ASSET MANAGEMENT AT THE MUNICIPALITY OF LAKESHORE

Asset Management Strategy

SUBMITTED BY PSD CITYWIDE
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psdcitywide

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Executive Summary

This asset management strategy provides a practical framework for the Municipality of Lakeshore to establish and maintain an efficient asset management program. We make recommendations to improve the Municipality's asset management program, introducing actionable items along with suitable timeframes. Following the recommendations enhances an asset management culture—reinforced by sound processes and practices.

The strategy identifies seven priority initiatives with 29 recommended tasks, distributed over four years. These recommendations are based on the Municipality's current state assessment. This assessment establishes the Municipality's current asset management maturity levels on seven core elements of asset management; identified gaps in asset management practices, procedures, and business processes; and, discovered critical information gaps in the Municipality's infrastructure datasets.

The seven core elements of asset management are: Organization and People; Strategy and Planning; Asset Data; Asset Management Decision Making (Project Prioritization); Risk Management; Levels of Service; and Financial Management. The elements, or core competencies, are consistent across leading asset management associations and industry groups, including the Institute of Asset Management (IAM), the Global Forum on Maintenance and Asset Management (GFMAM), and the International Infrastructure Management Manual (IIMM).

The Municipality of Lakeshore's overall asset management maturity was assessed as 'Intermediate', suggesting that the Municipality is in the learning and implementing stage of asset management. Its performance varied somewhat across all seven elements and did not surpass an intermediate maturity rating. The lowest score was measured in risk, and the highest was asset management decision making.

Organizations in the learning and implementation stages benefit from improving their asset management knowledge, and from actively assessing and building their capacity and culture. At this stage, it is typical to find many gaps across each of the seven core elements of asset management, particularly datasets and business processes. For Lakeshore, these gaps, constraints, and challenges include:

- There is no asset management coordinator or governance structure defined;
- The corporate Strategic Plan requires revision;
- Staff have moderately low confidence in asset datasets;
- The Municipality uses a short-term planning horizon;

- Risk models are basic to intermediate and are not consulted for decision making;
- Levels of service analysis is limited to regulatory reporting only; and
- There is minimal cross-departmental collaboration to develop budgets.

The priority initiatives we have proposed to address these gaps are designed to be cumulative; as a result, some recommendations are sequential, and require completion of preceding tasks. These tasks are scheduled in **Appendix 1**.

In Year 1, the focus is on enabling the Municipality to complete an effective Asset Management Plan that meets 2024 O. Reg. 588/17 compliance. The first year involves significant resource capacity expansion and training along with notable data and asset management strategy improvements.

In Year 2, the focus is on enabling the Municipality to complete an updated Asset Management Plan that meets 2025 O. Reg. 588/17 compliance. The first goal to enhance the Municipality's understanding of growth and demand drivers along with the associated costs. The second goal is to develop proposed levels of service and identify the associated costs with meeting the desired levels of service.

In Year 3, the recommendations are focused on expanding governance strategies. The Municipality will be seeking to adopt new communication tools and new policies and strategies that will facilitate the maintenance and advancement of the asset management program.

In Year 4 the final improvements involve making the most use of the advancements made in the previous three years. The recommendations support enhanced financial planning and advanced project prioritization.

Background and Context

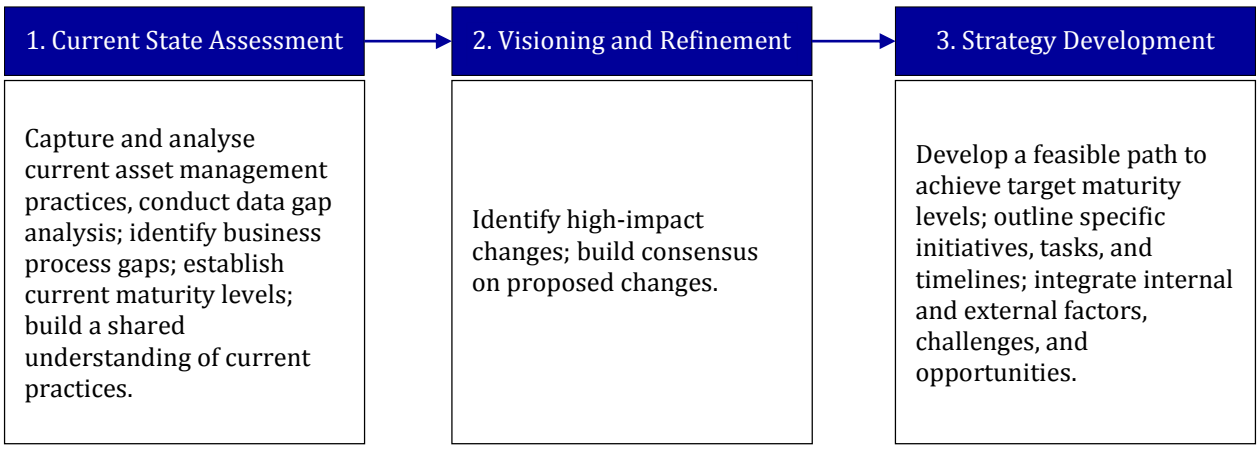
This asset management strategy will serve to guide staff at the Municipality of Lakeshore in establishing a high-functioning asset management program. The strategy outlines strategic priority initiatives designed to gradually close critical gaps in people, processes, and tools. Overall, it builds the Municipality's organizational capacity and culture for asset management.

This is the Lakeshore's first asset management strategy. The recommendations in this document span approximately three years, and reflect the challenges, opportunities, and priorities identified through the Municipality's current state assessment and ongoing dialogue with staff.

Methodology

The development of the strategy involved three distinct phases, as illustrated in Figure 1. It begins with a comprehensive current state assessment. A description of each phase follows.

Figure 1 Developing the Asset Management Strategy: Project Path



Current State Assessment

Lakeshore's current state assessment took place between January – March 2023 and included three core components: administration of PSD's Asset Management Self-Assessment Tool (AMSAT), a structured, technical survey; a data gap analysis (in progress); and follow-up discussions with departmental staff with direct knowledge of their respective asset portfolios.

The AMSAT is a technical survey that covers seven core elements of an industry standard asset management program, defined in Table 1. It is designed to diagnose underlying issues, limitations,

and concerns within a Municipality's asset management program. The seven elements are considered core competencies that are consistent across leading asset management associations and industry groups. These include the Institute of Asset Management (IAM), the Global Forum on Maintenance and Asset Management and Maintenance (GFMAM), and the International Infrastructure Management Manual (IIMM). The survey includes questions for each of the seven elements and is designed to assess the asset management maturity level of an organization.

The AMSAT was completed by 10 respondents, representing the Municipality's various asset classes including roads, bridges, water, storm network, buildings, machinery, and equipment. In addition, the respondent included perspectives from business support functions including Operations, Planning and Development, Finance, and Information Technology.

Following the administration of the survey, we completed an immersive dialogue with staff to further understand current asset management practices and approaches, particularly those related to data, lifecycle, risk, and levels of service.

Table 1 Seven Key Elements of Asset Management

Seven Key Elements of Asset Management		
1	Organization and People	Review of existing organizational capacity and culture for asset management
2	Asset Data	Asset data completeness, management strategy, standards, and systems
3	Strategy & Planning	Alignment between asset management activities and corporate or strategic objectives
4	Asset Management Decision Making (Project Prioritization)	Approach to lifecycle activities, including maintenance and rehabilitation, and project prioritization
5	Risk Management	Identification, understanding, and management of economic, financial, environmental and climate change related, social, and reputational risks
6	Levels of Service	Existing approach to the development and application of levels of service frameworks and their ongoing monitoring and review
7	Financial Strategy	The feasibility of current financial strategies to maintain a practical asset management program, and support current and proposed Levels of Service

The current state assessment will provide an overall rating of maturity as well as a rating of maturity for each of the seven key elements. This rating can either be basic, intermediate, or advanced. The following table defines the maturity ratings that will be used for this assessment.

Table 2 Current State Assessment Maturity Scale

Current State Assessment Maturity Scale	
Advanced	• Staff have expert understanding of asset management concepts and there is high human resource capacity for asset management with dedicated staff. • All key documents are in place and up-to-date and a service mission with vision and key objectives is in place. • The asset inventory is centralized, accessible, current, accurate, and linked to GIS. There are little to no gaps in the primary datasets and the secondary/attribute data is detailed. • A formalized project prioritization process is used to develop capital plans which include lifecycle analysis. Asset needs lists are produced based on a combination of asset age, condition assessments, risk management, growth and demand projections, and other factors. • Advanced risk models are in place and a formal and documented risk management process is used to inform project prioritization and infrastructure spending. • Levels of service data is managed in a centralized database and linked to assets/services within a software system. Levels of service reporting is used to set targets and trends for service delivery, prioritize capital projects, and more. • The municipal budgets are aligned with asset management strategies; financial requirement analysis accounts for operating and maintenance, future rehabilitation and renewal, growth elements, and/or proposed levels of service.
Intermediate	• Staff have some understanding of asset management concepts and there is adequate human resource capacity for asset management. • Some key asset management documents are in place and service mission is in place, but it may lack key objectives. • The asset inventory is centralized and has limited gaps in the primary datasets and some secondary/attribute data available. • A formalized project prioritization process is used to develop capital plans and asset needs lists are produced based on a combination of asset age, condition assessments, and growth and demand projections. • Rudimentary risk models are in place and a formal risk management process is used to inform project prioritization and infrastructure spending. • Levels of service data is managed in a centralized database and regularly reported on. • There is some alignment of municipal budgets and asset management strategies; financial requirement analysis accounts for operating and maintenance, future rehabilitation and renewal, growth elements, and/or proposed levels of service.
Basic	• Staff have minimal understanding of asset management concepts and there is inadequate human resource capacity for asset management practices. • The Municipality has few key asset management documents in place and no formal service mission vision.

	• The asset inventory is decentralized and/or has many gaps in primary and secondary/attribute data. • There is no formal project prioritization process that guides capital planning • There is no formal and document risk management processes • Levels of service reporting and data are managed through non-structure methods. • There is minimal alignment of municipal budgets and asset management strategies; financial requirement analysis does not account for operating and maintenance, future rehabilitation and renewal, growth elements, and/or proposed levels of service.

The current state assessment stage also includes a data gap analysis, which is included in **Appendix 2**. The gap analysis will identify critical gaps in both primary and secondary datasets. Primary datasets include information on asset replacement cost, estimated useful life (EUL), in-service date, condition, and historical cost. Secondary datasets include additional attribute information for assets, including location, material, composition, etc. This information is required in developing a thorough understanding of the Municipality's infrastructure portfolio and generate meaningful insights. This report will be updated upon completion of the data gap analysis, which will be included in the Appendix.

The assessment results will define the current stage of asset management as defined in the table below.

Table 3 Stages of Asset Management

Stages of Asset Management		
Stage	Description	Common Components
Learning	Municipality is building its knowledge on asset management, and actively assessing its own internal capacity and culture	Training, courses, workshops, knowledge-sharing, conferences, self-assessments
Capable	Municipality has adequate knowledge, skillsets, resources, and senior leadership commitment to begin implementing strategic asset management activities.	Understands what asset management entails (technical knowledge); how they link to the organizational goals and decision-making; their value; trends; a good cross-functional team
Implementing	Municipality is actively engaged in asset management. Still learning to balance asset management and lifecycle activities (e.g., prioritizing assets, networks, etc.)	An asset management policy, strategy, system, and plan are in place and actively guide decision-making; high data integrity, and strong data management practices; financial strategy to support asset management; levels of service framework (current); lifecycle framework; risk framework; capital prioritization framework

		(basic); internal and external communications program development
Proficient	Municipality implements data-driven asset management. Asset management is well-integrated with corporate/financial decision-making and value to constituents can be clearly demonstrated.	LOS framework (proposed); capital prioritization process (advanced); strong internal and external communications (to inform LOS); strong understanding of growth-related asset management activities and planning; potential alignment with ISO 50001
Innovating and Optimizing	Organization is continuously refining and enhancing its asset management program, resource and system gaps, and actively identifying ways to integrate emerging technologies and environmental trends into its asset management program.	Data governance strategy; strategic condition assessments (risk-based); asset management fully integrated with financial planning

Visioning and Refinement

Throughout the duration of the project, we consulted with Municipality staff to identify organizational needs, and high-value priority initiatives. Staff discussed current constraints, potential opportunities, and provided feedback that was instructive in developing the strategy document.

Strategy Development

The results of the AMSAT and departmental dialogues were synthesized to develop an ambitious, but feasible path for the Municipality to follow to improve its asset management program. As with most organizations that endeavour to build these programs systematically for the first time, considerable time and resources are required. However, the benefits of these initial investments are clear and far outweigh the costs incurred.

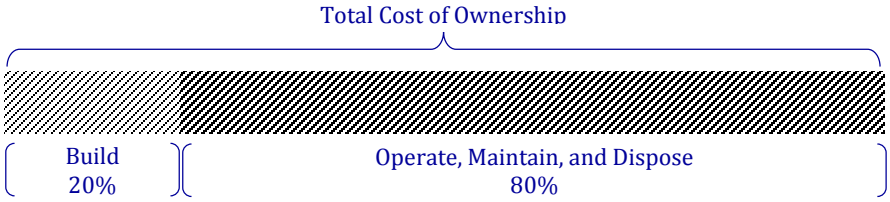
The Rationale for Systematic Asset Management

Asset management is not a new concept. Infrastructure-intensive organizations like Lakeshore exercise asset management every day. However, they may vary in the extent to which these activities are systematic, formal, documented, data-driven, analyzed, and optimized over time. Many lack a strong asset management framework, made of key skillsets, documents, business processes, and technological tools. Some simply lack the requisite organizational culture.

An Overview of Asset Management

Municipalities are responsible for managing and maintaining a broad portfolio of infrastructure assets to deliver services to the community, making up nearly 60% of Canada's public infrastructure stock. Investments in infrastructure can be substantial, ranging from minor repairs to multi-million-dollar upgrades and rebuilds. These are funded by taxpayers, and often financed over decades. The initial construction or acquisition of an asset accounts for only 20% of its lifecycle costs. The remaining 80% is incurred while maintaining, operating, and disposing an asset.

Figure 2 Total Cost of Asset Ownership



With proper lifecycle planning, these costs can be minimized. Without it, assets can malfunction and fail, disrupting service provision, day-to-day economic activity, and can threaten public health and safety. A long-term strategy that does not consider end-of-life activities, such as rehabilitation, renewal, or disposal, may not optimize the limited funding available. This can lead to a decline in service quality. Poorly managed infrastructure can also bring reputational damage to the community, making it less competitive and desirable.

Asset management is the coordinated effort of all relevant departments and stakeholders across an organization to extract the highest value from tangible assets at the lowest lifecycle cost. This relies on selecting the right asset, for the right lifecycle activity, at the right time. All departments across the organization must work together to implement strong asset management practices and build a high-functioning asset management program.

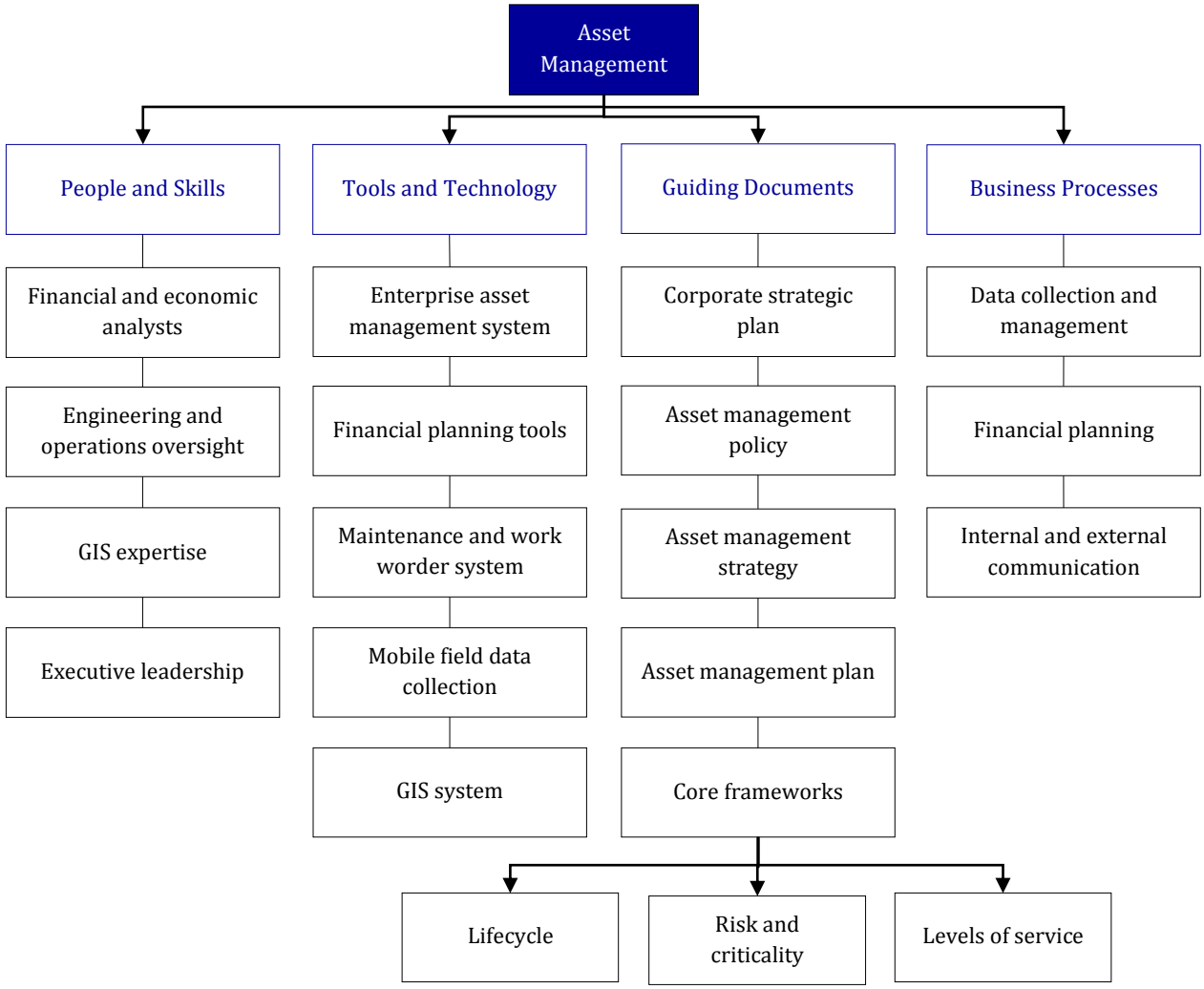
A municipal asset management program is a combination of several disciplines or business functions, including executive management, financial and economic analyses, engineering, and

operations and maintenance. A framework is comprised of many components such as: guiding documents including the asset management policy, strategy, and plan; software applications that can produce valuable analytics on the Municipality's infrastructure portfolio; and qualified and knowledgeable staff to carry out complex initiatives. All of this is underpinned by efficient, documented, and repeatable business processes.

The Asset Management Framework

As with any complex structure, a well-built yet flexible asset management framework has many parts, including people, processes, technology, and guiding documents. Figure 3 summarizes elements we typically find in effective asset management frameworks. These are non-exhaustive and presented only at the high-level. These elements all work together.

Figure 3 Asset Management Framework: Common Elements



Asset Management Plan vs. Asset Management Strategy

In the municipal sector, 'asset management strategy' and 'asset management plan' are often used interchangeably. Other concepts such as 'asset management system' and 'strategic asset management plan' further add to the confusion. Lack of consistency in the industry on the precise purpose and definition of these elements also offers little clarity. We make a clear distinction between the strategy and the plan.

An asset management strategy—this document—is typically a higher-level document, focusing on business processes, organizational practices, and key initiatives with associated timelines and resources designed to create and sustain an asset management program. While not a static document, the strategy should not evolve and change frequently—unlike the asset management plan. The strategy provides a long-term outlook on the overall asset management program development and strengthening key elements of its framework.

The asset management plan follows from the strategy, with a sharp focus on the current state of the Municipality's asset portfolio, and its approach to managing and funding individual service areas or asset groups. It is tactical in nature and provides cross-sectional data.

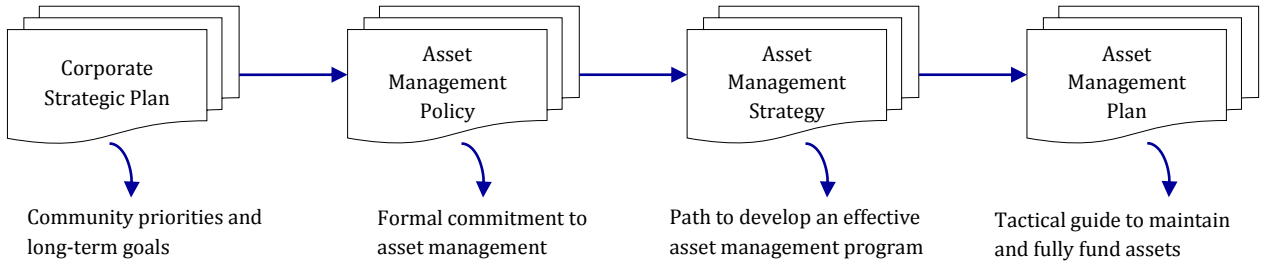
Table 4 Asset Management Strategy vs. Asset Management Plan

Element	Asset Management Strategy	Asset Management Plan
Perspective	Corporate, strategic, and programmatic	Departmental, tactical, and asset-centric
Focus	People, business processes, and tools	Assets
Purpose	Improve organizational capacity to create and maintain an asset management program; optimize asset portfolio based on strategic goals	Improve asset performance to maintain or improve levels of service; optimize asset performance and funding
Updates	Infrequent, e.g., 3-5 years	Frequent, e.g., annually, or biannually
Audience	Primary: Executive and council Secondary: Departmental	Primary: Departmental Secondary: Executive and council

Adopted from the Institute of Asset Management, **Error! Reference source not found.** illustrates the relationship between various industry-standard documents found in an effective asset management program, beginning with the Municipality's strategic plan. It also illustrates the concept of 'line of sight', or alignment between the Municipality's corporate strategic plan and various asset management documents.

The strategic plan has a direct, and cascading impact on asset management planning and reporting, making it a foundational element. Many municipalities begin with an asset management plan. However, without the preceding documents, the AMP operates in a vacuum.

Figure 4 Key Guiding Documents in Asset Management



Progress to date

The Municipality of Lakeshore has already taken important steps toward developing its asset management program. Table 5 identifies key asset management documents in progress or are already completed by the Municipality. In choosing to first develop a strategy and take an incremental approach to asset management, the Municipality becomes part of a small group of municipalities in Canada.

Table 5 Status of Various Asset Management Documents

Document	Status	Updates
Corporate Strategic Plan	Outdated	The current Strategic Plan is for 2019-2022
Asset Management Policy	Completed	Completed in 2019
Asset Management Strategy	In Progress	This document is in progress in 2023
Asset Management Plan	Completed	Completed in 2022

Current State Assessment

In this section, we detail the results of Lakeshore's current state assessment. The assessment measures the Municipality's asset management maturity and the degree to which the seven essential elements of asset management are implemented in the organization. See Table 1 for details on these elements. Municipalities with advanced asset management maturity deliver desired services consistently, in a fiscally responsible manner, while minimizing the associated risks. The assessment also includes a data gap analysis in **Appendix 2**.

The current state assessment was used to identify capacity, knowledge, and business process gaps, determine high priority areas of improvement, and inform the development of this asset management strategy. In total, we identified 32 overarching gaps across the seven core elements. These form the basis of our recommendations and strategic priorities outlined in 'The Strategy: A More Advanced Future State' section.

Current Asset Management Maturity Levels

As illustrated in Figure 5, the Municipality of Lakeshore's overall asset management maturity was assessed as 'Intermediate', suggesting that the Municipality is in the 'Implementing' stages of asset management. The Municipality has sufficient knowledge, skillsets, resources, and commitment to implement strategic asset management activities. All elements were assessed as 'Intermediate'; however, some elements of the asset management program require more attention than others.

Risk management and asset data had the lowest maturity scores. The results found that quantitative asset records, including those related to risk, were not advanced. Staff do not have a high level of confidence in the currency and accuracy of asset data and risk models. Furthermore, several participants were not able to provide an informed analysis of those elements, suggesting a lack of organizational knowledge of asset data and data management systems. Data gathering and management and the development of comprehensive risk models are difficult tasks that require significant resource capacity. The assessment results also found that the Municipality does not have sufficient resource capacity to advance and implement their asset management program.

A core component of the Municipality's current state assessment was the AMSAT, a technical survey with 62 questions, completed by nine respondents. We found that, in total, the nine respondents answered 'Unsure' 114 times. On average each respondent answered 'Unsure' to 13 questions with a range of 0 to 37 'Unsure' responses amongst the nine respondents. Respondents were unsure of the quality of the Municipality's asset data and how asset management is prioritized. Although there are many areas of improvement, minimizing uncertainty within the organization through better internal communication and information sharing should be a clear priority.

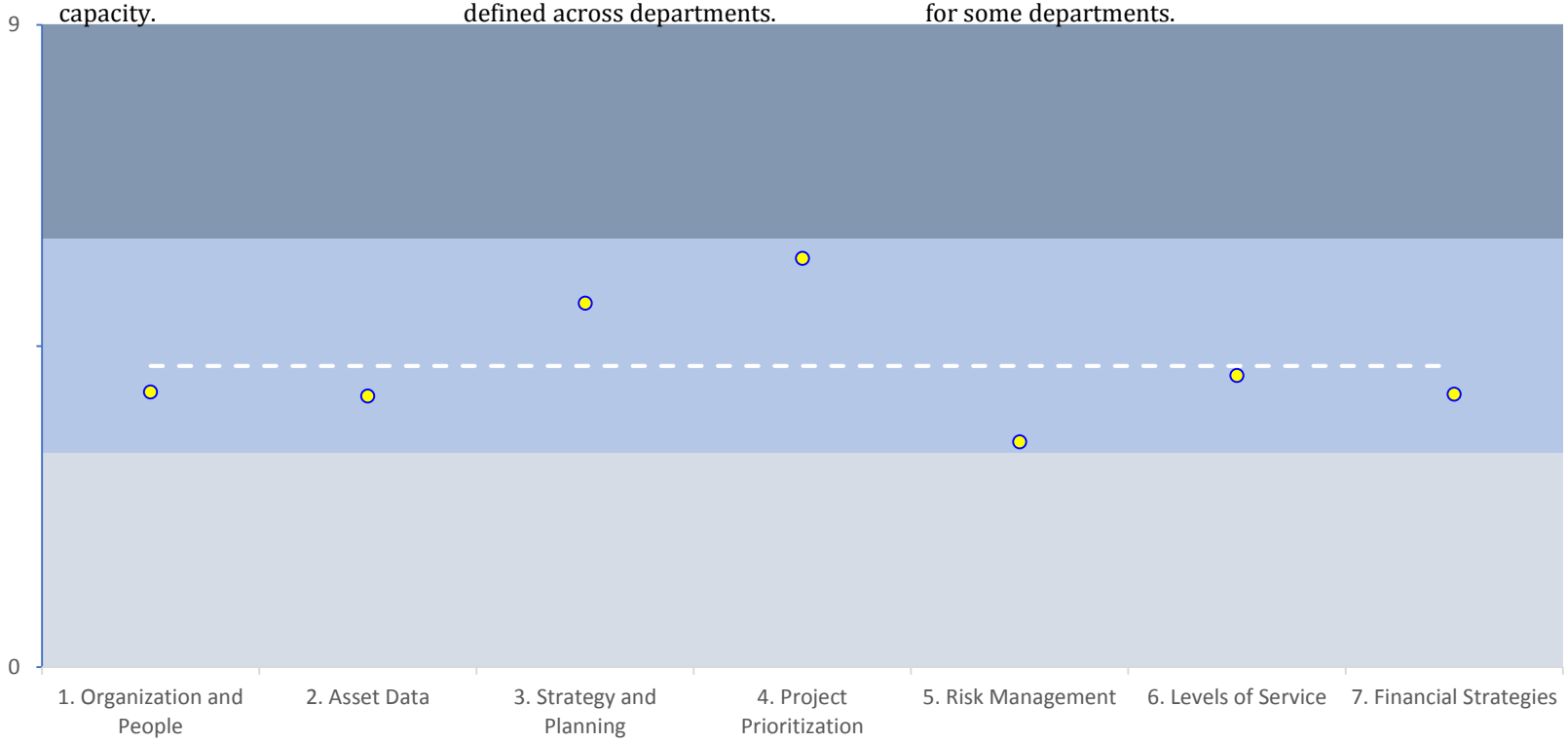
Figure 5 Current Maturity Levels

1. Operational-level understanding of asset management, it is not prioritized. Inadequate HR capacity.

3. Service demand planning is informed by many sources, including master planning. Service goals are not clearly defined across departments.

5. Unsure if risk models are used in the prioritization process. Overall risk management plan available for some departments.

7. A long-term financial strategy exists but is not strongly tied to levels of service.



2. Inventory update from 2022 AMP. No defined data governance procedures, low-to-medium confidence in data.

4. No corporate project prioritization process. Master Planning process across most departments; needs are based on capacity, condition, and functional requirements.

6. Although a levels of service framework exists through the AMP, it has not been operationalized.

Element 1: Organization and People

The 'Organization and People' element considers the Municipality's general ability to create and maintain an asset management program. Key components include team makeup, staff knowledge and capacity, processes and practices, communication, and how asset management is prioritized across the organization. This includes council, senior management, and departmental levels.

Table 6 summarizes the three maturity levels for the 'Organization and People' element and identifies key competencies typically found within each level.

Table 6 Defining Maturity Levels - Organization and People

Basic	Intermediate	Advanced
Minimal understanding of asset management concepts and principles among staff.	Some understanding of asset management concepts and principles among staff.	Expert understanding of asset management concepts and principles among staff.
Asset management a low priority.	Asset management a medium priority.	Asset management a high priority.
Absence of adequate human resource capacity for asset management.	Adequate human resource capacity for asset management	High human resource capacity for asset management, with dedicated staff.
Processes and tools do not facilitate asset management planning; may impede planning.	Processes or tools facilitate asset management planning.	Processes and tools facilitate asset management planning.
Lack of strategic communications on asset management initiatives.	Some or ad hoc communications related to asset management initiatives.	Strategic communications on asset management initiatives.

Current Practices and Maturity Level

We determined the Municipality of Lakeshore's overall asset management maturity for 'Organization and People' is **Intermediate**. At the management level, staff across departments value the importance of asset management to effectively deliver their services. Although most departments believe there are tools and processes available to facilitate asset management, all departments have indicated that there is limited capacity to contribute to a strong asset management program. Through departmental discussions, asset management was determined to be a low-to-medium priority at the Municipality.

There is limited asset management governance structure in place. Roles related to the asset management procedures, such as tracking key performance metrics and maintenance of asset data are distributed among all staff. There is no dedicated asset management coordinator at the Municipality. Most departments are tasked with managing their full-time responsibilities along with asset management activities; in some cases, they are unable to complete required asset management activities. The Municipality identifies staff turnover as a concern as well. The lack of

capacity contributes to limited communication across departments. The Municipality would benefit significantly from having additional staff, such as an asset management coordinator, who is able to prioritize asset management tasks, effectively connect departments, develop and maintain risk and lifecycle models, and gather and consolidate data to reflect an accurate asset inventory.

There is no standard process for communication for the asset management program within the organization and to Council. Staff and council members' understanding of the Municipality's asset management program differ, as Council is less familiar with the Municipality's systems and processes to manage assets and may not be aware of the capacity required to implement an effective asset management program. Council is often focused on short-term costs while staff are more focused on long-term sustainability; this can make it difficult receive timely funding for proactive capital renewal. Generally, council members prioritize asset management less than staff, however, improved communication of asset management goals and outcomes may increase Council support going forward.

Key Gaps in People, Tools, and Processes: Organization and People

Lakeshore's maturity rating on the 'Organization and People' element was assessed as intermediate. Key gaps identified through the technical survey, and follow-up dialogues with staff are discussed below.

- Generally, a low-to-medium prioritization of asset management by the Municipality, with the exception of the Public Works department, who has noted a high prioritization of asset management;
- Low human resource capacity dedicated to asset management across all departments;
- No full-time asset management coordinator or team exists;
- There are no defined standard operating procedures to govern asset management activities;
- Inconsistent communication channels regarding asset management both between departments and between staff and Council;

Table 7 Recommendations - Organization and People

Recommendations: Organization and People	Effort/Cost	Impact
Consider retaining an asset management coordinator to coordinate information and maintain and develop the asset management program.	High	Highest
Educate and train key personnel and Council on broader asset management best practices including database management and the optimal use of Citywide Asset Manager.	Medium	Medium
Define an asset management governance structure, including roles and responsibilities at each level.	High	Very High
Coordinate regularly scheduled meetings on asset management for staff, providing updates to ensure consistent approaches to asset management practices across departments.	Low	Very High
Coordinate regularly scheduled meetings to communicate asset management plan updates and levels of service reporting. Notify Council of key asset management initiatives.	Low	Very High

Element 2: Strategy and Planning

Asset management is only useful and meaningful if it aligns with the Municipality's overarching strategic direction as informed by council's priorities. This 'line of sight' approach ensures that all expenditures on infrastructure programs advance the community's long-term objectives. In the 'Strategy and Planning' element, we evaluated how closely the Municipality's asset management program is linked with its corporate goals.

Table 8 summarizes the three maturity levels for the 'Strategy and Planning' element and identifies key competencies typically found within each level.

Table 8 Defining Maturity Levels – Strategy and Planning

Basic	Intermediate	Advanced
No departmental service mission, vision, or key objectives.	Departmental service mission in place, but may lack vision, or key objectives.	Departmental service mission, vision, and key objectives in place.
No key asset management documents in place, such as an asset management policy, strategy, or up-to-date plan.	Some key asset management documents in place, such as an asset management policy, strategy, or up-to-date plan.	An asset management policy, strategy, and up-to-date plan are in place.
No formal service demand planning in place or done through ad hoc analyses.	Service demand planning integrates some, but not all, elements, including master plans, external engineering or economic studies, modeling, policies, and public consultation.	Service demand planning integrates most or all elements, including master plans, external engineering or economic studies, modeling, policies, and public consultation.

Current Practices and Maturity Level

The Municipality of Lakeshore's maturity level on 'Strategy and Planning' was assessed **Intermediate**. The Municipality has not developed an asset management policy that is regulated for all departments. The Municipality has recently developed a 2022 O. Reg. 588/17 compliant asset management plan in 2022. The Corporate Strategic Plan was developed for the years of 2019 to 2022 and will require revision. A more defined vision and mission along with key objectives to guide the overall direction of the asset management program can provide strategic direction for the Municipality.

The majority of departments do not have formalized service policies, however, service goals are guided by Minimum Maintenance Standards and Master Plans. The Municipality currently has a Master Plan for stormwater, fire, and parks and recreation services. A number of service policies do exist to guide activities such as snow removal and emergency response. Service policies set a vision, goals, and targets for each service area, holding a standard to which service areas must perform. Service policies should be developed in coordination with the the corporate level Strategic Plan to ensure departmental aims align with the Municipality's overall goals and values.

Overall, service demand planning is at an intermediate level, as it is informed by Master Plans, minimum maintenance standards, external studies, modeling, various ad hoc analyses, and informal public consultation.. Some departments are unsure or have limited information input towards service demand planning. Future demands due to growth have been evaluated in a variety of strategic documents, such as the Official Plan, Community Improvement Plan, Fire Master Plan, Parks and Recreation Master Plan, and Transportation Master Plan. However these documents don't outline future capacity demands and demographic change impacts across all services.

Key Gaps in People, Tools, and Processes: Strategy and Planning

Lakeshore's maturity rating on the 'Strategy and Planning' element was assessed as 'Intermediate'. Key gaps identified through the technical survey, and follow-up dialogues with staff are discussed below.

- Corporate strategic plan requires revision;
- Service goals are not defined within standardized policies for most services;
- Limited understanding of growth impacts and demand drivers across all services.
- Current and forecasted demand for capital assets and associated services is based on technical studies and master plans for only a few departments;

Table 9 Recommendations - Strategy and Planning

Recommendations: Strategy and Planning	Effort/Cost	Impact
Update the corporate Strategic Plan to be relevant for the next five years.	High	Very High
Identify current and future demand drivers and document within the current Asset Management Plan.	Medium	High
Project future asset acquisitions due to growth across all departments.	High	High
Define service policies with defined service goals and incorporate into the Asset Management Plan.	High	High

Element 3: Asset Data

The 'Asset Data' element considers the Municipality's current asset related data, and data management practices and processes—including how staff collect, store, analyze, and link data to their decision processes. Standardized, complete, and accurate information contributes to better decisions. In the long-term, this can help organizations stop the reactive maintenance loop and implement proactive strategies.

Although all seven elements are mainstays of an effective asset management program, most organizations find reinforcing datasets often brings the highest initial marginal value for time and money spent. As such, we have devoted a portion of the document to a data gap analysis found in the Appendix.

Table 10 summarizes the three maturity levels for the 'Asset Data' element and identifies key competencies typically found within each level.

Table 10 Defining Maturity Levels - Asset Data

Basic	Intermediate	Advanced
Many gaps in in primary datasets, including replacement costs, historical costs, estimated useful life, in-service dates, and condition.	Some gaps in primary datasets, including replacement costs, historical costs, estimated useful life, in-service dates, and condition.	Minimal gaps in primary datasets, including replacement costs, historical costs, estimated useful life, in-service dates, and condition.
Minimal secondary or attribute data, including physical properties, size, material	Some secondary or attribute data, including physical properties, size, material	Detailed secondary or attribute data, including physical properties, size, material
Inventory is decentralized across many systems.	Inventory is centralized, but may not be fully accessible, current, accurate, completed, or verified.	Inventory is highly centralized, accessible, current, accurate, verified, complete, linked to GIS
No established cycle for updating replacement costs.	Replacement costs are updated on an ad hoc basis.	Replacements costs are updated on an established cycle.
Replacement costs are updated primarily using inflation.	Replacement costs are updated using a combination of inflation and procurement data.	Replacement costs are updated using procurement data and/or prevailing market conditions.
No strategic and scheduled condition assessment programs in place.	Condition assessment programs is scheduled but not strategic.	Strategic and scheduled condition assessment program is in place.
Data governance is informal.	Some elements of formal data governance and management are in place and documented, including data governance policies and procedures.	Most elements of formal data governance and management are in place and documented, including data governance policies and procedures.

Current Practices and Maturity Level

The Municipality's maturity level for 'Asset Data' was identified as **Intermediate**. The Municipality has a robust centralized inventory that includes most of the capital assets owned by the Municipality. Although the Municipality has a centralized inventory for their assets, it is not fully accessible, current, and verified. There are a variety of database software used at the Municipality such as Citywide, Cityworks, and departmental excel records. The disconnect between databases and irregular updates to separate databases can result in inconsistencies across departments and inaccurate asset records.

Staff have indicated a low-to-medium level of confidence in the Municipality's infrastructure datasets. In terms of completeness, the most significant data gap is assessed condition. Assessed condition data is available for bridges and culverts, roads, and sidewalks; all other assets rely on age-based condition ratings. Furthermore, the majority of the Municipality's assets have outdated replacement costs that are not user-defined, making it difficult to develop accurate capital requirement projections. Updating the asset inventory frequently can allow for more effective decision-making.

Buildings are not componentized which provides inaccuracies in asset data. Each component has a unique estimated useful life (EUL) and requires asset-specific lifecycle strategies. Primary datasets of components within each building vary significantly and will create inaccurate budget requirements and project prioritization. The inventory overstates the number of assets that are in-service beyond their useful life; current data indicates that approximately 20% of assets are beyond their useful life. This could be caused by a variety of factors such as inaccurate conditions, outdated asset inventories, and/or inaccurate EULs.

The bridges and culverts, road network, and water network have established cycles for updating their replacement costs and condition through the use of data collection mechanisms such as the OSIM reports, road needs study, Streetscan, and third-party contractors. The public works department updates their replacement costs on an established cycle based on procurement data. The remaining departments do not have established cycles for replacement cost updates. Generally, replacement costs are gathered on an ad hoc basis. For the majority of the Municipality's inventory, replacement costs are obtained by inflating historical costs utilizing the consumer price index.

For most departments, no formal data governance policy or procedure exist. Most staff do not regularly consult the centralized asset inventory and there are no quality assurance procedures in place to ensure asset data in the inventory is accurate and relevant for operations and planning purposes. A detailed data gap analysis and recommendations can be found in **Appendix 2**.

Key Gaps in People, Tools, and Processes: Asset Data

Lakeshore's maturity rating on the 'Asset Data' element was assessed as 'Basic-to-Intermediate'. Key gaps identified through the technical survey, data gap analysis, and follow-up dialogues with staff are discussed below.

- Little corporate oversight on asset information management systems;

- Several data gaps were found in the data, including the service life of assets, componentization of buildings, assessed condition, and user-defined replacement costs;
- No formal data governance policy, procedures, or processes exist;
- Limited staff knowledge of data management and data tools.

Table 11 Recommendations - Asset Data

Recommendations: Asset Data	Effort/Cost	Impact
Comprehensive update of replacement costs for all asset classes, incorporating industry standard costing references and local market pricing which are updated periodically.	Medium	High
Develop a strategic and scheduled condition assessment program, documenting the timing and method of assessments. Observations should be linked to a condition score.	Medium	Medium
Ensure any remaining key data gaps are closed for assets.	High	Very High
Develop a data governance policy or set of procedures to guide the process of acquiring new information, updating systems, timing, and communicating changes to the inventory.	High	High
Ensure software functionality meet service area needs and is compatible with existing systems. Engage in information sharing about available tools and software training for all departments.	Low	Very High

Element 4: Asset Management Decision Making

In 'Asset Management Decision Making, we evaluate how the Municipality prioritizes specific projects and spending decisions. It is closely linked to the 'Strategy and Planning' element, which focuses on broader trends and corporate goals. With a focus on individual projects, it is more tactical in nature.

Table 12 summarizes the three maturity levels for the 'Project Prioritization' element and identifies key competencies typically found within each level.

Table 12 Defining Maturity Levels – Asset Management Decision Making

Basic	Intermediate	Advanced
Asset needs lists are produced primarily based on age data.	Asset needs lists are produced based on a combination of age data and condition assessments.	Asset needs lists are produced based on a combination of age, condition assessment data, and recommendations from various technical or economic studies.
Growth and demand projects not identified in long-term budgets.	Growth and demand projects identified in long-term budgets.	Growth and demand projects identified in long-term budgets.
No infrastructure master planning process to determine which growth and demand projects are coordinated into budgets.	An infrastructure master planning process determines which growth and demand projects are coordinated into budgets.	An infrastructure master planning process determines which growth and demand projects are coordinated into budgets. Accounts for public affordability expectations.
No formal project prioritization process to develop budgets and capital plans	A formalized project prioritization process is used to develop budgets and capital plans.	A formalized project prioritization process is used to develop budgets and capital plans and includes lifecycle analysis, treatment options, and risk management.
The capital investment prioritization process is best described as a set of informal recommendations.	The capital investment prioritization process is best described as a structured annual process.	The capital investment prioritization process is best described as a structured annual process identifying risks and benefits.

Current Practices and Maturity Level

The Municipality of Lakeshore's maturity level for 'Asset Management Decision Making' was assessed as **Intermediate-to-Advanced.** Asset needs for roads and bridges are identified through the most recent Roads Needs Study and OSIM report. The majority of departments provide an asset needs list that considers functional, capacity, and regulatory requirements, but rely mainly on aged-based condition data. Currently, operation and maintenance and capital costs are planned for a 5-year horizon. A longer planning horizon would allow for more effective financial planning that

includes the full lifecycle of municipal assets. Staff do not currently use a standardized corporate-wide business case report. A standard business case report allows individual projects to be compared while clearly communicating the risks and service-level implications of deferring these needs.

Many of the departments use a Master Plan to determine which growth and demand projects are coordinated into budgets. The planning process also considers public affordability expectations to determine which growth and demand projects match desired levels of service targets. For the majority of departments, the budgeting process is completed by considering risk and levels of service elements, and in some cases lifecycle strategies and forecasted renewal requirements are also part of the decision-making process. The Majority of departments have a structured annual capital investment prioritization process, but rational and full financial impacts of projects are not clearly and consistently communicated.

Despite staff efforts to integrate multiple considerations into asset management decision-making, there are notable gaps in the available asset data and limited staff resources to gather and analyze existing information. Staff are seeking to improve long-term operations and maintenance (O&M) and capital planning by advancing information related to asset replacement costs, asset conditions, asset risk models, growth and demand projections, and asset lifecycle management across all departments.

Key Gaps in People, Tools, and Processes: Asset Management Decision Making

Lakeshore's maturity rating on the 'Project Prioritization' element was assessed as 'Intermediate-to-Advanced. Key gaps identified through the technical survey, data gap analysis, and follow-up dialogues with staff are discussed below.

- O&M costs and capital costs are planned over a short-term horizon (5 years);
- Insufficient resources for information gathering and analysis, including assessed conditions, accurate replacement costs, asset risks, and growth and demand projections;
- Rational and full financial impacts of projects are not clearly and consistently communicated during the capital planning process;
- No corporate-wide business case template is available.

Table 13 Recommendations – Asset Management Decision Making

Recommendations: Asset Management Decision Making	Effort/Cost	Impact
Develop business case templates, clearly indicating whole life costs, risks, and levels of service impacts of capital projects.	Medium	High
Structure an annual, formalized capital prioritization process. Document the risks of deferring projects when capital budgets are limited, using input from staff.	High	Very High
Utilize information as it becomes available for project prioritization.	Low	High

Element 5: Risk Management

The level of risk an asset carries determines how closely it is monitored and maintained, including the frequency of various lifecycle activities, and the investments it requires on an ongoing basis. Risk is a function of an asset's probability of failure and the consequences of that failure event.

Risk = Probability of Failure x Consequence of Failure

The likelihood that an asset will fail can be based on many factors, including its age, condition, design, and its exposure to deterioration accelerators, e.g., extreme weather events. An asset failure event can have many different consequences, each with its own magnitude and weighting. These can include economic, financial, social, health and safety, environmental, and even political or reputational consequences.

Using probability and consequence data attributes, asset risk models and frameworks can be developed. Over time, as these 'Risk Management' frameworks become more sophisticated, they can provide reliable guidance on prioritizing projects.

There is no asset management without risk management. Together with target levels of service, an asset's risk profile should determine capital investment decisions. Table 14 summarizes the three maturity levels for the 'Risk Management' element and identifies key competencies typically found within each level.

Table 14 Defining Maturity Levels – Risk Management

Basic	Intermediate	Advanced
No documented understanding of the probability of asset failure, and the various economic, financial, social, and environmental risks associated with assets (risk frameworks).	Some documentation on the probability of asset failure, and the various economic, financial, social, and environmental risks associated with assets.	Various economic, financial, social, and environmental risks are well-documented for most or all assets. Probability of asset failure is also quantified. Detailed risk frameworks in place.
No quantitative models, scores, or risk matrices in place.	Rudimentary risk models, scores, or matrices in place.	Advanced risk models in place, including numerical indices, informed by staff judgement and expert reports and studies.
No formal and documented risk management process to prioritize infrastructure related spending.	Formal risk management process to inform project prioritization and infrastructure related spending; may not be documented.	Formal, documented risk management process to determine project prioritization and infrastructure related spending.

Current Practices and Maturity Level

The Municipality of Lakeshore's maturity level for 'Risk Management' was assessed as **Basic-to-Intermediate**. The Municipality has an informally documented understanding of the various economic, financial, social, and environmental risks associated with its assets. The Municipality also uses a basic risk management process to prioritize infrastructure expenditures. The survery results indicate that some staff are unsure about which risks are associated with their assets and how risk contributes to project priorization.

The Municipality currently does not prioritize projects based on quantitative risk models which may lead to neglecting the highest risk assets. The majority of departments are unsure about the quality of their current risk models and do not have a standardized process for gathering data for the risk models. Models have been developed as part of the asset mangement plan, but have not been regularly reviewed or utilized by staff for decision-making purposes. Risk models generally do not consider the full economic, social, environmental, and financial impacts. The development of risk models is limited by the available data.

Risk management processes within the Municipality are informal, and an overall risk management program is not in place to prioritize projects or identify the risk of project deferrals. Risk considerations are noted within some departments for critical assets, but there is no standardized process for gathering information nor is there a centralized system to record asset-related risks.

Key Gaps in People, Tools, and Processes: Risk Management

Lakeshore's lowest maturity rating, also assessed as 'Basic-to-Intermediate', was found in the 'Risk Management' element. Key gaps identified through the technical survey, data gap analysis, and follow-up dialogues with staff are discussed below.

- Basic-to-intermediate documentation of the various economic, social, environmental, and financial risks associated with assets;
- An overall risk management program is not in place to prioritize projects or identify the risk of project deferrals;
- Risks models are developed but not regularly reviewed;
- The majority of departments are unsure about their risk models associated with their assets;
- Basic-to-intermediate risk management processes are used to prioritize infrastructure related spending.

Table 15 Recommendations - Risk Management

Recommendations: Risk Management	Effort/Cost	Impact
Review and refine risk models with staff input once data maturity has improved.	High	High

Develop a corporate risk management program that is endorsed by Council. The program will identify system risks and provide a risk mitigation plan.	Very High	Very High
Document the risks of achieving the current and proposed lifecycle strategy.	Medium	High

Element 6: Levels of Service

Levels of service (LOS) measure the quality, function, and capacity of an asset class or service area. LOS is an internationally recognized concept employed across a variety of sectors, including public infrastructure. The International Standards Organization's ISO 55000 defines levels of service as the "parameters, or combination of parameters, which reflect the social, political, environmental, and economic outcomes that the organization delivers."

Levels of service are fundamentally about balancing three key parameters: cost, performance, and risk. Any adjustment to one of these parameters will have a direct impact on the other two. A sustainable levels of service approach requires municipalities to periodically recalibrate these parameters; an imbalance in any parameter can jeopardize the alignment of service delivery with community expectations, the strategic direction of the organization, and its fiscal capacity.

Levels of service frameworks must include both customer and technical key performance indicators to monitor community satisfaction and operational efficiency. Customer levels of service (C-LOS) are designed to measure or approximate end-user experience with the service. For transparency and reporting, they should be understandable to the general public. Technical levels of service (T-LOS) are designed to measure the various activities and steps (inputs) that the organization takes to deliver the customer-oriented levels of service.

Table 16 summarizes the three maturity levels for the 'Levels of Service' element and identifies key competencies typically found within each level.

Table 16 Defining Maturity Levels – Levels of Service

Basic	Intermediate	Advanced
Minimal, or no documentation on current technical or customer-oriented levels of service to track and monitor service delivery.	Some documentation on current levels of service, using customer and technical KPIs.	Detailed levels of service framework for all asset classes illustrating current and proposed customer and technical levels of service for all asset class.
Levels of service data is managed primarily using non-structured methods, e.g., paper records, or disconnected sheets and databases	Levels of service data is managed in centralized databases.	Levels of service data is managed in centralized databases and linked to assets/services within a software system.
No levels of service reporting.	Levels of service reporting is used for some, but not all of the following: set targets and trends for service delivery; prioritize capital projects; adjust operating practices; conduct financial analyses; inform public on the Municipality's performance and discuss trade-offs;	Levels of service reporting is used for most or all of the following: set targets and trends for service delivery; prioritize capital projects; adjust operating practices; conduct financial analyses; inform public on the Municipality's performance and discuss trade-offs;

Current Practices and Maturity Level

The Municipality's maturity for 'Levels of Service' was assessed as **Intermediate**. As with most municipalities in Ontario, the Municipality of Lakeshore is at the initial stages of developing LOS in accordance with Ontario Regulation 588/17. The Municipality has documented some key performance indicators for current LOS for all asset categories. Service goals, considering public consultation, fiscal capacity, and growth and demand related to LOS programs are not well established across most departments.

The current LOS framework was developed in 2022 for the AMP and only includes core asset categories (roads, bridges and culverts, stormwater, water, and wastewater). The framework exists at a basic level and focuses on meeting minimum O. Reg. 588/17 regulatory compliance. There is no summary of the direct and indirect costs associated with LOS. For most departments, key performance indicators are not embedded into staff operations. To advance the maturity of LOS programs, the Municipality will need to have a full understanding of the performance metrics, regional drivers, strategic goals, costing, and public feedback associated with the current LOS.

LOS data is mostly managed through non-structured records or disconnected sheets and databases. The Municipality would benefit from having a centralized database that is linked to assets or services within a software system such as work orders or a maintenance management system. Some departments are unsure how LOS performance indicators are tracked and if they are imbedded in asset decision-making processes. Some departments set out their own service levels but have limited capacity to monitor and achieve these goals.

A better understanding of the current LOS framework will be a critical step to meeting a key component of the 2025 requirements of O. Reg 588/17: establishing proposed levels of service. The Municipality will need to capture constituent priorities and balance this against regulatory, fiscal and operational constraints. Once this is done the Municipality will be able to clearly communicate the trade-offs between the cost, performance, and risk of meeting or not meeting desired levels of service.

Key Gaps in People, Tools, and Processes: Levels of Service

Lakeshore's maturity rating for the 'Levels of Service' element was assessed as 'Intermediate'. Key gaps identified through the technical survey, data gap analysis, and follow-up dialogues with staff are discussed below.

- LOS analysis is limited to regulatory reporting only (MMS and O. Reg. 588/17);
- Neither customer nor technical key performance indicators are embedded in staff operations;
- Work orders and service requests are not utilized to track technical performance indicators;
- Most departments do not consider public engagement to determine constituent priorities;
- Proposed levels of service have not yet been identified.

Table 17 Recommendations - Levels of Service

Recommendations: Levels of Service	Effort/Cost	Impact
Audit existing technical reports for levels of service metrics and consolidate to a centralized levels of service framework.	High	Very High
Track levels of service trends over time and utilize for decision-making.	High	High
Establish proposed levels of service, considering legislative requirements, trends, and commitments within strategic planning and Master Planning documents.	Medium	High
Consult the public on service expectations, utilizing surveys and/or public consultation workshops.	High	Medium
Link the costs and impacts of lifecycle activities to specific levels of service metrics to enable scenario analysis.	High	Medium

Element 7: Financial Management

The final element focuses on how the Municipality of Lakeshore links its long-term financial planning with its asset management program to maintain a sustainable, fiscally responsible service delivery model. Given the lengthy useful life of most capital assets, a long-term view to funding and financing is essential.

Effective 'Financial Management' reflects current and proposed levels of service, with a particular focus on community affordability. One of the primary corporate risks to municipalities is attempting to deliver levels of service that exceed their fiscal capacity.

Table 18 summarizes the three maturity levels for the 'Financial Management' element and identifies key competencies typically found within each level.

Table 18 Defining Maturity Levels – Financial Management

Basic	Intermediate	Advanced
Minimal alignment of departmental budgets with corporate strategic goals. Infrastructure spending does not reflect long-term direction of the community.	Some alignment of departmental budgets with corporate strategic goals. Some infrastructure spending aligned with long-term direction of the community.	Significant alignment of departmental budgets with corporate strategic goals. Infrastructure spending is required to be aligned with long-term direction of the community.
Financial requirement analysis does not account for most of the following elements: operating and maintenance needs; principal and interest payments; future rehabilitation and renewal; inflation; service enhancements; growth elements; proposed levels of service	Financial requirement analysis accounts for some, but not all, of the following elements: operating and maintenance needs; principal and interest payments; future rehabilitation and renewal; inflation; service enhancements; growth elements; proposed levels of service	Financial requirement analysis accounts for most or all of the following elements: operating and maintenance needs; principal and interest payments; future rehabilitation and renewal; inflation; service enhancements; growth elements; proposed levels of service
The department's budget development is not well-aligned with departmental asset management strategies to determine optimal expenditures on assets, and do not consider most of the following: risk, levels of service, optimized lifecycle strategies; forecasted renewal requirements; cross-departmental initiatives	The department's budget development is aligned with departmental asset management strategies to determine optimal expenditures on assets, considering some, but not all of the following: risk, levels of service, optimized lifecycle strategies; forecasted renewal requirements; cross-departmental initiatives	The department's budget development is aligned with departmental asset management strategies to determine optimal expenditures on assets, considering most or all of the following: risk, levels of service, optimized lifecycle strategies; forecasted renewal requirements; cross-departmental initiatives

Current Practices and Maturity Level

The Municipality's maturity level for 'Financial Management' was assessed as **Intermediate**. The Municipality has adequately analyzed its short-to-medium term O&M and capital requirements for its assets at the departmental level. However, the majority of departments have minimal collaboration when it comes to determining priorities and associated budget allocations for infrastructure services.

Financial needs consider service enhancements, growth, O&M costs, and future renewal requirements. The Municipality's budgets support the right initiatives by considering proactive lifecycle strategies and forecasted renewal requirements, but generally do not consider levels of service or cross-department initiatives. Some staff indicated a lack of knowledge related to the requirement analysis process and asset investment decision-making. Since long-term planning is not linked to LOS it will be challenging to determine costs associated with proposed LOS.

The Municipality does not develop multiple financial strategies for scenario analysis. Doing so can examine the use of different tax and rate increases, impacts of deferring projects, and allocating funds from reserves or taking debt. Generally, across all departments, staff noted that the municipality may not have sufficient budget to meet current and future asset management needs. This would indicate insufficient funding for both O&M and capital budgets needed to engage in advanced data management, effective risk management, proactive lifecycle activities, and timely asset replacement.

Key Gaps in People, Tools, and Processes: Financial Management

Lakeshore's maturity rating for the 'Financial Management' element was assessed as 'Basic-to-Intermediate'. Key gaps identified through the technical survey, data gap analysis, and follow-up dialogues with staff are discussed below.

- Analysis completed for short and long-term capital and O&M requirements is at a basic-to-intermediate level;
- There is minimal cross-departmental collaboration to develop budgets;
- Long-term budgeting is not linked to LOS;
- Multiple scenarios are not examined when developing budgets;
- Insufficient funding to meet current and future asset management needs.

Table 19 Recommendations - Financial Management

Recommendations: Financial Management	Effort/Cost	Impact
Examine at least two funding scenarios, exploring varying tax rate increases, rates, debt and reserve usage, and project deferrals.	High	High
Identify service level implications of not meeting budget requirements.	Medium	High

Identify cross-department initiatives during the budgeting process, and collectively determine funding requirements.	Medium	Medium
Examine long-term financial sustainability of the current funding strategies related to annual budgets, reserves, and debt.	Medium	Medium

The Strategy: A More Advanced Future State

The current state assessment identified 32 gaps across the seven core elements of asset management. The strategy is designed to close these gaps over time. There are several recurring themes throughout the strategy, including a sharp focus on documentation, standardization, and integration.

Some benefits of implementing the strategy will be realized immediately, including higher staff confidence in datasets, clarity on roles and responsibilities, and greater cohesiveness across the organization. Other benefits, such as improved capital planning, cost savings, better risk management, and more seamless alignment of infrastructure services with community expectations, will become evident more gradually.

The strategy outlines seven priority initiatives with 29 recommended tasks distributed over four years. The initiatives are designed to be cumulative; as a result, some recommendations require the completion of preceding task and initiatives. A 4-year schedule to undertake the recommendations has been drafted and is in **Appendix 1**.

Year 1: 2024 O. Reg. Compliance

Priority Initiative 1: Resource Capacity & Training

Task 1.1 Consider retaining an asset management coordinator to coordinate information and maintain and develop the asset management program.

The asset management coordinator (AMC) works with the Municipality's departments to develop and maintain a well-functioning asset management program. This includes completing all asset management related initiatives and processes, implementing, and maintaining systems and applications, and completing all pertinent reporting. Acting in this way, the asset management coordinator will ensure alignment or 'line-of-sight' between council's mandate, the long-term vision and direction, and departmental priorities for managing assets, as well as supporting departments to bring on new tools, processes, and systems. This role also ensures completion of relevant grant applications to secure maximum senior government funding, and in doing so, bridges Finance and operational groups to better optimize infrastructure budgets and communicates risks and benefits of infrastructure projects to the corporation.

An example business case for an asset management coordinator is attached in **Appendix 3**.

Task 1.2 Educate and train key personnel and Council on broader asset management best practices including database management and the optimal use of Citywide Asset Manager.

Educate and train key personnel on broader asset management best practices including database management and the optimal use of asset management software. Asset management is often viewed only as a list of projects, or the implementation of complex software applications. Although both are integral components, asset management first requires a deep understanding of core principles and technical concepts, including levels of service, lifecycle analysis and costing, risk management, and the various guiding documents that sustain an asset management program. We recommend that staff's asset management knowledge be improved through a structured education and training program. Several organizations offer asset management training and certification, including the Institute of Asset Management (IAM), the Institute of Public Works Engineering Australia (IPWEA), and PEMAC Asset Management Association of Canada. To improve asset management software knowledge, consider training offerings from the system provider to ensure the software is being utilized to its full capabilities.

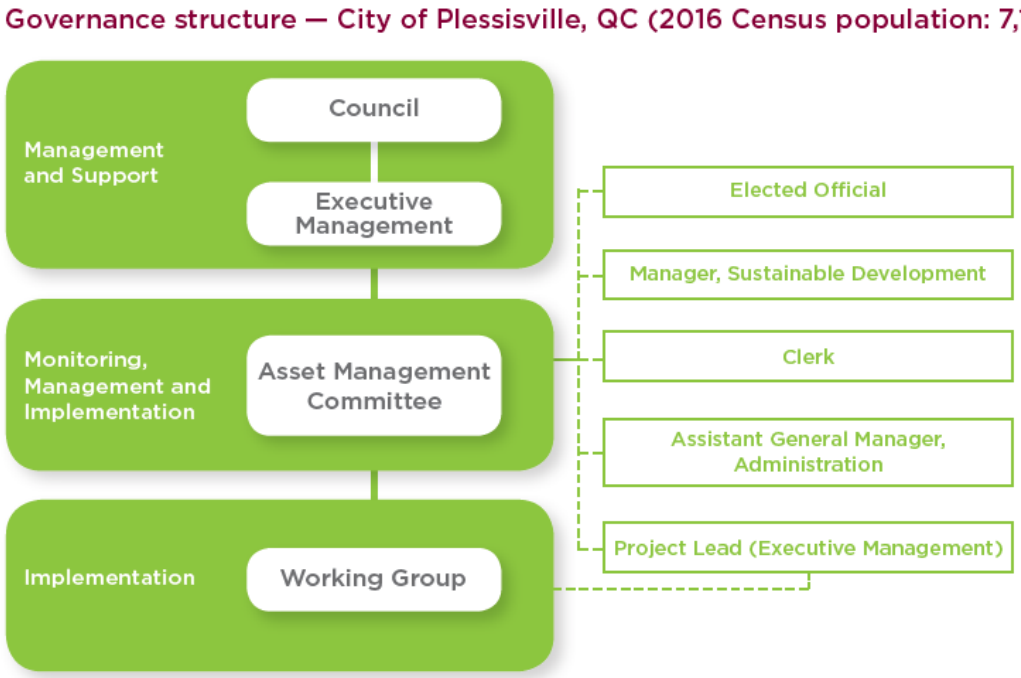
Task 1.3 Define an asset management governance structure, including roles and responsibilities at each level.

Asset management as a practice involves the use of many processes and tools to realize the most value from assets. To use these tools and processes, such as an asset inventory and budgetary process, a leadership committee should be defined, along with the appropriate responsibilities. The asset management committee is responsible for providing leadership in overseeing the continual improvement of the asset management program and implementing asset management practices. The asset management committee should generally include a senior manager that represents the major business functions included in the scope of your asset management program. The asset

management committee needs to include an adequate cross-functional representation to avoid silos.

The following is an example of a governance structure defined by the City of Plessisville, Quebec:

Figure 6 Example Governance Structure: City of Plessisville, Quebec



To best utilize the asset management governance structure identified, the Municipality should identify specific roles and responsibilities at each level of the governance structure. Defining roles in this way will ensure that all processes in the asset management program have someone who is accountable and responsible for delivery of that process. Further, identify roles to provide clear evidence on the effort to undertake an effective asset management program, and can be used as a starting point to assess staff capacity. The Municipality may consider hiring new staff or splitting roles in situations where one staff member is beyond capacity.

The following is an example of a key roles and responsibilities of an asset management governance structure as recommended from the Federation of Canadian Municipalities (FCM):

Table 20 Roles & Responsibilities for Governance Structure

Roles	Responsibilities
Council	Council has the following role in AM governance: a. Act on behalf of and represent the interests of stakeholders. b. Establish the vision, service mandates and corporate management policies. c. Adopt, review, and update the AM policy and ensure that an AM strategy is in place. d. Maintain the necessary corporate capacity to support the elements and practices of an AM system.

	e. Set priorities and articulate community values to city administration. The CAO has the following role in AM governance: a. Act on behalf of and represent the interests of council. b. Provide direction to the AM steering committee.
Chief Administrative Officer (CAO)	a. Implement the AM policy, AM strategy and supporting AM system. b. Establish an AM steering committee, with representation from each service area and business area; and appoint an asset management coordinator (AMC) to serve as chair of the steering committee. c. Define the AMC's responsibilities, and delegate responsibility to the AMC to act as a champion for AM within the organization. d. Ensure that staff are provided with sufficient resourcing, financial support, training, and tools to manage risk and support the elements of sustainable service delivery. e. Commit to the implementation and continual improvement of AM practices, processes, and tools to support the achievement of the city's organizational objectives. f. Schedule and complete periodic internal audits and management reviews to assess the effectiveness of the AM system in achieving the AM objectives and supporting organizational objectives and council priorities
Senior Management Team	a. Establish the AM objectives. b. Ensure robust and transparent decision-making and administration of service delivery. c. Provide appropriate and timely support to the asset management coordinator (AMC) and steering committee. d. Advise the AMC and AM steering committee on strategic issues related to corporate decision-making. e. Generate solutions to organizational challenges related to the implementation of AM. f. Ensure consistency of AM practices and processes across departments, including adoption and application of common principles of sustainability and AM. g. Empower employees based on the city's core values and priorities.
Asset Management Coordinator	a. Chair the AM steering committee. b. Report on the progress, capacity, effectiveness, and sustainability of the AM system to the CAO. c. Project manage the delivery of the prioritized AM improvement tasks, including the selection and leading of cross-divisional task-specific teams. d. Provide technical advice related to the AM system to asset managers and department staff. e. Collect tactical and operational-level feedback on the AM system performance, needs and improvement priorities. f. Coordinate AM training for staff.
Asset Management Committee	a. Prioritize the AM improvement plan. b. Coordinate and oversee corporate AM initiatives where integration across business units or service areas is desired, or where a standardized approach is required.

	c. Make recommendations on, and manage, the content of the AM policy and AM strategy, including the AM framework. d. Take any appropriate action necessary to ensure the smooth integration within and between AM system implementation and improvement projects. e. Advocate for AM within the organization, leading by example and setting expectations within teams. f. Manage the development of AM capacity and competency within the organization (i.e., increase the ability to do this work in-house). g. Monitor the progress and performance of the plans for AM program development and implementation, including line-of- sight between corporate and AM objectives. h. Conduct management reviews and internal audits of the AM system.
Departmental Staff	The responsibilities of the AM network and implementation teams are established as required by the program manager

Task 1.4 Coordinate regularly scheduled meetings on asset management for staff, providing updates to ensure consistent approaches to asset management practices across departments.

It is best practice for the asset management committee to meet on at least a quarterly basis to review the progress of asset management initiatives. This allows project schedules to be reviewed and plans to be made to ensure initiatives are carried out successfully. Members of the committee can then communicate progress of tasks to their respective departments.

Task 1.5 Ensure software functionality meets service area needs and is compatible with existing systems. Engage in information sharing about available tools and software training for all departments.

Task 1.2 identifies Citywide software training as a recommended strategy for improvement. To further enhance staff capacity to utilize the asset management software, staff should also be informed about all other tools and software that is available to support the asset management program. Other tools include GIS, Maintenance Management Systems, SCADA and other reporting tools, data collection templates, and plans and strategies that guide asset management.

The Municipality should ensure that the tools and software that are available are compatible with one another and that they effectively meet the needs of their asset management program. Each tool should be assessed by engaging staff and analysing what they need to effectively engage in proactive asset management. Additionally, new tools proposed by departmental staff should undergo a review and approval process with Digital Transformation and Cloud Services to ensure departmental needs align with the corporate direction.

Priority Initiative 2: Advance Data & Asset Management Strategies

Task 2.1 Ensure any remaining key data gaps are closed for assets.

Review the data analysis in **Appendix 2** to have a good understanding of existing data gaps. Utilize standardized forms and templates for data collection. All asset management decisions and field

activities should be premised on detailed knowledge of asset's components, condition, characteristics, and cost. This information is usually collected through third party studies (e.g., Master Plans, assessment reports) and field level inspections (e.g., fleet inspections). For the purposes of risk management, identify risks associated with municipal assets and collect attribute data that will facilitate the development of risk models.

As part of an overall data governance process, the Municipality can better translate third party or field level inspections to the asset inventory via the use of data templates. PSD Citywide developed data collection templates and conducted training to guide data collection for key staff members. Utilize the existing templates to gather new data on existing assets and to register new assets. Review the templates on a biennial basis to ensure all necessary data fields are included in the templates.

Task 2.2 Comprehensive update of replacement costs for all asset classes, incorporating industry standard costing references and local market pricing which are updated periodically.

Accurate replacement costs are required to project long-term replacement needs of an asset. The most basic way of doing this is inflating historical costs using the Construction Price Index (CPI). However, over a long period of time inflation does not scale with the true change in market value, as it does not account for changes in technology, changing material prices, or outdated methods of construction. Typically, inflation tends to underestimate true replacement needs. Rather, the Municipality should review recent Tender pricing or vendor quotes. Additionally, the Municipality can use third-party cost estimators such as RS Means. At a minimum, replacement costs should be updated every two years to ensure relevance.

Task 2.3 Review and refine risk models with staff input once data maturity has improved.

The current risk models developed in Citywide Asset Manager platform were developed through development of the asset management plan. These models are solely based on the data that was readily available, rather than a comprehensive suite of socio-economic, financial, and environmental risk factors. The risk models should be reviewed regularly to ensure that the relative risk rankings among assets generally matches how staff perceive risk to be. For example – if the top 5 highest risk road segments from the models do not match the Roads Needs Study or Public Works knowledge, the models should be revised. The review process should be conducted at least annually, and staff should review the accuracy of each risk factor and review the risk weightings.

Task 2.4 Audit existing technical reports for levels of service metrics and consolidate to a centralized levels of service framework.

Key technical documents, such as DWQMS reporting, operational plans, Master Plans, and any other document that describes the performance of a service should be reviewed. Over time the Municipality can identify metrics from the report that further build out the levels of service framework. This way, all key performance indicators are centralized to one sheet to be viewed in its entirety, rather than having to spend time reviewing several documents.

Year 2: 2025 O. Reg. Compliance

Priority Initiative 3: Growth Analysis

Task 3.1 Identify current and future demand drivers and document within the current Asset Management Plan.

The Municipality does not have an up-to-date and accurate documentation of the demand drivers in the community and how these are going to impact future growth and development. The Asset Management Plan does not include a comprehensive analysis of the demand drivers and therefore is not able to analyse the impacts of growth and development on municipal infrastructure and asset management planning. The Municipality may consider engaging a third-party consultant to update the planning documents or develop and report that identifies key drivers of demand and growth in the community, thus, allowing key stakeholders to engage in more effective asset management decision making.

Task 3.2 Project future asset acquisitions due to growth across all departments.

If the Municipality has an up-to-date Mater Plans, a Development Charges Bylaw, or has identified future developer contributed assets, then the Municipality will have a good estimate of the length and quantity of new assets acquired. Without this information, the Municipality will need to review growth projections from the Official Plan and determine the quantity of assets to serve that growth. Once identified in this way, the Municipality will have projected acquisition costs of new assets over the mid-to-long-term. The costs of acquisition due to growth, when combined with the costs of renewing and maintaining current assets, will provide a more complete needs analysis for the long-term financial strategy.

Priority Initiative 4: Develop Proposed Levels of Service & Analysis

Task 4.1 Link the costs and impacts of lifecycle activities to specific levels of service metrics to enable scenario analysis.

To further operationalize levels of service, the Municipality should track the costs and impacts of each lifecycle activity against a level of service metric. Tracking costs and benefits in this way will allow the Municipality to better demonstrate the effectiveness of each lifecycle activity. For example, if it is observed that the crack sealing budget increases, but the overall condition or rideability stays the same, then crack sealing is not a very effective measure. Alternatively, the Municipality may wish to reduce the number of complaints due to dust on gravel roads – doing so will require an increased expenditure on dust suppressant. The following is a simple example of how lifecycle activities can be linked to a level of service:

Table 21 Example Linking Lifecycle Activities to Levels of Service Metrics

Levels of Service Metric		2022	2023	2024
Average Condition of the Road Network	**Performance**	**77%**	**79%**	**83%**
	Crack Sealing Budget	$50,000	$55,000	$60,000
	Mill and Pave Budget	$1.2 M	$1.4 M	$1.6 M
Number of complaints due to dust	**Performance**	**7**	**9**	**15**

	Dust Suppressant Budget	$120,000	$120,000	$100,000

Task 4.2 Document the risks of achieving the current and proposed lifecycle strategy.

A requirement of the 2025 O. Reg. requirements is for the asset management plan to outline a lifecycle strategy that achieves the proposed levels of service, and identify any risks associated with achieving or not achieving this lifecycle strategy. Examples of risks include deferred maintenance, funding shortfalls, premature failures, and excessive maintenance costs. These risks can be explained qualitatively for each asset segment or reach portfolio of assets with a unique lifecycle strategy.

Task 4.3 Track levels of service trends over time and utilize for decision-making.

Once *Task 2.4* is complete the Municipality should track metrics year over year. This will allow the Municipality to observe service trends and justify adjusting budgets and operational activities to meet different service goals.

Task 4.4 Identify service level implications of not meeting budget requirements.

To supplement *Task 4.1*, the Municipality can identify how budget cuts can influence the future levels of service. *Task 4.1* looks at how historical expenditure is linked to service outcomes. These broad correlations can be used to cite how specific levels of service might degrade if a budget was cut. For example, in *Task 4.1*, it was illustrated that increasing the crack sealing budget improved overall condition of the network. If the crack sealing budget was cut, it is likely that the overall road condition will decline. This narrative should go along with the budget each year when presented to council, ensuring elected officials are aware of levels of service implications of passing or not passing specific budget items.

Task 4.5 Consult the public on service expectations, utilizing surveys and/or public consultation workshops.

To better understand community expectations, and to guide potential adjustments to service levels, we recommend the Municipality execute a variety of two-way public engagement initiatives, including surveys, Municipality halls, and focused groups. Staff should aim to obtain feedback on service quality, as well as broad feedback on community priorities. Develop a medium- to long-term external communication strategy to engage the public on asset management and obtain feedback to inform development of proposed levels of service.

Task 4.6 Establish proposed levels of service, considering legislative requirements, trends, and commitments within strategic planning and Master Planning documents.

Proposed service level targets should reflect evolving community needs, trends, and influencers, e.g., growth, service demand projections, and the Municipality's fiscal capacity. Rather than proposing adjustments to individual KPIs, we recommend the Municipality instead focus first on potentially adjusting the three broad parameters of levels of service: cost, performance, and risk. This exercise may include evaluating the risk appetite of the Municipality for particular asset classes; revising target condition levels; and/or adjusting funding allocations—recognizing that an adjustment to one parameter will lead to changes in the other two.

The above analysis can be supplemented by results of the public engagement, balancing regulatory and operational constraints with public priorities. Ultimately, the proposed levels of service is not an “optimized” service, but rather a realistic level the Municipality can commit to achieving. Once set, the proposed levels of service will need approval from Council.

Years 3 & 4: Asset Management Program Advancement

Priority Initiative 5: Expand Governance Strategies

Task 5.1 Coordinate regularly scheduled meetings to communicate asset management plan updates and levels of service reporting. Notify Council of key asset management initiatives.

It is best practice for the asset management committee to meet on at least a quarterly basis to review the progress of asset management initiatives. This allows project schedules to be reviewed and plans to be made to ensure initiatives are carried out successfully. Members of the committee can then communicate progress of tasks to their respective departments.

Task 5.2 Develop a data governance policy or set of procedures to guide the process of acquiring new information, updating systems, timing, and communicating changes to the inventory.

Data collection, gap analyses, and refinements are major initiatives that will deliver marked improvements in the Municipality's asset management program. To ensure these results are sustained, a data governance framework should be established. Data governance formalizes enterprise data management by establishing rigorous rules and guidelines through the lifecycle of datasets, from creation, storage, and usage, to archival and destruction. Data governance should be initiated through a data governance policy. Roles and responsibilities at the various stages should be defined.

Typically, a data governance policy consists of the following steps:

Table 22 Components of a Data Governance Process

Step	Description
Process Descriptions	Identify the business function that the Municipality wishes to achieve through the development of an asset management program (e.g., inventory building, risk management, etc.). Identify the processes that are required to achieve the data function (e.g., Inventory building → populate data templates, QA/QC data templates, upload to Citywide AM, departmental review). Describe when this process is required and how it should be utilized
Data Requirements	Describe the types of data required to complete the process; identify the data format and/or required data quality. The standards and rules for data quality should also be defined (e.g., are dates YYYY-MM-DD or DD-MM-YY? What is the appropriate grading scale for condition scores? What is the alphanumeric formatting for identifiers?)
Data Procedures	Outline in detail the procedures required to complete the identified process. How will the data be generated (e.g., data templates, other software systems, etc.)? What quality assurance processes will be used?
Define Roles and Responsibilities	Define individuals that will be involved in the implementation of this procedure and their responsibilities. Who is responsible for data collection? Uploading? Quality control? Oversight and strategic direction?

Data Transmission	Describe how data will be transmitted between different parties and what level of interdepartmental coordination is required? E.g., In what way will field records from Public Works be brough to Finance?
Process Review and Assurance	Outline the audit and assurance requirements that will ensure the processes is regularly evaluated, and change are made as necessary to reflect an evolving understanding of functional requirements.
Process Mapping (optional)	Develop a diagram to map out processes among each party

Task 5.3 Develop a strategic and scheduled condition assessment program, documenting the timing and method of assessments. Observations should be linked to a condition score.

Develop a condition assessment program, documenting the timing and method of assessments. Observations should be linked to a condition score. The Municipality should establish a formal, strategic, and scheduled condition assessment program for each asset group for the next 10 years. The program should include the timing, frequency, method of condition assessment, as well as how these assessments are translated to a condition score (if applicable). Given the strategic importance of condition assessments, a portion of capital funding should be dedicated to establishing and maintaining this program. The results of the condition assessment should be shared annually.

The Municipality worked with PSD Citywide to develop condition assessment guidelines. We recommend the Municipality reviews the data requirements and condition grading scales outlined in these guidelines as a starting point for building the program. Updates to the guidelines can be made to include specific practices that the Municipality wishes to adopt that may be more relevant than the broad industry recommendations.

Task 5.4 Develop a corporate risk management program that is endorsed by Council. The program will identify system risks and provide a risk mitigation plan.

A risk management program is useful for the Municipality to reduce all risk of liabilities, and to develop a response plan in the event of an emergency. Where risk models evaluate the criticality of an individual asset, the risk management plan will evaluate the strategic and service level risks. At a minimum a risk management plan should contain the risk events, risk rating of the event, and a risk treatment plan. An example of a simple risk management plan for a water system is outlined below:

Table 23 Example of a Basic Risk Management Plan

What can Happen	Risk Rating	Risk Treatment Plan
Reactive lifecycle management	Very High	Complete formal condition assessments of mains, pumping stations, and manholes to support proactive lifecycle management
Water Loss	High	Leverage annual water loss audits to address problem areas, increase water quality, and reduce frequent flushing needs
Fiscal Capacity Constraints	High	Optimize risk ratings to improve short- and long-term capital planning
Municipal Staff Capacity Constraints	Very High	Align staff functions and maintenance contracts with appropriate business unit
Information Management Constraints	High	Operationalize the asset management software for effective use of Service Requests and Work Orders and improve metrics

Task 5.5 Define service policies with defined service goals and incorporate into the Asset Management Plan.

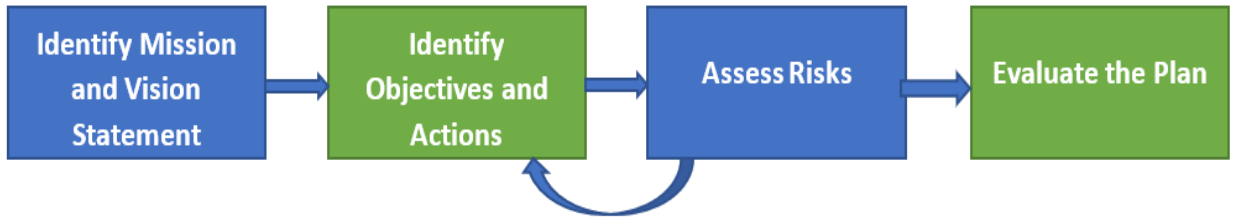
Service goals are crucial for future demand planning and useful to evaluate whether a service area is meeting expectations from all users and regulators. A service goal, such as servicing X customers, responding to an event in X hours, or being available to specific populations, can be tracked against over time and benchmarked. Defined service goals should reflect Minimum Maintenance Standards and existing Master Plans. Without service goals the Municipality will not be able to clearly demonstrate that service needs are not met, or that some services may be under or over capacity.

Task 5.6 Update the corporate Strategic Plan to be relevant for the next five years.

The Corporate Strategic Plan is one of the key asset management planning documents, as it outlines the organizations mission, vision, and objectives. All other asset management documents need to align with the Strategic Plan's priorities to ensure that the asset management program has line-of-sight to the corporate strategic direction.

The diagram below outlines the general process for developing a Strategic Plan. However, the Municipality may consider revising the objectives if the previous Mission and Vision statements still hold true. Stakeholders, including department heads and council, should meet over a period of workshops to determine the objectives and actions.

Figure 7 Process for Developing a Strategic Plan



Priority Initiative 6: Improve Financial Planning

Task 6.1 Identify cross-department initiatives during the budgeting process, and collectively determine funding requirements.

In many cases projects will involve multiple departments, such as needing to dig up a road to replace a watermain. In this example it makes sense to coordinate the watermain replacement location with a road that needs resurfacing or reconstruction. Doing so means that costs of the project can be optimized since a new road won't be resurface prematurely. At the beginning of each budget cycle, before projects are proposed, asset management committee members from each department should meet and identify projects. Locations for these projects can be mapped using the Municipality's GIS, and a heat map can be generated showing locations where there are overlaps of assets in need of renewal (e.g., those with a high-risk score in low condition). These locations can be shortlisted to identify the upcoming capital program.

Task 6.2 Examine long-term financial sustainability of the current funding strategies related to annual budgets, reserves, and debt.

The Municipality currently engages in short-term financial planning and staff do not have a comprehensive understanding of long-term financial needs. The Municipality should begin by identifying capital financial requirements beyond a 5-to-10-year horizon. Financial strategies should include at least one full replacement cycle of all assets to allow for holistic planning that includes the full lifecycle of the assets. The Municipality should also begin examining long-term financial plans for that include the full lifecycle of the assets for operations and maintenance costs. Once long-term financial needs are identified, the Municipality can begin developing long-term budgets, reserve contributions, and debt strategies.

Task 6.3 Examine at least two funding scenarios, exploring varying tax rate increases, rates, debt and reserve usage, and project deferrals.

Budgets can be better optimized if multiple scenarios are developed and compared against each other. The Municipality may have a set of projects proposed to achieve the proposed levels of service, but with a total value greater than the current revenue sources. The Municipality has several options – they may consider raising taxes and rates, may take on more debt or take from reserves, or consider taking on additional risks from deferring projects. Developing a narrative that explores these different scenarios will enable the Municipality to clearly communicate the trade-offs of different funding levels. This may also be used to demonstrate that if a greater level of service is expected, then the Municipality must be prepared to find new revenue streams.

Priority Initiative 7: Advance Project Prioritization

Task 7.1 Develop business case templates, clearly indicating whole life costs, risks, and levels of service impacts of capital projects.

The Municipality currently has no standardized business case templates that allow the costs, benefits, and risks of each project to be assessed against each other. Developing a standardized business case template will allow the Municipality to better justify which projects should make the budget and communicate any kinds of risks associated with not funding the project. The Municipality should also indicate the whole life costs of each project, such as the ongoing operations and maintenance costs of acquiring a new asset. An example of a business case template can be found in **Appendix 3**.

Task 7.2 Structure an annual, formalized capital prioritization process. Document the risks of deferring projects when capital budgets are limited, using input from staff.

As the Municipality's data and processes mature, it will be key to prioritize projects in a way to maximize service while minimizing costs and risks. Doing so requires a structured and formalized process, where risks and levels of service impacts can be assessed for each project.

Business cases should be developed for each proposed project and reviewed by department heads and Finance. Once the business cases are complete all department heads and Finance shall set up an annual meeting to review business cases. During this meeting the team will collectively agree on which projects should be funded, and which should be left unfunded. Further meetings may be

required, as per the discretion of the team, to re-prioritize or to examine funding with different budget envelopes.

Task 7.3 Utilize information as it becomes available for project prioritization.

By accomplishing the tasks detailed above, the Municipality will have greatly advanced their asset management data and information. The newly acquired information will significantly improve asset management decision-making capabilities, specifically the capability to engage in informed project prioritization. Relevant information includes, long-term capital and O&M costs, asset risks, growth and demand projections, asset condition, asset replacement costs, and alignment with levels of service objectives.

Appendix 1: Four Year Project Schedule

Table 24 Four Year Project Schedule

Priority Initiatives	Task	Description	2023		2024				2025				2026				2027	
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Resource Capacity and Training	1.1	Consider retaining an asset management coordinator to coordinate information and maintain and develop the asset management program.																
	1.2	Educate and train key personnel and Council on broader asset management best practices including database management and the optimal use of Citywide Asset Manager.																
	1.3	Define an asset management governance structure, including roles and responsibilities at each level.																
	1.4	Coordinate regularly scheduled meetings on asset management for staff, providing updates to ensure consistent approaches to asset management practices across departments.																
	1.5	Ensure software functionality meet service area needs and is compatible with existing systems. Engage in information sharing about available tools and software training for all departments.																
Improve Data & AM Strategies	2.1	Ensure any remaining key data gaps are closed for assets.																
	2.2	Comprehensive update of replacement costs for all asset classes, incorporating industry standard costing references and local market pricing which are updated periodically.																
	2.3	Review and refine risk models with staff input once data maturity has improved.																
	2.4	Audit existing technical reports for levels of service metrics and consolidate to a centralized levels of service framework.																
Growth Analysis	3.1	Identify current and future demand drivers and document within the current Asset Management Plan.																
	3.2	Project future asset acquisitions due to growth across all departments.																
Develop Proposed Levels of Service & Analysis	4.1	Link the costs and impacts of lifecycle activities to specific levels of service metrics to enable scenario analysis.																
	4.2	Document the risks of achieving the current and proposed lifecycle strategy.																
	4.3	Track levels of service trends over time and utilize for decision-making.																
	4.4	Identify service level implications of not meeting budget requirements.																

Priority Initiatives	Task	Description	2023		2024				2025				2026				2027	
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	4.5	Consult the public on service expectations, utilizing surveys and/or public consultation workshops.																
	4.6	Establish proposed levels of service, considering legislative requirements, trends, and commitments within strategic planning and Master Planning documents.																
Expand Governance Strategies	5.1	Coordinate regularly scheduled meetings to communicate asset management plan updates and levels of service reporting. Notify Council of key asset management initiatives.																
	5.2	Develop a data governance policy or set of procedures to guide the process of acquiring new information, updating systems, timing, and communicating changes to the inventory.																
	5.3	Develop a strategic and scheduled condition assessment program, documenting the timing and method of assessments. Observations should be linked to a condition score.																
	5.4	Develop a corporate risk management program that is endorsed by Council. The program will identify system risks and provide a risk mitigation plan.																
	5.5	Define service policies with defined service goals and incorporate into the Asset Management Plan.																
	5.6	Update the corporate Strategic Plan to be relevant for the next five years.																
Improve Financial Planning	6.1	Identify cross-department initiatives during the budgeting process, and collectively determine funding requirements.																
	6.2	Examine long-term financial sustainability of the current funding strategies related to annual budgets, reserves, and debt.																
	6.3	Examine at least two funding scenarios, exploring varying tax rate increases, rates, debt and reserve usage, and project deferrals.																
Advance Project Prioritization	7.1	Develop business case templates, clearly indicating whole life costs, risks, and levels of service impacts of capital projects.																
	7.2	Structure an annual, formalized capital prioritization process. Document the risks of deferring projects when capital budgets are limited, using input from staff.																
	7.3	Utilize information as it becomes available for project prioritization.																

Appendix 2: Data Gap Analysis

Purpose of this document

This document contains a data gap analysis of the Municipality of Lakeshore's asset inventory as managed in Citywide Asset Manager's AMP 2022 database. Data for each asset category was evaluated against key characteristics of high-quality datasets, including completeness and accuracy.

Types of Data

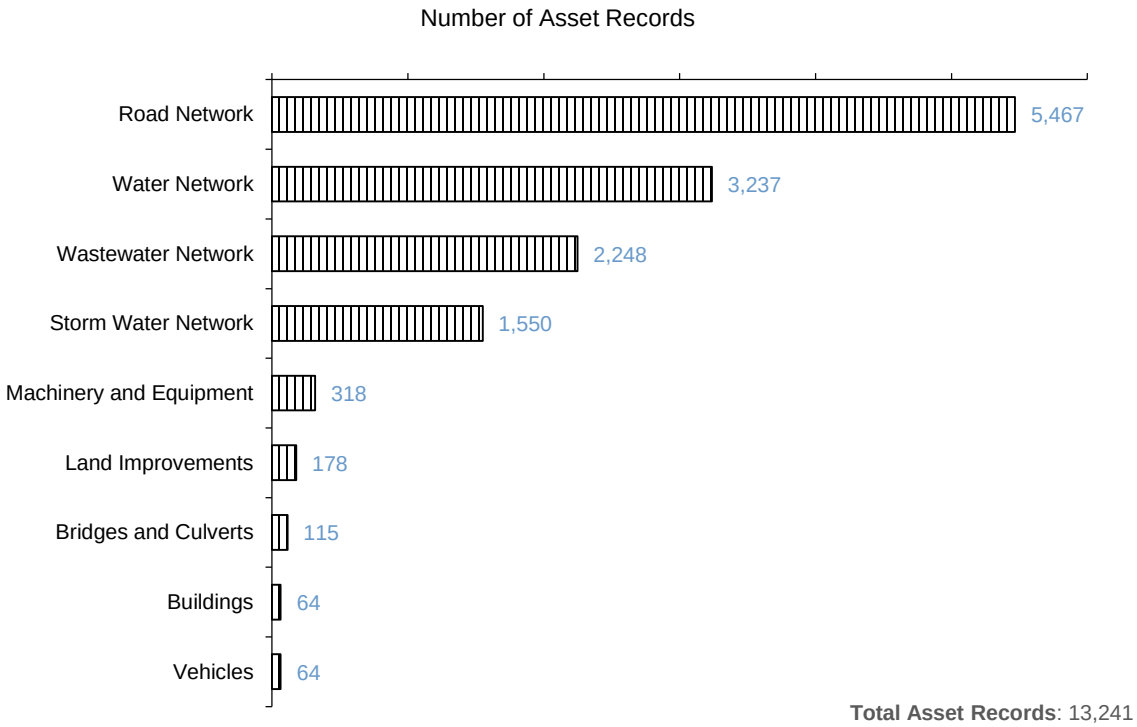
The quality of the Municipality's asset inventory data was assessed against primary and secondary data requirements. For the purpose of asset management, primary data includes five critical fields for each asset: quantity, in-service date, estimated useful life (EUL), replacement cost, and condition. This data is necessary for conducting asset management-related analysis and generating essential reports, such as portfolio valuations, condition summaries, forecasted replacement needs, and asset age profiles.

Secondary data includes various asset attributes that can support the development of risk frameworks. These can include material, size (e.g., pipe diameters), traffic data, break history, exposure to extreme weather events, etc. Assets can have many attributes.

Data Summary

The Municipality's asset inventory contains over 13,000 unique asset records, each with varying quantities. The road network contains the largest dataset. Figure 8 provides the number of asset records found for each of the 9 asset categories, as currently classified by staff. Table 1 provides a summary of other primary data fields.

Figure 8 Number of Asset Records in PSD Citywide Asset Manager AMP 2022 Database



Total Asset Records: 13,241

Table 25 Primary Data Summary by AMP Category

Category	Quantity	In-Service Dates	Estimated Useful Life (EUL)	Replacement Cost	% with Assessed Condition
Bridges and Culverts	218.84 m 1 m2	1940 - 2021	30 – 75 Years	$ 108,903,553	99%
Buildings	57 assets	1950 - 2020	10 – 75 Years	$ 81,865,013	0%
Land Improvements	433 assets 124.75 m 371 sq ft	1960 - 2020	0 – 50 Years	$ 12,320,954	0%
Machinery and Equipment	25,161 assets	1979 - 2020	4 – 100 Years	$ 11,766,506	0%
Road Network	7,432 assets 543,082.729 m 241,915.045 m2	1850 - 2021	10 – 100 Years	$ 534,045,705	88%
Storm Water Network	4 assets 112,712.180 m	1950 - 2021	25 – 100 Years	$ 119,871,087	0%
Vehicles	50 assets	2000 - 2020	8 – 20 Years	$ 8,368,079	0%
Wastewater Network	133 assets 176,280.590 m	1970 - 2021	6 – 100 Years	$ 85,051,810	0%
Water Network	73 assets 618,849.680 m	1950 - 2021	1 – 100 Years	$ 127,490,946	0%
Total	**33,457 assets** **1,451,273 m** **241,916 m2** **389,809 sq ft**	**1850 - 2021**	**1 – 100 Years**	**$ 1,400,141,415**	**41%**

Gap Analysis and Recommendations

This section includes a comprehensive gap analysis of each asset category as well as recommendations that may help address these gaps.

Table 26 Data Gap Analysis and Recommendations: Bridges & Culverts

Asset Category: **Bridges and Culverts**		Number of Asset Records: **115**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• 114 asset records have an Adjusted Quantity of 1, but the Unit of Measure vary from Length (m) to Area (m2). • The remaining asset record has an Adjusted Quantity greater than 1 and is measured in meters.	☐ Ensure that the Unit of Measure is correct for all asset records. With a quantity of 1, the Unit of Measure should likely be "Quantity".
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• All asset records contain an EUL, and they range from 30 to 75 years.	
Replacement Cost	• 114 asset records have a User-Defined replacement cost from 2021 or 2022. • The remaining asset record has a CPI inflated replacement cost from 2021.	
Condition	• 114 asset records have an assessed condition value from 2021.	
Asset Attributes	• Many attributes are available and populated, including Direction, Skew, Deck Width, Deck Length, Road Hierarchy, AADT, Bridge Type, and Number of Spans.	☐ The following additional attributes, if collected, would be useful for risk management: ☐ Load limits ☐ Vehicle clearance restrictions ☐ Detour distance ☐ Truck route (y/n) ☐ Proximity to critical services ☐ Exposure to extreme weather ☐ Vulnerability to extreme weather
General	• 113 asset records have a unique and alphanumeric Import ID. • All asset records have a description of the location of the structure.	

Table 27 Data Gap Analysis and Recommendations: Buildings

Asset Category: **Buildings**		Number of Asset Records: **64**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• 7 asset records have an Adjusted Quantity of 0 but remain in the active inventory.	☐ Review asset records and ensure the Adjusted Quantity field is accurate. ☐ Consider componentizing building assets using the Uniformat II Code standard.
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• All asset records contain an EUL, and they range from 10 to 75 years.	
Replacement Cost	• 61 asset records have a CPI inflated replacement cost from 2016. • 2 asset records have a replacement cost of $0, and have a non-zero Historical Cost. • 1 asset record is Not Planned For Replacement.	☐ Apply more accurate replacement costs. Recent contracts, invoices, tenders, etc., may offer useful benchmark for replacing like-for-like assets. Where possible, multiple projects should be used to estimate replacement costs. Consult with staff to develop rough estimates in the absence of procurement data. ☐ Consult with PSD to close replacement cost gaps where necessary.
Condition	• There is no assessed condition information.	☐ Integrate and upload any recent condition data, or consider a comprehensive assessment of the Municipality's buildings.
Asset Attributes	• There are some attributes, including Owner and various classifications/departments.	☐ The following additional attributes, if collected, would be useful for risk management: ☐ Building capacity ☐ Usage data, e.g., recreational facilities ☐ Regulatory data (e.g., hazardous material and asset retirement obligations (ARO), accessibility)
General	• There are no Import IDs.	☐ Consider appending descriptive and unique Import IDs.

Table 28 Data Gap Analysis and Recommendations: Land Improvements

Asset Category: **Land Improvements**		Number of Asset Records: **178**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• 19 asset records have an Adjusted Quantity of 0 but remain in the active inventory.	☐ Review asset records and ensure the Adjusted Quantity field is accurate.
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• 18 pond asset records have an EUL of 0 Months. • The EULs of other assets range from 10 to 50 years.	☐ Review asset records and ensure the EUL field is accurate.
Replacement Cost	• 124 asset records have a CPI inflated replacement cost from 2016 or 2017. • 52 asset records have a replacement cost of $0, and have a non-zero Historical Cost. • 2 lighting asset records have a Cost/Unit replacement cost from 2017.	☐ Apply more accurate replacement costs based on make and model.
Condition	• There is no assessed condition information.	☐ Integrate and upload any recent condition data.
Asset Attributes	• There are some attributes, including Owner, Dimensions (for ponds), and various classifications/departments.	
General	• There are no Import IDs.	☐ Consider appending descriptive and unique Import IDs.

Table 29 Data Gap Analysis and Recommendations: Machinery & Equipment

Asset Category: **Machinery and Equipment**		Number of Asset Records: **318**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• 23 asset records have an Adjusted Quantity of 0 but remain in the active inventory.	☐ Review asset records and ensure the Adjusted Quantity field is accurate.
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• All asset records contain an EUL and they range from 4 to 100 years.	
Replacement Cost	• 215 asset records have a CPI inflated replacement cost from 2016, 2017, 2020 or 2021. • 80 asset records have a replacement cost of $0, and 67 have a Historical Cost that could be inflated. • 23 asset records have a User-Defined replacement cost from 2016.	☐ Apply more accurate replacement costs based on make and model.
Condition	• There is no assessed condition information.	☐ Integrate and upload any recent condition data.
Asset Attributes	• There are attributes including VIN, Plate, and Vehicle Number.	☐ The following additional attributes, if collected, would be useful for risk management: ☐ Vendor ☐ Make, model, serial number ☐ Maintenance history
General	• There are no Import IDs.	☐ Consider appending descriptive and unique Import IDs.

Table 30 Data Gap Analysis and Recommendations: Road Network

Asset Category: **Road Network**		Number of Asset Records: **5,467**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• All road assets are measured in meters, but 7 asset records have an Adjusted Quantity of 1. • Sidewalk and trail assets are measured in meters and square meters, but 11 asset records have an Adjusted Quantity of 1.	☐ Ensure that the Adjusted Quantity is correct for assets measured in meters or square meters with a value of 1.
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• All asset records contain an EUL, and the range from 10 to 100 years. • Sidewalk assets have EULs of 15, 25, 28 or 30 years. • Trail assets have EULs of 14, 15, 30, 50 or 100 years.	☐ Ensure that similar assets across a segment have consistent EULs.
Replacement Cost	• 4,905 asset records (including assets from all segments) have a CPI inflated replacement cost from 2021. • 340 road and sidewalk asset records have a Cost/Unit replacement cost from 2022. • 216 streetlight asset records have a User-Defined replacement cost from 2022. • 6 road asset records are set to Not Planned For Replacement.	☐ Replacement costs should be applied consistently across similar assets in a segment. Unit costs are recommended for linear road and sidewalk assets. ☐ Recent contracts, invoices, tenders, etc., may offer useful benchmark for replacing like-for-like assets. Where possible, multiple projects should be used to estimate replacement costs. Consult with staff to develop rough estimates in the absence of procurement data. ☐ Consult with PSD to close replacement cost gaps where necessary.
Condition	• 1,416 asset records have an assessed condition value from 1990, 2010, 2018 or 2021. • For road assets, 94% of asset records have a condition assessment.	☐ Upload any recent condition data, e.g., from recent roads needs studies.
Asset Attributes	• There are many attributes including Road Hierarchy, Road Type, Road Class, Road Patrol, Speed Limit, Segment From, and Segment To.	☐ The following additional attributes, if collected, would be useful for risk management: ☐ Material ☐ Pavement Width ☐ Traffic Restrictions ☐ Number of lanes ☐ Collision data ☐ Ride comfort rating ☐ Proximity to critical services ☐ Exposure to extreme weather ☐ Vulnerability to extreme weather

General	• 1,414 asset records contain an Import ID.	☐ Consider appending descriptive and unique Import IDs to all asset records.

Table 31 Data Gap Analysis and Recommendations: Stormwater Network

Asset Category: **Storm Water Network**		Number of Asset Records: **1,550**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• 4 storm water main asset records have an Adjusted Quantity of 1 and are measured in meters. • 4 storm water main asset records are measured as a Quantity.	☐ All storm main assets should be measured in meters, and those with and Adjusted Quantity of 1 should be reviewed.
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• All asset records have an EUL, and they range from 25 to 100 years. • All asset records have a Profile Lifecycle EUL of 75 years, but 475 have a Lifecycle EUL Override.	☐ Review all EUL fields as the override is currently making the EULs inconsistent across storm mains.
Replacement Cost	• 1,043 asset records have a Cost/Unit replacement cost from 2022. • 507 asset records have a CPI inflated replacement cost from 2021.	☐ Replacement costs should be applied consistently across similar assets in a segment. Unit costs are recommended for linear storm main assets. ☐ Recent contracts, invoices, tenders, etc., may offer useful benchmark for replacing like-for-like assets. Where possible, multiple projects should be used to estimate replacement costs. Consult with staff to develop rough estimates in the absence of procurement data. ☐ Consult with PSD to close replacement cost gaps where necessary.
Condition	• There is no assessed condition information.	☐ Integrate and upload any updated or recent condition data.
Asset Attributes	• There are attributes including Diameter, Pipe ID, and Pipe Material.	☐ The following additional attributes, if collected, would be useful for risk management: ☐ Surrounding environment (e.g., rural/urban, etc.) ☐ Blockage or backup history ☐ Connection to or proximity to critical services ☐ AADT of associated road section ☐ Soil analysis ☐ Flood plain mapping analysis ☐ Exposure to extreme weather ☐ Vulnerability to extreme weather
General	• 1,360 asset records have a Pipe ID field but they are inconsistent in format and may not be globally unique.	☐ Consider appending descriptive and unique Import IDs to all asset records. ☐ The storm water inventory should be reviewed to ensure all major components and segments are fully captured. Currently only storm mains are captured with no storm structures.

Table 32 Data Gap Analysis and Recommendations: Vehicles

Asset Category: **Vehicles**		Number of Asset Records: **64**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• 14 asset records have an Adjusted Quantity of 0 but remain in the active inventory.	☐ Review asset records and ensure the Adjusted Quantity field is accurate.
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• All asset records contain an EUL, and they range from 8 to 20 years.	
Replacement Cost	• 55 asset records have a User-Defined replacement cost from 2018 or 2020. • 9 asset records have a replacement cost of $0, but have a Historical Cost that could be inflated.	☐ Replacement costs should be updated to reflect current pricing.
Condition	• There is no assessed condition information.	☐ Integrate and upload any updated or recent condition data.
Asset Attributes	• There are additional attributes including VIN, Plate, and Vehicle Number.	☐ Vendor data and maintenance history can also be useful for developing risk frameworks.
General	• 54 asset records have a Vehicle Number, but since they are numeric they may not be globally unique.	☐ Consider appending descriptive, unique and alphanumeric Import IDs to all asset records.

Table 33 Data Gap Analysis and Recommendations: Wastewater Network

Asset Category: **Wastewater Network**		Number of Asset Records: **2,248**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• All asset records contain a non-zero adjusted quantity. • All sewer main assets are measured in meters.	
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• All asset records have an EUL, and they range from 6 to 100 years. • 93% of sewer main assets have a Profile Lifecycle EUL of 75 years, but 56% have a Lifecycle EUL Override.	☐ Review all EUL fields as the override is currently making the EULs inconsistent across sewer mains.
Replacement Cost	• 1,557 asset records have a Cost/Unit replacement cost from 2022. • 691 asset records have a CPI inflated replacement cost from 2021 or 2022.	☐ Replacement costs should be applied consistently across similar assets in a segment. Unit costs are recommended for linear sewer main assets. ☐ Recent contracts, invoices, tenders, etc., may offer useful benchmark for replacing like-for-like assets. Where possible, multiple projects should be used to estimate replacement costs. Consult with staff to develop rough estimates in the absence of procurement data. ☐ Consult with PSD to close replacement cost gaps where necessary.
Condition	• There is no assessed condition information.	☐ Integrate and upload any updated or recent condition data.
Asset Attributes	• There are some additional attributes including Pipe Material, Diameter, and Type.	☐ The following additional attributes, if collected, would be useful for risk management: ☐ Surrounding environment (e.g., rural/urban, etc.) ☐ Blockage or backup history ☐ Connection to or proximity to critical services ☐ AADT of associated road section ☐ Soil analysis ☐ Flood plain mapping analysis ☐ Exposure to extreme weather ☐ Vulnerability to extreme weather
General	• 2,170 asset records have an Import ID, which are consistent in format.	

Table 34 Data Gap Analysis and Recommendations: Water Network

Asset Category: **Water Network**		Number of Asset Records: **3,237**
Data Type	**Gap Analysis**	**Recommendations**
Quantity	• All asset records contain a non-zero adjusted quantity. • All water main assets are measured in meters.	
In-service Date	• All asset records contain an in-service date.	
Estimated Useful Life	• All asset records have an EUL, and they range from 1 to 100 years. • 99% of sewer main assets have a Profile Lifecycle EUL of 75 years, but 88% have a Lifecycle EUL Override. • 8 asset records have an EUL of 1 Year 8 Months	☐ Review all EUL fields as the override is currently making the EULs inconsistent across water mains. ☐ Review asset records with EUL of 1 Year 8 Months. The Lifecycle EUL Override can be used to capture the service life of the assets without affecting amortization.
Replacement Cost	• 2,782 asset records have a Cost/Unit replacement cost from 2022. • 436 asset records have a CPI inflated replacement cost from 2021. • 19 asset records have a replacement cost of $0 and a historical cost of $1.	☐ Replacement costs should be applied consistently across similar assets in a segment. Unit costs are recommended for linear water main assets. ☐ Recent contracts, invoices, tenders, etc., may offer useful benchmark for replacing like-for-like assets. Where possible, multiple projects should be used to estimate replacement costs. Consult with staff to develop rough estimates in the absence of procurement data. ☐ Consult with PSD to close replacement cost gaps where necessary.
Condition	• There is no assessed condition information.	☐ Integrate and upload any updated or recent condition data.
Asset Attributes	• There are some additional attributes for Diameter, Pipe Material, VIN, Plate, and Vehicle Number.	☐ The following additional attributes, if collected, would be useful for risk management: ☐ Slope data ☐ Bury depth ☐ Surrounding environment (e.g., rural/urban, etc.) ☐ Number of connections ☐ Break history ☐ Connection to or proximity to critical services ☐ AADT of associated road section ☐ Model for hydrants ☐ Joint treatment ☐ Soil analysis ☐ Flood plain mapping analysis ☐ Exposure to extreme weather ☐ Vulnerability to extreme weather
General	• 3,171 asset records have an Import ID which are consistent in format.	

Summary of Recommendations

- Ensure that all active asset records have a non-zero adjusted quantity and that the unit of measure is correct.
- Review EULs to ensure they are consistent across similar assets in a segment.
- Ensure that replacement costs are current and non-zero for all asset records that will be replaced.
- Integrate and upload any available condition assessments, including OSIM, CCTV, and staff inspections.
- Populate or add additional attributes where available to help with building risk models.
- Consider generating and appending descriptive and unique IDs to those without.

Next Steps

This data gap analysis should be reviewed by departmental leads and other technical experts. Data gaps should then be prioritized based on their criticality, availability of information, and relevance to O. Reg compliance.

Appendix 3: Supporting Information

AM Coordinator General Description

The asset management coordinator (AMC) works with the Municipality's departments to develop and maintain a well-functioning asset management program. This includes completing all asset management related initiatives and processes, implementing, and maintaining systems and applications, and completing all pertinent reporting. Acting in this way, the asset management coordinator will ensure alignment or 'line-of-sight' between council's mandate, the long-term vision and direction, and departmental priorities for managing assets, as well as supporting departments to bring on new tools, processes, and systems. This role also ensures completion of relevant grant applications to secure maximum senior government funding, and in doing so, bridges Finance and operational groups to better optimize infrastructure budgets and communicates risks and benefits of infrastructure projects to the corporation.

Business Case for Lakeshore

The goal of asset management is to ensure that limited funds are spent on the right assets, at the right time, in the right way to bring the maximum value to the community at the lowest cost. The asset management coordinator functions as a single point of accountability in support of this important, overarching goal.

Increasingly, senior government funding programs are conditional on asset management reporting. Under Ontario Regulation 588/17, the Ministry of Infrastructure (MOI) now requires all municipalities to produce detailed asset management plans. (AMPs) Failing to meet these requirements may have funding and eligibility implications under both the Ontario Community Infrastructure Fund (OCIF) and through the Canada Infrastructure Program (ICIP). With municipal budgets, this would result in lost opportunities to invest in public infrastructure and potential deferral of important projects. As part of his or her responsibilities, an asset management coordinator would provide corporate oversight on asset management practices to ensure the Municipality is eligible for all senior infrastructure funding programs.

The asset management coordinator provides holistic analysis on infrastructure programs, with the aim of balancing the Municipality's fiscal capacity, the quality of the infrastructure services promised and delivered to constituents and minimizing associated risks. The analysis produced by the asset management coordinator can hold administration accountable for decision-making and improve transparency of infrastructure decisions. As the analysis also typically involves identification of long-term infrastructure needs, the data can be used to gradually build reserve levels and keep tax and utility rates stale. Ultimately, this can support effective communication with the community when difficult decisions need to be made.

To optimize departmental infrastructure programs, and improve collaboration across the organization, the Municipality will need to bring on new tools, processes, and systems—the implementation and maintenance of which require substantial additional staff time and effort. Some examples of these initiatives include building and maintaining asset inventories, implementing maintenance management systems, developing standardized data and business case templates, and

developing models and projections to compare different infrastructure investment scenarios. Most of this work can be consolidated and centralized with the asset management coordinator, alleviating capacity pressures.

Description of AM Coordinator Responsibilities

- Assist in establishing, developing, implementing, and administration of asset management plans, standards, strategies, policies, and procedures for all assets
- Reviewing risk and levels of service documentation, identifying existing and future infrastructure needs
- Lifecycle studies and evaluations to determine short and long-term rehabilitation and replacement needs
- Assist in the development of annual operating and capital budgeting requirements
- Asset management data and condition collection through field inspections
- Data entry and maintenance of asset information and financial data into AM systems while ensuring data integrity
- Identification of data gaps within asset inventory
- Provide training for staff, council and other stakeholders related to the AM program
- Ensuring regulatory compliance and other internal policies relating to AM
- Ensuring departmental asset programs align with corporate strategic direction/vision
- Researching best practices and emerging trends related to AM or financial planning

Risks of Forgoing an AM Coordinator Position

- Missed infrastructure funding opportunities
- Continuation of 'worst first' approach to infrastructure spending, and missed opportunities to cut costs and avoid unplanned asset failures by completing cheaper, timely, and more proactive maintenance and repairs
- Asset management plans, policies, and strategies may not be implemented
- Misalignment of municipal strategic goals/vision and individual service areas
- Difficulty meeting the levels of service for the community as well as any future levels of service goals
- Improper prioritization and allocation of budget to the right infrastructure projects, leading to potential service disruptions, and public dissatisfaction
- Unconsolidated, inaccurate, and outdated asset database
- Improper use of infrastructure management systems (e.g., work order and maintenance management systems)
- Inability to clearly communicate asset risks to the broader public

Business Case Template

Date	
Project Name	
Capital Code	
Project Manager	

The Project

Describe the business need for completing the project

-

Project History

Describe current work that has been completed to address this business need

-

Potential Solutions

Complete the Table below to describe solutions

Solution	Description	Total CAPEX	Impact on Operating

Chosen Solution

Describe the rationale for selecting the chosen solution:

-

Risks and Benefits of Chosen Solution

Indicate the level of impact the proposed solution has in reducing risk or providing benefits (L = low, M = moderate, H = high). Where categories don't apply, leave as N/A

	Project Impact (L, M, H)	Description
Risk Reduction		
Benefit – Cost Efficiency		
Benefit – Reliability		
Benefit – Safety		
Benefit – Regulatory Compliance		
Benefit – Enhanced Service		

Financial Expenditure of Chosen Solution

	Year 1	Year 2	Year 3	Year 4	Year 5
CAPEX ($)					
OPEX ($)					

Total Capital Expenditure:

Change Log

Version	Updated By	Date of Revision

Approval

X _____

Project Manager

X _____

Finance

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