Corporate Asset Management Plan 2024

North Bay

Executive Summary

Executive Summary

Community

North Bay is a vibrant community of 52,000 residents nestled between Lake Nipissing and Trout Lake making it the perfect location to live, learn, work and play. The local economy is made up of diverse industries and services. North Bay offers the benefits of urban and rural living that can provide an ideal balance for work and family life.

The City has state of the art health care, a wide range of public and post-secondary education, specialty family services, retirement facilities, places of worship and cultural associations, accessible transportation, technology-infrastructure and more.

The natural environment provides the setting for all season recreational activities and special events.

The effective and efficient management of the City's assets will ensure that the benefits and services stated above, and provided and available to City residents, are delivered appropriately and at a cost that the Community can afford.

Regulation

The primary objective of this Plan is to ensure that the current assets owned and operated by the City of North Bay are effectively managed in terms of ongoing maintenance and renewal activity so that desired levels of service are met now and into the future.

Executive Summary

In December 2017, the province passed an asset management planning regulation under the Infrastructure for Jobs and Prosperity Act 2015, Ontario Regulation 588/17.

See the following link for the detailed Regulation. https://www.ontario.ca/laws/regulation/r17588

An Asset Management Policy is a core requirement of an Asset Management System. The Asset Management Policy lays out a set of principles that guides municipal administration to implement an Asset Management System. The Asset Management Policy adopted by the City of North Bay is enclosed as Appendix 9.1.

North Bay's Asset Management Plan

The asset management planning process is driving a change in philosophy in regards to capital improvement projects: The old approach of "worst first" is being replaced with a more proactive approach focused on the rehabilitation within windows of opportunity and combined with reconstruction projects. This plan reflects on the current and desired condition of infrastructure assets, levels of service, optimal asset management, and financial strategies; all based on the infrastructure information and data currently available for the City of North Bay's assets. The asset categories included within this asset management plan include all infrastructure however they are funded by various sources as shown below:

Asset Category	Source of Funding
Bridges and Culverts	Tax Levy
Facilities	Tax Levy
Fleet & Equipment	Tax Levy
Land Improvements	Tax Levy
Machinery and Equipment	Tax Levy
Roads	Tax Levy
Stormwater	Tax Levy
Wastewater (Includes linear, machinery and equipment as well as facility assets)	Rate Supported
Water* (Includes linear, machinery and equipment as well as facility assets)	Rate Supported

The City's data collection programs and data updating processes are ongoing, and as such, the plan will be updated over time as more data regarding condition, capacity, expansion, and risks become available. Each section contains a Data Confidence Scale to assist the reader in understanding the recommendations.

This Asset Management Plan represents a snapshot in time and is based on the best available process, data and information at the City at that time. Strategic asset management planning is an ongoing and dynamic process that requires continuous support and dedicated resources. Several recommendations have been developed to guide the continuous refinement of the City's Asset Management Plan. These include:

- Asset inventory data review and validation
- The formalization of condition assessment strategies
- Implementation of risk-based decision-making as part of asset management planning and budgeting
- Continuous review, development and implementation of optimal life cycle management strategies
- Identification, establishment, maintenance and review of proposed levels of service

In summary, the estimated replacement cost of the City's assets is $3.2 billion which requires $80.8 million in annual life cycle investments. Currently, the City of North Bay is planning to invest on average $51.9 million annually; thereby, leaving an annual funding shortfall of $28.8 million.

The table below summarizes the above by asset category:

	Replacement Cost	Annual Requirement	Average Annual Funding Capital Budget (2024-2033)	Annual Shortfall (Surplus)
Bridges and Culverts	184,081,226	2,454,416	573,300	1,881,116
Facilities	488,800,478	14,645,106	7,423,152	7,221,954
Fleet & Equipment	51,562,780	4,074,386	3,217,787	856,599
Land Improvements	225,201,128	13,356,241	5,210,687	8,145,554
Machinery and Equipment	38,953,799	3,419,140	966,388	2,452,752
Roads	590,726,659	20,067,815	17,622,540	2,445,275
Stormwater	281,551,943	3,519,399	3,599,904	- 80,505
Wastewater	707,387,681	9,148,269	7,048,455	2,099,814
Water	636,110,618	10,083,838	6,259,137	3,824,701
Total	3,204,376,313	80,768,610	51,921,350	28,847,260

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2024:

Requirement	O.Reg Section	Status
Summary of assets in each category	S.5(2),3(i)	Complete
Replacement costs of assets in each category	S.5(2),3(ii)	Complete
Average age of assets in each category	S.5(2),3(iii)	Complete
Condition of assets in each category	S.5(2),3(iv)	Complete
Description of municipality's approach to assessing the condition of assets in each category	S.5(2),3(v)	Complete
Current levels of service in each category	S.5(2),1(i-ii)	Complete
Current performance measures in each category	S.5(2),2	Complete
Life cycle activities needed to maintain current levels of service for 10 years	S.5(2),4	Complete
Cost of providing life cycle activities for 10 years	S.5(2),4	Complete

The following qualitative risks were identified as applicable across the entirety of the City's asset categories.

Climate Change & Extreme Weather Events
The City's assets are susceptible to ongoing risks stemming from climate dynamics. This vulnerability may result in potential service disruptions, operational downtime, and increased costs from additional wear and tear on assets. Moreover, the evolving climate landscape introduces added uncertainty, further complicating effective risk management strategies. It is imperative that the City takes coordinated action, including conducting thorough risk assessments, fortifying infrastructure resilience, and fostering collaborative efforts with stakeholders. These measures are essential to mitigating risks and ensuring the continuity of services in the face of evolving climatic conditions.

Organizational Change & Capacity
The City faces ongoing challenges with hiring and knowledge transfer as experienced staff retire, worsened by a tight job market. Retiring employees take valuable knowledge with them as they leave the workplace, complicating organizational effectiveness. To tackle this, the City needs proactive succession planning, knowledge transfer, and innovative recruitment. Implementing mentorship, documentation, and cross-training can help transfer expertise. By prioritizing these strategies, the City can maintain workforce resilience and success amid changing demographics and job markets.

Regulatory Requirements
Identifying evolving regulatory requirements poses a significant risk to asset financial planning. As regulations change, managing assets becomes more complex, challenging alignment with projected lifecycles. Constant compliance adaptation disrupts financial projections and maintenance planning. To address this, proactive monitoring and decision-making are crucial. Collaboration between regulatory experts, asset managers, and financial planners is essential for navigating these challenges effectively. By implementing strategic approaches and fostering interdisciplinary collaboration, organizations can address risks and uphold asset management integrity.

This AMP includes a majority of all asset in all categories; however, as the Asset Management culture matures, assets that have been excluded, may be included. The following assumptions have been made within this AMP:

- Assets may be consolidated and not broken down to the detail level. Examples include; manholes, curbs, and catch basins
- Assets have not been planned for future growth related needs
- City Service Partners assets that are not included:
    a. DNSSAB
    b. Public Library
    c. Cassellholme
    d. Conservation Authority
    e. Heath Unit

  These Service Partners assets are managed independently. Only those facilities which are owned and maintained by the City are included.
- The Airport assets are included within this AMP

CORPORATE ASSET MANAGEMENT PLAN 2024

Introduction

1. Introduction

The primary objective of this Plan is to ensure that the current assets owned and operated by the City of North Bay (the “City”) are managed in terms of ongoing maintenance, renewal activity and expenditure so that all desired levels of service are met now and into the future.

Asset Management objectives need to be achieved while also meeting a number of goals as outlined by Council:

- The effective management of the City's assets are in line with corporate policies, strategies and objectives, statutory and legislative requirements and regulations
- Ensuring that assets are safe, appropriately accessible, well maintained and meet citizens' needs in a manner that is sustainable
- Recognizing appropriate levels and sources of capital investment required to meet the City's asset renewal and replacement needs
- Maximizing the service potential of current assets by ensuring they are used and maintained appropriately
- Achieving better value for money through evaluation processes that take into account life cycle costing
- Minimizing the City's exposure to risk as a result of asset failures

These goals and objectives will be achieved by this Asset Management Plan because it will provide details to promote the best decisions possible on renewal, replacement, maintenance, disposal and expansion of the City’s assets. This plan provides the framework that functions along with annual budgets and financial planning needed to make the best possible decisions with regard to City infrastructure. Also, the plan will develop the baseline for our current asset practices and will also identify the funding gap to maintain our current service levels.

1.1 Asset Management Definition:

Asset management is the coordinated activity of an organization to realize value from its assets. This value is created by delivering services at an appropriate cost while managing long-term risks. (ISO –International Organization for Standardization)

This Asset Management Plan document has been developed for infrastructure assets of the City of North Bay, which include Water, Wastewater, Stormwater, Roads, Bridges and Culverts, Fleet, Facilities, Parks, Solid Waste and the North Bay Jack Garland Airport. The plan is intended to provide a comprehensive reference for renewing, operating, maintaining, building, replacing, and disposing of the City's core infrastructure assets. The plan is based on the guidelines provided in the Province of Ontario Ministry of Infrastructure's Building Together Guide for Municipal Asset Management Plans and Ontario Regulation 588/17.

The current asset stock of the City consists of over 33,000 individual assets including Roads, Water, Wastewater, Bridges and Culverts, Facilities, Stormwater, Buildings, Fleet and Land including Parks and Landfill. In total this asset portfolio has a replacement value of approximately $3.2 billion.

Asset management helps protect and enhance quality of life by making the best possible decisions about the City's assets in a way that provides targeted levels of service and manages risk in a cost-effective manner.

Good asset management means making decisions based on the lowest long-term cost over the entire life cycle of the asset and also managing assets in a way that balances service levels, risk and cost rather than short-term savings.

Why is Asset Management important?

- Establishes processes for Corporate Asset Management.
- Signifies that the City is committed to implementing an Asset Management business model and continual improvement.
- Builds awareness of what the City regards as good practice for Asset Management and sets strong direction and clear expectations.
- Provides a strong mandate and catalyst for business improvement activities where required.
- Provides a basis to develop Asset Management related objectives that align with the City's overarching strategic objectives.

As identified in the City's Official Plan and Corporate Strategic Plan the viability of the City is highly dependent on the infrastructure and how it supports economic activity and improves the quality of life for its citizens. These assets are essential for the City to deliver quality municipal services to residents, businesses, and community partners by enhancing the physical, leisure, economic, and environmental quality of life for the community and region that is affordable, sustainable and relevant. ISO 55000 defines asset management as the “coordinated activity of an organization to realize value from assets”. The ability to deliver value requires an understanding of the goals and objectives of the asset owners. For municipalities, strategic plans most often outline these goals. Through the identification of strategic goals, asset management practices and decisions can be aligned to support strategic goal advancement. Level Of Service (LOS) metrics can also be selected to measure asset performance in relation to strategic goal advancement. The process of aligning an organization’s strategic plan and asset management activities delivered by staff is referred to by the Institute of Asset Management as the “line of Sight”. Having a “line of sight” provides staff with an understanding of the purpose to their actions and why they are needed.

The Asset Management Plan is a living document which will require regular review and updating as more data becomes available and the levels of service required by the community are defined through public consultation. It is anticipated that the life cycle strategies will be reviewed by staff annually and adjusted accordingly to ensure that it reflects the current priorities of Council and the community; the Asset Management Plan will be updated on a five-year cycle to incorporate all adjustments identified within the annual reviews. This fluid plan will be revised and updated as required by legislation, as revisions become available and as the Asset Management process matures. All updates will be published to the City's website.

Through the implementation of the City’s Official Plan, it is the goal of Council and the community to grow and develop North Bay in a sustainable manner. The term "sustainability" means that the community will continue to work towards maintaining and enhancing its attributes and improve conditions that lead to a better quality of life for future generations. The three elements of sustainable development (economic, social/cultural and environmental) are considered in an integrated manner by Council in order to make planning decisions.

The Official Plan concludes that the City of North Bay is well positioned to experience steady residential and non-residential growth over the medium and long-term forecast period. Over the 22-year forecast period covered by the City’s Official Plan, the City's total number of households is forecasted to increase from 22,962 in 2009 to 26,081 in 2031, a total increase of approximately 3,119 units. It should be noted that approximately 15,000 of the current households are serviced by water and sewer.

This growth will add new assets to the City's infrastructure portfolios which will increase the challenges of funding the maintenance and replacement of these assets in the future. Therefore, it is essential to recognize that the funding challenges outlined in the Asset Management Plan only deal with the existing assets and do not account for the assets associated with the projected growth.

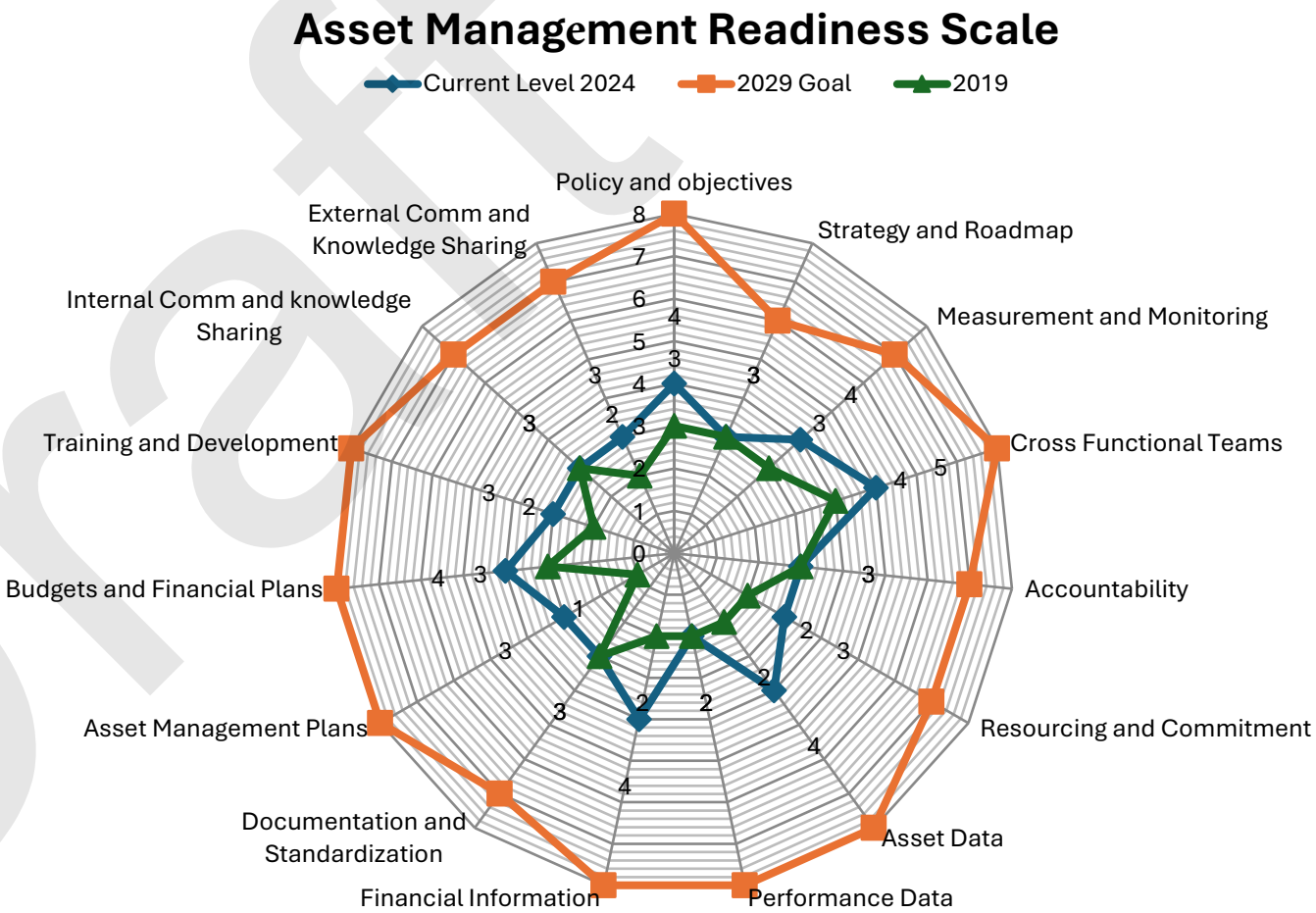
1.2 Maturity of Asset Management Progress

The Federation of Canadian Municipalities (FCM) has developed an Asset Management Readiness Scale to assist municipalities in determining their level of maturity so they can adopt business practices that better support decisions about investing in infrastructure assets such as roads, bridges, water and wastewater systems.

The readiness scale helps:

- Assess current asset management practices in a municipality.
- Identify opportunities to adopt new practices or formalize asset management activities that may already be occurring, into documented business practices.
- Measure and track the progress of a municipality's asset management practices and activities.

The readiness scale is designed for staff and elected officials in any municipality or local government organization across Canada. Municipalities can use the scale as a framework to guide actions to improve asset management practices.
The blue line in the spider graph below outlines the City of North Bay's current Asset Management maturity. As Asset Management maturity develops, the outcomes move from the inner points ie "0" on the web scale to the outer points. The objective is to achieve the highest maturity level of "8" by 2029.



1.3. Asset Management Roadmap

Year	Goal	Action
2022	First Asset Management Plan (Phase 1).	Includes Core Infrastructure: Water, Wastewater, Roads, Bridges and Culverts, Stormwater.
2024	Second Asset Management (Phase 2).	Addition of Fleet, Facilities, Parks, and Solid Waste. (not related to Water or Wastewater)
2025	Third Asset Management Plan (Phase 3).	Development of LOS options, hold community consultations and obtain Council approval. Phase in of O.Reg.588/17 complete.
2026	Align and integrate Asset Management Plan with Capital Budget Process	Capital Budget is supported with Asset Management Life cycle strategies and rehabilitation plans.
	Ongoing	Continuous improvement monitoring of Asset Management Planning.
	Ongoing	Revisions to Plan, Policies, and Strategy as needed.

1.4. Corporate Asset Management Policy

An Asset Management Policy represents a statement of the principles guiding the municipality's approach to asset management activities. It aligns with the organizational strategic plan and provides clear direction to municipal staff on their roles and responsibilities as part of the asset management program.
The City adopted its Strategic Asset Management Policy on July 1, 2019 in accordance with Ontario Regulation 588/17. As required by this regulation the policy includes statements with respect to strategic alignment, guiding principles, fiscal responsibilities, public input/council direction, governance and continuous improvement. Specifically, the policy includes the following objectives:

- Provide a consistent framework for implementing asset management throughout the organization.
- Provide transparency and accountability and to demonstrate to stakeholders the legitimacy of decision-making processes which combine strategic plans, budgets, service levels and risks.

See the link below for the City's Strategic Asset Management Policy

https://www.northbay.ca/media/5osiawpa/corporate-asset-management-policy.pdf

2. Risk Background

2. Risk Background

The City of North Bay engaged PSD Citywide as an asset management consultant to guide and develop life cycle strategies, levels of service and risk frameworks for infrastructure assets. The project's first area of focus was the development of risk frameworks. This report provides an overview of risk and then discusses the risk framework for each of the asset classes.

PSD conducted initial collaboration sessions with staff to develop risk frameworks. Risk and criticality models are key elements of good asset management practices and programs. Through their use, asset owners can rank and rate the level of business risk associated with each infrastructure asset. This customized analysis is generally based on the asset type and the attributes and considerations specific to it. Risk assessment can be conducted across all asset types and reviewed for all assets or at the individual asset level.

Identification of qualitative risks and development of quantified risk models are key elements of good asset management practices and programs. A clear understanding of qualitative risks and asset specific quantitative risks enables more proactive and strategic asset management considerations and actions, including risk mitigation.

2.1 Approach to Risk

Municipalities generally take a worst-first approach to infrastructure spending. Rather than prioritizing assets based on their importance to service delivery; assets in the worst condition are fixed first, regardless of their criticality. However, not all assets are created equal. Some are more important than others and their failure poses more risk to the community than that of others. For example, a road with a high volume of traffic that provides access to critical services poses a higher risk than a low volume rural road. Therefore, 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 identify critical assets and determine where maintenance efforts and spending should be focused.

The City's Asset Management Plan includes a high level evaluation of the asset risk and criticality. 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 or quantitative measurement that can be used to rank assets.

$$Risk = (Probability\ of\ Failure) \times (Consequence\ of\ Failure)$$

The City's approach relies on a quantitative measurement of risk. The probability and consequence of failure are each scored from 1 to 5, producing a minimum risk rating of 1 for the lowest risk assets and a maximum risk rating of 25 for the highest risk assets.

2.2 Risk Scales

Table 1

Probability of Failure	Consequence of Failure	Risk Rating
1 – Rare	1 – Insignificant	1 – Lowest
2 – Unlikely	2 – Minor	4 – Low
3 – Possible	3 – Moderate	9 – Medium
4 – Likely	4 – Major	16 – High
5 – Almost Certain	5 – Severe	25 – Highest

2.3. Probability of Failure (PoF)

Several factors can help decision-makers estimate the probability or likelihood of an asset's failure. For example, a bridge may be in good structural condition, but its structure type or usage (traffic volumes) may increase its susceptibility to failure.

For each asset class the risk model considers and accounts for various factors based on their respective weights. Weighting allows the model to recognize that each factor may impact the probability of failure to a different degree. Where the weight is higher, the impact that factor has on the model increases too.

2.4. Consequence of Failure (CoF)

The consequence of failure describes the overall anticipated effect of an asset's failure to the City and its asset management goals. Consequences of failure can range from insignificant to severe. For example, failure of an infrequently used bridge may affect only a small number of residents and/or inconvenience them slightly (i.e. minimal detour distance). Conversely, failure of a more significant bridge could create significant issues to industry transportation networks and affect residents' ability to access critical community services (i.e. hospitals and schools).

For each asset class the CoF parameters aim to comprehensively capture relevant consequences and align with the Triple Bottom Line (economic, social, and environmental) approach to risk management. When the various consequences of an asset's failure are identified and properly weighted, an asset's criticality can be approximated.

2.5. Types of Consequences

Inherent in the management of public infrastructure is the assumption of risk. The risks that the City may be exposed to are often wide ranging, and risks that materialize have a wide range of consequences. Generally, these consequences can be categorized as follows:

2.6 Consequence of Failure Classifications

Consequence	Description
Financial	Direct financial consequences are typically measured as the replacement cost of the assets affected by the failure event.
Economic	Economic impacts of asset failure may include disruption to local economic activity and commerce, service disruptions, revenue loss, etc. Whereas financial impacts can be seen immediately or within hours or days, economic impacts can take weeks, months and years to emerge.
Socio-political	Socio-political impacts are more difficult to quantify and may include inconvenience to the public and key community stakeholders, adverse media coverage and reputational damage to the community and the municipality.
Environmental	Environmental consequences can include pollution, erosion, sedimentation, habitat damage, etc.
Health and Safety	Health and safety impacts may include injury, fatality, or impeded access to critical services (i.e. hospitals).
Strategic	These include the effects of an asset's failure on the community's long-term strategic objectives, including economic development, tourism, etc.

Risk Treatments

Understanding the risks carried by an asset is an important first step in identifying appropriate risk treatments. How asset owners choose to respond to risk may vary based on the assessed risks, the available risk treatments, and the risk appetite and tolerance. For reference, common risk treatments have been identified below.

Avoid (Completely or Significantly)

Completely: Disposing of the assets that carries the risk or discontinuing the services provided by the asset (i.e., permanently closing a road). This response may only be viable in select circumstances (i.e., mine is closed and public access road is also permanently closed).

Significantly: Investing substantially in assets to reduce the risks they hold. For example, replacing or significantly rehabilitating an important road asset reduces the probability of failure and therefore its overall risk.

Transfer - the risk carried by an asset is transferred to a third party (i.e., public road is made private).

Mitigate - the risk is reduced through a variety of actions and initiatives. Some methods of risk reduction may be non-infrastructure based (i.e., updates to bus routes etc.).

Accept - the risk is accepted and carried. This may be more common amongst road assets deemed less critical to the Municipality's transportation network.

The effort to respond to and treat risks will naturally vary based on the confidence in the data used to calculate risk and the proportion of risk being treated. For example, where there is low confidence in asset data the efforts may first focus on general data review to validate risk scores and thereafter risk treatment. As well, investigation into treatment options for assets with very low risk may be much more limited when compared with investigation into treatment options for high-risk assets. This would support efficient resource allocation and the asset management principle of managing cost, risk, and performance.

2.7. Data Confidence Scale

Each asset category concludes with a data confidence scale which outlines the strengths or weaknesses of the data for that asset category. For example, in some cases, useful metrics have been added to the risk models, as placeholders, where the accompanying data is not currently documented or tracked in the database. Where this occurs, the model will exclude the placeholder metrics from the calculation and redistribute its weighting into the other metrics. As seen in the example below, soil corrosivity is identified as a risk metric, but it has no data tagged to the assets, so its weighting gets reallocated to the other metrics. Asset Management Plans are as of a point in time; however, the data quickly changes and updates are always being considered to optimize the asset life cycle. The data confidence scale provides the reader with perspective with respect to accuracy and reliability of the data.

As a best practice, the quality of data can be evaluated based on the six data quality dimensions. These quality dimensions are as follows:

1. **Accuracy**: The information collected reflects reality and can be confirmed with a verifiable source (i.e. VIN information). An example of accuracy not being met is the in-service year on record is 1950 & the Asset model indicates a service year of 1980. Accurate reporting assists in powerful and trusted reporting.

2. **Completeness**: Data is comprehensively collected so that it can deliver meaningful inferences and effectively inform decisions. i.e. Required fields are populated for all assets

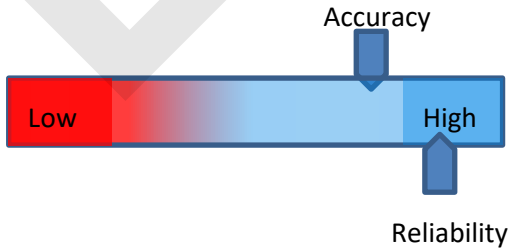
3. **Consistency:** Data on the same asset is consistent across multiple sources if applicable. For example, information in the asset management system matches information in the finance system.

4. **Timeliness:** Data is available when it is needed. This often requires limited lag time between the event that generates the asset data (i.e.condition assessment) and the updates to the system to reflect the event.

5. **Validity**: Consistent data format that is supported by any associated standards or structures. For example, the asset in service date is consistently formatted YYYY-MM-DD and not sometimes YYYY-DD-MM and month value is never greater than 12.

6. **Uniqueness:** Each asset appears only once in the system and there is no data duplication or overlaps. For example, each asset has a unique asset ID, no duplication of asset information.

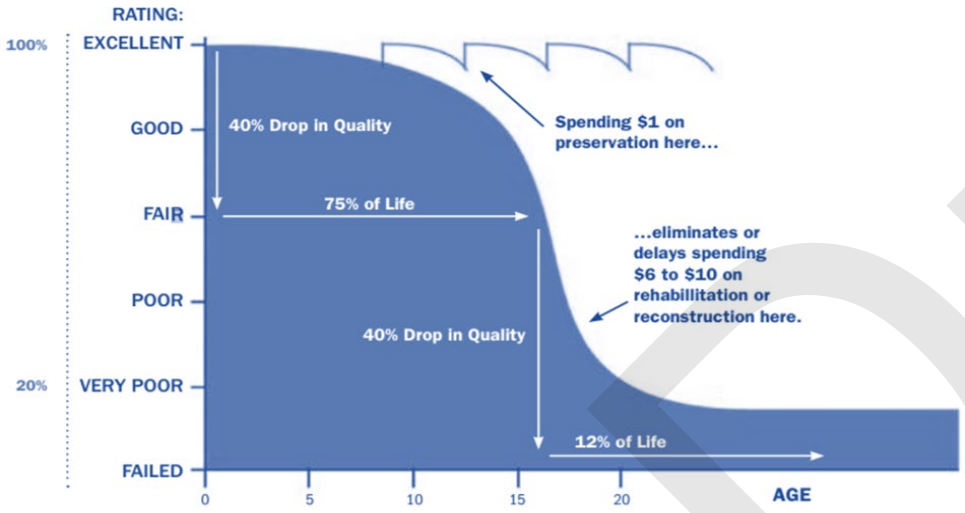
Example of Data Confidence Scale:



2.8. Life Cycle 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.

In most cases, the rate of deterioration is not perfectly linear. Instead, assets tend to maintain a fair or better condition in the first half or so of their life and then begin to decline in condition more rapidly. For this reason, the timing of investment to assets can impact the amount of betterment obtained per unit of investment. This is illustrated below:



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

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

The following table provides a description of each type of activity and level of cost:

Life Cycle Activity	Description	Example (Roads)	Cost
Maintenance	Activities that prevent defects from occurring	Crack Seal	$
Rehabilitation/Renewal	Activities that rectify defects or deficiencies that are already present and may be affecting asset performance	Mill and Resurface	$$
Replacement /Reconstruction	Asset end of Life activities that often involve the complete replacement of assets	Surface and subsurface replacement and/or reconstruction	$$$

Depending on initial life cycle management strategies, asset performance can be sustained through a combination of maintenance and rehabilitation, but at some point replacement is required. Understanding what affect these activities will have on the life cycle of an asset, and their cost, will enable staff to make better recommendations. The City's approach to life cycle management is described within each asset category outlined in the AMP. Developing and implementing a proactive life cycle strategy will determine which activities to perform on an asset and when to optimize useful life at the lowest total cost of ownership.

2.9. Determining 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 AMP relies on two methodologies:

- **Unit Cost** - User-Defined Cost and Cost/Unit: Based on costs provided by municipal staff which could include average costs from recent contracts; information from engineering reports and assessments; staff estimates based on relevant information and experience.
- **Historical Cost Inflation** - Cost Inflation/CPI Tables: Historical cost of the asset is inflated based on Consumer Price Index or Non-Residential Building Construction Price Index.

User-defined costs based on reliable sources are a reasonably accurate and reliable way to determine asset replacement costs (recently purchased or replaced). Cost inflation is typically used in the absence of reliable replacement cost data. As assets age, and new products and technologies become available, cost inflation becomes a less reliable method.

Since complete asset failure most often requires asset replacement as a resolution, replacement cost is a commonly used Consequence of Failure parameter. In most cases, this financial consequence of failure is based on the asset's replacement value

2.10. Estimated Useful Life and Service Life Remaining

The estimated useful life (EUL) of an asset is the period over which the City expects the asset to be available for use and remain in service before requiring replacement or disposal. The EUL for each asset in this AMP was assigned according to condition assessments, experience of municipal staff and supplemented by industry standards. By using an asset's in-service data and its EUL, the City can estimate the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the City can more accurately forecast when it will require replacement. The SLR is calculated as follows:

$$Service\ Life\ Remaining\ (SLR) = In\ Service\ Date + Estimated\ Useful\ Life (EUL) - Current\ Year$$

Effective Date

It is important to note that this report is based on a ***2023 year-end***; therefore, it represents a snapshot in time using the best available processes, data, and information at the Municipality. Strategic asset management planning is an ongoing and dynamic process that requires continuous data updates and dedicated data management resources. Future updates to asset information including replacement cost, condition, and planned capital events will be needed.

2.11. Asset Condition

An incomplete or limited understanding of asset condition can mislead long-term planning and decision-making. Accurate and reliable condition data helps to prevent premature and costly rehabilitation, or replacement, and ensures that life cycle activities occur at the right time to maximize asset value and useful life.

A condition assessment rating system provides a standardized descriptive framework that allows comparative benchmarking across the City's asset portfolio. The table below outlines the condition rating system used in this AMP to determine asset condition. This rating system is aligned with the Canadian Core Public Infrastructure Survey which is used to develop the Canadian Infrastructure Report Card. When assessed condition data is not available, service life remaining is used to approximate asset condition.

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

3. Levels of Service

3.0 Levels of Service

A level of service (LOS) is a measure of what the City is providing to the community and the nature and quality of that service. Within each asset category in this AMP, technical metrics and qualitative descriptions that measure both technical and community levels of service have been established and measured as data is available.
These measures include a combination of those that have been outlined in O. Reg. 588/17 in addition to performance measures identified by the City as worth measuring and evaluating. The City measures the level of service provided at two levels: Community Levels of Service and Technical Levels of Service.

3.1. 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 & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in the AMP. For non-core asset categories, the City has determined the qualitative descriptions that will be used to determine the community level of service provided. The current levels of service have been established through past practice and historical public expectation. These descriptions can be found in the Levels of Service subsection within each asset category.

3.2. 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 municipality'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 & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in the AMP. For non-core asset categories, the City 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.

3.3. Current and Proposed Levels of Service

The AMP focuses on measuring the current level of service provided to the community. Once current levels of service have been reviewed, the City plans to establish proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service should be realistic and achievable within the timeframe outlined by the City. Proposed levels of service should be determined with consideration of a variety of factors or criteria including community needs and wants, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability. Once proposed levels of service have been established, the City must identify a life cycle management and financial strategy which allows these targets to be achieved and maintained.

4. Assets

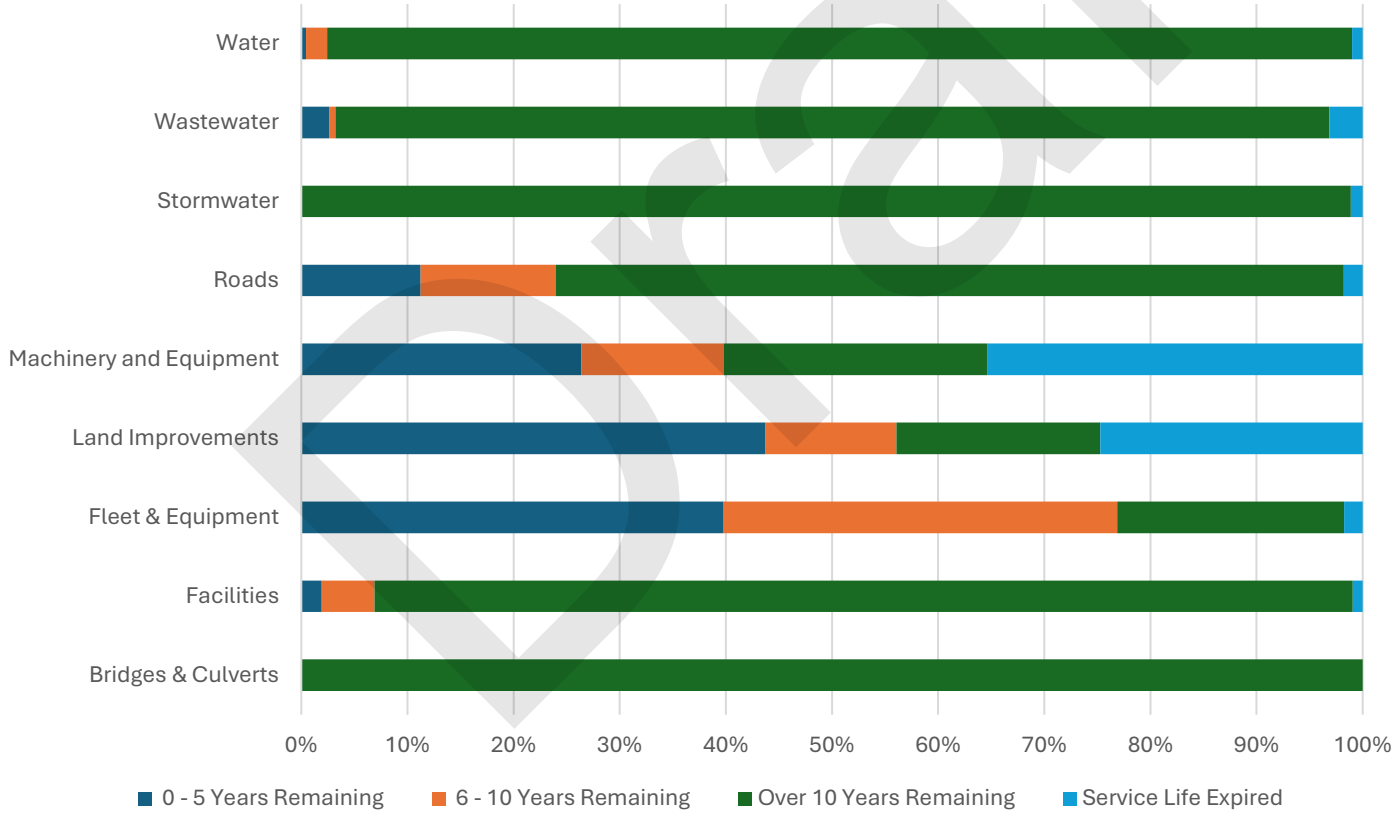
4. Core Assets

The 2024 Asset Management Plan includes all infrastructure as required by O. Reg 588/17. The state of infrastructure provides the baseline for discussion of the infrastructure and is intended to be the beginning of good asset management decision making. A summary of the average age of asset and their respective average estimated useful life is in the table below.

	Replacement Cost	Average Age	Average Estimated Useful Life
Bridges and Culverts	184,081,226	21 Years 3 Months	75
Facilities	488,800,478	14 Years 1 Month	30
Fleet & Equipment	51,562,780	8 Years 3 Months	12
Land Improvements	225,201,128	25 Years 9 Months	23
Machinery and Equipment	38,953,799	7 Years 7 Months	9
Roads	590,726,659	13 Years 9 Months	30
Stormwater	281,551,943	44 Years 5 Months	75
Wastewater	707,387,681	48 Years 1 Month	75
Water	636,110,618	18 Years 8 Months	75
Total	3,204,376,313		

In conjunction with the average age, it is important to understand the service life remaining which is based on the asset age, assessed condition and estimated useful life. As can be noted in the graph below a majority of the assets have been projected over 10 years of service life remaining. This provides the City with time to continue planning and implement further life cycle strategies that will provide the lowest long-term cost over the entire life cycle of the asset.

Remaining Service Life



4.1 Bridges and Culverts

The City is responsible for 58 structural bridges and culverts with an average age of 41 years along with 63 non-structural Bridges and Culverts whose average age is 28 years. The combined replacement value is approximately $183.9 million.

Life cycle activities are based on recommendations supplied through the biennial Ontario Structural Inspection Manual (OSIM) reports. The most recent OSIM report was completed in 2022. Life cycle activities are also influenced from staff input and expertise. The City has enhanced practices which include inspections of non-structural culverts which have their own set of life cycle events. City staff performs visual inspections on a regular basis, between OSIM inspections to ensure the condition/performance of the structures is not deteriorating unexpectedly. The OSIM report provides a Bridge Condition Index (BCI) value which is calculated using asset management principles based on the remaining economic worth of the bridge. It is based on the premise that a bridge starts at a new condition and deteriorates to a lower condition with time. It uses actual inspection data from various bridge elements and as the elements deteriorate, they have a lower economic value. Essentially, the BCI is a weighted average of all elements (since not all elements are of equal value to the bridge) and all condition states (since each condition state represents a certain degree of loss of value to the element). The goal of the City of North Bay is to maintain a BCI level of 65 or greater for Structural Bridges and Culverts.

The BCI begins at a score of 100 when the bridge is in a new condition and theoretically becomes a score of 0 as all elements become fully in poor condition. Practically, it is impossible for the BCI to fall to a score of 0 since the entire bridge does not become poor before rehabilitation work is performed. The BCI score is based on the current value and replacement value of all the elements in a bridge.

4.1.1. Life Cycle Management Strategy

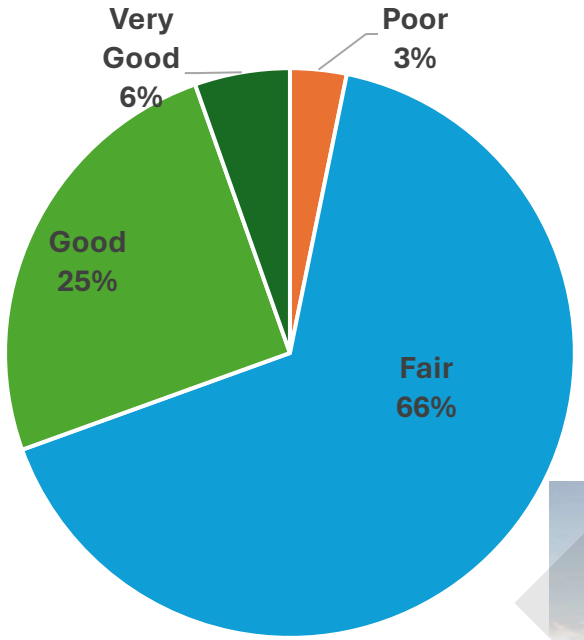
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a life cycle management strategy to proactively manage asset deterioration.

The following table outlines the City's current life cycle management strategy:

Event Class	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All life cycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM). The report may lead to the need for a more detailed condition assessment on individual structures to identify a more detailed scope of required rehabilitation work.
Inspection	The most recent inspection report was completed in 2022

4.1.2. Condition

The pie chart below is developed on the current average condition for bridges and culverts. One hundred percent of bridges and culverts were assessed in 2022 with 89% of the assets in this category as being in above fair condition. Due to the health and safety aspects of this asset category it is considered positive that no assets have a very poor condition and only 3% are in poor condition.



Very Good Condition – Lakeshore Overpass

Trout Lake Overpass – Fair Condition

Ski Club Road – ONR Underpass – Fair Condition Culvert

4.1.3. Levels of Service

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

4.1.4 Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by Bridges and culverts:

Core Value	Level of Service Statement	Community Level of Service
Accessible & Reliable	Bridges and culverts provide reliable access to the roads for vehicles and/or pedestrians.	Bridges and structural culverts are a key component of the municipal transportation network. Only one of the municipality's structures (Stanley over Chippewa Creek has loading or dimensional restrictions meaning that some types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists cannot cross them.
Safe & Regulatory	Bridges and culverts provide safe vehicular and/or pedestrian passage, and all structures are fully compliant with regulatory requirements.	Every two years the City contracts out the OSIM report as well as visual inspections performed by staff on a regular basis to ensure the condition of the structures are not deteriorating unexpectedly.
Affordable	Bridges and culverts are managed cost-effectively for the expected level of service.	Maintenance and rehabilitation activities include: removing debris from expanding joint seals and bearing seats, implementing erosion control measures to shoulders and side banks, repairing asphalt on approaches, concrete crack injection, patch work, bearing replacement, and deck replacement.
Sustainable	There are long-term plans in place for the sustainability of all Bridges and Culverts.	The 10 year capital budget allocates annual funding towards maintenance of sustainable bridges and culverts.

4.1.5 Technical Levels of Service

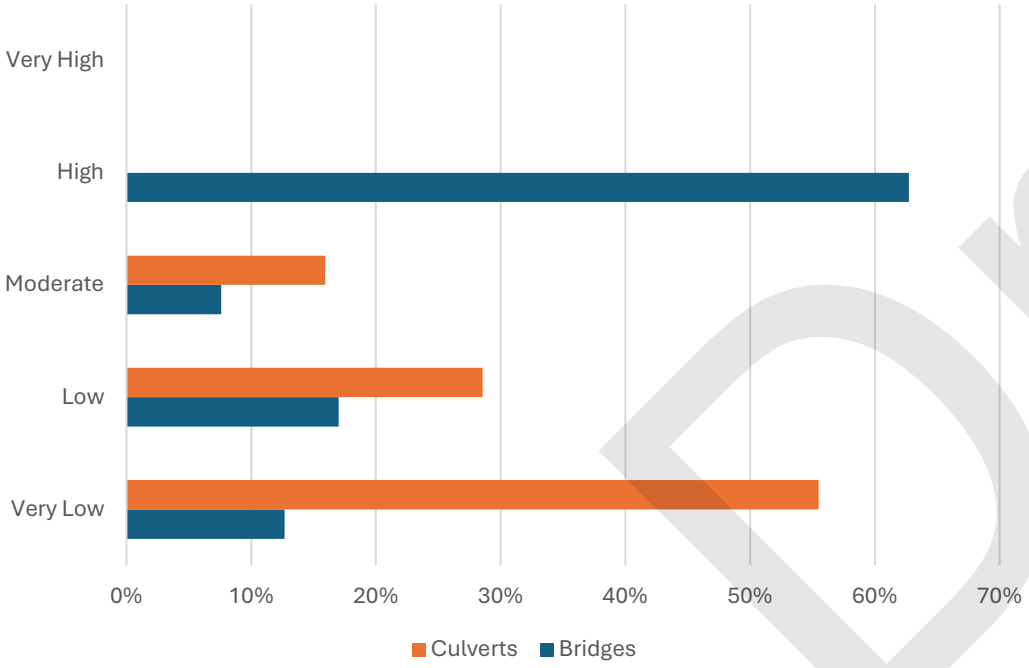
The following table outlines the quantitative metrics that determine the technical level of service provided by bridges and culverts:

Core Value	Level of Service Statement	Technical Level of Service	Current and Historical Performance	
			2021	2023
Quality	Bridges and culverts provide reliable access to the road network for vehicles and/or pedestrians.	% of bridges in the municipality with loading or dimensional restrictions.	3.92%	1.71%
	Bridges and culverts provide safe vehicular and/or pedestrian passage, and all structures are fully compliant with regulatory requirements.	% of bridges inspected every two years.	100%	100%
Performance	Bridges and culverts are managed cost-effectively for the expected level of service.	Current reinvestment rate vs target reinvestment rate.	0.21% : 1.33%	0.31 % : 1.33%
	There are long-term plans in place for the sustainability of all bridges and culverts.	Average bridge condition index value for bridges in the municipality.	68.3%	67%
		Average bridge condition index value for structural culverts in the municipality.	66.5%	73%

4.1.6. Bridges and Culverts Risk

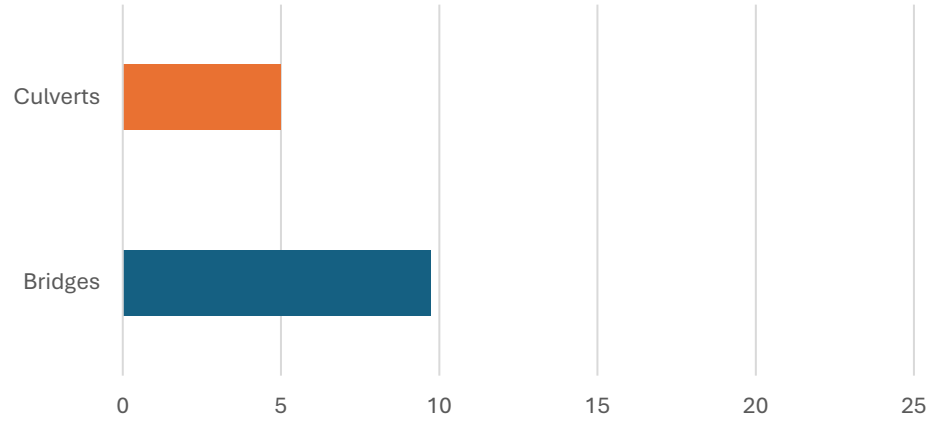
Risks are evaluated on a quantitative and qualitative basis. Qualitative risks include infrastructure design and construction as well as climate change and serious weather events. Quantitative analysis below is demonstrated in two ways. The one bar chart below distributes the percent of the Bridges and Culverts' assets in each of the risk profiles. As noted in the overview, risk is the probability of failure times the consequence of failure.

Risk: % of assets in very low, low, moderate, high, very high risk profiles.



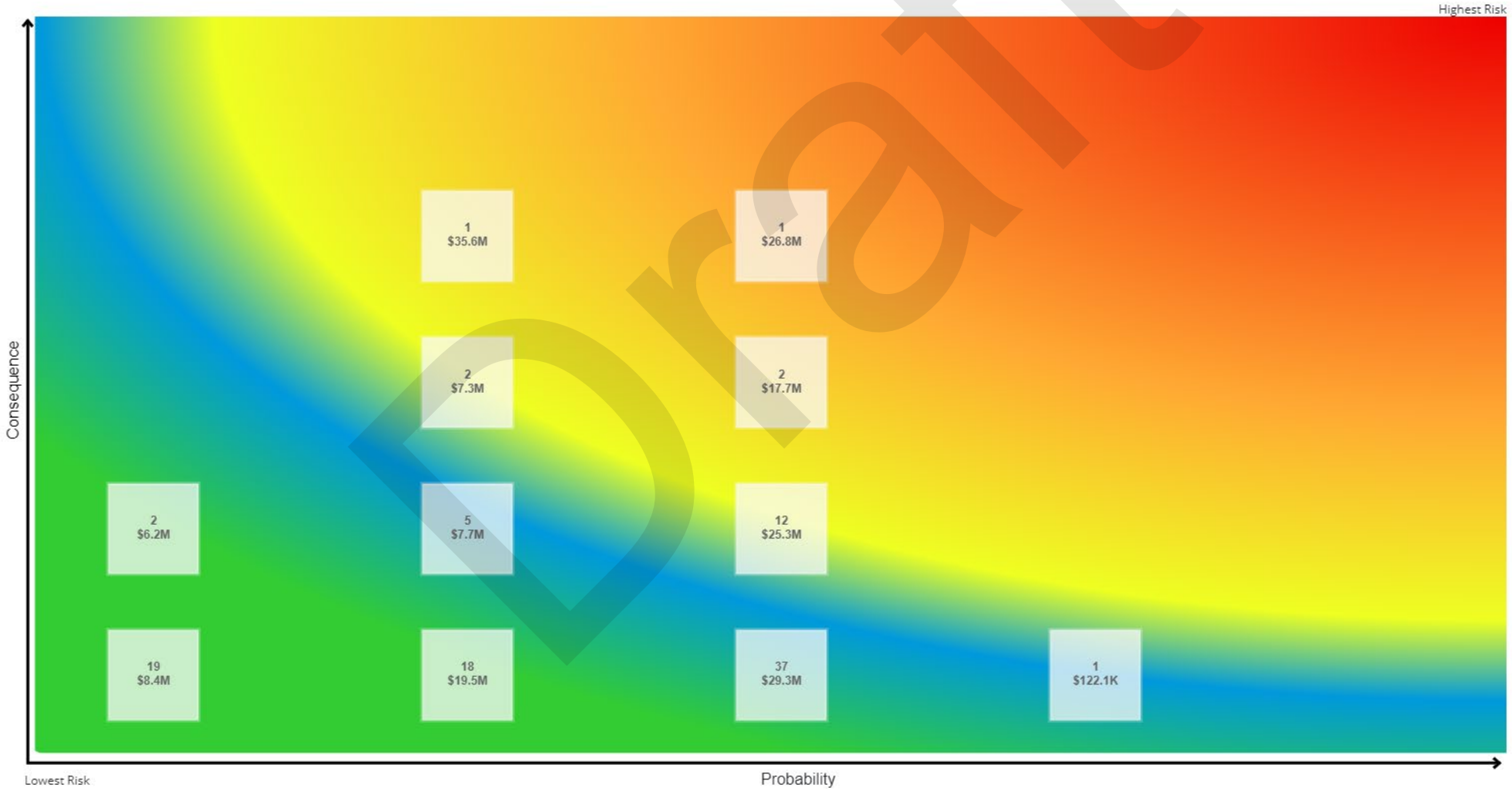
Quantitative risk is calculated using the probability of failure which is established by condition, truck or bus route and structure type. Consequence of failure is evaluated by replacement costs, potential detour distance, road class and traffic volumes. These factors can help decision-makers estimate the probability or likelihood of an asset's failure. For example, a bridge may be in good structural condition, but its structure type or usage (traffic volumes) may increase its susceptibility to failure. Multiplying probability and consequence for a total possible risk score is out of 25. Overall, the average risk rating is moderate.

Risk score out of 25 by segment



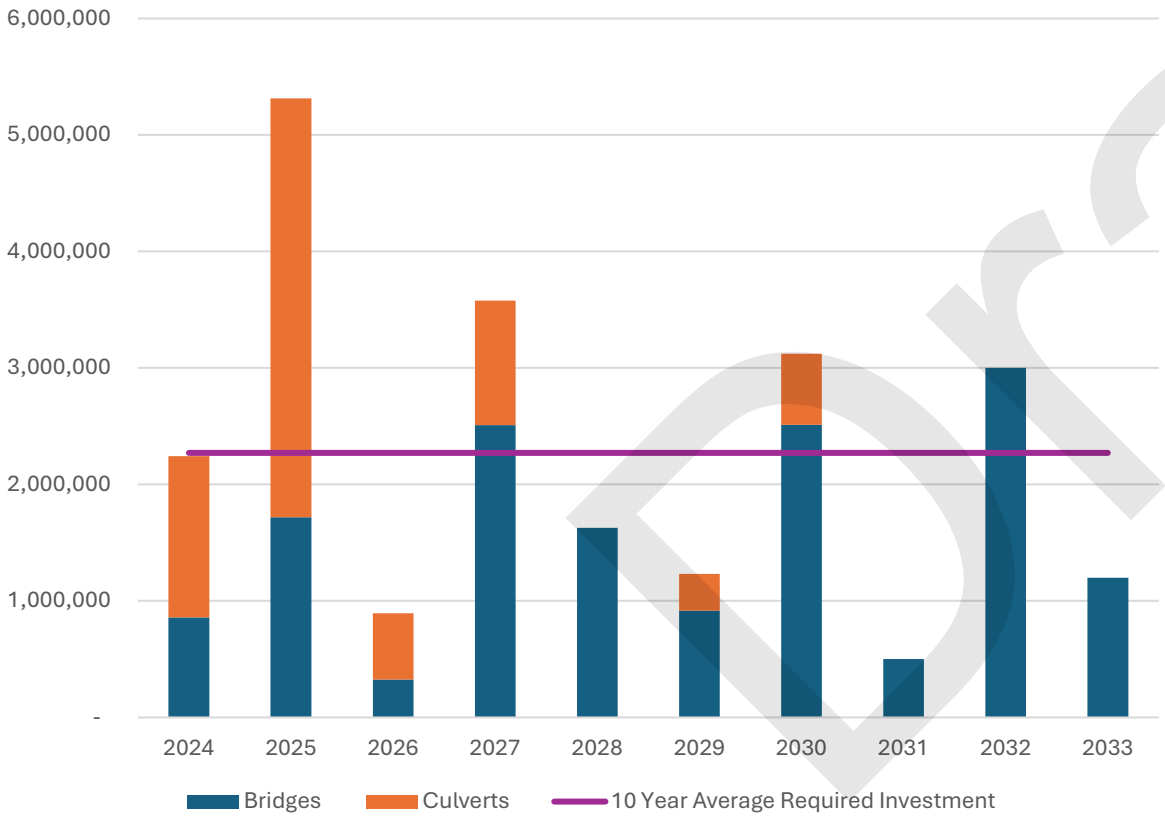
4.1.7. Bridges and Culverts Risk Matrix

The matrix below provides a visual representation of the relationship between the probability of failure and the consequence of failure for Bridges and Culverts. Probability of failure is modeled on factors such as condition, structure type, truck route and bus route. Consequence of failure is modeled on financial replacement cost, road class, access, rise, Average Annual Daily Traffic (AADT) and number of spans. The bridge with high consequence and medium probability with a replacement cost of $26 million is Trout Lake Overpass Bridge.



4.1.8. Costs of providing lifecycle activities for 10 years

Applying life cycle strategies, the current replacement value is approximately $184 million. Assuming all assets in this category are replaced at end of life and life cycle strategies are applied, an annual capital investment of approximately $2.5 million is required. The graph below highlights that in 2025 significant investment is required when the following most notable investments become due for replacement; Booth over Jessop's Creek Culvert, Duke over Chippewa Creek Culvert and Queen over Chippewa Bridge.

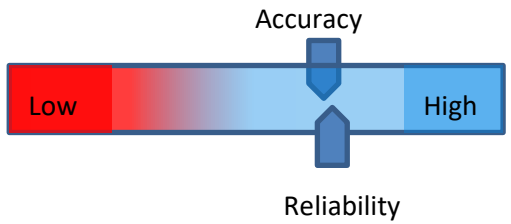


The 2024 Capital Budget has an average annual investment of approximately $573,300 in Bridges and Culverts. As noted in the graph a sustainable annual funding level over the next 10 years to maintain the current lifecycle strategy is $2.3 million.

The annual funding shortfall is approximately $2 million (average annual requirement of $2.5 million less average annual investment in 2024 capital plan $573,300).

The above forecasted capital investment estimates do not factor in annual inflation.

4.1.9. Data Confidence Scale



Bridges and Culverts undergo extensive condition reports every two years. The reports also include anticipated replacement data. The last OSIM report was completed in 2022. The data is also mapped in great detail to the GIS system making the data accuracy very high.

4.1.10. Recommendations

Data Review/Validation

Continue to review and validate inventory data, assessed condition data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2 years.

Risk Management Strategies

Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Life Cycle Management Strategies

The AMP includes capital costs associated with the major rehabilitation/reconstruction of bridges and culverts as estimated by the OSIMs contractors. Ongoing review of replacement values and life cycle strategies is required to ensure changes in information remains accurate.

Document and map in the AMP software the ongoing preventative maintenance program to improve efficiency and effectiveness of life cycle strategies with the overall objective of optimizing the life of the asset in a cost-effective manner.

Levels of Service

Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the City believes to provide meaningful and reliable inputs into asset management planning.

Work towards public consultation and input into levels of service.

4.2 Facilities

The City is responsible for the operations and capital upkeep of several facilities used both for municipal operations and public services. Facilities include those under management by the following departments:

- Landfill
- Fleet
- Transit
- Public Works
- Parks
- Administration

The Facilities for the City were broken down into the following segments reflecting groupings of assets by their service:

- Airport Facilities
- Emergency Services: Covering Fire and Police Facilities
- General Government: Includes Government, Library, Parking Facilities and Transit
- Recreation & Cultural Services Facilities: Arenas, Parks Structures and Washrooms

Current Asset Structure

Currently, major components are grouped as a singular asset (e.g. HVAC, roof) and have not yet been componentized to a more granular level.

In most cases, replacement costs are the building's insured replacement value and information on specific asset interventions (i.e., repairs, replacements) is limited.

NOTE: Water and Wastewater are recorded within the respective service area.

Asset Segment	Quantity (# Facilities)	Replacement Cost
Airport	13	36,824,852
Emergency Services	6	64,115,069
General Government	10	122,092,321
Landfill	5	8,861,215
Parks	15	20,053,802
Public Works	4	5,986,533
Recreational & Cultural Services	14	230,616,686
Overall Totals	67	**$ 488,550,478**

4.2.1. Life Cycle Management Strategy

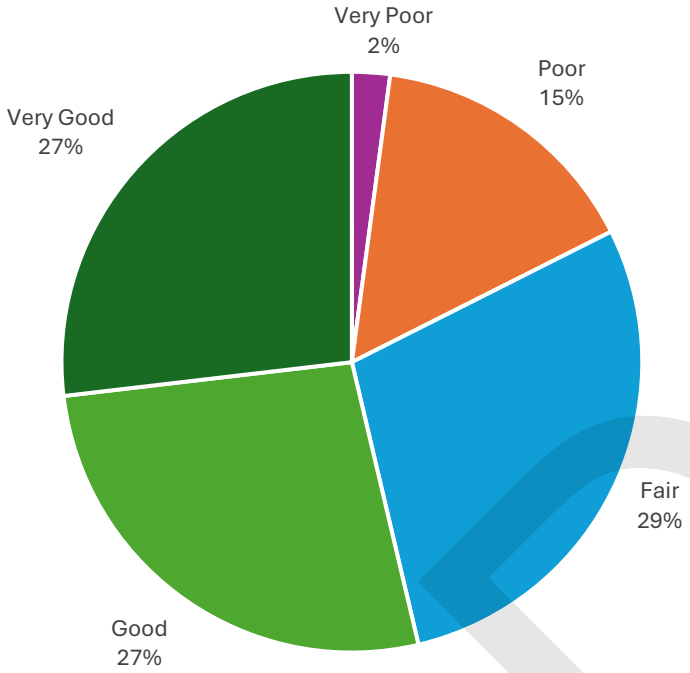
The City's life cycle strategy involves the following activities and events.

Event Class	Description
Maintenance, Inspection, & Testing	**General Facilities** • Certain Facilities undergo regular inspections. • HVAC units in the City's Facilities are inspected quarterly by Honeywell, Ainsworth and other qualified contractors, with identified deficiencies reported to the City. • Elevators are inspected semi-annually by OTTIS and annually by the Technical Standards and Safety Association (TSSA), with inspection reports detailing deficiencies and recommendations. • Fire alarms and sprinkler systems are regularly inspected and tested. • Facilities maintenance is primarily funded through the annual operating budget. **Transit – Bus Shelters** • Bus shelter visual inspections are conducted regularly by staff, with maintenance reactive to issues like graffiti or damage. • Cleaning has been performed on a scheduled basis by a third-party contractor; considering internal options in collaboration with other departments. **Airport Facilities** • Annual walkthroughs and in-depth inspections are conducted. • Core functions such as HVAC and water supply are inspected weekly. • Additional inspections are conducted as per service agreements and regulatory requirements.

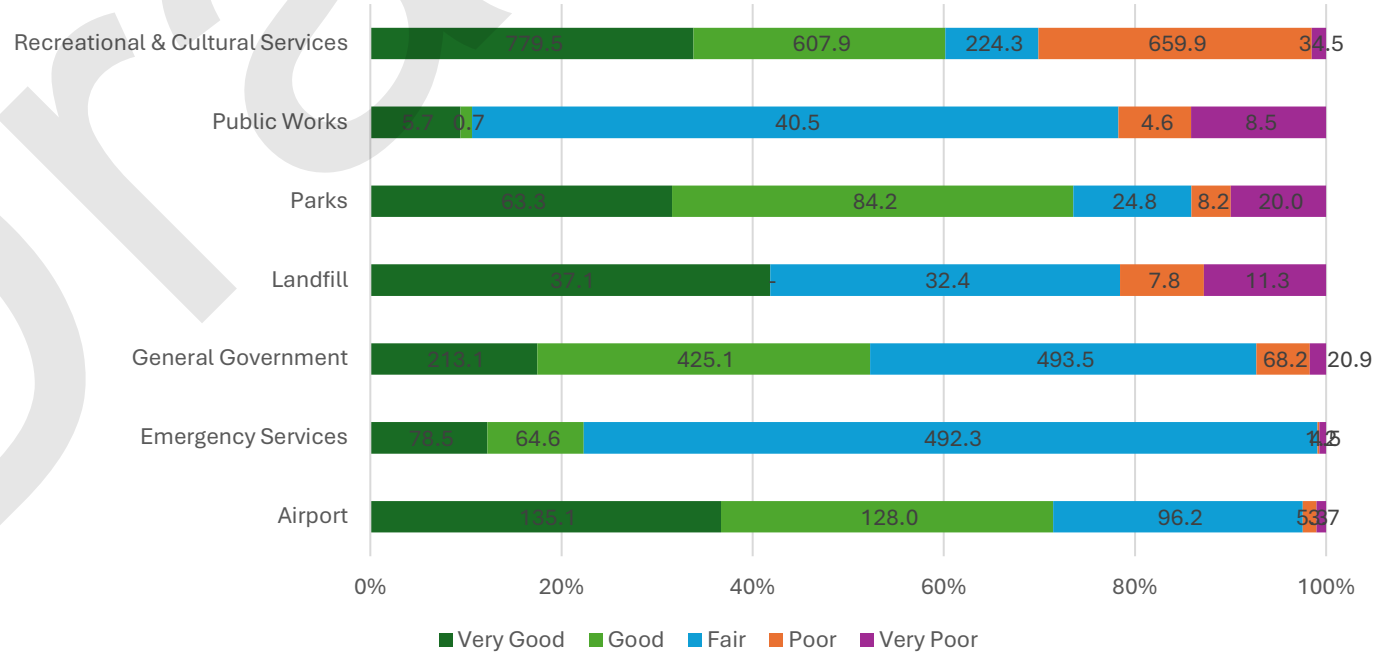
Event Class	Description
Rehabilitation	**General Facilities** • Accessibility concerns and improvement requests are reviewed and addressed by the City, with recent upgrades including renovations for improved accessibility and installation of emergency cardiac kits. **Transit – Bus Shelters** • Rehabilitation and installation of new panels are conducted regularly for safety and asset availability. **Airport Facilities** • Rehabilitation efforts are pursued while maintaining service levels.
Replacement	**General Facilities** • Replacement decisions for building components are based on factors like occupant safety, legislative compliance, cost feasibility of rehabilitation, and replacement cost. Capital replacement projects are typically planned one year in advance. **Transit – Bus Shelters** • Bus shelters are replaced when rehabilitation is not viable. **Airport Facilities** • Replacement follows a 10-year capital plan, with additional replacements as needed.

4.2.2. Condition

The pie chart below is developed on the current average condition. Condition of the various buildings has been gathered by condition assessments, or staff visual inspections and a review of asset performance. 83% of the facilities are rated with a condition of Fair or greater.



The following chart details the assessed condition of Facilities assets, reported by segment, and weighted against asset replacement cost.



In $100,000

4.2.3. Levels of Service

The following tables show the City's current level of service for facilities assets. Metrics include the community and technical levels of service that are required as part of O.Reg 588/17, as well as any additional performance measures that the City has selected for the AMP.

4.2.4 Community Levels of Service

The following table outlines the qualitative metrics that determine the community level of service provided by Facilities.

Core Value	Level of Service Statement	Community Level of Service
Quality	Appropriate actions and interventions are taken to ensure the regular safe use of Facility assets. Facility assets are diverse and serve the needs of residents and the operations of the Municipality.	Recreation focused facilities assets include recreation facilities, outdoor pavilions, halls, and park washrooms. Municipal operations facilities include fire halls, public works garage, and the City Office. Input from the Parks Master plan and community continue to influence the amenities in our community.
Performance	There are long-term plans in place for the renewal and replacement of facilities assets.	Facilities asset rehabilitation and replacement decisions are predominantly based on opportunities for accessibility improvement, risk to occupant health and safety, legislative compliance, cost and construction feasibility. Currently, decisions to replace components of facilities through capital investment projects are forecasted ten (10) years in advance and formally planned one year in advance of project initiation.

4.2.5. Technical Levels of Service

The table below outlines the quantitative metrics that determine the technical level of service provided by Facilities:

Core Value	Level of Service Statement	Technical Level of Service	2023
Quality	Appropriate actions and interventions are taken to ensure the regular safe use of Facility assets. Facility assets are diverse and serve the needs of residents and the operations of the Municipality.	Weighted Average Condition of Assets: (Rating scale in section 2.11)	Good: 62%
Performance	There are long-term plans in place for the renewal and replacement of facilities assets. There is an understanding of the asset condition, and its trends in the portfolio.	Annual Budget vs. Average Annual Capital Requirement:	1.52% : 3.00% Current funding strategies do not meet average annual capital requirements
		% of Assets in Good or Very Good	Condition: 54%
		% of Assets in Poor or Very Poor	Condition: 17%

4.2.6. Facility Risk

Risks are evaluated on a quantitative and qualitative basis. Qualitative risks were identified through an interview-based discussion with department experts and PSD CityWide consultants. Below are key findings of risks identified relevant to Facilities.

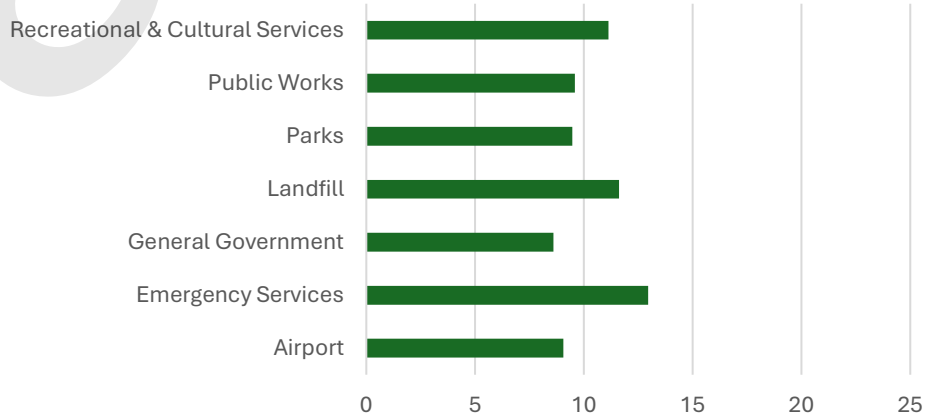
Infrastructure Design & Installation

As Facilities assets mature, certain aspects of their design and implementation combine to have a detrimental impact on the ability of the facility to provide its service. For instance, structural design and material choices have advanced since the construction of some recreation facilities. As a result, the assets aren't reaching the expected longevity and may require rehabilitation or replacement sooner than assets using updated design standards. In addition, there are multiple facilities in the portfolio that are at an age where the addition of new asset components such as HVAC units require additional investment as they seek to adapt the building to new standards and technologies.

Climate Change & Serious Weather Events

Facilities have a large weight to bear when it comes to climate change. Roof structures in particular face a significantly increased impact due to climate change. With snow loads and precipitation becoming unpredictable, the estimated useful lives and maintenance activities for these assets can become obsolete. This movement of climate away from previous predictions has a similar impact on many other facilities asset types, with more of an impact likely to appear in the future.

Quantitative risk is calculated using the probability of failure which is established by condition and consequence of failure which is calculated using weighted replacement costs. Multiplying probability and consequence for a total possible risk score is out of 25. Emergency Services' risks are very high primarily due to high replacement values. Facilities overall risk rating is high.



4.2.7 Facility Risk Matrix

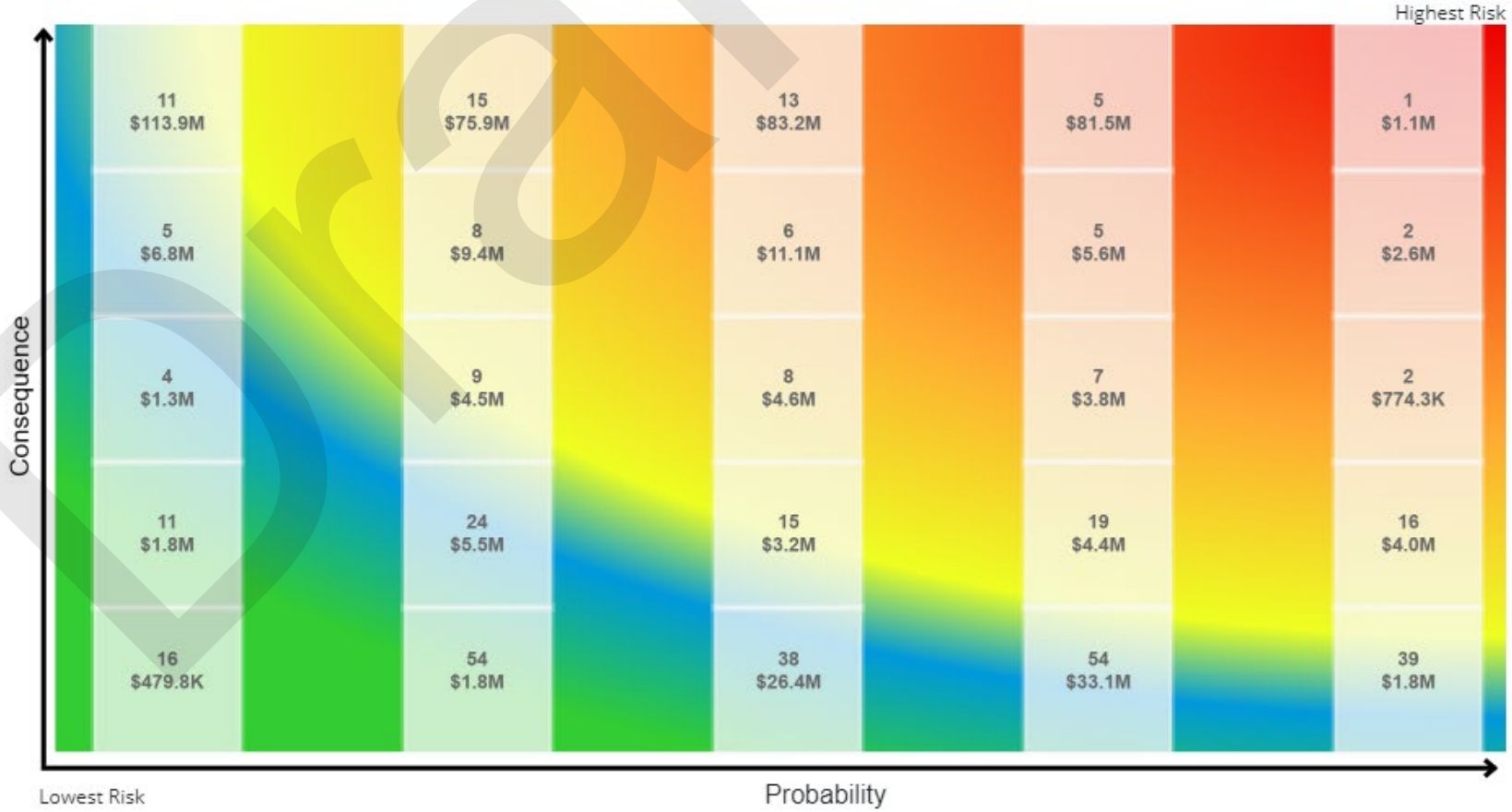
To gain a more detailed overview of risk distribution, we can also review a risk heatmap, which plots each asset's probability and consequence of failure and overall risk. This can better illustrate risk distribution and associated replacement costs. Most assets carry a low probability and a low consequence of failure and therefore are low risk and identified in green. Some assets carry a slightly higher consequence of failure and/or probability of failure and are considered to have moderate risk . These assets are identified in blue and yellow.

As of 2023-year end data, 45% of Facilities are identified as medium or lower risk with 55% identified as high/very high risk. However, risk is a time-specific measure that changes over time as asset condition declines, and assuming there is insufficient investment, risks held by Facilities assets can be expected to increase.

As well, asset risks could change following increased evaluation (i.e., Building Condition Assessments discussed in lifecycle strategies report). Therefore, it is important to regularly review data used to calculate risk and the resultant outputs, and then to treat identified risks appropriately.

In this model, estimating the probability that a facilities asset will fail relies on asset condition. The economic consequences used to estimate the consequence of failure for facilities assets considers the replacement costs, criticality, and the type of facility.

The facilities in the far-right corner include the Landfill, West Ferris Arena and City Hall.

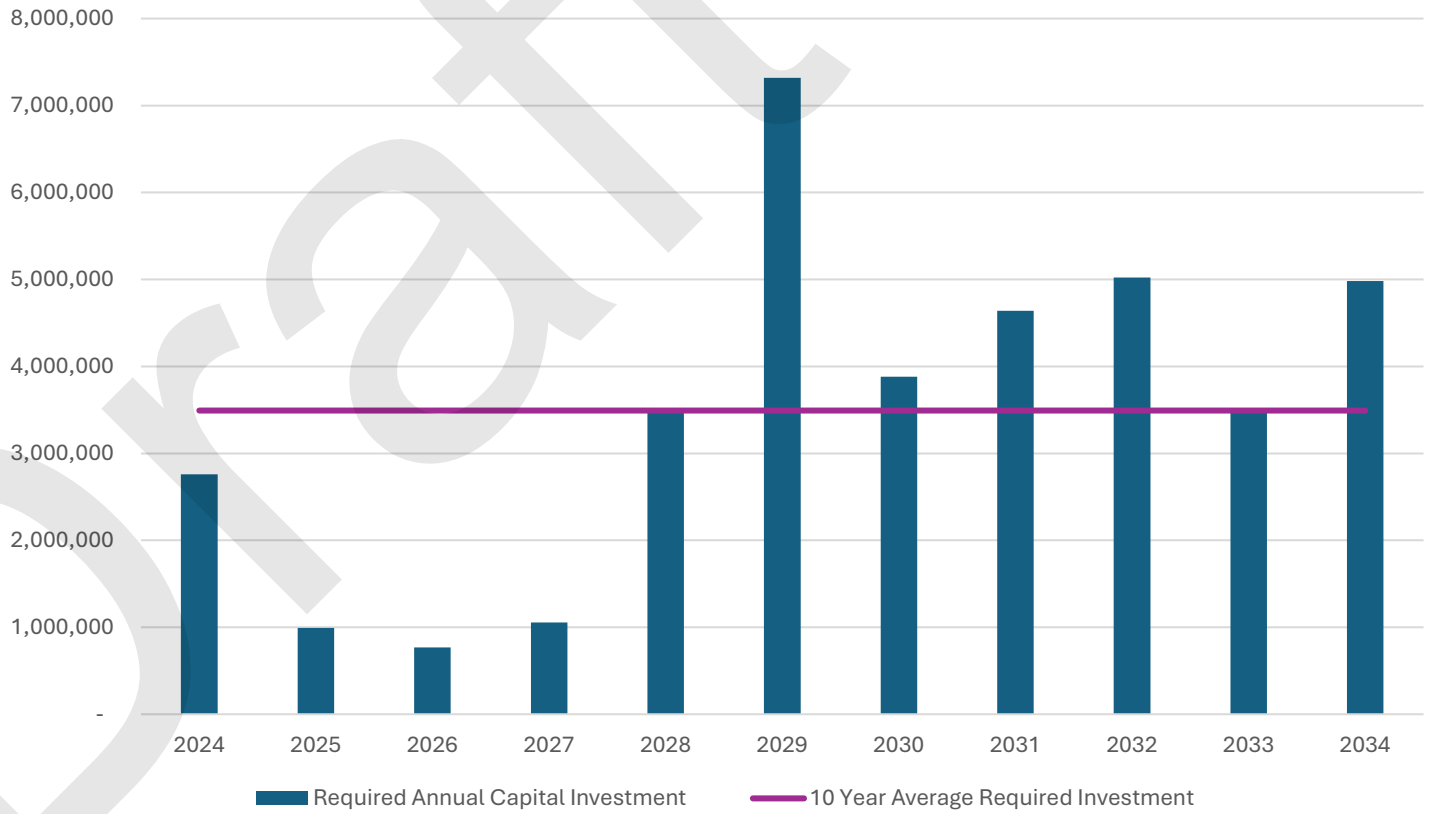


4.2.8. Costs of providing lifecycle activities for 10 years

The time over which every Facilities asset would be replaced was determined based on the existing data and data structure. Based on estimated useful life the total annual capital requirement was determined to be $14.6 million. This represents the required annual investment assuming all assets are replaced at end of life. The accompanying graph demonstrates the required annual capital for the next 10 years.

A significant investment is required in 2029 for roof, changerooms and washrooms at both Memorial Gardens and City Hall.

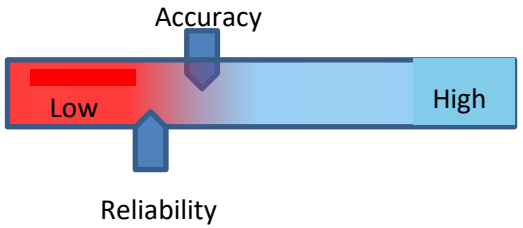
The annual funding shortfall is approximately $7.2 (average annual requirement of $14.6 million less 10 year average annual investment in 2024 capital plan $7.4 million). Note that the line in the adjacent graph represents the 10 year average required investments of $3.5.



Note: West Ferris Community Center has been removed from this analysis because 2025 has a $60 million dollar requirement.

The above forecasted capital investment estimates do not factor in annual inflation.

4.2.9. Data Confidence Scale



As noted in the life cycle strategies the development completion of a comprehensive Building Condition Assessment will increase the accuracy of the data specifically as it relates to cost and life cycle forecast.

4.2.10. Recommendations

1. Completion of a comprehensive Building Condition Assessment (BCA) would likely unveil much more detailed information about recommended interventions, including schedule, and estimated cost, which may result in changes to the average annual requirement and/or the capital requirements by period.

2. Continue to develop on a consistent componentization of their assets so that all components are appropriately accounted for, and replacement schedules are tailored to each assets estimated useful life and relevant details (i.e., poor condition may prompt earlier replacement).

3. Through the completion of a BCA, the City will have more accurate information on Facilities near and long-term capital requirements. The identified capital requirements should be strongly considered when setting budgets and determining any required changes (i.e., taxation and user fee rates, reserve contributions) to meet the identified capital needs.

4. The capital budget should consider the current and future forecasted capital requirements of Facilities assets; dedicated and consistent capital funding is needed to maintain Facilities assets and prolonged deferral of work is likely to reduce the expected life and/or the performance of Facilities assets.

4.3 Fleet & Fleet Equipment

The City owns a variety of Fleet & Fleet Equipment assets that are central to the City's daily operations. Vehicles are managed by the Fleet Department and are allocated to departments to reflect cost of services. The departments that rely on fleet to deliver services are defined as segments within the AMP. Below are some segments and examples of common assets:

- Public Works: Predominately comprised of pick-up and dump trucks, trailers and various small utility vehicles including excavators and tractors.
- Transit: Transit vehicles including multiple types of buses needed to support the City's transit program.
- Parks: An assortment of trucks and light vehicles to support the transportation and work requirements of parks and recreation staff.
- Fire: Comprised of a variety of assets including tankers, pumpers, and utility vehicles.
- Airport: Trucks and Airport service vehicles for the ongoing maintenance and support of airport activities.

The City's Fleet & Fleet Equipment assets have detailed records within a computerized fleet system. High level data has been integrated into the Asset Management System.

The following table provides summary information based on an updated inventory of their data as of a 2023 year-end:

Segment	Quantity	Replacement Cost
Airport	11	1,883,476
Fire	23	9,818,642
General Government	3	125,859
Landfill	6	1,968,367
Parking	2	65,539
Parks	44	2,708,723
Public Works	78	11,441,693
Recreation & Cultural Services	6	699,678
Transit	28	15,620,996
Water & Sewer	46	7,229,807
Total	**247**	**51,562,780**

4.3.1. Life Cycle Management Strategy

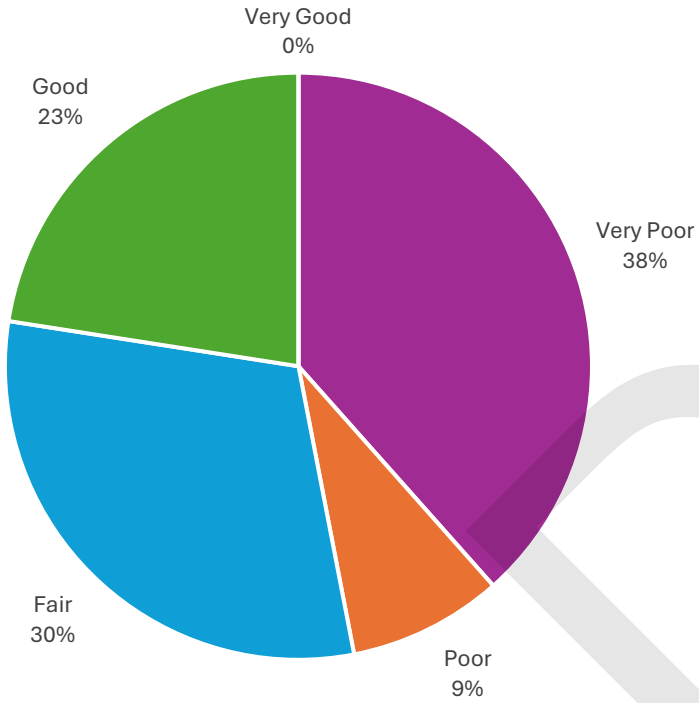
Depending on initial life cycle management strategies, asset performance can be sustained through a combination of maintenance and rehabilitation, but at some point, replacement is required. Understanding what effect life cycle activities have on assets and their cost, enables more prudent life cycle management decisions. Often, this also provides a better balance of asset cost, risk and performance in alignment with organizational goals. The following table provides a description of common types of life cycle activities.

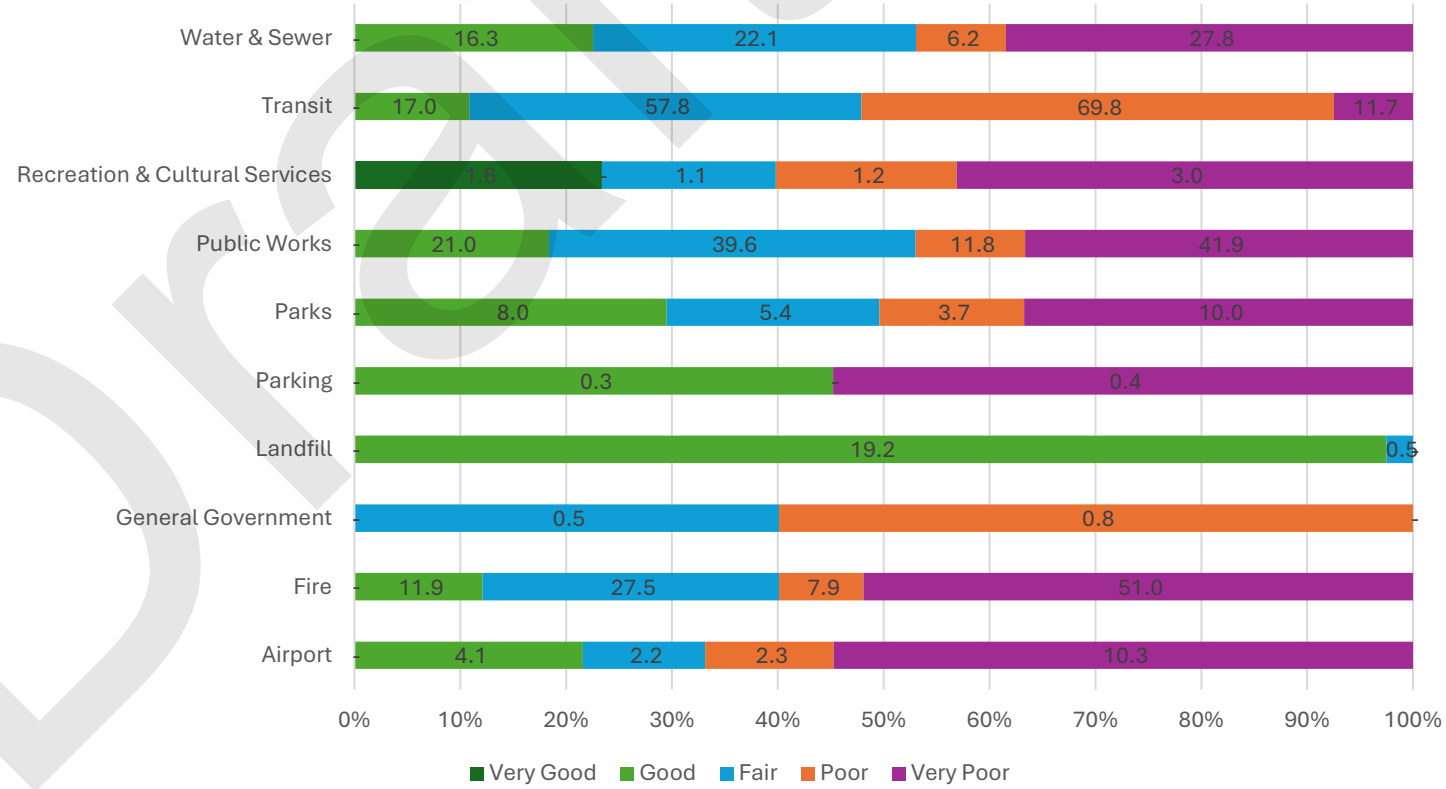
Event Class	Description
Maintenance & Inspection	**General Fleet Assets** • General Fleet vehicle maintenance is systematically managed and documented within a centralized Computerized Maintenance Management System (CMMS). • Maintenance planning adheres to industry best practices. • Vehicles undergo regular inspections before each use, with additional periodic inspections to ensure safety and compliance. **Fire Fleet Assets** • Fire Fleet assets undergo daily inspections in accordance with firefighting regulations. • Specially certified staff mechanics handle maintenance, following manufacturer recommendations and legislative requirements, with additional maintenance performed as necessary for reliable operation. • Third-party maintenance is enlisted when in-house capacity is exceeded.

Event Class	Description
Rehabilitation	**General Fleet Assets** • Rehabilitation decisions are made on a case-by-case basis, considering asset type, usage, and criticality, weighed against available rehabilitation resources. **Fire Fleet Assets** • Rehabilitations are considered on a case-by-case basis with respect to the remaining useful life and cost of the asset. • Rehabilitation is not considered if it poses a potential risk to safety and operation in fire-fighting activities.
Replacement	**General Fleet Assets** • Replacement decisions factor in asset age, condition, maintenance cost, and historical trends, managed through the municipality's fleet CMMS to maintain service levels. • Technology advancements are considered, influencing replacement strategies as vehicles evolve. **Fire Fleet Assets** • Replacement decisions are based on age, condition, maintenance history and utility, integrated into the fleet CMMS for effective resource planning. • Utility comparisons between existing and potential replacements guide decisions, optimizing functionality and efficiency. • Replacement ensures sufficient available and backup assets for emergency response readiness.

4.3.2. Condition

The pie chart and bar chart below are developed on the current average condition for all fleet segments. Condition is based on condition assessments completed by mechanics according to fleets condition rating specifications. If a vehicle has not been inspected the condition is based on age. Fleet rotates vehicles between segments; therefore, the condition below by segment solely reflects the data at a specific point in time. (Note: Airport Fleet below is managed by the Airport).





In $100,000

4.3.3. Levels of Service

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

4.3.4 Community Levels of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by Fleet & Fleet Equipment:

Core Value	Level of Service Statement	Community Level of Service
Quality	Appropriate actions and interventions are taken to ensure the regular safe use of Fleet assets. Fleet assets are essential components to the ongoing operation of municipal services.	Maintenance of Fleet asse conditions are essential to the City's fire, public works, and parks and recreation services departments.
Performance	There are long-term plans in place for the renewal and replacement of Fleet assets in line with estimated useful life and industry best practice.	Capital replacement activities for Fleet are generally planned 10 years in advance and consider the asset's age, condition, utility, availability of replacement stock, and cost-benefit analysis of replacement.

4.3.5 Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by Fleet & Fleet Equipment:

Core Value	Level of Service Statement	Technical Level of Service	Current Performance 2023
Quality	Appropriate actions and interventions are taken to ensure the regular safe use of Fleet assets. Fleet assets are essential components to the ongoing operation of municipal services.	Weighted Average Condition of Assets: (Rating scale in section 2.11)	Fair: 42%
Performance	There are long-term plans in place for the renewal and replacement of Fleet assets in line with estimated useful life and industry best practice.	Annual Budget vs. Average Annual Capital Requirement:	6.24% : 7.90%
		% of Assets in Good or Very Good	Condition: 23%
		% of Assets in Poor or Very Poor	Condition: 47%

4.3.6. Fleet Risk

Risks are evaluated on a quantitative and qualitative basis. Qualitative risks were identified through an interview-based discussion with department experts and PSDCity Wide consultants. Below are key findings of risks identified relevant to Fleet & Fleet Equipment assets.

Fiscal Capacity & Cost Escalations

The present level of financial reinvestment does not adequately address maintenance and capital rehabilitation requirements to ensure City assets remain at their current service levels and achieve their intended service life over time. The increase in component cost and complexity has led to increases in repair costs and downtime from said repairs. Lead time for new assets has also significantly increased. This challenging position may negatively impact service delivery and quality.

Organizational Change and Capacity

Similar to qualitative risk in Fiscal Capacity & Cost Escalations, the changing complexity and product map of vehicles impacts the staff's ability to provide the same levels of service on an increasingly diverse fleet. With the introduction of additional electronics and alternative fuel systems, the vehicle population has seen an increase in different parts, fuel and maintenance needs. This means increasing maintenance staff training as well as including these hidden costs in replacement activities.

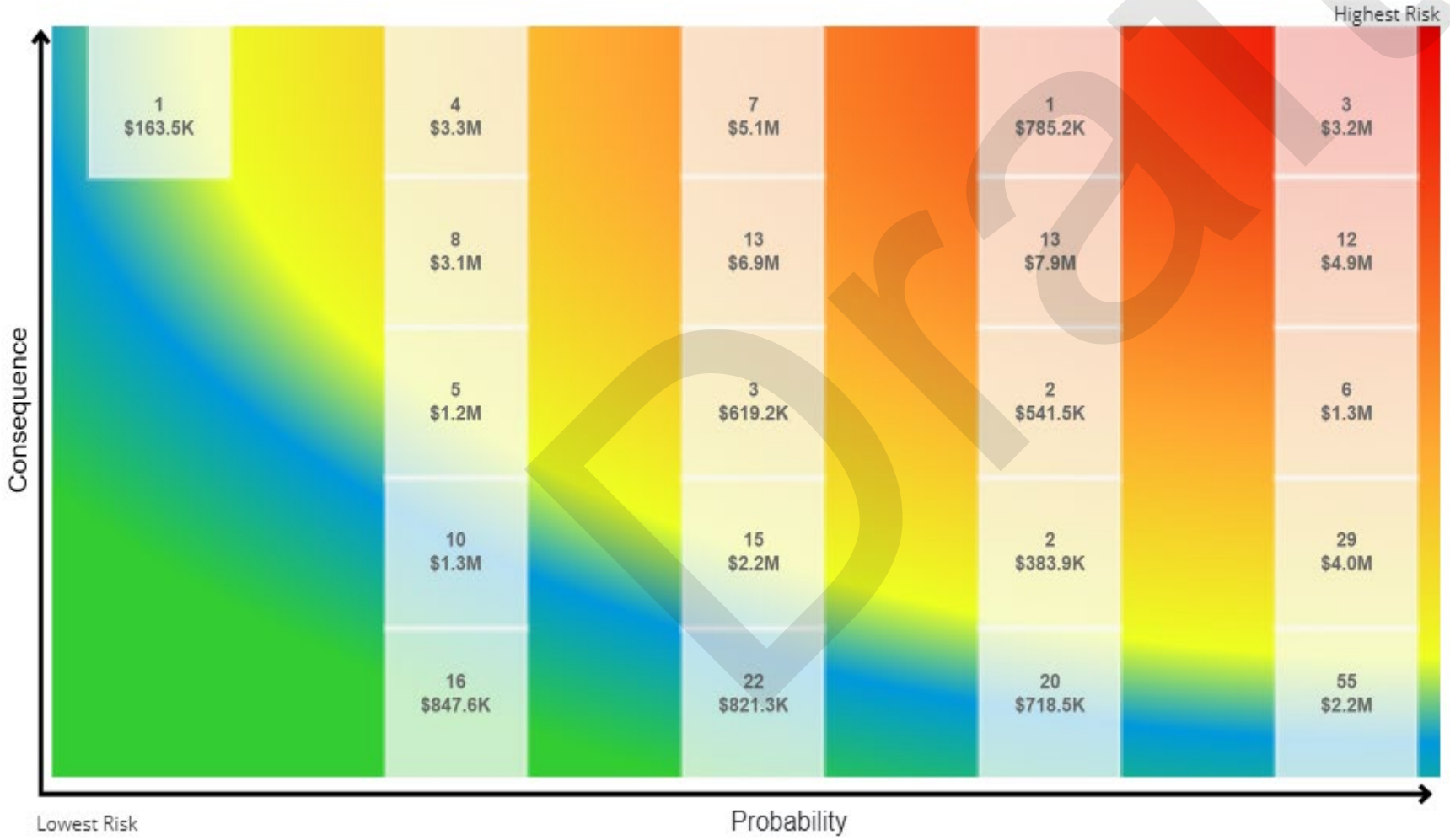
As with any organization, staff departures are a reality. North Bay faces issues maintaining service staff as the industry becomes more and more competitive. This is being addressed by mentorship programs and the use of fleet and maintenance tracking software.

Quantitative risk is calculated using the probability of failure which is based on condition and consequence of failure which is based on weighted replacement costs. Multiplying probability and consequence for a total possible risk score is out of 25. Fire, risk is very high which is primarily driven by the high replacement values. Fleet overall risk rating is high.

4.3.7. Risk Matrix

Probability of Failure

Risk measures are dynamic, changing as assets age and deteriorate. If investment is inadequate, the risks associated with Fleet assets are likely to grow. If investment is sufficient the risks would be reduced by the improved condition; however, the consequence is based on replacement value. Thus, it is essential to routinely review and update the data for risk calculation and take appropriate action on identified risks.



Consequence of Failure

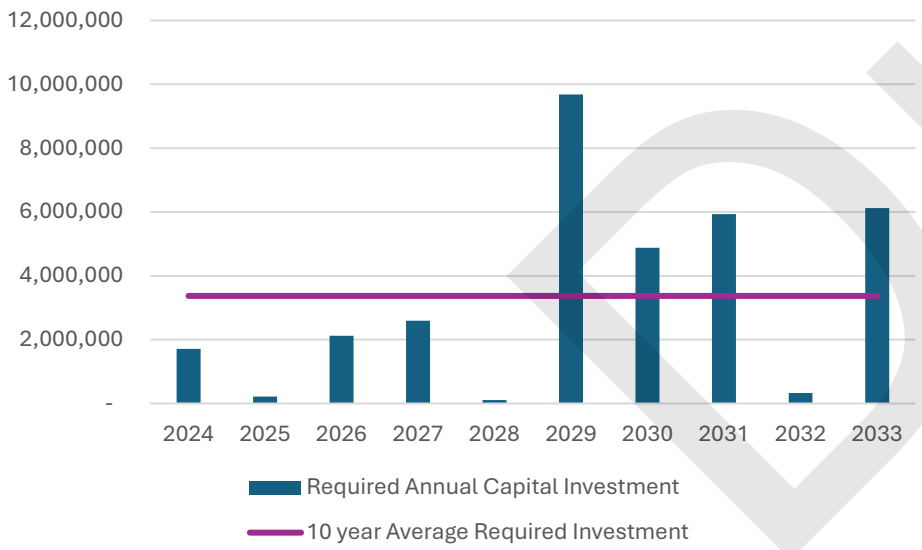
The economic consideration used to estimate the consequence of failure for Fleet & Fleet Equipment is based on replacement cost of the asset. The accompanying table outlines the metrics used and the associated scoring framework.

The three assets in the top right are the Fire departments Aerial and two Pumper trucks. The twelve units also in the far right are 6 Ton Plows and Zambonis.

4.3.8. Costs of Providing Lifecycle Activities for 10 Years

Applying life cycle strategies, the current replacement value is approximately $51.4 million. The annual requirement of $4 million assuming all assets in this category are replaced at end of life. Over the next 10 years the average annual capital investment is $3.2 million. The 2024 capital budget has approximately $3.2 million annual investment in Fleet therefore the overall risk levels are not forecasted to change over the next 10 years.

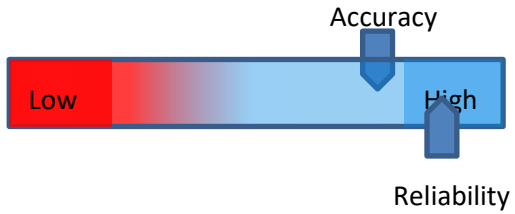
The graph below highlights that in 2029 significant investment is required when some notable investments become due for replacement within Public Works, Transit and Fire.



The annual funding shortfall is approximately $856,600 (average annual requirement $4 million less average annual investment in 2024 capital plan $3.2)

The above forecasted capital investment estimates do not factor in annual inflation.

4.3.9. Data Confidence Scale



4.3.10 Recommendations

- To ensure capital projections are as accurate as possible, regularly review and update replacement costs, especially for assets of high value. Wherever possible, obtain estimates based on comparable recent purchases or quotes.
- Review projected capital requirements against current capital funding amounts to determine if funding adjustments may be needed and if so, to enable adjustments to be made more sustainably over time.
- Consider aligning asset management categorization of assets with budgeting structure so that analysis is more streamlined.
- Ensure that the process for assessing asset condition is uniform across fleet assets so that meaningful comparisons and inferences can be drawn from condition data. A manual detailing the factors reviewed, with supportive information like photographs and scales would be helpful, especially in the event of staff changes.
- Work towards the digitization of assessed condition and thereafter the regular updating of asset condition to the asset management software system.
- Consider digitizing service records so that review and costing analysis can be streamlined and more easily documented.

4.4 Land Improvements

The City is responsible for the operations and capital upkeep of a diverse array of Land Improvements assets. For reporting purposes, these assets may be summarized by department or by common segments. Some examples of common assets included in the segments include the follow:

- Parks Land Improvements includes: athletic fields & playgrounds as well as non-enclosed structures like gazebos, benches, picnic tables etc.
- Parking Lots: parking lots associated with buildings and parks
- Airport Land Improvements: tarmac, electrical, and additional assets
- Landfill Land Improvements: sludge ponds and clay liners
- Transit: bus shelters

The following table provides summary information based on the 2023 year end:

Asset Segment	Quantity	Replacement Cost
Airport	66	$85,997,000
Fire	4	$196,000
General Government	6	$558,000
Landfill	4	$4,700,000
Parking	49	$14,024,000
Parks	538	$155,576,000
Public Works	5	$434,000
Recreation & Cultural Services	5	$784,613
Transit	94	$687,000
Total	766	$262,172,000

4.4.1. Life Cycle Management Strategy

Depending on initial lifecycle management strategies, asset performance can be sustained through a combination of maintenance and rehabilitation, but at some point, replacement is required. Understanding what effect lifecycle activities have on assets, and their cost, enables more prudent lifecycle management decisions. Often, this also provides a better balance of asset cost, risk, and performance in alignment with organizational goals. The following table provides a description of common types of lifecycle activities.

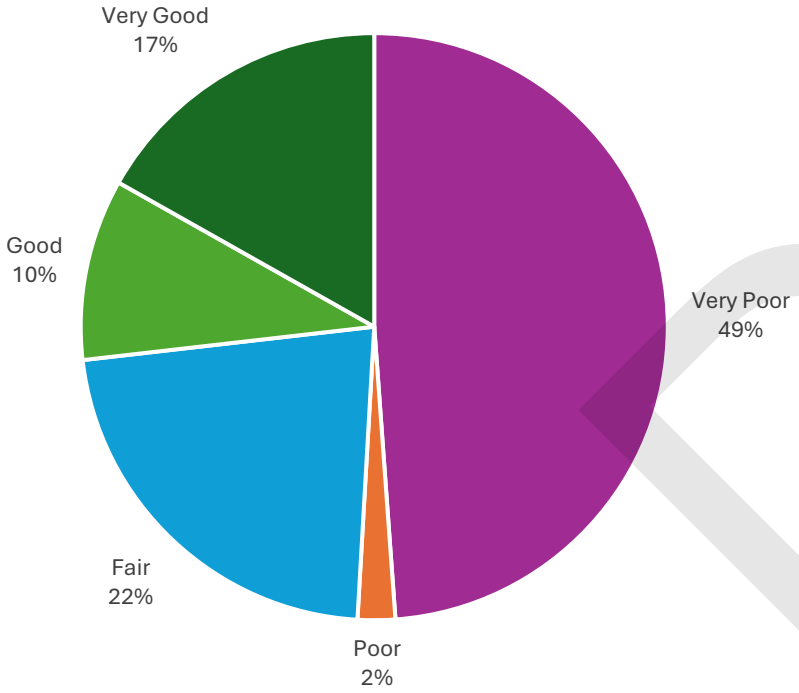
Event Class	Description
Maintenance & Inspection	**Parks** • North Bay playgrounds undergo monthly inspections by internal staff to ensure safety standards. Identified issues are promptly addressed by Parks and Recreation personnel. • Outdoor recreation facilities like soccer fields and outdoor rinks are subject to comprehensive yearly inspections, with deficiencies documented for repair. These facilities receive visual inspections 2 to 3 times weekly. • Daily inspection and maintenance routines are upheld for park facilities and amenities. **Landfill** • Assets inaccessible for direct inspection or maintenance, such as the clay liner, undergo multiple tests to verify adherence to expected lifespans. • Regular inspections and dredging are conducted for assets like sludge ponds, with staff performing visual assessments for reactive maintenance. • Centralized CMMS oversees maintenance activities, including long-term planning and lifecycle tracking.

Event Class	Description
Maintenance & Inspection	**Airport** • Ongoing maintenance of Land Improvements assets is managed internally by the Airport. • Daily inspections of asset function and structure are conducted in-house, complemented by third-party assessments to meet regulatory standards. **Parking** • Ongoing maintenance of Land Improvements assets is managed internally by the Parking Dept. • Daily inspections of asset function and structure are conducted in-house, complemented by third-party assessments to meet regulatory standards.
Rehabilitation	**Landfill** • Asset rebuilds are determined on a case-by-case basis, balancing cost considerations with staff capacity for repairs. **Airport** • Rehabilitation efforts for Land Improvements assets prioritize achieving expected useful lifespans while adhering to safety standards. **Parking** • Rehabilitation of parking Land Improvements assets are initiated when necessary, though infrequent.

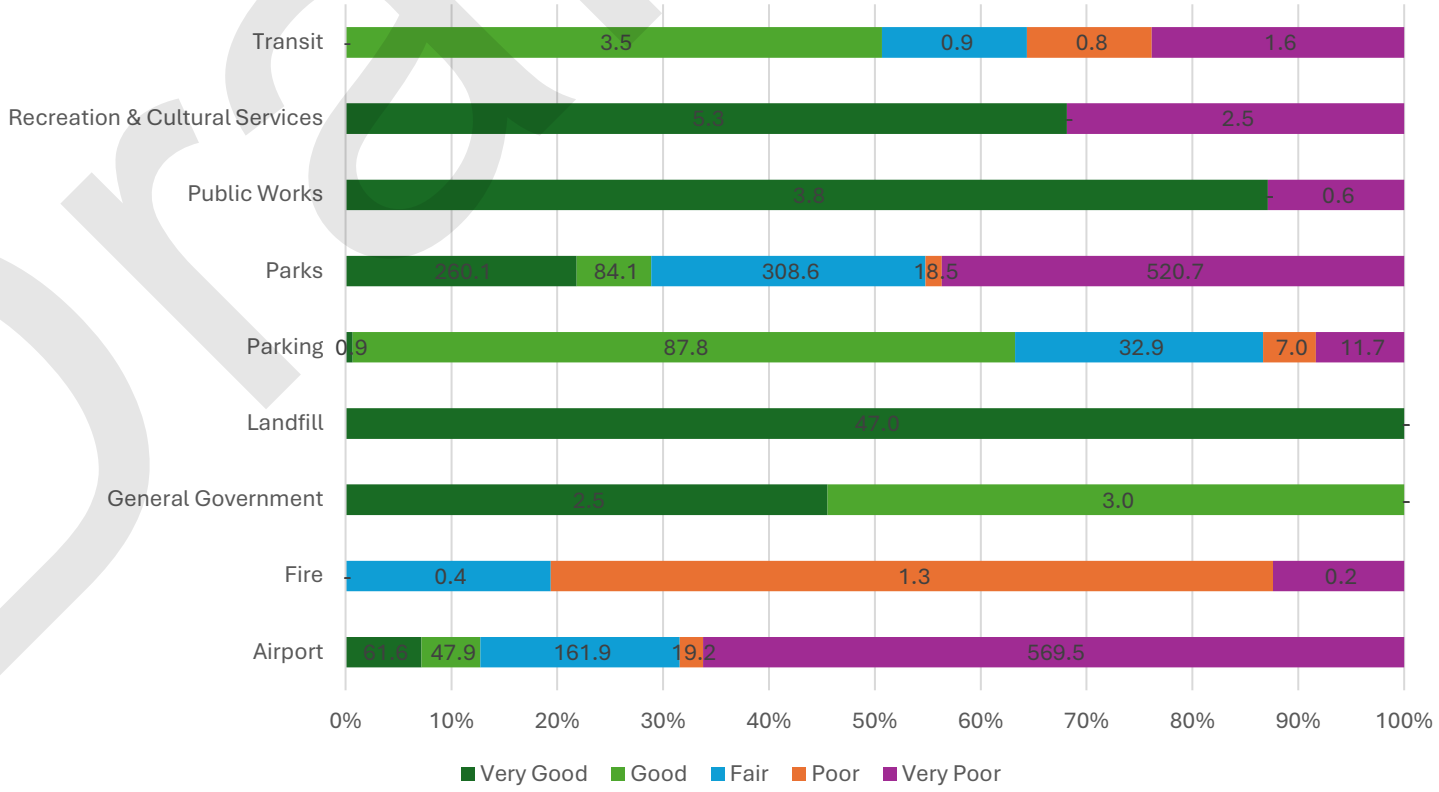
Event Class	Description
Replacement	**Parks** • Asset replacement decisions integrate factors such as useful life, anticipated utility, usage rates, and public feedback regarding safety and condition. These considerations inform replacement cost assessments. • If an asset is damaged midway through the lifecycle, it will be slated for partial or full replacement, depending on the use and regulation context. **Landfill** • Replacement decisions are based on asset criticality, with senior staff adjusting replacement schedules in response to landfill demands. **Airport** • A 10-year replacement planning cycle is adhered to, prioritizing assets critical to safety and regulatory compliance. • Decision-making incorporates modeled useful life estimates and contractual obligations

4.4.2. Condition

Condition has been determined by age and estimated useful life in accordance with the City's Tangible Capital Asset Policy. In future it is recommended that the Land Improvement assets be inspected and evaluated against a defined set of criteria. The below pie chart depicts that 51% of the assets are in Poor condition with 49% being fair or above condition.



Condition by segment highlights that the Airport runway is in need of investment which is planned for in the 2029 Capital Budget



In $100,000

4.4.3. Levels of Service

The following tables show the City's current level of service for the Land Improvements. Metrics include the community and technical levels of service that are required as part of O.Reg 588/17, as well as any additional performance measures that the City has selected for the AMP.

4.4.4 Community Levels of Service

The following table outlines the qualitative metrics that determine the community level of service.

Core Value	Level of Service Statement	Community Level of Service
Quality	Appropriate actions and interventions are taken to ensure the regular safe use of Land Improvements assets.	Land improvement assets include municipal parks, airport assets, bus shelters, and sports fields. Wherever possible, assets are designed to serve a wide range of users.
Performance	There are long-term plans in place for the renewal and replacement of Land Improvements assets.	Land Improvements asset investment decisions are predominantly based on asset condition and expected future utility alongside existing rate of use and the relevant regulatory requirements surrounding the asset type. Land improvement capital investment projects are formally and publicly identified within the 10 year Capital Plan and forecast.

4.4.5. Technical Levels of Service

The table below outlines the quantitative metrics that determine the technical level of service provided by Land Improvements:

Core Value	Level of Service Statement	Technical Level of Service	Performance
Quality	Appropriate actions and interventions are taken to ensure the regular safe use of Land Improvements assets.	Weighted Average Condition of Assets: (Rating scale in section 2.11)	Poor: 21%
Performance	There are long-term plans in place for the renewal and replacement of Land Improvements assets	Annual Budget vs. Average Annual Capital Requirement:	2.31% : 5.93%
		% of assets in Good or Very Good Condition:	27%
		% of Assets in Poor or Very Poor Condition:	51%

4.4.6 Land Improvements Risk

Climate Change & Extreme Weather Events

There has been an increase in the variability around snow and precipitation loads. This causes additional stress on the Airport Land Improvements assets via additional plowing, clearing, and load bearing. This will have an impact on the asset's ability to meet the lifecycle timelines as more plowing increases the rate of deterioration of asphalt surfaces. This will require flexibility as they face an increasing pressure from these changes.

In kind with the Airport Land Improvements, there is a similar impact on landfill assets. Increased or heavier precipitation, including snowfall events, place more pressure on the assets. In response, the team is looking at increasing capacity through both addition and enhancement of current assets.

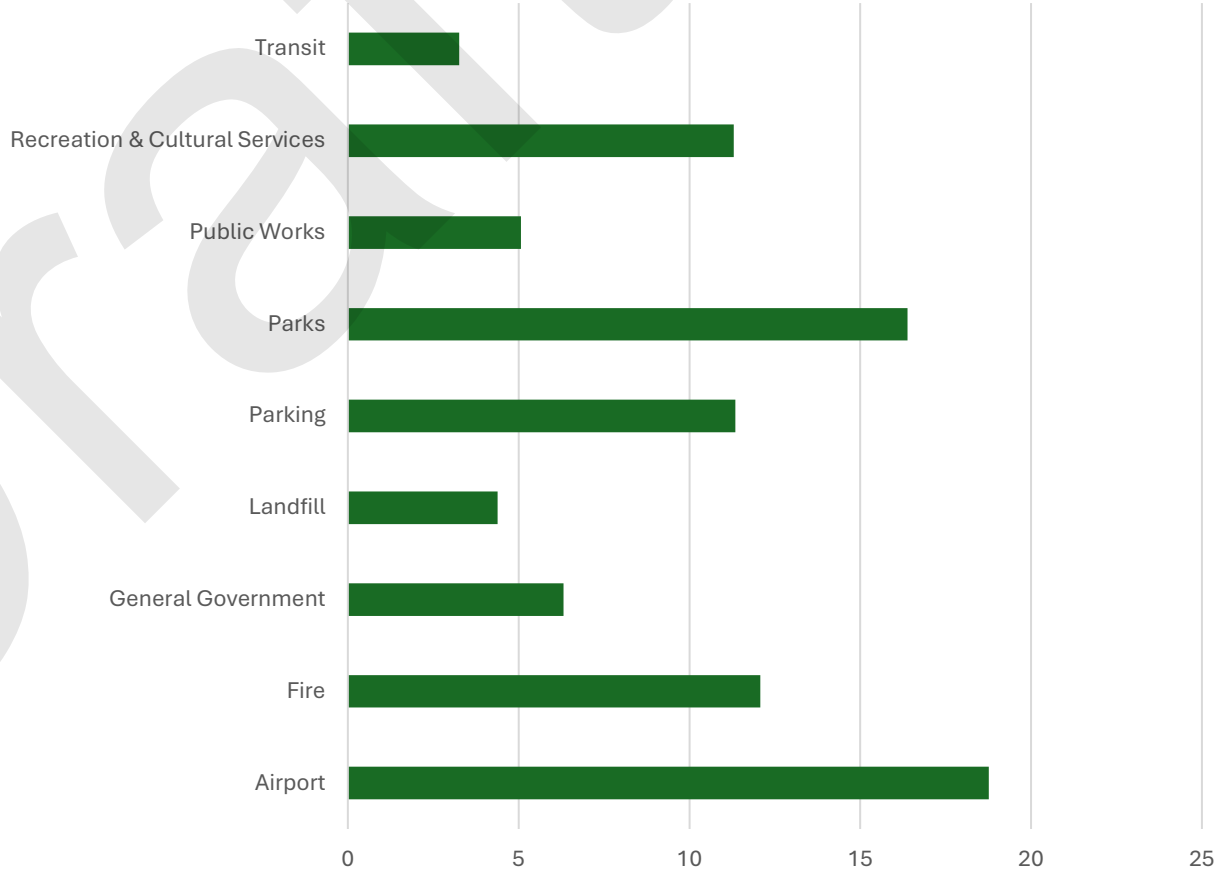
Organization Cognizance & Capacity Risk

Key staff are invaluable to the ongoing work and service delivery of the airport. The knowledge held by long-term staff is not always collected and maintained by the department. This leaves a vulnerability to staff retirements or unexpected leave as there are key processes that are not involved in the day-to-day operations but are essential when called upon. With retirements of key personnel on the horizon, there is an urgency to document and circulate their knowledge to assist staff to operate at the same level in their absence.

Overall, Airport Assets carry the highest average risk rating. This is in part due to the strict safety and regulatory requirements for the assets.

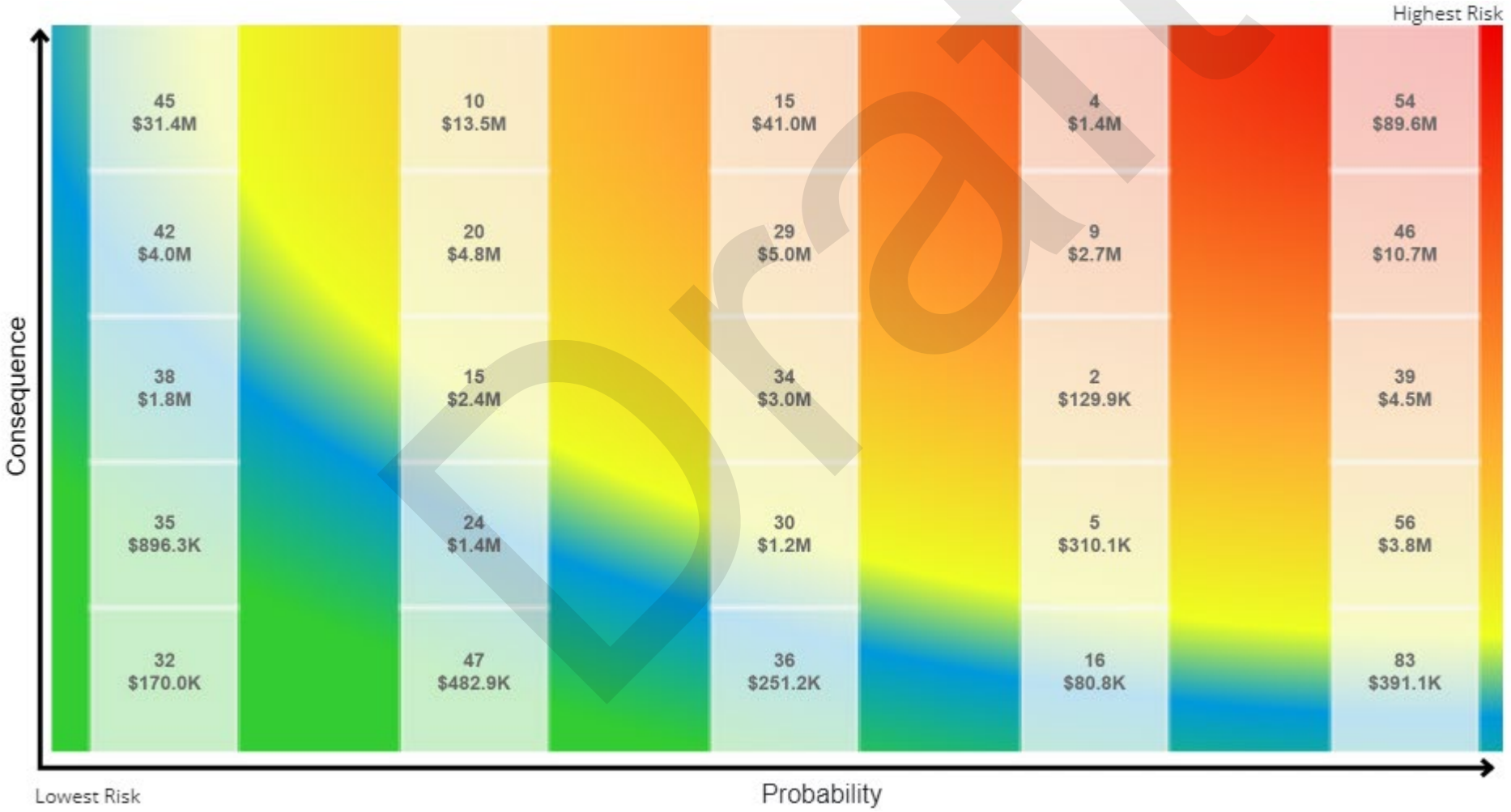
Risk is inherently tied to time, evolving as the condition of assets deteriorates. Without adequate investment, the risks associated with Land Improvements assets are likely to rise. Additionally, risks may shift following more thorough evaluations. It is crucial to consistently reassess the data used for risk calculations and address any identified risks accordingly.

Risk treatments would be valuable to explore at a minimum for assets with moderate-high risk. Further investigation may help the City identify suitable risk treatments based on their accepted risk tolerance.



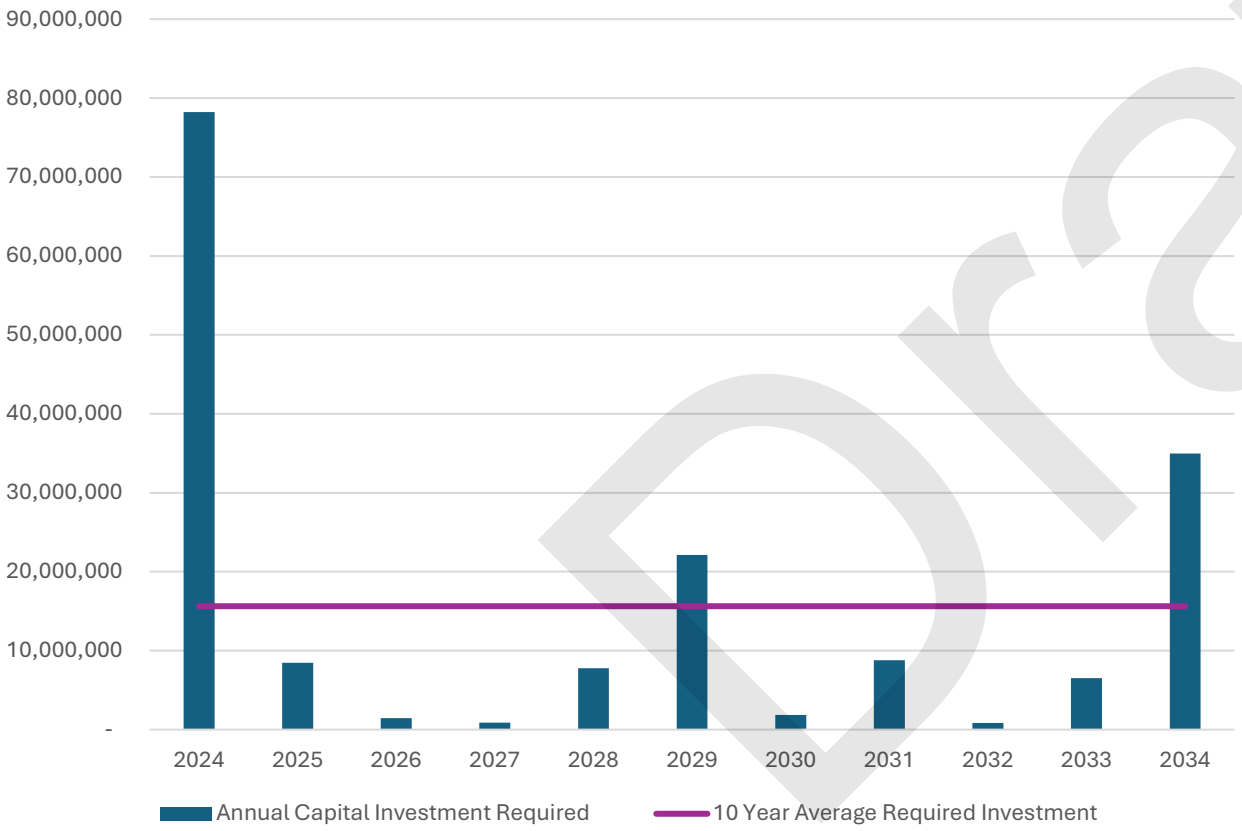
4.4.7. Land Improvements Risk Matrix

The risk matrix below provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within Land Improvements as of December 31, 2023. The identification of the critical assets allows the City to determine appropriate risk mitigation strategies and treatment options. There is generally a wide spread of assets in all areas of the risk matrix.



4.4.8. Costs of providing lifecycle activities for 10 years

The time over which every Land Improvements asset are scheduled for replacement are in line with the asset's criticality, safety ramification, in-service date and EUL. The total average annual capital requirement was determined to be $13.4 million. This represents the required annual investment assuming all assets are replaced at end of life.



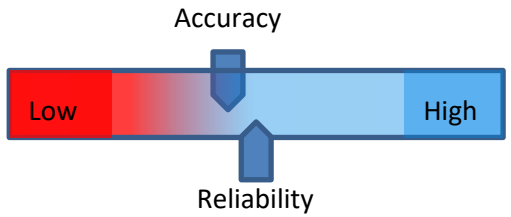
The above forecasted capital investment estimates do not factor in annual inflation.

The adjacent graph demonstrates the required annual capital for the next 10 years and the average annual investment over the 10 years.

One significant investment required in 2034 is for Omischel Sports Complex.

The annual funding shortfall is approximately $8.2 million (average annual requirement of $13.4 million less average annual investment in 2024 capital plan of $ 5.2 million)

4.4.9. Data Confidence Scale



4.4.10. Recommendations

Data Review/Validation

Review internal processes for assessing asset condition and ensure that the considerations are appropriate for each asset and have a structured process with appropriate reference documentation for evaluation criteria. Such documentation will assist in more objective analysis and, in the event of staff changes, will be valuable to the new incumbent and the sustainability of the asset management program.

Risk Management Strategies

Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Life Cycle Management Strategies

Assess the suitability of rehabilitation for certain assets, especially those that may be more costly to replace and can be cost-effectively rehabilitated (i.e., Tennis courts).

Incorporate the results of the Parks and Recreation Master Plan into asset investment decisions.

Levels of Service

Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the City believes to provide meaningful and reliable inputs into asset management planning.

Work towards public consultation and input into levels of service.

4.5 Machinery & Equipment

North Bay owns a variety of Machinery & Equipment assets that are central to the City's daily operations. For reporting purposes, these assets have been segmented based on their department of use. These segments, and examples of common assets included in them, are detailed below:

- Emergency Services: tools, communication equipment, bunker gear and hoses.
- Parks: brooms, mowers and pressure washers.
- Landfill: lab and SCADA equipment.
- Fire and Fleet: mechanics' tools and lifts.
- Transit: coin vault, bus lift and bike racks.
- Parking: pay stations and line painters.
- IT: computers, servers and cellphones.

Machinery & Equipment assets are recorded in an asset management software system. The following table provides summary information based on a 2023 year-end effective date:

	Assets Count	Replacement Cost
Airport	74	980,303
Emergency Services	91	3,204,141
Fleet	8	626,425
General Government	28	2,044,005
IT	883	2,365,788
Landfill	14	1,701,088
Parking	24	2,256,008
Parks	90	1,779,704
Public Works	158	16,360,763
Recreational & Cultural Services	49	3,403,879
Transit	43	2,859,522
Water & Sewer	83	1,372,173
Machinery & Equipment Total	**1,545**	**38,953,799**

4.5.1. Life Cycle Management Strategy

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

The following table outlines the City's current life cycle management strategy:

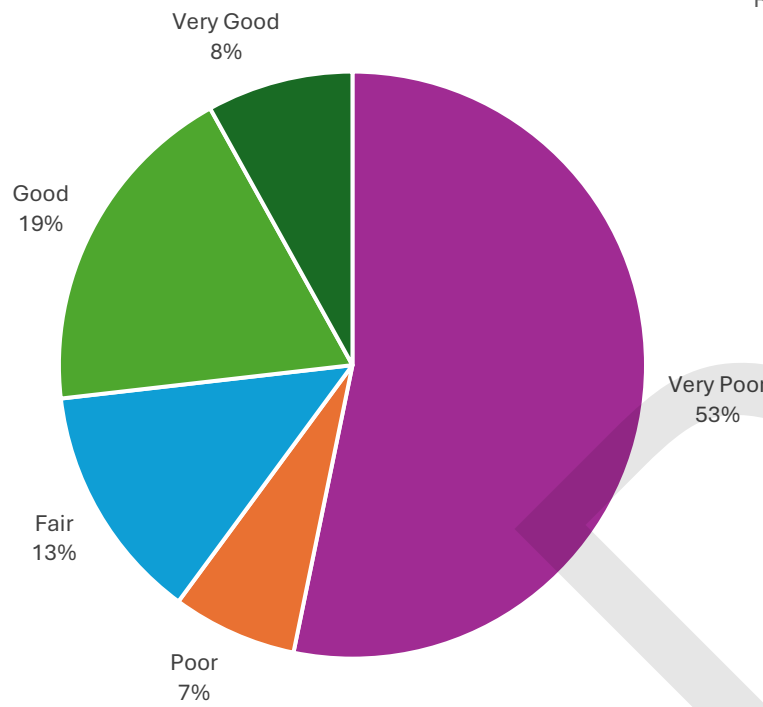
Event Class	Description
Maintenance & Inspection	**IT Assets** • Asset inspections are initiated in response to user issue reports. • Maintenance activities are reactive to failures, with vendor engagement if assets are within warranty terms. **Landfill Assets** • Routine testing of the generator is conducted by a combination of in-house and contracted inspectors. • Landfill scales are regularly maintained and inspected to ensure accuracy. • Lab equipment undergoes regular testing against known standards for accuracy. • Staff are vigilant in identifying and reporting asset faults, facilitated by a CMMS for maintenance scheduling. **Fire Assets** • Daily inspections are conducted in compliance with firefighting regulations, with comprehensive weekly inspections. • Certain maintenance tasks are managed by fire department staff within their capabilities, with third-party support when internal capacity has been exceeded.

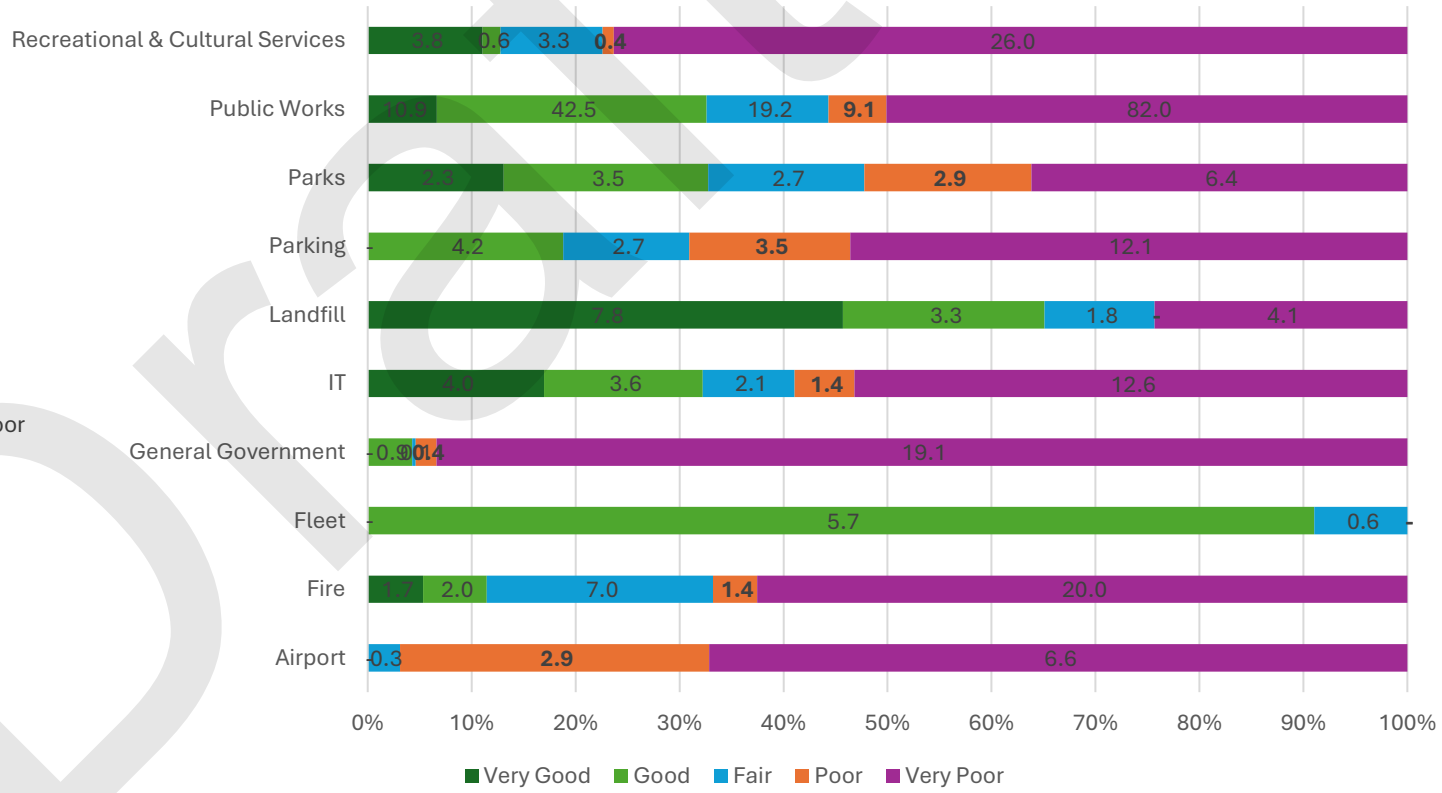
Event Class	Description
Maintenance & Inspection	**Airport Assets** • Machinery & Equipment operated by the airport are inspected according to regulations and service contracts, supplemented by annual asset inspections. • Unique airfield software is vendor-supported, while general IT equipment is managed by the IT Department. • Maintenance is performed on an as-needed basis, prompted by planned inspections or staff notifications. **Parking Assets** • Machinery & Equipment operated by the parking department are inspected by commissionaires on their daily rounds, by service contracts, supplemented by annual asset inspections. • Maintenance is performed on an as-needed basis, prompted by inspections or staff notifications.
Rehabilitation	**Landfill Assets** • Rehabilitation efforts are aligned with staff millwright capabilities and capacity. **Fire Assets** • Rehabilitation decisions are made based on remaining useful life and asset cost, avoiding risks to firefighting activities and regulatory compliance. Airport Assets • Rehabilitation decisions are contingent on asset type, usage, and criticality, with priority given to larger and more expensive equipment.

Event Class	Description
Replacement	**IT Assets** • Replacements are coordinated with vendors if assets fail within warranty terms. • Planned replacements are phased according to asset useful life. **Landfill Assets** • Replacements are coordinated with vendors if assets fail within warranty terms. • Planned replacements are phased according to asset useful life. **Fire Assets** • Replacements are coordinated with vendors if assets fail within warranty terms. • Planned replacements are phased according to asset useful life. **Airport Assets** • Replacement activities align with asset criticality and cost taking into account technological advancements and regulatory requirements. **Parking Assets** • Asset replacements are determined by warranty coverage or capital requests. • Consideration is given to adopting new technologies for service delivery.

4.5.2. Condition

The pie chart below is developed on the current average condition for Machinery & Equipment assets. Age-based condition was used primarily for Machinery & Equipment assets.





In $100,000

4.5.3. Levels of Service

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

4.9.4 Community Levels of Service

The table below outlines the qualitative descriptions that determine the community levels of service provided:

Core Value	Level of Service Statement	Community Level of Service
Quality	Appropriate actions and interventions are taken to ensure the regular safe use of Machinery & Equipment assets.	Machinery & Equipment assets are diverse and assist the needs of fire, parks, recreation, public works services and the airport.
Performance	There are long-term plans in place for the renewal and replacement of Machinery & Equipment assets.	Machinery & Equipment asset replacement decisions predominantly consider asset condition, criticality, and legislative compliance. Machinery & Equipment investments are currently identified and forecasted ten (10) years in advance and are continually reviewed to ensure that budgeting practice aligns with the ongoing needs of the separate departments.

4.5.5. Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by Machinery & Equipment:

Core Value	Level of Service Statement	Technical Level of Service	Performance
Quality	Appropriate actions and interventions are taken to ensure the regular safe use of Machinery & Equipment assets.	Weighted Average Condition of Assets: (Rating scale in section 2.11)	Poor: 32%
Performance	There are long-term plans in place for the renewal and replacement of Machinery & Equipment assets.	Annual Budget vs. Average Annual Capital Requirement:	2.48% : 8.78%
		% of Assets in Good or Very Good Condition:	27%
		% of Assets in Poor or Very Poor Condition:	60%

4.5.6. Risk

Qualitative Risk

Qualitative risks were identified through an interview-based discussion with North Bay staff. The following risks were deemed relevant to Machinery & Equipment assets.

Asset Design & Installation

Regulation and standard revisions are always an ongoing identified risk, especially within the fire, airport, and landfill departments. Ongoing regulation shifts and updated requirements change the kind of maintenance and assets used. This can greatly impact capital forecasting, and service delivery. New standards in equipment are hard to plan for, with certain standards requiring a host of new assets for new adoption. There is a similar story for developing regulations across all departments. These can come forth without warning and strain department budgets as they seek to remain compliant in an ever-shifting landscape. This risk can be lessened by the City employing industry experts with experience navigating these concerns.

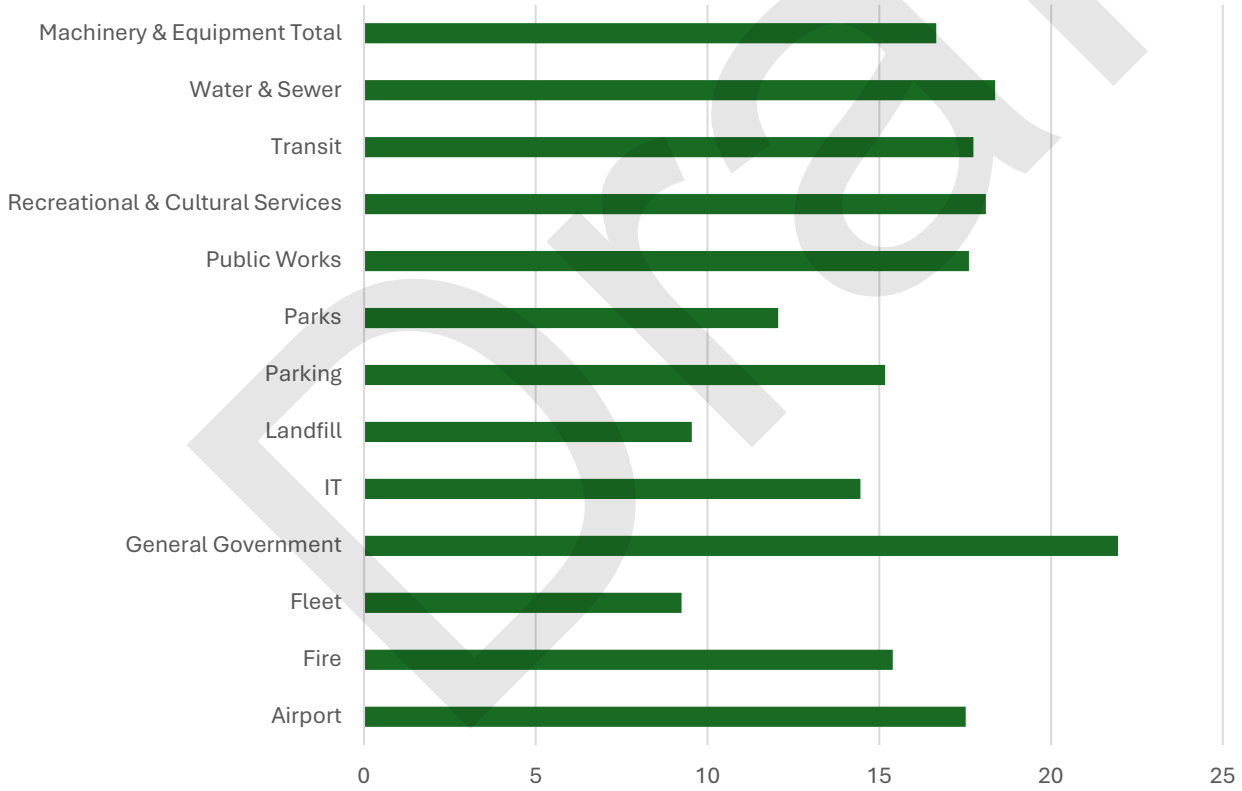
Organizational Change and Capacity

Staff identified organizational change as a relevant risk. It was noted that current maintenance practices across departments such as the airport, fleet and fire are completed by long-term staff. If these long-term staff were to move on from their role, there would be a knowledge gap, leaving maintenance on certain assets up in the air. This risk is being mitigated through training and mentorship programs that invest in the staff powering the City.

In addition to the challenge of transferring the vast knowledge base held by long-term employees, there is also difficulty in finding individuals to replace said staff as they depart. In speaking with the landfill, fleet, and fire department, there is difficulty in finding and retaining qualified individuals in roles throughout the organization due to the premium placed on their expertise. Evolving regulatory requirements provide additional strain to staff workload on top of their existing role responsibilities. This risk is currently being addressed through the aforementioned training and mentorship programs held by a number of the departments.

Quantitative Risk

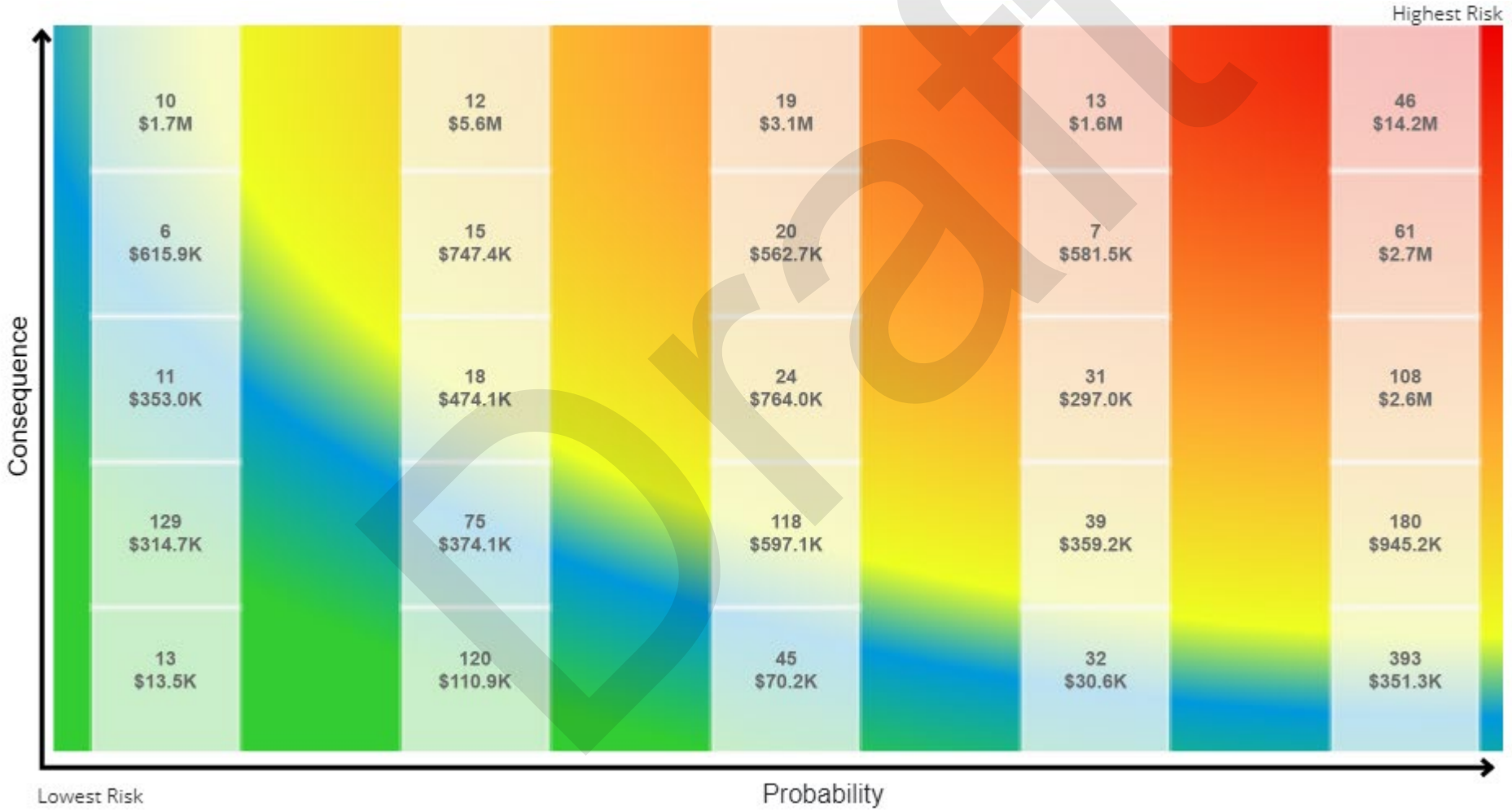
Estimating the probability that a Machinery & Equipment asset will fail relies on asset condition. Consequence of failure metrics differ between departments; this demonstrates differences in priorities between service deliverers. Using the risk models developed, reports can be generated. Such outputs are often key resources and components of a City's asset management program. The graph below summarizes the average risk scores and the risk rating for Machinery & Equipment asset segments on a scale of 25.



4.5.7. Risk Matrix

The matrix below provides a visual representation of the relationship between the probability of failure and the consequence of failure for Machinery & Equipment.

Machinery and equipment spans across the organization. There is no critical theme within the high-risk assets. The high risk assets do have high replacement values.



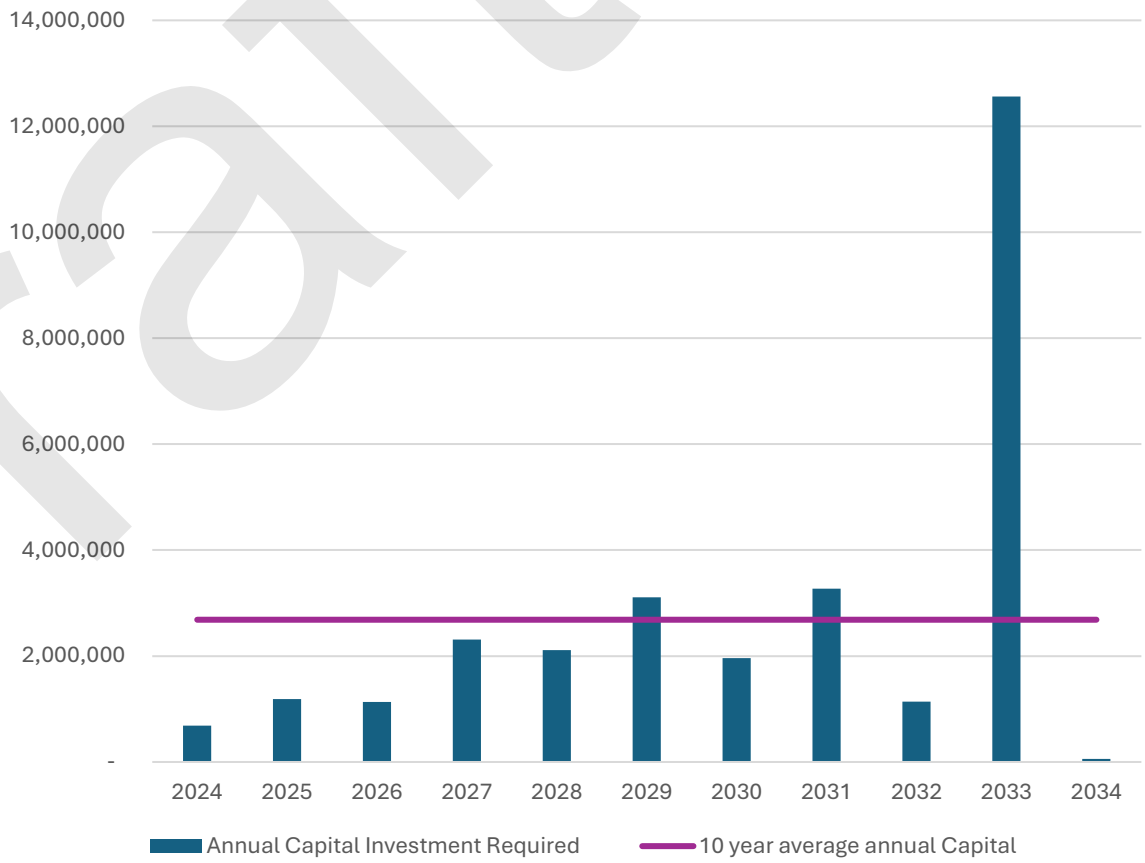
4.5.8. Costs of Providing Lifecycle Activities for 10 Years

As indicated in the chart below, forecasted capital requirements for Machinery & Equipment assets spike most significantly starting in 2033.

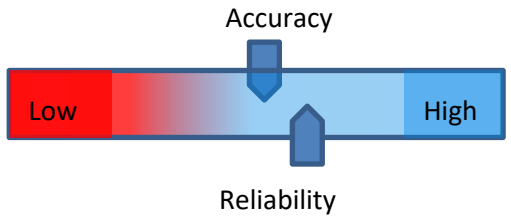
The time over which every machine and equipment asset would be replaced was determined based on the existing data. The total annual capital requirement was determined to be $3.4 million. This represents the required annual investment assuming all assets are replaced at end of useful life which is an average of 9 years.

A significant investment is required in 2033 Public Works machinery and equipment.

The annual funding shortfall is approximately $2.5 million (average annual requirement of $3.4 million less average annual investment in 2024 capital plan of $966,000)



4.5.9. Data Confidence Scale



Life Cycle Management Strategies

- Review projected replacement dates and estimated cost for Machinery & Equipment assets. If they do not appear reasonable, update the date, and adjust capital requirement projections accordingly.
- When developing capital budgets, consider identified capital requirements and determine if existing revenues are sufficient and, if not, what changes may need to occur (e.g., changes in taxation rates, special funding applications) so that capital budgets meet asset requirements.
- As part of the lifecycle strategy and in particular, replacement considerations, review and consider assets risk when making investment decisions.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the City believes to provide meaningful and reliable inputs into asset management planning.
- Work towards public consultation and input into levels of service.

4.9.10. Recommendations

Data Review/Validation

- Review inventory to determine if all capital assets are included and asset information is accurate; adjust data as necessary.
- Continue to assess condition data and replacement costs.
- Ensure that when assets are reviewed for condition, staff apply a consistent set of criteria. Consider the development of supportive guides and documentation.

Risk Management Strategies

- Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

4.6 Roads

Roads include all municipally owned and maintained roadways in addition to supporting roadside infrastructure.

The City's roads and sidewalks are maintained by the Public Works Department which is also responsible for winter operations. The Asset Management Plan currently only includes the City's paved roads which are over 367,000 meters in combined length and have an estimated replacement value of $531 million.
The City's road system accounts for over one-half of the total asset portfolio. The roads are exposed to a number of stresses that contribute to accelerated deterioration (including winter freeze-thaw cycles and increased traffic loading); therefore, typically have lower life expectancies than other assets. As a result, the investment needs for rehabilitation and replacement of roads occur on a more frequent cycle.

The City's network average Pavement Quality Index (PQI) is currently calculated to be a value of approximately 55. The City has identified that its desired level of service for roads is to maintain its average network condition at its current state (i.e., at an average value of PQI=55). This goal is in line with the City's understanding of Community expectations and with currently available funding levels.

Within future iterations of this Asset Management Plan, further refinements will be made to the desired level of service for roads.

4.6.1. Life Cycle Management Strategy Roads

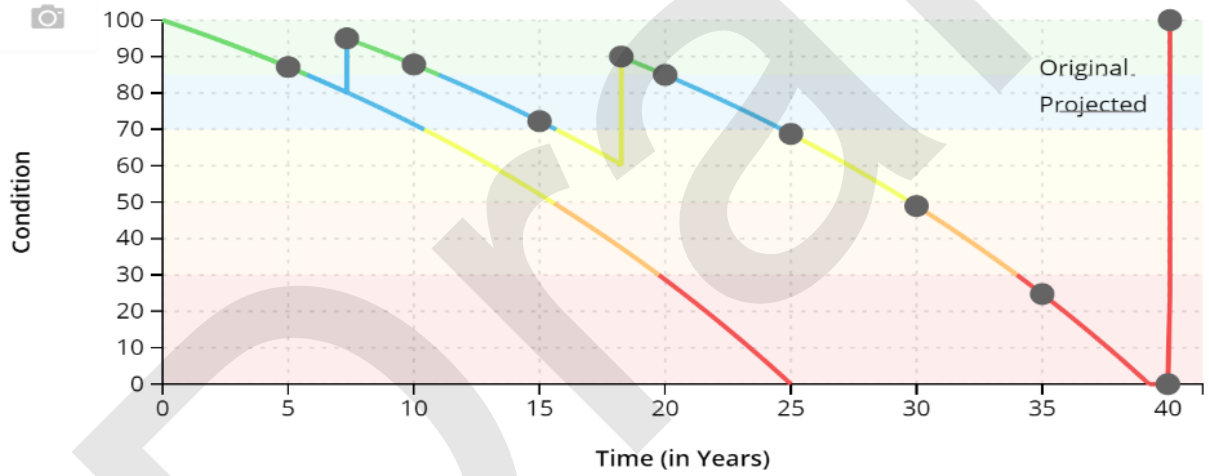
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

The following life cycle interventions have been developed as a proactive approach to managing the life cycle of various design class roads. Instead of allowing the roads to deteriorate until replacement is required, strategic rehabilitation is expected to extend the service life of roads at a lower total cost than full replacement, thus optimizing life expectancy and costs.

Paved Roads

		Unit Cost per /m^2
Crack Sealing	Preventative Maintenance	$16.00
Chip Seal	Preventative Maintenance	$5.30
Pulverize and Overlay (50/100mm)	Rehabilitation	$42.00/$73
Mill, Removal, & Overlay(50/100mm)	Rehabilitation	$42.00/72
Overlay (50mm)	Rehabilitation	$34
Full Replacement (Arterial, collector)	Replacement	$330
Full Replacement (Local)	Replacement	$167.00

The implementation of a proactive life cycle strategy can lead to direct and indirect cost savings when compared to end-of-life replacement. Potential cost savings are influenced by current market costs, the coordination of multiple projects, and the criticality of the assets. The proactive strategy can also decrease the number of complaints, lower health and safety hazards and maintains the desired level of service that the City wants to sustain. Below is a sample graph illustrating a potential life cycle strategy application that includes: 1. Crack and Seal Applied at 5 year intervals and 2. Mill and Overlay applied at years 7 and 18; thereby extending the life from 25 years to 40 years before full replacement is required.



4.6.2. Condition

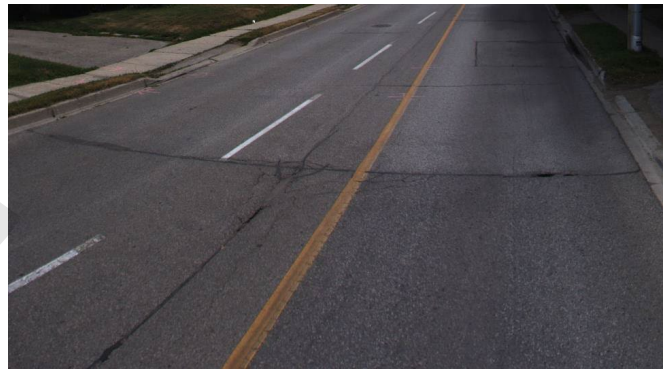
The pie chart on the next slide identifies the percentage of road assets in very good, good, fair, poor, very poor condition. The City's approach to condition data includes the following:

- Completion of a Road Needs Study every 5 years. In 2021 the City engaged with GM Blue Plan Engineering Limited to complete an assessment of 100% of the roads. Pavement Quality Index (PQI) values were collected and updated in the RoadMatrix system and then uploaded to the corresponding road assets in PSD Citywide.
- Pothole patching is applied as per Minimum Maintenance Standards (MMS) requirements to repair pothole formations.
- Resurfacing program of approximately $3.6 million annually that includes the following treatments:
  - Capital expenditures
  - Crack sealing
  - Double Mill & Pave Treatment

The pictures demonstrate the differences in the condition rating.

Very Good Condition

Very Poor Condition

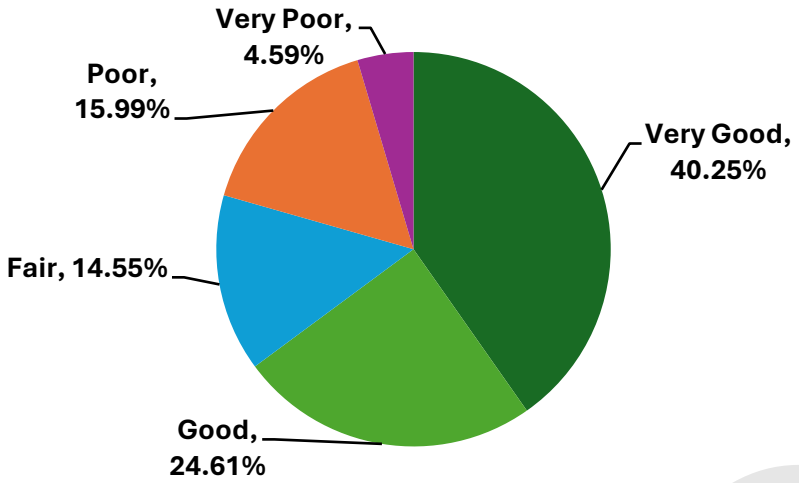


Fair Road Condition

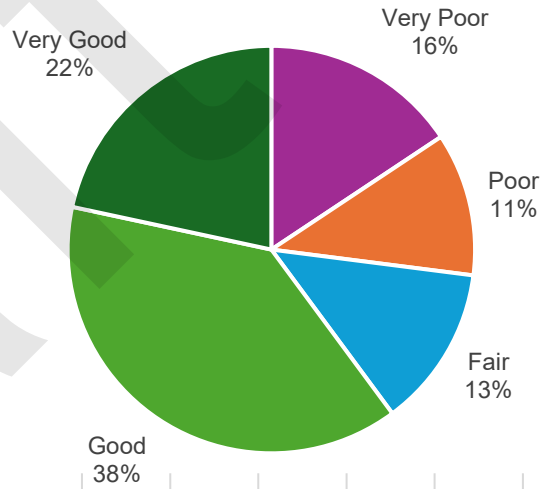
Poor Road Condition

As the City is ending the 5 year cycle of the condition assessment the below pie charts demonstrates the shift in road conditions. The increase in very poor condition from 4.59% to 16% can be a result of the funding gap however 60% of the road network remains above fair condition.

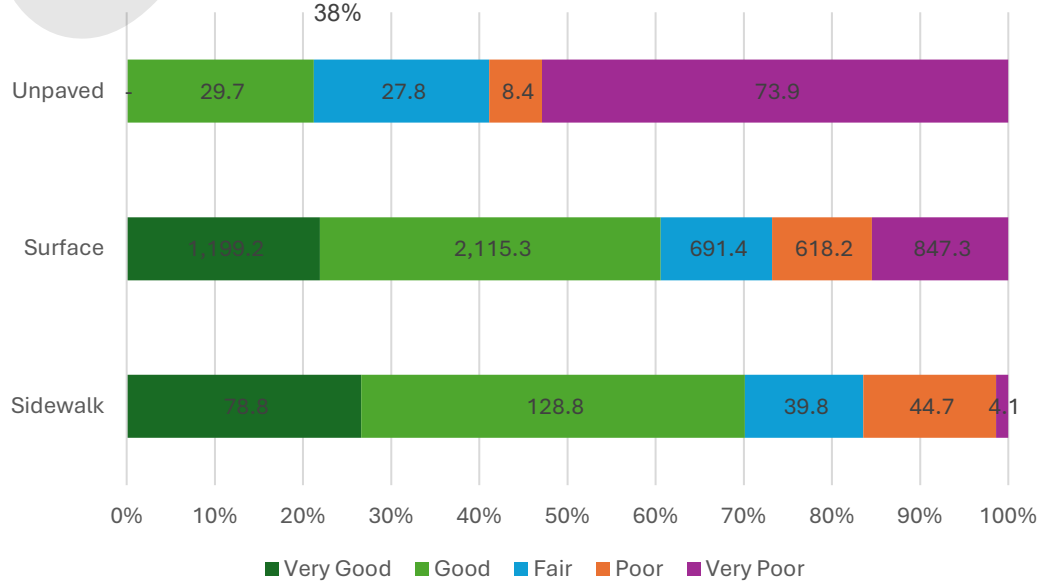
Condition as of December 31, 2021



Condition as of December 31, 2023



The road network also includes segments of Unpaved, Surface (paved) and Sidewalks. The adjacent bar graph depicts the condition by segment.



In $100,000

4.6.3 Levels of Service

The following tables show the City's current level of service for the roads. Metrics include the community and technical levels of service metrics that are required as part of O.Reg 588/17 as well as any additional performance measures that the City has selected for the AMP.

4.6.4 Community Levels of Service

The table below outlines the qualitative descriptions that determine the community levels of service provided by the roads:

Core Value	Level of Service Statement	Community Level of Service
Accessible & Reliable	Roads are accessible to the whole community and unplanned service disruptions are minimized.	The City maintains urban arterial, collector and residential roads as well as rural roads. See section 4.6.11 for map of the roads. Road pictures are also included in section 4.6.2 to demonstrate various road conditions.
Safe & Regulatory	Roads meet all minimum maintenance standards.	The City completed a Road Condition assessment in November 2021. Every road section received a surface condition rating which then was converted into a PQI measurement. PQI between 0 and 50 exhibits poor to very poor deterioration and requires renewal or full replacement within 0-10 years. PQI surface is in good condition or has been recently re-surfaced. Renewal or reconstruction is not required for 10 to 20 years.
Affordable	Roads are managed cost-effectively for the expected level of service.	Crack sealing, chip seal, mill, removal and overlay, full replacement.
Sustainable	There are long-term plans in place for the sustainability of roads.	See section 4.6.2 for description or images that illustrate the different levels of road class pavement condition.

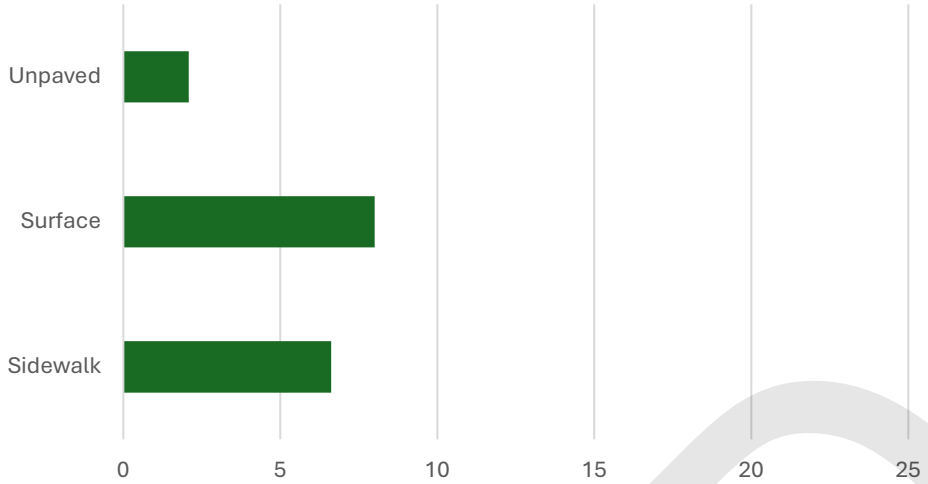
4.6.5 Technical Levels of Service

The table below outlines the quantitative metrics that determine the technical level of service provided by the roads.

Core Value	Level of Service Statement	Technical Level of Service	2021	2023
Accessible & Reliable	Roads are accessible to the whole community and unplanned service disruptions are minimized.	Lane-km of arterial roads (MMS classes 1 and 2) per land area in the municipality (km/km^2).	147km/771,000km^2	228km / 771,000km^2
		Lane-km of collector roads (MMS classes 3 and 4) per land area in the municipality (km/km^2).	103km/771,000km^2	160km / 771,000km^2
		Lane-km of local roads (MMS classes 5 and 6) per land area in the municipality (km/km^2).	454km/771,000km^2	705km / 771,000km^2
Affordable	Roads are managed cost-effectively for the expected level of service.	Current reinvestment rate vs target reinvestment rate.	1.9% : 4.94%	2.98% : 3.4%
Sustainable	There are long-term plans in place for the sustainability of the roads.	Average pavement condition index for paved roads in the municipality	55.1%	55%
		Average surface condition for unpaved roads in the municipality.	Very Poor	Good

4.6.6 Roads Risk

The bar chart below distributes road segment assets in each of the risk profiles. The total risk rating is on a scall of 0-25 with 25 being the highest risk. The roads probability of failure is based on condition, drainage and subgrade strength. Consequence of failure is based on replacement cost, road class, bus route, Average Annual Daily Traffic (AADT) and pavement type. The probability of failure for unpaved and sidewalk is based on condition. Consequence of failure for unpaved and sidewalk is based on replacement cost.



Climate Change & Serious Weather Events

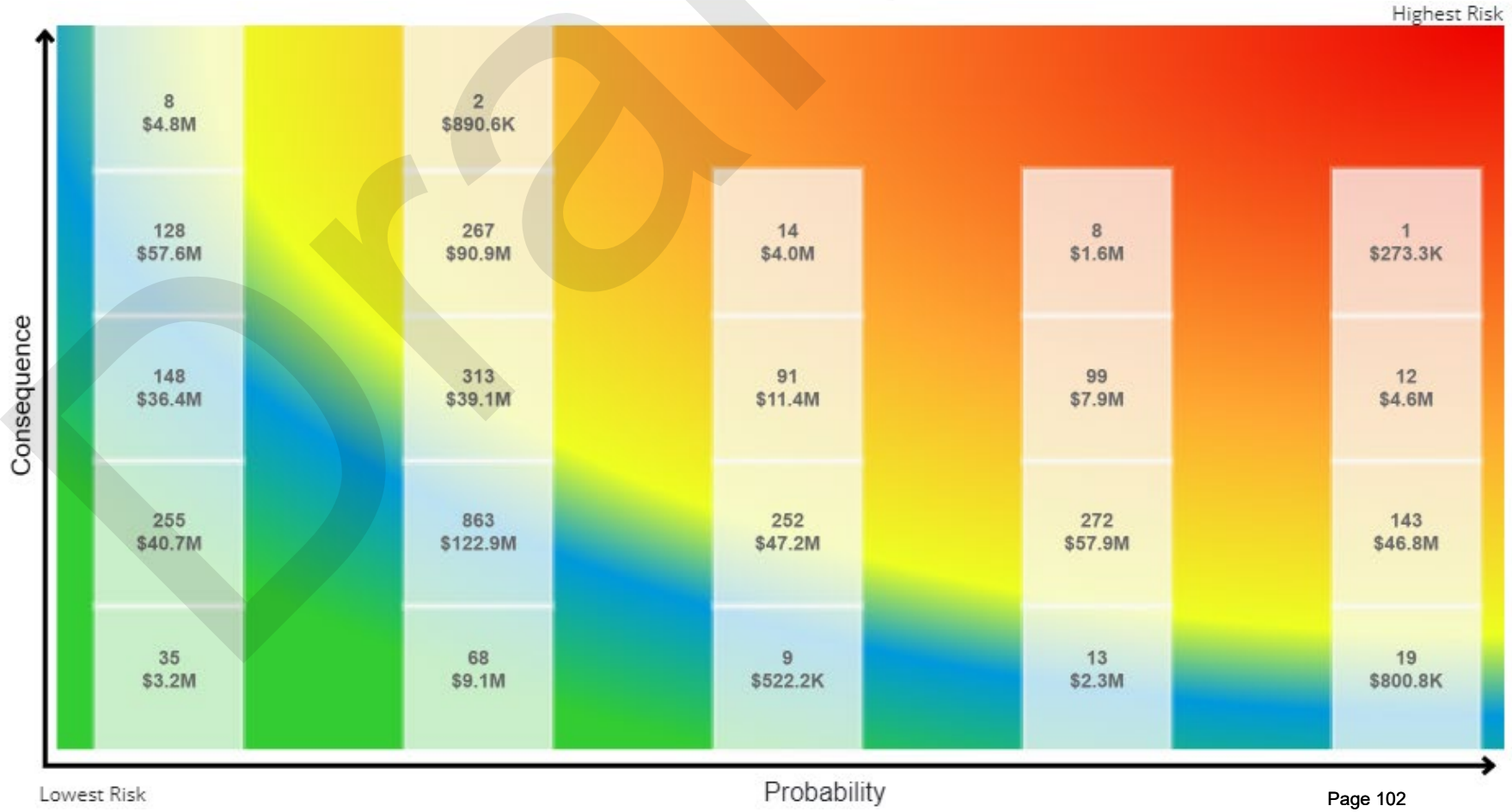
Climate change risks such as more intense and frequent rainfalls, as well as longer shoulder seasons with more frequent freeze-thaw cycles have significant implications on City roads infrastructure. An increase in freeze-thaw cycles will lead to shorter life expectancies, and extreme weather events will likely lead to exceeding the capacity of watercourse crossing infrastructure and road washouts, leading to more frequent and substantive repairs, as well as significant disruptions to the road traffic system. Understanding the severity and frequency of these climate change events and incorporation of climate change considerations into the City's asset management planning approach is critical to maintaining service levels and managing risk.

Sidewalk in good condition

Granular Road

4.6.7. Roads Risk Matrix

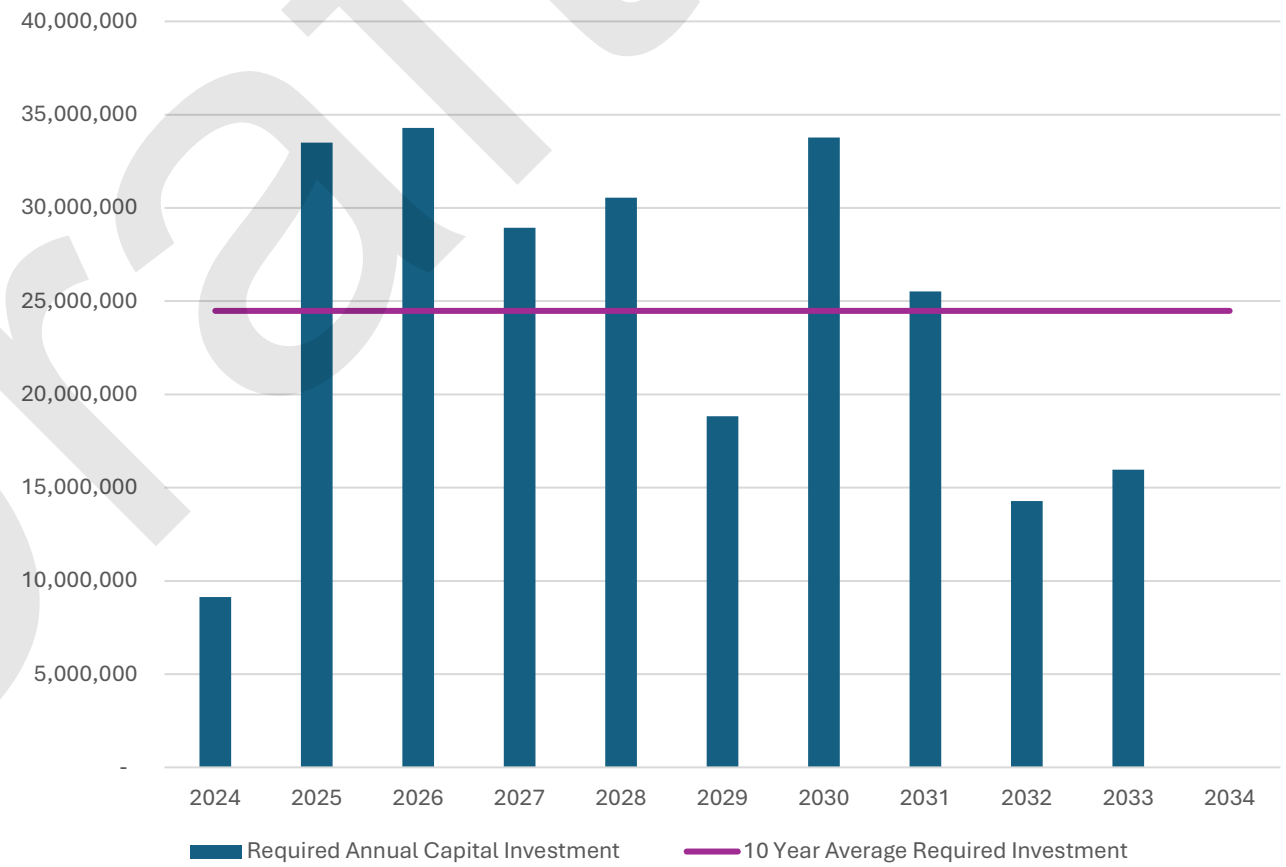
The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within the roads as of December 31, 2023. The identification of the critical assets allows the City to determine appropriate risk mitigation strategies and treatment options. It should be noted that the assets highlighted in red may not necessarily require immediate renewal or replacement.



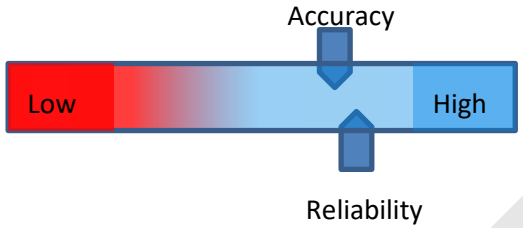
4.6.8. Roads Infrastructure Gap

The infrastructure gap for roads is $2 million annually ($20-$17.6); however, in the City's approved 2024 Capital Budget plans to invest approximately $17.6 million a year into the roads. As can be noted below the average 10 year required investment is $24 million. According to the Roads Life Cycle Plan the Annual Requirement for all assets to have a full life cycle would require an annual investment of $9 million.

The notable investments in 2025 and 2026 include, Cedar Heights Road, Golf Club Road, Springdale Drive, Collins Drive, Barnett Road, and Larocque Road.



4.6.9. Data Confidence Scale



Roads have undergone extensive condition reports and the data is mapped in great detail to the GIS system making the data accuracy very high. The data obtained from the condition assessment was loaded into Roadmatrix then uploaded into Citywide. The life cycle strategies within Citywide are not as complex as in Roadmatrix therefore outer years may be less reliable. The roads life cycle strategies within Citywide will require improvements as the City matures in the Asset Management Planning program and integrates the results into the 10-year Capital Budget.

4.6.10 Recommendations

Asset Inventory

Roads include non-core asset categories such as sidewalks and street lighting. The inventory of these assets is included within Citywide; however, the life cycle strategies require development for the issuance of the next AMP. The inventory for sidewalks and street lighting also requires final validation and departmental sign off to ensure completeness.

Condition Assessment Strategies

The City anticipates continuing its practice of completing comprehensive assessments of the roads every five years. Condition assessment strategies for sidewalks and street lighting require finalization. Continued linkage to GIS of all road assets is also recommended.

Life Cycle Management Strategies

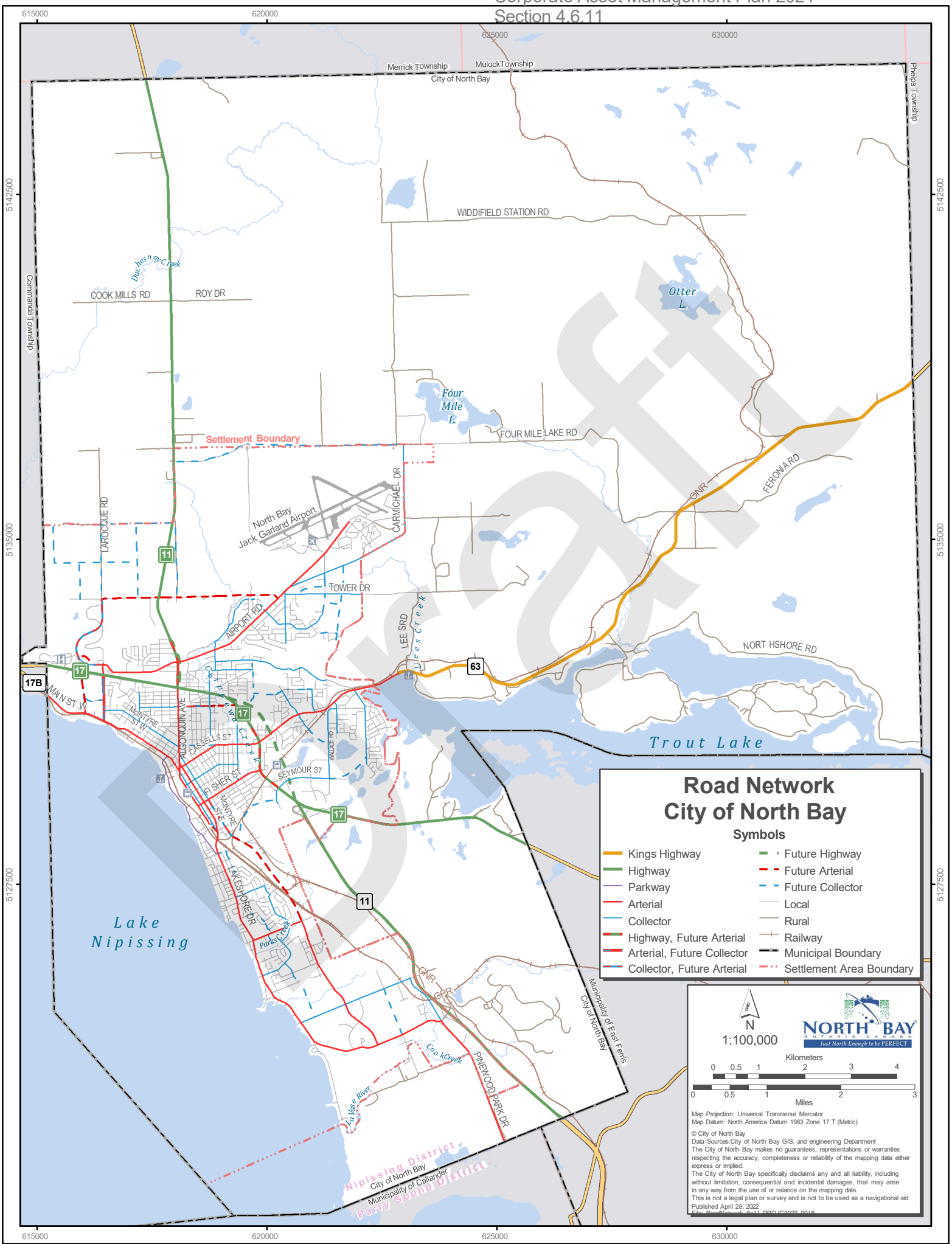
Continue to transition life cycle management strategies from Roadmatrix into Citywide . Maximize the linkage to the capital budget plan by implementing the identified life cycle management strategies for paved roads. Realize potential cost avoidance and maintain a high quality of road pavement condition.
Evaluate the efficacy of the City's life cycle management strategies at regular intervals to determine the impact cost, condition, and risk.

Risk Management Strategies

Continue to transition risk models from Roadmatrix into Citywide as well as review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the City believes to provide meaningful and reliable inputs into asset management planning.
Provide public input opportunities to designate different levels of service for collector, residential and arterial roads.



Road Network
City of North Bay

Symbols

Kings Highway	Future Highway
Highway	Future Arterial
Parkway	Future Collector
Arterial	Local
Collector	Rural
Highway, Future Arterial	Railway
Arterial, Future Collector	Municipal Boundary
Collector, Future Arterial	Settlement Area Boundary

N

1:100,000

NORTH BAY ONTARIO CANADA
Just North Enough to be PERFECT

Kilometers
0 0.5 1 2 3 4

Miles
0 0.5 1 2 3

Map Projection: Universal Transverse Mercator
Map Datum: North America Datum 1983 Zone 17 T (Metric)

Published April 28, 2022
File: RoadNetwork_8x11_PROJ2022_0016

4.7 Stormwater

4.7 Stormwater

The City is responsible for maintaining a stormwater network of 122 kilometres of storm mains, catch basins, culverts (less than 3m diameter) and other supporting infrastructure such as manholes, drains, pump stations, storm pond systems.

Staff is working towards improving the accuracy and reliability of Stormwater inventory to assist with long-term asset management planning. Estimated Useful Life (EUL) is based on a combination of industry standards and staff knowledge. Average Age (AA) of the assets is based on the number of years the asset has been in service. The average service life remaining represents the difference between the EUL and the Average Age, except where an asset has been assigned a condition rating; this could potentially increase or decrease the average service life remaining.

4.7.1. Life Cycle Management Strategy Stormwater

Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The storm water system has a maintenance system that includes a scheduled flushing, cleaning and inspection program. CCTV inspections are conducted as a diagnostic tool to better inform capital rehabilitation or replacement activities.

Activity Type	Description of Current Activity
Maintenance	Maintenance activities are completed to a lesser degree compared to other underground linear infrastructure.
Maintenance	Primary activities include catch basin cleaning and storm main flushing, but only a small percentage of the entire network is completed per year.
Assessment	CCTV inspections and cleaning is completed as budget becomes available and this information will be used to drive forward rehabilitation and replacement plans.
Rehabilitation	Trenchless re-lining reduces total life cycle costs, but also requires a formal condition assessment program to determine viability.
Replacement	Without the availability of up-to-date condition assessment information, replacement activities are purely reactive in nature.

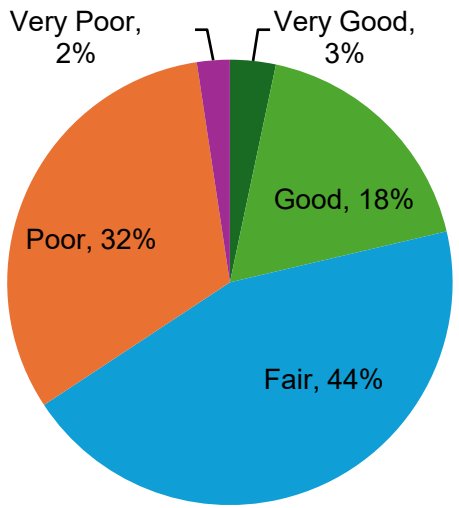
The City's life cycle strategy involves the following activities and events at the following projected costs:

Event	Event Class	Cost /m
Flushing	Preventative maintenance	$5/m
CCTV Inspection	Assessment	$8/m
Trenchless Re-lining	Rehabilitation	$1,000/m

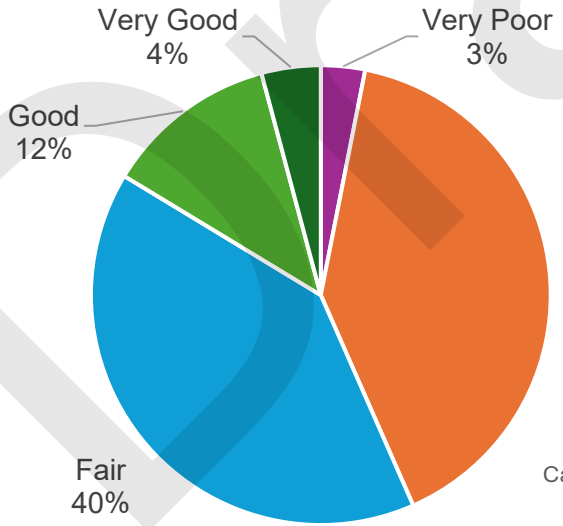
4.7.2. Condition

The pie chart below is primarily based on asset age as a city-wide CCTV program has not yet been implemented. A slight majority of storm assets remain in good to fair condition.

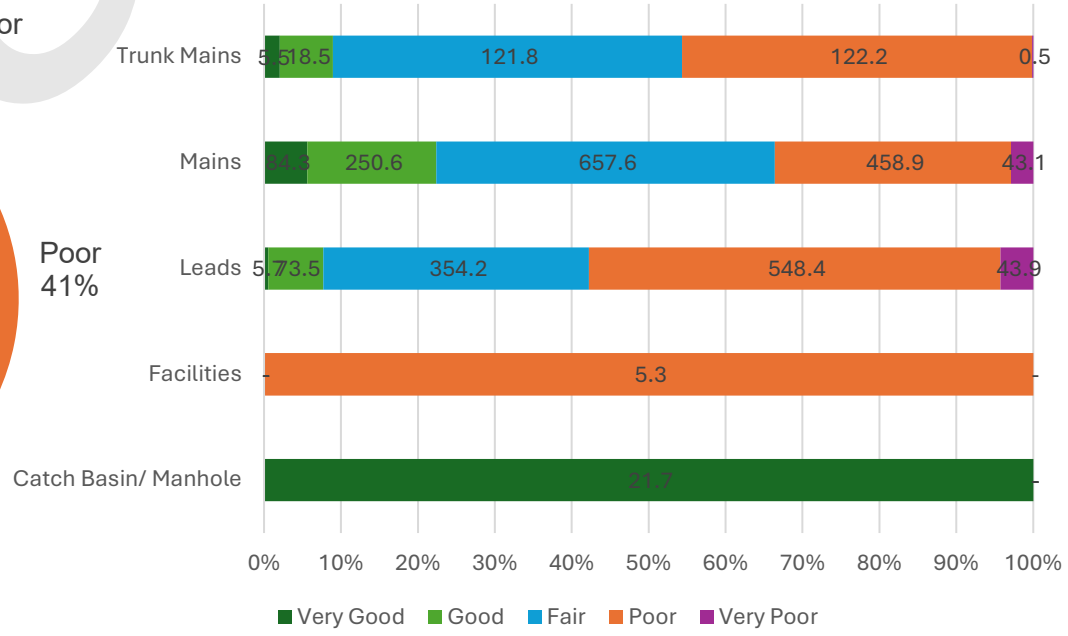
Condition as of December 31, 2021



Condition as of December 31, 2023



Condition by Segment as of December 31, 2023



In $100,000

4.7.3. Levels of Service

The following tables show the City's current level of service for stormwater. Metrics include the community and technical levels of service that are required as part of O.Reg 588/17, as well as any additional performance measures that the City has selected for the AMP.

4.7.4. Community Levels of Service

The following table outlines the qualitative metrics that determine the community level of service provided by Stormwater:

Core Value	Level of Service Statement	Community Level of Service
Accessible & Reliable	Stormwater system protects property and people from the impacts of flooding.	A map of the Stormwater system is in section 4.7.11.
Affordable	Stormwater system is affordable and managed cost-effectively for the expected level of service.	Activities including flushing, CCTV inspection, localized repairs, pipelining and end of life replacement.
Sustainable	Stormwater assets are managed efficiently, and long-term plans are in place for the sustainability of Stormwater infrastructure.	Current condition would be mostly based on age and material type.

4.7.5. Technical Levels of Service

The table below outlines the quantitative metrics that determine the technical level of service provided by Stormwater:

Core Value	Level of Service Statement	Technical Level of Service	2021	2023
Accessible & Reliable	Stormwater system protects property and people from the impacts of flooding.	% of properties in municipality resilient to a 100-year storm.	87%	87%
		% of the municipal Stormwater management system resilient to a 5-year storm.	70%	70%
Affordable	Stormwater system is affordable and managed cost-effectively for the expected level of service.	2021 reinvestment rate vs 2023 reinvestment rate.	0.61% :1.29%	1.28% : 1.25%
Sustainable	Stormwater assets are managed efficiently, and long-term plans are in place for the sustainability of stormwater infrastructure.	% of the Stormwater system that is in good or very good condition.	21%	16%
		% of the Stormwater system that is in poor or very poor condition.	34%	44%

4.7.6. Stormwater Risk

A combination of condition and pipe material is used to indicate the probability of failure. The ranking is based on a scale of 1-5 in accordance with the NASSCO Pipeline Assessment Certification Program (PACP) rating system. The City of North Bay has assigned a weighting factor of 70% to condition and 30% to pipe material. With respect to consequence of failure, the stormwater mains have weighted financial risk at 50%, community service risk at 30% and environmental risk at 20%.

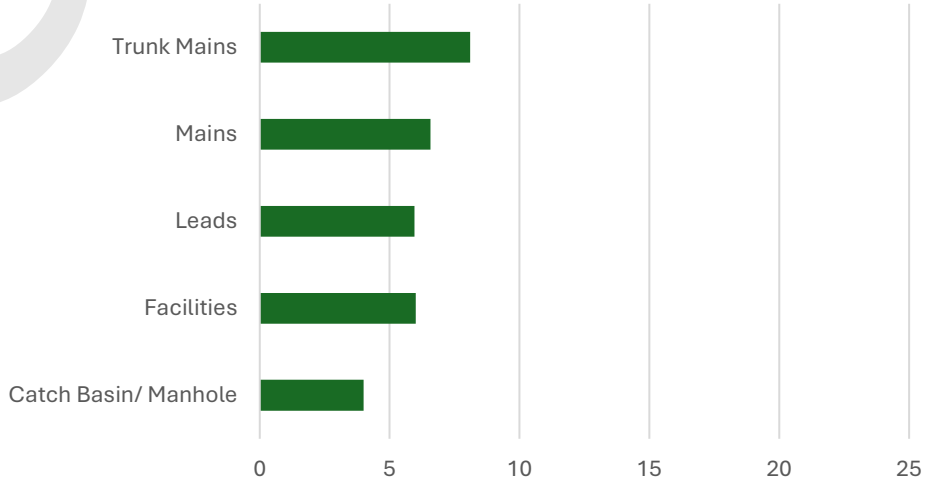
Infrastructure Design & Installation

As assets mature, certain aspects of their design and implementation combine to have a detrimental impact on the ability of the asset to provide its service. For instance, design and material choices have advanced with the changes in climate. As a result, the assets aren't reaching the expected longevity and may require rehabilitation or replacement sooner than assets using updated design standards.

Climate Change & Serious Weather Events

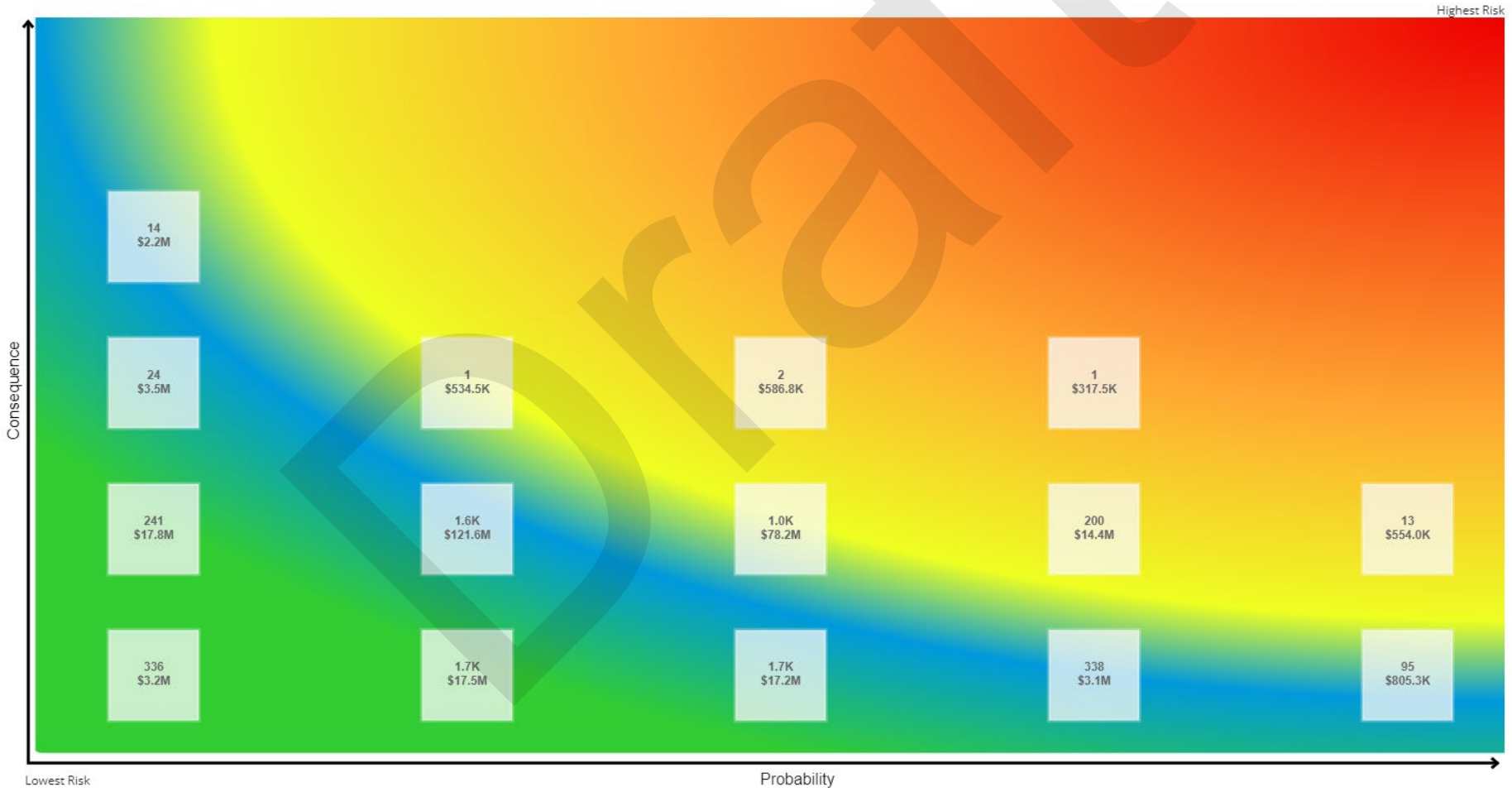
Climate change risks such as more intense and frequent rainfalls, rain on snow events, heat waves, and ice-storms have significant implications on City infrastructure. An increase in extreme weather events will likely lead to exceeding capacity of infrastructure and eventual flooding, thus requiring increased investment in maintenance and system improvements. Understanding the severity and frequency of these climate change events and the incorporation of climate change considerations into the City's asset management planning approach is critical to maintaining service levels and managing risk.

Quantitative risk is calculated using the probability of failure which is established by condition and consequence of failure which is calculated using weighted replacement costs. Multiplying probability and consequence for a total possible risk score is out of 25. Overall risk level of all Stormwater assets is low.



4.7.7. Stormwater Risk Matrix

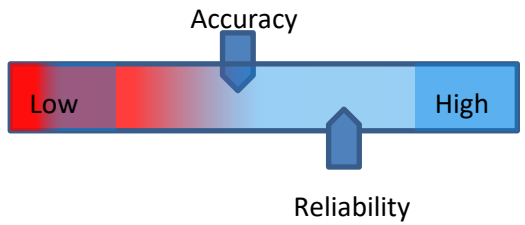
The risk matrix below provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within Stormwater as of December 31, 2023. The identification of the critical assets allows the City to determine appropriate risk mitigation strategies and treatment options. It should be noted that the assets within Stormwater have a low probability and consequence of failure.



4.7.8. Costs of Providing Life Cycle Activities for 10 Years

Stormwater does not have an annual shortfall. The required capital investments are premised on end of life and life cycle strategies. With the current life cycle strategies, the annual shortfall begins to develop shortly after 10 years. Prudent planning and financial resource allocations are recommended to begin now to prevent increased competing resources and a significant funding gap in the future.

4.7.9. Data Confidence Scale



As noted in the life cycle strategies the development of a CCTV program will increase the accuracy of the data specifically as it relates to condition.

4.7.10. Recommendations

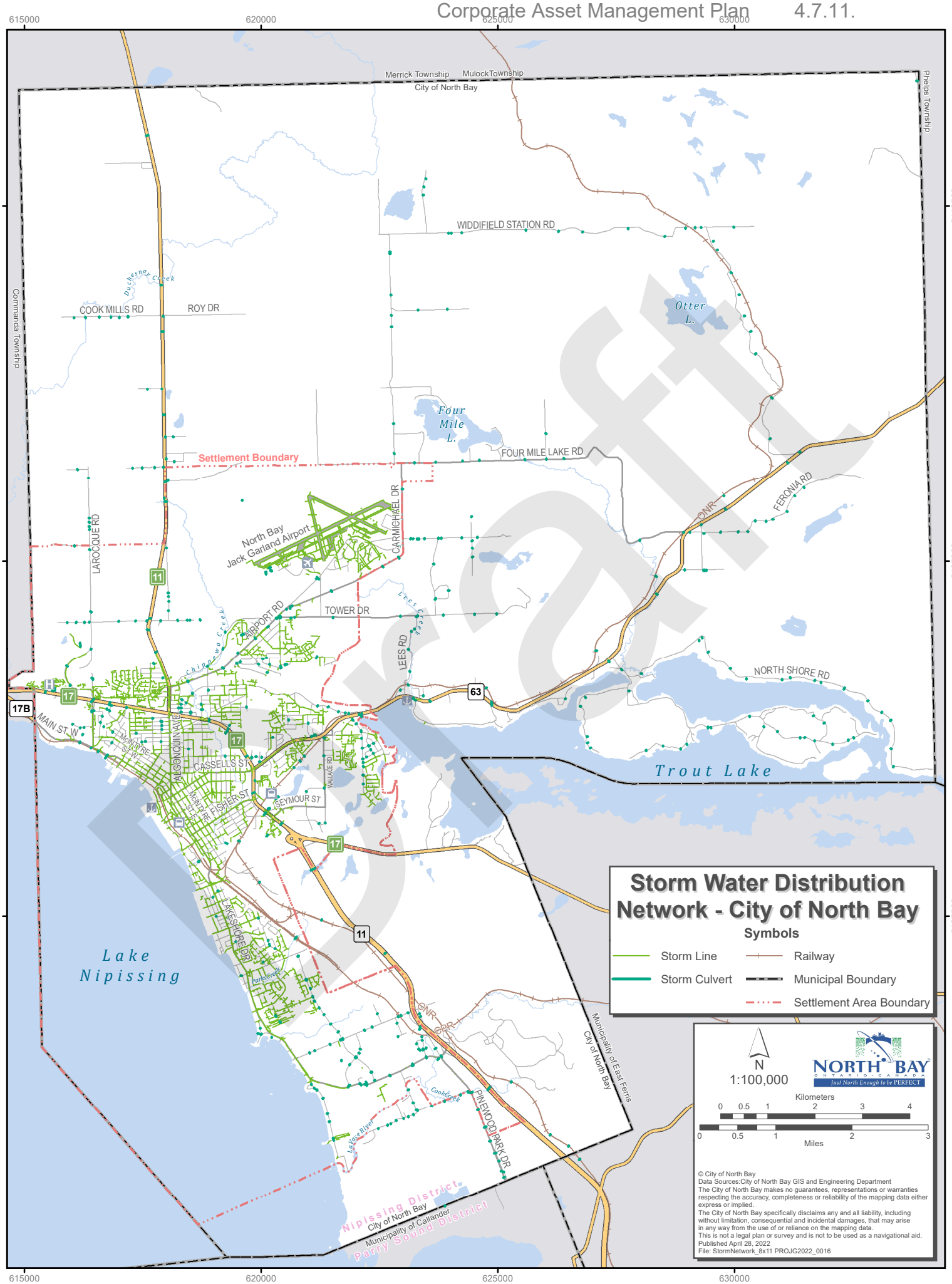
Condition Assessment Strategies
Implement annual inspections and maintenance of the municipal drains to reduce surface ponding issues. Activities typically include ditch and vegetation maintenance, and realignment. Implement a city-wide CCTV program phased over several years (ie 10-15) to allow for annual inspections of a select percentage of the network. Focus on problematic areas first and use results of inspection to inform future life cycle activities.

Risk Management Strategies
Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Life Cycle Management Strategies
Document and review life cycle management strategies for Stormwater on a regular basis to achieve the lowest total cost of ownership while maintaining adequate service levels.
.

Levels of Service
Continue to measure current levels of service in accordance with the metrics that the City has established in the AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.

Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.


615000
620000
625000
630000
5142500
5135000
5127500
Merrick Township
MulockTownship
City of North Bay
Phelps Township
Commanda Township
WIDDIFIELD STATION RD
COOK MILLS RD
ROY DR
Duchesnay Creek
Otter L.
Four Mile L.
FOUR MILE LAKE RD
Settlement Boundary
LAROCQUE RD
CARMICHAEL DR
North Bay Jack Garland Airport
CNR
FERONIA RD
AIRPORT RD
TOWER DR
Lees Creek
LEES RD
Chippewa Creek
NORTH SHORE RD
17B
MAIN ST W
ALGONQUIN AVE
McINTYRE ST W
CASSELLS ST
WALLACE RD
McINTYRE ST E
FISHER ST
SEYMOUR ST
LAKESHORE DR
Trout Lake
Lake Nipissing
Parks Creek
CPR
Municipality of East Ferris
City of North Bay
Cooke Creek
PINEWOOD PARK DR
La Vase River
Nipissing District
City of North Bay
Municipality of Callander
Parry Sound District
Storm Water Distribution Network - City of North Bay
Symbols
Storm Line
Storm Culvert
Railway
Municipal Boundary
Settlement Area Boundary
N
1:100,000
NORTH BAY
ONTARIO CANADA
Just North Enough to be PERFECT
Kilometers
0 0.5 1 2 3 4
Miles
0 0.5 1 2 3
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Published April 28, 2022
File: StormNetwork_8x11 PROJG2022_0016

4.8 Wastewater

4.8 Wastewater

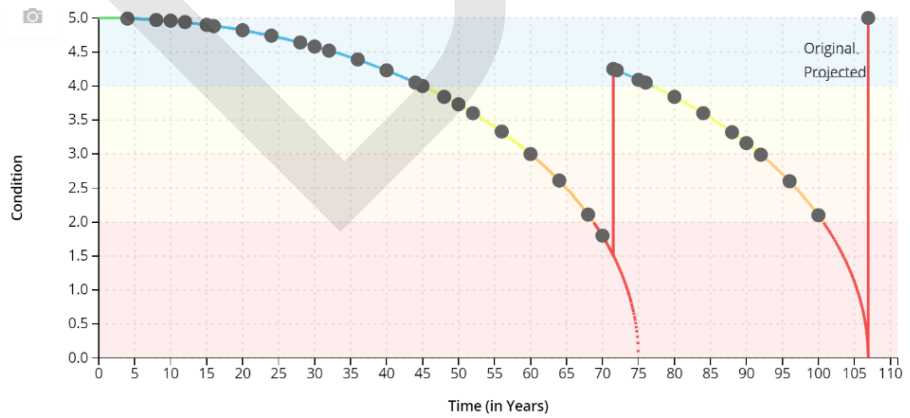
The wastewater system including sanitary mains, 17 lift stations, manholes, force mains and services contain approximately 270 kilometers of sanitary main, 15,000 services and 3,500 sanitary maintenance holes. The City of North Bay Wastewater Treatment System has a design capacity of 54,500 m3/day and is a Class 4 Wastewater Treatment Plant with a Class 2 wastewater collection system. The conventional activated sludge facility uses biological oxidation, anaerobic digestions and centrifugation. The Wastewater Plant is located on Memorial Drive and is used to treat all of North Bay's Wastewater/Sewage. The original Wastewater Treatment Facility was built in 1962 and was expanded in 1973 and 1984. The Facility is a conventional activated sludge facility, which uses the following treatment processes: raw sewage pumping, sewage grinding and screening, grit removal, primary settling, aeration, final settling, chemical phosphorus removal and chlorination for effluent disinfection.

4.8.1. Life Cycle Management Strategy

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. The following life cycle strategy has been developed as a proactive approach to managing the life cycle of sanitary mains.

Example Life Cycle Strategy:

Condition deteriorates until a betterment to the asset is done to extend the useful life. A betterment in the example below is complete at approximately year 70.



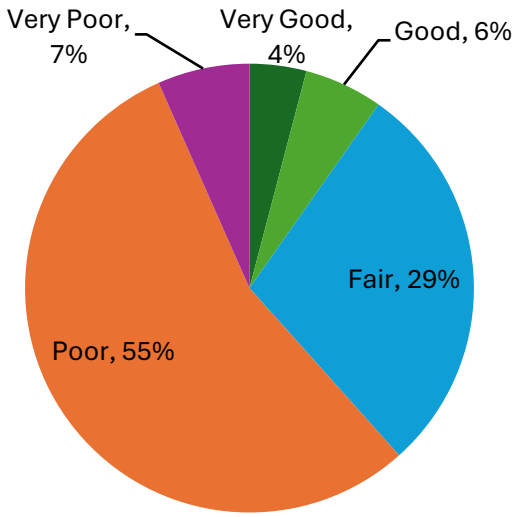
4.8.2. Condition

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

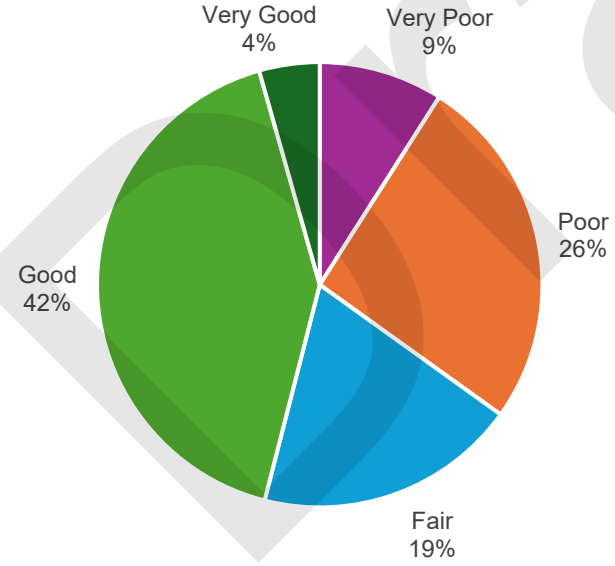
- CCTV inspections are completed for sanitary mains to determine the condition of the infrastructure and troubleshoot reported issues.
- Rehabilitation projects are prioritized by growth and capacity considerations, in addition to condition.
- Trenchless re-lining program is in place.
- System flushing is performed as needed.

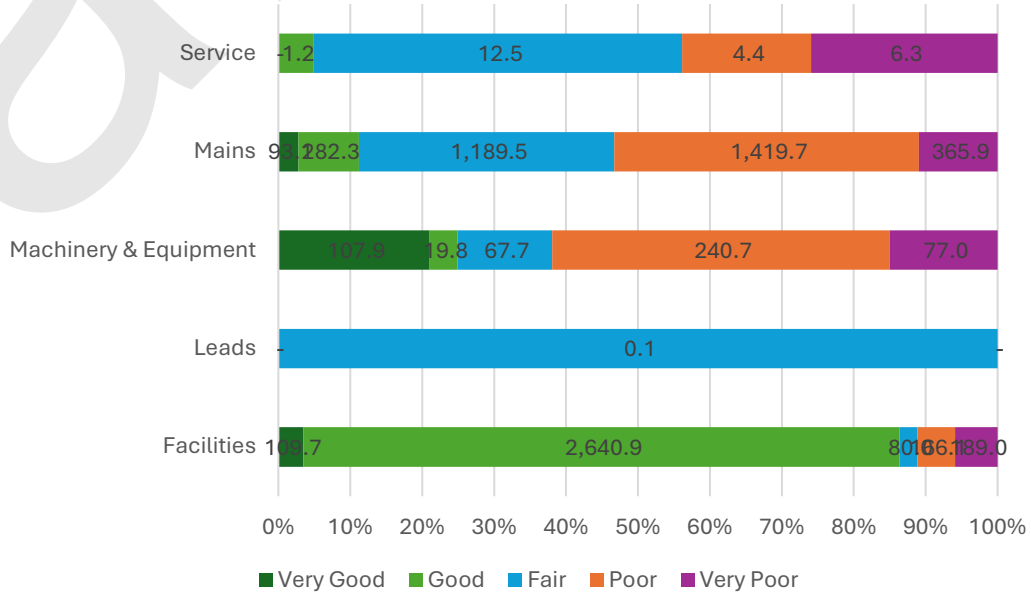
The pie chart below illustrates the % of assets in very good, good, fair, poor, very poor condition. There has been a significant improvement in the condition of the Wastewater system. To the right is condition by segment.

Condition as of December 31, 2021



Condition as of December 31, 2023





In $100,000

4.8.3 Levels of Service

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

4.8.4 Community Level of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by wastewater:

Core Value	Level of Service Statement	Community Level of Service
Accessible & Reliable	A reliable wastewater service is provided with minimal service disruptions	Wastewater Distribution Network map following in section 4.8.11
Safe & Regulatory	Wastewater is managed without risk or hazard to public health; there is full compliance with all regulatory requirements	Sanitary sewers are designed to meet the City of North Bay Design Guidelines, Provincial AODA Guidelines, and MECP Design Guidelines for Sewage Works.
Affordable	Wastewater services are affordable and household charges are fair and reasonable; infrastructure is managed cost-effectively for the expected level of service	CCTV inspections are completed for wastewater to determine condition of the infrastructure and trouble reported issues. Rehabilitation projects are prioritized by growth and capacity considerations, in addition to condition.
Sustainable	Wastewater resources are used efficiently, and long-term plans are in place for the sustainability of wastewater treatment and infrastructure	Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost effective approach to managing assets.

4.8.5 Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by wastewater:

Core Value	Level of Service Statement	Technical Level of Service	2021	2023
Accessible & Reliable	A reliable wastewater service is provided with minimal service disruptions.	% of properties connected to the municipal wastewater system.	83%	83%
Safe & Regulatory	Wastewater is managed without risk or hazard to public health; there is full compliance with all regulatory requirements.	# 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 – City does not own combined sewers	N/A – City does not own combined sewers
		# of connection days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	48 connection day backups in 2021 compared to 16,648 properties connected to municipal wastewater	41 connection day backups in 2023 compared to 16,783 properties connected to municipal wastewater
		# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	There was 1 effluent violation due to wastewater discharge compared to 16,648 properties	There was 0 effluent violation due to wastewater discharge compared to 16,783 properties

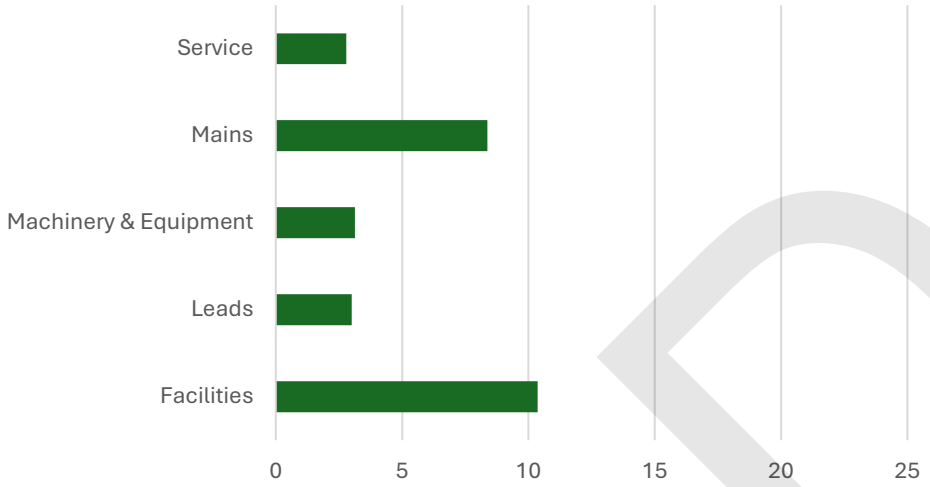
4.8.5 Technical Levels of Service

Core Value	Level of Service Statement	Technical Level of Service	2021	2023
Affordable	Wastewater services are affordable, and household charges are fair and reasonable; infrastructure is managed cost-effectively for the expected level of service.	2021 reinvestment rate vs 2023 reinvestment rate.	0.88%: 1.28%	1% : 1.29%
Sustainable	Wastewater resources are used efficiently, and long-term plans are in place for the sustainability of wastewater treatment and infrastructure.	% of the wastewater system that is in good or very good condition.	10%	46%
		% of the wastewater system that is in poor or very poor condition.	62%	35%

4.8.6 Wastewater Risk

The bar chart below distributes the percent of the wastewater assets in each of the risk profiles. There are several assets in the high risk profile because of the much older age of the infrastructure within the wastewater assets.

Quantitative risk is calculated using the probability of failure which is established by condition and consequence of failure which is calculated using weighted replacement costs. Multiplying probability and consequence for a total possible risk score is out of 25



Qualitative Risks

Climate Change & Serious Weather Events

Climate change risks such as more intense and frequent rainfalls, rain on snow events, heat waves, and ice-storms have significant implications for City infrastructure. An increase in extreme weather events will likely lead to exceeding capacity of infrastructure and eventual flooding, thus requiring increased investment in maintenance and system improvements. Understanding the severity and frequency of these climate change events and incorporation of climate change considerations into the City's asset management planning approach is critical to maintaining service levels and managing risk.

Organizational Change and Capacity

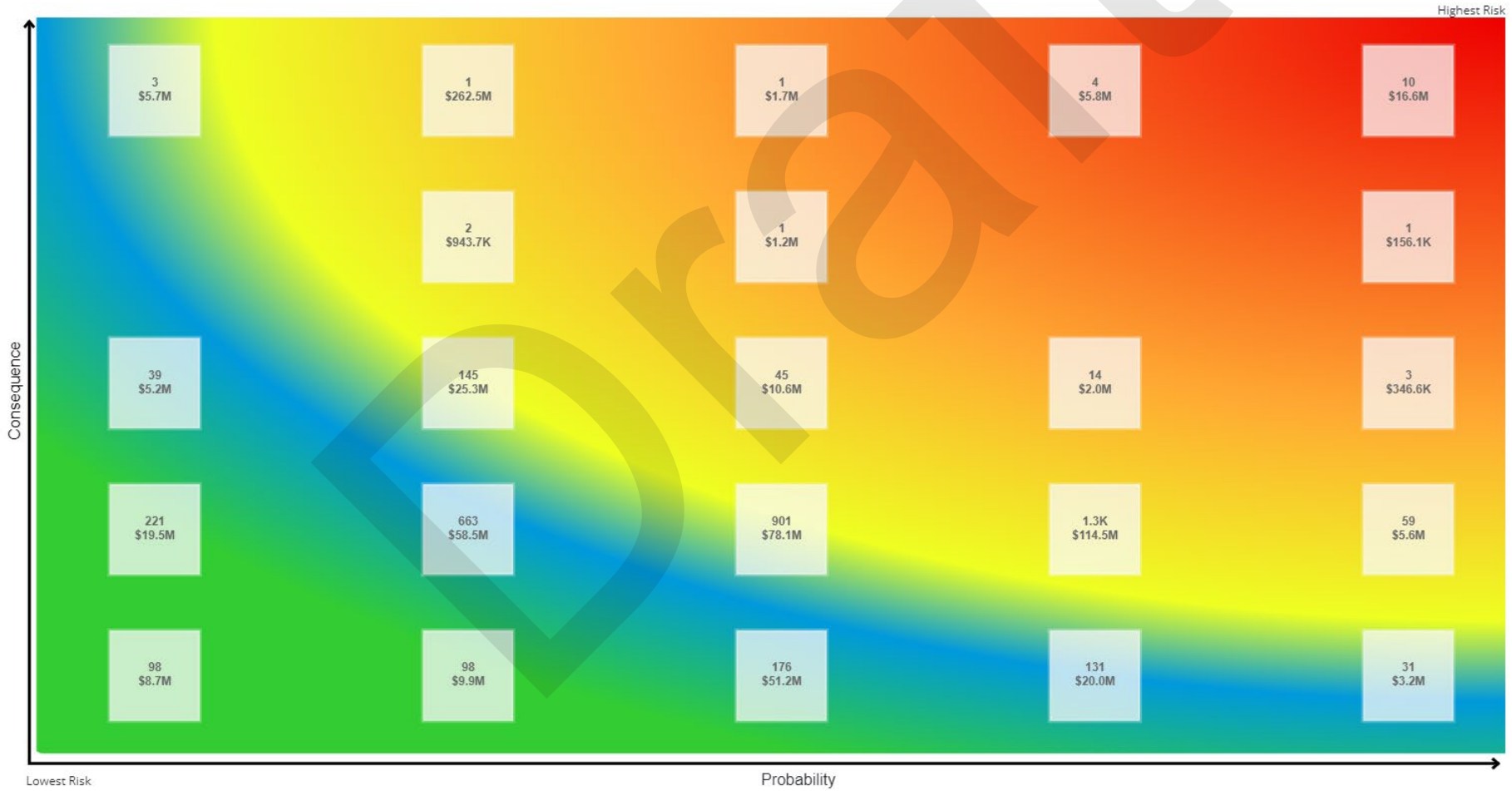
As with any organization, staff departures are a reality. North Bay faces issues maintaining service staff as the industry becomes more and more competitive.

Infrastructure Design & Installation

As assets mature, certain aspects of their design and implementation combine to have a detrimental impact on the ability of the asset to provide its service. For instance, design and material choices have advanced with the changes in climate. As a result, the assets aren't reaching the expected longevity and may require rehabilitation or replacement sooner than assets using updated design standards.

4.8.7. Wastewater Risk Matrix

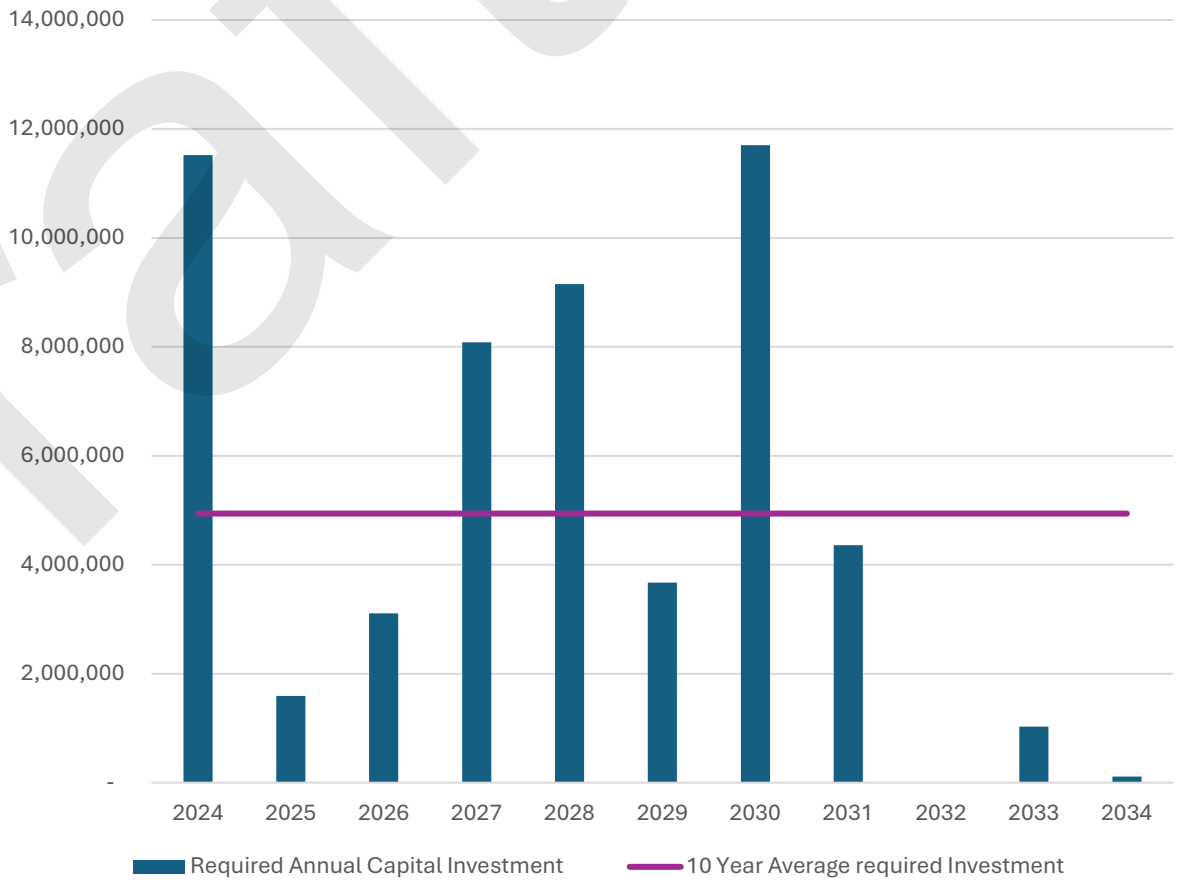
The matrix below provides a visual representation of the relationship between the probability of failure and the consequence of failure for the wastewater assets as of December 31, 2023. The assets in the top right represent the highest risk and consequence of failure due to their high replacement values. These assets are primarily Lift Stations across the City.



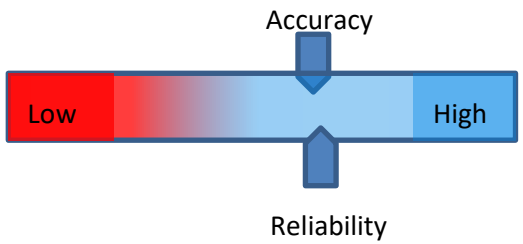
4.7.8. Costs of Providing Life Cycle Activities for 10 Years

Wastewater assets are sufficiently funded in the short term; however, it is important for the City to slowly increase the funding directed towards infrastructure renewal. The wastewater plant is much older and requires several renewal projects in the next 10 years. Most notably in 2024 there is reconstruction of the intake chamber, the pumping station and structural repairs at the facility. The City is procuring a condition assessment of the wastewater facilities. The 2024 10 year capital budget has a significant project planned to expanded the Wastewater treatment Plant to accommodate a potential legislative change to the treatment process between 2026 and 2029.

This $17 million dollar project is planned for however not reflective in the adjacent graph which captures only assets currently operating within the wastewater network. Therefore, this project has been removed from the calculation to determine the average annual funding within the 10 year capital budget of $7 million. The adjacent graph displays the assets that would require to be replaced as well as the costs of life cycle strategies. Based on estimated useful life the total annual capital requirement was determined to be $9.15 million. Therefore, annual shortfall is $2. million ($9 - $7). The horizontal line in the adjacent graph represents the required average spend over the next 10 years to be $5 million.



4.8.9. Data Confidence Scale



This asset class has undergone extensive condition reports, and the data is mapped in detail to the GIS system making the data accuracy high. Improvements are yet to be gained in reliability.

4.8.10. Recommendations

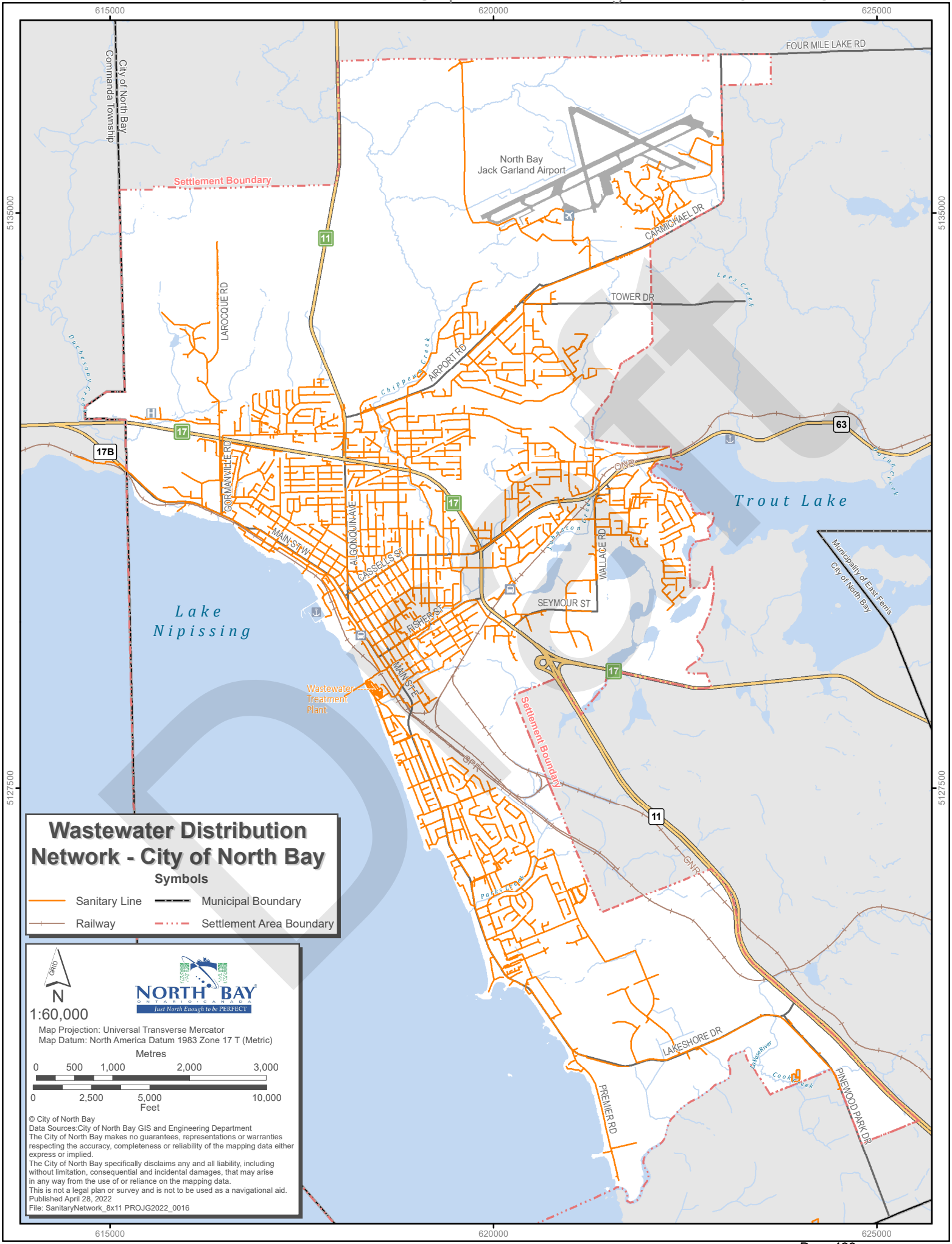
Identify condition assessment strategies for high value and high-risk water network assets.

Implement risk-based decision-making as part of asset management planning and budgeting processes. This should include the regular review of high-risk assets to determine appropriate risk mitigation strategies.

Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Continue to measure current levels of service in accordance with the metrics that the City has established in the AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.

Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.



Wastewater Distribution Network - City of North Bay

Symbols

- Sanitary Line
- Railway
- Municipal Boundary
- Settlement Area Boundary

N

1:60,000

Map Projection: Universal Transverse Mercator
Map Datum: North America Datum 1983 Zone 17 T (Metric)

Metres
0 500 1,000 2,000 3,000

0 2,500 5,000 10,000
Feet

Data Sources:City of North Bay GIS and Engineering Department
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Published April 28, 2022
File: SanitaryNetwork_8x11 PROJG2022_0016

4.9 Water

Water Systems are rated based on a Class system created by the Ministry of the Environment, Conservation and Parks (MECP). Systems can be rated from Class 1 (less complex) to Class 4 (most complex).

The construction of North Bay's Water Treatment Facility began in April 2006 and the Facility became operational February 17, 2010. The Water Treatment Plant is a Class 3 facility while the water distribution system is Class 4. The Facility operates using a multibarrier approach to meet its treatment goals.
The primary barrier in this Facility is a microfiltration system, which is made up of 11 parallel membrane racks, each equipped with dozens of pressure vessels that house thousands of hollow-fibre membranes. These membranes provide an effective barrier to physically separate the various contaminants in the City's drinking water.
The secondary treatment barrier is the UV disinfection system, which inactivates any organisms that are present in the water, using high intensity light. The water is then injected with chlorine, to kill off any viruses and bacteria that are able to bypass the previous systems. The raw water for the Facility is drawn from an intake pipe that extends 300 metres off the shore, into Trout Lake. An average of 20 million litres (ML) of water run through the facility every day, with a design capacity of 79.5ML day.
These treatment facilities consist of a group of components, including building structures, pipes, valves, pumps, Supervisory Control and Data Acquisition (SCADA) systems, and so forth. The State of the Infrastructure analysis of these components was based upon existing inventories.

4.9.1. Life Cycle Management Strategy

The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment. The following life cycle strategy has been developed as a proactive approach to managing the life cycle of water mains.

Water Mains Event Name	Event Class	Event Trigger
Valve Exercising	Maintenance	Every 4 years
Large Diameter valve (16"+)	Maintenance	Every 2 years
Uni-directional flushing	Maintenance	Every 4 Years
Cathodic Protection	Preventative Maintenance	New Construction
Trenchless Re-lining	Rehabilitation	Condition
Full Reconstruction	Replacement	Condition/New Development
Dead End Flushing	Preventative Maintenance	Twice Annually(spring/fall)
Hydrant Maintenance	Preventative Maintenance	Every 4 years
Trenchless Relining	Rehabilitation	Condition

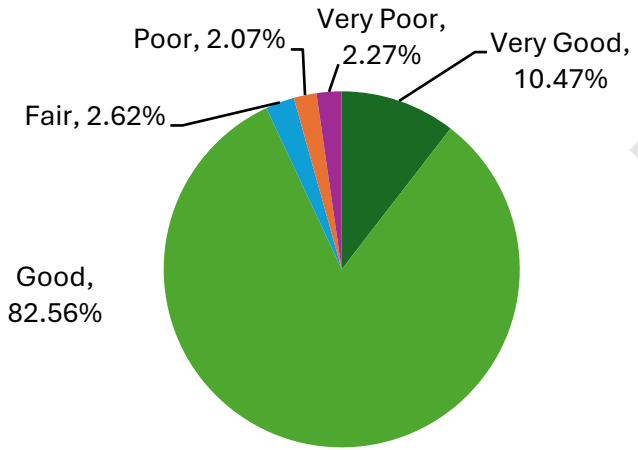
4.9.2. Condition

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 more confidently. The following describes the municipality's current approach:

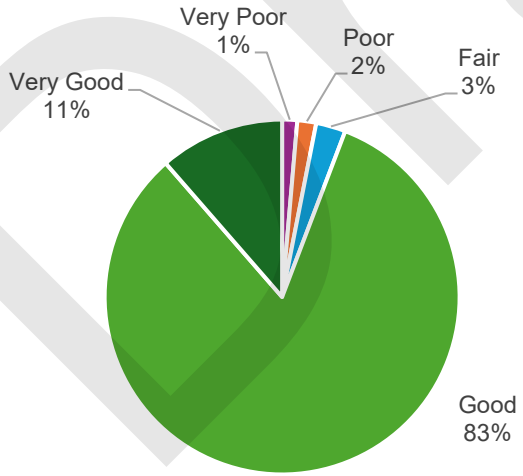
- Staff primarily relies on the age, pipe material, break history, and dirty water complaints to determine the projected condition of water mains.
- Trenchless water relining is used as a rehabilitation method where deemed appropriate.
- Main flushing and valve turning is completed on the network (300 valves/year). Hydrant valves are exercised regularly
- Fire flow and pressure testing is performed as required for infrastructure upgrades and new development. Uni-directional flushing is performed over a four year cycle.

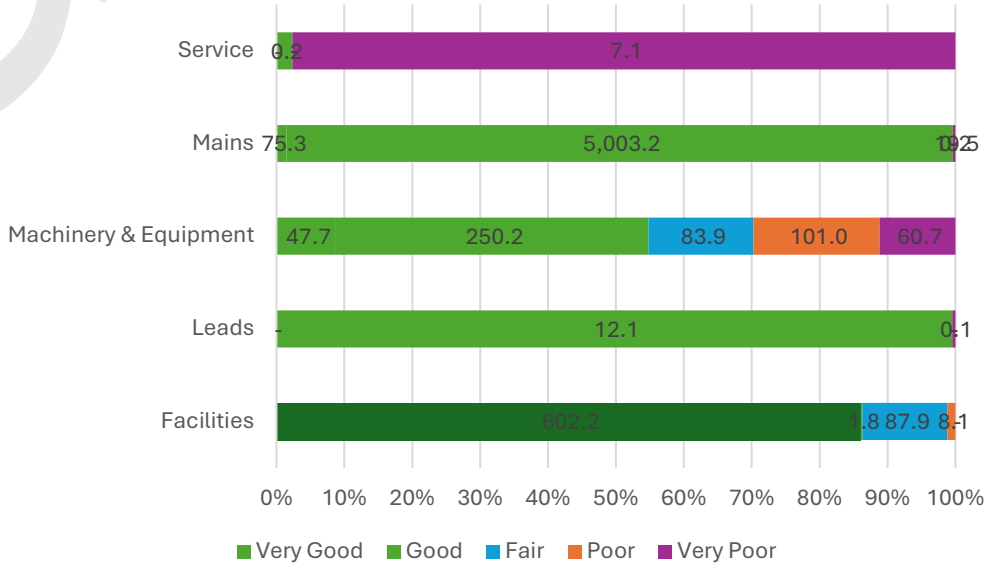
The pie chart below illustrates the % of assets in very good, good, fair, poor, very poor condition.

Condition as of December 31, 2021



Condition as of December 31, 2023





In $100,000

4.9.3. Levels of Service

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

4.9.4. Community Level of Service

The following table outlines the qualitative descriptions that determine the community levels of service provided by water:

Core Value	Level of Service Statement	Community Level of Service
Accessible & Reliable	A reliable water supply is provided with minimal service disruptions.	See section 4.9.11 for map of municipality connected to water system and 4.9.12 fire flow map.
Safe & Regulatory	Water supply is safe to drink and meets all regulatory requirements	The City's annual Drinking Water Inspection completed by the Ministry of the Environment Conservation and Parks rated the City water system at 95.27% for 2023.
Affordable	Water services are affordable, and household charges are fair and reasonable; infrastructure is managed cost effectively for the expected level of service	Life Cycle activities include valve exercising, uni-directional flushing, cathodic protection, dead end flushing, trenchless relining, and full reconstruction.
Sustainable	Water resources are used efficiently, and long-term plans are in place for the sustainability of the water supply and all water infrastructure	The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an assets characteristics, location, utilization, maintenance history and environment. Life cycle strategies are used as a proactive approach to having a sustainable system.

4.9.5 Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by water assets:

Core Value	Level of Service Statement	Technical Level of Service	2021	2023
Accessible & Reliable	A reliable water supply is provided with minimal service disruptions.	% of properties connected to the municipal water system.	83%	83%
		% of properties where fire flow is available	83%	100%
		# of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system.	248 Connection days due to water main breaks compared to 16,779 properties connected to municipal water	200 Connection days due to water main breaks compared to 16,783 properties connected to municipal water

4.9.5 Technical Levels of Service

The following table outlines the quantitative metrics that determine the technical level of service provided by water assets:

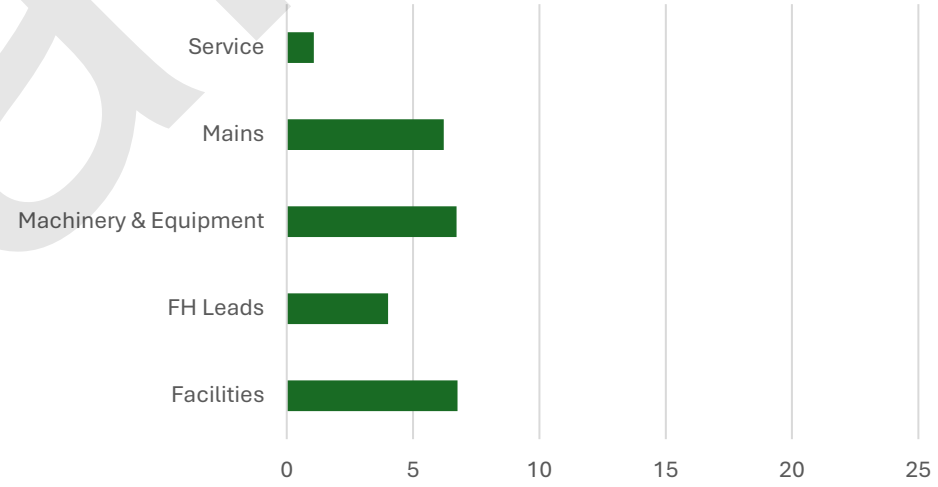
Core Value	Level of Service Statement	Technical Level of Service	2021	2023
Safe & Regulatory	Water supply is safe to drink and meets all regulatory requirements.	# of connection-days per year where a boil water advisory or drinking water advisory notice is in place compared to the total number of properties connected to the municipal water system.	15 connection days due to boil water advisory compared to 16,779 properties connected to municipal water	0 connection days due to boil water advisory compared to 16,783 properties connected to municipal water
Affordable	Water services are affordable, and household charges are fair and reasonable; infrastructure is managed cost effectively for the expected level of service.	Average annual residential water bill	$563.78	$551.52
		Current reinvestment rate vs target reinvestment rate	0.62% : 1.59%	0.98% : 1.59%
Sustainable	Water resources are used efficiently, and long-term plans are in place for the sustainability of the water supply and all water infrastructure.	% of the water system that is in good or very good condition-	93.03%	94.00%
		% of the water system that is in poor or very poor condition- confirm with client if it is just distribution.	4.31%	3%

4.9.6. Water Risk

The bar chart below distributes the percent of the water assets in each of the risk profiles. The majority of water assets have low risk assessments due to the built in redundancy within the water processes. Overall low risk.

Qualitative Risks

Quantitative risk is calculated using the probability of failure which is established by condition and consequence of failure which is calculated using weighted replacement costs. Multiplying probability and consequence for a total possible risk score is out of 25



Climate Change & Serious Weather Events

Climate change risks such as more intense and frequent rainfalls, rain or snow events, heat waves, and ice-storms have significant implications for City infrastructure. An increase in extreme weather events will likely lead to exceeding capacity of infrastructure and eventual flooding, thus requiring increased investment in maintenance and system improvements. Understanding the severity and frequency of these climate change events and incorporation of climate change considerations into the City's asset management planning approach is critical to maintaining service levels and managing risk.

Organizational Change and Capacity

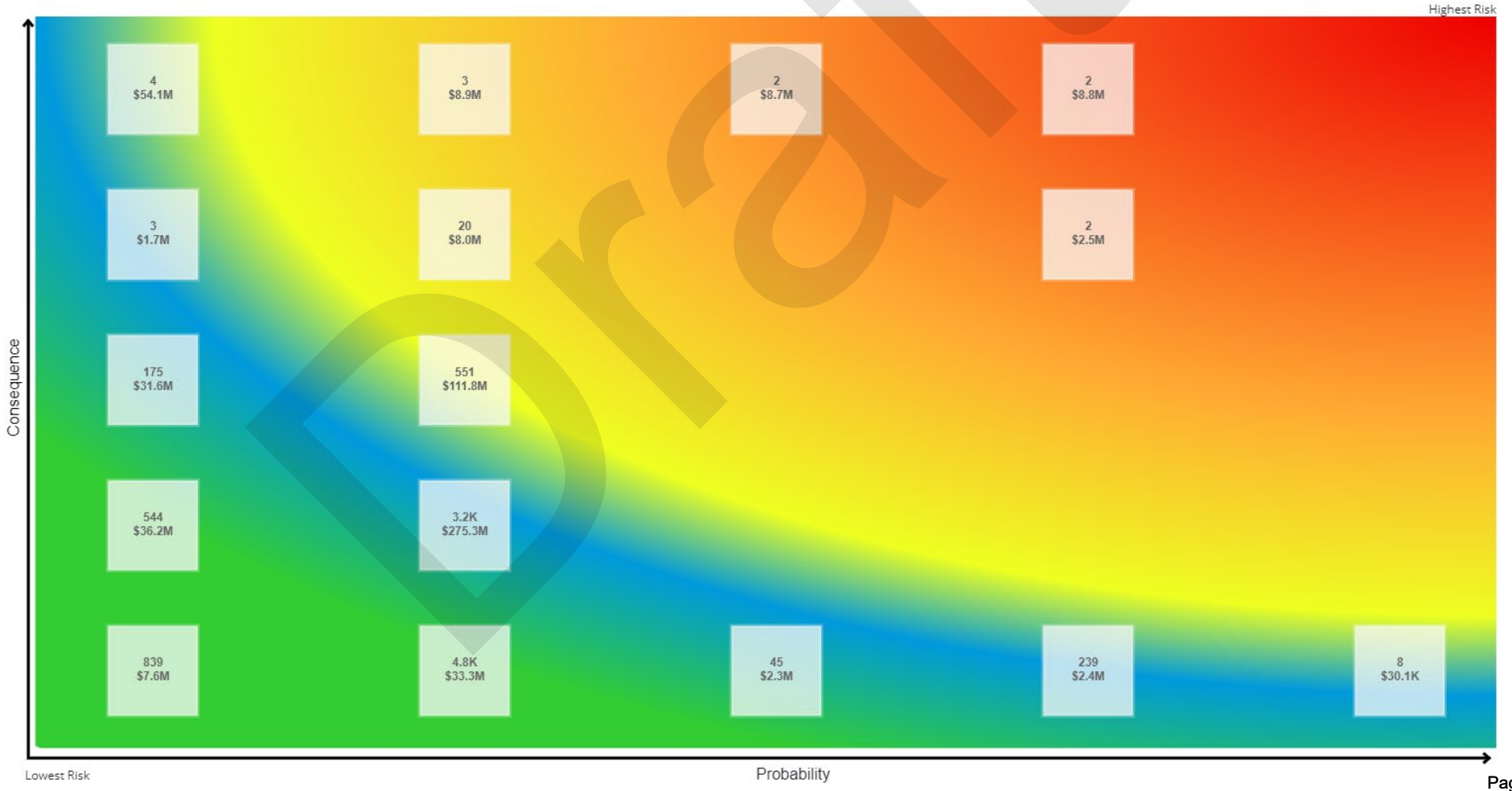
As with any organization, staff departures are a reality. North Bay faces issues maintaining service staff as the industry becomes more and more competitive.

Infrastructure Design & Installation

As assets mature, certain aspects of their design and implementation combine to have a detrimental impact on the ability of the asset to provide its service. For instance, design and material choices have advanced with the changes in climate. As a result, the assets aren't reaching the expected longevity and may require rehabilitation or replacement sooner than assets using updated design standards.

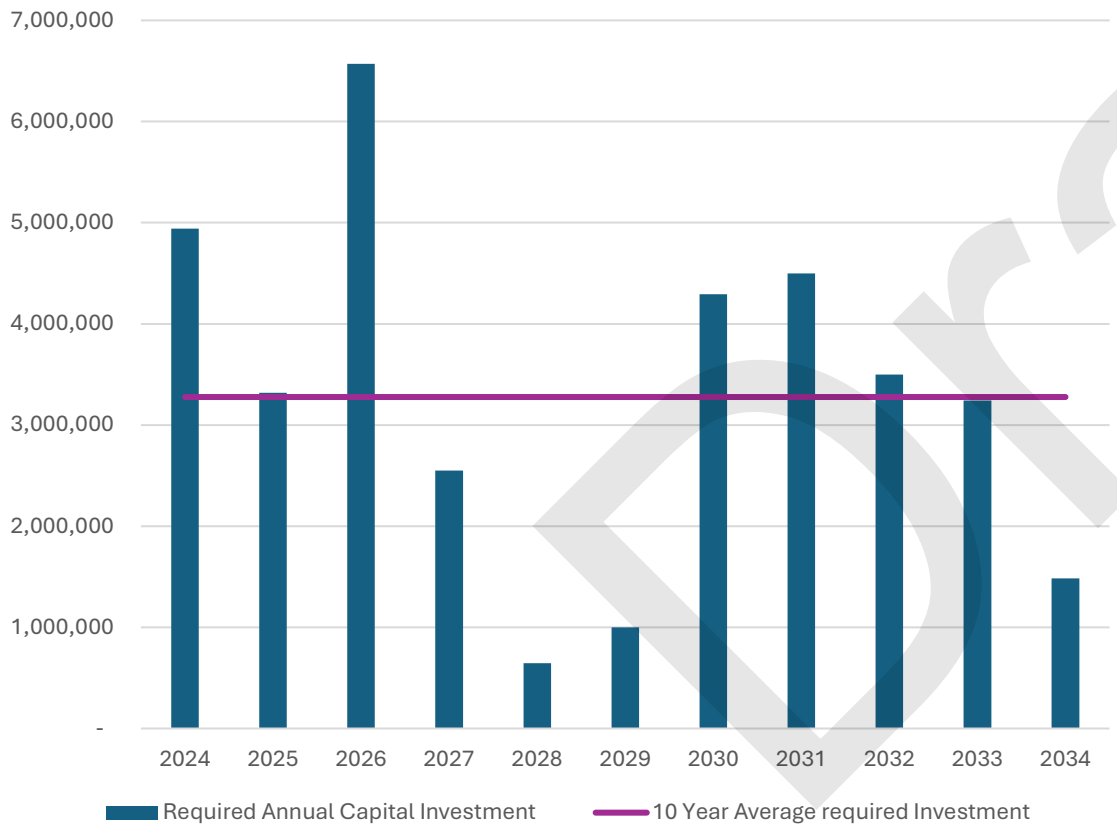
4.9.7. Water Risk Matrix

The matrix below provides a visual representation of the relationship between the probability of failure and the consequence of failure for the water assets as of December 31, 2023. The identification of the critical assets allows the City to determine appropriate risk mitigation strategies and treatment options. For example, the matrix identifies one asset for $7.6 million (membranes) at the water treatment facility that has exceeded its expected life of 10 years and is scheduled for replacement in 2024/2025.



4.9.8. Costs of Providing Life Cycle Activities for 10 Years

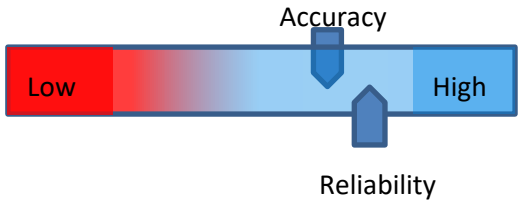
The City of North Bay invested in a new water treatment facility which opened in 2010. The water treatment facility has a 75-year estimated useful life. The most notable investment is with the Machinery and Equipment to replace the membranes that have exceeded the anticipated 10-year life. The graph below highlights that in the short term (approximately 10 years) the current annual budget appears to be sufficient; however, over the longer term (estimated useful life of the assets) the water network is underfunded by approximately $3.8 million a year ($10-$6.2). This gives the City time to pivot and implement the financial strategy recommendations contained within the AMP.



.Based on estimated useful life the total annual capital requirement was determined to be $10 million. The ten year funding without growth projects is forecasted to be $6.2 million per year.

4.9.9. Data Confidence Scale

This asset class has undergone extensive condition reports; the data is mapped, in great detail, to the GIS system making the data reliability very high.



4.9.10. Recommendations

Condition Assessment Strategies

Identify condition assessment strategies for high value and high-risk equipment and centralize within PSD CityWide.

Review assets that have surpassed their estimated useful life to determine if immediate replacement is required or whether these assets are expected to remain in-service. Adjust the service life and/or condition ratings for these assets accordingly.

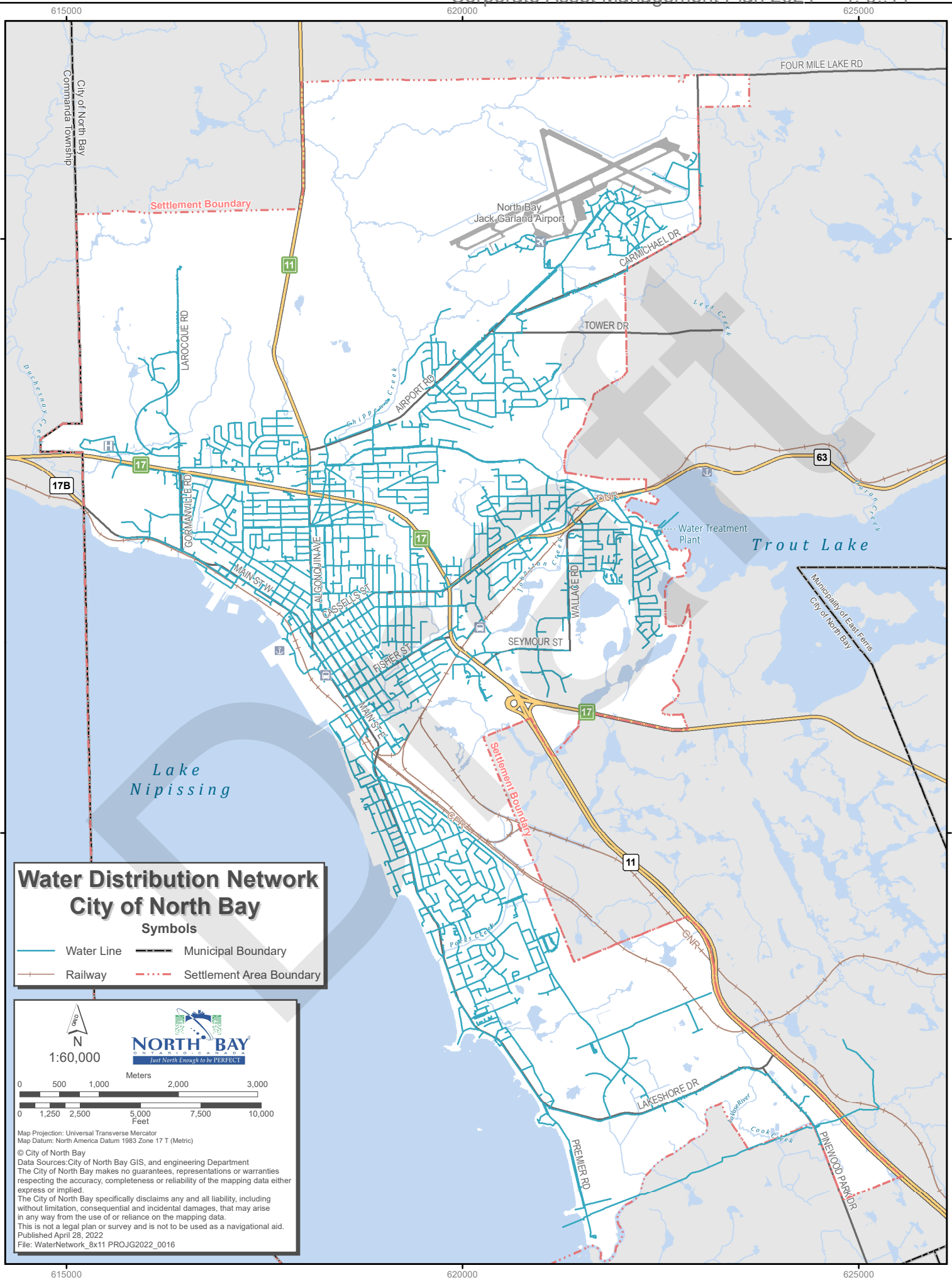
Risk Management Strategies

Review risk models on a regular basis and adjust according to an evolving understanding of the probability and consequences of asset failure.

Levels of Service

Begin measuring current levels of service in accordance with the metrics that the City has established in the AMP. Additional metrics can be established as they are determined to provide meaningful and reliable inputs into asset management planning.

Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.



Water Distribution Network
City of North Bay

Symbols

- Water Line
- Municipal Boundary
- Railway
- Settlement Area Boundary

N

1:60,000

NORTH BAY
ONTARIO CANADA
Just North Enough to be PERFECT

Meters
0 500 1,000 2,000 3,000

0 1,250 2,500 5,000 7,500 10,000
Feet

Map Projection: Universal Transverse Mercator
Map Datum: North America Datum 1983 Zone 17 T (Metric)

Data Sources:City of North Bay GIS, and engineering Department
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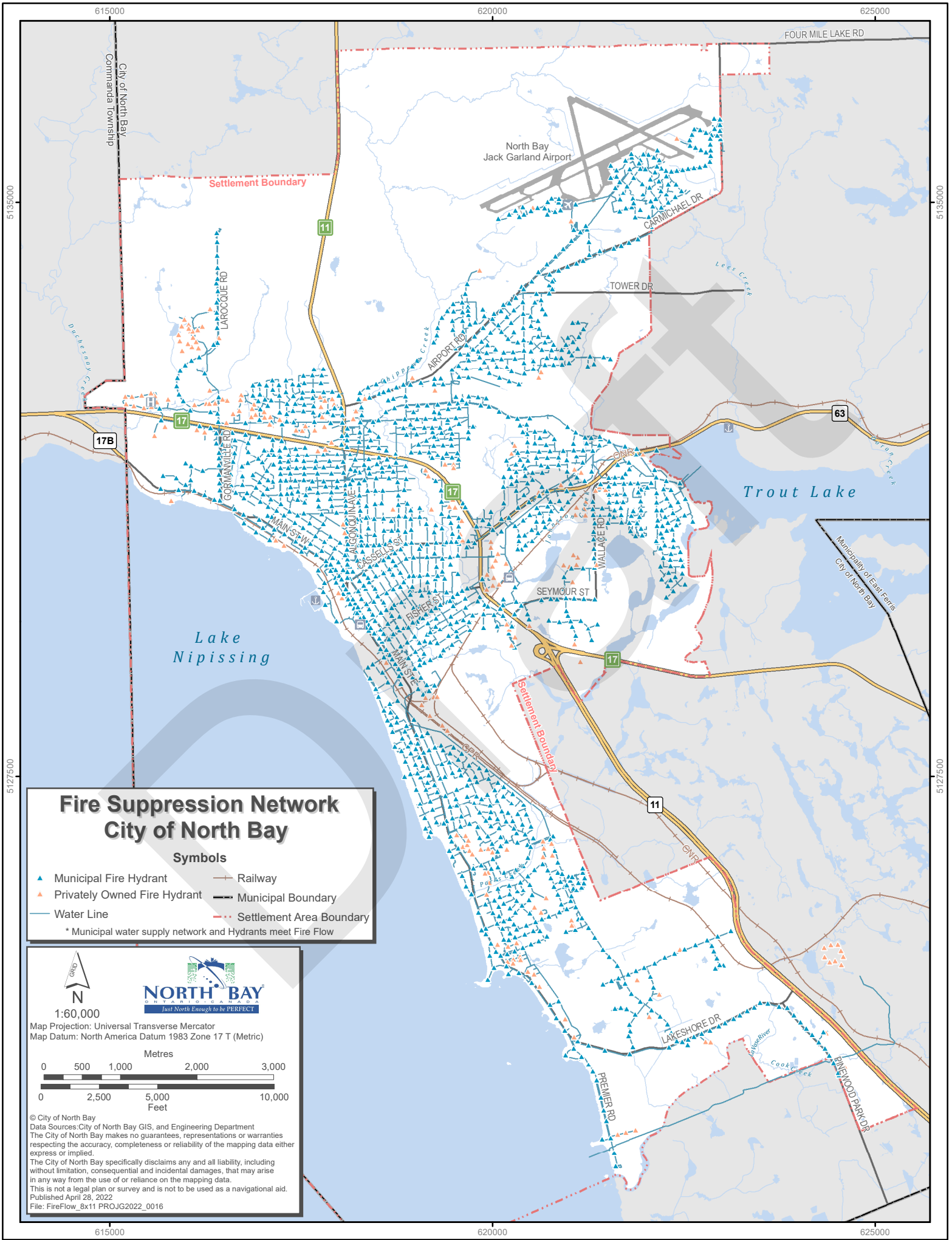
615000
620000
625000
5135000
5127500
City of North Bay
Commanda Township
Settlement Boundary
North Bay
Jack Garland Airport
FOUR MILE LAKE RD
CARMICHAEL DR
TOWER DR
LAROCQUE RD
AIRPORT RD
Chippewa Creek
Lees Creek
Duchesnay Creek
17B
17
11
63
GORMANVILLE RD
MAIN ST W
ALGONQUIN AVE
CASSELS ST
FISHER ST
MAIN ST E
SEYMOUR ST
WALLACE RD
GNR
Trout Lake
Lake Nipissing
Municipality of East Ferris
City of North Bay
Settlement Boundary
LAKESHORE DR
PREMIER RD
PINEWOOD PARK DR
Cook Creek
Fire Suppression Network
City of North Bay
Symbols
Municipal Fire Hydrant
Privately Owned Fire Hydrant
Water Line
Railway
Municipal Boundary
Settlement Area Boundary
* Municipal water supply network and Hydrants meet Fire Flow
N
1:60,000
NORTH BAY
ONTARIO CANADA
Just North Enough to be PERFECT
Map Projection: Universal Transverse Mercator
Map Datum: North America Datum 1983 Zone 17 T (Metric)
Metres
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0 2,500 5,000 10,000
Feet
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5.0 Finance Strategy

5.1 Financing Strategy Background

This section contains the financial requirements associated with the management of the City's assets over the AMP period. The financial projections and annual averages presented in this section are based on the best available information at this time (ie. approved 2024 10 year Capital Budget). Improving the quality of information and the planning process will be an integral part of the City's Corporate Asset Management Program going forward and is covered in the recommendations below.

The effectiveness and meaningfulness of an asset management plan is dependent on the integration with financial planning and long-term budgeting. The development of a comprehensive financial plan will allow the City of North Bay to identify the financial resources required for sustainable asset management based on existing asset inventories, desired levels of service, legislative requirements and projected growth requirements.

This version of the AMP is primarily focused on the City's asset lifecycle needs, specifically the expenditure required to maintain the current level of service to the City's community. A funding shortfall, however, is not assessed for growth and service enhancement needs. Growth and service enhancement needs are to be updated in a future AMP as the City's capacity and expertise in AMP develops. As growth and new assets are considered, an analysis of full life cycle costing costs may also form part of the decision making process. Therefore, the funding shortfalls discussed within this Asset Management Plan refer only to the needs and funding available for existing assets to maintain the current levels of service and do not include any new infrastructure identified in the 10 year Capital Budget.

Working within current funding levels, the City has to continuously prioritize expenditures between asset sustainability, growth demands and changes in service levels. The objective of the Asset Management Plan is to ensure there is an increased focus on asset renewal needs. The AMP forecasts a shortfall in annual funding levels required for several assets to sustain their current expected level of service. This is a common challenge for cities across Canada including the City of North Bay. The AMP will inform development of a financial plan that:

- Identifies the financial requirements for existing assets
- Utilizes existing services levels
- Identifies the traditional sources of municipal funds; and
- Explores alternative and/or sources of municipal funds (reallocated budgets, partnerships)

If the financial plan component results in a funding shortfall, the Province requires the inclusion of a specific plan as to how the impact of the shortfall will be managed. In determining the legitimacy of a funding shortfall, the Province may evaluate a City's approach to close the funding shortfall gap. For example:

A. In order to reduce financial requirements, consideration has been given to potentially revising service levels downward.

B. All asset management and financial strategies have been considered. For example:

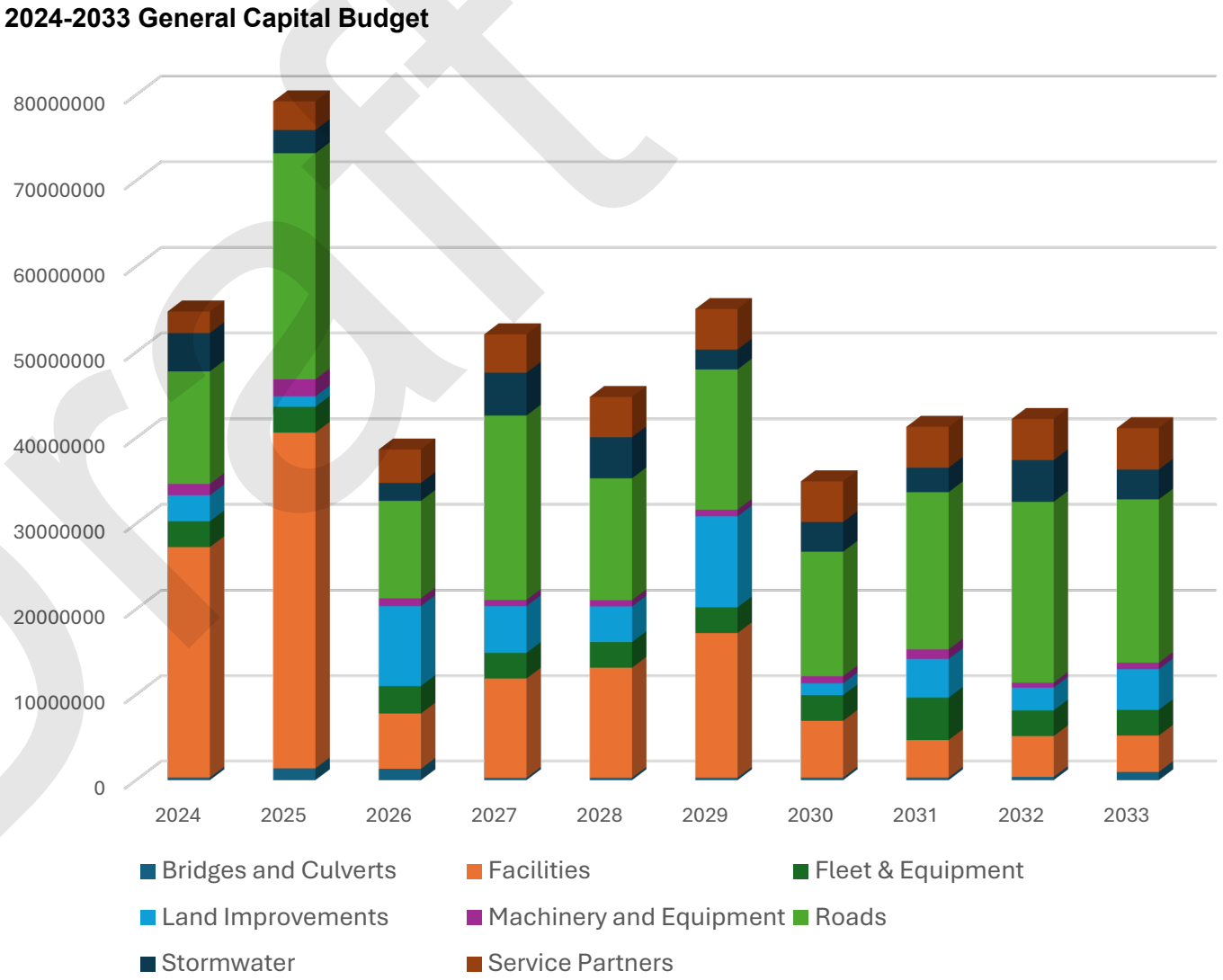
- If a zero-debt policy is in place, is it warranted?
- Has the use of debt been considered?
- Do user fees reflect the cost of the applicable service? If not, have increased user fees should been considered?

5.2 Capital Budget Forecast

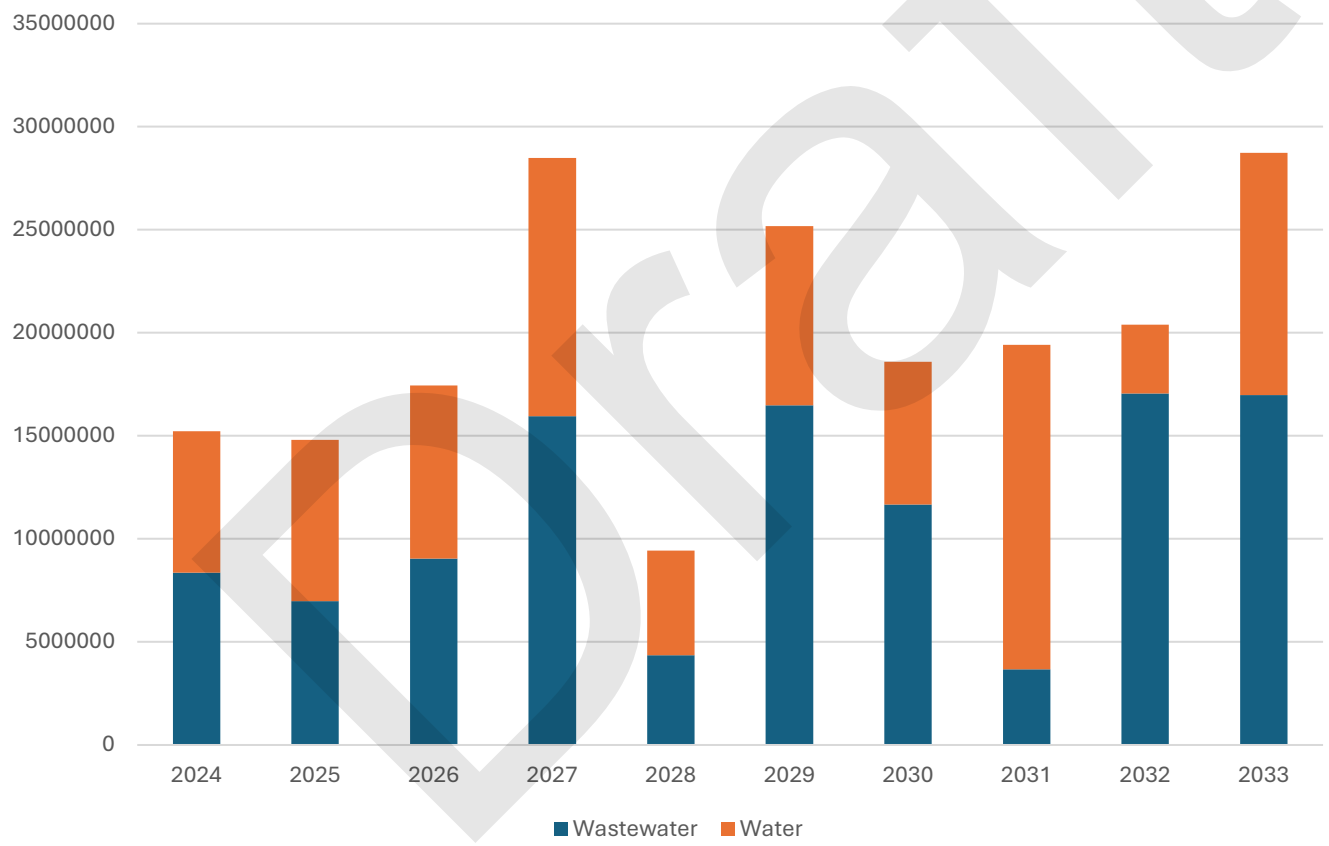
Capital budget forecasts for the AMP period are based on the City's 2024 10 year Capital Budget, which meets the requirement of O.Reg 588/17. A multi-year capital budget plan is presented to Council on an annual basis. Generally, Council approves year one of the capital budget and approves, in principle, the remaining years.

The selection, project development, and prioritization processes for the projects within the 10 year Capital Budget plan are reviewed with the Service Areas to assess the program needs, trends and priorities. The review includes actual costs incurred in the past for similar projects, as well as current costs to date for projects in progress. Capital project information is gathered from the Service Areas to provide justification for recommended projects.

The graph illustrates the 2024 10 year Capital Budget. For this AMP the 2024-2033 General Capital Budget (tax levy funded) has been separated out into the various asset categories Roads, Stormwater, Bridges & Culvert, Land Improvements, Facilities, Machinery & Equipment, and Fleet.



The Water and Wastewater Budget is included within the Asset Management Plan and is funded by water and wastewater rates. The graph below reflects the 2024 10-year capital budget for Water and Wastewater.



5.3 Operating Budget

In preparing the Operating Budget the Capital Budget forecast is taken into consideration. This ensures that sufficient funding is available to operate, repair and maintain any new assets that were created in the previous year or are subject to significant renewal projects. Maintaining infrastructure in good condition continues to be a priority. In developing the annual Operating Budget, there is an annual transfer to the Capital Budget called PAYGO (Pay as you go) that represents the cash payments collected through the tax levy or through water and wastewater rates for capital investments.

In accordance with the City's Long Term Capital Funding Policy, moderate increases to the tax levy are necessary to ensure funding for capital investment and payment of principal and interest on debt. City Council continues to recognize and support the need for increased transfers to fund the Capital Budget due to inflationary pressures as well as funding increases required to address municipal transformation projects. Operating Budgets are developed with consideration of the capital requirements needed to address the City's assets.

The components related to the PAYGO funding of the Capital Budget will continue to be reviewed in conjunction with the needs identified in this AMP. There will also be an increased focus on the best life cycle solutions for maintaining the asset base and continued delivery of current or improved LOS. Maintaining assets is more than investments in capital. As discussed, life cycle strategies include operating investments that ensure the assets are delivering the intended LOS. Therefore, long term sustainable funding for maintenance and repairs is foundational to address challenges in infrastructure deficits because it is often preventative and will optimize the life of the assets. Generally, wages and materials for repairs are reported within the Operating Budget; however, there is also Operating Capital (routine maintenance / repairs) within the Capital Budget. The Average Annual Operating Capital in the table represents the investment in routine maintenance activities for the assets reported in this AMP and are calculated from the 2024 10 Year Capital Budget. It is recommended that a transition plan be developed to move these expenditures of routine maintenance and repairs from capital to operating.

	Average Annual Operating Capital
Bridges and Culverts	275,800
Facilities	1,896,398
Fleet & Equipment	
Land Improvements	1,199,555
Machinery and Equipment	784,982
Roads	2,224,742
Stormwater	173,290
Wastewater	2,128,868
Water	2,185,629
Total	10,869,264

5.4 Capital Investment Revenue

The City obtains funding for its operating and capital expenditures from a number of sources. A significant portion of revenue is derived from property taxes. The City has adopted a Long Term Capital Funding Policy that balances the traditional pay-as-you-go financing approach with debt and third party funding sources. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period of the AMP. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF (Ontario Community Infrastructure Fund) formula-based funding, as well as Canada Community Building Fund, since these funding formulas are multi-year commitments. Funding agreements with executed agreements has also been included. With regards to the funding of capital projects, the main sources of current funding for the City are as follows:

- *Pay As You Go / PAYGO*
  - General Operating Budget (tax levy)
  - Water and Wastewater (user rates)
- Debt Financing
- Discretionary Reserves
  - General Completed Capital Reserve
  - Water Completed Capital Reserve
  - Wastewater Completed Capital Reserve
  - Other Reserves
- Development Charges
- External Sources
  - Provincial Transit Funding
  - Canada Community Building Funding
  - Various Grants including, but not limited to: Public Transit Infrastructure Funding, NOHFC, FEDNOR, OCIF, Disaster Mitigation and Adaption Fund
  - Developer Contributions
  - Other One-time Third-Party Recoveries

Funding sources available for capital over the 2024 – 2033 planned periods are detailed in the Table below. Despite the City's continued increases in capital funding, it is clear that to successfully deal with the infrastructure deficit, municipalities will need significant ongoing reliable funding and Provincial and Federal assistance. While the City continues to pursue all grant opportunities for capital projects, by their nature they are not sustainable nor predictable. As such, the use of grants will continue to be used to leverage funding and where applicable make available City funding for other projects. The tables below summarize the funding plan within the 2024 10 year Capital Budget

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Capital Levy in Operating Budget PAYGO	18.31	18.37	18.33	19.06	19.85	20.45	21.35	22.33	23.25	24.03
Debenture and Long-term Debt**	2.90	6.10	8.10	8.10	8.50	8.50	8.50	8.50	8.50	8.50
Special Debt for Community Centre**	-	14.73	-	-	-	-	-	-	-	-
Canada Community Building Fund for Community Centre	3.46	3.46	-	-	-	-	-	-	-	-
Canada Community Building Fund	3.31	3.45	3.45	3.59	3.59	3.59	3.59	3.59	3.59	3.59
Development Charges	-	0.64	-	-	-	0.05	-	-	-	-
Ontario Community Infrastructure Fund (OCIF)	3.70	7.43	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Reserves	24.90	20.46	2.97	10.12	7.77	7.48	4.45	3.95	2.50	2.50
Total	**56.59**	**74.64**	**37.34**	**45.37**	**44.20**	**44.56**	**42.38**	**42.86**	**42.33**	**43.12**

**Debt is not a revenue source but rather an important financing tool.

Planned and Projected Funding Sources for Water and Wastewater Capital (in millions)

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Capital Levy in Operating Budget PAYGO	11.93	12.19	13.55	14.94	16.40	17.48	18.77	19.69	20.94	22.04
Debenture and Long-term Debt**	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Development Charges / Reserves	-	0.16	0.16	-	-	-	-	-	-	-
Ontario Community Infrastructure Fund (OCIF)	-	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Grants and Other Funding	0.17	-	0.60	-	-	0.37	-	-	-	-
Total	**15.10**	**15.85**	**17.81**	**18.44**	**19.90**	**21.34**	**22.27**	**23.19**	**24.44**	**25.54**

PAYGO revenues allow for maximum flexibility when funding projects. As can be seen in the table above, the tax supported funding is planned to achieve 56% total funding from PAYGO by 2033 whereas the rate supported PAYGO is planned to achieve 86% in 2033. The amounts included in the capital budget are to fund all capital projects. Therefore, in order to determine the funding gap adjustments were required to remove the funding for, operating capital (routine maintenance and repairs), growth related projects as well as capital allocated to support the City's Service Partners. Examples of projects within the growth category include investments in projects such as the Extension of Four Mile Lake Road, Leachate Management future cells, Innovation Hub and Pinewood Park and Lakeshore Intersection, as well as investments in projects such as cycling infrastructure, Parks Master Plan and various studies. Lastly, capital requirements and funding for Service Partners has significantly increased in recent history.

In many cases, projects can be a combination of growth and maintenance and as such project funding is split between these two categories to capture the true nature of the total investment. For the purposes of this AMP, if a project is split in nature, the project was classified as one or the other. This is an area of improvement as the City modifies its Capital Budget process and Asset Management practices.

5.5 Reserves

Reserves play a critical role in long-term financial planning. The benefits of having reserves available for infrastructure planning incude:

a) the ability to stabilize tax rates and water / wastewater rates when dealing with variable and sometimes uncontrollable factors
b) financing one-time or short-term investments
c) accumulating the funding for significant future infrastructure investments
d) managing the use of debt
e) normalizing infrastructure funding requirement

The table below identifies examples of some of the capital related reserves currently available to support capital initiatives:

Reserve Name	Balance as of Dec 31, 2023 (unaudited)
General Completed Capital	$6,888,947
Water Completed Capital	$5,798,827
Wastewater Completed Capital	$5,940,100

Most municipalities in the Province of Ontario fund capital projects through their reserves and therefore hold reserve accounts by asset category. The City of North Bay funds capital projects directly from the tax levy or rate support levy PAYGO, debt issuance or other sources of funding. Capital reserves are established for one-time expenses or one-time revenues. The capital reserve target is established by the City's Reserve Policy and the above noted reserves are intended to be used for emergency capital costs or as a funding tool for unexpected capital project contingencies. The reserves are funded primarily by savings experienced in completed capital projects. Recommended amendments to the Reserve Policy to transition to reserves for each asset category to ensure sustainability is maintained for all asset categories will provide enhanced infrastructure gap reporting.

There is considerable debate in the municipal sector as to the appropriate level of reserves that a City should have on hand. There is no clear guideline that has gained wide acceptance. Factors that municipalities should consider when determining their capital reserve requirements include:

a) breadth of services provided
b) age and condition of infrastructure
c) use and level of debt
d) economic conditions and outlook
e) internal reserve and debt policies
f) transition or phase in guidelines

The Policy review in 2023 has some recommendations modify the Reserve and Capital Levy funding; however, the findings of this AMP were required to finalize the policy recommendations.

5.6 The Infrastructure Gap

The 2014 AMP was contracted out and represented an inflationary adjustment to the 2010 AMP. Since 2014, the City has embraced best practices with investments in an Asset Management full time position as well as investment in City Wide, an Asset Management program. The implementation of the system has consolidated the records within Finance and the operating departments as well as provided for the analytics contained within the AMP.

This AMP is focused on reporting on tall assets while continuing to ensure the assets included in the report are able to be sustained at current service levels. While there have been many improvements made creating an overall positive change, not all of the individual asset categories display these same positive trends. This AMP is focused on determining the annual funding level required to sustain these assets going forward. This ensures consideration of the annual funding required to appropriately apply maintenance, rehabilitation, replacement and reconstruction activities which maintain and/or extend the life of the assets.

The AMP defines the City's Infrastructure Gap as the shortfall between required annual needs to sustain current service levels over the life of the assets and the average annual funding levels projected based on the 2024-2033 Capital Budget. The table below provides a summary of the results by asset type and the overall infrastructure gap of approximately $28.8M annually.

The annual requirement (with events) in the table below represents the amount the City should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability through the implementation of the life cycle strategies. As previously noted, the life cycle strategies are continuously being improved and is subject to change based on new more objective condition data, impacts of climate change, and unexpected external factors. Each asset category has been considered with the best information available at the time of this report, and considers the following:

- Appropriate maintenance and rehabilitation activities which can be undertaken to extend the useful life
- The risks associated with running the assets to failure
- Average annual capital funding from 2024-2033
- Average annual needs for reconstruction / replacement

The Average Annual Funding Capital Budget (2024-2033) in the table below represents the portion of the planned and projected funding sources that have been earmarked for each of the asset categories less funding currently attributable to growth, and operating capital (routine maintenance/repairs).

Replacement Cost and Annual Funding Shortfall

	Replacement Cost	Annual Requirement	Average Annual Funding Capital Budget (2024-2033)	Annual Shortfall (Surplus)
Bridges and Culverts	184,081,226	2,454,416	573,300	1,881,116
Facilities	488,800,478	14,645,106	7,423,152	7,221,954
Fleet & Equipment	51,562,780	4,074,386	3,217,787	856,599
Land Improvements	225,201,128	13,356,241	5,210,687	8,145,554
Machinery and Equipment	38,953,799	3,419,140	966,388	2,452,752
Roads	590,726,659	20,067,815	17,622,540	2,445,275
Stormwater	281,551,943	3,519,399	3,599,904	- 80,505
Wastewater	707,387,681	9,148,269	7,048,455	2,099,814
Water	636,110,618	10,083,838	6,259,137	3,824,701
Total	3,204,376,313	80,768,610	51,921,350	28,847,260

As the data used to calculate the annual funding shortfall is linked to the 2024 10 year Capital Budget the average annual funding is aligned to the current Long Term Capital Funding Policy and the capital projects put forward without the details of the asset management system. It is recommended that future budgets have more emphasis put on ensuring project funding is clearly identified for maintenance/rehabilitation, growth, service enhancements and/or economic development. This will ensure any increased funding approved by City Council to support the recommendations in this report, addressing the sustainability of existing assets at current LOS, is allocated as approved.

5.7. Funding Options

The City has several options with respect to funding the projected annual infrastructure gap. As previously mentioned, updating the Reserve Policy is an opportunity as well as updates to the Long Term Capital Funding Policy including the following:

A. Implementation of an Allocation Policy
B. Strategic use of debt limits
C. Modifying tax levy PAYGO funding

A. Implementation of an Allocation Policy

The identified infrastructure funding gap is not absolute due to several reasons; however, one factor is the current nature of the City's Long Term Capital Funding Policy. The current policy defines a total capital expenditure limit based on the sum of funds generated by the issuance of debentures and capital levy funding after principal and interest is paid. Allocation of development charges and federal and provincial grants as well as reserve transfers are completed at the project level to ensure appropriate requirements of the funding source are adhered to. The policy is silent on the basis of allocation between each of the asset categories as well as growth and maintenance type projects. In preparation of this plan, the assumption was that the allocation of funds within the 2024 10 year budget is representative of the allocation of funding between asset categories, growth and maintenance in the long term. Therefore, the identified funding gaps are subject to change with updates to the Long Term Capital Funding Policy. An allocation policy may also mirror or complement the recommended changes to the reserve policy. The City currently does not have an allocation or funding policy that designates funding by asset category. The 2023 Policy Review process supported the concept of an allocation Policy however the outcomes of this AMP update were required to finalize the policy recommendations.

B. Strategic Use of Debt limits

The current Long Term Capital Funding Policy allows for $8 million in debt to be issued annually to support tax levy assets with an additional $3 million in debt to be issued annually to support Water and Wastewater investments. The current policy attempts to balance the concepts of promoting intergenerational equity by spreading out the cost of a capital project over its useful life thereby allowing costs to be paid by today's and future users of the asset. The policy also allows for special debt issues to be approved by City Council to support transformational projects. Currently, City Council has supported the Cassellholme Home for the Aged redevelopment in which the City's portion will be reflected as debt within the Financial Statements. City Council has also planned to use special debt for the Community Center.

In the context of reducing the infrastructure gap, debt needs to be strategically used to avoid the risk of issuing too much debt which can impact the financial sustainability of the municipality. Debt can also impose unreasonable additional costs on current and future members of the community as the municipality has to pay for the financing costs of borrowed funds (interest charges).

The City's current policy and the role of debt should be updated to reflect Council's debt management decisions with respect to reducing the infrastructure gap and other long-term plans such as the reserve policy and development charges, as well as maintaining adherence to the legislative framework governing long-term municipal borrowing. Strategic use of debt focuses on enhancing services rather than maintaining the current asset and can be issued within the following guiding principles to finance projects that:

- Increase/new services to residents for new initiatives
- New, non-recurring infrastructure requirements
- Projects tied to third party funding
- Growth related project costs not recovered from Development Charges

Furthermore, Council decisions with respect to debt issuance should also be considered with financial indicators in the following areas:

- Sustainability Indicators – ability to maintain existing financial obligations both in respect to services and financial commitments without inappropriately increasing debt or tax burden relative to the economy. Examples may include: total discretionary reserve funds as a percent of municipal expenses; debt burden; total discretionary reserves per household.
- Flexibility Indicators – ability to change available sources of funding (debt, taxes, user fees) to meet financial obligations. Examples may include: debt servicing costs as a percent of Total Operating revenue, liquidity, property tax as a percent of household income
- Vulnerability Indicators – dependency on sources of revenue, predominantly grants from senior levels of government, over which it has no discretion or control. Examples may include: operating grants as a percent of total revenues, capital grants as a percent of total capital expenditures

Lastly, the Province regulates the amount of debt municipalities may issue by setting an Annual Repayment Limit (ARL) of 25% of a Municipality's own-source revenue as calculated on the Annual Financial Information Return (FIR). The City's current Long Term Capital Financing Policy has adopted a target of total annual debt servicing costs (including principal and interest) cannot exceed 15% of the sum of the City's budgeted municipal levy, water user fees and sanitary sewer user fees.

The annual debt issuances contained within the current Long Term Capital Financing Policy are linked more to annual limits that will stabilize the tax levy. It is also an important goal that the annual debt issue should also consider the perspectives of project type and overall ARL internal limit. These policy updates should be contemplated over the next several years in order to optimize the use of debt in maintaining and growing the City's infrastructure.

C. Modifying Tax Levy Pay-As-You Go Funding

PAYGO Tax Levy Funded

The current Long Term Capital Funding policy provides for 1% of the previous year's budgeted tax levy less the required principal and interest payments. The policy also includes an adjustment for inflation to be applied to the previous year's long term capital funding allowance in the Operating Budget. For several years City Council has forgone the inflation adjustment. Given the insights from this Asset Management Plan the inflationary adjustment should be applied to prevent any further growth in the funding gap. The asset infrastructure gap for tax levy assets is approximately $26 million. If PAYGO was the only method of financing it would then translate into a required tax levy increase of 24%. The infrastructure gap outlined in section 4 calculates the funding gap over the life of the assets to ensure long term sustainability. Therefore, a balanced approach may consider a 10 year phase in of increasing the PAYGO component of capital financing. City Council previously supported tax levy increases greater than the 1% policy to build capacity to fund the Cassellholme redevelopment project. The Policy review highlighted the interest to shift towards and allocation policy this approach may influence the requirements of the PAYGO requirements. The findings of this AMP will be applied to an allocation policy to determine the appropriate PAYGO requirements.

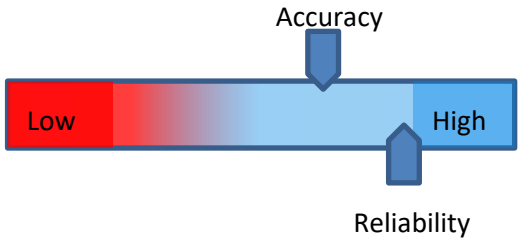
PAYGO Rate Supported Water and Wastewater

With respect to water and wastewater the Long Term Capital Funding policy allows for 2% of previous year's water and wastewater bill revenues. The policy also includes an adjustment for inflation to be applied to the previous year's long term capital funding allowance in the Operating Budget. For several years City Council has forgone the inflation adjustment. Given the insights from this Asset Management Plan the inflationary adjustment should be applied to prevent any further growth in the funding gap. There is opportunity for enhancements with respect to the allocation between water and wastewater.

The current modeling allows for the allocation between water and wastewater to shift with the investment requirements. It is recommended that the 2% be allocated to water and wastewater independently rather than globally. Similar to the general capital, the funding sources are currently allocated based on the ten year identified capital projects; therefore, the current split between water and wastewater may not reflect the future funding requirements.

In conclusion, the funding gap can be financed by increasing the tax levy or user rates in water and wastewater; however, this option may not be affordable to the community. The funding options presented in this AMP have several combinations that will contribute to reducing the infrastructure gap. Once feedback from the Community and City Council is received the possible outcomes will be modeled and brought forward with policy amendments.

5.8. Data Confidence Scale



Extensive work is required to break down the Capital Budget into more detail for clarity on the type of investments, funding allocations and assets being invested in. Administration does see further opportunity in this area for the next AMP as the capital budget process integrates in a more linear mapping from asset management to capital budgeting. Implementation of solutions to build the capital budget and the funding plan at the asset class level will help enhance the data confidence. This will also provide benefit to the annual financial statement process to capture and report on changes to the Tangible Capital Asset Data.

5.9 Recommendations

- Establish reserves for each asset category to ensure sustainability is maintained for all asset categories and allow enhance infrastructure gap reporting by asset category
- Modernize the Long Term Capital Funding policy to reflect funding through the asset category reserves
- Apply the Policy funding inflation adjustment on an annual basis
- Align the tax levy, water and wastewater PAYGO funding with the recommendations of the Policy review by establishing Life Cycle reserves and an allocation policy to ensure sustainability
- Apply strategic use of debt principles to reflect eligible projects and financial indicators to support required annual debt issues
- Develop a plan to transition operating capital (routine maintenance / repairs) out of the 10 year Capital Budget and into the annual Operating Budget
- Enhance Capital Budget to clearly report maintenance, rehabilitation, growth and service level changes

The phase in of the recommendations may take five to 10 years; therefore, the next major AMP plan will be able to determine if further adjustments are required.

6. Climate Change

The City is beginning to monitor the effects of climate change on its infrastructure assets. The data provided suggests that it is a possibility that there will be an increase in precipitation and an overall increase in mean temperature for the municipality. The climate projection scenarios from “climatedata.ca” suggest that the increase in mean temperature within North Bay area may result in the possibility of a decrease of freeze-thaw days, additional summer days, more very hot days and additional tropical nights.

For the 1951-1980 period, the annual average temperature was 4.3 degrees Celsius. Under a high emissions scenario, annual average temperatures are projected to be 6.9 degrees for the 2021-2050 period, 9 degrees Celsius for the 2051-2080 period and 10.7 degrees Celsius for the last 30 years of this century.

Average annual precipitation for the 1951 -1980 period was 916mm. Under a high emissions scenario, this is projected to be 7% higher for the 2021-2050 period, 11% higher for the 2051-2080 period and 15% higher for the last 30 years of this century.

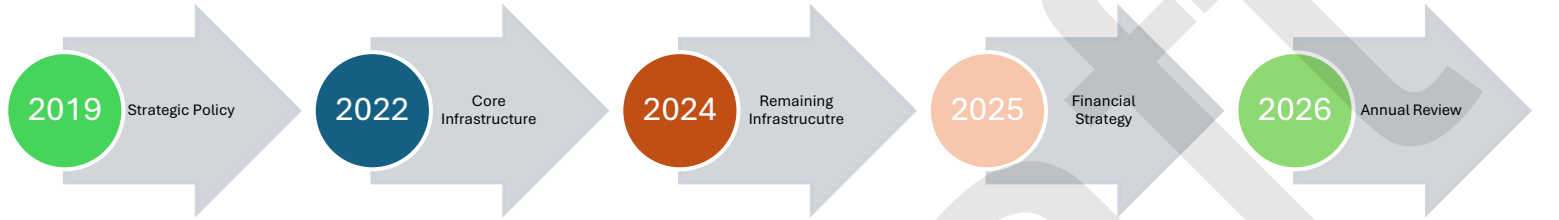
These predicted changes in temperature and precipitation need to be taken into consideration when building new assets or completing betterments to extend the life of the existing asset.

The City's non-core assets are susceptible to ongoing risks stemming from climate dynamics. This vulnerability may result in potential service disruptions, operational downtime, and increased costs from additional wear and tear on assets. Moreover, the evolving climate landscape introduces added uncertainty, further complicating effective risk management strategies. It is imperative that the City takes coordinated action, including conducting thorough risk assessments, fortifying infrastructure resilience, and fostering collaborative efforts with stakeholders. These measures are essential to mitigating risks and ensuring the continuity of services in the face of evolving climatic conditions.

7. Next Steps

O. Reg 588/17 has a phased in approach with three timelines of July 1, 2021(adjusted to July1, 2022), July 1, 2023, and July 1, 2024. The July 1, 2021 and July 1, 2023 timeline is where ‘Core’ assets (Water, Wastewater, Stormwater, Road and Bridges and Culverts) and all City infrastructure assets, respectively will have an asset management plan documenting current levels of service. The final deadline is to document proposed levels of service and financial strategies to fund these expenditures. For directly-owned City infrastructure assets, the Asset Management Plan is compliant with the July 1, 2024 regulation requirements.

Timeline for O.Reg. 588/17



Strategic Policy	Core Infrastructure	Remaining Infrastructure	Financial Strategy	Annual Review
• **Define Role of Council and senior management** • **Integration with Budgets & Long-Term Financial Plan** • **Alignment with Official Plan** • **Alignment with Master Plans** • **Community Engagement** • **Climate Change Mitigation & Resiliency**	• Phase 1: Roads, Bridges & Stormwater, Water, Wastewater • Inventory of Assets • Current Levels of Service • Cost to Maintain Current Levels of Service	• Phase 2: All Assets • Inventory of Assets • Current Levels of Service • Cost to Maintain Current Levels of Service	• Builds on Phase 1 & 2 • Proposed Levels of Service based on Sustainability & Affordability • Life cycle Management • Financial Strategy	• Annual Update to Council • CAM Update every five years

Recommendations	Timeline
Measure & Review Current LOS • Review current LOS at least on an annual basis to identify trends and as necessary adjust asset operations, investment decisions, or strategic plans. Consider historic LOS when informing proposed LOS.	Ongoing
Determine Reporting Responsibility, Frequency, & Response Standards • Clearly define roles and responsibility for data update, review, and LOS reporting. Consider developing a standard for reporting frequency and as necessary for reviewing and responding to LOS. • To support LOS reporting, consider drafting budgets based on the asset management categorization to support asset management analysis and determination of investment allocations by asset category	Immediate
Develop a Public Consultation Process for Proposed LOS • Develop a public consultation process to support determination of proposed LOS as required by 2025. • Include information on the cost, risk, and performance impacts to increasing or decreasing a level of services when gathering input about suitable proposed LOS targets. • Wherever possible, report in relation to existing costs (i.e. percentage increase on taxes and user-rates) that are of relevance to the public (e.g. based on average residential assessed value) • Consider using existing surveys like the budget or strategic plan as a tool to obtain public input on proposed LOS.	Mid-Term

Recommendations	Timeline
Determine Resource Requirements for Proposed LOS Reporting • **By 2025, all municipalities AMP's must include proposed LOS each year over the next 10 years from when it is developed.** • **Begin preparing for this requirement. Consider what needs to be measured and reported, what information and tools are required to do so, and what staff resources are needed to manage the project.** • **If a capacity shortfall is identified, the City may consider taking on new resources.**	Immediate

Acronyms and Abbreviations

1. AM – Asset Management

2. AMP – Asset Management Plan

3. Amortization – The accounting process of allocating the cost less the residual value of a tangible capital asset over its useful life.

4. Betterment – A cost incurred to enhance the service potential of a tangible capital asset. Such expenditures would be added to the tangible capital asset's cost.

5. CBA – Cost-Benefit Analysis

6. CCA – Canadian Construction Association

7. CCTV (Closed Circuit Television) – Used to monitor and assess corporate infrastructure

8. CMMS – Computerized Maintenance Management System

9. CNAM – Canadian Network of Asset Managers

10. Core Assets – Ontario Regulation 588/17 defines these as; roads, storm and wastewater collection, transmission, treatment, retention, infiltration, control and or disposal and bridge/structure or culvert.

11. Cost of TCA – The gross amount of consideration given up to acquire, construct, develop or better a tangible capital asset, and includes all costs attributable to the asset's acquisition, construction, development or betterment, including installing the asset at the location and in the condition necessary for its intended use.

12. CSCE – Canadian Society for Civil Engineering

13. Design Life – The period of time during which the item is expected, by its designers, to work within its specified parameters.

14. Disposal – The processes involved in the removal of the TCA from use and from the TCA sub-ledger subsequent to: donation, sale, abandonment, or destruction.

15. Fair Value – The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction who are under no compulsion to act.

16. FCM – Federation of Canadians Municipalities

17. FIR (Financial Information Return) - A standard set of year-end reports which capture financial and statistical information for each municipality in the Province.

18. Historical Cost – The original cost to acquire an asset and/or make it operational. Includes all costs associated with the purchase (e.g. delivery, set-up).

19. IT – Information Technology

20. KPI – Key Performance Indicator

21. Life Cycle Costing – A method of economic analysis to estimate the total cost of ownership of an asset, over its expected life.

22. Linear Assets – Assets constructed or arranged in a continuous and connected network. Roads and sewers are examples of linear assets.

23. LOS – Levels of Service

24. MOI – Ministry of Infrastructure

25. NBV (Net Book Value) – The remaining value of an asset as defined by the assets original cost (historical cost) minus accumulated amortization

26. O & M – Operations and Maintenance

27. OSIM – Ontario Structure Inspection Manual

28. PACP – Pipeline Assessment & Certification Program

29. Pooled Assets – Assets that are homogenous in terms of their physical characteristics, use and expected useful life. Pooled assets are amortized using a composite amortization rate based on the average useful life of the different assets in a group.

30. PSAB – Public Sector Accounting Board

31. Replacement Cost – The cost to replace an asset today. All stated replacement costs are as of 2017 closing balances

32. Replacement Cost End of Life (future replacement cost) – Estimated cost of replacing an asset at the end of its useful life based on an estimated rate of inflation.

33. SCADA – Supervisory control and data acquisition system

34. Straight-line Amortization – Allocates the cost less estimated residual value of a capital asset equally over each year of its estimated useful life.

35. Sustainable – the approach to service delivery is financially achievable over the long term, is not wasteful of resources, minimizes or reverses environmental damage, continuously improves social and inter-generational equality. The approach for estimating asset investment need and developing AM strategies is based on achieving triple-bottom-line outcomes over the long term and considers the full lifecycle of assets.

36. TCA (Tangible Capital Assets) – Non-financial assets that are held for use in the production or supply of goods and services, used for administrative purposes or for the development, construction, maintenance or repair of other tangible capital assets, have useful economic lives extending beyond an accounting period, and are to be used on a continuing basis

37. Useful Life – The period over which the municipality expects to use a tangible capital asset.

38. WIP (Work in Progress) – The accumulation of costs for Tangible Capital Assets that are in construction or development in progress but are not yet in use or the capital project is still open to accumulate costs.

39. WLC – Whole Life-Cycle Costing

40. Write-down – A reduction in the cost of a tangible capital asset to reflect the decline in the asset’s value due to a permanent impairment.

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The Corporation of the City of North Bay

Strategic Asset Management Policy

1.0 Purpose:

A strategic asset management policy formalizes the City's commitment to asset management, aligns its asset management actions with strategic goals and objectives, and provides direction to guide Council, management and staff in carrying out its business strategies, plans and activities. This policy will support the City in focusing its infrastructure efforts on managing risks, addressing priorities, and meeting short and long-term capital and operating community needs within its financial capabilities.

2.0 Vision:

The vision is to proactively manage City assets to best serve the City's objectives, including:

- Prioritizing the need for existing and future assets to effectively deliver services
- Supporting sustainability and economic development
- Maintaining prudent financial planning and decision making

3.0 Objectives:

The objectives of this policy are to:

- Provide a consistent framework for implementing asset management throughout the organization
- Provide transparency and accountability and to demonstrate to stakeholders the legitimacy of decision-making processes which combine strategic plans, budgets, service levels and risks

4.0 Strategic Alignment:

The City of North Bay's Vision is to "be economically prosperous for all residents, by ensuring that we are a vibrant, integrated, and balanced community rooted in the natural beauty of Ontario's near north". Alignment of the Asset Management Plan and the City's Strategic Vision is necessary to consider whether the level of service provided

by our existing and planned assets is congruent with and supports the City's Strategic Vision.

Asset Management planning therefore will not occur in isolation from other City goals, plans and policies. Rather, an integrated approach will be followed to successfully develop practical asset management plans that align with the overarching vision, plans, and responsibilities of our community. The elements of our asset management planning approach keep us mindful of the goals described in our Strategic Plan, Master Plans, and Financial and Business Plans while respecting and considering environmental conditions in which we operate.

5.0 Community Stakeholder Engagement

The ultimate goal of the City is to efficiently provide its various community stakeholders with the municipal services they need within the bounds of regulatory requirements, the built environment, and the natural environment. In order to achieve this goal, it is necessary that the City understands the current needs of the community, envision the needs of future generations and incorporate these into the asset management plan. The City recognizes community stakeholders as an integral part of the asset management approach. Accordingly, the City will:

- Provide opportunities for the stakeholders served by the City to provide input into asset management planning; and
- Coordinate asset management planning with other infrastructure asset owning agencies such as municipal bodies and regulated utilities

6.0 Guiding Principles

The Infrastructure for Jobs and Prosperity Act, 2015 sets out principles to guide asset management planning in municipalities in Ontario. The City of North Bay will strive to incorporate the following principles whenever possible into the day to day operation of the City:

- **Forward Looking:** The City shall take a long-term view while considering demographic and economic trends in the region
- **Budgeting and Planning:** The City shall take into account any applicable budgets or fiscal plans, including those adopted through Ontario legislation
- **Prioritizing:** The City shall clearly identify infrastructure priorities which will drive investment decisions
- **Economic Development:** The City shall promote economic competitiveness, productivity, job creation, and training opportunities
- **Evidence Based and transparent:** The City shall be evidence-based and transparent, basing decisions on publicly shared information and make info available to the public

- **Consistency:** The City shall ensure the continued provision of core public services such as water and waste water
- **Environmentally Conscious:** The City shall minimize the impact of infrastructure on the environment by:

  1. Respecting and helping maintain ecological and biological diversity,
  2. Augmenting resilience to the effects of climate change, and
  3. Endeavoring to make use of acceptable recycled aggregates

- **Health and Safety:** The City shall ensure that the health and safety of workers involved in the construction and maintenance of infrastructure assets is protected
- **Community Focused:** The City shall promote community benefits, being the supplementary social and economic benefits arising from an infrastructure project that are intended to improve the well-being of a community affected by the project, such as:

  1. Local job creation and training opportunities (including for apprentices, within the meaning of section 9 of the Infrastructure for Jobs and Prosperity Act, 2015),
  2. Improvement of public space within the community, and
  3. Promoting accessibility for persons with disabilities

- **Innovative:** The City shall create opportunities to make use of innovative technologies, services, and practices
- **Integrative:** The City shall where relevant and appropriate, be mindful and consider the principles and content of non-binding provincial or municipal plans and strategies established under an Act or otherwise, in planning and making decisions surrounding the infrastructure that supports them

7.0 Community Planning

Asset management planning will be aligned with the Municipality's Official Plan and the Provincial Policy Statement issued under the Planning Act. The asset management plan will reflect how the community is projected to change with respect to development. The Municipality will achieve this by consulting with those responsible for managing the services to analyze the future costs and viability of projected changes. The combination of lifecycle analysis and financial sustainability principles will be the driver in the selection of community development or redevelopment that requires new assets, or existing asset enhancements. Methods, assumptions, and data used in the selection of projected changes should be documented to support the recommendations in the Asset Management Plan.

Cross-referencing the Municipality's Official Plan and the Asset Management Plan will ensure that development occurs within the Municipality`s means through an understanding of current and future asset needs.

8.0 Climate Change

Climate change will be considered as part of the City's risk management approach embedded in local asset management planning. This approach will balance the potential cost of vulnerabilities to climate change impact and other risks with the cost of reducing these vulnerabilities and other risks. The balance will be struck in the levels of service delivered through operations, maintenance schedules, disaster response plans, contingency funding and capital investments. The City's contribution to climate change through greenhouse gas emissions will be mitigated in accordance with its local reduction targets, financial capacity, and community stakeholder objectives(needs).

9.0 Scope

The service rendered by an asset will be the determining factor of whether or not to include the asset in asset management plans. This qualitative approach is unlike the quantitative and dollar value based methodology prescribed in the tangible capital asset policy.

10.0 Financial Planning and Budgeting

The City will integrate asset management planning into the City's annual capital budget, operating budget, and its long-term financial plan. Sound financial analysis will be encompassed in asset management planning in order for the asset management plan to be a guide to employees in budgeting and financial planning. The asset management plan will be referenced by the service area personnel in the preparation of their budget submission to help:

1. Identify all potential revenues and costs (including operating, maintenance, replacement, and decommissioning) associated with forthcoming infrastructure asset decisions;
2. Evaluate the validity and need of each significant new capital asset including where possible the asset's impact on future operating costs; and
3. Incorporate new revenue tools and alternative funding strategies where possible

11.0 Governance and Continuous Improvement

The policy requires the commitment of key stakeholders within the City's organization to ensure the policy guides the development of a clear plan that can be implemented, reviewed and updated.

Council is entrusted with the responsibility of overseeing, on behalf of citizens, a large range of services provided through a diverse portfolio of assets. Council, having stewardship responsibility, is the final decision maker on all matters related to asset

management in the City. The Council and executive lead are committed to the success of asset management planning.

Within the asset management planning:

Council is responsible for:

- Approve the AM policy and direction of the AM program
- Maintain adequate organizational capacity to support the core practices of the AM program
- Prioritize effective stewardship of assets in adoption and ongoing review of policy and budgets
- Approving by resolution the Asset Management Plan and its updates every five years
- Conducting annual reviews of the management plan implementation progress on or before July 1st of every year, including:
    - Progress on ongoing efforts to implement the Asset Management Plan;
    - Factors affecting the ability of the Municipality to implement its Asset Management Plan;
    - Support ongoing efforts to continuously improve and implement the Asset Management Plan

Chief Administrative Officer (CAO) is responsible for:

- Provide organization-wide leadership in AM Practices and concepts
- Work in conjunction with CFO for AM implementation and progress
- Ensure senior management team staff coordination and participation and progress

Executive Lead – CFO/Treasurer is responsible for:

- Oversees asset management planning and provide corporate support across the organization. The executive lead is ultimately responsible for the asset management planning across the City and maintaining compliance with the regulation
- Manage policy and policy updates
- Provide departmental staff coordination
- Coordinate and track AM program implementation and progress

Steering Committee responsibilities:

- The Steering Committee is comprised of Department leads that are responsible for asset management planning activities that fall within their service area and in support of others
- Provides governance and best practice leadership for operational decision making in support of the Corporate Asset Management Program

- Champions and supports the development and maintenance of strategic roadmaps for future enhancements and on-going alignment to the corporate strategies