Corporate Asset Management Overview

Appendix B

HAMILTON

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2025 Corporate Asset Management Overview
Appendix “B” to Report PW25036

1.0 INTRODUCTION

The 2025 Corporate Asset Management Overview completed by the Corporate Asset Management (CAM) office is intended to outline the framework the City is using to meet Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (O.Reg. 588/17) requirements.

The City is using the Federation of Canadian Municipalities (FCM) approach to asset management in partnership with the Institute of Public Works Engineering Australasia (IPWEA) and NAMS (National Asset Management System) Canada framework for asset management.

Asset management relates to the coordinated set of activities and practices an organization applies to achieve strategic objectives through balancing lifecycle costs, risks, and performance to deliver the agreed upon levels of service. In simpler terms, it is about making the right decisions so that the City is doing the right work, on the right asset, at the right time, for the right cost.

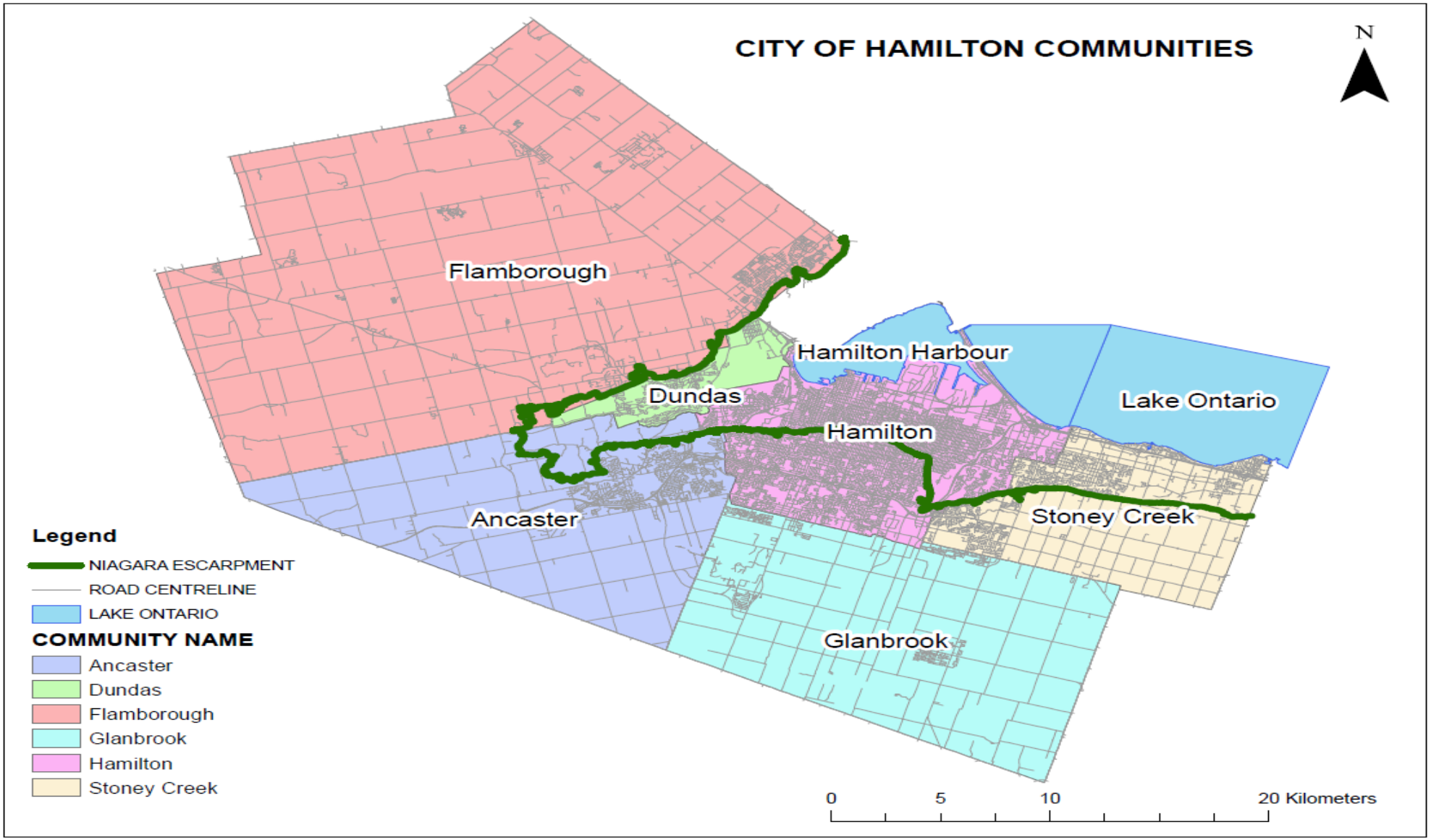
2.0 BACKGROUND

The City of Hamilton is located on the western tip of Lake Ontario and has a population of approximately 570,000. The City is geologically unique as it is bisected by the Niagara escarpment which splits the City into upper and lower parts. This geographic challenge can impact a wide variety of city services and helped shape the development of the City over its history.

In 2001, the new City of Hamilton was formed with the amalgamation of Hamilton and its surrounding communities: Ancaster, Dundas, Flamborough, Glanbrook, and Stoney Creek. As a result, the City acquired many assets in varying condition, and with varying levels of documentation. The City has been working for the last 20 years to collect and compile data for our assets to improve decision making City wide and accomplish our vision of being the “*best place to raise a child and age successfully*”. The following map, ***Figure 1,*** shows the City of Hamilton, the five historic communities with major landmarks including the Niagara Escarpment, Hamilton Harbour, and Lake Ontario.

The City of Hamilton was granted official city status by the Province of Canada in 1846. In Hamilton’s long history it has acquired many assets which have required significant effort to operate, maintain, renew, and eventually, dispose of.

Figure 1: MAP OF CITY OF HAMILTON COMMUNITIES



3.0 DEFINITIONS

Table 1: DEFINITIONS

TERM	DEFINITION
Acquisitions	The activities to provide a higher level of service through either the construction of new assets, expanding an existing assets service capacity or assumption of donated assets.
Asset	An item, thing or entity that has potential or actual value to an organization. It can be tangible or intangible, financial, or non-financial and includes consideration of risks and liabilities**.**
Asset Management Plan	Document that specifies the activities, resources and timescales required for the asset network to achieve its objectives. Long-term plans (usually 10-25 years or more) that outline the asset activities and programs for each service area and resources applied to provide a defined level of services in the most cost-effective way.
Asset Owner	The Asset Owner has direct responsibility for the operation and provision of services related to an asset and is therefore responsible for the effective management of the asset over the asset's lifecycle, while also recognizing that assets spend the majority of their lifecycle in the operate and maintain stages. This involves ensuring that assets deliver their identified levels of service in a sustainable manner which is compliant with all policies and regulatory requirements, while emphasizing public safety and climate resiliency. Asset Owners may seek assistance from others (e.g. Engineering Services division, Facilities Management section or an external source) for the provision of certain tasks (e.g. maintenance activities or technical services including, but not limited to, condition assessments, asset maintenance, and capital programming activities) to aid in decision making related to the management of the assets
Asset Renewal Funding Ratio	A financial indicator that considers the forecast renewal needs versus the planned renewal budget over 10 years.
Condition	The physical state of an infrastructure asset.
Core Assets	Refers to core municipal infrastructure assets owned by the City and defined by O. Reg 588/17 as water, wastewater, stormwater, road, or bridge or culvert assets.

TERM	DEFINITION
Critical Asset	Assets having potential to significantly impact on the achievement of Hamilton's objective and often refer to those assets necessary to provide services to critical customers. The assets that are likely to result in a more significant financial, environmental, and social costs in terms of impact. These assets can be safety critical, environmentally critical or performance critical and can relate to legal, statutory, or regulatory requirements.
Current Levels of Service	The levels of service targets which were approved and documented in the most recent Asset Management Plans.
Customer	Person or organization that could or does receive a product or a service. A customer can be internal or external to the organization. E.g. Consumer, client, end-user, retailer, receiver of product or service from an internal process, beneficiary, and purchaser. In the context of AM - Any person who uses the asset or service, is affected by it, or has in interest in it either now or in the future. This definition does not require that payment is made for the use of the asset or service
Customer Levels of Service	Customer Levels of Service interpret how the customer feels about the services that it receives from the City of Hamilton. These levels of service are intended to measure customer preference in 3 distinct ways: • Condition - How good is the service? What is the condition or quality of the service/asset? • Function - Is the service suitable for its intended purpose? Is it the right service? • Capacity - is the service over or under used? Do we need more or less of the asset/service?
Customer Values	Customer Values define what aspects of a service are important to a customer and include traits such as ‘affordability, responsiveness, availability, comfort, cleanliness, etc. Each customer will value specific traits from a service which allows the customer to perceive. The organization will measure what its customers value frequently to ensure services are delivered in a way to meet those values.
Demand	The desire customers have for assets or services they will use and are willing to pay for.
Demand Management	Actions taken to influence demand for services and assets. This can be done through either the supply side or the demand side. (Supply side - i.e., Minimize water leaks loss through leak detection. Demand side - i.e. Through pricing, regulation, education, and incentives)

TERM	DEFINITION
Disposal	Actions necessary to decommission and dispose of assets that are no longer required.
Estimated Service Life	The period of time Hamilton expects an asset to be available for use. It is the expected time between placing the asset into service and removing it from service.
Infrastructure Funding Gap	Represents the difference between the total available budget and the estimated lifecycle forecast needs to maintain current levels of service targets. If the forecasted needs exceed the available budget, it indicates there is a funding shortfall between what is required and what is available to fund service levels.
Level of Service (LOS)	Levels of Service measure the outputs for services that the organization provides to its customers, residents and visitors. These are measured through 'parameters' such as safety, customer satisfaction, quality, quantity, capacity, condition, reliability, responsiveness, availability, environmental acceptability and cost. Levels of service are dived into two focused categories which include Customer LOS and Technical LOS.
Levels of Service Statement	Statements that connect the customer and technical performance measures and are formulated using customer values.
Lifecycle	The time that commences with the identification of the need for an asset and terminates with the decommissioning of the asset. Stages involved in the management of an asset include acquisition, operations, maintenance, renewal and disposal.
Lifecycle Activity	The activities undertaken by the City to ensure an asset is reaches its intended useful life.
Lifecycle Costs	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, renewal, and disposal costs.
Maintenance	The ongoing management of deterioration. All actions necessary for retaining an asset as near as practicable to its original condition but excludes renewal. Maintenances does not increase the service potential of the asset or keep it in its original condition, it slows down deterioration and delays replacement.
Non-Core Asset	Refers to any other assets the City owns that are not core assets as defined above.
Operations	Regular activities to provide services such as public health, safety, and amenities. (E.g. cleaning, street sweeping, grass mowing).

TERM	DEFINITION
Operating, Maintenance and Renewal Ratio	A financial indicator that considers the forecast operating, maintenance, and renewal needs versus the planned operating, maintenance, and renewal budgets over 10 years.
Planned Maintenance	Necessary activities that ensure the reliability or to achieve the useful life of an asset (as per the operating and maintenance manual). These can be either proactive, periodic or preventative in nature.
Proposed Levels of Service	Indicates how the City is proposing to deliver service levels since the development of the most recently approved Asset Management Plans. The options for proposed levels of service include: 1. Levels of Service Change: Proposing a change to levels of service targets through formal reports to the Mayor and Members of Council. 2. Maintain Levels of Service: Proposing current levels of service targets continue to be maintained.
Reactive Maintenance	Unplanned repair work that is carried out in response to service requests or asset failure.
Renewal	The activities that return the assets service capability to a state which it had originally provided. This includes replacement or near total reconstruction of assets that are at the end of their lives.
Replacement Cost	The cost Hamilton would incur to acquire an equivalent new asset today.
Risk	The effect of uncertainty. An effect is a deviation from the expected — positive or negative. Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood. Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood. In the context of the Risk Management standard- Effect of uncertainty on objectives.
Risk Management	Hamilton’s coordinated activities to direct and control actions as well as inform decisions with regards to risk.
Service Enhancement	Proposing an increase to levels of service often requiring an increase to the operating budget due to additional staff and assets.
Service Reduction	Proposing a decrease to levels of service often resulting in budget reallocation to higher priority items, reallocation of staff and potential disposal of assets.

TERM	DEFINITION
Strategic Asset Management Policy	Document that specifies how Hamilton objectives are to be converted into asset management objectives, it defines the approach for developing the asset management plans and the role of the asset management system in supporting achievement of Hamilton's objectives.
Sustainability	The capacity to endure. Meeting the needs of the future by balancing social, economic, cultural, and environmental outcomes or needs when making decisions today.
Technical Levels of Service	Measures that enable Hamilton to demonstrate to its customers how effectively it provides services to them and how the provision each service aligns with customer values and expectations. Technical LOS are designed to measure a services performance by establishing specific and quantifiable stewardship measures with defined targets which will be monitored and reported on regularly. Typically, these stewardship measures are derived from: • Lifecycle Activities • Budget and Financial Measures • Risk Management • Compliance

4.0 KEY STAKEHOLDERS

Table 2: KEY STAKEHOLDERS

KEY STAKEHOLDER	ROLE IN ASSET MANAGEMENT PLAN
Customers/Public	• Participate in engagement to allow Hamilton to understand the communities desired level of service and willingness to pay.
Mayor and Council	• Approve asset management plans and policy; • Articulate community values and define priorities; • Approve funding and resources to implement the AM plans and policy and associated requirements; and, • Approve asset funding through multi-year and long-range financial plans.
General Managers of Public Works and Corporate Services	• Executive sponsors for Asset Management in Hamilton.
City Manager and Senior Leadership Team	• Responsible for ensuring the Asset Management Plans and Policy are relevant, suitable, adequate, reviewed and updated as required; • Responsible for communicating land-use or master plans, forecasts, policies and other planning or financial commitments related to municipal infrastructure assets; and, • Authority to carry out these responsibilities.
Director, Corporate Asset Management (CAM)	• Responsible for the implementation of Corporate Asset Management including development of Asset Management strategies, policies, plans and procedures for the Corporation. Responsible for ensuring the City complies to O.Reg. 588/17 including regular reporting to SLT and the Mayor and Council on effectiveness of the Program.
Boards (Hamilton Public Library, Hamilton Police Service, CityHousing)	• Informed of asset management plans • Articulate community values and define priorities; • Approve funding and resources to implement the AM plans and policy and associated requirements; and, • Approve asset funding through multi-year and long-range financial plans.
Operational Staff	• Verify asset data and regularly inspect and monitor condition of the assets for public safety; • Provide operational and maintenance service to the assets; and • Report to senior management any progress, deficiencies and effectiveness of operations and maintenance activities.
Province of Ontario	• Establish Legislation for Asset Management Plans (O. Reg. 588/17).

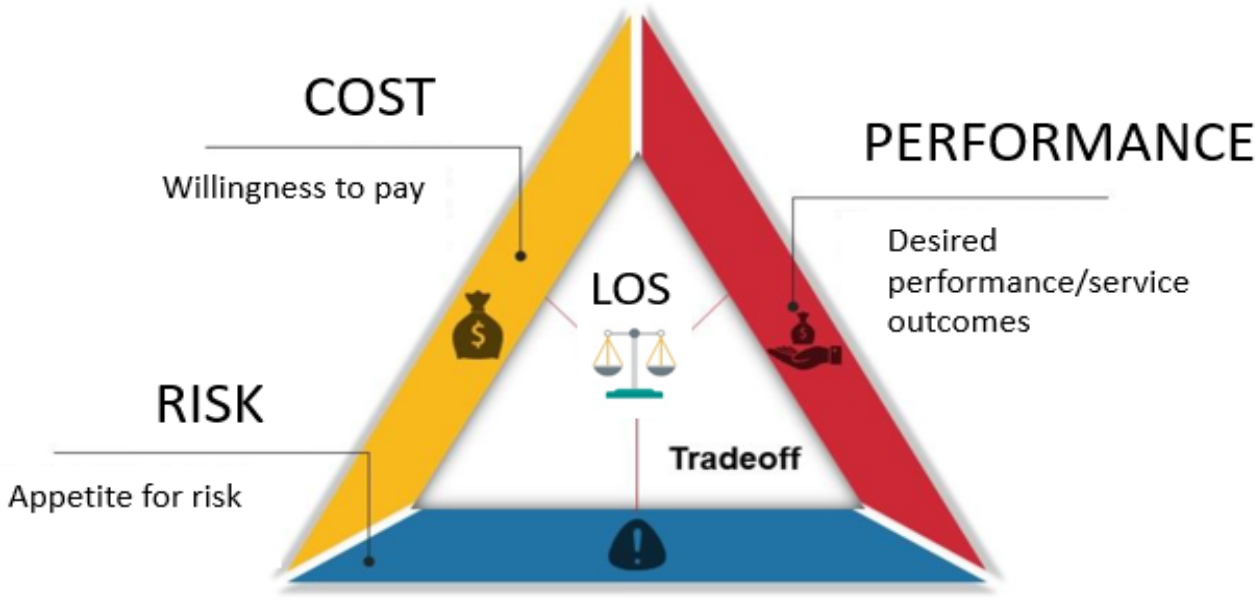
5.0 ASSET MANAGEMENT PLANNING

Asset management relates to the coordinated set of activities and practices an organization applies to achieve strategic objectives through balancing lifecycle costs, risks, and performance to deliver the agreed upon levels of service. In simpler terms, it is about making the right decisions so that the City is doing the right work, on the right asset, at the right time, for the right cost.

Historically, the City has viewed asset management from a lens of “managing assets” which involved specific activities such as completing inventories, performing condition assessments, completing lifecycle activities, and forecasting needs. While those activities are important parts of asset management, if the activities are not coordinated and strategic objectives are not defined, the City will experience disconnects between the activities being completed and the service needs expected by the customer.

Asset Management Plans are intended to be a shift from “managing assets,” to a more holistic view of asset management where the City acts as a steward for assets that contribute to City services which are ultimately paid for and are in service for the customer. It is the City’s responsibility to manage costs, risks, and performance in the best interests of the customer, consult customers on their values with respect to these services, and use our technical expertise to set and achieve expectations, in the form of levels of service as shown below in ***Figure 2***.

Figure 2: LEVEL OF SERVICE APPROACH



Many municipalities face similar challenges with their assets. Many assets have long useful lives which can continue through multiple generations, and these assets may cost a significant amount of money throughout their lifecycle. This means that one generation may build an asset which does not require any substantial work in their lifetime but will lock in future generations with significant costs and risks. Given the long lifespan of many infrastructure assets and the City's limited annual budget, it is essential for the City to develop a comprehensive plan to prioritize and execute projects effectively, ensuring success for future generations. Some questions we are answering in these Asset Management Plans include:

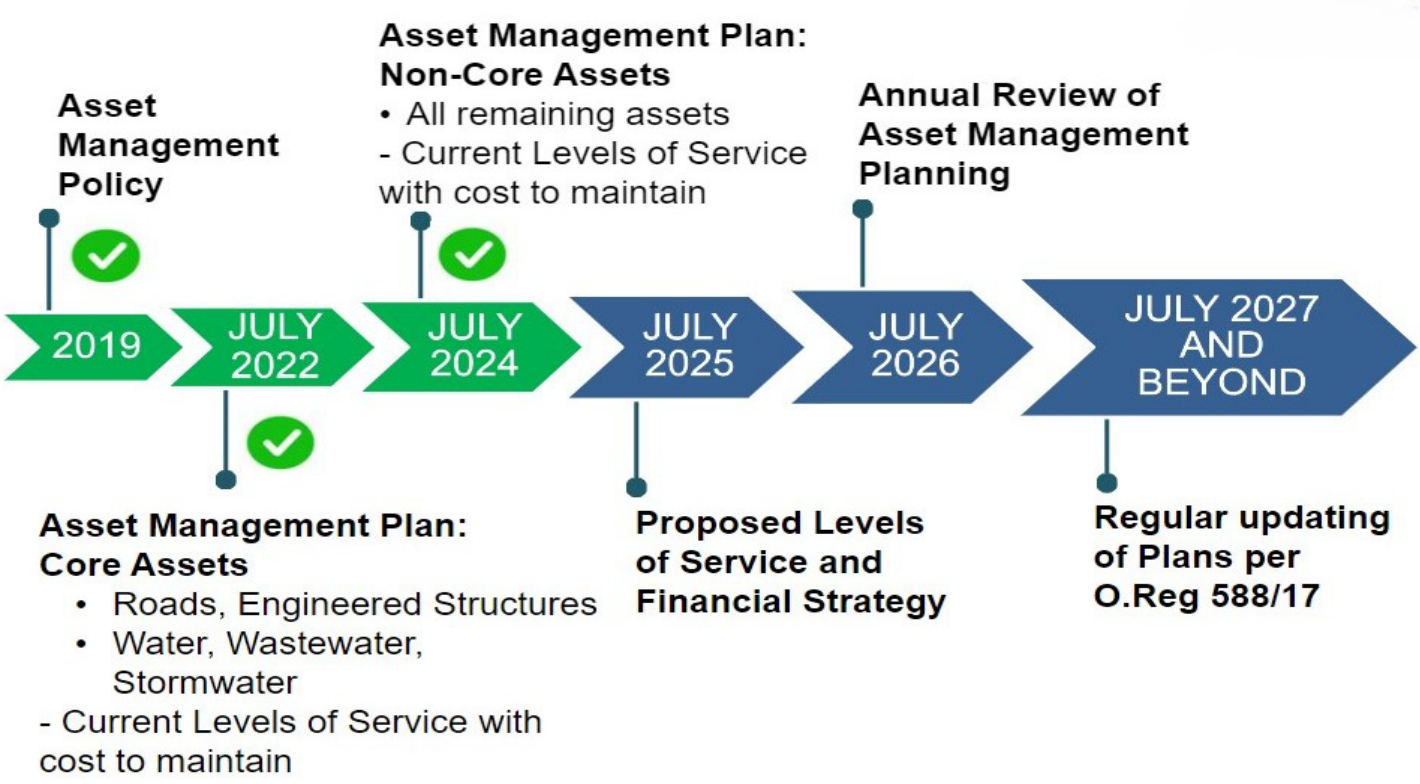
- What do we own?
- What condition is it in?
- Where is it?
- What needs to be done?
- What is it worth?
- When does the work need to be done by?
- Do we have sufficient resources to do the work?
- If we do not have sufficient resources, what are the consequences?
- Are we meeting minimum legislative requirements?
- What level of service are our assets providing?
- How are our assets performing?
- What are our demand requirements?
- How do we manage current and future risks?
- What are the costs required and how do we prioritize competing interests?
- Are there assets that are not needed?
- How successful are we at managing assets?
- Are there areas for improvement?

6.0 O.REG. 588/17 OVERVIEW

In January 2018, the province enacted O.Reg. 588/17: Asset Management Planning for Municipal Infrastructure, which was created under the 2015 Federal Infrastructure for Jobs and Prosperity Act. This regulation was created because the province recognized that many Ontario municipalities were facing similar issues with existing infrastructure degrading faster than it was being repaired or replaced. The goals of the regulation were to: standardize asset management plans, spread best practices among municipalities, and improve infrastructure planning in municipalities.

O. Reg. 588/17 prescribed the timelines and requirements that municipalities had to complete the Strategic Asset Management Policy (SAMP), and Asset Management Plans (AM Plans). The regulation separated the AM Plan requirements into core and non-core assets and current and proposed levels of service. Core assets were assets supporting the delivery of the following services: roads, bridges and culverts, water, wastewater, and stormwater. Non-core assets were deemed to be any other assets supporting all other City services including green infrastructure. Current levels of service are defined as the level of service the City is currently delivering considering lifecycle costs, risks, and performance. Proposed levels of service are the levels of service the City will be proposing to provide. A brief snapshot of the timelines and requirements for each iteration of the AM Plan is shown below in ***Figure 3.***

Figure 3: O. REG. 588/17 TIMELINES



These Asset Management Plans (AM Plan) are a continuation of the process set out in O.Reg. 588/17, which began with the 2019 Strategic Asset Management Policy, and include information related to the current and proposed levels of service for core and non-core assets. The City will continue to proceed with achieving the remaining timelines outlined in the figure above.

7.0 IPWEA AND NAMS CANADA FRAMEWORK

Asset Management regulations are not new globally, but they are relatively new to Canada. Asset Management has been used globally by multiple governments especially in Australia and New Zealand. There are two international standards that have evolved for asset management which are applied throughout the AM Plan documents: ISO 55000 –Asset Management Standard and ISO 31000 – Risk Management Standard.

The Federation of Canadian Municipalities (FCM) recognizes that there are globally recognized practices that best meet the requirements of O.Reg. 588/17 and therefore, these AM Plans follow the Institute of Public Works Engineering Australasia (IPWEA) and National Asset Management System (NAMS) Canada template and philosophy, while fulfilling the O.Reg. 588/17 timeline and requirements.

The five key asset management principles for organizations to adopt through the IPWEA framework are included below. These principles will be adopted for all asset classes throughout the City:

1. Adopt a lifecycle approach – Apply a whole life methodology for managing infrastructure assets including acquisition, operations, maintenance, renewal, and disposal.
2. Endorse evidence-based decision making – Utilize current infrastructure information to support asset planning and decisions.
3. Embrace continuous improvement practices – Implement and adopt asset management practices that formalize and document continuous improvement efforts across the organization.
4. Provide optimal value – Asset service levels will be clearly defined, communicated and fact-based on the realities of today.
5. Develop service knowledge – Developing this key competency across the organization will ensure Hamilton is able to balance costs, risk and performance and ensure long term sustainability is achieved.

In addition, there are benefits to asset management across the organization, and these six key benefits identified by IPWEA for asset management planning include:

1. Strong Governance and Accountability;
2. Improved Financial Efficiency;
3. More Effective and Sustainable Decisions;
4. Effective Risk Management;
5. Improved Social Outcomes; and,
6. Improved Customer Engagement.

8.0 STRATEGIC ALIGNMENT

The City's strategic goals and objectives are shaped by internal drivers such as Council approved strategies and plans, as well as external forces such as citizen expectations, and legislative and regulatory requirements. In addition to O.Reg 588/17, the legislative and regulatory requirements specific to each service areas are referenced in each AM Plan.

The ***2023 Strategic Asset Management Policy*** indicates the following principles in decisions to invest, design, construct, acquire, operate, maintain, renew, replace, or decommission infrastructure assets:

- Service Delivery to Customers;
- Long-term Sustainability and Resilience;
- Integrated and Systematic Approach;
- Fiscal Responsibility and Asset Management Decision Making; and,
- Innovation and Continuous Improvement.

The relevant goals and objectives for Corporate Strategy documents and how these are addressed in the AM Plans are summarized in ***Table 3***.

Table 3: ASSET MANAGEMENT ALIGNMENT WITH OTHER CORPORATE STRATEGIES

INTERNAL DRIVERS	GOAL	HOW GOAL AND OBJECTIVES ARE ADDRESSED IN THE AM PLAN
2022-2025 Strategic Plan Priorities	Economic Prosperity and Growth	The objective of the AM Plans is to quantify levels of service with the costs to maintain and comment on the sustainability of the service through an infrastructure funding gap.
	Culture and Diversity	Specific AM Plans were completed for Tourism and Culture and Hamilton Public Library.
	Clean and Green	The AM Plans consider and identify risks and opportunities for climate change adaptation and mitigation.
	Community Engagement and Participation	The AM Plans engage our customers and community to understand service level values and expectations.
	Our People and Performance	The AM Plans strive to provide data driven evidence for effective decision making.
	Built Environment and Infrastructure	The AM Plans address and seek to identify the lifecycle activities required to deliver the levels of service for infrastructure assets.

INTERNAL DRIVERS	GOAL	HOW GOAL AND OBJECTIVES ARE ADDRESSED IN THE AM PLAN
2022-2026 Council Priorities, Outcomes and Measures of Success	Sustainable Economic and Ecological Development	The AM Plans identify financial ratios, considers demands on assets and services, consider and identify risks and opportunities for climate change adaptation and mitigation. An AM Plan and Roadmap was completed for Natural Assets.
	Safe and Thriving Neighbourhoods	Specific AM Plans were completed for CityHousing Hamilton, Transportation, Parking, Transit and Recreational Trails, and Recreation.
***All priorities will be applied with an equity and accessibility lens. (Adopted Sept 20, 2023)**	Responsiveness and Transparency	The AM Plans are presented and available in a publicly accessible format. They are intended to engage our customers and community to understand service level values and expectations. A City of Hamilton Asset Management Training program was also developed and is accessible for use by all City staff.
Climate Action Strategy	Achieve net zero greenhouse gas emission by 2050 and prepare for the unavoidable impacts of climate change.	The AM Plans consider and identify risks and opportunities for climate change mitigation and adaptation.

9.0 ASSET REGISTRY

Throughout the AM Plans, background information includes information related to inventory, replacement cost, age, estimated service life, condition and asset usage. The individual AM Plans have specific details on the overall Age and Condition profiles by Asset, where information is available. They also describe the methodology and frequency of condition assessment, where this information is available.

9.1 ASSET REGISTRY AND HIERARCHY

An asset registry is a single data source which contains an inventory of asset data including attribute information for each individual asset. This attribute information includes a record for each individual asset including condition, age, replacement cost, and asset specific information (e.g., length, diameter, material etc.). At this time, the City does not have an asset registry for all assets but is currently implementing an Enterprise Asset Management System (EAM) for Public Works. The asset registry should be structured in the form of an asset hierarchy explained below.

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The City’s asset hierarchy is a functional hierarchy, which means that the hierarchy has been established based on what the asset owner needs or wants the asset or system to do. Generally, assets and systems are organized according to their primary function.

For the AM Plan the asset hierarchy includes the service area, asset class and asset levels defined below in ***Table 4***. This hierarchy was used for asset planning, financial reporting and service planning and delivery.

It is important to note that the asset hierarchy used in an enterprise asset management system such as the EAM project will drill down in more detail to the component level of the asset (e.g., pump for a pump station, engine for a vehicle). Since the AM Plan is intended to be a high-level planning document, the asset hierarchy is only provided to the level required for this purpose.

Table 4: ASSET HIERARCHY DEFINITIONS

HIERARCHY LEVEL	DEFINITION
Service Area	The Service Area level should not represent any physical objects i.e., Assets or Systems and identifies a unique function and service, as defined by the respective Division.
Asset Class	This level further separates the service area level into distinct levels. It is a system used to drill down the service provided within a service area level.
Asset	An asset is the lowest level the City is reporting to in the AM Plan.

10.0 ASSET DATA

Asset data was obtained from a wide variety of sources within the City of Hamilton. Details on inventory data, can be found within the individual AM Plans. Many plans have identified Continuous Improvement items to improve inventory and asset registry data.

10.1 DATA CONFIDENCE

Data Confidence is referenced throughout the AM Plans. It indicates how confident the City is in the reliability and accuracy of the data for use in evidence-based decision making. If the data was obtained using reliable documentation or methodology, then the data has higher confidence than if it was estimated. It is a continuous improvement item to continue to assess the data accuracy for assets and look for areas for improvement. The Data Confidence Grading Scale is located below in ***Table 5***.

Table 5: DATA CONFIDENCE GRADING SCALE

DATA CONFIDENCE GRADING SCALE		
CONFIDENCE GRADE	**RELIABILITY**	**ACCURACY**
A - Very High	Data based on sound records, procedures, investigations, and analysis, documented properly, and agreed as the best method of assessment.	Dataset is complete and estimated to be accurate +/- 2%
B – High	Data based on sound records, procedures, investigations, and analysis, documented properly but has minor shortcomings. For example, some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation.	Dataset is complete and estimated to be accurate +/- 10%
C – Medium	Data based on sound records, procedures, investigations, and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available.	Dataset is substantially complete but up to 50% extrapolated data and accuracy estimate +/- 25%
D – Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis.	Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy +/- 40%
E - Very Low	None or very little data held.	Dataset does not exist or very little accuracy.

11.0 MUNICIPALITY'S APPROACH TO CONDITION

Condition is the preferred measurement for planning lifecycle activities to ensure assets deliver the agreed upon levels of service and reach their expected useful life. The City outlines the existing condition assessment methodology (if available) for each of the asset classes in the individual AM Plans.

11.1 CONDITION SCORING

Although the City considers condition as the preferred measurement for planning, many assets in the City do not yet have a process to determine condition. For assets where a condition program exists, and a condition score was output, those conditions were converted to the scale in ***Table 6*** below and these conversions are shown in each of the AM Plans. For assets where there was no known condition information, or inspections were not output in a way where the conditions could be converted, the condition was assumed based on remaining service life per **Table 6** below.

In future, the City is investigating completing condition assessments for assets where no program exists. For some assets, condition assessments are not economical, but for many assets, regular inspections occur to ensure these assets are in working order. The City is investigating how to modify these regular inspections to output a condition score.

The individual AM Plans contain further details on how existing service area specific condition grading was used and/or converted to a standardized 5-point scale.

Table 6: CONDITION SCORING

EQUIVALENT CONDITION GRADING	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE
1-Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	>79.5%
2-Good	The asset is adequate and has slight defects and shows signs of some deterioration that has no significant impact on asset's usage. Minor/preventative maintenance may be required.	69.5% – 79.4%
3-Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	39.5% - 69.4%
4-Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4%
5-Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4%

12.0 LIFECYCLE MANAGEMENT APPROACH

The lifecycle management plans in each AM Plan summarize the forecasted costs and planned budgets in today's dollars over 30 years to manage the assets over their entire lifecycle to deliver the agreed levels of service. Per ***Figure 4*** below, the lifecycle costs and budgets are categorized by lifecycle stages which include acquisition, operations, maintenance, renewal, and disposal. These lifecycle management plans are used to calculate the financial sustainability of the service which is further expanded on in ***Section 17.***

Figure 4 : ASSET MANAGEMENT LIFECYCLE STAGES

Once Hamilton acquires an asset, the City then becomes obligated to fund the remaining lifecycle costs such as its operations, maintenance, and eventual renewal or disposal. For assets with long lifespans, these subsequent lifecycle costs are far more significant than the initial construction or purchase cost and are often multigenerational. Since lifecycle costs are spread across multiple decades, it is essential that Hamilton approach its asset planning over the long term to ensure it is effectively managing assets to achieve service objectives.

12.1 ACQUISITION PLAN

Acquisition activities are necessary for the City to maintain levels of service due to ongoing growth demands. In addition, acquisitions are also commonly driven by customer demand, legislative requirements, and/or approved levels of service enhancements.

- The Acquisition lifecycle stage involves adding new assets that did not exist before or improving an existing asset's capability or function through purchasing or construction of a new asset or through the assumption of assets through development agreements (i.e. donated assets). The costs and activities included as part of the acquisition stage include design, training, consulting, purchase costs, construction costs and staff time.

Examples of acquisition activities include:

- Extending water works services to un-serviced areas;
- Expanding a road from 1 lane to 2 lanes;
- Expanding a bridge to accommodate increased traffic volumes;
  - Adding an expansion to an existing Long-Term Care Facility; and
  - Building additional recreation centers or acquiring additional parkland.

Once assets are acquired, the City then becomes the stewards of these assets and is responsible for all ongoing costs for the assets' operation, continued maintenance, inevitable disposal, and their likely renewal. It is critical for Hamilton to improve its understanding of the connection between acquisitions and what future costs will be incurred because of these acquisitions.

The City is reviewing its acquisition process through the regular updating of the AM Plans to ensure that it proactively understands what assets are being acquired over the planning period and to ensure they are considered and funded properly across their lifecycle. Improved knowledge of both constructed and donated assets will allow multiple departments across the City to plan for the assets properly such as:

- Documenting and forecasting the long-term needs and obligations (e.g. inspections, legislative compliance activities, regular operations, and maintenance) for planned acquisitions and ensuring these are accounted for in future lifecycle plans;
- Ensuring appropriate transfer of assets process to track when the City has assumed responsibility for acquisitions; and
- Ensuring that acquisitions are properly captured and recognized appropriately for financial purposes (Audited Financial Statements, TCA process, Provincial reporting such as the FIR).

Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options however, at this time the plans are limited on those aspects. Expenditure on new assets and services will be considered in the long-term financial plan.

12.2 OPERATIONS AND MAINTENANCE PLAN

Operations and Maintenance activities are an essential component to the asset lifecycle and are necessary to ensure that an asset can continue to provide the service at its expected level. Without these necessary activities and interventions, the assets will not reach their expected useful life and will require costly renewals before they reach their estimated service life. Hamilton will review and report on its operational and maintenance activities through the creation of future iterations of the AM Plans.

- The Operations lifecycle stage includes all regular activities to provide services.
    - Examples of typical operational activities include facility cleaning, calibrating equipment, painting, energy costs, security costs, snow plowing, street sweeping, waterline flushing, biennial bridge inspections etc., and the necessary staffing resources to perform these and other activities.

- The Maintenance lifecycle stage should be viewed as the ongoing management of deterioration. It includes all actions necessary for retaining or returning an asset as near as practicable to an appropriate service condition.
    - Examples of typical maintenance activities include oil changes on equipment, roof replacement on a facility, pipe repairs, pothole repairs, bridge deck repairs, equipment repairs along with appropriate staffing and material resources required to complete these works.

Adding additional assets over time significantly impacts the operational and maintenance resources required to sustain the expected or mandatory level of service. For many services, a significant amount of operational and maintenance expenditures is mandatory due to legislative requirements and cannot simply be avoided or deferred. For example, if Hamilton builds one km of roadway, it then becomes obligated by legislation to follow the Minimum Maintenance Standards (MMS) for the road class by repairing potholes and plowing roadways after snow events within specific timeframes which all require resources that are in high demand.

There are operational and maintenance activities that Hamilton can influence once an asset has been constructed such as the frequency of cleaning or inspections as well as preventative maintenance programing. Hamilton will continue to identify and review its operational and maintenance lifecycle activities to ensure the optimal management of its assets.

Proactively funding planned maintenance is always preferred compared to responding to high cost reactive maintenance. Hamilton will continue to review its maintenance planning to ensure it is maximizing its opportunities and investments and minimize the impacts and resources required for reactive maintenance.

12.3 RENEWAL PLAN

Renewal activities are essential for the provision of service as most assets do not have an infinite service life. Without timely renewals, an asset typically requires reactive, high-cost maintenance activities to ensure the asset can perform its intended function or possible disposal when maintenance efforts are no longer economically feasible.

- The Renewal lifecycle stage involves replacing an existing asset with an asset of similar type and purpose without changing its service capacity (i.e. like-for-life replacement).

- Examples of typical renewal activities include:
  - Replacing a watermain pipe with the same size pipe;
  - Replacing a 2-lane roadway with another 2-lane roadway;
  - Replacing a bridge and accommodating the same traffic capacity; and
  - Replacing an existing Recreation or Long-Term Care Facility with a facility of the same size.

Asset renewals are typically undertaken to either ensure the asset’s reliability or quality will meet the service requirements set out by the City. Renewal projects are often triggered by service quality failure or risk of a physical failure and are often prioritized by those that have the highest consequence of failure, have high usage and/or significant operational and maintenance costs, and other deciding factors.

Renewal investment is required to ensure the optimal delivery of service is possible. Continually deferring renewals can create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. When renewals are programmed for the optimum time, it ensures that services can continue with minimal interruption and that resources are optimized through the mitigation or avoidance of high-cost maintenance and risk costs.

It is recommended to continue to analyse asset renewals based on criticality and availability of funds for future AM Plans. Renewals being completed in a timely manner is critical to ensure that Hamilton can deliver its services over the long term at their expected level of service.

12.4 DISPOSAL PLAN

Disposals occur when an asset reaches the end of its useful life. The end of its useful life can be determined by factors such as excessive operation and maintenance, poor asset condition, regulatory changes, obsolescence, or demand for the infrastructure has diminished.

- The Disposal lifecycle stage involves disposing of a decommissioned asset which can then either be renewed or permanently out of service.
  - Examples of typical disposal activities include sale, possible closure of service, decommissioning, or disposal of asset materials.

Future iterations of the AM Plan will improve upon disposal reporting and planning options. Hamilton will provide a summary of the disposal costs and estimated reduction in annual operations and maintenance costs for assets that will not be replaced.

13.0 LEVELS OF SERVICE APPROACH

Levels of Service (LOS) are measures for what Hamilton provides to its customers, residents, and visitors. Service levels are best described as the link between providing the outcomes the community wants, and the way that Hamilton provides those services. Ideally, Hamilton should provide the levels of service that the current and future community both want and are prepared to pay for while also considering intergenerational equity. Hamilton's approach to developing levels of service is outlined in the sections below.

13.1 LEVELS OF SERVICE DEVELOPMENT

Levels of service are created considering four main components: customer values, level of service statements, customer performance, and technical performance as shown below in ***Table 7***.

Table 7: LEVEL OF SERVICE DEFINITIONS

CONCEPT	DEFINITION
Customer Values	What the customer can expect from their tax dollar in "customer speak," and include: • What aspects of the service is important to the customer; • Whether customers see value in what is currently provided; and, • The likely trend over time based on the current budget provision. These values can be gathered using an engagement survey and are used to develop level of service statements.
Level of Service Statements	Level of Service (LOS) statements describe the goal of service delivery. They utilize objectives to spell out exactly what the customer can expect from their tax/rate dollars and tie the customer and technical levels of service together. The LOS statements describe the outputs Hamilton intends to deliver to customers and commonly relate to service attributes such as: quality, reliability, accessibility, affordability, quantity, responsiveness, timeliness.
Customer Performance Measures	Customer performance measures relate to how the customer feels about the service, and so these measurements are typically qualitative. These should also be written in "customer speak" and are considered in terms of three factors:

CONCEPT	DEFINITION
	• ***Condition*** - How good is the service? What is the condition or quality of the service? • ***Function*** - Is it suitable for its intended purpose? Is it the right service? • ***Capacity/Usage*** - Is the service over or under used? Do we need more or less of these assets?
Technical Performance Measures	Technical performance measures relate to what the City does to deliver the services and are quantitative measurements. These should be used internally to measure performance against service levels and are technical in nature. Technical service measures are linked to lifecycle activities and annual budgets covering Acquisition, Operation, Maintenance, Disposal, and Renewal.

The Levels of Service components should work together and also connect to the City budget required to deliver the desired level of service. ***Table 8*** below shows this link and how the components support each other to deliver levels of service. Levels of service statements indicate the goal of service delivery and connect the customer and technical performance measures together. Customer performance measures are more service focused and consider how customers feel about the condition, function and capacity of the service. Technical performance measures are focused on how the assets support the service delivery goal and are broken into the lifecycle stages explained in ***Section 12***. The cost to complete these activities then feeds into the City capital or operating budget depending on the purpose of the lifecycle activity. Future AM Plans will continue to work to align Levels of Service with the City budget.

Table 8: LEVEL OF SERVICE ALIGNMENT

LEVELS OF SERVICE				
SERVICE DELIVERY OBJECTIVE	**CUSTOMER PERFROMANCE MEASURES**	**TECHNICAL PERFORMANCE MEASURES**	**LIFECYCLE STAGES**	**BUDGET AFFECTED**
Level of Service Statements	***Condition***		Renewal and Disposal	Capital or Operating Budget
	Customers are satisfied with the quality of the service	Assets are maintained in adequate condition to deliver service		
	Function		Maintenance and Operations	
	Services meet customer needs and limit negative impacts	Assets comply with regulations and perform as expected		
	Capacity		Acquisition and Disposal	
	Services have enough capacity and are accessible to customers	Assets of sufficient capacity are available		

13.2 CUSTOMER PERFORMANCE MEASUREMENT

The City of Hamilton strives to engage with its users to better understand customer satisfaction levels with Hamilton's assets and services to ensure that the City understands customer values and formulates the correct customer performance measures. The City of Hamilton strives to measure the services that our customers are receiving, and how effective we are at delivering those services. Hearing a range of perspectives will give the City the opportunity to ensure that future planning of services aligns with our customer needs.

The Corporate Asset Management division intends to release surveys on a regular basis for each service area to ensure the City is continually receiving feedback on City services. Other methods may also be used in the future to receive this critical feedback.

While these surveys were used to establish customer values and customer performance measures, the number of survey respondents only represents a small portion of the population. The City will continue to improve the marketing strategy to ensure these future engagement

opportunities reach a larger audience. This has been identified as a continuous improvement item.

If a survey was completed as part of the AM Plan process, the results and survey launch dates can be found in the individual AM Plan. These results were used to inform the customer values and customer performance measures to develop levels of service for the AM Plan.

13.3 TECHNICAL PERFORMANCE MEASUREMENT

Historically, the City of Hamilton has identified measuring performance as a priority. For core plans and other AM Plans in public works, the existing Public Works Balanced Scorecard was the starting point to develop the technical performance measures for this iteration of plans. For non-core and service areas outside of Public Works, existing technical performance measures were used or developed for use in the AM Plans.

These metrics should be revisited for future iterations of AM Plans to confirm that they reflect the entire lifecycle of the assets as well as aligning to customer values. This has been identified as a continuous improvement item in many AM Plans.

When creating and revising technical performance metrics, the City will be ensuring that SMART criteria are used. The acronym has been defined in ***Table 9*** below:

Table 9: SMART OBJECTIVES

LETTER	CRITERIA	DEFINITION
S	Specific	Provide a clear description of what needs to be achieved.
M	Measurable	Include a metric with a target that indicates success.
A	Attainable	Set a challenging but realistic target which is agreed to by those who must complete the task.
R	Relevant	Ensure the metric can be applied to known problems
T	Time-based	Establish clear timeframe for achieving the outcome.

14.0 FUTURE DEMAND MANAGEMENT APPROACH

For asset management purposes, demand is defined as the desire customers have for assets or services they use and that they are willing to pay for. These desires are for either: new assets or services, or for additional existing assets. Hamilton's approach to demand management is outlined in the sections below.

14.1 DEMAND MANAGEMENT

Demand for services is typically measured considering how many customers use the assets. In order to manage demand, the City must plan and take action to influence demand for services or usage of assets. In addition, demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services (e.g., assumption of assets due to development growth) and types of service required (e.g., different assets are required to meet consumer preference).

Typical demand drivers identified throughout the AM Plans are:

- Population Change;
- Regulatory Changes/Obligations;
- Changes in Demographics;
- Seasonal Factors;
- Consumer Preferences and Expectations;
- Technological Changes;
- Economic Factors; and,
- Environmental Awareness/Commitments.

14.2 GROWTH PROJECTIONS

The 2019 Development Charge Background Study thoroughly assessed the impact of growth on demand and the resulting capital and significant operating expenditures that are anticipated for core assets to 2031. The ***2024 Development Charge Background Study*** was used to inform the 2023/2024 Non-Core AM Plans and the Proposed Levels of Service AM Plan. These forecasts, results and recommendations are used in the asset management discussions for each asset category.

Per ***Table 10*** below, in the 2024 Development Charges Background Study, the City's population was anticipated to reach 608,640 by late 2023 and 672,550 by late 2033, resulting in an increase of 63,910 persons, respectively, over the 10-year and longer term (2023 to 2033) forecast periods. A requirement per O. Reg. 588/17 was to include the Greater Golden Horseshoe (GGH) projections for Hamilton, which shows that the population is expected to be

approximately 820,000 by 2051. Total employment, including work at home and no fixed place of work (NFPOW) for Hamilton is anticipated to reach 280,760 by late 2033. This represents an employment increase of 28,920 for the 10-year forecast period late 2023 to late 2033. A requirement per O. Reg. 588/17 was to include the Greater Golden Horseshoe (GGH) projections for Hamilton, which shows that employment is expected to be approximately 360,000 by 2051.

Table 10: POPULATION AND EMPLOYMENT PROJECTIONS

	2016	EARLY 2029	MID 2031	LATE 2023	LATE 2033	2051
SOURCE	**2019 DC STUDY**	**2019 DC STUDY**	**2019 DC STUDY**	**2024 DC STUDY**	**2024 DC STUDY**	**GREATER GOLDEN HORSESHOE**
Population	557,110	614,943	636,080	608,640	672,550	820,000
Employment	203,336	285,130	300,000	251,840	280,760	360,000

14.3 DEMAND MANAGEMENT PROCESS

When quantifying demand in the AM Plans, the four-step process shown below in ***Figure 5*** was used to develop a high-level demand management plan for key demand drivers identified for the service area.

Figure 5: DEMAND MANAGEMENT PROCESS

15.0 CLIMATE CHANGE MITIGATION AND ADAPTATION APPROACH

Cities have a vital role to play in reducing and eliminating greenhouse gas emissions (mitigation), as well as preparing assets for the accelerating changes cities have already begun to experience (adaptation). At a minimum, the City must consider how to manage our existing assets given forecasted climate change impacts for our region.

Changes to Hamilton's climate will impact City assets in the following ways:

- Affecting the asset lifecycle and associated costs;
- Affecting the levels of service that can be provided and the cost to maintain;
- Affect the demand for services (for example, emergency services during extreme weather events);
- Increasing or changing the demand on some systems; and
- Increasing or changing the risks involved in service delivery.

While it is anticipated that proactively taking actions to mitigate and adapt to climate change impacts by reducing emissions and strengthening infrastructure and services will require an initial increase in funding, taking steps to prepare for these impacts in the short-term will likely result in long-term savings as it will reduce the likelihood of emergency responses to future extreme weather events.

15.1 BACKGROUND

In March 2019, Hamilton City Council declared a climate change emergency, and directed staff to form a Corporate Climate Change Task Force (CCCTF) to investigate and identify additional actions to be taken. This resulted in the creation and adoption of the City's first Climate Action Strategy, passed in 2022, which inludes both the Community Energy and Emissions Plan (also known as ReCharge Hamilton) and the Climate Change Impact Adaptation Plan. These plans lay out a comprehensive framework to both achieve net-zero greenhouse gas emissions for the City and community by 2050, and protect people and property from the unavoidable impacts of climate change. By reviewing and incorporating these frameworks, asset owners have worked to understand mitigation and adaptation opportunities. The goal is to eliminate our City's contributions to greenhouse gas emissions to slow global warming as well as increase our infrastructure's capacity to recover, adapt, and thrive in the face of adversity, chronic stresses and acute shocks that will be encountered in a future of changing climate conditions.

15.1.1 CLIMATE CHANGE MITIGATION

Climate Mitigation refers to human intervention to eliminate greenhouse gas (GHG) emissions (e.g. building transportation infrastructure that can support cycling and public transit and reduce

the need for car travel) or enhance GHG removals. The City of Hamilton's Community Energy + Emissions Plan (CEEP) includes five Low-carbon Transformations necessary to achieve the City's target of net-zero GHG emissions by 2050 which were considered in each of the AM Plans:

- Innovating our industry.
- Transforming our buildings.
- Changing how we move.
- Revolutionizing renewables; and
- Growing green.

15.1.2 CLIMATE CHANGE ADAPTATION

Climate Adaptation refers to the process of adjusting to actual or expected climate and its effects (e.g., building facilities that can handle new climate loads).

Climate change impacts on assets will vary depending on the location and the type of services provided, as will the way in which those impacts are responded to and managed. In 2021, the City of Hamilton completed a Vulnerability and Risk Assessment Report guided by ICLEI's Building Adaptive and Resilient Communities (BARC) Framework as part of the Climate Change Impact Adaptation Plan (CCIAP). The BARC Framework identified thirteen high-impact areas and actions to address them, grouped into the following four Themes:

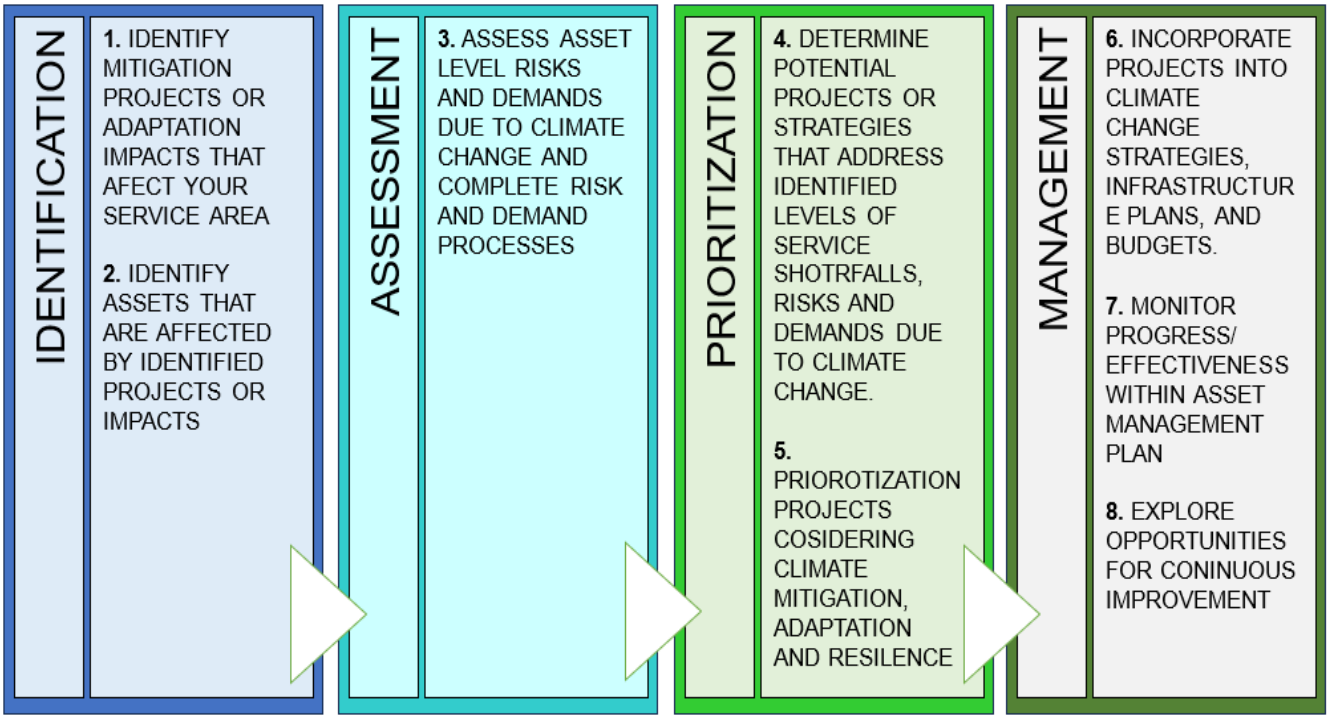
- Built Environment,
- People and Health,
- Natural Environment, Agriculture and Water, and
- Energy and Economy

15.2 ASSET MANAGEMENT CLIMATE CHANGE FRAMEWORK

A four-step framework for Climate Change is used within the City of Hamilton's Asset Management Plans. This framework is based on the Federation of Canadian Municipalities Asset Management Climate Change Framework, and also builds on the aforementioned Community Energy + Emissions Plan and the Vulnerability and Risk Assessment Report for priority climate change impacts.

In the context of the asset management planning process, climate change can be considered as both a future demand and a risk. Therefore, this framework looks at climate mitigation and adaptation from both a demand and risk lens and describes the impacts of climate change on an asset specific level. The four-step process is described in ***Figure 6*** below:

Figure 6: CLIMATE CHANGE FRAMEWORK



The climate change framework in the AM Plans ends at the Assessment phase with the intention that the Prioritization and Management phases will occur following the release of the AM Plan. In addition, new projects should incorporate climate mitigation and adaptation methods. Moving forward, the Climate Lens tool implemented in 2023 for Public Works service areas will also analyze projects and help identify mitigation and adaptation opportunities and will assist with the prioritization of climate mitigation and adaptation projects in future.

16.0 RISK MANAGEMENT APPROACH

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines. Risk is defined in ISO31000 as 'the effect of uncertainty on an organization's objectives.

Hamilton will explicitly document its risk consideration within the AM Plan to demonstrate how the City actively considers risk with regards to its assets and the services that are provided to the community. Hamilton will utilize various risk measurements including impact, probability, frequency, and consequences of these risks to inform decisions and optimize choices by either reducing, removing, mitigating, or accepting the risk. Hamilton incorporates risk management into its asset management planning to ensure:

- Desired levels of service will be achieved through the balance of cost, risk, and performance;
- Prioritized projects can be funded appropriately and within the required planned time;
- Hamilton is compliant with all regulatory and legislative obligations; and,
- Hamilton is continually monitoring risk to identify new and emerging risks as they present themselves and to measure the effectiveness of the City's mitigation efforts over time.

Risk is dynamic, iterative, and responsive to change. To manage risk effectively, Hamilton will also need to continuously monitor and consider risk to ensure the appropriate mitigation efforts are applied. Hamilton will continuously monitor and report on risk through operational initiatives which include but are not limited to asset management planning processes, condition assessments, and regular staff inspection programs. By continuously monitoring risk Hamilton:

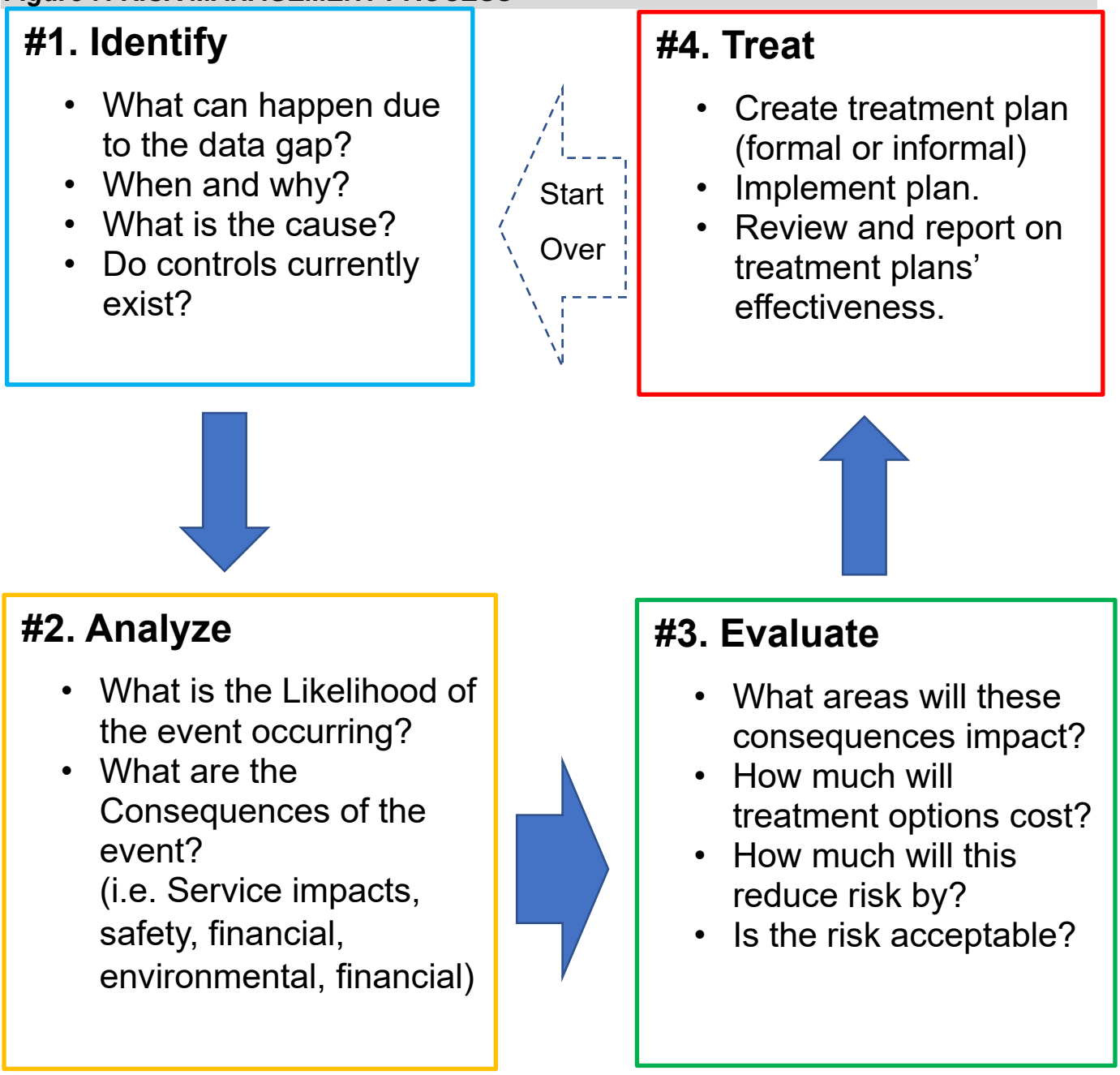
- Ensures evaluation of risk is an integral part of normal business process and part of the decision making process;
- Tailors its risk management to meet community needs and includes human, cultural and social factors;
- Ensures transparency in our decisions; and,
- Explicitly address the uncertainty that is incumbent on asset owners.

16.1 RISK MANAGEMENT PROCESS

Hamilton has begun to undergo a shift in how it evaluates risk in accordance with its infrastructure planning. Hamilton has adopted an infrastructure-based risk management process to ensure that all assets will be reviewed utilizing a standardized approach. This will

ensure that Hamilton is able to measure and compare risks consistently across a broad spectrum of assets and services. Each step in the risk management process ensures specific questions are answered and a decision is made on how to resolve or mitigate the known risk with identified costs. Future prioritization processes which are to be developed would further integrate risk into the budget process. The risk management process is summarized in ***Figure 7*** below.

Figure 7: RISK MANAGEMENT PROCESS



16.2 RISK SCORING

The overall risk rating is the result of multiplying the consequence of the risk event times the likelihood of the risk event and converting the score to a rating. To ensure a consistent approach to risk scoring, Hamilton has standardized scales and categories for both the consequence (***Table 11***) and the likelihood of the risk event occurring ***(Table 12***) below. ***Table 13*** shows the Risk Rating Heat Map for how a risk rating is assigned based on different combinations of consequence times likelihood.

Table 11: RISK CONSEQUENCE SCALE

	REDUCTION / INTERRUPTION OF SERVICE	FINANCIAL	SAFETY	REPUTATION	ENVIRONMENTAL
1	Asset Failure - Little to No Interruption to service. (Few Customers)	< $10,000 or <0.1% of operating budget	Potential for Minor Injury	Minimal to no concern	Negligible Impact (restored within 1 week)
2	Asset Failure - Minor Interruption to service. 4 Hours Downtime	$10K - $30K or 0.2-2.0% of operating budget	Lost Time Incident, WSIB, Minor Injuries to few people	Internal Concerns, few complaints from public, minor Council questions	Minor Impact (Restored within 1 month)
3	Asset Failure - Serious Interruption to service. 4 - 24 Hours Downtime	$30K - 250K or 2.1-4.9% of operating budget	Permanent Injury	Large volume of phone calls, emails, major Council questions	Significant Short-Term Impact (up to 2 Months)
4	Asset Failure - Major Interruption to service. 2 Days-1 Week Downtime	$250K - $2.5 Million or 5% to 10% of operating budget	Disabling Injury or Casualty	Local News, TV, Social Media	Significant Long-Term Impact (up to 1 Year)
5	Asset Failure - Catastrophic Interruption to service. > 1 Week of Downtime	> $2.5 Million or >10% of operating budget	Multiple Casualties, Long Term Hospitalizations	National/International News Coverage	Major Long-Term Impact (< 1 year/permanent)

Table: 12 RISK LIKELIHOOD SCALE

SCORING	DESCRIPTION	RANGE
1	Rare	< 1 per 100 Years
2	Unlikely	Once in 11-100 Years
3	Possible	Once in 3-10 Years
4	Likely	>10 times per year to Once in 2 years
5	Almost Certain	Over 10 Times per Year

Table 13: CONSEQUENCE X LIKELIHOOD RISK RATING HEAT MAP

		CONSEQUENCE				
		INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC
		1	2	3	4	5
Almost Certain	5	Medium (5)	High 10	High (15)	Very High (20)	Very High (25)
Likely	4	Low (4)	Medium (8)	High (12)	High (16)	Very High (20)
Possible	3	Low (3)	Medium (6)	High (9)	High (12)	High (15)
Unlikely	2	Very Low (2)	Low (4)	Medium (6)	Medium (8)	High (10)
Rare	1	Very Low (1)	Very Low (2)	Low (3)	Low (4)	High (5)

Critical risks are those assessed with ‘Very High’ (requiring immediate corrective action), and ‘High’ (requiring corrective action) risk scores identified with the AM Plans. Hamilton will continue to improve the scales and ensure that they accurately reflect the City’s appetite for risk. ***Table 11, 12 and 13*** were revised for use in developing the 2023/2024 Non-Core AM plans. For the risk ratings and terms used for the *2022 Transportation and Water Works Asset Management Plans* please refer to the *2022 Corporate Asset Management Plan Overview*.

17.0 FINANCIAL MANAGEMENT APPROACH

Effective asset and financial management will enable Hamilton to ensure its assets will continue to provide the appropriate level of service for the City to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the City is transparently fulfilling its stewardship accountabilities.

Creating a Long-Term Financial Plan (LTFP) that connects the Budget to the AM Plan is critical for the City to ensure that the various asset lifecycle activities such as acquisition, operations, maintenance, and disposal can and do happen at the optimal time and to maintain the agreed upon Levels of Service. Hamilton is under increasing pressure to meet the wants and needs of its customers while keeping costs at an affordable level and maintaining financial sustainability.

Without funding asset activities properly for assets, the City will have difficult choices to make in the future which will include options such as higher cost reactive maintenance and operational costs, reduction of service and potential reputational damage.

Future iterations of the plan will ensure that Hamilton:

- Creates and utilizes a LTFP that connects the budget process to AM Plans;
- Provide accurate costs within the near future horizon (10 years)
- Provide visibility to future lifecycle needs over the planning horizon (30 years);
- Detail the costs to ensure a defined level of service can be achieved;
- Plan how to manage the financial gap that currently exists; and,
- Detail what cannot be done and the effects of underfunding infrastructure.

The City aims to fully integrate its assets and services into the LTFP. Aligning the LTFP with the AM Plan is essential to ensure that the needs of all services are addressed while the City develops a clear financial strategy with measurable financial objectives. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

17.1 FINANCIAL TARGETS

Hamilton needs to determine financial targets that are appropriate to achieving its objectives for its infrastructure assets and services. Hamilton has presented two key financial indicators to measure and report on its efforts to deliver its services: the 10-Year Asset Renewal Funding Ratio, and the 10-Year Operating, Maintenance and Renewal Ratio. A 10-Year Maintenance Ratio was added for some asset categories where renewals were not the largest driver for the service's financial sustainability but is not found within all plans. In future additional ratios might be considered. The ratios are defined below in ***Table 14.***

Table 14: CALCULATING FORECAST INFRASTRUCTURE FUNDING GAP

Financial Indicator	Ratio Measurement	Description	Target
10-Year Asset Renewal Funding Ratio	Planned renewal budget for the next 10 years / forecast renewal needs for next 10 years	It is used to determine if the City is accommodating asset renewals in an optimal and cost-effective manner from a timing perspective and relative to financial constraints for the 10-year reporting period.	90-110%
10-Year Operations, Maintenance and Renewal Ratio	Planned operations, maintenance, and renewal budget for the next 10 years / forecast operations, maintenance and renewal needs for next 10 years	It is used to determine if the City is funding assets in an optimal way over their lifecycle to meet the organization's risk and service level commitments for the 10-year reporting period.	
10-Year Maintenance Ratio[1]	Planned maintenance budget for the next 10 years / forecast maintenance needs for next 10 years	It is used to determine if the City is accommodating asset maintenance in an optimal and cost-effective manner from a timing perspective and relative to financial constraints for the 10-year reporting period.	

These indicators largely report on existing assets and services. Acquisitions costs are not directly included in the ratio calculations. However, some AM Plans have estimated the costs of ongoing operations and maintenance for anticipated acquisitions at a low data confidence. If acquisitions are acquired and an insufficient budget is not allocated to the ongoing operations, maintenance and eventual renewal and disposal then these ratios will decrease over time.

Ultimately, the targets are intended to be planning tools and organizational goalposts to ensure Hamilton can monitor its financial performance in managing assets and delivering services.

[1] Used for some service areas where asset renewals were not the largest driver for the service's financial sustainability

18.0 INFRASTRUCTURE FUNDING GAP

Hamilton's current infrastructure position represents a huge social investment that has been built up progressively over the last 150 years. Continued acquisitions over that time compounded with growth, insufficient resources, and underinvestment to keep up with the necessary required works has created a 'gap' of funding. Per ***Figure 8*** below, this gap represents the difference between what Hamilton currently spends versus the amount of investment required to ensure the optimal delivery of services.

Figure 8: CALCULATING FORECAST INFRASTRUCTURE FUNDING GAP

Hamilton's challenge is to determine how it will manage the gap over the long term to ensure that they can continue to deliver its services sustainably today and across future generations.

The gap was calculated utilizing identified renewal needs and planned operations and maintenance activities or budgets. The details of the 10-Year Infrastructure Funding Gap are detailed in the specific AM Plans for each service area.

18.1 MANAGING THE INFRASTRUCTURE FUNDING GAP

Due to data confidence and affordability considerations, the infrastructure funding gap should not be funded immediately. Closing the overall gap in funding city-wide will require validation, planning and resources to begin to incorporate gap management into the future budgets for all City services. This gap will need to be managed over time to reduce it in a sustainable manner and limit the financial impact to customers.

The options to manage the gap are included in ***Table 15 below.*** These options and others will allow Hamilton to ensure the gap is managed appropriately and ensure the level of service outcomes the customers desire.

Table 15: OPTIONS TO MANAGE INFRASTRUCTURE FUNDING GAP

OPTIONS TO MANAGE INFRASTRUCTURE FUNDING GAP	DESCRIPTION
Prioritize Lifecycle Activities	Without sufficient funding, the City may have to defer necessary lifecycle activities. Deferring important lifecycle activities is not recommended, and a prioritization framework must be used. The City will continue to develop its long-term financial plan to ensure that over time the City can prioritize necessary lifecycle activities which ensures the assets are compliant, safe, and effectively delivering the service the customers need and desire while considering intergenerational equity. The City will also continue to develop its risk management framework and ensure that projects are prioritized effectively, and that the infrastructure funding gap is based on the City's current appetite for risk.
Dispose/Close Underutilized Assets	Some assets may be underutilized and not providing as much value as others, but still incur operations and maintenance costs to continue functioning at a safe level. It is recommended those assets be considered for disposal and the funds required for upkeep be distributed to other assets.
Reduce the Expected Levels of Service	Some assets may be overperforming and/or providing levels of service that customers do not value. For these assets the City can consider decreasing maintenance or operations activities and decreasing or limiting renewals and acquisitions to decrease the levels of service.
Increase Data Confidence	Hamilton needs to mature further in its asset management knowledge to ensure that it fully captures the needs of its assets throughout their lifecycles and to provide higher confidence forecasts to accurately present the gap. • As the City continues to develop condition profiles and necessary works are identified based on their condition instead of their age, it is anticipated maintenance and renewal forecasts will change significantly. • The City will continue to improve its asset lifecycle data to improve the confidence in the lifecycle forecasts, increase the understanding of costs to deliver levels of service, and allow better informed decision-making on the types of assets to acquire.

OPTIONS TO MANAGE INFRASTRUCTURE FUNDING GAP	DESCRIPTION
Increase Funding Allocations	In some service areas, primarily those with a low Operations, Maintenance and Renewal financial ratio, there is insufficient budget to address the forecasted lifecycle needs over the 10-year period. As acquisitions occur, their increased costs may impact the service delivery. Without some adjustment to available funds or other lifecycle management decisions there may be insufficient budget to address all planned lifecycle activities. Increase funding allocations may include increased taxation, increased block funding for specific lifecycle activities, and long term debt utilization.

19.0 LONG-TERM FINANCIAL PLAN (LTFP)

Hamilton will be developing the Long-Term Financial Plan to connect the current funding allocation within the budget process directly to the asset management plans and the level of services Hamilton provides. This will be a critical task for Hamilton to assist with the undertaking of timely renewals, ensuring legislative compliance and assuring the continuation of services.

The LTFP seeks to accommodate ongoing funding of existing service’s lifecycle costs as well as new services and assets as required. The plan itself will connect the revenues and income raised annually and the intended expenditures to ensure the provision of service can be achieved. The LTFP will inform the financial strategy and the likely consequences of diverting from the AM Plans proposed activities. The LTFP ultimately will allow Hamilton to:

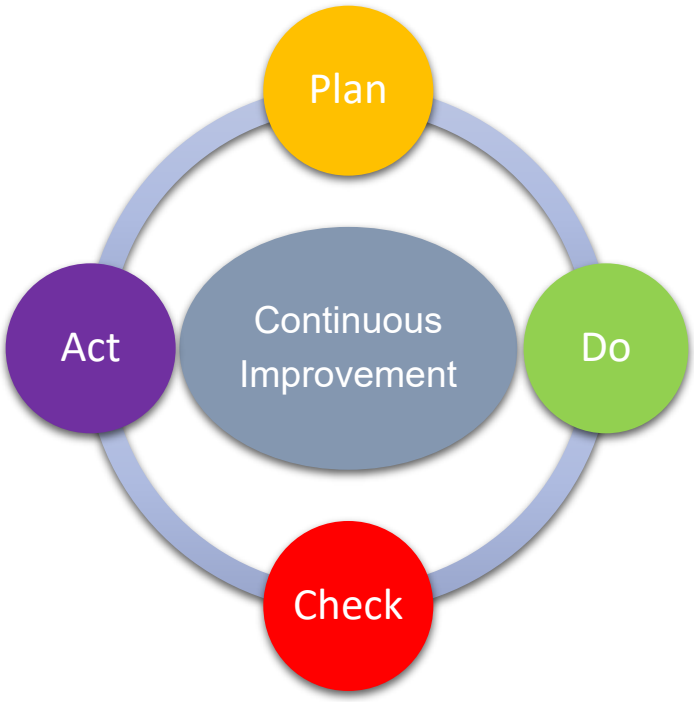
- Model financial implications of various service level scenarios to help inform long term planning options;
- Determine a combination of proposals that best meets the needs of the community; and,
- Ensure ongoing financial sustainability and intergenerational equity.

The LTFP will be reviewed annually in conjunction with the budget process and throughout each iteration of every asset management plan.

20.0 CONTINUOUS IMPROVEMENT

The first AM Plan is a starting point to inform the City on what we own, how we manage it, when we will replace it, and the long-term costs and risks of ownership of these assets. By continuously developing our AM Plans, the City will realize the benefits of applying asset management principles across all service areas. ***Figure 9*** below shows the process for how the City proposes to perform continuous improvement over time.

Figure 9: CONTINUOUS IMPROVEMENT



The first iteration of AM Plans completed between 2022-2024 identified over 375 opportunities for improvement which will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. Future iterations of these AM Plans will provide updates on these improvement plans.