** | **$2,927,127,510** | **Very Good (82%)** |

## 3.3 Inventory and Valuation

The total East Gwillimbury asset portfolio has a replacement cost of $2.93 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 2: Asset Portfolio Replacement Value Breakdown*

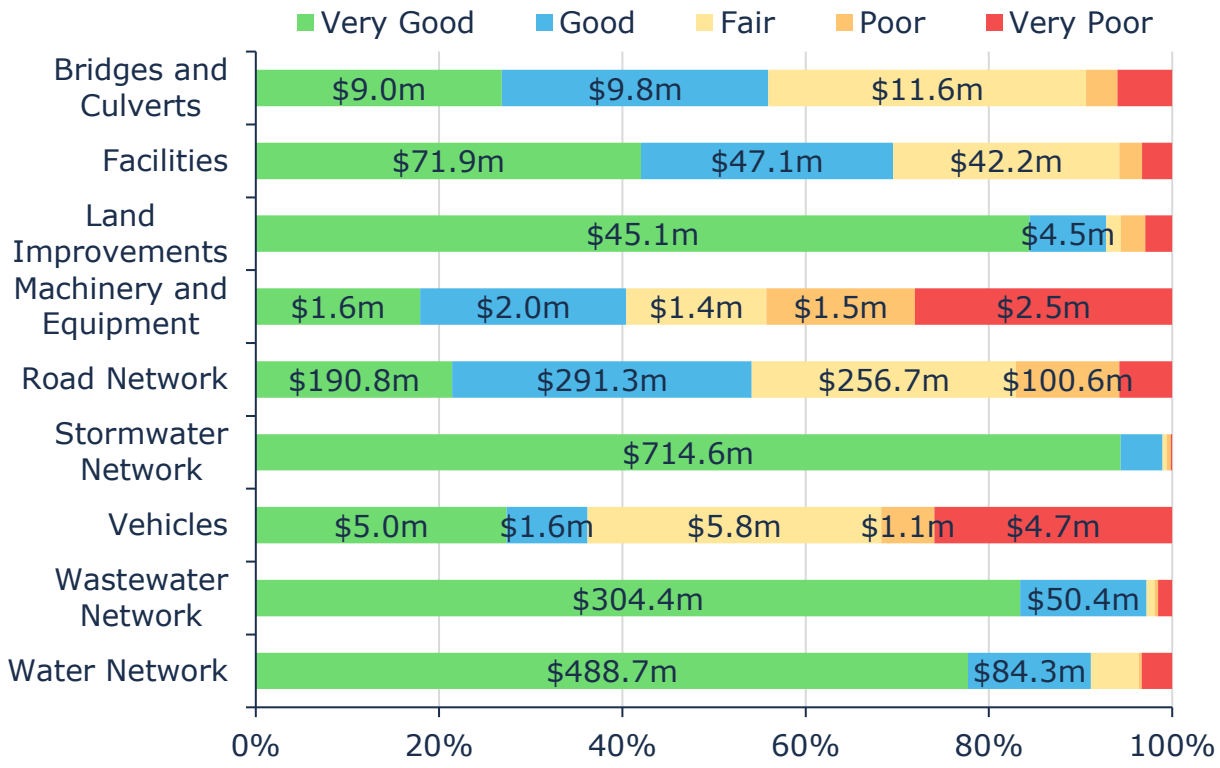



## 3.4 Asset Condition

Table 3 in section 2.2.5 outlines the condition rating system used in this AMP to determine asset condition. This 5-tier rating system, is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. Using a standardized system for all assets provides comparability across asset categories and with other municipalities that use the same standard.

When assessed condition data is not available, service life remaining is used to approximate asset condition.

*Figure 3 Asset Condition by Asset Category*




The analysis in this AMP is based on assessed condition data that was translated to a condition rating within the asset inventory. The Town continues to develop assessment programs and procedures to develop inspection methodologies that align with AMP requirements. The conformance to AMP condition methodology is based on acceptable asset condition data inspections.

## 3.5 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 5% of the Town's assets will require replacement within the next 10 years. Details of the capital requirements are identified based on the 10-year financial plan in the Financial Management section.

## 3.6 Risk Management

A risk assessment framework, when applied to asset management, should provide an asset risk rating to assist with the management of assets. This requires the development of quantitative and qualitative models that can leverage asset data and information.

A good risk model will analyse existing data then provide information and processes needed to help prioritize and allocate the available money and resources to the right asset at the right time. Not all assets are created equal. Some are more important than others, and their failure or disrepair poses more risk to the community. For example, a road with a high volume of traffic that provides access

to critical services poses a higher risk than a low volume rural road. These high-value assets should receive funding before others.

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

### 3.6.1 Qualitative Risk

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. Municipal staff provided information related to the following potential risks:

*Table 6: Qualitative Risks in East Gwillimbury*

| Risk Type | Description |
|---|---|
| Asset Data Confidence | The asset data available to support asset management planning is not all in one master location where there would be confidence of the most up to date data is available. |
| Organizational Cognizance /Capacity | Training is needed for staff to have the knowledge and capacity to engage in informed asset management practices. |
| Infrastructure Design/Installation | There are concerns with the past design and/or materials used for some types of infrastructure |
| Aging Infrastructure | Significant portions of the infrastructure are reaching the end of their useful lives. |
| Climate Change & Extreme Weather Events | Climate and extreme weather events have an impact on infrastructure service life as well as functionality |
| Growth | Community growth is expected to continue as the fasted growing community in Ontario |

The qualitative risks identified can guide information and data gathering in the future.

### 3.6.2 Quantitative Risk

A high-level evaluation of asset risk and criticality was performed. 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.

Risk is a product of two variables: the probability that an asset will fail, and the resulting consequences of that failure event. It can be a qualitative measurement, (low, medium, high) or quantitative measurement (1-5), that can be used to rank assets and projects, identify appropriate lifecycle strategies, optimize short- and

long-term budgets, minimize service disruptions, and maintain public health and safety.

## Probability of Failure

Several factors can assist decision-makers in estimating the probability or likelihood of asset failure. These include an asset's condition, age, performance history, and exposure to extreme weather events.

In East Gwillimbury, the probability of asset failure has been defined using two key parameters: Condition and Climate Vulnerability.

Condition is assessed using criteria outlined in Table 3: Condition Rating Criteria, as well as detailed condition scales and definitions provided in the Appendix B through J for each asset category.

Climate vulnerability was evaluated by identifying five climate-related events (refer to 193.1.2 Integrating Climate Change), and assessing their potential impact on municipal infrastructure. The rating scale used to measure climate vulnerability is as follows:

1. No noticeable impact
2. Minor impacts on service life and/or capacity
3. Significant deterioration or reduction in capacity
4. Exceeds service capacity or loss of functionality
5. Loss of asset

To model the probability of asset failure, a weighted approach was applied to the risk models, 80% based on asset condition, and 20% based on climate impact. This weighting method was selected to ensure that while the effects of severe climate events are incorporated into failure probability calculations, they do not override the asset's existing condition data. Instead, the climate vulnerability acts as a modifier, increasing the likelihood of failure for assets exposed to higher climate risk

## Consequence of Failure

Estimating criticality also requires identifying the types of consequences that the organization and community may face from an asset's failure, and the magnitude of those consequences. Consequences of asset failure will vary across the infrastructure portfolio; the failure of some assets may result primarily in high direct financial cost but may pose limited risk to the community. Other assets may have a relatively minor financial value, but any downtime may pose significant health and safety hazards to residents. See the Appendix B through J for more details on each Asset Category including the definitions and consequences of failure metrics.

### Overall Risk Summary

The risk breakdown provides a visual representation of the overall risk profile of the assets within East Gwillimbury's infrastructure inventory. The relationship between the probability of failure and the consequence of failure as outlined above was modeled at the asset level and summarized as follows in Figure 4.

*Figure 4: Risk Summary*

| 1 - 4<br>Very Low | 5 - 7<br>Low | 8 - 9<br>Moderate | 10 - 14<br>High | 15 - 25<br>Very High |
|---|---|---|---|---|
| $1,780,197,602<br>(61%) | $820,639,843<br>(28%) | $264,163,331<br>(9%) | $55,336,133<br>(2%) | $6,790,601<br>(<1%) |

# 4 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 effectively plan for new infrastructure, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect asset needs and the appropriate level of service to meet the needs of the community.

## 4.1 Official Plan

The Official Plan establishes the vision for long-term growth and development within the Town. The Plan provides policy guidance on land uses for parks, employment, housing, and other uses and informs the long-term objectives for core infrastructure and public services such as transportation, water, and wastewater.

East Gwillimbury Council adopted an updated Official Plan in 2022. The vision of the plan is to develop a sustainable community and ensure that growth does not place an undue financial burden on the residents of the Town. The Official Plan is developed in accordance with the Provincial Policy Statement (2005), the Provincial Growth Plan "Places to Grow", the Lake Simcoe Protection Plan, Green Energy & Economy Act and Greenbelt Plan.

The Plan is also structured to conform to the Region of York Official Plan, the Region's comprehensive infrastructure master plans and plan for supporting regional growth. York Region approved a new Official Plan in 2022. Population and employment growth projections for the Town of East Gwillimbury were defined and utilized in the most recent version of the Town's Official Plan. York Region's population is projected to increase from 1.2 million residents to over 2 million residents by 2051. The Official Plan provides a regional analysis of this growth along with policy objectives to support efficient growth and a diversified economy for all municipalities within its borders. In February 2025, the Town conducted a Growth Management Council Workshop. During this session, growth projections

estimated a population of 128,600 residents and 44,300 jobs by 2051, slightly more conservative than the York Region projections.

## 4.2 Infrastructure Master Plans

The Town of East Gwillimbury has developed several key master plans that serve as guiding documents for municipal services with the expected growth. The master plans are deemed to be an integral component of the Town's Official Plan. East Gwillimbury has a Water and Wastewater Master Plan (2009) updated in 2024, Transportation Master Plan (2010) updated in 2024, and Stormwater Management Master Plan (2009) that is scheduled to be updated in 2026. These plans will be regularly reviewed and updated.

The Water and Wastewater Master Plan was developed with significant residential and employment growth in mind. The Plan states that with expected growth, the previous water supply plans will not be sufficient; the proposed water storage capacity must meet the Ministry of Environment, Conservation and Parks (MECP)'s requirements for peak equalization, fire and emergency uses. The Plan also states that the Region's wastewater collection and treatment system will require expansion to accommodate growth in East Gwillimbury.

The updated Transportation Master Plan identifies the long-term transportation goals as well as specific solutions requiring further study. Some of the study subjects are already defined, such as public and stakeholder engagement, multimodal networks, managing peak travel demand, and community-oriented traffic control.

The Stormwater Management Master Plan (SWMMP) is intended to prepare a practical framework that balances infrastructure and development requirements with economic, social, and environmental constraints. The Plan provides recommendations to improve the management of stormwater for both existing and planned development. The Plan includes an assessment which found that a general increase in peak flow will occur due to the expected growth. The Town is preparing an updated Storm Water Management Master Plan (SWMMP) that will investigate and recommend opportunities in new and existing areas to prevent flooding, reduce phosphorus loading on Lake Simcoe, mitigate erosion, maintain/improve water quality, and explore opportunities for sustainable stormwater funding sources.

The Master Plans for core infrastructure indicate that the Town must integrate notable considerations for population and employment growth in new developments. Further studies may be required to update the plans and strategies to improve growth management.

## 4.3 Growth Trends and Demand Drivers

Historically, the Town has experienced population growth above the national average. According to the 2021 Census, East Gwillimbury is the fastest growing

municipality in Canada with more than 44% population growth between 2016 and 2021. Population and employment in the Town are expected to continue to increase at significant rates.

This AMP relies on growth projections that were identified as part of East Gwillimbury's 2022 Official Plan review and the Growth Management Council Workshop on February 11, 2025. The following table summarizes population and employment projections.

*Table 7 East Gwillimbury's 2022 Official Plan Population and Employment Projections*

| Type | Location | Current | 2031 | 2041 | 2051[1] |
|---|---|---|---|---|---|
| Population | Central Growth Area | 24,500 | 45,300 | 68,000 | 114,600 |
| | Mount Albert | 6,000 | 8,000 | 8,000 | 8,000 |
| | Rural Area | 6,000 | 6,000 | 6,000 | 6,000 |
| | **TOTAL** | **36,500** | **59,300** | **82,000** | **128,600** |
| Employment | Central Growth Area | 8,300 | 14,300 | 23,500 | 41,300 |
| | Mount Albert | 1,000 | 1,500 | 2,000 | 2,000 |
| | Rural Area | 1,000 | 1,000 | 1,000 | 1,000 |
| | **TOTAL** | **10,300** | **16,800** | **26,500** | **44,300** |

The Town of East Gwillimbury is projected to experience significant growth; population growth of 62% between 2021 and 2031 and 250% growth between 2021 and 2051. Employment is projected to follow a similar growth trend as population with 63% growth between 2021 and 2031 and 325% growth between 2032 and 2051.

As stated in the Official Plan, the Town will continue to support a wide range of employment opportunities and a diverse economy within its borders. East Gwillimbury is committed to diversifying commercial land use while also supporting the existing rural/agricultural economy.

## 4.4 Impact of Growth

Planning for forecasted population growth will require the expansion of existing infrastructure and services. As growth-related assets are constructed or acquired, they will be integrated into the Town's Asset Management Plan. 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

[1] Data presented at the 2025 Growth Management Council Workshop on February 11, 2025.

growth-related infrastructure. These costs should be considered in long-term funding strategies designed to maintain the current level of service.

In this Asset Management Plan, a high-level analysis was conducted to determine infrastructure and service needs that will result from projected growth. This analysis includes consideration of new acquisitions and the related capital and operations and maintenance costs as well as potential staffing demands.

Of specific note, availability of wastewater allocation to service new development demand is limited. York Region's Upper York Sewage Solution, proposed for 2031, is legislated under the More Homes Built Faster Act, 2022 (Bill 23), specifically through Schedule 10, the Supporting Growth and Housing in York and Durham Regions Act, 2022, to expand treatment capability for East Gwillimbury. Growth projections outlined in this plan are subject to the timing of this solution coming on-line and could change based on the solution determined.

### 4.4.1 Infrastructure Acquisition

Population and employment growth in East Gwillimbury is projected to necessitate significant development and asset acquisition. Municipal staff used population growth projections, seen in Table 7, and the existing inventory to predict the amount of linear assets that may be required to support growth. See Appendix B through J for more details in each asset category's growth management section.

### 4.4.2 Impacts on Operating

Each department is expected to require additional staffing to support growth and new development in the Town. Some divisions already have limited staffing to manage existing assets. Newly acquired assets will require more staff resources to undertake the planning, lifecycle management, and administration needed to maintain the desired level of service.

# 5 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. As described in section 2.2.8, Levels of Services are described in two ways: Community Levels of Service, and Technical Levels of 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 were outlined in O. Reg. 588/17 in addition to performance measures identified by the Town.

## 5.1 Strategic Plan

East Gwillimbury's strategic focus is on sustainability. Sustainability is defined by supporting the ability of current and future generations to thrive, while ensuring a

balance between economic growth, environmental stewardship, and social well-being. Our efforts are focused on finding ways to improve, enhance, and do better.

*Figure 5: Strategic Plan Pillars*

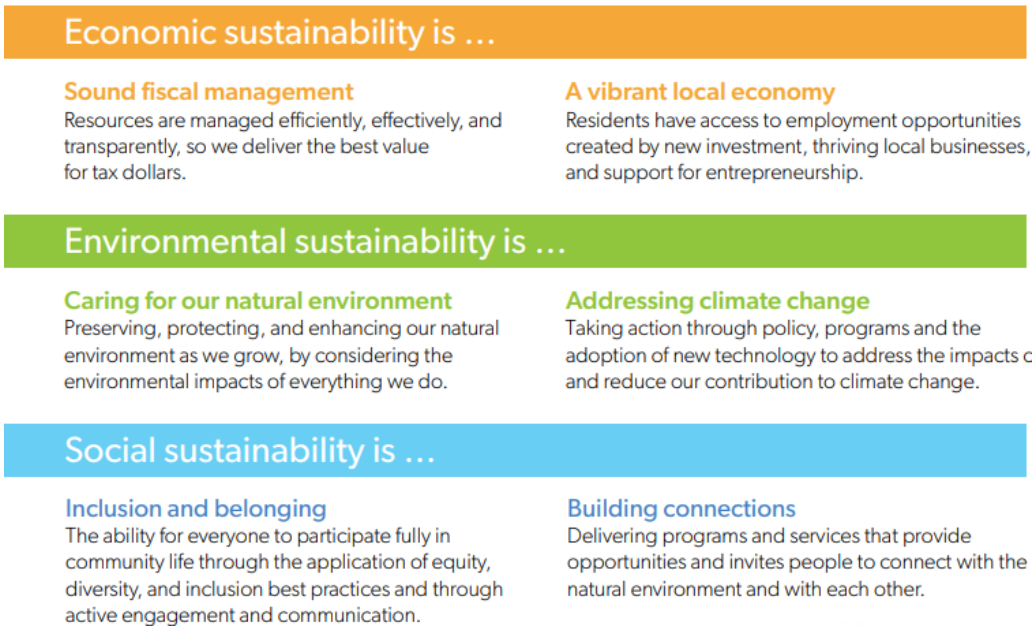



To help define the intent of the pillars, Figure 6 below provides more details.

### 5.1.1 Our Vision and Core Purpose

East Gwillimbury's vision is to be a resilient, sustainable, and welcoming community that connects residents to each other, services, and opportunities. The core purpose is to deliver value for tax dollars, while providing quality services that the community wants and needs.

*Figure 6: Defining Sustainability Pillars*



### 5.1.2 Strategic Priorities

Strategic plan priorities were identified with key deliverables to ensure the plan has achievable outcomes. The priorities are:

**Quality programs and services** – provide value for tax dollars through the delivery of programs and services that support our economic, environmental, and social goals.

**Responsible growth** – ensure responsible and balanced growth management.

**Environmental stewardship** – preserve and protect our natural environment as we grow.

**Build complete communities** – build complete communities that support the ability for residents to connect to amenities, services, employment, and each other.

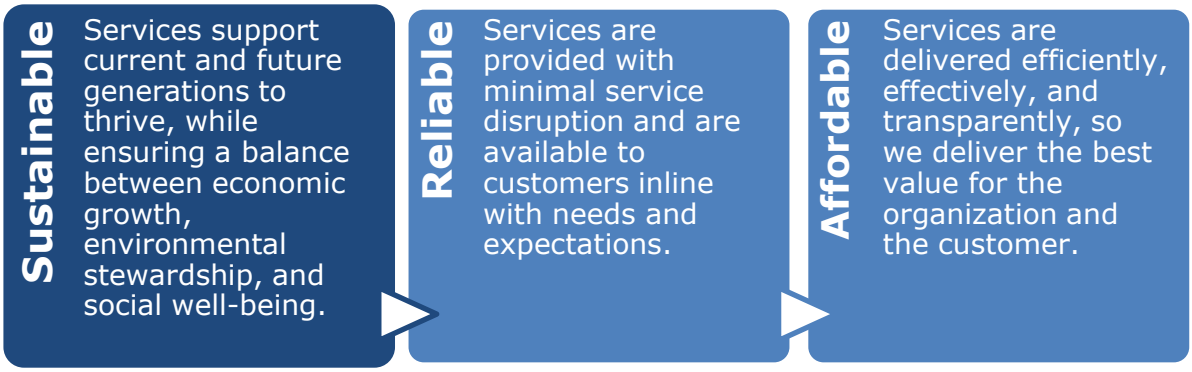
**Culture of municipal excellence** – foster a culture of service excellence, engagement, and transparency.

The Council approved strategic plan provides overall direction to guide decisions, projects and initiatives undertaken by the Town over the 2022-2026 term of Council.

## 5.2 Current Levels of Service

Leveraging the strategic plan's sustainability lens and strategic priorities as a guide to developing and measuring service delivery, the following best practices were identified.

*Figure 7: Service Delivery Best Practices*




The community and technical levels of service are directly aligned with the service delivery best practices and are detailed in Appendix B through J for each asset category.

## 5.3 Proposed Levels of Service

To ensure their long-term sustainability and practical implementation, the following principles were utilized in the development of proposed levels of service for the Town:

Staff Engagement –The project team met with staff who work with core and non-core assets to gather feedback.

Data-Driven Approach – Data analytics were used to inform levels of service, risk, and funding needs.

Flexibility and Adaptability – The principles were designed to be adaptable, allowing adjustments in response to evolving community needs and priorities.

Continuous Improvement – A process was established for the regular review and refinement of the levels of service to support ongoing enhancement, including engagement with staff subject matter experts throughout the process.

### 5.3.1 Scenarios

A primary objective of the AMP and the July 1, 2025, milestone of O. Reg. 588/17 is to determine the costs needed to manage the Town's lifecycle activities and achieve proposed levels of service for the next 10 years. To accomplish this, a forecasting analysis of asset lifecycle requirements was conducted using four different funding model scenarios.

In developing the scenarios, the Town prioritized alignment with all current planning documents—including master plans, growth studies, and the Development Charges Background Study. To ensure consistency with these documents and long-term planning horizons, the scenarios were projected to the year 2051 apart from scenario 4 which looks at the full lifecycle of all assets in the inventory.

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. As outlined in Table 3 the condition scale ranges from Very Poor to Very Good. The scenarios are defined as follows:

**Scenario 1: 2025 Current Investment** focused on evaluating current capital funding levels across each service area and asset category, projecting the resulting average asset condition through to 2051 for all assets in the scenario.

**Scenario 2: "Fair" Condition** focused on identifying any service area or asset category where the projected average condition fell below a "Fair" rating (i.e., below a condition rating of 40), and determined the financial investment required to maintain this minimum condition standard through to 2051 for all assets in the scenario.

**Scenario 3: "Good" Condition** identified any service area or asset category where the projected average condition fell below a "Good" rating (i.e., below a condition rating of 60), and determined the financial investment required to maintain this minimum condition standard through to 2051 for all assets in the scenario.

**Scenario 4: Full Lifecycle** considers the full lifecycle of all assets within the service area to estimate the average investment necessary to fund all identified lifecycle activities such as rehabilitation and replacement.

Each scenario was then evaluated based on its financial impact on the Town, the resulting overall asset condition, and any anticipated risks associated with the outcomes.

### 5.3.2 Results

The results of the analysis are summarized in Figure 8, which illustrates the funding levels for each scenario.

#### Scenario 1: 2025 Current Investment

Scenario 1 results indicate that, under the current capital funding level of $10.3 million per year, approximately 10% of the Town's $2.9 billion infrastructure portfolio is projected to fall below a "Fair" average condition by 2051.

Allowing infrastructure to deteriorate from the current average condition of "Very Good" overall to below a "Fair" condition presents several key risks for core infrastructure.

Within this scenario, due to the age and life expectancy of the core infrastructure, the scenario results are all above "Good" condition overall in 2051. For the non-core infrastructure categories, the overall average condition by 2051 is Poor, it is within these categories, projected to experience the increased risk over the scenario time frame examples are:

- Facilities: Potential program and service interruptions due to building closures, an increase in health and safety deficiencies, lack of code compliance and not meeting residents' expectations.
- Vehicles, Machinery, and Equipment: Increased failure rates could reduce the Town's ability to respond to emergencies—posing serious safety risks, including the potential for fatalities among staff or community members.
- Land Improvements are parks, sports fields, playground equipment, natural capital as well as trails, these assets all have a direct impact on the community due to personal injury because of assets in "Poor" or worse condition.

Still, we also must consider the longer-term impacts on core assets, if investments in maintenance and rehabilitation are not addressed in the near term. For example:

- Stormwater Network: Increased risk of flooding due to asset failure and washouts for the Road Network.
- Wastewater Network: Greater likelihood of sewer backups into homes and environmental contamination.
- Drinking Water System: Higher risk of contamination, increased water loss, and more frequent service disruptions.

## Scenario 2: "Fair" Condition

The results of scenario 2 indicate that an additional $1.96 million per year would be required to maintain a minimum average condition of "Fair" across all asset categories. This is specifically for non-core infrastructure that is expected to fall below the "Fair" condition in Scenario 1. By ensuring the infrastructure's average condition is at least "Fair" reduces the risks identified in the previous scenario however assets in "Fair" condition are still expected to show signs of deterioration with some significant deficiencies. For example, a deteriorating chlorine analyzer is at risk of giving false readings, which could lead to unnecessary or incorrect actions, like over-chlorination or other corrective measures that may not be needed. While this scenario will not present a significant financial impact to the Town, the mitigation of risks is not a significant improvement to scenario 1.

## Scenario 3: "Good" Condition

Scenario 3, which aims to maintain an average asset condition of "Good", determined that an additional $6.2 million in annual capital funding would be required. As noted in Scenario 1, current funding levels support a core infrastructure average condition of "Good," but non-core infrastructure categories are projected to decline to "Poor" by 2051. This scenario aims to improve the average condition of non-core assets to an overall "Good" rating, thereby reducing long-term risks and supporting reliable, consistent service delivery.

## Scenario 4: Full Lifecycle

The goal of asset management is to minimize the lifecycle costs of delivering infrastructure services, manage associated risks, and maximize the value and levels of service that the community receives from its asset portfolio. Because lifecycle costs span multiple decades, effective asset management requires long-term planning and foresight to ensure financial responsibility is distributed equitably across generations.

This scenario adopts a whole life cycle approach to managing all assets, ensuring they are maintained for optimal performance and enabling the asset portfolio to sustain its current overall condition score of "Very Good". While it results in low risk levels and high-quality service delivery, it would require an additional $38.4 million in annual funding, placing a significant financial burden on the community in the short term.

## Conclusion

The Proposed Level of Service (PLOS) scenario analysis outlines the additional funding needed under different condition scenarios. It compares three scenarios—

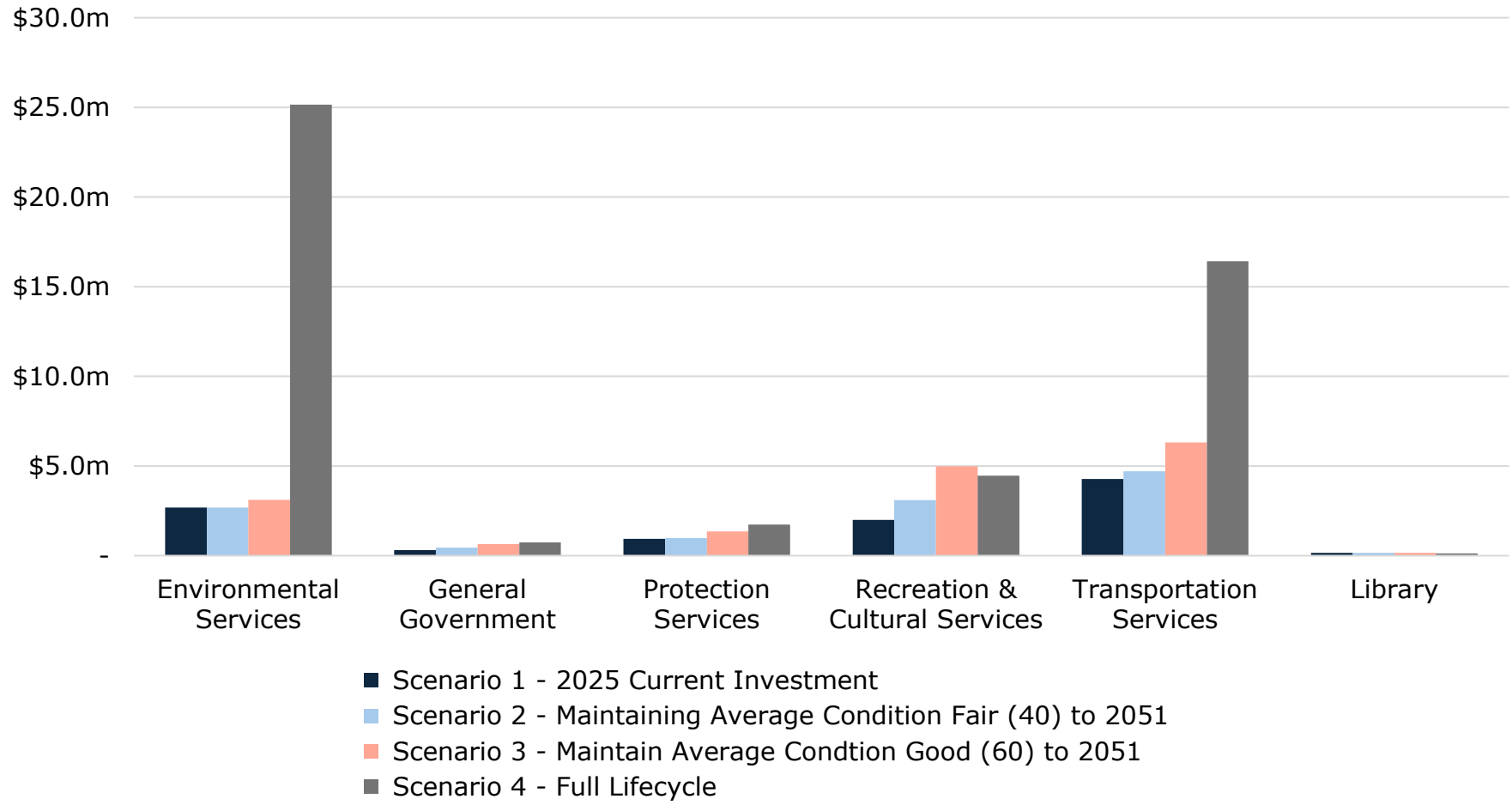
"Fair," "Good," and Full Lifecycle—highlighting the annual funding increases required to maintain or improve infrastructure conditions through to 2051.

*Table 8 - Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | $1.96M | $6.2M | $38.4M |

The recommended proposed level of service for the Town is to maintain an average asset condition of "Good", which corresponds to the funding levels outlined in Scenario 3, while continuing to work towards achieving scenario 4 full lifecycle in the longer term.

*Figure 8: Scenario Results by Service Area*



# 6 Financial Management

## 6.1 Financial Strategy

Each year, municipalities make important investments in infrastructure maintenance, renewal, rehabilitation, and replacement to ensure assets remain in a state of good repair. However, spending needs typically exceed fiscal capacity and most municipalities in Ontario 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 East Gwillimbury's existing asset portfolio and is premised on two key inputs: average annual capital requirements and 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.

O. Reg 588/17 requires that all proposed LOS are demonstrated to be appropriate based upon an assessment of:

- Proposed LOS options (increase, decrease, or maintain current LOS) and the associated risks (e.g., asset reliability, safety, affordability) in relation to long-term sustainability
- How the proposed LOS differs from the current LOS
- The achievability of the proposed LOS
- The municipality's financial capacity to afford the proposed LOS

In the proposed level of service analysis, the Town used infrastructure condition as a key factor in determining the appropriate level of service for residents, while ensuring the integrity of both services and infrastructure. The analysis established a recommended infrastructure target for average condition of "Good"—defined as infrastructure that is considered acceptable, generally approaching mid-stage of expected service life.

East Gwillimbury looked at reliable and predictable sources of funding 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 Building Fund (CCBF), formerly the Federal Gas Tax Fund
- The Ontario Community Infrastructure Fund (OCIF)

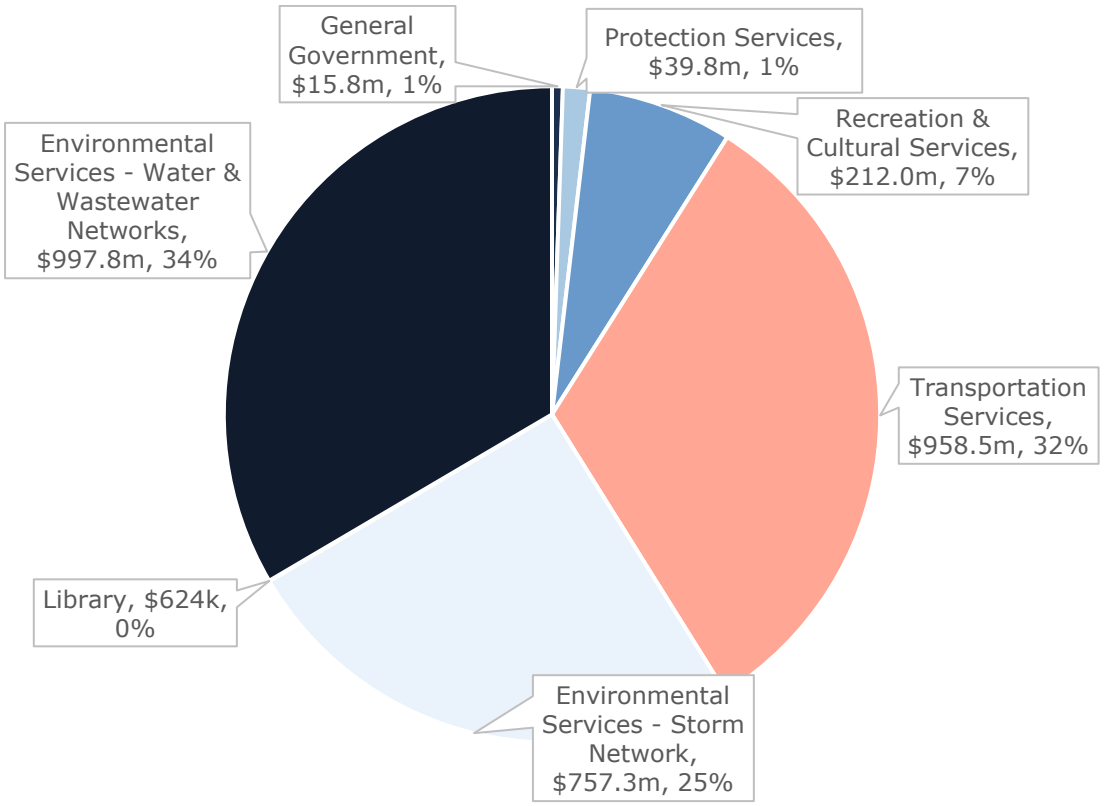
Although provincial and federal infrastructure programs can change with evolving policies, CCBF and OCIF are considered reliable and predictable revenue sources.

### 6.1.1 Annual Capital Requirements

Annual capital requirements represent the investment the Town requires in each asset category for maintenance, renewal, rehabilitation and eventual replacement of infrastructure assets. The annual investment ensures the long-term sustainability of the Town's assets.

The Town of East Gwillimbury owns and manages approximately $2.98 billion dollars of core and non-core assets. The figure below shows the breakdown of assets in each service area.

*Figure 9: Asset Replacement Cost Breakdown by Service Area*




It is estimated that maintaining the Town's assets for the entire lifecycle of the infrastructure requires an average annual investment of $48.6 million. The estimated useful lives of the Town's assets, which range from 3 to 100 years, are used to determine the recommended average annual investment.

Currently, the Town allocates $10.3 million annually for rehabilitation and replacement of its assets. Table 9 summarizes how current capital funding levels compare with funding required for each service area.

*Table 9: Current Funding Position vs Lifecycle Funding*

| Asset Category | Forecasted Annual Capital Requirements | Annual Funding Available | Annual Funding Deficit |
|---|---|---|---|
| General Government | $1.6M | $308K | $1.3M |
| Protection Services | $1.7M | $932K | $778K |
| Recreation & Cultural Services | $4.6M | $2.0M | $2.6M |
| Transportation Services | $15.7M | $4.3M | $11.4M |
| Environmental Services – Stormwater Network | $9.9M | - | $9.9M |
| **Total** | **$33.4M** | **$7.7M** | **$25.7M** |
| Environmental Services – Water & Wastewater Networks[2] | $15.3M | $2.7M | $12.6M |
| **Overall Total** | **$48.6M** | **$10.3M** | **$38.4M** |

At the existing levels, the Town is funding 21% of its forecasted annual capital requirements to maintain its assets over the full lifecycle. This creates a total annual funding deficit of $38.4 million. Eliminating the funding deficit would require a tax-levy increase of 72.5% or 5.6% per year over 10 years as well as a water and wastewater rate increase of 81.6% or 6.2% per year over 10-years without considering any other source of funding. The above analysis assumes all assets will be maintained in accordance with the lifecycles outlined in each asset section of Appendix B through J.

However, the financial strategy reflects the recommendation of the proposed level of service of "good condition" by 2051. This proposed level of service would require an annual investment of $16.6 million. 2051 was selected as a target year to align with the Town's Official Plan, growth projections, and other master planning documents.

Table 9 outlines the annual capital requirements associated with the proposed level of service strategy of "Good", compared to the Town's current levels of investment, resulting in an annual deficit of $6.2 million.

[2] Water and Wastewater Networks are funded through revenue generated by fixed charges and usage fees.

*Table 10: Proposed Level of Service Capital Requirement vs Current Funding*

| Asset Category | Forecasted Annual Capital to Maintain "Good" Condition | Annual Funding Available | Annual Funding Deficit |
|---|---|---|---|
| General Government | $646K | $308K | $338K |
| Protection Services | $1.4M | $932K | $427K |
| Recreation & Cultural Services | $5.0M | $2.0M | $3.0M |
| Transportation Services | $6.3M | $4.3M | $2.0M |
| Environmental Services - Stormwater Network | $209K | - | $209K |
| Library | $155K | $155K | - |
| **Tax Funded Total** | **$13.7M** | **$7.7M** | **$6.0M** |
| Environmental Services – Water & Wastewater Networks[3] | $2.9M | $2.7M | $230K |
| **Total** | **$16.6M** | **$10.3M** | **$6.2M** |

To close the annual funding deficit, without consideration of any other sources of revenue or cost containment strategies, a dedicated tax levy increase of 16.8%, or 1.57% annually would be required over a ten-year period. This contribution would be required beyond commitments made by the Town in the past to asset management funding. The reduction in the average annual requirement reflects the fact that much of the Town's infrastructure is relatively new and has long life expectancies, extending beyond the 2051 projection horizon. As a result, the Town can gradually phase in the required funding levels over time. However, the funding gap for water and wastewater rates will persist until a detailed analysis is completed through the upcoming rate study and program reviews.

## 6.2 Ten-Year Financial Plan

The long-term financial strategy aims to achieve sustainable funding levels for the Town's infrastructure services within 10 years. However, even with sustainable funding projected by 2035, the Town is expected to continue operating with an infrastructure deficit based on the longer-term lifecycle projections. The table below provides a 10-year capital projection for each asset category, including proposed funding levels.

[3] Water and Wastewater Networks are funded through revenue generated by fixed charges and usage fees.

The Town is currently conducting reviews of its water, wastewater, and stormwater programs. These rate reviews and financial plans are in progress, and the resulting funding targets will be detailed and incorporated into future asset management plans and annual reviews.

Stormwater is included in the projections below to ensure that initial funding is allocated toward the system's lifecycle costs until further analysis is completed.

*Table 11: 10-Year Financial Plan*

| Asset Category | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 |
|---|---|---|---|---|---|---|---|---|---|---|
| General Government | $270K | $2.0M | $550K | $620K | $1.3M | $825K | $2.0M | $480K | $740K | $605K |
| Protection Services | $150K | $100K | $165K | $220K | $145K | $150K | $175K | $180K | $195K | $215K |
| Recreation & Cultural Services | $985K | $1.8M | $1.8M | $2.1M | $3.5M | $3.5M | $353K | $3.4M | $1.8M | $310K |
| Transportation Services | $2.3M | $4.2M | $967K | $1.7M | $241K | $5.3M | $1.8M | $215K | $28K | $95K |
| Environmental Services - Tax Funded (Stormwater) | $16.1M | $7.9M | $3.7m | $4.5M | $4.3M | $4.1M | $4.5M | $4.0M | $4.2M | $3.5M |
| Library | $139K | $227K | $184K | $230K | $273K | $219K | $267K | $294K | $279K | $298K |
| *Grants* | *$-4.6M* | *$-1.7M* | *$-848K* | *$-848K* | *$-848K* | *$-848K* | *$-848K* | *$-848K* | *$-848K* | *$-848K* |
| *Due from Other Municipalities* | *$-7.7M* | *$-195K* | | | | | | | | |
| **Total Tax Funding Required** | **$11.2M** | **$16.6M** | **$6.6M** | **$8.6M** | **$9.2M** | **$13.3M** | **$8.3M** | **$7.8M** | **$6.4M** | **$4.1M** |
| **Proposed Funding** | **$7.7M** | **$8.2M** | **$8.8M** | **$9.4M** | **$10.0M** | **$10.5M** | **$11.2M** | **$11.8M** | **$12.4M** | **$13.0M** |

The current 10-year program requires $92 million in funding over its duration, while the proposed available funding is $116.6 million. This indicates that the financial strategy's annual funding targets will be achieved within the 10-year period. As a result, the Town will be able to fully fund the outlined 10-year plan and will also have additional capacity to support future infrastructure or capital needs.

## 6.3 Estimated Growth Financial Requirements

Annual net operating costs will increase because of the growth-related capital projects proposed under the Town's Development Charge Background Study. 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.

## 6.4 Future Considerations

Funding the annual capital requirements ensures that major capital events, including replacements, are completed as required. The estimated annual funding requirements to maintain the Town's assets throughout their life cycle are estimated at $48.6 million. Based on current annual funding, there is an annual funding difference of $38.4 million.

Funding targets for water, wastewater, and stormwater services will be detailed and integrated into future asset management plans and annual reviews.

The review of asset management funding requirements will be reviewed annually as part of the budget process.

# 7 Recommendations

## 7.1 Level of Service

It is recommended that the Town targets an annual capital funding requirement of $16.6 million to maintain infrastructure assets in 'Good' condition or better through to 2051, in alignment with the proposed level of service target. This represents a $6.2 million increase over the current annual funding being allocated by the Town.

## 7.2 Financial Strategy

To maintain infrastructure assets in 'Good' condition, an annual tax-levy increase of 1.57% per year over ten years would be required. This investment will fund infrastructure assets and support the projects in the Town's 10-year capital plan. This meets the O. Reg 588/17 requirement that all proposed LOS are demonstrated to be appropriate based upon an assessment of:

- Proposed LOS options (increase, decrease, or maintain current LOS) and the associated risks (e.g., asset reliability, safety, affordability) in relation to long-term sustainability
- How the proposed LOS differs from the current LOS
- The achievability of the proposed LOS

- The municipality's financial capacity to afford the proposed LOS

## 7.3 Governance

Strategic recommendations identified in general include further inventory data refinement, documentation and revisions to asset management strategies, and improvements to the inventory systems.

Assets that are not assessed through technical studies are regularly inspected by staff or consultants to meet regulatory requirements or best management practices. These inspection methodologies have not yet been converted to a suitable % assessed metric as staff continue to search for best management practices that meet the needs of the industry and asset management reporting requirements. Staff should continue to work with partners to ensure future condition assessments are aligned with the best management practices and included in the inventory

## 7.4 Data Management

Other key strategic recommendations involve further refining and documenting inventory data, updating asset management strategies, and improving the inventory systems. Furthermore, staff should focus on enhancing these systems and continue to operationalize asset management by incorporating risk-based decision-making into planning and budgeting processes.

# 8 Next steps

The effectiveness of the AMP can be measured in the following ways:

- The accuracy of the forecasted costs identified in this plan as compared to those costs identified in the long-term financial plan
- The degree to which the existing and projected service levels and service risks and residual risks are incorporated into the Strategic Plan and business plans
- The number of infrastructure project business cases that utilize levels of service reporting and risk to identify and justify the business need of the infrastructure project.

The annual review requirement in O.reg. 588/17 the Town must address the progress in implementing the 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: Definitions 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. |
| Estimated 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. |
| Funding Gap | The difference between;<br>a. The amount of funds required annually for satisfactory operation, maintenance & renewal of an asset over the useful life, and<br>b. The amount of funds currently being spent on the asset annually |
| HCB Road | High Class Bituminous (HCB) Paved Surface(s) are surfaces that feature one or more layers of high-quality asphalt (bitumen), usually designed for heavy traffic, durability, and a smooth finish. |
| LCB Road | Low Class Bituminous (LCB) surfaces typically involve lower-grade asphalt or fewer layers, and are generally |

| | |
|---|---|
| | suited for lighter traffic, less demanding applications, or cost-effective construction. |
| 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. |

# Appendix B: Facilities

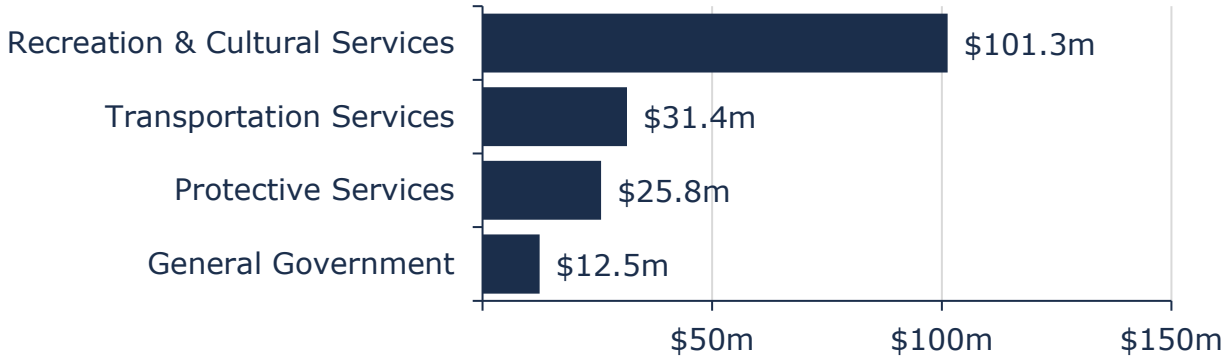
The Town of East Gwillimbury owns and maintains several facilities that provide key services to the community. These include:

- administrative offices
- fire stations
- public works garages and storage sheds
- community centres
- parks
- libraries

## Inventory and Valuation

The graph below displays the total replacement cost of each asset segment in East Gwillimbury's buildings inventory.

*Figure 10: Facilities Replacement Cost*

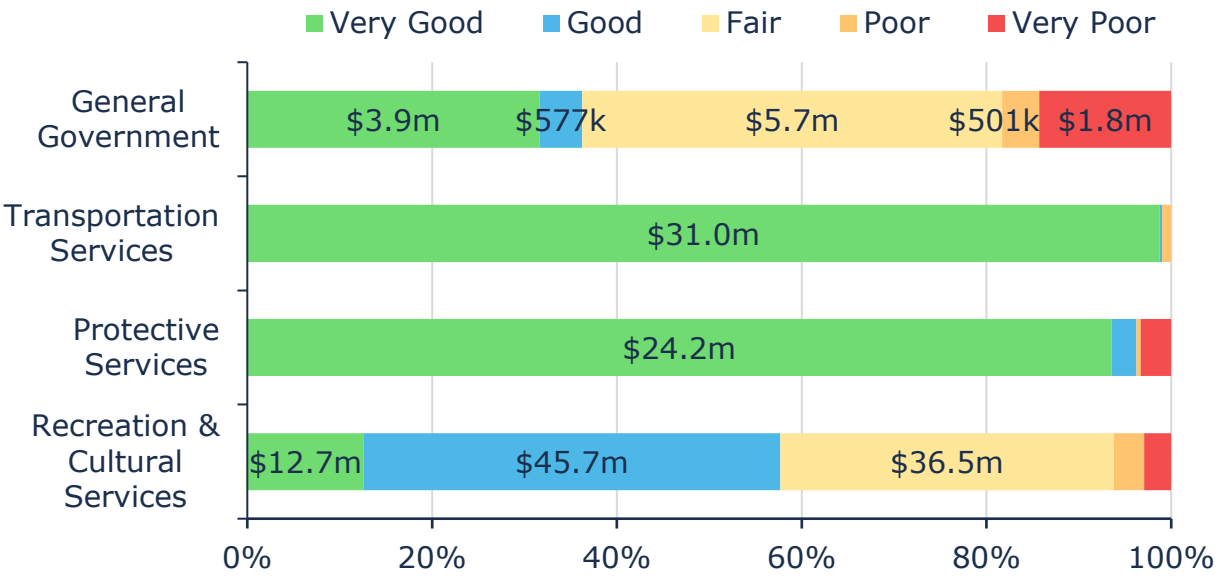



Each asset's replacement cost should be reviewed periodically to determine if adjustments are needed to represent capital requirements more accurately.

## Asset Condition

Facility asset data utilizes the standardized UNIFORMAT II classification system, which provides a consistent framework for analyzing building components such as structure, roofing, interior finishes, mechanical, and electrical systems. This enhances the accuracy of condition projections, enables comparisons across facilities, and supports informed decisions on maintenance, renewals, and capital planning. The graph below illustrates the average condition of each asset segment, using a scale that ranges from Very Good to Very Poor.

*Figure 11: Facilities Condition Breakdown*




Facility inspections are conducted to comply with Health and Safety standards. Regulatory obligations are being met, and the condition of Town facilities is not impacting public safety.

To ensure that the municipal buildings 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 the best 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 if adjustments need to be made to better align with the observed service life.

Accurate and reliable condition allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets.

## Lifecycle Management

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

Maintenance of buildings is dealt with on a case-by-case basis. There are lists of preventative maintenance contracts and routine Health and Safety checks are performed.

A 10-year capital plan is in place based on updates to the building condition assessment completed previously and used to componentize the facilities in the Town.

# Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within facilities based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 100% | 80-100 | 1 |
| | | | 60-79 | 2 |
| | | | 40-59 | 3 |
| | | | 20-39 | 4 |
| | | | 0-19 | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure for facilities was calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (40%) | Replacement Cost | 100% | <250,000 | 1 |
| | | | 250,000 - 500,000 | 2 |
| | | | 500,000 - 750,000 | 3 |
| | | | 750,000 - 1,500,000 | 4 |
| | | | >1,500,000 | 5 |
| Operational (40%) | Level 2 – Component Group | 100% | Furnishings, Exterior, Site Improvement | 1 |
| | | | Interior Finishes, Site Mechanical, Site Electrical | 2 |
| | | | Interior, Staircases, Equipment, Special Construction | 3 |
| | | | Exterior Closures & Enclosures, Roofing, Plumbing, HVAC, Electrical, Conveyance | 4 |

| | | | | |
|---|---|---|---|---|
| | | | Foundations, Basement Construction, Superstructure, Fire Protection | 5 |
| Service Delivery (20%) | AMP Segment | 100% | Recreation & Cultural Services | 2 |
| | | | General Government | 3 |
| | | | Protection Services | 4 |
| | | | Transportation Services | 5 |

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

*Figure 12: Facilities Risk Breakdown*

| 1 - 4 | 5 - 7 | 8 - 9 | 10 - 14 | 15 - 25 |
|---|---|---|---|---|
| **Very Low** | **Low** | **Moderate** | **High** | **Very High** |
| $20,506,440 (12%) | $72,525,517 (42%) | $40,912,634 (24%) | $37,073,965 (22%) | - (0%) |

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

# Growth Management

## Trends

Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new facility infrastructure. Between DC bylaw and developer contributed assets, the core infrastructure is expected to more than double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

From 2023 to 2032 the estimated replacement cost of facilities is expected to grow by $178,992,400 based on maintaining the current levels of service.

# Levels of Service

## Current Levels of Service

The following tables identify the Town's current level of service for the facility assets. These metrics include the community level of service and technical levels of service the Town is recommending.

*Table 13: Facilities Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description of the municipal services supported by facilities | Facilities support the delivery of municipal services through the support of several service areas, including:<br>• administrative offices – general government services<br>• Fire – emergency services<br>• public works garages and storage sheds – roadway and winter control services<br>• community centres – recreation and cultural services | Scope | Replacement Cost | $171,018,557 |
| | | | Quantity | 18 |
| Description of the services being provided | The Town's facilities are providing service that is reliable and sustainable while ensuring affordability | Reliable | Average condition | Good (69%) |
| | | | % Condition > Fair | 94% |
| | | | % Condition poor and very poor | 6% |
| | | Sustainable | % Risk that is High and Very High | 22% |
| | | Affordable | Capital re-investment | $2,644,445 |
| | | | Capital re-investment rate | 1.55% |

## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

The current average condition of the Town's facilities is rated as "Good", with a condition score of 69. However, under Scenario 1 (maintaining current funding levels), this is projected to decline to a score of 39, "Poor", by 2051.

To maintain a minimum condition of "Fair" as outlined in Scenario 2, an additional $43,000 per year in funding is required. To meet the proposed level of service in Scenario 3, which targets maintaining an average condition of "Good", an annual funding increase of approximately $1.4 million is needed.

*Table 12: Facilities Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | $43K | $1.4M | $1.2M |

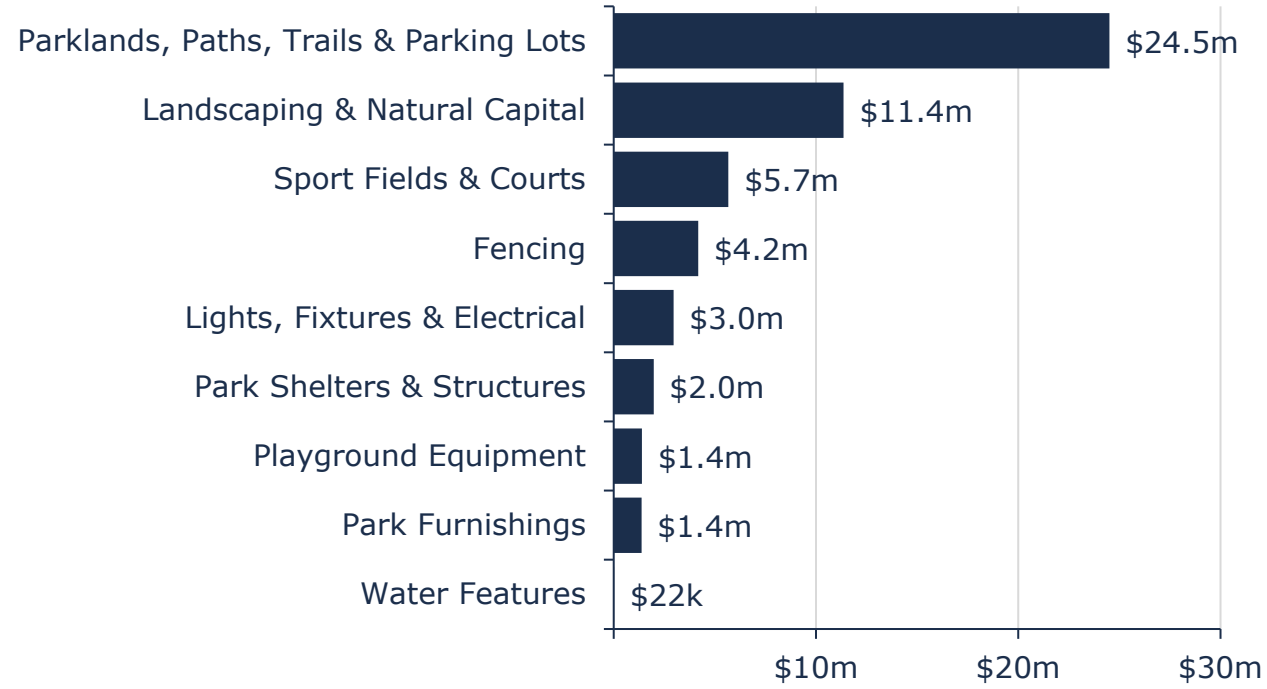
# Appendix C: Land Improvements

East Gwillimbury owns several assets that are considered Land Improvements, which include park and sports field assets like ball diamonds, soccer fields, playground equipment, water features and courts. Other assets included in land improvements are landscaping and natural capital, park lighting and fencing. The state of the infrastructure for the land improvements is summarized in the following table.

## Inventory and Valuation

The graph below displays the total replacement cost of each asset segment in the Town's land improvement inventory.

*Figure 14: Land Improvements Replacement Cost*



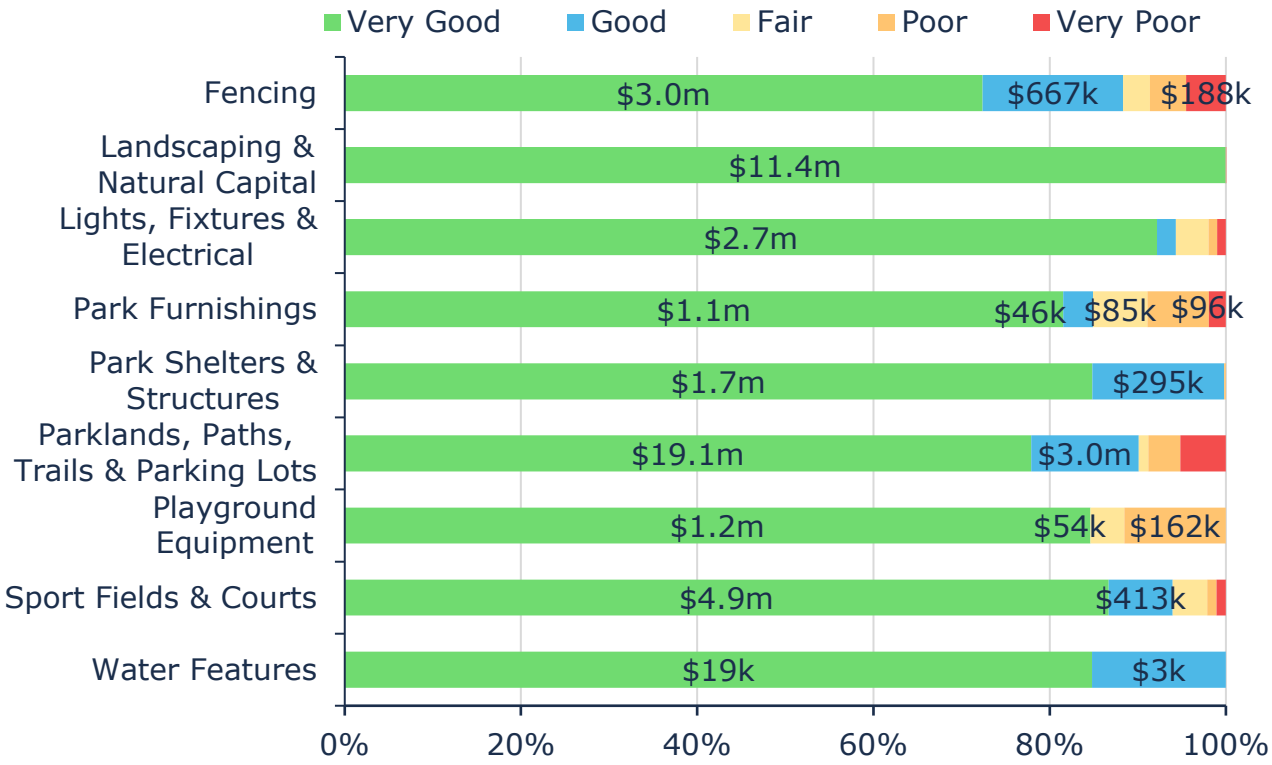

Each asset's replacement cost should be reviewed periodically to determine if adjustments are needed to represent capital requirements more accurately.

## Asset Condition

To ensure that the Town's land improvements and parks continue to provide an acceptable level of service, East Gwillimbury should monitor the average condition of all assets. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine the combination of maintenance, rehabilitation, and replacement activities required to increase the overall condition.

The graph below visually illustrates the average condition for each asset segment on a scale of Very Good to Very Poor.

*Figure 15: Land Improvements Condition Breakdown*




Each asset's estimated useful life should also be reviewed periodically to determine if adjustments need to be made to better align with the observed length of service life for each asset type.

Accurate and reliable condition allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The current approach varies significantly due to the varied assets included in this category; Town staff are working on improving inventory values by assessing asset conditions.

## Lifecycle Management

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. Most maintenance is done through external contracting, and staff perform routine maintenance.  Rehabilitation and replacements are performed reactively, with asset failure.  Playground structures are monitored and are proactive replacement is scheduled to meet health and safety requirements of the Canadian Standards Association (CSA).

## Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that should be allocated towards funding rehabilitation and replacement needs.

# Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequences of failure for the assets within land improvements, based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 100% | 80-100 | 1 |
| | | | 60-79 | 2 |
| | | | 40-59 | 3 |
| | | | 20-39 | 4 |
| | | | 0-19 | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure were calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (50%) | Replacement Cost | 100% | <250,000 | 1 |
| | | | 250,000 - 500,000 | 2 |
| | | | 500,000 - 750,000 | 3 |
| | | | 750,000 - 1,500,000 | 4 |
| | | | >1,500,000 | 5 |
| Operational (50%) | Ops Segment | 25% | Furniture, Seating, Receptacles, Trees, Planters, Garden, Irrigation | 1 |
| | | | Bike Parks, Skate Parks, Dog Parks | 2 |
| | | | Sports Fields, Lighting, Splash Pad, Courts & Surfaces | 3 |
| | | | Active Transportation, Signs, Entry Features | 4 |
| | | | Playground, Structures, Retaining Walls | 5 |
| | GIS – Asset Type | 25% | Parkette | 1 |
| | | | Park | 3 |
| | | | Park – Civic Centre, Park – Community Centre, Park – Fire Station, Park – Open Space | 5 |

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

*Figure 16: Land Improvements Risk Breakdown*

| 1 - 4 Very Low | 5 - 7 Low | 8 - 9 Moderate | 10 - 14 High | 15 - 25 Very High |
|---|---|---|---|---|
| $37,300,854 (70%) | $13,272,914 (25%) | $1,598,941 (3%) | $1,280,921 (2%) | - (0%) |

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

# Growth Management

## Trends

Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new land improvements and park infrastructure. Between DC bylaw and developer contributed assets, the core infrastructure is expected to nearly double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

From 2023 to 2032 the estimated replacement cost of land improvements is expected to grow by $60,210,655 based on maintaining the current levels of service.

# Levels of Service

## Current Levels of Service

The following tables identify the Town's current level of service for land improvement assets. These metrics include the community level of service and technical levels of service the Town is recommending.

*Table 17: Land Improvements Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description of the services being provided | The Town's land improvements are providing service that is reliable and sustainable while ensuring affordable park services | Scope | Replacement Cost | $53,453,630 |
| | | | Quantity | 27,478 |

| | | |
|---|---|---|
| | Average condition | Very Good (84%) |
| Reliable | % Condition > Fair | 94% |
| | % Condition poor and very poor | 6% |
| Sustainable | % Risk that is High and Very High | 2% |
| Affordable | Capital re-investment | $295,000 |
| | Capital re-investment rate | 0.55% |

## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

The current average condition of the Town's land improvement assets is rated as "Very Good", with a condition score of 84. However, under Scenario 1 (maintaining current funding levels), this is projected to decline to a score of 21,"Very Poor", by 2051.

To maintain a minimum condition of "Fair" as outlined in Scenario 2, an additional $1.3 million per year in funding is required. To meet the proposed level of service in Scenario 3, which targets maintaining an average condition of "Good", an annual funding increase of approximately $1.8 million is needed.

*Table 13: Land Improvements Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | $1.3M | $1.8M | $1.64M |

# Appendix D: Vehicles

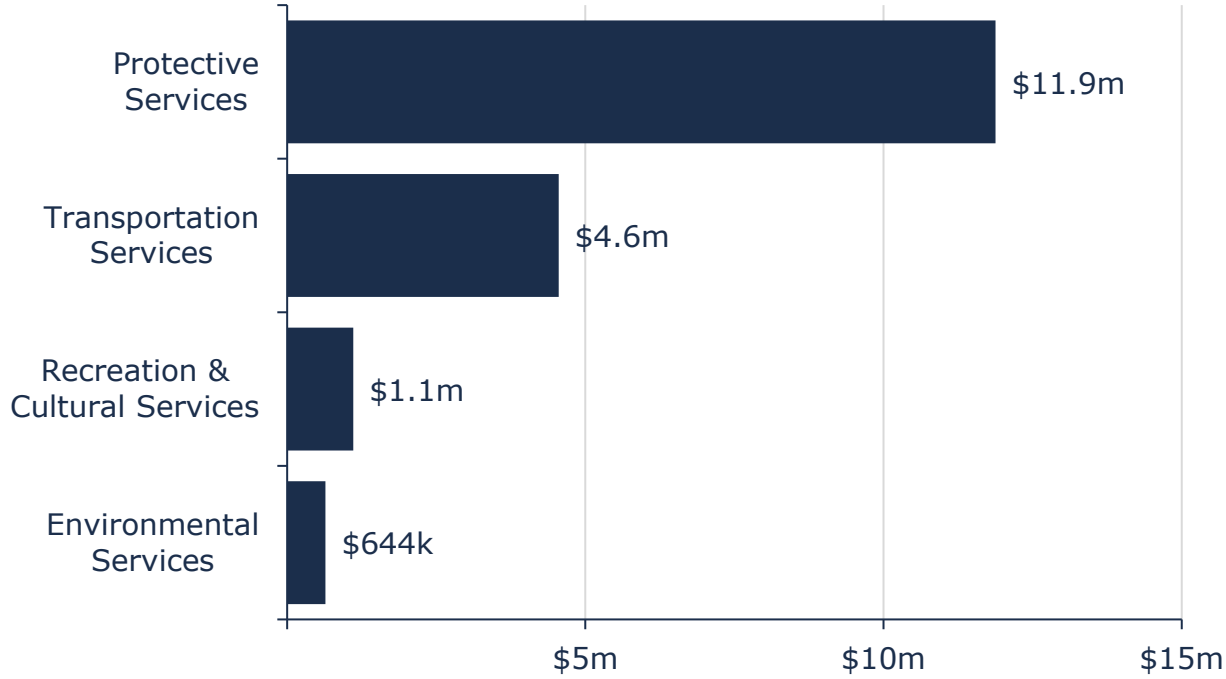
Vehicles support the delivery of municipal services through the support of several service areas, including:

- Plow vehicles for winter control activities
- Recreation vehicles to provide park management
- Admin vehicles for building permit and inspection services
- Fire Trucks for emergency or protective services

## Inventory and Valuation

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

*Figure 18: Vehicle Replacement Costs*

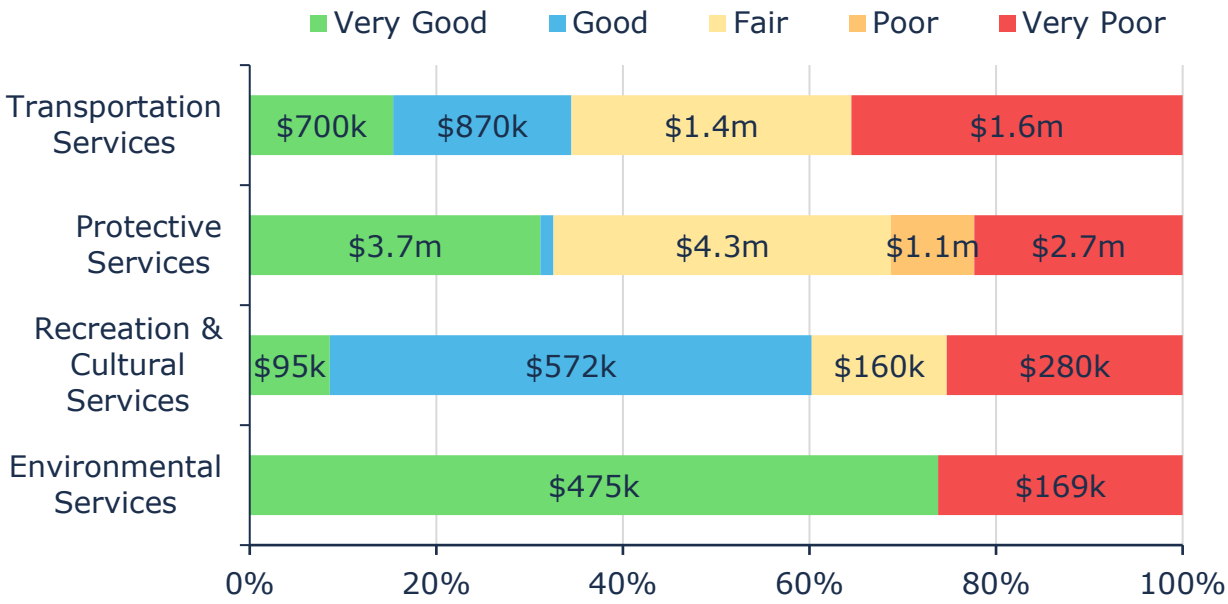



Each asset's replacement cost should be reviewed periodically to determine if adjustments are needed to represent capital requirements more accurately.

## Asset Condition

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

*Figure 19: Vehicles Condition Breakdown*




To ensure that the Town's vehicles continue to provide an acceptable level of service, the average condition of all assets should be monitored. If the average condition declines, staff should re-evaluate their lifecycle management strategy to determine what combination of maintenance, rehabilitation and replacement activities is required to increase the overall condition of the vehicles.

Accurate and reliable condition allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Currently, staff complete regular visual inspections of vehicles to ensure they are in a state of adequate repair prior to operation.

## Lifecycle Management

The condition or performance of assets will deteriorate over time. To ensure vehicles are performing as expected, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Lifecycle replacement model is put into a 10-year capital plan which is reviewed annually to determine the best interventions to use based on mileage, time, and manufacturer's recommendations.

### Forecasted Capital Requirements

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

# Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within vehicles, based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 100% | 80-100 | 1 |
| | | | 60-79 | 2 |
| | | | 40-59 | 3 |
| | | | 20-39 | 4 |
| | | | 0-19 | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure for vehicles were calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (40%) | Replacement Cost | 100% | <250,000 | 1 |
| | | | 250,000 - 500,000 | 2 |
| | | | 500,000 - 750,000 | 3 |
| | | | 750,000 - 1,500,000 | 4 |
| | | | >1,500,000 | 5 |
| Operational (40%) | AMP Segment | 100% | Light Duty | 1 |
| | | | Medium Duty | 2 |
| | | | Heavy Duty | 3 |
| | | | Fire Truck, Plow Truck | 5 |
| Service Delivery (20%) | AMP Segment | 100% | Light Duty Pick Up Trucks | 1 |
| | | | Light Duty Vehicle | 2 |
| | | | Medium Duty Trucks | 3 |
| | | | Heavy Duty Trucks | 4 |
| | | | Fire Trucks, Plow Trucks | 5 |

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

*Figure 20: Vehicles Risk Breakdown*

| 1 - 4<br>Very Low<br>$1,893,560<br>(10%) | 5 - 7<br>Low<br>$4,714,365<br>(26%) | 8 - 9<br>Moderate<br>$3,043,162<br>(17%) | 10 - 14<br>High<br>$4,817,056<br>(26%) | 15 - 25<br>Very High<br>$3,712,792<br>(20%) |
|---|---|---|---|---|

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

# Growth Management

## Trends

Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new vehicles. Between DC bylaw and developer contributed assets, the core infrastructure is expected to nearly double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

From 2023 to 2032 the estimated replacement cost of vehicles is expected to grow by $9,170,000 based on maintaining the current levels of service.

# Levels of Service

## Current Levels of Service

The following tables identify the Town's current level of service for vehicles. These metrics include the community level of service and technical levels of service the Town is recommending.

*Table 21: Vehicles Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description of the municipal services supported by vehicles | Vehicles support the delivery of municipal services through the support of several service areas, including:<br>• Plow vehicles for winter control activities<br>• Recreation vehicles to provide park management<br>• Admin vehicles for building permit and inspection services<br>• Fire Trucks for emergencies or protective services | Scope | Replacement Cost | $18,180,935 |
| | | | Quantity | 64 |
| Description of the services being provided | The Town's vehicles are providing service that is reliable and sustainable while ensuring affordability | Reliable | Average condition | Fair (47%) |
| | | | % Condition > Fair | 68% |
| | | | % Condition poor and very poor | 32% |
| | | Sustainable | % Risk that is High and Very High | 46% |
| | | Affordable | Capital re-investment | $778,268 |
| | | | Capital re-investment rate | 4.28% |

## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

The current average condition of the Town's vehicles are rated as "Fair", with a condition score of 47. However, under Scenario 1 (maintaining current funding levels), this is projected to decline to a score of 29, "Poor", by 2051.

To maintain a minimum condition of "Fair" as outlined in Scenario 2, an additional $252,000 per year in funding is required. To meet the proposed level of service in Scenario 3, which targets maintaining an average condition of "Good", an annual funding increase of approximately $757,000 is needed.

*Table 14: Vehicles Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | $252K | $757M | $976K |

# Appendix E: Machinery and Equipment

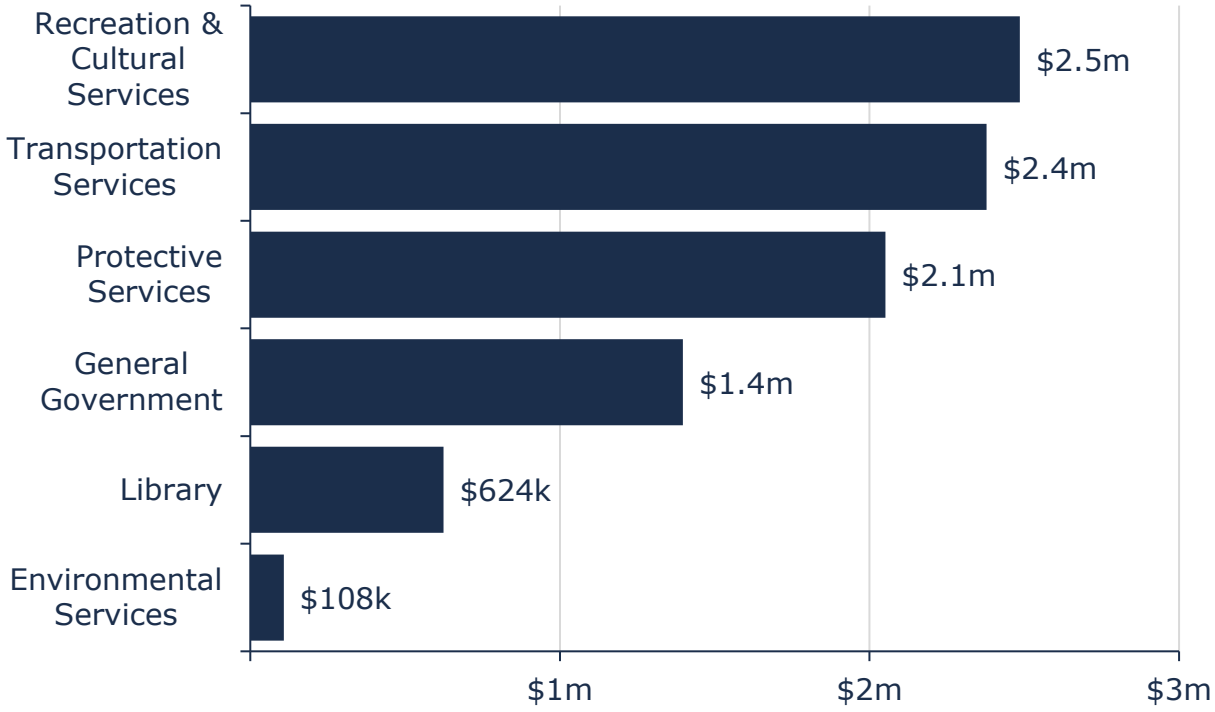
To maintain the quality stewardship of East Gwillimbury's infrastructure and support the delivery of services, municipal staff own and employ various types of equipment. This includes:

- Computers, furniture and phone systems to support all municipal services
- Engineering and Public Works equipment to support roadway maintenance
- Fire equipment to support emergency services
- Library, Parks and Recreation equipment to support recreation programs

## Inventory and Valuation

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

*Figure 22: Machinery and Equipment Replacement Costs*

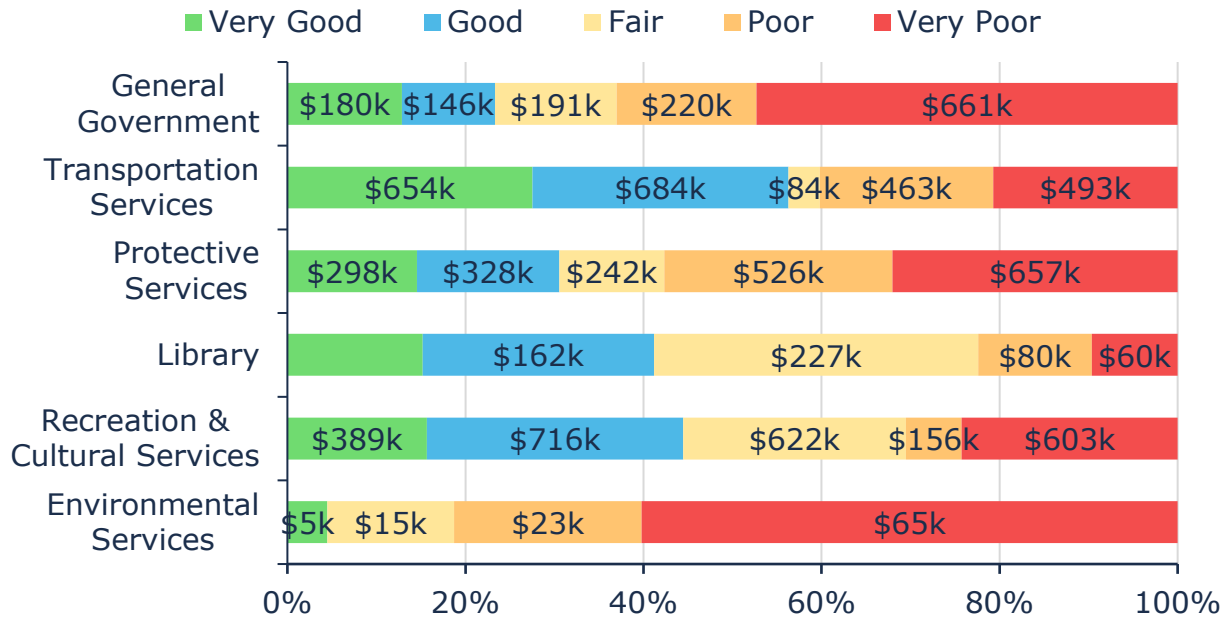



Each asset's replacement cost should be reviewed periodically to determine if adjustments are needed to more accurately represent capital requirements.

## Asset Condition

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

*Figure 23: Machinery and Equipment Condition Breakdown*




To ensure that the Towns's machinery and equipment continues to provide an acceptable level of service, East Gwillimbury 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.

Accurate and reliable condition 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

The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meet the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration. Machinery and equipment have identified lifecycles and through use and staff recommendations are replaced on the schedule developed. Maintenance is performed based on manufacturers' recommendations for equipment with regulatory requirements, for example fire equipment.

## Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that should be allocated towards funding rehabilitation and replacement needs.

# Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within machinery and equipment, based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 100% | 80-100 | 1 |
| | | | 60-79 | 2 |
| | | | 40-59 | 3 |
| | | | 20-39 | 4 |
| | | | 0-19 | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure of machinery and equipment was calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (50%) | Replacement Cost | 100% | <250,000 | 1 |
| | | | 250,000 - 500,000 | 2 |
| | | | 500,000 - 750,000 | 3 |
| | | | 750,000 - 1,500,000 | 4 |
| | | | >1,500,000 | 5 |
| Operational (50%) | Ops Segment | 50% | Computer Equipment, Library Material, AV Equipment, Networking Components | 1 |
| | | | Motorized Equipment | 3 |
| | | | Emergency Equipment (Fire, Snow Removal, Personal Protection, Defibrillator) | 5 |

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

*Figure 24: Machinery and Equipment Risk Breakdown*

| 1 - 4<br>Very Low | 5 - 7<br>Low | 8 - 9<br>Moderate | 10 - 14<br>High | 15 - 25<br>Very High |
|---|---|---|---|---|
| $3,290,184<br>(36%) | $3,498,530<br>(39%) | $1,520,076<br>(17%) | $253,272<br>(3%) | $483,336<br>(5%) |

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

# Growth Management

## Trends

Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new machinery and equipment. Between DC bylaw and developer contributed assets, the core infrastructure is expected to nearly double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

From 2023 to 2032 the estimated replacement cost of machinery and equipment is expected to grow by $3,412,400 based on maintaining the current levels of service.

# Levels of Service

## Current Levels of Service

The following tables identify the Town's current level of service for machinery and equipment. These metrics include the community level of service and technical levels of service the Town is recommending.

*Table 25: Machinery & Equipment Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description of the municipal services supported by machinery and equipment | To maintain the quality stewardship of East Gwillimbury's infrastructure and support the delivery of services, municipal staff own and employ various types of equipment. This includes: | Scope | Replacement Cost | $9,045,398 |
| | • Computers, furniture and phone systems to support all municipal services | | | |
| | • Engineering and Public Works equipment to support roadway maintenance | | | |
| | • Fire equipment to support emergency services | | | |
| | • Library, Parks and Recreation equipment to support recreation programs | | Quantity | 61,971 |
| Description of the services being provided | The Town's machinery and equipment are providing service that is reliable and sustainable while ensuring affordability | Reliable | Average condition | Fair (44%) |
| | | | % Condition > Fair | 56% |
| | | | % Condition poor and very poor | 44% |
| | | Sustainable | % Risk that is High and Very High | 8% |
| | | Affordable | Capital re-investment | $568,411 |
| | | | Capital re-investment rate | 6.28% |

## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

The current average condition of the Town's machinery and equipment are rated as "Fair", with a condition score of 44. Under Scenario 1, which maintains current funding levels, this is projected to decline to "Poor"—a score of 35—by 2051.

To maintain the minimum condition of "Fair" as defined in Scenario 2, an additional $141 thousand per year in funding is required. To achieve the proposed level of service in Scenario 3, targeting an average condition of "Good", an annual funding increase of approximately $416 thousand is needed.

*Table 15: Machinery and Equipment Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | $141K | $416K | $512K |

# Appendix F: Road Network

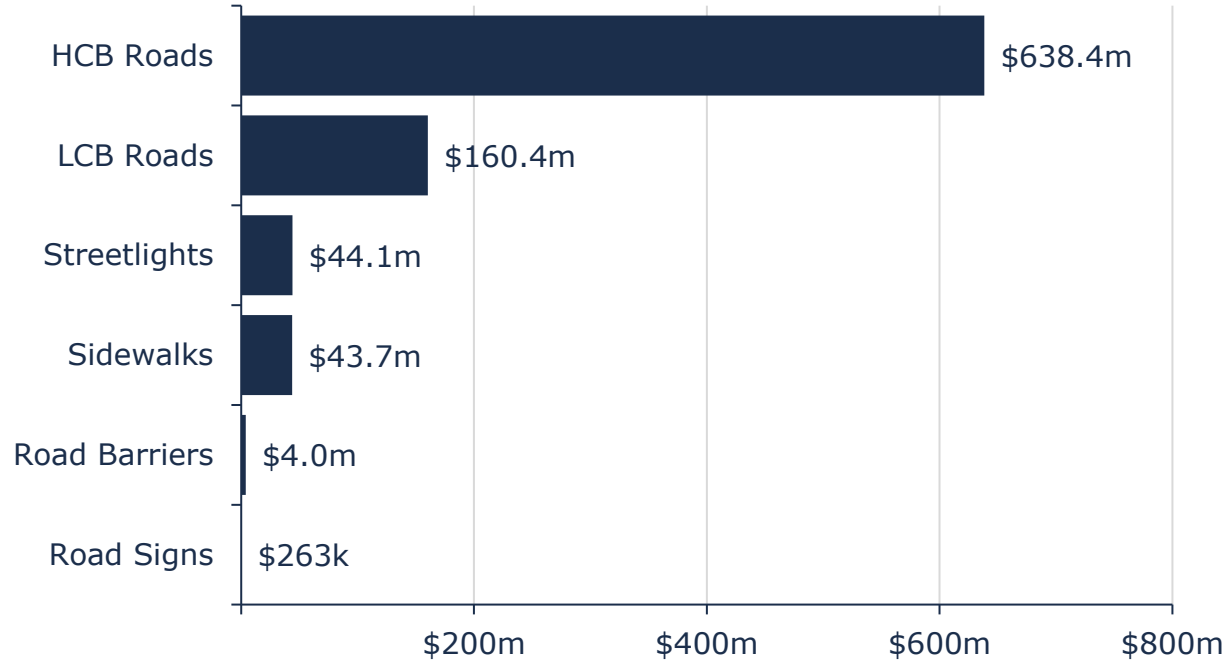
East Gwillimbury's road network comprises the third largest share of its infrastructure portfolio, with a current replacement cost of $890 million, distributed primarily between asphalt roads and surface treated roads.

The Town also owns and manages other supporting infrastructure and capital assets, including sidewalks, road signs, road barriers and streetlights.

## Inventory and Valuation

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

*Figure 26: Road Network Replacement Value*

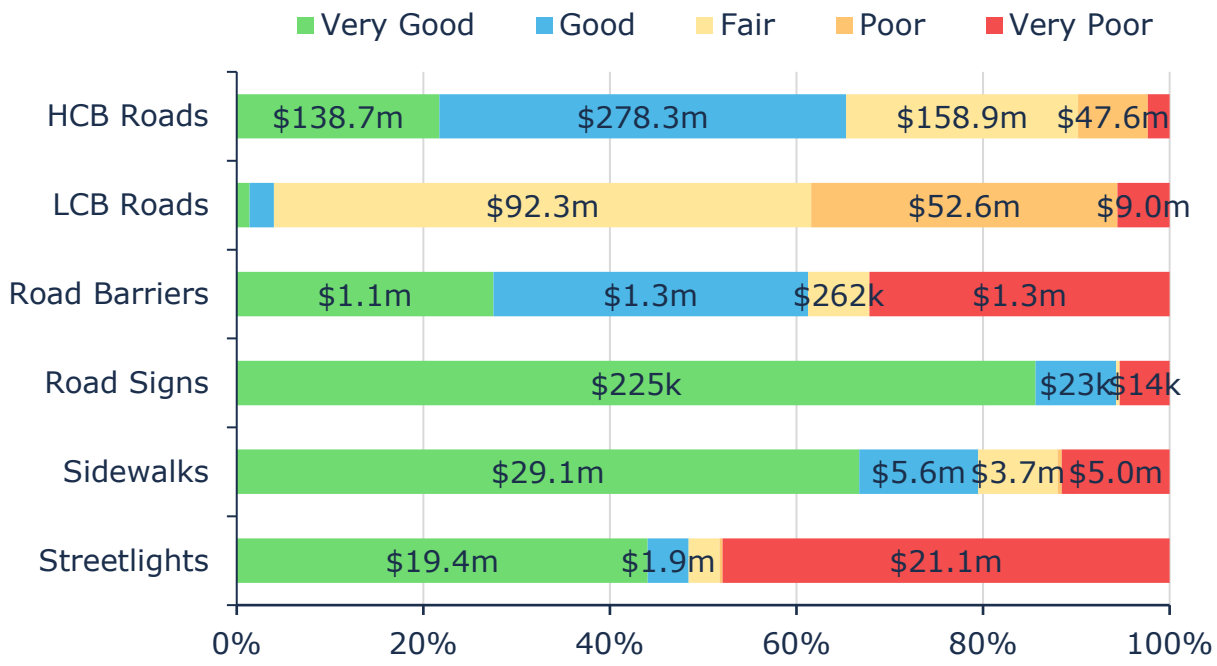



Each asset's replacement cost should be reviewed periodically to determine if adjustments are needed to more accurately represent realistic capital requirements. As shown in Figure 26, there is a 226% increase in replacement value compared to the costs reported in the 2024 AMP. This significant increase is primarily due to updated estimated costs based on the Development Charges background study. In contrast, the 2024 figures were based on inflated 2021 costs.. Additionally, rising material costs and the inclusion of more high-cost HCB roads, which are more expensive to construct than LCB roads, contributed to this increase.

## Asset Condition

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

*Figure 27: Road Network Condition Breakdown*




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

Each asset's estimated useful life should also be reviewed periodically to determine if adjustments need to be made to better align with the observed length of service life for each asset type.

Accurate and reliable condition 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 is described below.

The condition of roads is collected every two years by an external consultant, utilizing a detailed visual inspection of the entire network. A pavement condition index (PCI) and surface distress index (SDI) are calculated from observed defects, geometry and drainage, and rideability.

Streetlights, barriers, sidewalks, signs, and signals are assessed through a combination of age-based conditions, where the useful life and age is used to estimate deterioration, inspection records where defects are noted, and engineering

studies. Road network assets are being inspected regularly, in compliance with industry standards and regulatory requirements.

## Lifecycle Management

Infrastructure assets provide the Town value by enabling the delivery of key services. Over time these assets will deteriorate, which will lower the service they provide. The road network is organized into functional classes and maintenance classes, which determine the level of maintenance they require, the type of traffic they can accommodate, speed limit, and volume of traffic.

Asphalt and surface treated roads are triggered for rehabilitation and replacement via the decision trees developed by Stantec's PMS. Results were obtained by running the model over a 50-year period with an unconstrained budget and optimized for cost effectiveness. This scenario best accounts for the current levels of service, as it determines the rehabilitation program for lifecycle needs at the lowest cost option.

The renewal and replacement strategy for asphalt roads uses a combination of pavement preservation techniques, thin asphalt milling and resurfacing, full asphalt milling and resurfacing and reconstruction. Surface treated roads are generally resurfaced on a regular cycle when the pavement condition index drops below 55. Specific triggers for these activities are dependent on numerous factors, including pavement condition index, surface distress index, roadside class, and material.

### Forecasted Capital Requirements

The annual capital requirement represents the average amount that should be allocated each year to support the rehabilitation and replacement of assets.

## Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within the road network, based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 100% | 85-100 | 1 |
| | | | 70-84 | 2 |
| | | | 55-69 | 3 |
| | | | 40-54 | 4 |
| | | | 0-39 | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure for Road network were calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (40%) | GIS – Roadside Environment | 100% | Rural Section | 1 |
| | | | Semi Urban Section | 3 |
| | | | Urban Section | 5 |
| Operational (60%) | GIS – MMS Class | 50% | 6 | 1 |
| | | | 5 | 2 |
| | | | 4 | 3 |
| | | | 3 | 4 |
| | | | 1, 2 | 5 |
| | GIS – Roadside Class | 50% | 6 | 1 |
| | | | 5 | 2 |
| | | | 4 | 3 |
| | | | 3 | 4 |
| | | | 1, 2 | 5 |

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

*Figure 28: Road Network Risk Breakdown*

| 1 - 4<br>Very Low | 5 - 7<br>Low | 8 - 9<br>Moderate | 10 - 14<br>High | 15 - 25<br>Very High |
|---|---|---|---|---|
| $186,676,307<br>(21%) | $513,316,638<br>(58%) | $189,078,270<br>(21%) | $1,696,036<br>(<1%) | -<br>(0%) |

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

# Growth Management

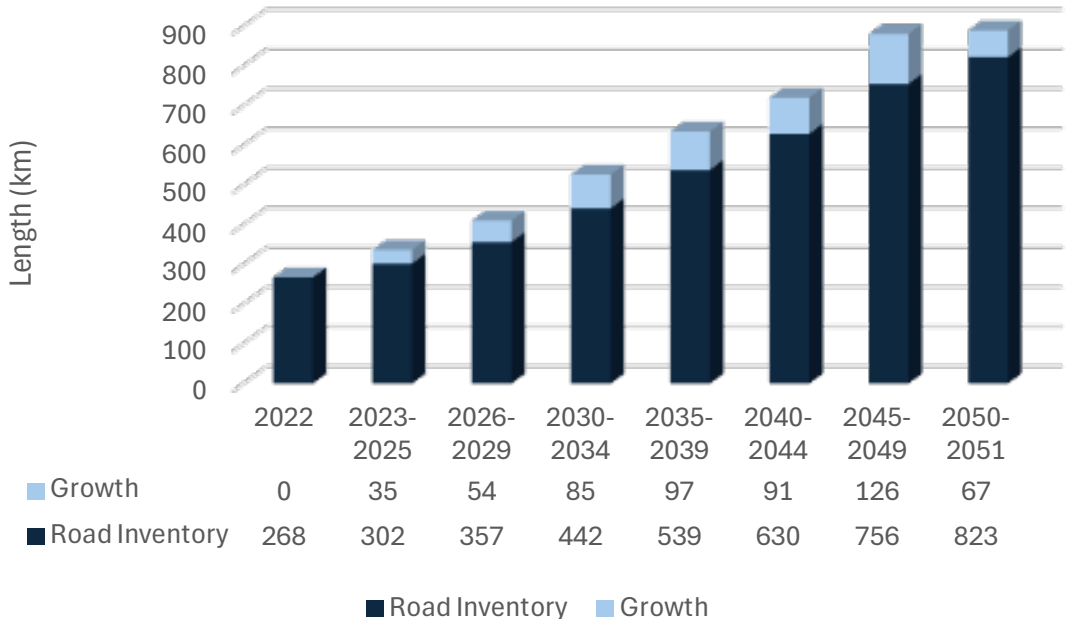
## Trends

Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new road network infrastructure. Between DC bylaw and developer contributed assets, the core infrastructure is expected to nearly double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

*Figure 29: Road Network Growth Estimate*



# Levels of Service

## Current Levels of Service

The following tables identify the Town's current level of service for the road network. These metrics include the community level of service and technical levels of service the Town is recommending, as well as those prescribed by the O.Reg.588/17.

*Table 30: Road Network Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description, which may include maps of the road network in the municipality and its level of connectivity | See Figure 31: Road Network by Class | Scope | Replacement Cost | $890,767,250 |
| | | | Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km$^2$) | 0 |
| | | | Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km$^2$) | 0.472 |
| | | | Lane-km of local roads (MMS classes 5 and 6) per land area (km/km$^2$) | 1.488 |
| Description or images that illustrate the different levels of road class pavement condition | See Figure 32: Images of Pavement Condition for the description of road condition | Reliable | Average pavement condition index for paved roads | 70.6 |
| | | | Average surface condition for unpaved roads (e.g. excellent, good, fair, poor) | N/A |
| | | | Average condition | Good (70%) |
| | | | % Condition > Fair | 83% |
| | | | % Condition poor and very poor | 17% |
| | | Sustainable | % Risk that is High and Very High | <1% |
| | | Affordable | Capital re-investment | $3,360,542 |
| | | | Capital re-investment rate | 0.38% |

## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

For the purpose of analysis, the road network was separated into road assets (HBC and LBC paved roads) and roadside assets (sidewalks, streetlights, traffic signs).

When analyzed together, the current average condition of the road network is "Good" with a condition score of 70.

Under Scenario 1, the condition for roadside assets is projected to decline to a score of 32, "Poor", by 2051. Over the same period, the average condition for road assets is projected to have a score of 66, "Good".

The following analysis focuses on roadside assets.

For roadside assets, to maintain a minimum condition of "Fair" as outlined in Scenario 2, an additional $274,000 per year in funding is required. To meet the proposed level of service in Scenario 3, which targets maintaining an average condition of "Good", an annual funding increase of approximately $1.1 million is needed.

*Table 16: Road Network Proposed LOS Scenario Analysis*

| | Scenario 2 (roadside assets): Condition "Fair" | Scenario 3 (roadside assets): Condition "Good" | Scenario 4 (all assets): Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | $274K | $1.1M | $11M |

*Figure 31: Road Network by Class*

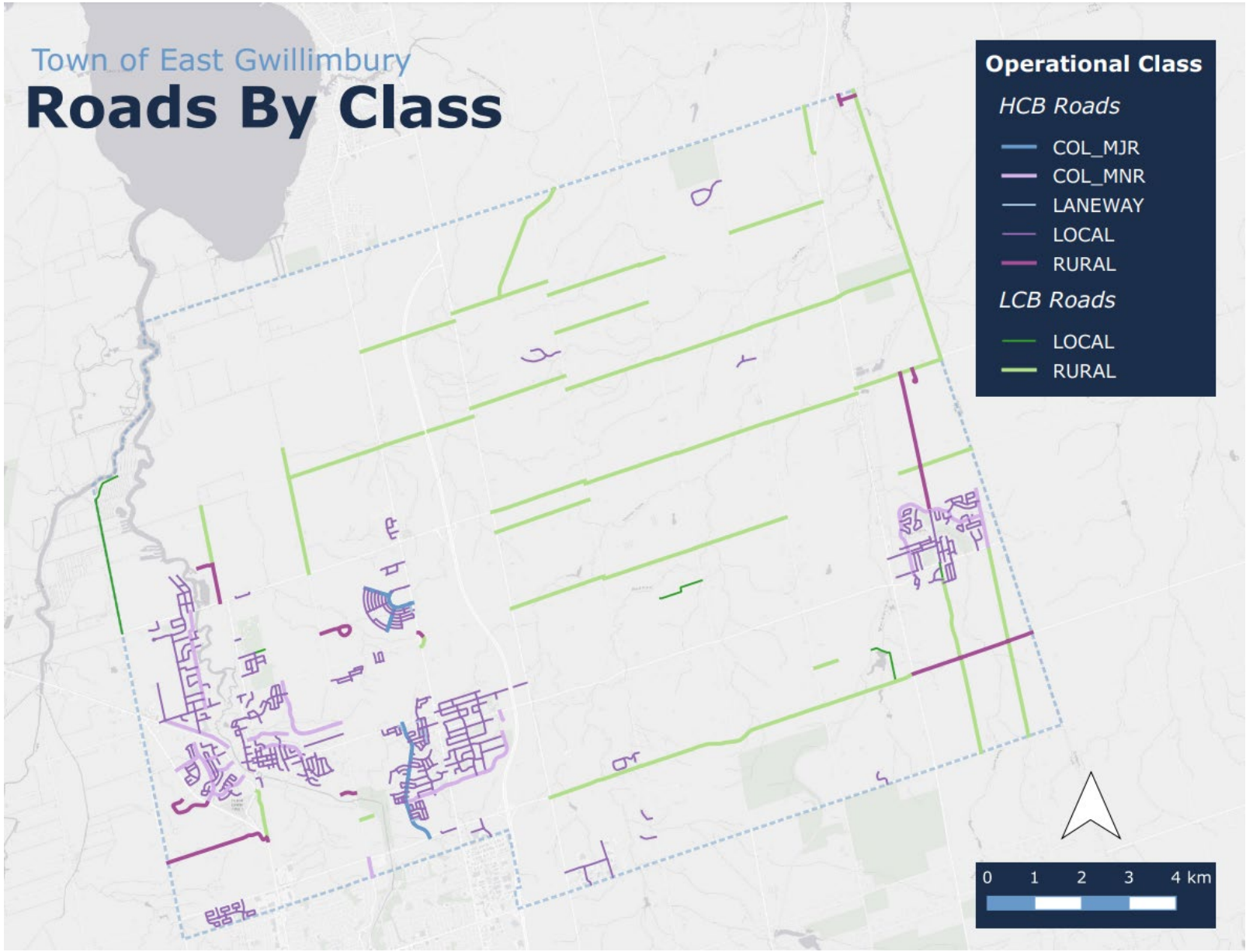
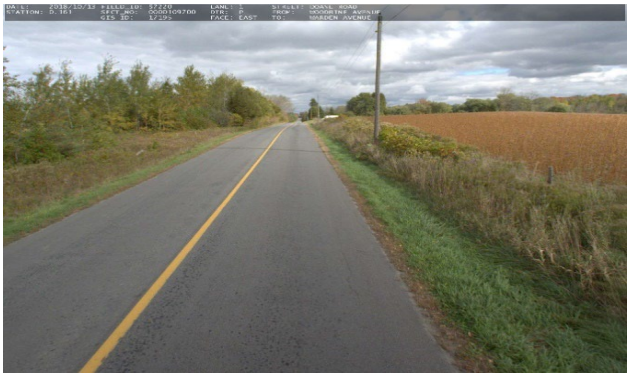


*Figure 32: Images of Pavement Condition*

Very Good




Good

Fair




Poor




Very Poor





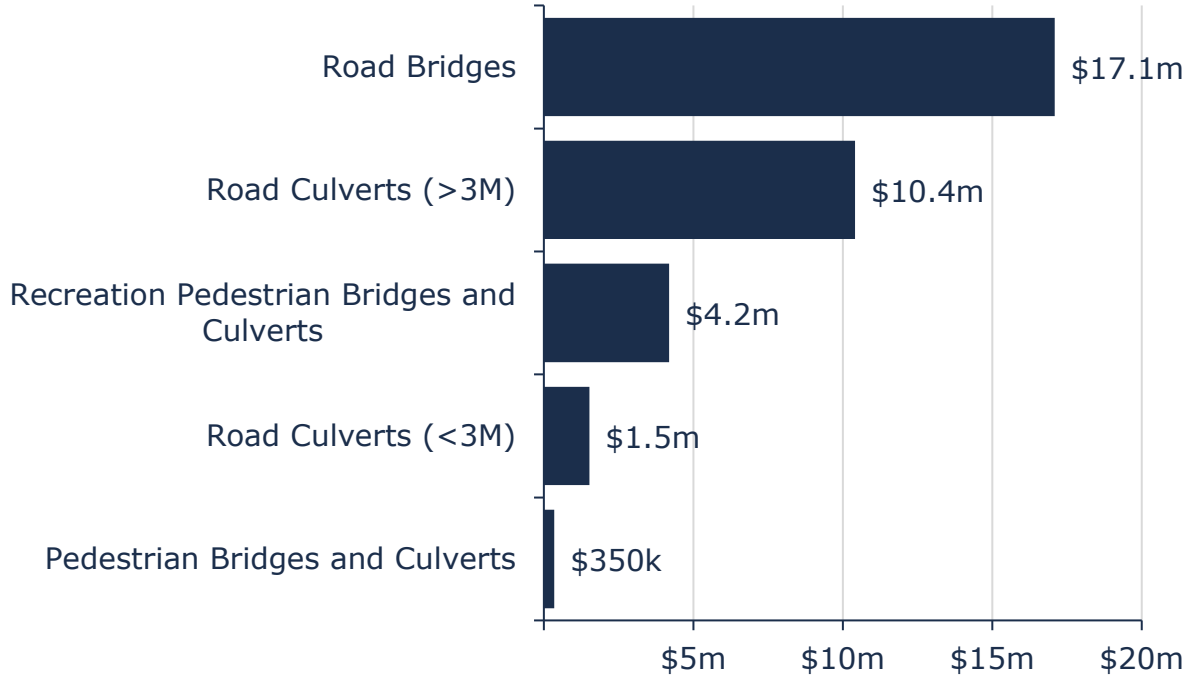
# Appendix G: Bridges and Culverts

Bridges and culverts (B&C) represent the combination of road and pedestrian bridges and culverts greater than 3m and less than 3m.

## Inventory and Valuation

Figure 33 below displays the replacement cost of each asset segment in the Town's bridges and culverts inventory.

*Figure 33: Bridges & Culverts Replacement Cost*

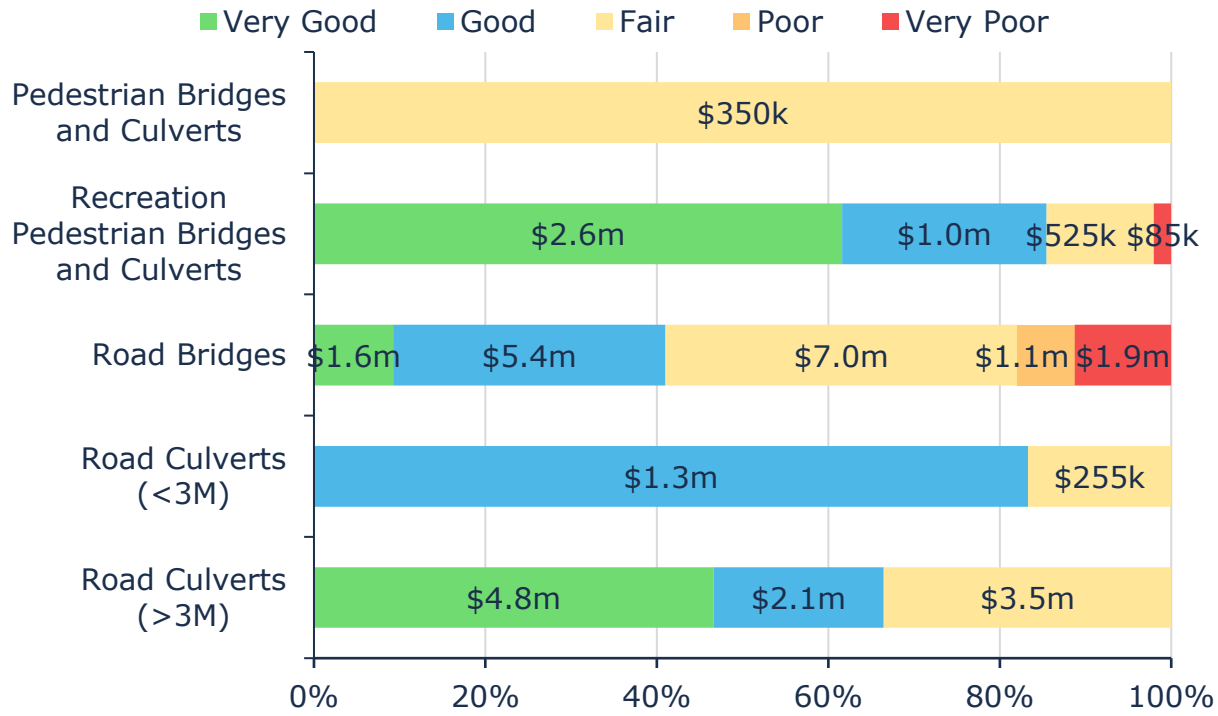



Each asset's replacement cost should be reviewed periodically to determine if adjustments are needed. This can be included in the Ontario Structures Inspection Manual (OSIM) inspections as the replacement cost is part of the calculation for the bridge condition index (BCI).

## Asset Condition

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. Accurate and reliable condition allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The condition of bridges and structural culverts is established via biennial inspections, which produce a bridge condition index (BCI) score for each structure, as well as detailed condition information on each structure element.

*Figure 34: Bridges and Culverts Condition Breakdown*




Bridges and structural culvert deficiencies are documented in detail as part of the biennial OSIM inspection process. Loading and dimensional restrictions and criticality of deficiencies are identified for each structure. The condition scale for bridges and culverts utilized is from 0 to 100 from Very Poor to Very Good.

*Table 17: Bridges and Culvert Condition Scale*

| Condition Category | BCI Range | Description |
|---|---|---|
| Very Good | 85 - 100 | Bridges/culverts in very good condition do not require any corrective maintenance or rehabilitation. Structures are fully operational. |
| Good | 70 - 84 | Bridges good condition may require some corrective maintenance. Bridges/culverts are fully operational. |
| Fair | 55 - 69 | Bridges in fair condition would have some deficiencies and may require minor to major rehabilitation. These bridges are typically fully operational, but in some cases can have restrictions placed. |
| Poor | 40 - 54 | Bridges in poor condition require major rehabilitation or replacement. These bridges may have load or dimensionality restrictions placed on them. In some cases, these structures could be closed. |
| Very Poor | 0 - 39 | Bridges in very poor condition require major rehabilitation or replacement. These bridges likely have load or dimensionality restrictions placed on them. In many cases, these structures could be closed. |

# Lifecycle Management

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

Bridge and culvert renewals are scheduled as per the cost estimates and timelines recommended by the latest OSIM inspection report for road and pedestrian bridges and culverts.

## Forecasted Capital Requirements

The annual capital requirement represents the average amount that should be allocated each year to support the rehabilitation and replacement of assets.

OSIM condition assessments and a robust risk framework will ensure that high-criticality assets receive proper and timely lifecycle intervention, including rehabilitation and replacement activities.

# Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within the bridges and culvert category, based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 100% | 85-100 | 1 |
| | | | 70-84 | 2 |
| | | | 55-69 | 3 |
| | | | 40-54 | 4 |
| | | | 0-39 | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure for bridges and culverts were calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (40%) | Replacement Cost | 60% | <25,000 | 1 |
| | | | 25,000 - 150,000 | 2 |
| | | | 150,000 - 500,000 | 3 |
| | | | 500,000 - 1,000,000 | 4 |
| | | | >1,000,000 | 5 |

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

*Figure 35: Bridges and Culvert Risk Breakdown*

| 1 - 4 | 5 - 7 | 8 - 9 | 10 - 14 | 15 - 25 |
|---|---|---|---|---|
| **Very Low** | **Low** | **Moderate** | **High** | **Very High** |
| $1,190,000 (4%) | $13,511,071 (40%) | $10,900,000 (32%) | $6,363,144 (19%) | $1,600,000 (5%) |

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

# Growth Management

## Trends

Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new bridges and culvert infrastructure. Between DC bylaw and developer contributed assets, the core infrastructure is expected to nearly double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

# Levels of Service

## Current Levels of Service

The following tables identify the Town's current level of service for bridges and culverts. These metrics include the community level of service and technical levels of service the Town is recommending, as well as those prescribed by the O.Reg.588/17.

*Table 36: Bridges and Culverts Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists) | The Town's bridges support a range of traffic types, including heavy and light vehicles, pedestrians and cyclists. They are used as part of major transportation routes that accommodate all types of travel including emergency response, transportation of goods/services, and personal travel. See Figure 43: Bridges and Culverts Site Location Map | Scope | Replacement Cost | $33,564,215 |
| | | | % of bridges in the Town with loading or dimensional restrictions | 17% |
| Description or images of the condition of bridges and how this would affect use of the bridges | See Figure 38: Images of Bridge and Culvert Condition | Reliable | Average bridge condition index value for bridges in the Town | Good (67%) |
| Description or images of the condition of culverts and how this would affect use of the culverts | See Figure 38: Images of Bridge and Culvert Condition | | Average bridge condition index value for structural culverts in the Town | Very Good (83%) |
| | The Town's bridges and culverts provide | | Average Condition | Good (75%) |

| | | | | |
|---|---|---|---|---|
| Description of the services being provided | quality services that are reliable and sustainable while ensuring affordability | | % Condition > Fair | 91% |
| | | | % Condition poor and very poor | 9% |
| | | Sustainable | % Risk that is High and Very High | 24% |
| | | Affordable | Capital re-investment | $111,489 |
| | | | Capital re-investment rate | 0.33% |

## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

The current average condition of the Town's bridges and culverts are rated as "Good", with a condition score of 75. However, under Scenario 1 (maintaining current funding levels), the bridges and culverts condition is projected to decline to a score of 34, "Poor", by 2051.

To maintain a minimum condition of "Fair" as outlined in Scenario 2, an additional $91,000 per year in funding is required. To meet the proposed level of service in Scenario 3, which targets maintaining an average condition of "Good", an annual funding increase of approximately $360,000 is needed

*Table 18: Bridges and Culverts Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | $91K | $360K | $427K |

*Figure 37: Bridges and Culverts Site Location Map*

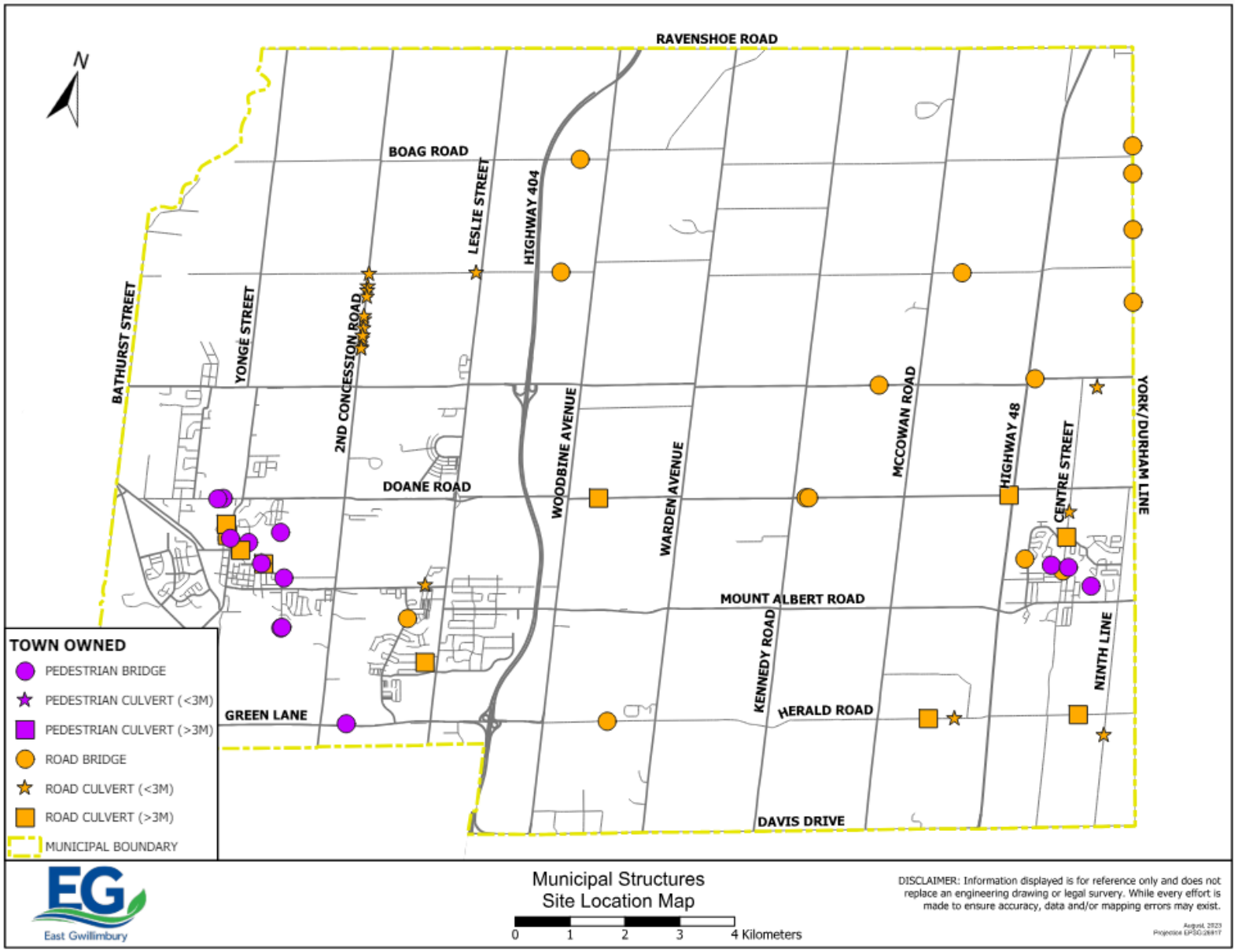
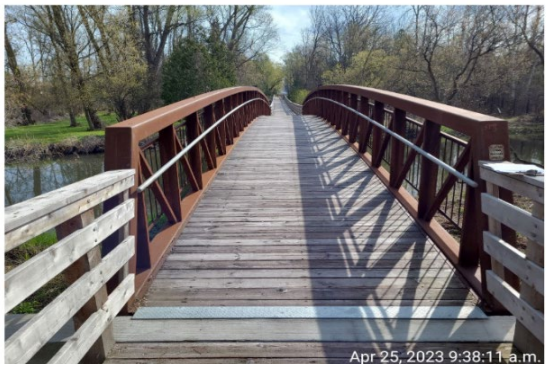


*Figure 38: Images of Bridge and Culvert Condition*

**Very Good -** Oriole Drive Pedestrian Bridge




**Good -** Herald Road Culvert





**Fair -** Pony Hill Bridge





**Poor -** Marles Bridge






# Appendix H: Stormwater Network

East Gwillimbury's stormwater network is the largest category of all the municipal infrastructure with a total replacement cost of $757 million.

## Inventory and Valuation

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

*Figure 39: Stormwater Network Replacement Cost*

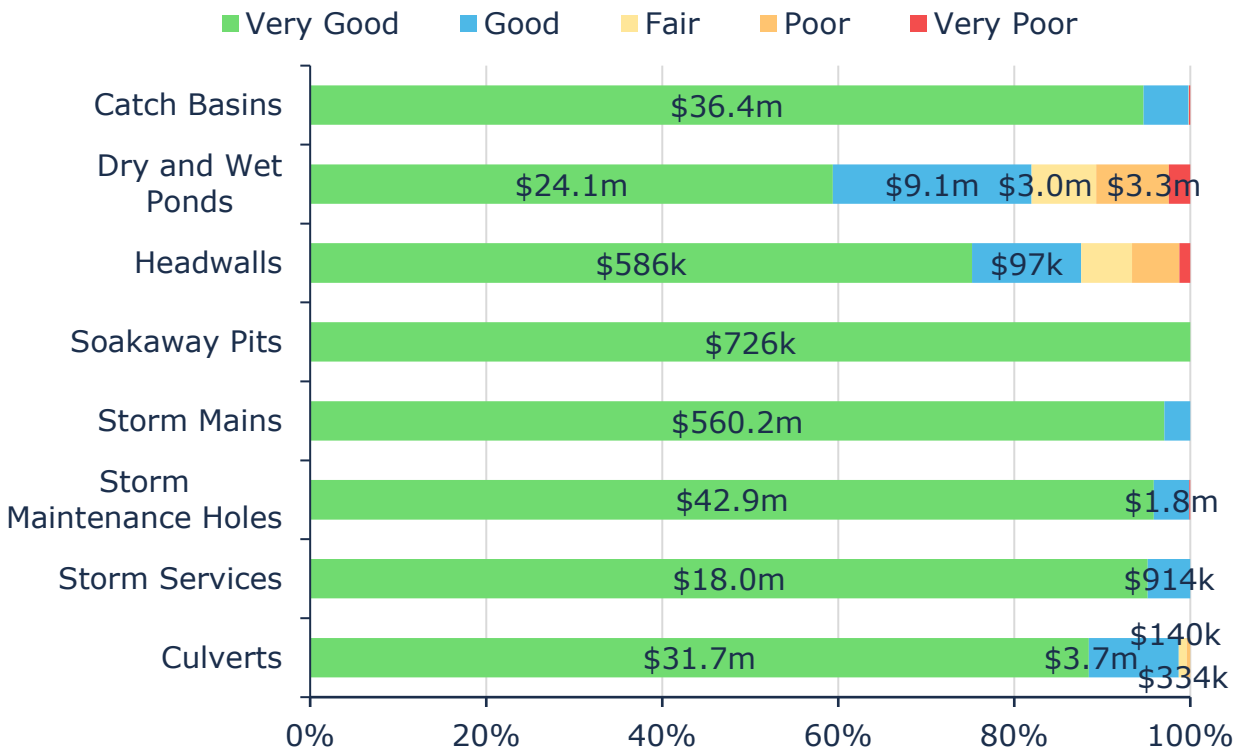



Storm services include foundation drain collector (FDC) sewer service and storm service.

## Asset Condition

The graph below visually illustrates the average condition for each asset segment on a very good to very poor scale. To ensure that the Towns's stormwater network continues 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 the combination of activities required to increase the overall condition of the stormwater network.

*Figure 40: Stormwater Network Condition Breakdown*




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. Results from culvert inspections have been transformed to a 1 – 5 condition rating scale. Stormwater mains are assessed for defects, and a condition score can be developed if a rating criterion is determined. There is no industry standard for converting asset conditions to the 5-tier condition rating of very good to very poor, so staff should develop an internal methodology to adopt.

Some storm ponds have been assessed for sediment loads, in which case the assessed ponds have a condition score equal to the % sediment fill. Storm ponds and other assets that have not been assessed rely on age-based conditions.

Age-based condition is calculated by prorating the age of the asset over its useful life. These condition ratings are transformed to a 0 – 100 condition rating scale, spread across five condition increments: very poor, poor, fair, good, very good.

## Lifecycle Management

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

Historically, the Town has inspected 10% of the piped storm sewer network per year using a closed-circuit television (CCTV). This work includes the gravity mains and manholes, but not the laterals. In addition to the network-wide inspection, sewer

mains are inspected prior to capital work, and those that are contributing to inflow and infiltration are inspected. Approximately 30% of catch basins and oil grit separators are inspected and cleaned each year. Culverts are inspected annually for blockages and other defects.

## Forecasted Capital Requirements

Although actual spending may fluctuate substantially from year to year, this figure is a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise. These projections and estimates are based on asset replacement costs and age analysis.

It is unlikely that all the mains will need to be replaced as forecasted. Coordinated projects, along with camera inspection data, will help drive replacements and rehabilitations.

# Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within the stormwater network category, based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 100% | 80-100 | 1 |
| | | | 60-79 | 2 |
| | | | 40-59 | 3 |
| | | | 20-39 | 4 |
| | | | 0-19 | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure for storm mains and services were calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (80%) | GIS - Size (mm) | 100% | 0-200 | 1 |
| | | | 201-399 | 2 |
| | | | 400-599 | 3 |
| | | | 600-999 | 4 |
| | | | 1,000+ | 5 |
| Operational (20%) | GIS - Easement | 100% | No | 1 |
| | | | Yes | 2 |

The consequences of failure for storm ponds were calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (40%) | Replacement Cost | 100% | <250,000 | 1 |
| | | | 250,000 - 500,000 | 2 |
| | | | 500,000 - 750,000 | 3 |
| | | | 750,000 - 1,500,000 | 4 |
| | | | >1,500,000 | 5 |
| Service Delivery (60%) | GIS – SWM Function | 100% | Quantity Control | 3 |
| | | | Quality and Quantity control | 5 |

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

*Figure 41: Stormwater Network Risk Breakdown*

| 1 - 4 Very Low | 5 - 7 Low | 8 - 9 Moderate | 10 - 14 High | 15 - 25 Very High |
|---|---|---|---|---|
| $607,550,524 (80%) | $131,629,005 (17%) | $13,294,939 (2%) | $3,851,739 (<1%) | $994,473 (<1%) |

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

# Growth Management

## Trends

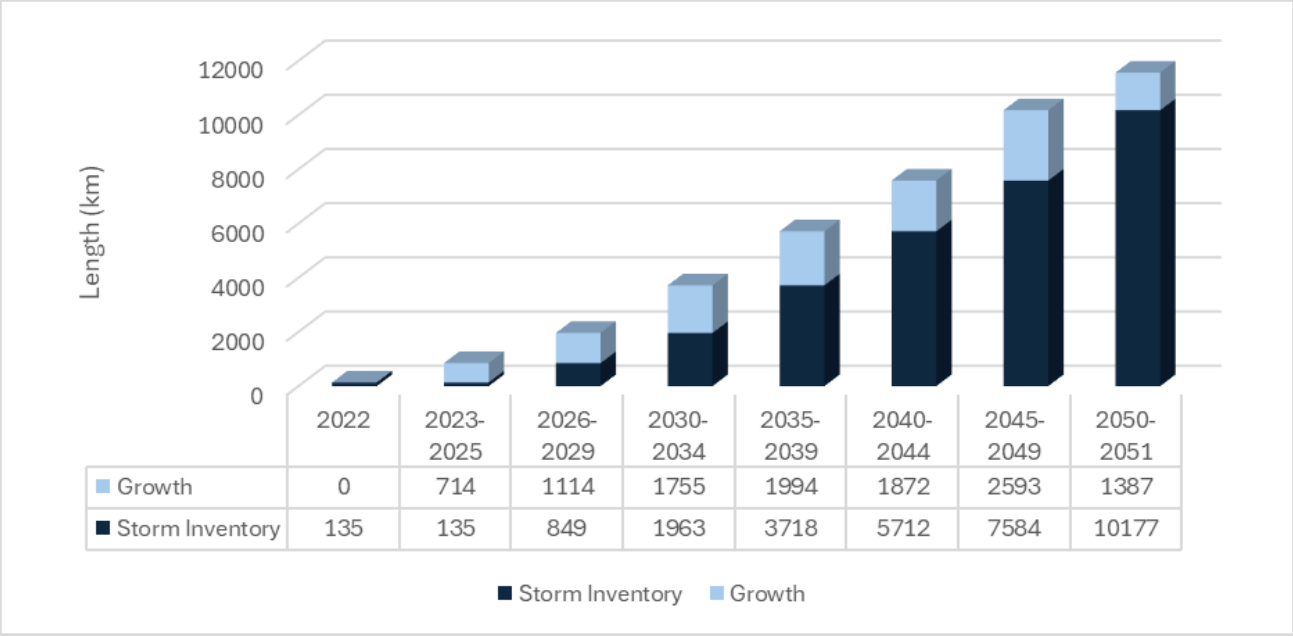
Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and

expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new stormwater infrastructure. Between DC bylaw and developer contributed assets, the core infrastructure is expected to nearly double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

*Figure 42: Stormwater Network Growth Estimate*




# Levels of Service

## Current Levels of Service

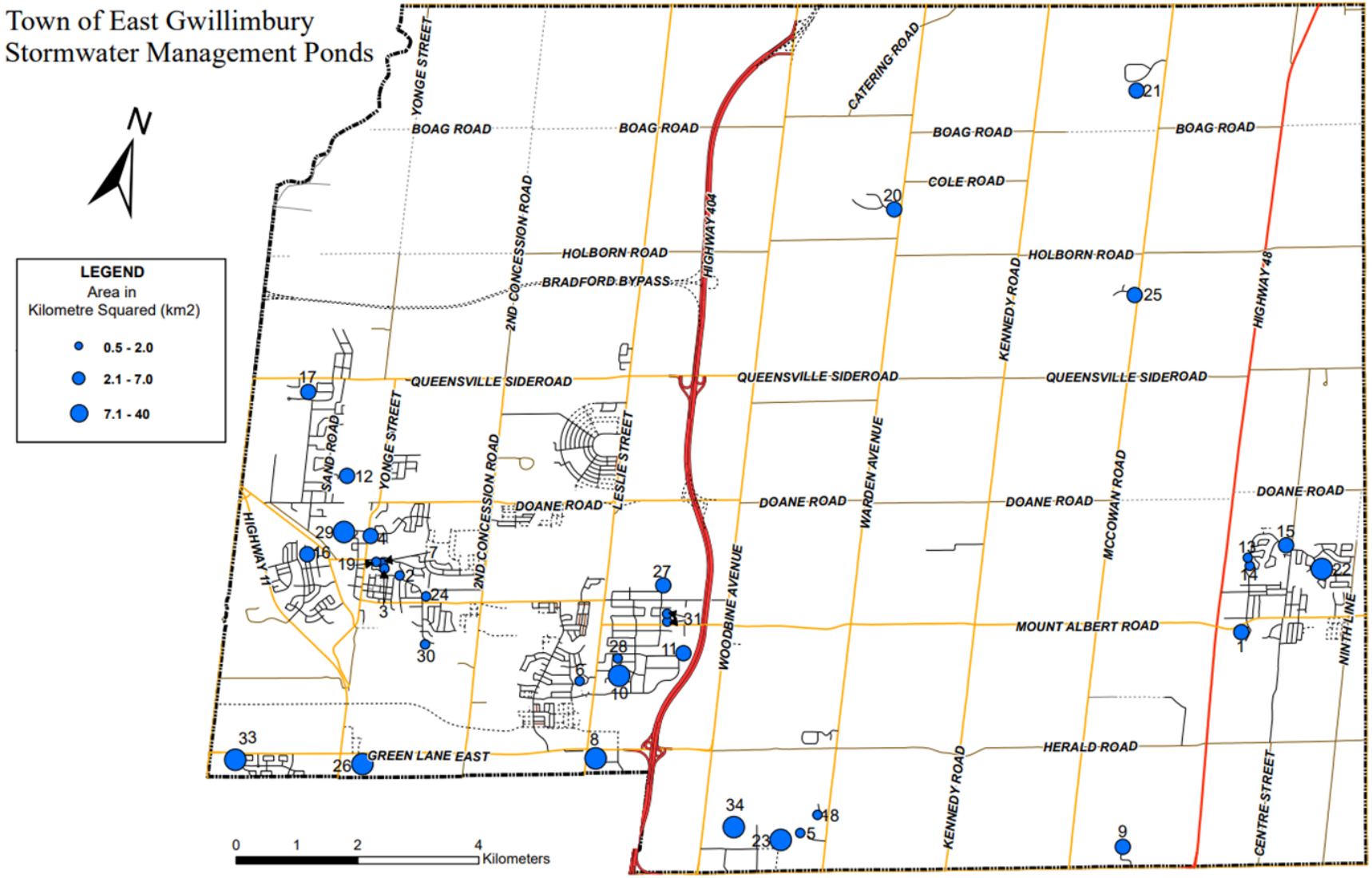
The following tables identify the Town's current level of service for the stormwater network. These metrics include the community level of service and technical levels of service the Town is recommending, as well as those prescribed by the O.Reg.588/17.

*Table 43: Stormwater Network Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description, which may include map, of the user groups | See Figure 44 Stormwater Ponds Map | Scope | Replacement Cost | $757,320,680 |
| | | | Quantity of mains (meters) | 179,861 |

| | | | | |
|---|---|---|---|---|
| or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater management system | | | % of properties in the municipality that are resilient to a 100-year storm | 99.35% |
| | | | % of the municipal stormwater management system resilient to a 5-year storm | 100% |
| Description of the services being provided | The Town's stormwater network is providing service that is reliable and sustainable while ensuring affordability | Reliable | Average condition | Very Good (93%) |
| | | | % Condition > Fair | 99% |
| | | | % Condition poor and very poor | 1% |
| | | Sustainable | % Risk that is High and Very High | 1% |
| | | Affordable | Capital re-investment | $0 |
| | | | Capital re-investment rate | 0.0% |

*Figure 44: Stormwater Ponds Map*



## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

The current average condition of the Town's stormwater network is rated as "Very Good", with a condition score of 93. However, under Scenario 1 (maintaining current funding levels), the stormwater network condition is projected to decline to a score of 78, "Good", by 2051.

To maintain a minimum condition of "Fair" as outlined in Scenario 2, as well to meet the proposed level of service in Scenario 3, which targets maintaining an average condition of "Good" the stormwater network maintains an adequate condition.

*Table 19: Stormwater Network Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | No increase in funding proposed at this time.[4] | | $9.9M |

The Town is currently undertaking a review of its stormwater program. A rate review and financial plan are in progress, and the resulting management strategy will be detailed and incorporated into future asset management plans and annual updates.

[4] Pending review of the Town's Stormwater program, with strategy to be incorporated into future plans and updates.

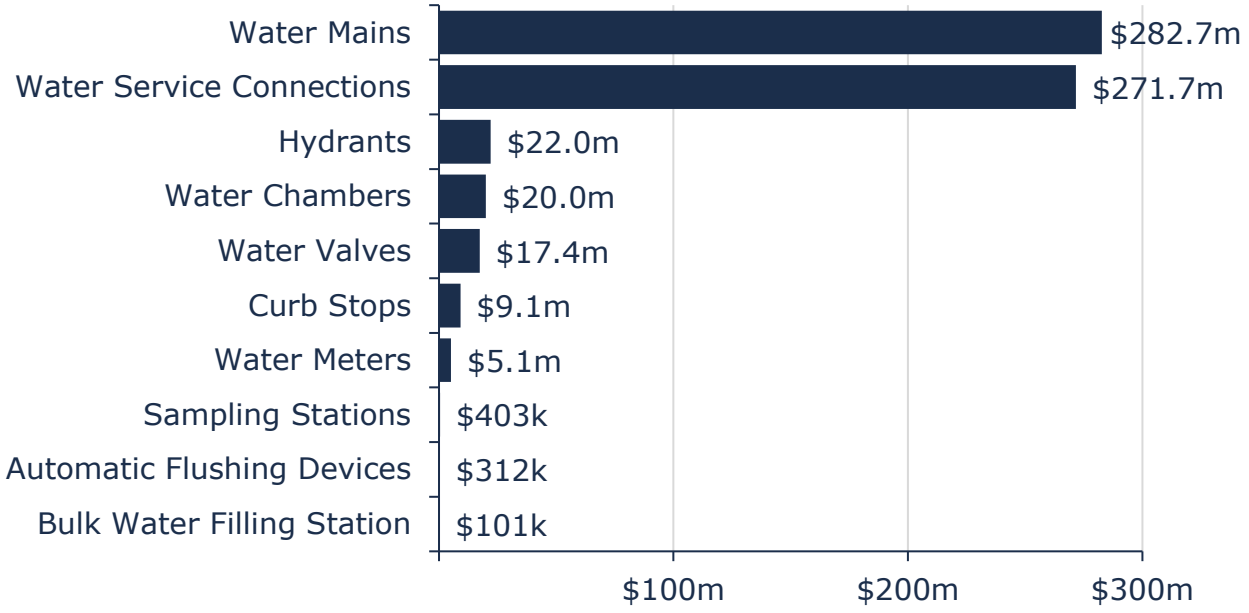
# Appendix I: Water Network

East Gwillimbury's water network is supplied by the Region of York treated water and is otherwise managed by the Town consisting of water distribution assets.

## Inventory and Valuation

The graph below displays the replacement cost of each asset segment in the Town's water network inventory. The system replacement value is approximately $629 million.

*Figure 45: Water Network Replacement Cost*

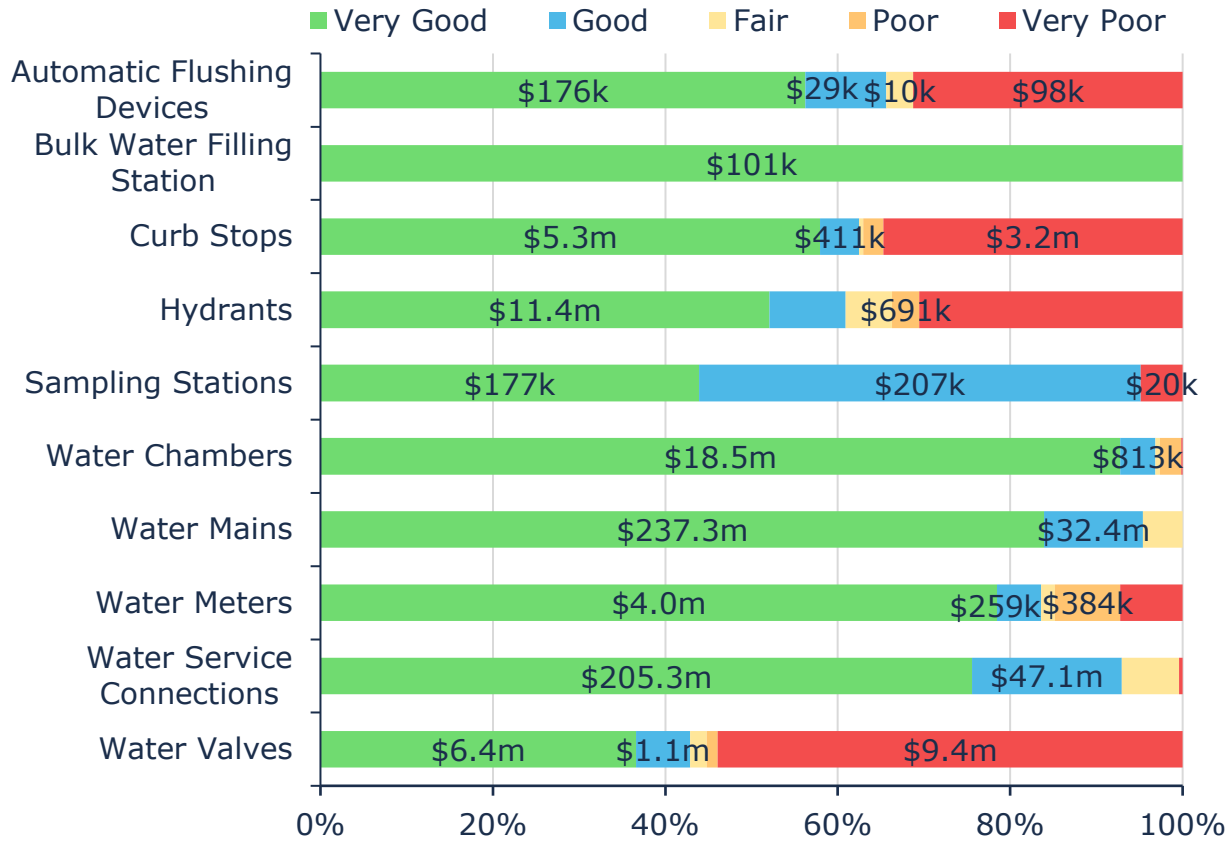



## Asset Condition

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

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

*Figure 46: Water Network Condition Breakdown*




Each asset's estimated useful life should also be reviewed periodically to determine if adjustments are needed based on actual performance. For watermains, the estimated useful life was extended following an industry review that found certain pipe materials last longer than initially estimated. The estimated useful lives used are as follows:

| Material | Current Estimated Useful Life | Updated Estimated Useful Life |
|---|---|---|
| PVC – Polyvinyl Chloride | 60 | 90 |
| AC – Asbestos Cement | 50 | 75 |
| DI – Ductile Iron | 60 | 60 |
| HDPE – High Density Polyethylene | 60 | 80 |

Accurate and reliable condition allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Water network assets are all assessed based on age and service life as it is not feasible to assess conditions in any other manner. Industry standard it to use age to assess condition of water network assets. Staff monitor and record breaks, hydrant issues, and valve issues, but these are not translated into an overall condition rating.

# Lifecycle Management

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

Annually, the Town completes a review of hazardous events and their risks which may occur in the system. Every three years the Town undertakes a full risk assessment and an emergency preparedness field exercise. Additionally, the Town assesses the functioning of the water system through inspections and operational activities, such as valve turning, water meter repairs, and hydrant maintenance. Auto-flushers are inspected monthly as part of a new program to monitor water loss within the system.

Renewal and replacement for the water network is a combination of reactive and proactive approaches. Due to the Drinking Water Quality Management System (DWQMS) regulations, the network is highly monitored and maintained. This increased oversight allows staff to fix upcoming problems proactively. However, projects such as the high-risk asbestos cement watermain replacements remain in the queue, providing a reactive approach if a break were to occur. There are currently no mid-life rehabilitation events proactively scheduled, rather, water assets are replaced at the end of their useful life.

## Forecasted Capital Requirements

Although actual spending may fluctuate substantially from year to year, forecasted capital requirements are a useful benchmark value for annual capital expenditure targets (or allocations to reserves) to ensure projects are not deferred and replacement needs are met as they arise.

# Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within the water network category, based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 75% | 80-100 | 1 |
| | | | 60-79 | 2 |
| | | | 40-59 | 3 |
| | | | 20-39 | 4 |
| | | | 0-19 | 5 |
| | GIS - Material | 25% | HDPE, PE,PVC | 1 |
| | | | Asbestos Cement, Copper, Ductile Iron | 3 |
| | | | Thin Wall PVC | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure for watermains and services was calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (50%) | GIS - Size (mm) | 60% | 0-50 | 1 |
| | | | 51-150 | 2 |
| | | | 151-300 | 3 |
| | | | 301-450 | 4 |
| | | | 451+ | 5 |
| Operational (50%) | GIS - Material | 50% | Copper, Ductile Iron, HDPE, PE, PVC, Thin Wall PVC | 1 |
| | | | Asbestos Cement | 5 |
| | GIS - Easement | 50% | No | 1 |
| | | | Yes | 5 |

The consequences of failure for all other components were calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (100%) | Replacement Cost | 100% | <250,000 | 1 |
| | | | 250,000 - 500,000 | 2 |
| | | | 500,000 - 750,000 | 3 |
| | | | 750,000 - 1,500,000 | 4 |
| | | | >1,500,000 | 5 |

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

*Figure 47: Water Network Risk Breakdown*

| 1 - 4<br>Very Low | 5 - 7<br>Low | 8 - 9<br>Moderate | 10 - 14<br>High | 15 - 25<br>Very High |
|---|---|---|---|---|
| $572,365,154<br>(91%) | $55,843,634<br>(9%) | $533,190<br>(<1%) | -<br>(0%) | -<br>(0%) |

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

# Growth Management

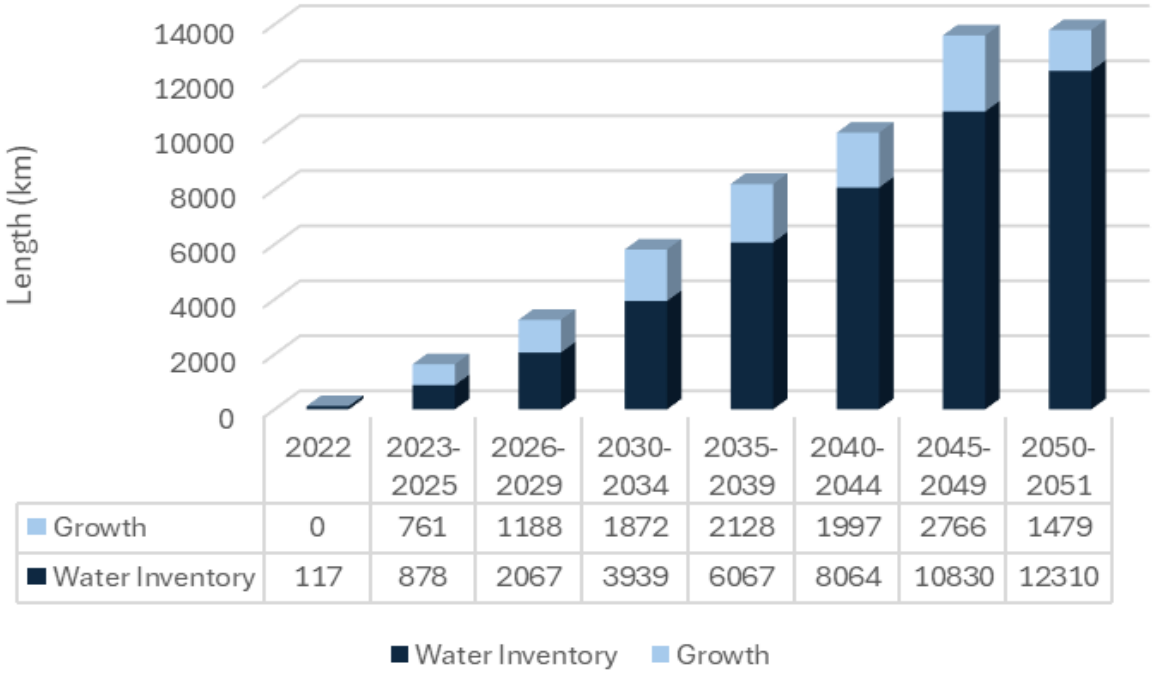
## Trends

Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new water network infrastructure. Between DC bylaw and developer contributed assets, the core infrastructure is expected to nearly double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

*Figure 48: Water Network Growth Estimate*




# Levels of Service

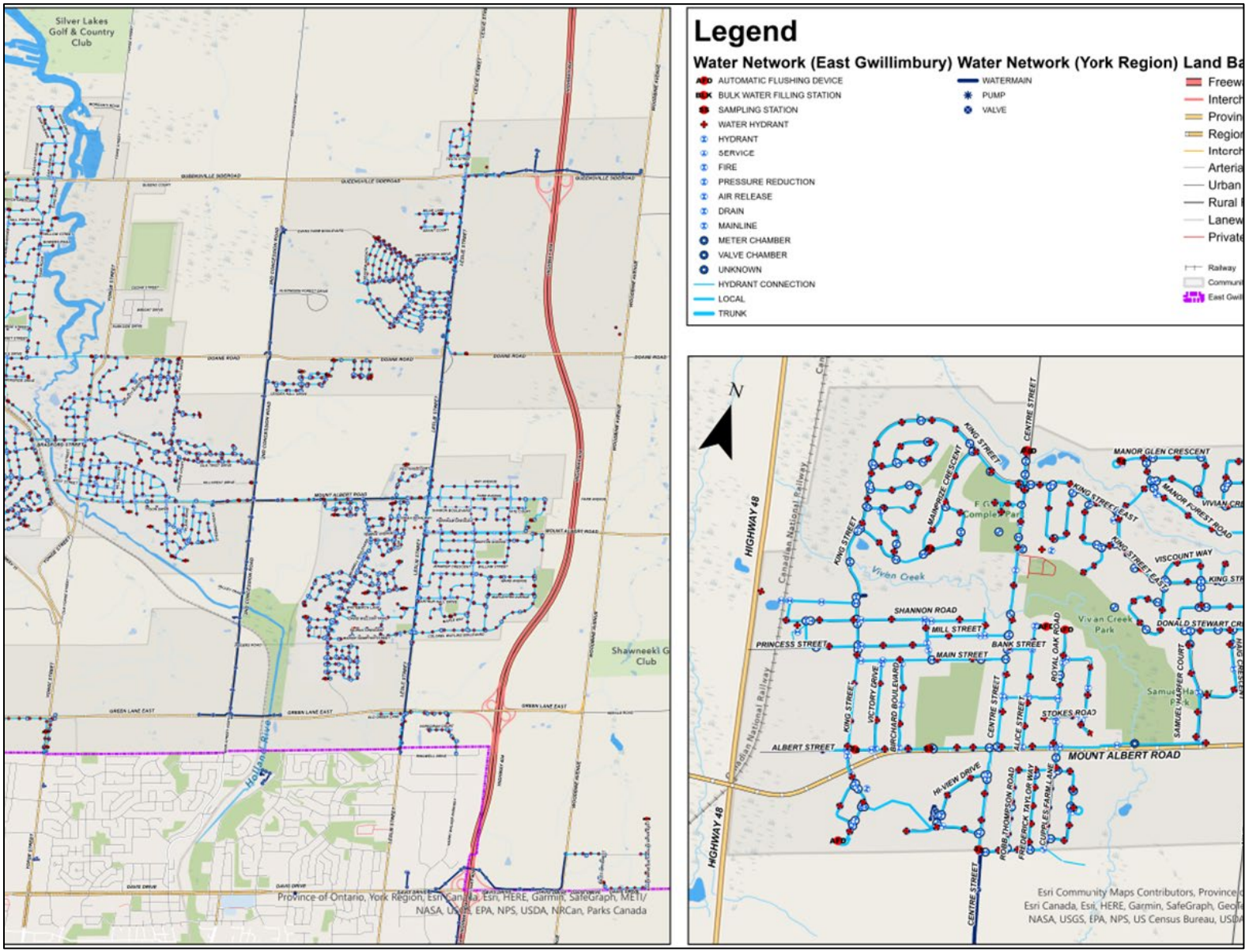
## Current Levels of Service

The following tables identify the Town's current level of service for the water network. These metrics include the community level of service and technical levels of service the Town is recommending, as well as those prescribed by the O.Reg.588/17.

*Table 49: Water Network Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system | See Figure 50 Water Network Map | Scope | Replacement Cost | $628,741,977 |
| | | | Quantity of mains (meters) | 165,957 |
| Description, which may include maps, of the user groups or areas of the municipality that have fire flow | Fire flow is available where water system exists | | % of properties connected to the municipal water system | 71% |
| | | | % of properties where fire flow is available | 100% |
| Description of boil water advisories and service interruptions | N/A | Reliable | # of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system | 0 |
| | | | # of connection-days per year where water is not available to water main breaks compared to the total number of properties connected to the municipal water system | 2 |
| | | | Average condition | Very Good (87%) |
| | | | % Condition > Fair | 96% |
| | | | % Condition poor and very poor | 4% |
| Description of the services being provided | The Town's facilities are providing service that is reliable and sustainable while ensuring affordability | Sustainable | % Risk that is High and Very High | 0% |
| | | Affordable | Capital re-investment | $987,425 |
| | | | Capital re-investment rate | 0.16% |

*Figure 50: Water Network Map*



## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

The current average condition of the Town's water network is rated as "Very Good", with a condition score of 87. However, under Scenario 1 (maintaining current funding levels), the water network condition is projected to decline to a score of 68, "Good", by 2051.

The overall water network is currently maintaining adequate condition and meets the minimum standard outlined in Scenario 2 (maintaining a condition of "Fair") as well as the proposed level of service in Scenario 3 (targeting "Good").

In the analysis, services and meters were assessed separately. To maintain the average condition of "Good" as defined in Scenario 3, an additional $226 thousand per year in funding is required for these components.

*Table 20: Water Network Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | $0 | $226K[5] | $9.9M |

The Town is currently undertaking a review of its water program. A rate review and financial plan are in progress, and the resulting management strategy will be detailed and incorporated into future asset management plans and annual updates.

[5] This value is expected to increase, pending review of the Town's water rate program, with strategy to be incorporated into future plans and updates.

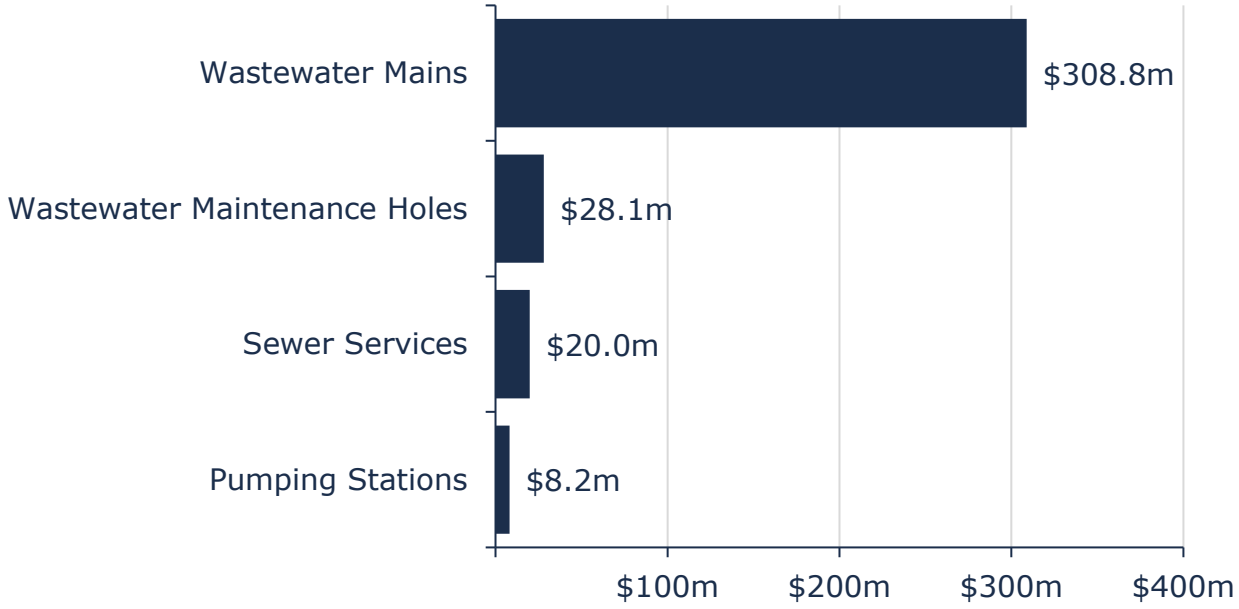
# Appendix J: Wastewater Network

East Gwillimbury's wastewater network is collected and treated by the Region of York and is otherwise managed by the Town consisting of wastewater collection assets. The overall replacement value of the system is $365.1 million.

## Inventory and Valuation

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

*Figure 51: Wastewater Network Replacement Cost*

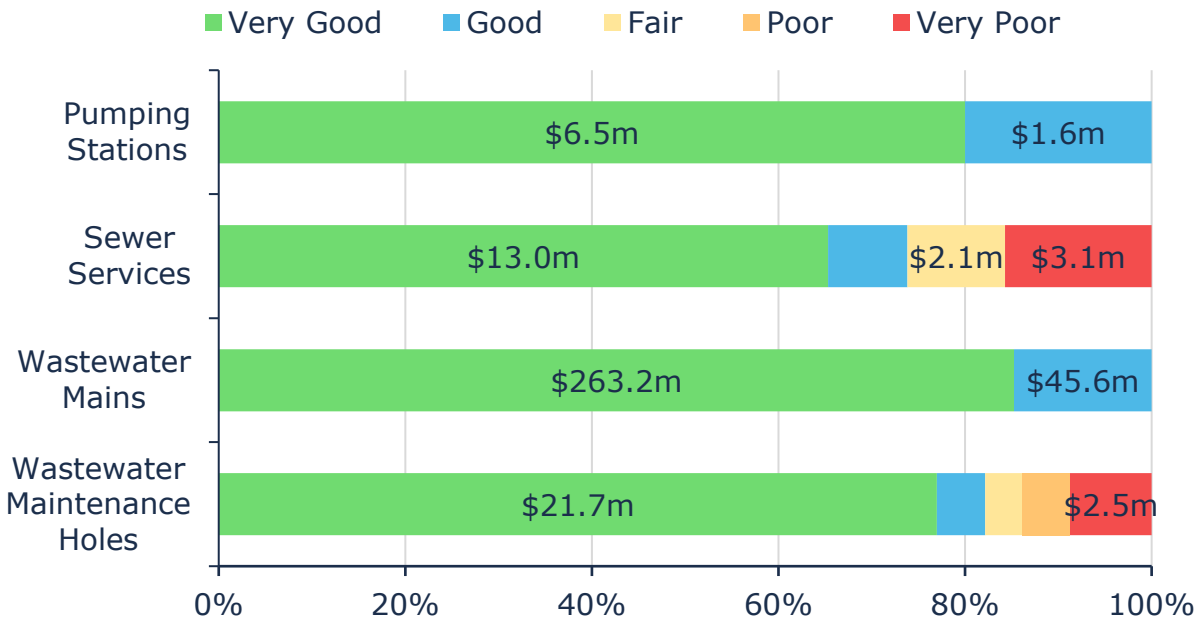



## Asset Condition

To ensure that East Gwillimbury's wastewater network continues 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 the lifecycle management strategy to determine the combination of activities required to increase the overall condition.

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

*Figure 52: Wastewater Network Condition Breakdown*




Each asset's estimated useful life should also be reviewed periodically to determine if adjustments need to be made to better align with the observed length of service life for each asset type.

Accurate and reliable condition allows staff to determine the remaining service life of assets and identify the most cost-effective approach to managing assets. Wastewater network assets are all assessed based on age and service life. The CCTV program on wastewater mains is currently underway by a third-party contractor. Staff are developing condition criterion for the assessments so condition data can be attached to inventory assets.

## Lifecycle Management

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

Historically, the Town has inspected 50% of the wastewater network per year using a closed-circuit television (CCTV). This work includes the gravity mains and manholes, but not the laterals. The Town is currently reviewing its sewer inspection program to determine the appropriate inspection frequency going forward. In addition to the network-wide inspection, sewer mains are inspected prior to capital work, and those contributing to inflow and infiltration are inspected.

Pumping stations are inspected/monitored multiple times per week with maintenance identified as needed.

Generally, renewal and replacement of the piped system is done reactively. However, there are opportunities to coordinate proactive replaced along with renewing roads. Wastewater pumping stations receive regular maintenance as per manufacturer recommendations. Findings from inspections are used to proactively replace components of pumping stations, however, pumping stations are relatively new and have not experienced significant renewal activities.

## Forecasted Capital Requirements

The annual capital requirement represents the average amount that should be allocated each year to support the rehabilitation and replacement of assets.

# Risk Management

The risk breakdown provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within the wastewater network category, based on available inventory data.

## Risk Criteria

The probability of failure was calculated using the following:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Structural (80%) | Condition | 100% | 80-100 | 1 |
| | | | 60-79 | 2 |
| | | | 40-59 | 3 |
| | | | 20-39 | 4 |
| | | | 0-19 | 5 |
| Climate Change (20%) | Extreme Rainfall | 20% | 1 - 5 | 1 - 5 |
| | Extreme Snow | 20% | 1 - 5 | 1 - 5 |
| | Freeze / Thaw | 20% | 1 - 5 | 1 - 5 |
| | Extreme Wind | 20% | 1 - 5 | 1 - 5 |
| | Extreme Heat | 20% | 1 - 5 | 1 - 5 |

The consequences of failure for wastewater mains and services were calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (50%) | GIS - Size (mm) | 100% | 0-200 | 1 |
| | | | 201-399 | 2 |
| | | | 400-599 | 3 |
| | | | 600-999 | 4 |
| | | | 1,000+ | 5 |
| Operational (50%) | GIS - Material | 20% | PVC | 1 |
| | | | Asbestos Cement | 5 |
| | GIS - Easement | 40% | No | 1 |
| | | | Yes | 5 |
| | GIS – SL Type | 40% | Gravity Sewer, Overflow, Siphon | 1 |
| | | | Force main | 5 |

The consequences of failure for pumping stations and wastewater maintenance holes was calculated using the following criteria:

| Criteria | Risk Criteria | Criteria Weighting | Value/Range | Risk Score |
|---|---|---|---|---|
| Financial (100%) | Replacement Cost | 100% | <250,000 | 1 |
| | | | 250,000 - 500,000 | 2 |
| | | | 500,000 - 750,000 | 3 |
| | | | 750,000 - 1,500,000 | 4 |
| | | | >1,500,000 | 5 |

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

*Figure 53: Wastewater Network Risk Breakdown*

| 1 - 4 Very Low | 5 - 7 Low | 8 - 9 Moderate | 10 - 14 High | 15 - 25 Very High |
|---|---|---|---|---|
| $349,081,338 (96%) | $12,328,170 (3%) | $3,625,360 (<1%) | - (0%) | - (0%) |

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

# Growth Management

## Trends

Drivers affecting demand include population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

## Population and Economic Growth Forecasts

Growth of population within the Town results in a need to acquire new wastewater network infrastructure. Between DC bylaw and developer contributed assets, the core infrastructure is expected to nearly double by 2051, with significant growth occurring between 2026 and 2040. This growth generally follows the expected population growth. Growth outlined in the DC Background Study estimates increases because of growth to maintain current levels of service.

*Figure 54: Wastewater Network Growth Estimate*




| | 2022 | 2023-2025 | 2026-2029 | 2030-2034 | 2035-2039 | 2040-2044 | 2045-2049 | 2050-2051 |
|---|---|---|---|---|---|---|---|---|
| Growth | 0 | 788 | 1231 | 1939 | 2203 | 2069 | 2864 | 1532 |
| Wastewater Inventory | 172 | 960 | 2191 | 4130 | 6333 | 8402 | 11266 | 12798 |

# Levels of Service

## Current Levels of Service

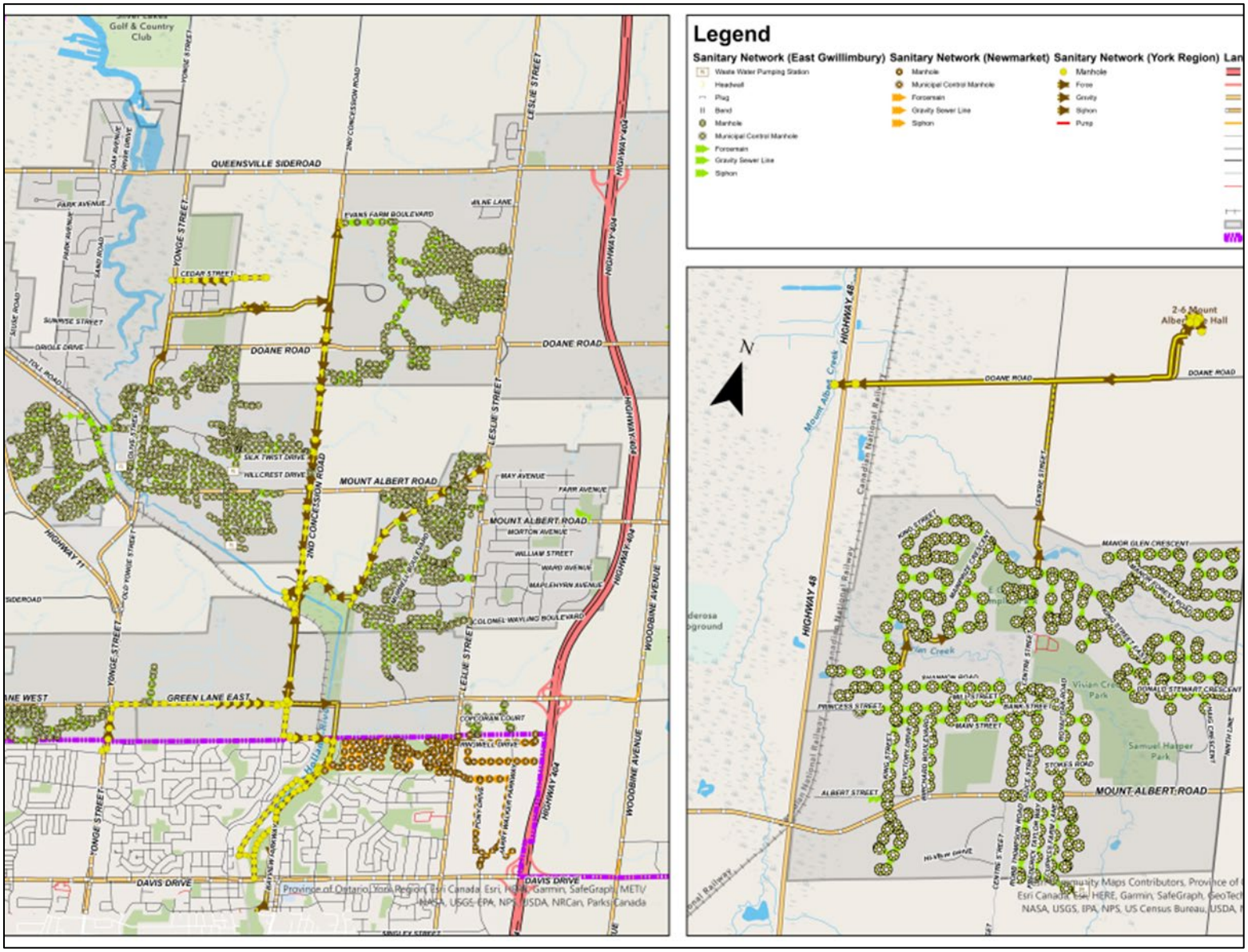
The following tables identify the Town's current level of service for the wastewater network. These metrics include the community level of service and technical levels of service the Town is recommending, as well as those prescribed by the O.Reg.588/17.

*Table 21: Wastewater Network Current Levels of Service*

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system | See Figure 55 | Scope | Replacement Cost | $365,034,868 |
| | | | Quantity of mains (meters) | $104,847 |
| | | | % of properties connected to the municipal wastewater system | 54% |
| 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 | N/A | Reliable | Average condition | Very Good (92%) |
| Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches | N/A | | % Condition > Fair | 98% |
| Description of how stormwater can get into wastewater mains in the municipal wastewater system, causing sewage to overflow into streets or backup into homes | No known cross-connections by design. Infiltration of groundwater to pipes occurs through pipe defects. | | % Condition poor and very poor | 2% |

| Community Levels of Service | | Service Attributes | Technical Levels of Service | |
|---|---|---|---|---|
| Description of how wastewater mains in the municipal wastewater system are designed to be resilient to stormwater infiltration | Modern wastewater system is built to seal it from infiltration. I&I is not present in new areas, and mostly an issue with older areas. | Reliable | # of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system | N/A |
| Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system | Sewage Treatment is managed by York Region | | # of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system | 0% |
| Description of the services being provided | The Town's facilities are providing service that is reliable and sustainable while ensuring affordability | | # of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system | N/A |
| | | Sustainable | % Risk that is High and Very High | 0% |
| | | Affordable | Capital re-investment | $1,596,170 |
| | | | Capital re-investment rate | 0.44% |

*Figure 55: Wastewater Network Map*



## Proposed Level of Service

The scenarios were developed to ensure that a minimum average asset condition is maintained across the Town's infrastructure. See section 5.3 of the Asset Management Plan for a description of each scenario.

The current average condition of the Town's wastewater network is rated as "Very Good", with a condition score of 92. However, under Scenario 1 (maintaining current funding levels), the wastewater network condition is projected to decline to a score of 64, "Good", by 2051.

The overall the wastewater network is currently maintaining adequate condition and meets the minimum standard outlined in Scenario 2 (maintaining a condition of "Fair") as well as the proposed level of service in Scenario 3 (targeting "Good").

*Table 22: Wastewater Network Proposed LOS Scenario Analysis*

| | Scenario 2: Condition "Fair" | Scenario 3: Condition "Good" | Scenario 4: Full Lifecycle |
|---|---|---|---|
| Annual Funding Increase Required | No increase in funding proposed at this time.[6] | | $9.2M |

The Town is currently undertaking a review of its wastewater program. A rate review and financial plan are in progress, and the resulting management strategy will be detailed and incorporated into future asset management plans and annual updates

[6] Pending review of the Town's Wastewater program, with strategy to be incorporated into future plans and updates.