



Report to: General Committee

Meeting Date: October 22, 2024

SUBJECT: 2024 Asset Management Plan
PREPARED BY: Denny Boskovski, Manager, Corporate Asset Management
Sustainability & Asset Management, Extension 6190

RECOMMENDATION:

1. That the report and presentation titled “2024 Asset Management Plan” be received; and,
2. That Council endorse the findings from the update of the City’s Asset Management Plan, for all city owned and/or managed assets assessed at current levels of service; and,
3. That Council direct staff to submit the 2024 Asset Management Plan (the document) to the Ministry of Infrastructure, informed by the findings noted under Recommendation two and as outlined in this report; and make the document publicly available on the City’s website upon its completion; and,
4. That Staff be authorized and directed to do all things necessary to give effect to this resolution.

EXECUTIVE SUMMARY:

The report seeks Council’s endorsement of findings from the update to the City’s asset management plan, which is required to maintain our compliance with Ontario Regulation 588/17. The regulation requires the 2024 update to include an assessment of all City assets based on current service levels, and to provide financial projections (minimum of 10 years). The findings are summarized as follows:

- The City’s assets have a combined current replacement value of \$17.5B
- City’s asset portfolio is relatively young (average age 33 years and average service life 81 years)
- City’s assets are in a GOOD state of performance (nearly 90 per cent)
- Additional funding will be required for asset repair and replacement, as well as asset acquisition to support growth (610,500 residents and 301,600 jobs by 2051)
- The City is applying and should continue to improve its asset management practices, including governance, standards, data management, and resource planning

The findings from the update to the asset management plan will inform the 2024 Asset Management Plan (the document), which is expected to be finalized before year end. Once the formal document is complete, staff will submit it to the Ministry of Infrastructure and post it on the City’s publicly facing website. This will conclude our regulatory requirements for phase three.

PURPOSE:

The purpose of this report is to seek Council’s endorsement of the findings from the update to the City’s asset management plan, which will inform the finalization and submission of the 2024 Asset Management Plan (the document) as required by Ontario Regulation 588/17.

BACKGROUND:

Provincial legislation has been enacted requiring all municipalities to implement asset management planning

In 2015, the province passed the [Infrastructure for Jobs and Prosperity Act](#) with [Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure](#), filed under this act. The regulation sets out detailed requirements for municipalities to ensure the long-term sustainability of municipal infrastructure through the preparation of a Strategic Asset Management Policy and a comprehensive Asset Management Plan (AMP) and companion Financial Strategy, through four phases or milestones, by July 1, 2025.

The regulatory phases and ongoing requirements are:



To date, the City has fulfilled phases one and two of the regulation with the 2024 Asset Management Plan (2024 AMP) fulfilling phase three requirements. Staff note that phase three was due on July 1, 2024. In consultation with the Ministry of Infrastructure, this date was recalibrated to October 2024. The 2025 Asset Management Plan and Financial Strategy due on July 1, 2025, fulfills phase four (and final phase) of the regulation.

Previous and current undertakings include:

- 2016 Corporate Asset Management Plan
- 2019 Asset Management Audit by MNP LLP
- **Regulation phase 1** - 2019 Asset Management Policy
- 2021 Corporate Asset Management Program Review and Strategic Roadmap
- **Regulation phase 2** - 2021 Corporate Asset Management Plan
- 2021 Enterprise Asset Management (EAM) Software – Lucity Implementation (Phases 2 complete, Phase 3 scheduled to be complete in Q1 2025)
- 2022 Natural Assets Inventory and Evaluation
- **Regulation phase 3** - 2024 Asset Management Plan (subject of this report)
- Corporate Asset Management Strategy and Governance Framework (underway)

OPTIONS/ DISCUSSION:

Asset Management is the coordinated activity of an organization to realize value from assets by balancing costs, risks, opportunities and performance benefits, in a sustainable manner. It considers all asset types and includes all activities involved in an asset's life cycle including planning, acquisition and the impacts of growth, operations, maintenance, renewal and disposal of any remaining liabilities.

Having said this, asset management best practice ensures that:

- **Value** – That the value proposition that assets support, from their initial acquisition, through to their renewal or replacement, stays in the forefront as customer and stakeholder needs change over time.
- **Alignment** – That organizational objectives translate into holistic and informed technical and financial decisions, and ensure that we are doing what we “say” is important.
- **Leadership & Workplace Culture** – That decision makers stay informed of the asset management system's state of maturity (outlines current state of capabilities and capacity to provide key functions), and of our asset's current state of performance.
- **Assurance** – That assets fulfill their required purpose by ensuring that processes link asset purpose and performance to strategic objectives, and checks that the City “gets” what it set out to achieve.

Markham is projected to grow in population (people) and employment (jobs) to 610,500 and 301,600 respectively by 2051. Demands for services from customers and stakeholders alike will also evolve and continue to compete for limited resources throughout this journey of growth and intensification.

As a result, modernization and integration of the City's asset management governance, systems and processes, aims to develop sustainable service levels and practices that balance costs, residual risks, and acceptable performance results. The benefits of a modern and integrated asset management system and practice will position the City to successfully manage current and anticipated future service pressures and be a powerful enabler. Additional benefits include:

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- Support holistic and informed asset investment decisions
 - Support financial and asset performance
 - Enhance risk management within a common framework
 - Improve services and outputs
 - Demonstrate sustainability, climate change and community social responsibility
 - Demonstrate regulatory and industry compliance
 - Enhance the City's reputation
 - Improve organizational sustainability
 - Improve efficiency and effectiveness of resources, data and information

The 2024 Asset Management Plan is a multi-disciplinary guiding document that considers all City strategies and regulatory and community-based business drivers

Asset management plans play an important role in municipal planning, informing the amount and timing of funding to maintain, repair or replace assets, ensuring that they are in a good state of performance and support desired service levels. The City uses information from asset management plans, such as condition assessments, as an input into work plans, operating and capital budgets, and financial strategies, including updates to City's Life Cycle Reserve and the Waterworks Stabilization/ Capital Reserve studies. An asset management plan itself is a decision-making tool, which informs the financial strategy required to achieve a desired level of service, while balancing or minimizing risks.

The 2024 Asset Management Plan is the 3rd of 4 phases required to satisfy O. Reg. 588/17. Scope of this plan includes:

- All known assets that the City owns and manages
- An assessment of the current state of the infrastructure, including asset replacement values and current asset performance
- An assessment of the current levels of service provided to the community
- Documentation of the lifecycle activities required to maintain current service levels
- A risk assessment of the City's assets
- A financial summary outlining the cost requirements to maintain current service levels through to 2051
- Plan is based upon 2023 year-end data

The process of developing this asset management plan resulted in the development or establishment of several industry best practice frameworks and tools that will support the City's asset management program well into the future. These include:

- A service-centric asset hierarchy that details the relationships between assets and the services they provide to the community
- In-house growth model forecasting future asset acquisitions and resource needs
- Levels of service framework and performance measures
- Risk management strategy and risk ratings aligned to assets
- Life cycle renewal forecast computational model

The State of the Infrastructure

The City's assets have a combined current replacement value of **\$17.5B**. This means that it would cost the City approximately \$17.5 billion should it replace all of its assets today.

Figure 1 below provides a breakdown of asset current replacement value organized by the services they support. The previously endorsed 2021 Asset Management Plan established that all City assets have a combined replacement value of \$9.63B. The increase in overall value is attributed to:

- The updating of replacement cost unit rates (including accounting for inflation)
- Increase in quantities of assets related to:
 - new assets acquired since the 2021 Asset Management Plan
 - inclusion of natural assets
 - improvements to the currency and accuracy of base-data inflows

Specifically, the road pavement component of the Transportation Service represents the largest material change due to an increase in their current replacement value and life cycle renewal unit rates where:

- Road value from the 2021 Asset Management Plan = \$768M
- Road value from the 2024 Asset Management Plan = \$7.149B

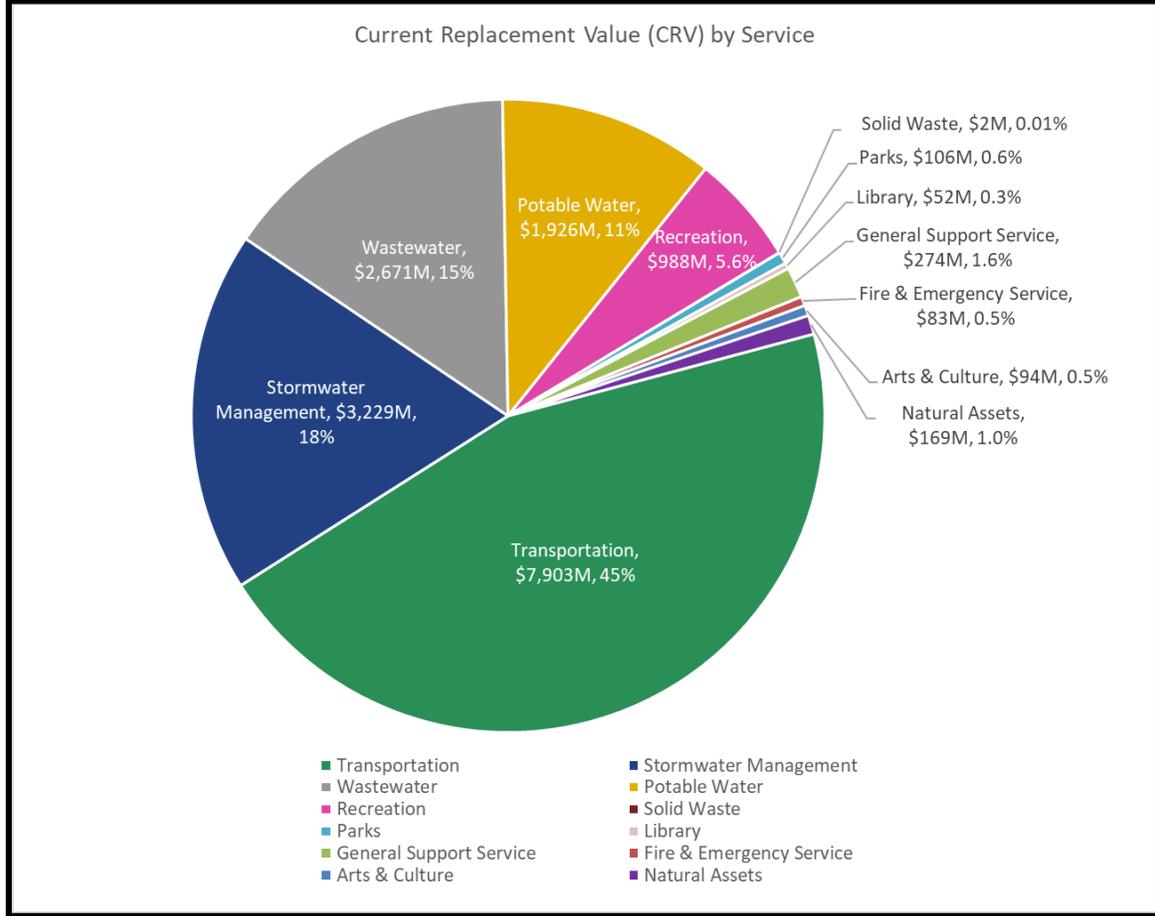
Current replacement value means the total cost to replace an asset like-for-like. Markham's standard practice to maintain roads in a good state of performance is to provide preventative maintenance including road resurface ("shave and pave"). For the 2021 Asset Management Plan, resurfacing unit rates were used to determine a road's current replacement value.

The 2024 Asset Management Plan uses industry best practice to determine the full replacement cost of assets. Staff note that the updated value is aligned with other GTA based municipalities and was recommended by GEI Consultants Inc. (formerly GM BluePlan Engineering Limited), whom were retained to develop the 2024 Asset Management Plan.

Staff also note that this change will not affect the Lifecycle Reserve Study for resurfacing as resurfacing unit rates continue to be used to determine the cost to resurface a road. Staff will review and adjust the proposed annual capital budget based upon changes to the road network size, condition ratings, and identified needs as they come forward.

While this increase may be perceived as significant, it is an example of **asset management best practice achieving** what it sets out to accomplish. In this instance, to continuously improve an organization's data accuracy.

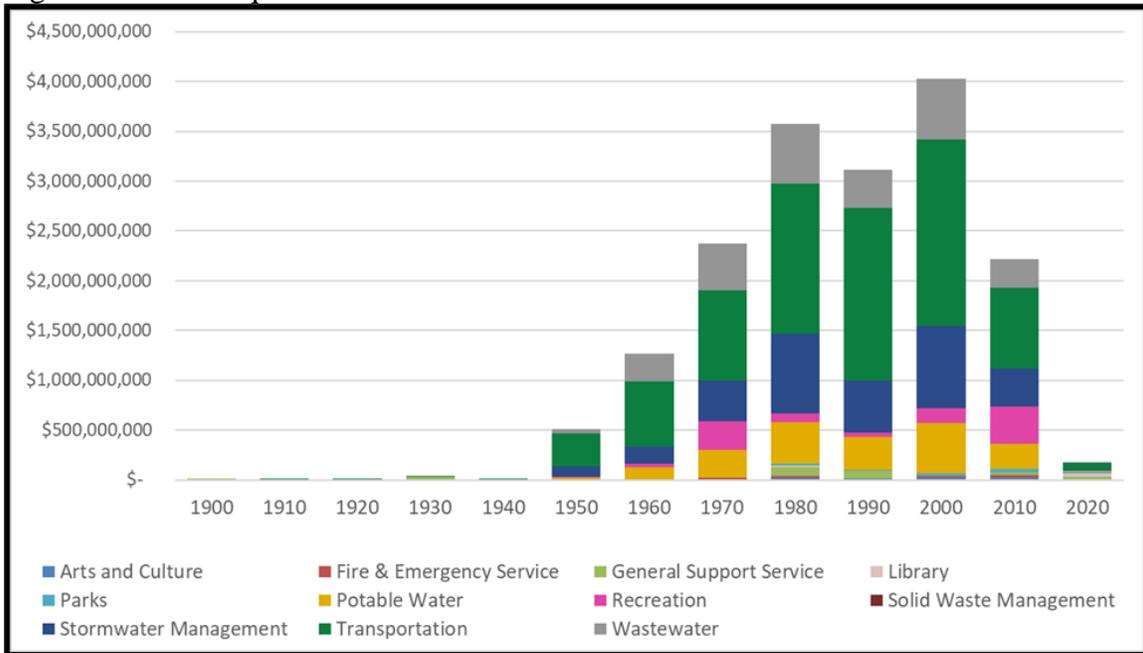
Figure 1: Asset Current Replacement Value by Service



Most of the City’s assets were acquired from the 1980s through to the 2000s

Historically, asset acquisitions supporting growth peaked from the 1980s through to the 2000s. Figure 2 highlights the City’s asset acquisition profile organized by service. It is typical to see population growth and construction peaks beginning in the 1970s for many GTA municipalities.

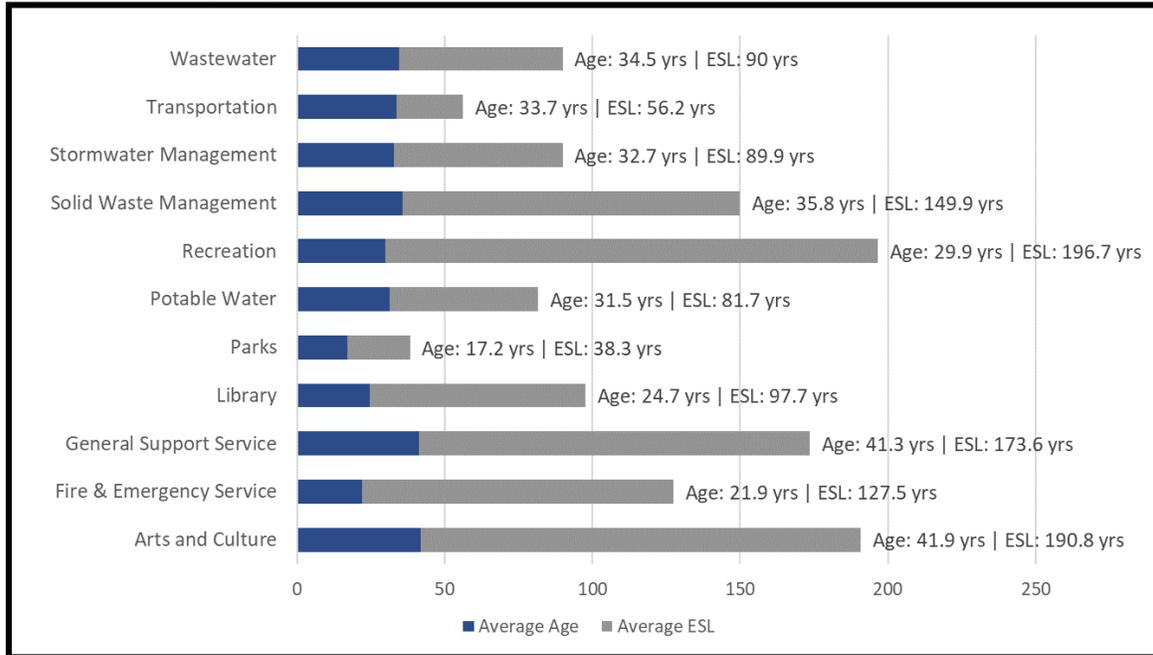
Figure 2: Asset Acquisition Profile



Overall, the City’s combined asset portfolio has an average age of 33 years and average useful service life of 81 years. Figure 3 below highlights the average age of assets compared with their average estimated service life. Furthermore, this figure highlights the degree of service life “consumption” at a macro level.

Generally, the City’s assets are in the earlier stages of their service life. This indicates that City assets on average should experience lower maintenance and renewal pressures. As assets continue to age, the City will see an increase in maintenance and renewal pressures, of which will generally correspond with historical and/or significant construction peaks noted in Figure 2. This is a primary benefit of integrated asset management planning where use of a long-term lens to forecast and identify financial pressures into the future provides the City with improved capabilities to proactively plan its approach to keep assets in a good state of performance.

Figure 3: Average Age and Estimated Service Life Profile by Service



Overall, the City’s assets are in a GOOD state of performance

The assessment rating system used in this asset management plan is aligned with the Canadian Infrastructure Report Card methodology. This system provides a standardized and descriptive framework that allows for comparative benchmarking across all services and asset portfolios. Figures 4 and 5 below highlight the distributed performance state of the City’s assets including an explanation of what each category state means.

Overall, the combined average performance rating for all assets is **GOOD** and have remained in this state since staff last reported to Council through the endorsed 2021 Asset Management Plan. Specifically:

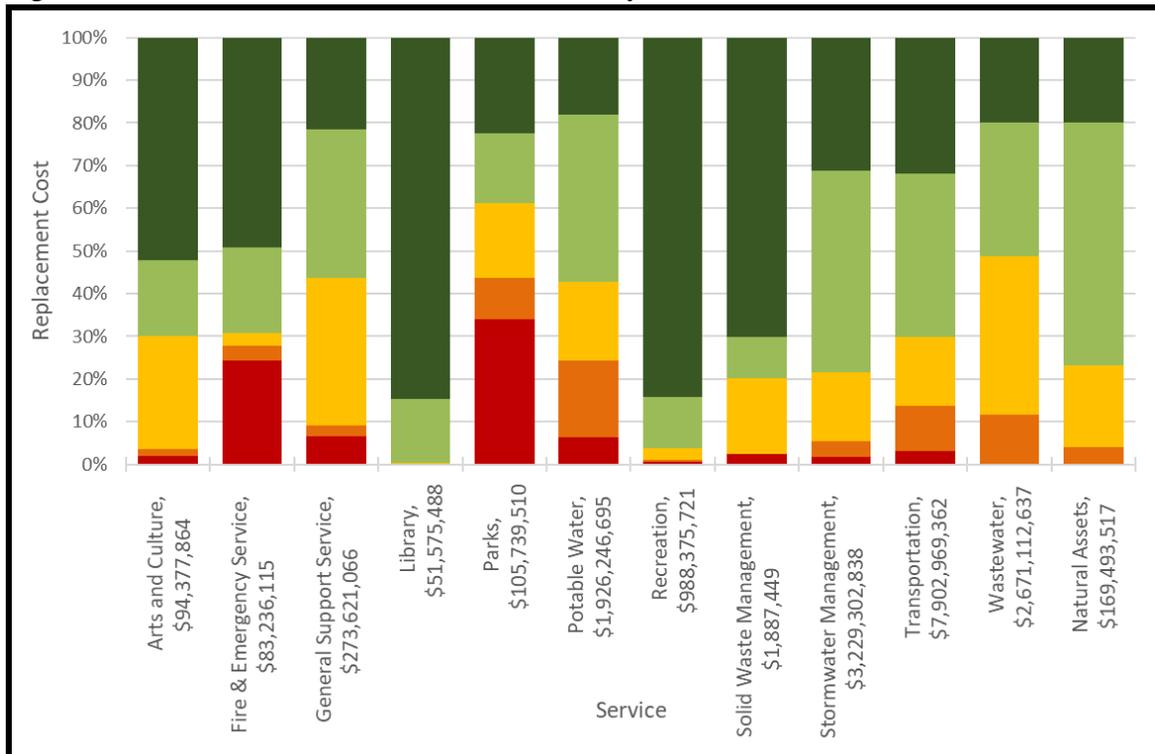
- 88% of assets are generally within the first half of their useful service life and are performing as intended
- 12% of assets are generally within the latter half of their useful service life and are the subject of planned maintenance and/or renewal life cycle activities

The objective is to ensure that assets remain fit for purpose and continue to deliver services to the community long into the future. By continuing to monitor asset performance, the City can be proactive in its approach to managing assets in a state of performance.

Figure 4: Overall Asset Performance State



Figure 5: Asset Performance State Distribution by Service



Markham is poised to grow significantly by 2051

The 2022 York Region Official Plan identifies growth forecasts that the City is responsible for implementing. York Region's plan forecasts that population will grow to approximately **610,500 residents and 301,600 jobs by 2051**. Growth within Markham will primarily be accommodated through development within designated growth areas (typically green fields) and intensification within strategic growth areas (Yonge Street corridor, etc.).

Ontario Regulation 588/17, Section 5.(2).6.vi, requires the City to integrate the following information into their asset management plans:

“For each of the 10 years following the year for which the current levels of service under paragraph 1 are determined, the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth, including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets.”

To support asset management requirements and inform more granular financial planning, staff developed growth projections that align the City's land use policies with the population and employment projections noted above. **Preliminary projections suggest possible asset growth needs averaging a 74% increase across all portfolios with resource needs averaging a 70% increase.** This growth in asset base will require additional funding and resourcing to adequately support acquisition, operations, maintenance and renewal pressures (see Financial Considerations).

Three industry best practice frameworks and tools were developed for this plan

Asset management is a centre of excellence that directly informs financial planning, annual business planning, budget allocation and expected performance results. Frameworks, standards and tools work to better coordinate the activities of an organization and improve upon its capabilities. The following are new “tools in the toolbox” that will complement the development the City's 2025 Asset Management Plan and Financial Strategy, and be further operationalized and integrated within the City's systems and processes over time.

1. Levels of Service

A level of service (LOS) is a measure of “what” the City provides to the community and the nature and quality of that service. Many activities may be directly driven by legislated requirements, as well as by federal, provincial and City strategic objectives. **This framework is key to linking service levels (effort) with expected performance results (condition, function or capacity).** Service levels are defined in three ways; customer values, customer/ community levels of service, and technical levels of services.

- Customer Values: summarizes the different customer expectations of each service

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- Customer/community LOS: contains a suite of LOS measures that focus on customer experiences that use language that is familiar to the community.
 - Technical LOS: details measures that the City uses to understand if it is managing assets to the level appropriate to meet community expectations.

In summary, technical service levels represented by our day-to-day work programs provided at their current provision, result in customer service levels (the asset's resulting performance state), that work to satisfy customer values and deliver the City's strategic objectives.

2. Risk Management Strategy

The purpose of a Risk Management Strategy is to detail the City's approach to evaluating risk, as well as the risks associated with the current state of assets and service areas. As part of the development of the 2024 AMP, a risk management strategy was developed to assess the risks of the City's asset portfolio. This was done by evaluating the likelihood of failure (LOF) and consequence of failure (COF) of each asset using a standardized framework.

LOF represents the likelihood of an asset failing, relative to a specific failure event. For the purposes of the 2024 AMP, asset failure refers to failure due to poor condition, resulting in the asset no longer functioning as intended, and/or inability to provide its intended service. Therefore, the LOF of an asset is linked to its condition and is rated on a scale of 1 to 5.

The COF framework defines the consequences that may occur should an asset fail or stop providing its intended service. The City's COF framework contains evaluation criteria, which were developed using a "triple bottom line" analysis, which evaluates the financial, social, and environmental consequences, also on a scale of 1 to 5.

LOF and COF scores are multiplied together to determine an overall risk rating score out of a maximum score or highest risk of 25. The City's risk management framework is a new analytical tool that ranks all assets from very low risk through to very high risk, and can be used to better inform departmental business planning and decision making, specifically to determine where investment is best made within an environment of limited resources. Results from this analysis indicate that:

- 48.8% or \$8.5B of all assets assessed as Very Low risk or fit for future use
- 44.4% or \$7.8B of all assets assessed as Low risk or adequate for now
- 6.4% or \$1.1B of all assets assessed as Moderate risk or may require attention
- 0.4% or \$67.5M of all assets assessed as High risk or requires attention
- **NO ASSETS are assessed as Very High risk or unfit for sustained service**

Staff note that an asset assessed as moderate risk or higher does not necessarily mean that an asset should be replaced, but rather highlights the significance of the asset in the context of the service it supports. This in turn informs the planning and integration of robust mitigation strategies within regular day to day operating and maintenance practices or better inform future renewal needs.

3. Life Cycle Renewal Strategies and Computational Model

Life cycle is a term used to document activities and their costs throughout all stages of an asset's life. Lifecycle activities and/or events generally consist of day-to-day activities of an organization to provide services. These activities are organized into categories that include; acquisition, operations, maintenance, renewal and disposal.

The City generally employs 2 methods of renewal which are defined as:

- Rehabilitation – significant works or repairs that extend an asset's service life
- Replacement – replacement of an asset with another like-asset

The 2024 Asset Management Plan developed a computational model that integrates the decision-making logic that departments principally use to determine when an asset will require renewal at a macro level. Renewal unit rates determine the cost of the activity. The computational model does not consider more advanced resource optimization strategies such as strategically deferring or bundling renewal activities in order to realize an economic, social or environmental benefit. Those nuances in business planning remain at the discretion of staff.

Outputs from the model and how they relate to the City's budgeting trends and process is discussed further in the Financial Considerations section of this report.

The City's commitment to continuous improvement is a journey that never ends

Ontario Regulation 588/17, Section 3.(1).3, requires the City to document:

“The municipality's approach to continuous improvement and adoption of appropriate practices regarding asset management planning.”

Under the supervision of the Asset Management Steering Committee, Corporate Asset Management has embarked on an evaluation of the City's current capabilities in order to determine the City's approach to continuous improvement and adoption of appropriate practices regarding asset management planning. This can also be referred to as modernization.

The Corporate Asset Management Strategy and Governance Framework project (in progress) has assessed the City's current state of practice compared with industry best practice. The industry refers to this exercise as a maturity assessment. The goal of the maturity assessment is to determine if there are any gaps in the City's practices and how well coordinated practices are. Maturity assessment findings are scored using the following categories; 0-innocent, 1-aware, 2-developing, 3-core, 4-optimizing and 5-excellent.

The City has completed a maturity assessment with the results shown in Figure 6 below.

Figure 6: Maturity Assessment Results



Markham aspires to mature our asset management planning capabilities to a “core” (3.0) rating across all eight areas.

Staff note that most municipalities in Ontario are below a “core” rating. Improvement strategies that will bring the City to a “core” rating are in the early stages of development.

Emerging improvement strategy themes include:

- Defining and evaluating asset management governance, roles and responsibilities
- Consistent and formalized standards, processes and procedures
- Improved data and information
- Formalized resource planning
- Improved demand/ growth analysis
- Stakeholder engagement
- Acquire and/or improve upon supporting systems, tools and integrations

Further updates from this important work will be socialized as new information becomes available.

In closing, staff are finalizing the formal 2024 Asset Management Plan (the document) with its completion expected before year’s end. Once the formal document is complete,

staff will submit it to the Ministry of Infrastructure and post it on the City's publicly facing website. This will conclude our regulatory requirements for phase 3.

FINANCIAL CONSIDERATIONS

Endorsement of this report and the 2024 Asset Management Plan has no immediate financial impacts.

Subject to further analysis and assessment, the findings should help inform the development of future financial plans. These include the asset management financial strategy that will accompany the 2025 update of the Asset Management Plan. Phase 4 of the regulation requires the City to build upon the endorsed 2024 Asset Management Plan in order to consider "proposed or appropriate" levels of service, and develop a financial strategy that outlines how the City will fund said level of service. Council will be required to endorse this plan and financial strategy by July 1, 2025. As with any resource planning exercise, discussions around service levels, risk-based prioritization, and financial sustainability will need to be part of asset management considerations going forward.

Asset management findings and the financial strategy should also help inform more regular processes like the development of annual budgets and updates to development-based background studies. Using historical financial data to estimate possible funding requirements to support the City's asset management needs, the 2024 update suggests average capital budget requirements of approximately **\$200 million per year** for the Asset Management Plan's planning period (to 2051). These figures are expected to vary year-over-year, depending on a number of factors, including asset management schedules, prioritization of capital projects, etc. The cost of new assets to service growth will be incorporated into the development of future development charge background studies; for reference, the current Council-approved background study (2022–2031) incorporates a \$2.79 billion capital program (hard and soft services). Asset management needs will also result in operating pressures, including staffing, that will be considered as part of the annual budget process.

As part of the City's financial policy and planning process, annual contributions to the City's Life Cycle Reserve enable the City to set aside funds to meet asset management needs. These contributions form part of the annual operating budget, and are supplemented by any year-end surplus. To address increasing asset management needs, the City has been gradually escalating budgeted contributions to the Life Cycle Reserve, with a current target incremental contribution of 1% of the City's tax levy.

While the Life Cycle Reserve Study is a substantive portion of our repair and renewal strategy, it should be noted that the City also utilizes funding from the water rate, the storm water fee, and external grants to support maintaining assets in a good state of performance. The water rate and storm water fee are regularly reviewed and calibrated as part of the budget process with a view to ensuring sustainable funding for identified assets.

Further incremental contributions, or adjustments to the revenue mix from these revenue sources may need to be considered to support the asset management financial strategy.

In closing, staff note that the practice of asset management is a journey of continuous improvement and not a destination. Some source data, frameworks, tools and models developed for this asset management plan were developed for the first time and represents the best information available as of this writing. The new “tools in the toolbox” developed for the 2024 AMP assist in quality control, validate and monitor our performance. As the City matures its practices, accuracy of data and forecasting will improve. This may result in ongoing adjustments to monetary values that will be reported through future iterations of asset management plans.

HUMAN RESOURCES CONSIDERATIONS

Not applicable

ALIGNMENT WITH STRATEGIC PRIORITIES:

Asset Management is a broad practice and centre of excellence that covers the majority of services that a municipality provides. All of the City’s strategic priorities are an input to developing and implementing asset management policy, objectives, strategies, plans, systems and processes.

The 2024 Asset Management Plan is fully aligned with Building Markham’s Future Together:

- Goal 1 – Exceptional Services by Exceptional People
- Goal 2 – Engaged, Diverse, Thriving and Vibrant City
- Goal 3 – Safe, Sustainable and Complete Community
- Goal 4 – Stewardship of Money and Resources

BUSINESS UNITS CONSULTED AND AFFECTED:

This report was developed under the supervision of the City’s Asset Management Steering Committee and in consultation with Financial Services.

RECOMMENDED BY:

Graham Seaman
Director, Sustainability & Asset Management
Chair, Asset Management Steering Committee

Joseph Silva
Treasurer

Arvin Prasad
Commissioner, Development Services

Morgan Jones
Commissioner, Community Services

Trinela Cane
Commissioner, Corporate Services

Andy Taylor
Chief Administrative Officer

ATTACHMENTS:
2024 Asset Management Plan - Staff Presentation