Information Technology 2024 Asset Management Plan

Hamilton

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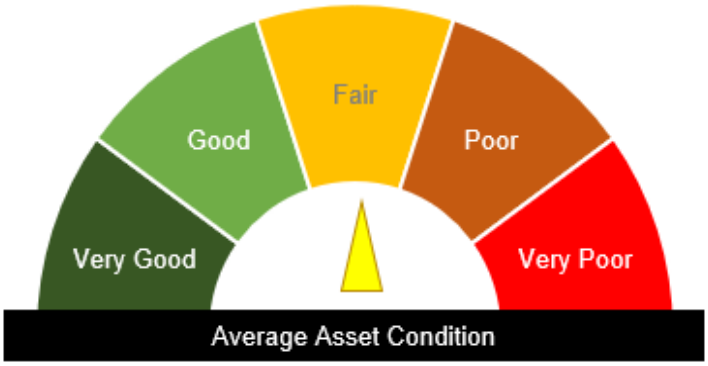
SUMMARY AND QUICK FACTS

SERVICE PROFILE

The Information Technology (IT) Division provides secure and reliable IT services across the City of Hamilton. Since IT services affects most, if not all city services, ensuring a seamless IT experience is vital for the smooth operation of city services for internal and external users alike.

ASSET SUMMARY

Replacement Value: **$25.2 M**
Average Condition: FAIR
Average Age: **7** years or 16**%** of the average service life remaining



LEVEL OF SERVICE SUMMARY

Customer Values

- IT devices and data are properly secured.
- IT Service Desk is responsive and effective.

Customer Levels of Service

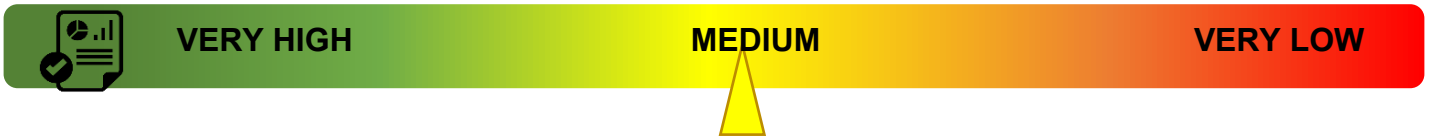
- Enable access to reliable data and information.
- Enable the City workforce with access to tools and training to deliver services effectively.

Technical Levels of Service (not yet measured)

- Average time for the service desk to answer calls.
- Network uptime.
- Unscheduled database downtime.

ASSET HIGHLIGHTS				
ASSETS	**QUANTITY**	**REPLACEMENT COST**	**AVERAGE CONDITION**	**STEWARDSHIP MEASURES**
Networking Equipment	1750	$6.7 M	No Data	Funding is allocated for Infrastructure Asset Management in a 10-year capital plan.
Datacentre Assets	135	$4.7 M	No Data	

DATA CONFIDENCE



INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

DEMAND DRIVERS

Ongoing response to cybersecurity incident – Complete recovery from the incident is an ongoing process and an opportunity for the City to rebuild its systems and make them stronger and more resilient.

Market Changes – Vendors are moving away from selling solutions and moving toward subscription and transaction-based models.

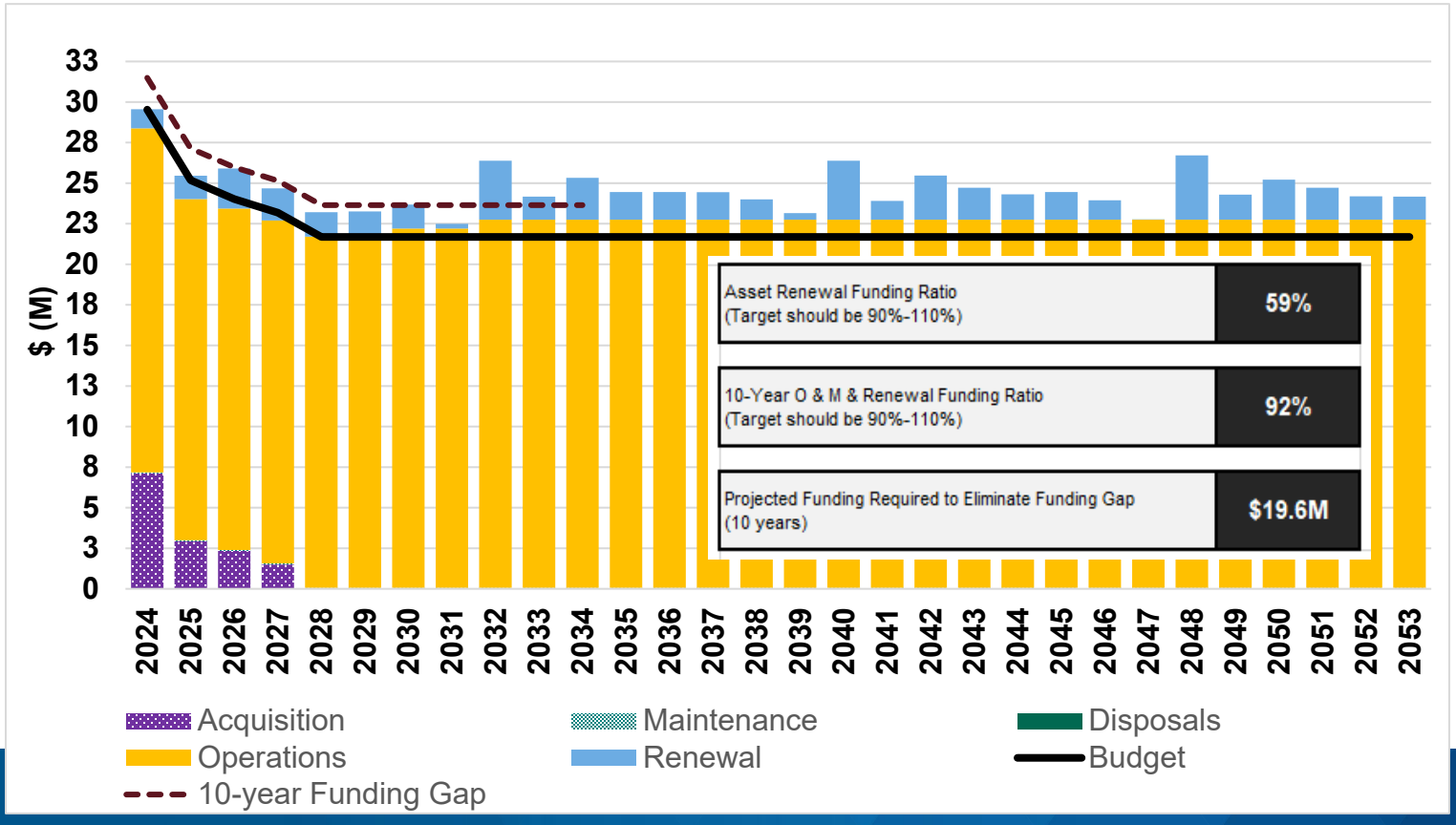
RISK

- Critical Assets are identified as networking equipment and data centre assets, critical business applications and data assets, and the uninterruptible power supply (UPS) system.
- Critical risks are cybersecurity risks and power supply interruption risks.

CLIMATE CHANGE ADAPTATION

- There would be an increase in requests for real-time authoritative data to support reports and online services. IT Division will continue to work with business units across the City to identify demands emerging from climate change.

LIFECYCLE SUMMARY



INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

1. INTRODUCTION

The Information Technology (IT) Division delivers information technology services within the City of Hamilton to both internal and external users. It provides and maintains the technology infrastructure necessary for the city to operate its services and provides end-user devices and IT service desk support to City staff. In addition, the IT Division provides business applications support, spatial solutions, data services as well as technology solutions to support departmental goals. Finally, through the provision of online web-based services, the IT Division allows residents to access municipal services and perform civic duties. The purpose of this Asset Management Plan (AM Plan) is to ensure that the IT Division has the required assets to deliver secure and reliable information technology services to the City.

This AM Plan is intended to communicate the requirements for the sustainable delivery of services through the management of assets, compliance with regulatory requirements and required funding to provide the appropriate levels of service over the 2024-2053 planning period.

Since Sunday, February 25, 2024, the City of Hamilton experienced a cyber incident that disabled some of the IT systems. As a result, this AM Plan was created based on the data that was accessible at the time of publication.

2. BACKGROUND

The information in this section is intended to give a snapshot in time of the current state of the IT Division service area by providing a service profile, outlining legislative requirements, and defining the asset hierarchy used throughout the report. This section will provide the necessary background for the remainder of the AM Plan.

2.1 SERVICE PROFILE

Listed below are related documents reviewed in preparation of the Asset Management Plan:

- Asset Management Plan Overview Document;
- 2024 Proposed Operating and Capital Budget Presentation;
- 2023 Enterprise Data Management Update;
- 2023 City of Hamilton's Digital Strategy;
- 2023-2026 IT Strategy;
- 2022 City of Hamilton IT Satisfaction Scorecard: Department Report; and,
- 2022 Improving Online/Digital Services Survey.

Additional financial-related documents are identified in ***Section 10*** Plan Improvement and Monitoring.

2.1.1 SERVICE HISTORY

The Information Technology (IT) Division originally consisted of two sections: 'Business Applications' and 'Infrastructure and Operations.' In 2018, by council direction, the IT division began the process of centralizing departmental IT resources and a new section, 'Strategy and Architecture', was created. In 2021, the 'Infrastructure and Operations' section was divided into two distinct sections: 'IT Operations' and 'Infrastructure and Security'. In 2023, in response to information gathered during the development of the IT Strategy, a new section, 'Data Services', was created to provide data and analytics-related services to city departments.

In 2024, the City of Hamilton experienced a cybersecurity incident. IT Division staff responded to the extraordinary challenge and were able to keep many of the City's systems running. The City's response to the incident is ongoing and it may take months before the recovery is complete.

2.1.2 SERVICE FUNCTION

The IT Division provides and maintains the hardware and software necessary for the City of Hamilton to deliver all municipal services. The IT Division is composed of the following sections:

- IT Infrastructure and Security: Provides and maintains datacentre operations, communications and networking infrastructure, and IT security to support city services;
- IT Operations: Provides and maintains end-user devices and software, and includes service desk support services to City of Hamilton staff;
- Business Applications: Provides and maintains the business applications used across the organization to support internal and external business processes;
- Strategy and Architecture: Provides strategy enablement and enterprise architecture services for value realization and project services for technology implementation; and,
- Data Services: Provides enterprise spatial solutions, and data and analytics services, including data literacy to City staff and public.

Some of the areas identified as priorities by users of the service which are mentioned in ***Section 4.2*** are:

- Organizational devices and data are properly secured;
- Communication systems and networks are reliable;
- Business applications meet needs;
- IT service desk is responsive and effective;
- Staff devices meet needs; and,
- Digital services have a clear and simple process to navigate.

2.1.3 USERS OF THE SERVICE

The IT Division plays a vital role in supporting both internal and external municipal functions within the City of Hamilton.

Internally, IT is responsible for providing essential information technology resources and support to over 8,000 City employees. [1] City staff rely on the IT Division for devices, IT service desk support, as well as for business applications to perform vital organizational activities. IT is the custodian of the City's datacentre which allows storage and computing capacity to deliver all City services. Effective communication and networking tools provided by the IT Division enable seamless collaboration among staff across different departments. Business units across the city rely on the IT Division's expertise in planning for and implementing technology solutions. Finally, the newly added Data Services section is set to help departments utilize data insights to make more informed decisions.

Externally, the IT Division extends its support to residents, businesses, and community partners, offering a diverse range of digital services. These services cater to a broad user base, encompassing different demographics and needs. City websites, such as the recreation page, waste collection website, and open data portal, are examples of these digital services hosted by IT. A recent survey conducted by the City of Hamilton revealed that 60% of survey respondents

[1] (City of Hamilton, 2022)

are frequent users of digital services[2]. While precise web traffic data for these services is presently unavailable, the use of online services to access municipal services and perform civic duties is set to grow.

2.1.4 UNIQUE SERVICE CHALLENGES

The IT Division has some unique service challenges which will be discussed throughout this report. Some of these challenges are summarized below:

- Unauthorized use of IT resources outside established governance frameworks, also known as 'shadow IT', undermines the integrity of IT systems. The City of Hamilton's resolve to rebuild a secure, reliable and robust IT infrastructure can only be possible with trained and vigilant City staff that eliminates the use of 'shadow IT'.

- The information technology landscape has largely shifted from perpetual and on-premises solutions to subscription-based and cloud services. Most vendors that the IT Division works with now operate through these 'technology as a service' models. To adapt to this changing reality requires a new way of thinking including but not limited to how the IT Division budgets, procures and hires;

- Certain applications, platforms and devices have reached the end of life and are now either without support, warranty, or both. Naturally, not all legacy systems can be updated simultaneously. However, the most critical of these systems need to be identified and prioritized to ensure seamless service delivery;

- More residents are using digital services to engage with the City when it comes to accessing municipal services, seeking information on programs, or performing civic duties. Many of these digital services are hosted by the IT Division. As the City continues to develop and implement its digital and enterprise customer service strategies, the IT Division will need to play a critical role as an enabler of these advancements;

- The *2022 IT Department Scorecard* suggested dissatisfaction with the IT Division from other business units within the City with respect to the ability to get IT capacity to complete projects. Additionally, various City departments have requested enhanced data and analytics services for improved decision making. The new IT Strategy emphasizes business relationship management and enterprise data management as the IT Division continues to aim to meet the needs of its partners;

[2] (City of Hamilton, 2023)

- The IT Division competes directly with the private sector for recruiting and retention of top talent. Compensations in the private sector for in demand IT professionals may be much higher leaving the IT Division at a disadvantage when it comes to attracting the best human resources; and,

- The Uninterrupted Power Supply (UPS) system for the City's datacentre does not meet IT Division's assessment of its needs.

2.2 LEGISLATIVE REQUIREMENTS

The most significant legislative requirements that impact the delivery of IT Division services are outlined in ***Table 1***. These requirements are considered throughout the report, and where relevant, are included in the levels of service measurements.

Table 1: Legislative Requirements

LEGISLATION OR REGULATION	REQUIREMENT
Municipal Freedom of Information and Protection of Privacy Act (MFIPPA)[3]	Protect the privacy of individuals concerning personal information about themselves held by institutions and provide individuals with a right of access to that information.

2.3 ASSET HIERARCHY

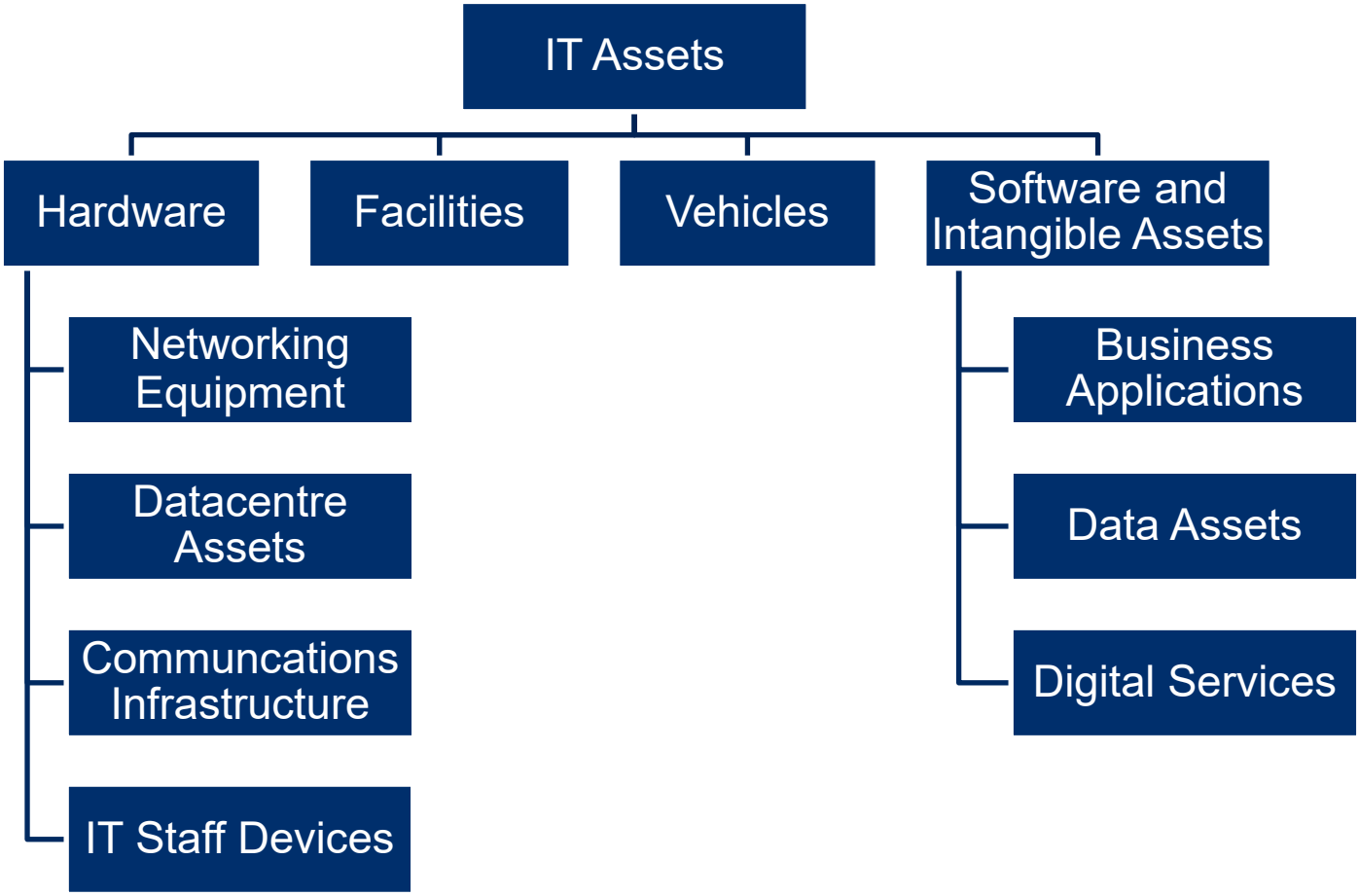
To deliver secure and reliable services, the IT Division requires assets. The IT Division service area has been broken down into four asset classes for the purpose of this AM Plan:

- Hardware: refers to the IT infrastructure provided and maintained by the IT Division as well as all the end-user devices used by IT staff;
- Facilities: refers to any City-owned facilities necessary to deliver IT services;
- Vehicles: describes different types of vehicles which are used to enable IT services; and,
- Software and Intangible Assets: describes the business applications, data assets and digital services provided and maintained by the IT Division.

The detailed asset hierarchy of the IT Division is shown in **Figure 1**.

[3] https://www.ontario.ca/laws/statute/90m56

Figure 1: IT Division Asset Hierarchy



An explanation of each of these asset classes can be found in ***Section 3.***

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

3. SUMMARY OF ASSETS

This section provides a detailed summary and analysis of the existing inventory information as of June 2023 including age profile, condition methodology, condition profile, asset usage and performance for each of the asset classes.

Table 2 displays the detailed summary of assets for the IT Division service area. The sources for this information are a combination of data included in the City's database information which is included in ***Section 10.1***. It is important to note that inventory information does change often, and that this is a snapshot of information available as of June 2023. An asset registry for IT Division assets does not exist and the development of one has been recognized as a continuous improvement item in ***Table 28***.

The City owns approximately **$25.2 million**[4] in IT Division assets which are on average in **FAIR** condition. Assets are a weighted average of **7 years** in age which is **16%** of the average remaining service life (RSL).

Note that replacement values of the asset class *software and intangible assets* have not been determined and hence are not included in the total. It is recognized that these may be potentially high value assets and thus the total for replacement cost of IT Division assets may be significantly higher. Determination of replacement costs for this asset class has been identified as a continuous improvement item in ***Table 28***.

Data confidence descriptions are outlined on ***page 32*** of the AMP Overview. The replacement costs below are typically at a **MEDIUM** data confidence level overall. Replacement costs for hardware assets were provided by staff based on historical records and market information. Replacement values for facilities and vehicles were provided by Corporate Facilities and Energy Management and Fleet Services, respectively. Replacement values of software and intangible assets are as yet undetermined.

Data confidence for average age is **MEDIUM** overall as most hardware assets do not have their ages formally tracked. On the other hand, the average equivalent condition has a **LOW** data confidence as no asset class has a formal condition scoring methodology. Continuous improvement items identified in ***Table 28*** include developing methodologies to determine asset conditions for IT Division's assets.

The Corporate Asset Management (CAM) Office acknowledges that some works and projects are being completed on an ongoing basis and that some of the noted deficiencies may already be completed at the time of publication. In addition, the assets included below are assets that are assumed and in service at the time of writing. This has been identified as a continuous improvement item in ***Table 28***.

[4] The total does not include hardware, software, or intangible assets owned by other City of Hamilton departments and divisions. Those assets have been broken out into each individual plan.

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

Table 2: Detailed Summary of Assets
****(Weighted Average based on Replacement Cost)***

HARDWARE				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Networking Equipment	1750	$6.7M	No Data	No Data
DATA CONFIDENCE	High	Medium		
Datacentre Assets	135	$4.7M	7 years (13%)	No Data
DATA CONFIDENCE	High	Medium	High	
Communications Infrastructure	4800	$1.6M	No Data	No Data
DATA CONFIDENCE	High	Medium		
IT Staff Devices	350	$0.4M	3 years (40%)	3-FAIR
DATA CONFIDENCE	High	Medium	High	Low
SUBTOTAL	**$13.4M**		**7 years (15%)**	**3-FAIR**
DATA CONFIDENCE	**Medium**		**Medium**	**Low**

FACILITIES[5]				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Central Public Library (Offices and Datacentre)	1	$11.4M	39 years (48%)	2-GOOD
DATA CONFIDENCE	Very High	Medium	High	High
Lister Block (Offices)	1	$0.3M	95 years (37%)	2-GOOD
DATA CONFIDENCE	Very High	Medium	High	High
SUBTOTAL	**$11.7M**		67 years (42%)*	2-GOOD*
DATA CONFIDENCE	**Medium**		**High**	**High**

[5] Facility list includes City of Hamilton facilities where IT Division occupies floor space.

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

VEHICLES				
ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
SUV	2	$0.07M	4 years (50%)	3-FAIR
DATA CONFIDENCE	Very High	High	High	Medium
Van	1	$0.07M	5 years (50%)	3-FAIR
DATA CONFIDENCE	Very High	High	High	Medium
SUBTOTAL	**$0.14M**		4 years (50%)	3-FAIR
DATA CONFIDENCE	**High**		**High**	**Medium**

SOFTWARE AND INTANGIBLE ASSETS				
ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
Business Applications	No Data	No Data	Not Applicable	Not Applicable
Data Assets				
Digital Services				

TOTAL	$25.2M	7 Years (16%)*	3-FAIR*
DATA CONFIDENCE	**Medium**	**Medium**	**Low**

*To best represent the IT Division assets, the total average age and condition estimates exclude Facilities' values from the weighting.

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

3.1 ASSET CONDITION GRADING

Condition refers to the physical state of the IT Division assets and is a measure of the physical integrity of these assets or components and is the preferred measurement for planning lifecycle activities to ensure assets reach their expected useful life. Since condition scores are reported using different scales and ranges depending on the asset, ***Table 4*** below shows how each rating was converted to a standardized 5-point condition category so that the condition could be reported consistently across the AM Plan.

Table 3: Equivalent Condition Conversion Table

EQUIVALENT CONDITION GRADING CATEGORY	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE	FACILITIES CONDITION INDEX (FCI)
1 Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance is required only.	>79.5%	N/A
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%	< 5%
3 Fair	The asset is sound but has minor defects. Deterioration has some impact on asset usage. Minor to significant maintenance is required.	39.5% - 69.4%	>= 5% to < 10%
4 Poor	The asset has significant defects and deterioration. Deterioration has an impact on asset usage. Rehabilitation or major maintenance is required in the next year.	19.5% -39.4%	>= 10% to <30%
5 Very Poor	The asset has serious defects and deterioration. The asset is not fit for use. Urgent rehabilitation or closure is required.	<19.4%	>= 30%

The following conversion assumptions were made:

- Facilities Condition Index was based on ranges provided by the consultant who completed the Building Condition Assessment (BCA);
- For assets where a condition assessment was not completed, but age information was known, the condition was based on the percent of remaining service life e.g., vehicles and staff devices;
- As previously mentioned, development of methodologies to determine asset conditions for IT Division assets has been identified as a continuous improvement item in ***Table 28***.

3.2 ASSET CLASS PROFILE ANALYSIS

This section outlines the Age Profile, Condition Methodology, Condition Profile, and Performance Issues for each of the asset classes.

- The age of an asset is an important consideration in the asset management process as it can be used for planning purposes as typically assets have an estimated service life (ESL) where they can be planned for replacement. Some lower-cost or lower criticality assets can be planned for renewal based on age as a proxy for condition or until other condition methodologies are established. It should be noted that if an asset's condition is based on age, it is typically considered to be of a low confidence level. Although typically, age is used when projecting replacements beyond the 10-year forecast to predict degradation.

- Condition refers to the physical state of assets and is a measure of the physical integrity of assets or components and is the preferred measurement for planning lifecycle activities to ensure assets reach their expected useful life. Assets are inspected/assessed at different frequencies and using different methodologies to determine their condition which are noted in this section.

- Finally, there are often insufficient resources to address all known asset deficiencies, and so performance issues may arise which must be noted and prioritized.

3.2.1 HARDWARE PROFILE

IT Hardware is the physical and tangible technology assets that play a critical role in the administration of City services. IT Hardware consists of networking equipment, communications infrastructure, datacentre assets, and IT staff devices. Note that staff devices for other service groups are included in their respective plans.

Networking assets form a critical component of IT systems, facilitating seamless connectivity within and between different departments. These assets, such as routers and switches, serve

as the backbone of network infrastructure, ensuring that City of Hamilton employees can access the resources and information they need to perform their duties effectively.

Data Centre assets play a vital role in securely storing and managing the vast amount of data generated by the City of Hamilton. Servers and data storage systems are integral components of our data centre infrastructure, providing reliable storage solutions for the diverse range of information used in municipal operations. These assets ensure that data is safely stored and accessible to authorized personnel when needed.

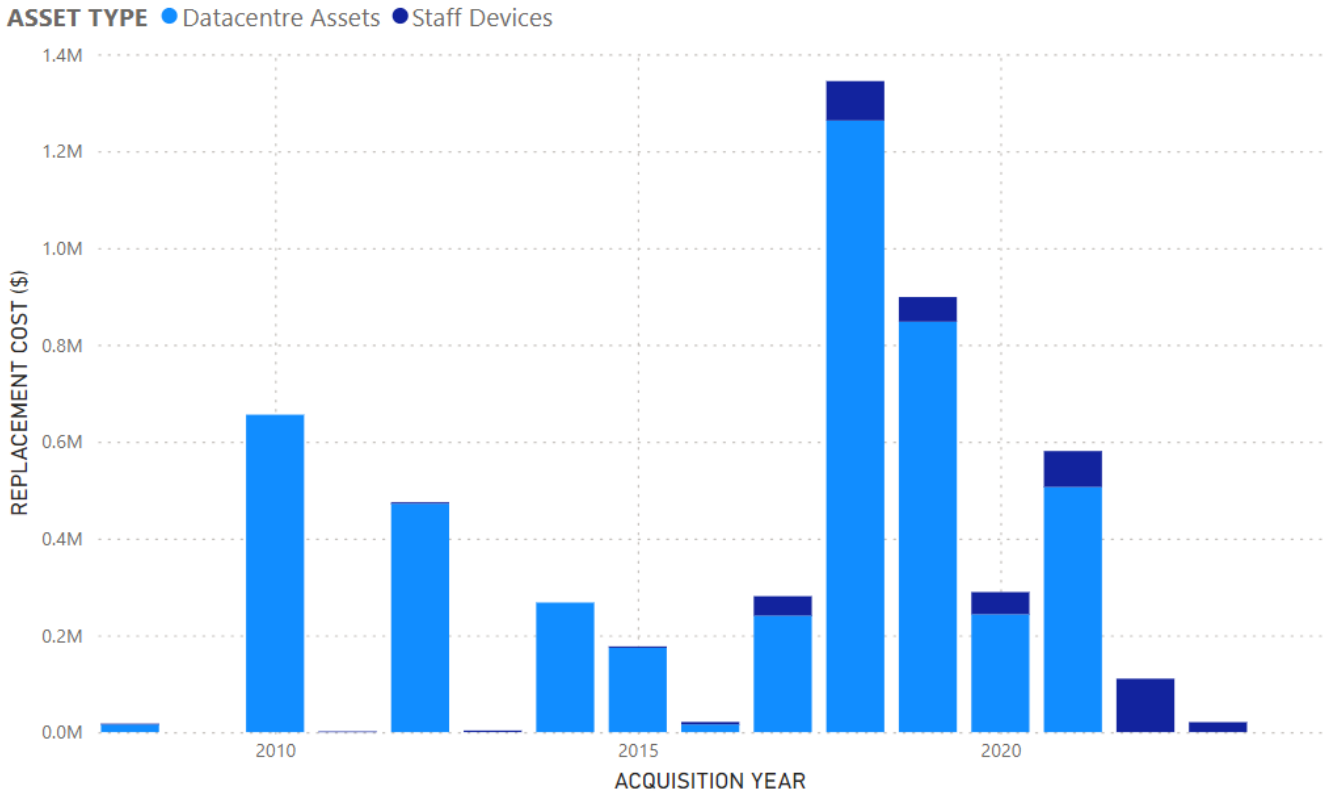
Effective communication is essential for fostering collaboration and productivity within our organization. Communication assets, such as IP telephones, enable the City of Hamilton employees to communicate efficiently with colleagues, partners, and stakeholders. By providing reliable communication tools, we ensure that staff can easily connect with each other, regardless of their location or department, facilitating smoother workflows and improved information sharing.

IT staff devices are used by IT Division staff to conduct administrative tasks and manage the processes of various city services. Some examples of devices within IT operations are laptops and mobile phones. These devices are essential for tasks such as email communication, document creation, data analysis, accessing software systems, and coordinating with other departments. The devices also support service desk functions.

3.2.1.1. AGE PROFILE

The Age profile for hardware assets used by IT Division is shown in ***Figure 2***. Currently, there is no available data regarding the age of communication and networking equipment. Therefore, the age profile provided in ***Figure 2*** only relates to data centre assets and staff devices. As a result, for Hardware assets, the data confidence for the age is Medium. The estimated service life (ESL) is between four to five years for staff devices, and therefore it is evident that many devices are approaching or beyond their ESL. It is also important to note that tablets have been categorized under computers for staff devices. With an estimated service life (ESL) of eight years for data centre assets, it is apparent that many devices are nearing or have surpassed their ESL.

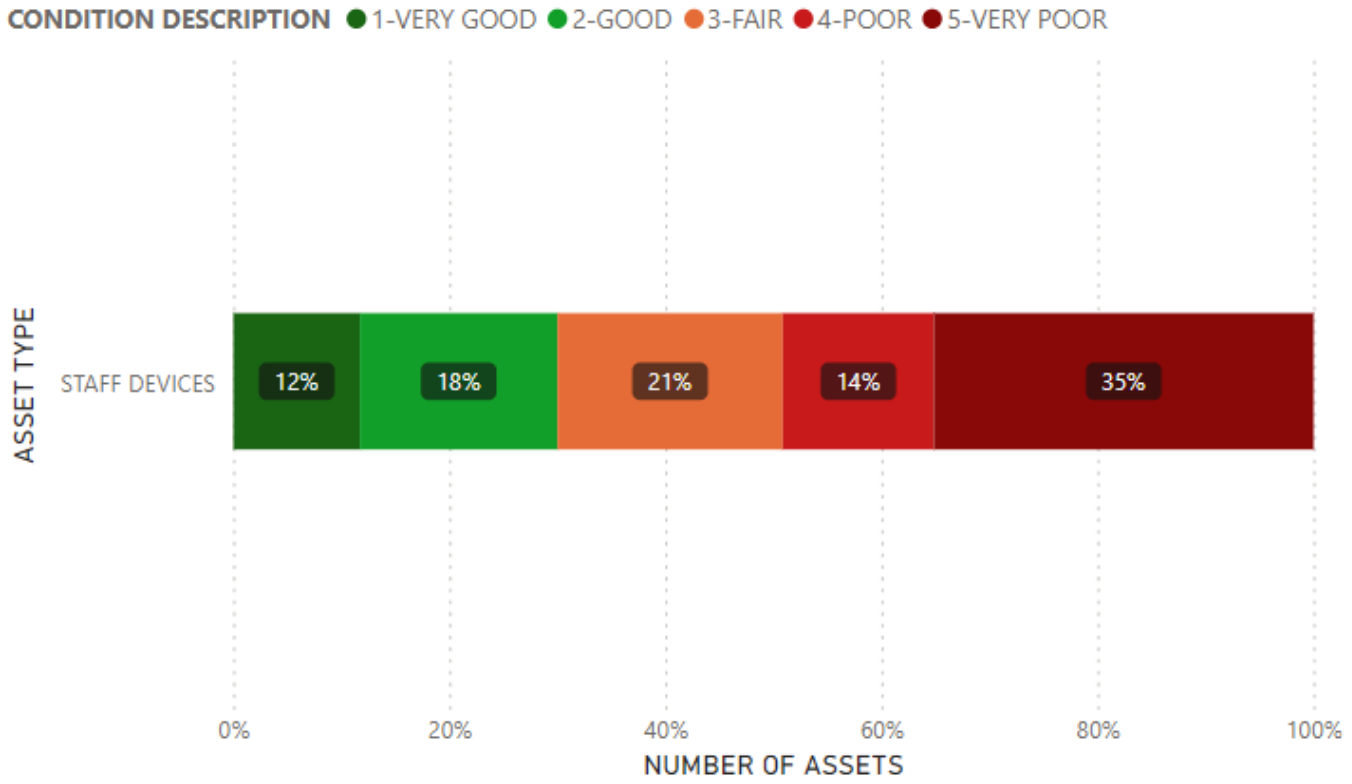
Figure 2: IT Hardware Age Profile



3.2.1.2. CONDITION METHODOLOGY AND PROFILE

There is no formal methodology to access the condition for IT assets. Condition data for datacentre assets, networking equipment, and communication infrastructure is unavailable at this time. It is known that the networking equipment is near end of life and needs to be replaced as soon as possible. For IT staff devices, the condition is based on the estimated service life (ESL), which as previously mentioned, is between four to five years. Devices are not inspected unless there is a reported deficiency, and an incident management triage process is employed to resolve it. ***Figure 3*** shows the condition profile of IT's Hardware assets (data is available only for staff devices). As shown in ***Figure 3***, around half the staff devices are shown to be in POOR or VERY POOR condition based on ESL.

Figure 3: IT Hardware Condition Distribution



3.2.1.3. ASSET USAGE AND PERFORMANCE

Assets are generally provided to meet design standards where available. Known service performance issues for technology assets involve some assets being beyond their Estimated Service Life (ESL).

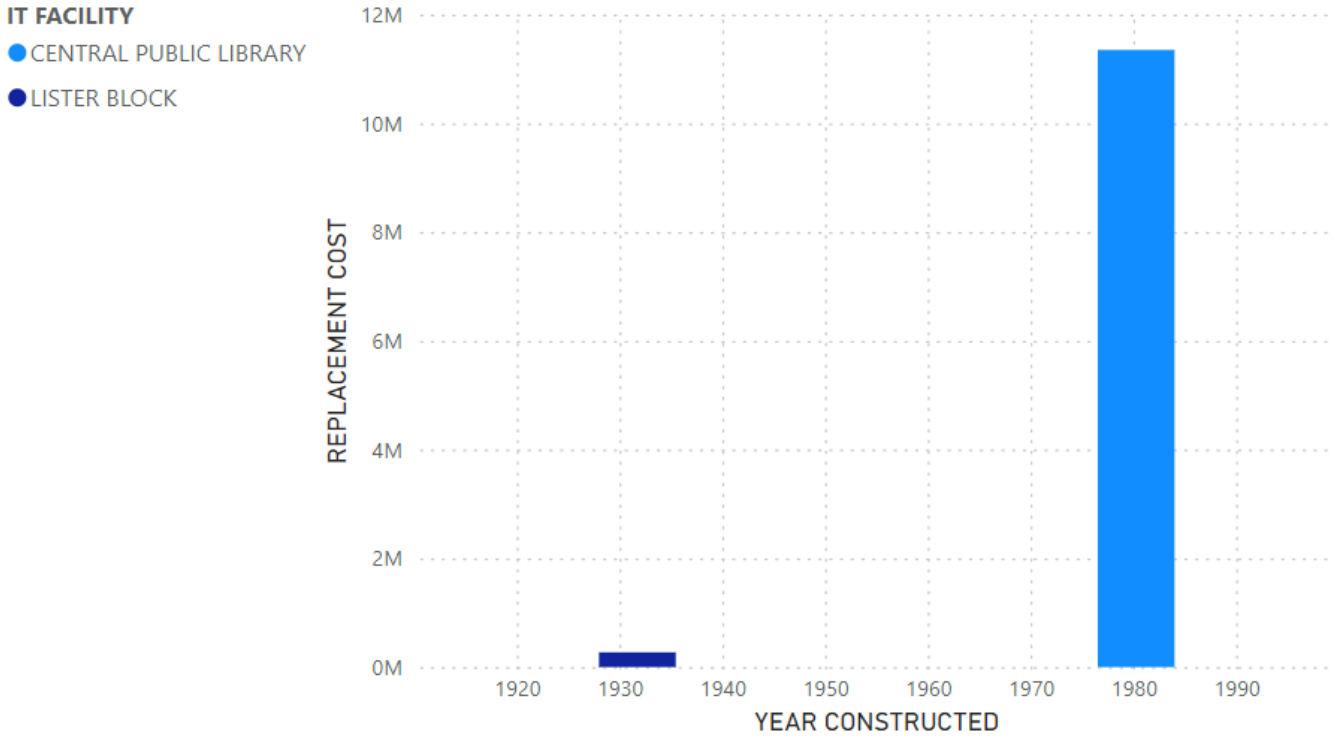
3.2.2 FACILITIES PROFILE

IT Division shares all their facility locations with business units within the City of Hamilton. For the purposes of this report, IT facilities have been considered with replacement values allocated based on the proportion of the building that IT uses.

3.2.2.1. AGE PROFILE

The age profile for IT assets is shown in ***Figure 4***. For IT Facility assets, the data confidence for age is typically Very High because this information was recorded during the construction of the facilities.

Figure 4: IT Facilities Age Profile



The spike in 1984 is due to the acquisition of Central Public Library. IT shares this facility with Hamilton Public Library. IT facilities have varying Estimated Service Life (ESLs) depending on the building. Central Public Library has an ESL of 75 years and Lister block 150 years. Both buildings are within their ESL.

3.2.2.2. CONDITION METHODOLOGY AND PROFILE

The condition of IT facilities is determined based on the results of a Building Condition Assessment (BCA) completed by the Corporate Facilities and Energy Management (CFEM) division. The BCA identifies necessary major and minor maintenance activities in a 10-year forecast with projected costs and outputs a detailed report outlining methodology over findings, and conditions.

BCAs are completed on IT facilities every five years and output a score called a Facility Condition Index (FCI) which is considered to be a high confidence level source for condition. The FCI is a ratio of the total cost for required repairs, renewal, or upgrades to the replacement value of building components.

A summary of the Facilities' condition methodology is provided in ***Table 5***. The condition conversion from FCI to the standardized 5-point scale used in Asset Management is shown in ***Table 4***.

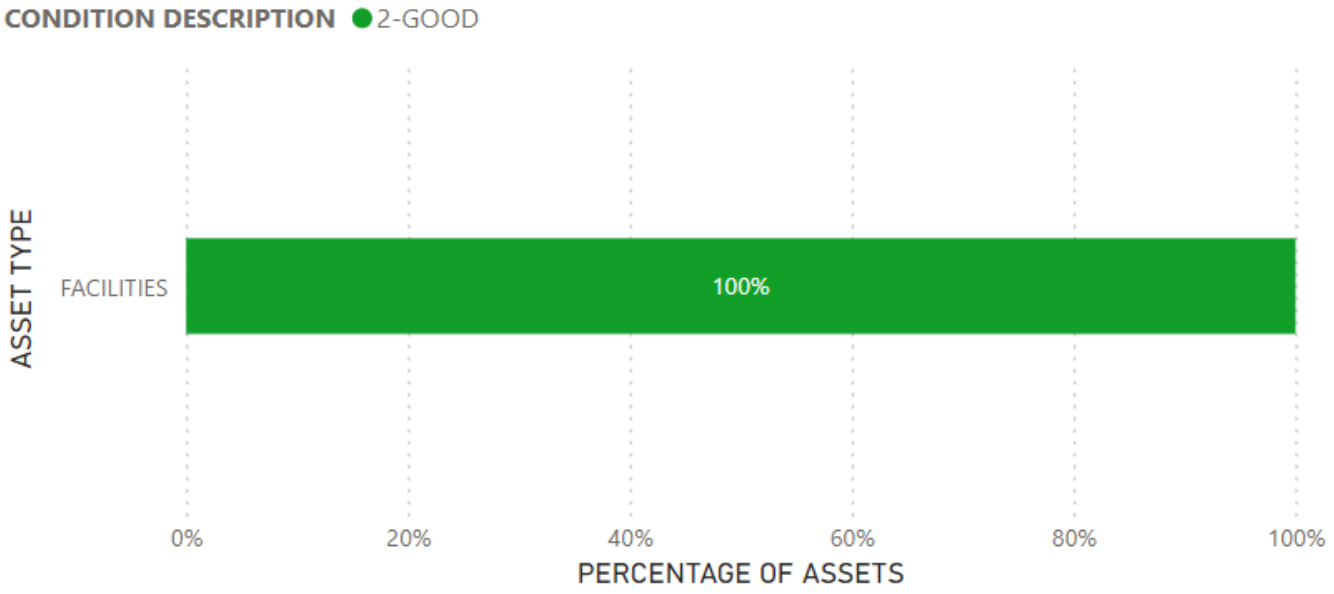
Table 4: Inspection and Condition Information

ASSET	INSPECTION FREQUENCY	LAST INSPECTION	CONDITION SCORE OUTPUT
All Facilities	5 years	2021	Facilities Condition Index (0% - 100%)

The condition profile for IT Facilities assets is shown below in

Figure 5. It is important to note that Central Public Library had a major renovation in 2010. Since IT shares much of its space with libraries, the renovation of the building contributed to the overall Good condition of the library. Lister Block, which was built in 1923, also had major renovations in 2011 bringing the condition of the facility to a Good rating as well.

Figure 5: IT Facilities Condition Distribution



3.2.2.3. ASSET USAGE AND PERFORMANCE

Assets are generally provided to meet design standards where available.

Table 5: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Facility	**Central Public Library**	Limited Staff Bathrooms	Lack of adequate number of bathroom facilities for staff
		Insufficient Space	Current office space can only accommodate 60% of staff

3.2.3 VEHICLES PROFILE

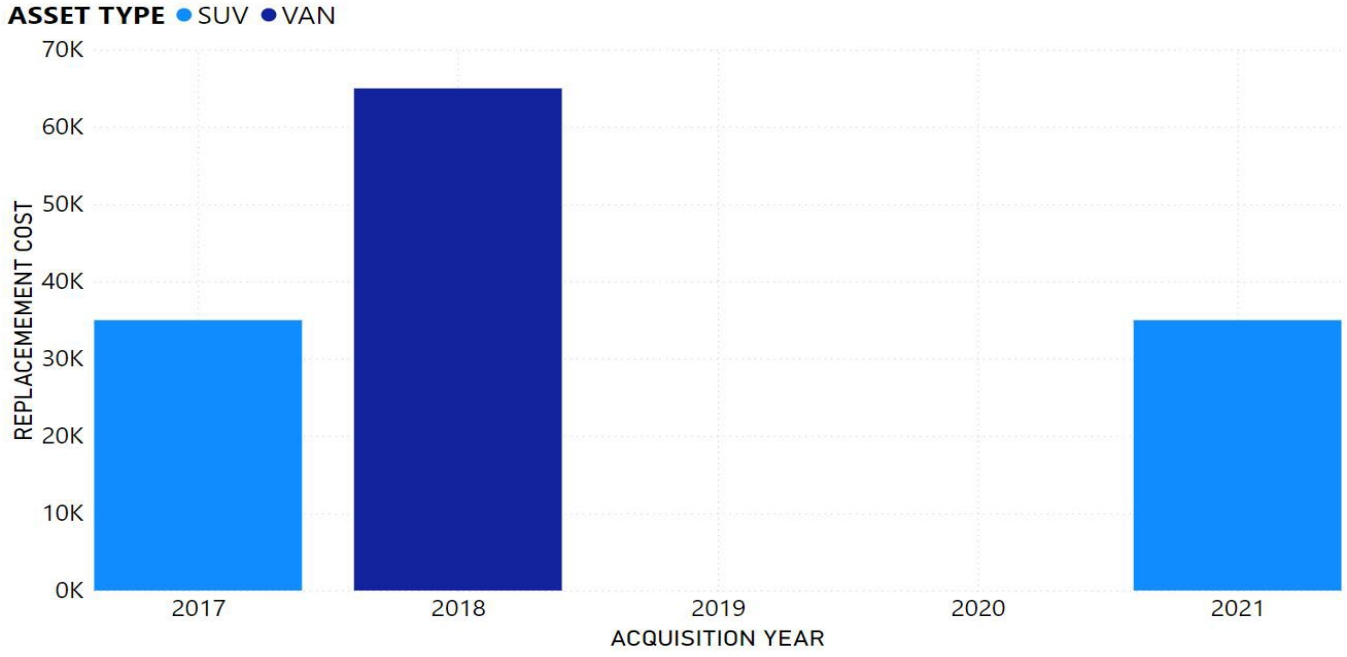
Vehicles consist of a small proportion of IT's assets. The IT Division owns three vehicles including two SUVs and a van.

3.2.3.1. AGE PROFILE

The age profile of the IT Division Vehicles assets is shown in

***Figure* 6**.

Figure 6: IT Vehicles Age Profile



The Estimated Service Life (ESL) of both SUVs is 8 years and the van is 10 years. All vehicles are currently within their ESL.

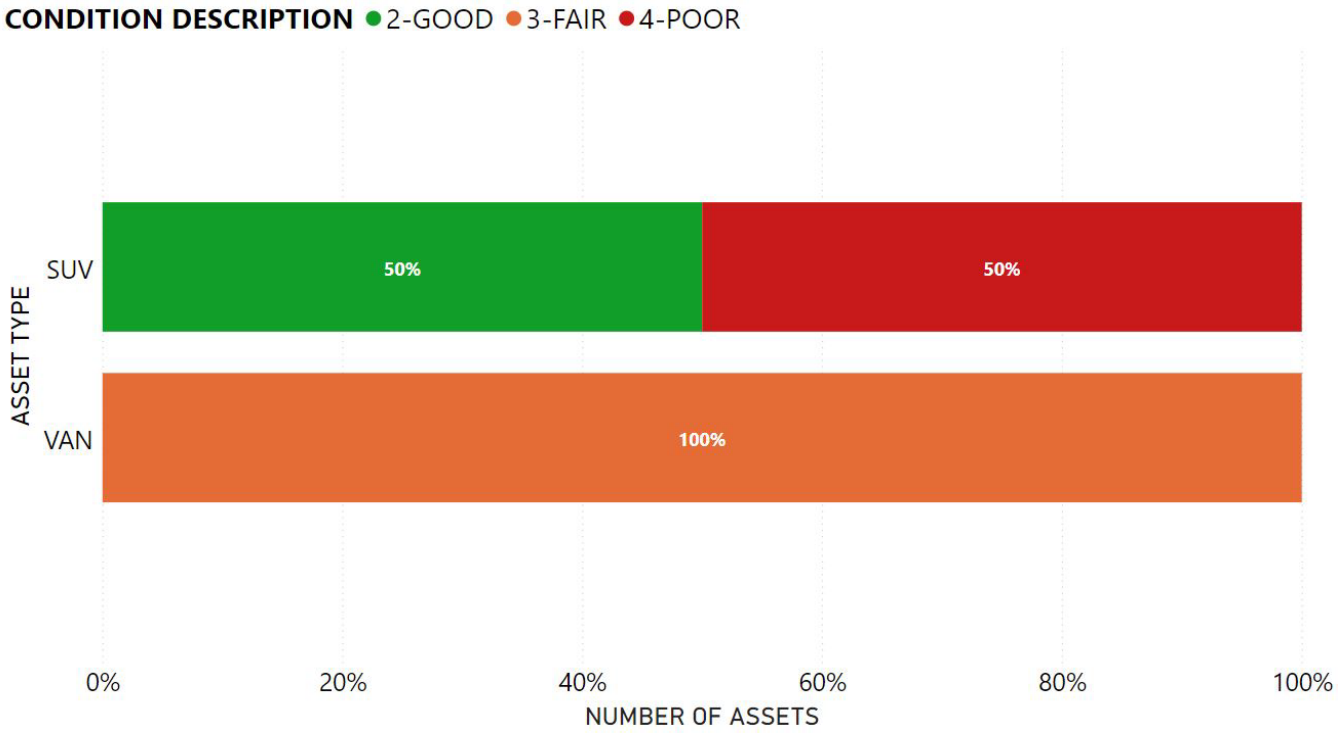
3.2.3.2. CONDITION METHODOLOGY AND PROFILE

Vehicles are inspected and maintenance activities are conducted at specific intervals throughout the asset's lifecycle however no formal condition rating is assigned to each vehicle. IT Division relies on the Fleet section in the Corporate Asset Management (CAM) division to assist with the inspection, maintenance, and procurement of vehicles on their behalf. In the absence of a formal condition methodology, the condition has been assigned based on the asset owner opinion. Developing a condition methodology has been identified as a continuous improvement item in **Table 6.**

Table 6: Inspection and Condition Information

ASSET	INSPECTION TYPE	DESCRIPTION	FREQUENCY	CONDITION SCORE OUTPUT
Vehicles	**Inspection**	Regular Maintenance Inspection	Scheduled twice per year	N/A

Figure 7: IT Vehicles Condition Profile



3.2.3.3. ASSET USAGE AND PERFORMANCE

The only deficiency identified was one of the SUVs approaching its end of service life.

Table 7: Known Service Performance Deficiencies

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
SUV	End-of-Service Life	A SUV acquired in 2017 is approaching the end of its service life in 2025 and is deemed to be in POOR condition.

3.3 SOFTWARE AND INTANGIBLE ASSETS

Software and intangible assets rely on the hardware assets to run, connect, and store the library of data and tools the City of Hamilton uses. Software and intangible assets refer to these three subcategories: business applications, data assets and digital services.

For this asset management plan, software and intangible assets are not assigned values and hence replacement costs are not available. It is recognized that these yet unquantified replacement costs are most likely significant. The standard methodology to assess condition and age profiles used for physical assets is also not directly applicable to software and intangible assets. Developing a consistent methodology for the assessment of quantity, replacement cost, age and condition of software and intangible assets has been identified as a continuous improvement item and may be added to the next iteration of IT Division's Asset Management Plan. The following sections provide a brief introduction to the three categories of IT Division's software and intangible assets.

3.3.1 BUSINESS APPLICATIONS

Business applications are software solutions or a set of programs that provide business functionality and are used to support business processes. These applications run on, maintain, and generate data that belongs to the City. Departments and divisions across the City depend on these business applications to provide services to their respective customers. City of Hamilton's own internal processes including human resources and finance related functions and services are also made possible through these business applications. ***Table 8*** presents examples of some of the business application assets owned by IT:

Table 8: IT Business Applications

BUSINESS APPLICATION	FUNCTION
Peoplesoft HCM	Employee Life-Cycle Management
AMANDA	Permitting and Licensing for Planning and Economic Development
Hamilton Fire Hexagon Dispatching Software	Dispatching of Vehicles/Personnel to Emergency Events
Transit Trapeze Software	Transit System Management Software
Vailtech Tax Billing / Receiving Software	Property Tax Management
PeopleSoft Financial Management Software	Enterprise Finance Software – G/L, Procurement, Accounts Receivable /Payable

3.3.2 DATA ASSETS

Data Asset refers to a digital object that:

a. Is stored in a database, file, or folder; or
b. Is compiled to meet an IT-related business need (e.g., system or application); or
c. Is used to transform or move data between systems (e.g., scripts, processes)

For this plan, IT Division's data assets include:

a. Datasets (tables, records, etc.) and processes (ETLs, scripts, etc.) required for IT to operate as a business unit.
b. Databases owned and supported in IT, whether for IT or non-IT purposes (tables and records may be owned by non-IT business units). For example, an Oracle database may belong to IT, but the contents may belong to a non-IT business unit.

Table 10 presents some examples of data assets owned by IT:

Table 9: IT Data Assets

DATA ASSETS	FUNCTION
Geospatial data	Provides the location (point, line, polygon) of various City assets, services, properties, activities and related metadata and attributes. The majority of GIS data is owned and stewarded by business units. Where they are not identified and the data is critical to a service, IT provides stewardship. Data can be either internal, external, or private.
Data marts, warehouses, and lake houses	These datasets have been architected and curated for Open Data and Business Intelligence reports and analytics
Microsoft user account data in Active Directory	Critical data that governs the access to applications, systems, and data
Service Request and Incident data in IVANTI (Service Desk Online)	Transactional data used to manage the status of incidents and service requests being service levels
Project Management Data	Data used to manage IT capacity for project resources and measure and report project status/progress

3.3.3 DIGITAL SERVICES

Digital services refer to the vast array of online services provided and maintained by the IT Division. These include public-facing transactional services such as licensing and permit applications, and ticket paying platforms; informational services such as open data platforms, voting information and maps; feedback services such as experience surveys and frozen pipe reporting; and internal and administrative Services.

Table 10 presents some examples of digital services assets owned by IT:

Table 10: IT Digital Services

DIGITAL SERVICES	FUNCTION
Transactional Services	Public-facing online services to complete a transaction with the City, such as permit applications, Licensing, or ticket payment
Informational Services	Online services to provide information to citizens such as open data platforms, and interactive maps to locate parks or snowplows.
Feedback Services	Online services to provide feedback or experience results or report issues to the City such as frozen pipes.
Internal and Administrative services	For internal management of processes and services, such as freedom of information requests, or administrative services such as job postings and contract bid opportunities

3.3.4 ASSET USAGE AND PERFORMANCE

Each Software and intangible asset subcategory has its own unique deficiencies. ***Table 12***below describes the unique challenges related to business applications, data assets, and digital services.

Table 11: Known Service Performance Deficiencies

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Business Applications	A number of critical business applications are legacy systems that have reached the end of support and/or lack consumer-grade user experience (UX).	Some business applications (e.g., PeopleSoft HCM) are legacy systems which means they are outdated with newer alternatives available. Legacy systems require higher maintenance, find it difficult to 'talk' with newer technologies, and some do not receive security and/or software updates. Some of the business applications in use due to their legacy status lack newer features that enhance user experience (UX).

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ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Data Assets	Redundancies in both data and services/solutions.	There are multiple applications doing the same thing and duplicate datasets at different levels of accuracy and completeness.
Digital Services	An estimated 30% of online services are built on a platform that is end of life or identified for replacement within the next 1-3 years.	Platforms that have reached the end of life are identified for replacement. Services are on an active work plan to transition to a new or updated platform.

4. MUNICIPALLY DEFINED LEVELS OF SERVICE

Levels of service are measures of what the city provides to its customers, residents, and visitors, and are best described as the link between providing the outcomes the community desires, and the way that the city provides those services.

O.Reg 588/17 does not define levels of service for IT assets and therefore the City has developed municipally defined levels of service. Levels of service are defined in three ways, customer values, customer levels of service and technical levels of service which are outlined in this section. An explanation for how these were developed is provided in ***Section 7.5*** of the AMP Overview.

4.1 SURVEY METHODOLOGY

To develop customer values and customer levels of service, two different surveys were utilized for this report and are discussed below. Data confidence and data consistency were not measured for these surveys, but the results can still provide some insight into the level of service provided by the IT Division.

- The *City of Hamilton: IT Satisfaction Scorecard: Department Report* was an internal customer engagement survey which was released on June 14, 2022**.** The purpose of this survey was to gain insight into customer satisfaction for the internal services that the IT Division provides city staff as part of the IT Division's strategy refresh. This survey received submissions from 54 director level employees at City of Hamilton and has been used in this report to determine the internal customer values and levels of service.

- The *City of Hamilton's Digital Services* survey was released on November 18, 2022. This was a public survey and received a total of 172 responses. It is important to note that this survey was done by the City's Digital and Innovation Office as part of the development of the City's Digital Strategy. This survey has been used in this report to gauge the public's customer values and levels of service for the online services that the IT Division provides to the public.

It is important to note that a Corporate Asset Management (CAM) survey has not been conducted. For future iterations of the plan, surveys may be developed and performed to capture the opinions of external and internal users while also measuring confidence levels and data consistency. This has been noted in ***Table 28*** as a continuous improvement item.

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4.2 CUSTOMER VALUES

Customer values are what the customer can expect from their tax dollar in "customer speak" which outline what is important to the customer, whether they see value in the service, and the expected trend based on the 10-year budget. These values are used to develop the level of service statements.

Customer Values indicate:

- What aspects of the service is important to the customer;
- Whether they see value in what is currently provided; and,
- The likely trend over time based on the current budget provision.

As previously mentioned, the customer values below were determined using the results from the ***City of Hamilton: IT Satisfaction Scorecard: Department Report 2022*** and *the* ***City of Hamilton's Digital Strategy Survey 2023.***

It is important to note that since the cyber security incident in 2024, the results of the survey may not reflect today's customer values or customer levels of service.

Table 12: Customer Values

SERVICE OBJECTIVE			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
Organizational devices and data are properly secured	2022 IT Satisfaction Scorecard: Department Report	Survey respondents rated device and data security as the most important IT service.	Increase
Communication systems and networks are reliable		Survey respondents feel network and communication infrastructure is the 2nd most important IT service.	
Business applications meet needs		Survey respondents feel business apps are the 3rd most important IT service.	Maintain
IT Service Desk is responsive and effective		Survey respondents feel the IT Service Desk is the 4th most important IT service.	Maintain

SERVICE OBJECTIVE			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
Staff devices meet needs		Survey respondents feel provision and maintenance of staff devices is the 5th most important IT service.	Maintain
Digital services have a clear and simple process to navigate	Digital Services Survey 2023	Survey respondents feel a clear and simple process to navigate digital services is the most important criteria to improve service delivery.	Increase

4.3 CUSTOMER LEVELS OF SERVICE

Ultimately, customer performance measures are the measures that the City will use to assess whether it is delivering the level of service the customers desire. Customer levels of service measurements relate to how the customer feels about the City's IT Division in terms of their quality, reliability, accessibility, responsiveness, sustainability and, over the course, their cost. The City will continue to measure these customer levels of service to ensure a clear understanding on how the customers feel about the services and the value for their tax dollars.

The Customer Levels of Service are considered in terms of:

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/Use	Is the service over or underused? Do we need more or less of these assets?

In ***Note*** that confidence levels were not measured in the 2022 IT Satisfaction Scorecard: Department Report nor the Digital Strategy Survey 2023. In future iterations, a CAM survey for IT Division may consider confidence levels, data consistency, and a broader range of survey respondent demographics.

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Table 13 under each of the service measure types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current allocation. Note that confidence levels were not measured in the 2022 IT Satisfaction Scorecard: Department Report nor the Digital Strategy Survey 2023. In future iterations, a CAM survey for IT Division may consider confidence levels, data consistency, and a broader range of survey respondent demographics.

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Table 13: Customer Levels of Service

TYPE OF MEASURE	LEVEL OF SERVICE STATEMENT	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Quality/ Condition	Improve IT service delivery execution	2022 IT Satisfaction Scorecard: Department Report	Average survey respondent satisfaction level with the IT Division and its ability to support their needs	Satisfied	Increase
			Average survey respondent satisfaction level with the value of the IT Division relative to cost and staffing	Satisfied	Maintain
		Digital Strategy Survey 2023	Average survey respondent satisfaction with the delivery of services	Satisfied	Increase
Function	Enable access to reliable data and information.	2022 IT Satisfaction Scorecard: Department Report	Average survey respondent opinion on if data access friction is acceptable	Very Satisfied	Maintain
	City digital services are simple and easy to use.	Digital Strategy Survey 2023	Average survey respondent opinion on level of competency using digital services	Very Satisfied	Maintain
Capacity	Enable the City workforce with access to tools and training to deliver services effectively	2022 IT Satisfaction Scorecard: Department Report	Average survey respondent satisfaction with the ability to get IT capacity to complete projects	Neutral	Maintain
			Average survey respondent satisfaction with responsiveness and effectiveness of service desk	Satisfied	Maintain

4.3.1 CUSTOMER INDICES

The 2022 IT Satisfaction Scorecard survey only contains one index calculated to assess how customer expectations for a service align with the perceived performance for a service listed below in ***Table 15***. In addition, this index was only included for internal customers. The information below is intended to provide context around the survey results to assist IT Division with areas to further investigate before proposing any new levels of service.

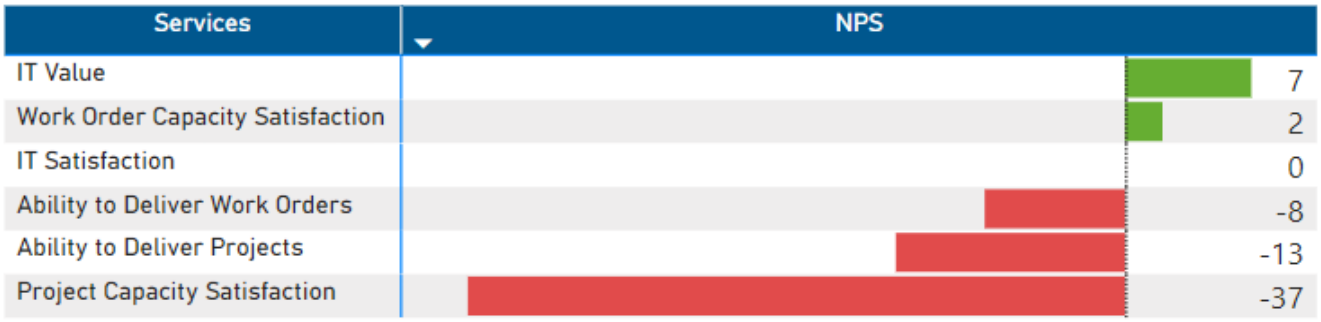
NET PROMOTER SCORE INDICE

The Net Promoter Score (NPS) indices outline how likely an individual is to recommend a service to another person and measure customer loyalty. This score provides valuable information for determining if customers would recommend using the service or whether they may seek alternatives or avoid using the service altogether.

Respondents who selected a score less than four are considered 'Detractors' meaning that they would not recommend the service, while scores of five are considered 'Promoters' who would recommend the service. Scores of four are considered 'Passive' which means they do not have strong feelings about the service and so they are not considered in the Net Promoter score calculation. In addition, respondents who opted out by not answering or selecting 'Can't Say' were removed from the sample. The Detractor and Promoter scores were then converted to a percentage, and the Net Promoter Score was calculated by subtracting Detractors from Promoters. The exact number of detractors and promoters was not provided in this survey.

Based on the results of the Net Promoter Score shown in ***Figure 15***, users are generally neutral about the IT Division's service since most of these results are approaching zero. However, for the Project Capacity Satisfaction service, the NPS is -37 which suggests an opportunity for improvement for the IT Division to explore increasing their capacity to support the delivery of projects. It is important to note that the survey results were a sample of director-level staff and may not reflect average customer indices for all city staff. In future iterations, a CAM survey for IT Division may consider a broader range of survey respondent demographics as well as confidence level and data consistency measurements.

Figure 14: Net Promoter Score



4.3.2 TECHNICAL LEVELS OF SERVICE

Technical levels of service are operational or technical measures of performance, which measure how the City plans to achieve the desired customer outcomes and demonstrate effective performance, compliance and management. The metrics should demonstrate how the city delivers its services in alignment with its customer values; and should be viewed as possible levers to impact and influence the Customer Levels of Service. The city will measure specific lifecycle activities to demonstrate how the city is performing on delivering the desired level of service as well as to influence how customers perceive the services they receive from the assets.

Technical service measures are linked to the activities and annual budgets covering Acquisition, Operation, Maintenance, and Renewal. Asset owners and managers create, implement and control technical service levels to influence the service outcomes.[6]

Table 16 shows the activities expected to be provided under the current 10 year Planned Budget allocation and the Forecast activity requirements being recommended in this AM Plan.

Table 15: Technical Levels of Service

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE (2023)	CURRENT TARGET PERFORMANCE (2023)	PROPOSED 10-YEAR PERFORMANCE
Operations	Improve IT service delivery execution	Percent of production server availability	Not yet measured	Not determined	Not determined
		Average time to answer calls	Not yet measured	Not determined	Not determined
Maintenance	Enable access to reliable data and information	Network uptime	Not yet measured	Not determined	Not determined
		Unscheduled database downtime	Not yet measured	Not determined	Not determined
Renewal	Enable workforce with access to tools and training to deliver services effectively	Percent of IT Division assets that are beyond the end of support	Not yet measured	Not determined	Not determined
Budget			Not determined	Not determined	Not determined

[6] IPWEA, 2015, IIMM, p 2|28.

4.3.3 PROPOSED LEVELS OF SERVICE DISCUSSION

Currently, performance metrics to determine the quality of IT Division services are not being measured. As a result of this limitation, it is not possible to present a comprehensive analysis of proposed levels of service at this time. However, the following are some areas that could be explored further when proposing service levels:

- Security and reliability of data and devices has been rated as the most important IT Division service by survey respondents. However, the recent cybersecurity incident highlighted the need for improvement in the City's cybersecurity protocols. Going forward, the IT Division must invest in the resources required to develop a robust IT infrastructure system as it continues to recover from the incident and rebuild trust with its user base. Organizational level security would also require participation from City of Hamilton employees and Shadow IT would also need to be addressed.

- Digital services are becoming increasingly more important as residents prefer to engage with the City online. The City has recently developed a Digital Strategy and an Enterprise Customer Service Strategy is currently in development. The recommendations from these strategies may result in changes to levels of service.

- Business units across the City are looking towards the IT Division for enhanced data and analytics services. As a result, the IT Division has recently created a Data Services section that will support the link between various departments and the Enterprise Data Management Steering Committee, as well as actively championing and enforcing data standards and policies. Its role in promoting uniformity in data collection, storage and utilization will significantly improve inter-departmental collaboration and elevate the overall performance of data management throughout the corporation.

- The IT Division plays a key role in any City project that involves significant planning and implementation of technology solutions. The 2022 IT Satisfaction Scorecard reveals that a number of survey respondents felt that the IT Division's capacity constrained and prevented them from reaching their strategic goals. This is highlighted by a Net Promoter Score of -37 for satisfaction with the ability to get IT capacity to complete projects (see ***Section 4.3.1***). A new IT Strategy has been developed with an increased emphasis on business relationship management. It is anticipated that, as a result, satisfaction with IT's capacity will increase.

- Although some performance measures have been proposed in ***Section 4.3.2*** (e.g., average time to answer calls and network uptime), the IT Division is currently not measuring its technical levels of service . Additional technical metrics may be proposed in future iterations of the plan and should include target performance.

5. FUTURE DEMAND

Demand is defined as the desire customers have for assets or services and that they are willing to pay for. These desires are for either new assets/services or current assets.

The ability for the City to be able to predict future demand for services enables the City to plan ahead and identify the best way of meeting the current demand while being responsive to inevitable changes in demand. Demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services and types of services required.

5.1 DEMAND DRIVERS

For the IT Division service area, the key drivers are:

- Ongoing response to cybersecurity incident;
- Market changes; and
- Demands arising from various City of Hamilton projects and initiatives

5.2 DEMAND FORECASTS

The present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented in ***Table 16: Demand Management Plan.*** Growth projections have been shown on **Page 45** in the ***AMP Overview Document.***

Since the assessment of costs associated with these demands is ongoing, these costs have not been added separately to the lifecycle management plan in ***Section 8***.

5.3 DEMAND IMPACT AND DEMAND MANAGEMENT PLAN

The impact of demand drivers that may affect future service delivery and use of assets are shown in *Error! Reference source not found.**7***. Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks, and managing failures.

Opportunities identified to date for demand management are shown in ***Table 16: Demand Management Plan***. Climate change adaptation is included in ***Table 22***.

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Table 16: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Ongoing Response to Cybersecurity Incident	Since Sunday, February 25, 2024, the City of Hamilton experienced a cyber incident that disabled some of the IT systems.	The City is expected to continue its efforts to strengthen its technological security.	While the City has kept many of its services running, some services have been compromised as a result of the incident.	Complete recovery from the incident is an ongoing process and an opportunity for the City to rebuild its systems and make them stronger and more resilient.
Market Changes	Currently, the IT Division utilizes a mix of perpetual (purchased) and subscription-based products.	Vendors are moving away from selling solutions and moving toward subscription and transaction-based models.	There is a need to shift from capital expenditure to operating expenditure. New employee skills and new procurement methods are necessitated.	Work with finance to evolve the IT Division's cost model and budget process to deliver enterprise-level services.
Projects and work order requests from other business units within the City of Hamilton	Capacity forecast related to bandwidth, storage, and backup is not clear due to both technology changes and limited visibility to department work plans and growth forecasts.	Business units within the City of Hamilton will continue to rely on the IT Division to meet strategic goals related to technology planning and implementation.	There may be potential lags in service delivery and system performance due to reacting to demand rather than planning with line of sight to future plans and forecasts.	Work through the Business Relationship Management program to identify department-level strategies and priorities.
Enterprise Data Management	There is a need to put structure in place around inventorying and governing the City of Hamilton's data, while supporting employees in understanding data processes, how to better manage and use data, and increasing transparency to the public.	Strong data governance will become an increasingly important consideration for the City.	Enterprise Data Management will help to advance the City's practices around: • Data Management and Standardization; • Data Literacy and Utilization; and, • Data Sharing and Reporting.	A Data Services section has been established within the IT Division. This new section will support the link between various departments and the Enterprise Data Management Steering Committee. Its role in promoting uniformity in data collection, storage and utilization will significantly boost inter-departmental collaboration and elevate the overall efficiency of data management throughout the corporation.
Various City of Hamilton initiatives	Various City initiatives such as the NG 9-1-1 project, Digital Strategy implementation and Enterprise Customer Service Strategy development rely on IT's key role in enabling these advancements.	IT will continue to play a critical role as the City looks to modernize its systems and build a high-performing public service.	IT will need more staff and resources to support these City initiatives.	The following business cases have been presented to and approved by Council. • 1 FTE: IT Support for City 311 and Digital Strategy • 1 FTE: IT Architect to modernize and integrate City systems. Additional business cases will be presented to Council as they become necessitated.

5.4 ASSET PROGRAMS TO MEET DEMAND

The new assets required to meet demand may be acquired, donated or constructed. For IT Division, typically assets are acquired or constructed.

At this time there are approximately **$13.9 million** in assets acquired over the next 10 years. Acquiring new assets will commit the IT Division to ongoing operations, maintenance and renewal costs for the amount of time that the service is required. These future costs have been estimated at a high level in the Lifecycle Models in ***Section*** 54***8***, but should be quantified further for future iterations of the report for consideration in developing higher confidence forecasts of future operations, maintenance and renewal costs for inclusion in the long-term financial plan.

6. RISK MANAGEMENT

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 Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk[7].

The City is developing and implementing a formalized risk assessment process to identify risks associated with service delivery and to implement proactive strategies to mitigate risk to tolerable levels. The risk assessment process identifies credible risks associated with service delivery and will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

The risk assessment process identifies credible risks, the likelihood of those risks occurring, and the consequences should the event occur. The city utilizes two risk assessment methods to determine risk along with subject matter expert opinion to inform the prioritization. Hamilton is further developing its risk assessment maturity with the inclusion of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable in the next iteration of the plan.

6.1 CRITICAL ASSETS

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarized in ***Table 18***. Failure modes may include physical failure, collapse or essential service interruption.

[7] ISO 31000:2009, p 2

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Table 17: Critical Assets

CRITICAL ASSET	FAILURE MODE	IMPACT
Networking Equipment	Cyber-attack, physical failure, loss of critical vendor support	Various City of Hamilton internal and external services will be lost while others may need to be temporarily disabled. Failure will result to an extent in decrease in level of service for the whole City of Hamilton. Failure repercussions may also be financial, legal and/or reputational.
Datacentre Assets		
Critical Business Applications	Essential service iinterruption	Loss of critical business application function
Critical Data Assets	Essential service iinterruption	Permanent loss of critical data
UPS	Essential service iinterruption	Loss of power to City supported technology

By identifying critical assets and failure modes an organization can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

6.2 RISK ASSESSMENT

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, the development of a risk rating, the evaluation of the risk and the development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan are shown in ***Table 19***. It is essential that these critical risks and costs are reported to management. Additional risks will be developed in future iterations of the plan and are identified in ***Table 28*** in the Continuous Improvement Section of the plan. Since the assessment of treatment costs associated with these risks is ongoing, these costs have not been added separately to the lifecycle management plan in ***Section 8***.

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Table 18: Risks and Treatment Plans

RISK	WHAT COULD HAPPEN	RISK RATING	RISK TREATMENT PLAN	TREATMENT COSTS
Cyber Security Risk	Cyber-attacks can leave critical city services unavailable for both internal and external users. Additional threats include privacy breaches and/or loss of critical data.	Very High	Ongoing assessment	Ongoing assessment
Power Supply Interruption Risk	Loss of power to critical City IT services	Very High	Complete redesign of the UPS power delivery system.	Ongoing assessment
Application Failure Risk	Certain applications, platforms and devices have reached end of life and are now either without support, warranty, or both.	High	Update legacy systems or acquire new application systems on a case-by-case basis.	Ongoing assessment
Shadow IT Usage Risk	Unauthorized use of IT resources (Shadow IT) can lead to data loss, data leaks, disconnected network access, and security vulnerabilities.	High	Establish clear compliance mandates for staff to adhere to IT policies and procedures. Provide approved alternatives to meet the needs of users.	Ongoing assessment
Talent Management Risk	The IT Division competes directly with the private sector for recruiting and retention of top talent. Compensations in the private sector for in demand IT professionals may be much higher.	High	Not yet determined	Ongoing assessment

6.3 INFRASTRUCTURE RESILIENCE APPROACH

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions the City needs to understand its capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service. We do not currently measure our resilience in service delivery and this will be included in the next iteration of the AM Plan.

Resilience covers the capacity of the City to withstand any service disruptions, act appropriately and effectively in a crisis, absorb shocks and disturbances as well as adapting to ever-changing conditions. Resilience is built on aspects such as response and recovery planning, financial capacity, climate change risk, assessment and crisis leadership.

6.4 SERVICE AND RISK TRADE-OFFS

The decisions made in AM Plans are based on the objective to achieve the optimum benefits from the available resources.

The following table outlines what activities the IT Division cannot afford to do over the next 10 years with their existing budget and provides the associated service and risk tradeoffs.

Table 19: Service and Risk Tradeoffs

WHAT WE CAN NOT DO (What can we not afford over the next 10 years?)	SERVICE TRADE-OFF (How will not completing this affect our service?)	RISK TRADE-OFF (What risk consequences are we undertaking?)
Upgrading all legacy systems including outdated software, customer apps, database systems, hardware, and more.	Slower services of apps, servers, and devices. Reduced effectiveness of city services	More reliance on legacy devices and systems. Increased vulnerability and attack surface leading to cybersecurity compromise, data loss, or worse.

Legacy systems present a significant challenge for the City of Hamilton. Dependence on outdated hardware and software elevates the likelihood of cybersecurity incidents and operational breakdowns. Furthermore, antiquated systems impede efficiency, diminishing the quality of services provided.

7. CLIMATE CHANGE AND MITIGATION

Cities have a vital role to play in reducing the emission of greenhouse gases (mitigation), as well as preparing assets for the accelerating changes we have already begun to experience (adaptation). At a minimum, the City must consider how to manage our existing assets given the potential climate change impacts for our region.

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

- Affect the asset lifecycle;
- Affect the levels of service that can be provided and the cost to maintain;
- Increase or change the demand on some of our systems; and
- Increase or change the risks involved in delivering service.

To quantify the above asset/service impacts due to climate change in the Asset Management Plan, climate change is considered as both a future demand and a risk for both mitigation and adaptation efforts. These demands and risks should be quantified and incorporated into the lifecycle models as well as levels of service targets.

If climate change mitigation/adaptation projects have already been budgeted, these costs have been incorporated into the lifecycle models. However, many asset owners have not yet quantified the effects of the proposed demand management and risk adaptation plans described in this section, and so associated levels of service and costs will be addressed in future revisions of the plan. This has been identified as a Continuous Improvement item in ***Table 28***.

7.1 CLIMATE CHANGE MITIGATION

Climate Mitigation refers to human intervention to reduce GHG emissions or enhance GHG removals (e.g. building transportation infrastructure that can support cycling and public transit and reduce the need for car travel). 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:

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

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Mitigation Demand Analysis

These transformations were incorporated into the climate mitigation demand analysis for this service area by:

- Identifying the City's modelled targets for the low carbon transformations that applied to the service/asset;
- Discussing the impact, the targets would have on the service/asset; and
- Proposing a preliminary demand management plan for how this modelled target will be achieved by 2050 as shown in ***Table 21*** below.

As previously mentioned, due to the high level of uncertainty with the demand management plans, the cost of the demand impacts below have not been included in the lifecycle models or levels of service at this time. The demand management plans discussed in this section should be explored by asset owners in more detail following the AM Plan, and new projects should incorporate GHG emissions reduction methods, and changes which will be incorporated into future iterations of the AM Plan. This has been identified as a continuous improvement item in ***Table 28.***

Moving forward, the Climate Lens tool discussed in the AMP Overview will assess projects based on these targets and will assist with the prioritization of climate mitigation projects.

Mitigation Demand Analysis

Table 20: Climate Change Mitigation Transformation

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE OR ASSET	DEMAND MANAGEMENT PLAN
Changing How We Move	100% of new municipal small and light-duty vehicles are electric by 2040.	Electric Vehicle Chargers will need to be installed at all Yards. Compensation for staff who charge City vehicles at home will need to be considered. Initial upfront capital costs for electric vehicles.	The vehicle conversion schedule for the existing fleet will be developed in partnership with Fleet to convert where feasible and as the market allows. Limitations may exist for heavy-duty vehicles due to availability within the market. Capital budgets will reflect increased costs related to conversions and additions to the existing fleet. Capital budgets will also be developed and submitted for charging stations on facilities.

MITIGATION RISK ANALYSIS

Since the risk of not completing climate change mitigation projects is that the City continues to contribute to climate change in varying degrees which were modelled in the Climate Science Report for the City of Hamilton completed by ICLEI Canada, a risk analysis has not been completed in this AM Plan for not completing climate mitigation projects (ICLEI Canada, 2021).

7.2 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).

The impacts of climate change may have a significant impact on the assets we manage and the services they provide. 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. [8]

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) (ICLEI, 2021). The BARC Framework identified thirteen high-impact areas.

[8] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

Adaptation Demand Analysis

Table 21: Managing the Demand of Climate Change on Assets and Services

ADAPTATION IMPACT STATEMENT	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
All Impact Statements	IT will need to respond to requests from other business units for effective delivery of city services. There may be an increase in requests for real-time data to support reports and online services Increased demand for mapping services (e.g., beach closures, building locations etc.).	Continue to work with business units across the City to identify demands emerging from climate change. Continue to improve the robustness of IT infrastructure and systems across the City. Continue to develop an Enterprise Data Management strategy.

ADAPTATION RISK ANALYSIS

Additionally, the City should consider the risks for the asset or service as a result of climate change and consider ways to adapt to reduce the risk. Adaptation can have the following benefits:

- Assets will withstand the impacts of climate change;
- Services can be sustained; and,
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint.

Similarly, to the exercise above and using the risk process in ***Section 6***, asset owners:

- Reviewed the likelihood scores in the Vulnerability and Risk Assessment Report for the adaptation impact occurring;
- Identified the consequence to the asset/service if the event did happen to develop a risk rating; and,
- If the risk was identified as high, the asset owner produced a preliminary risk adaptation plan shown below in ***Table 24***.

It is important to note that due to the high level of uncertainty with the climate change risk adaptation plans, the cost of mitigating the risks below has not been included in the lifecycle and financial models at this time. The adaptation plans discussed in this section should be explored by asset owners in more detail following the AM Plan, and new projects should consider these risks during the planning and design processes. Future changes will be incorporated into future iterations of the AM Plan. Moving forward, the Climate Lens tool will assess projects based on these targets and will assist with the prioritization of climate adaptation projects. This has been identified as a continuous improvement item in ***Table 28.***

Table 22: Adapting to Climate Change

ADAPTATION IMPACT STATEMENT	WHAT COULD HAPPEN	RISK ADAPTATION PLAN
Rising summer temperatures and extreme heat will increase energy demand for air conditioning, causing a financial burden for low-income households.	Additional load on power storage systems (UPS) feed to data centre and IT closet environment control equipment. Expect an increased frequency of power outages.	Design UPS systems with sufficient capacity. Complete regular battery maintenance. Introduce automatic condition monitoring.
Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns.		

CLIMATE ADAPTATION DISCUSSION

The IT Division has a central role to play in the City of Hamilton's response to climate change. A successful city-wide climate action plan is impossible without a robust IT system. IT will remain instrumental as an enabler of the dissemination of information for residents as well as officials making informed decisions in case of weather emergencies.

8. LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the City plans to manage these assets at the agreed levels of service and at the accepted lifecycle costs while excluding inflationary values. The costs included in the lifecycle management plan include costs from both the Capital and Operating budget. Asset management focuses on how taxpayer or ratepayer dollars are invested by lifecycle activities and not by budget allocation. Since both budgets contain various lifecycle activities, they have been consolidated together and separated by lifecycle activity in this section.

As a result of this new process, there may be some areas where the budget was not able to be broken down perfectly by lifecycle activity. Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options. However, at this time the plan is limited to those aspects. Expenditure on new assets and services will be accommodated in the long-term financial plan but only to the extent that there is available funding.

8.1 ACQUISITION PLAN

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its current capacity. They may result from growth, demand, legal obligations or social or environmental needs. Assets can either be donated through development agreements to the city or through the construction of new assets which are mostly related to population growth.

CONSTRUCTED OR PURCHASED ACQUISITIONS

Major acquisition expenditures over the next ten years include:

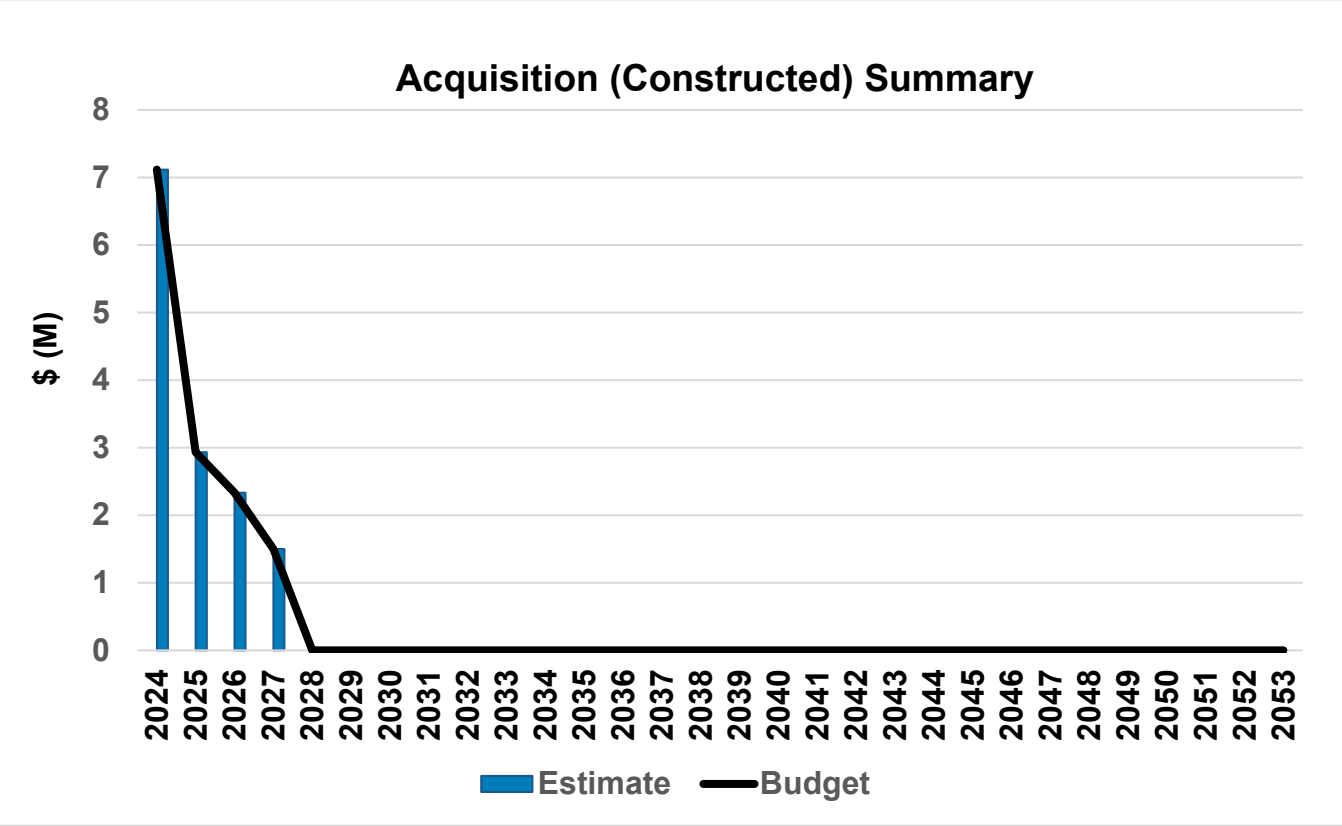
- **$9.2 million** for Infrastructure Asset Management from 2024 to 2027 (note that numbers for this project might change as the City responds to the cybersecurity incident); and,
- **$4.7 million** for Telephony to Cloud from 2024 to 2026

Note that the assets acquired for the project Next Generation 9-1-1 (NG 9-1-1) are also procured and maintained by IT and these operations and maintenance costs are quantified in ***Section 8.2***. However, since these assets are acquired for the provision of Hamilton Police Service (HPS) and Hamilton Fire Department (HFD) services, these assets have already been included in these AM Plans.

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

Figure 8 shows the IT Division's planned constructed acquisitions over the next 10 years.

Figure 8: Acquisition (Constructed) Summary:
(All Figure Values are Shown in 2023 Dollars)

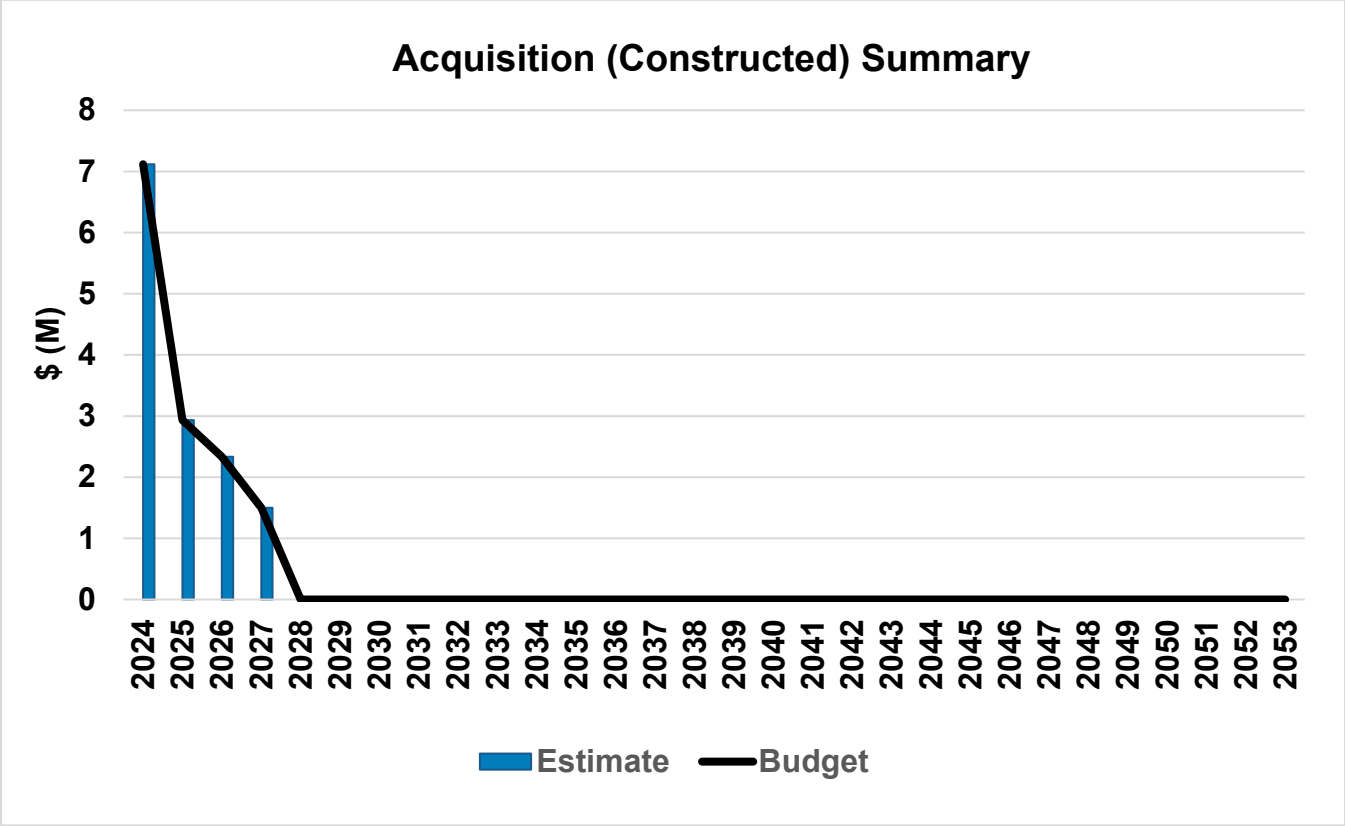


ACQUISITIONS SUMMARY

Over the next 10-year planning period Hamilton will acquire approximately **$13.9 million** of IT Division assets. Hamilton has a sufficient budget for its planned acquisitions at this time. Note that through the construction of new assets, the City will be committing to funding the ongoing operations, maintenance, and renewal costs. These costs have been added to the forecast operating and maintenance costs in ***Section 8.2***.

Forecast acquisition asset costs are summarized in ***Figure 12*** and show the cumulative effect of asset assumptions over the next 10-year planning period.

Figure 9: Acquisition Summary
*(*All Figure Values are Shown in 2023 Dollars)



8.2 OPERATIONS AND MAINTENANCE PLAN

Operations include all regular activities to provide services. Daily, weekly, seasonal and annual activities are undertaken by staff to ensure the assets perform within acceptable parameters and to monitor the condition of the assets for safety and regulatory reasons.

Over the next 10 years, the following capital projects have been identified which relate to the operations stage of the asset lifecycle:

- **$570k** for IT Strategy Refresh from 2024 to 2025;
- **$450k** for Information Security Program in 2024;
- **$400k** for Technology End of Life Migrations from 2024 to 2025;
- **$300k** for Windows 11 Upgrade for End User Computing from 2024 to 2025; and,
- **$200k** for Enterprise Data Management Strategy in 2024.

In addition to these projects, major annual operations expenditures include:

- **$17.9 million** for employee-related costs
- **$8.0 million** for computer software
- **$2.5 million** for contracts for computers and servers

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

Maintenance should be viewed as the ongoing management of deterioration. The purpose of planned maintenance is to ensure that the correct interventions are applied to assets in a proactive manner and to ensure they reach their intended useful life. Maintenance does not significantly extend the useful life of the asset but allows assets to reach their intended useful life by returning the assets to a desired condition. Examples of typical maintenance activities include equipment repairs and component replacements along with appropriate staffing and material resources required to perform these activities.

Proactively planning maintenance significantly reduces the occurrence of reactive maintenance which is always linked to a higher risk to human safety and higher financial costs. The City needs to plan and properly fund its maintenance to ensure that IT assets are reliable to deliver the desired level of service.

Note that although IT Division does significant maintenance work ($1 million annually) towards the City's Corporate Trunked Radio system, for the purpose of this plan, that is considered an operations stage cost for IT Division. This is because the Corporate Trunked Radio assets are considered assets of other City service groups.

Figure 10: Operations and Maintenance
(All Figure Values are Shown in 2023 Dollars)

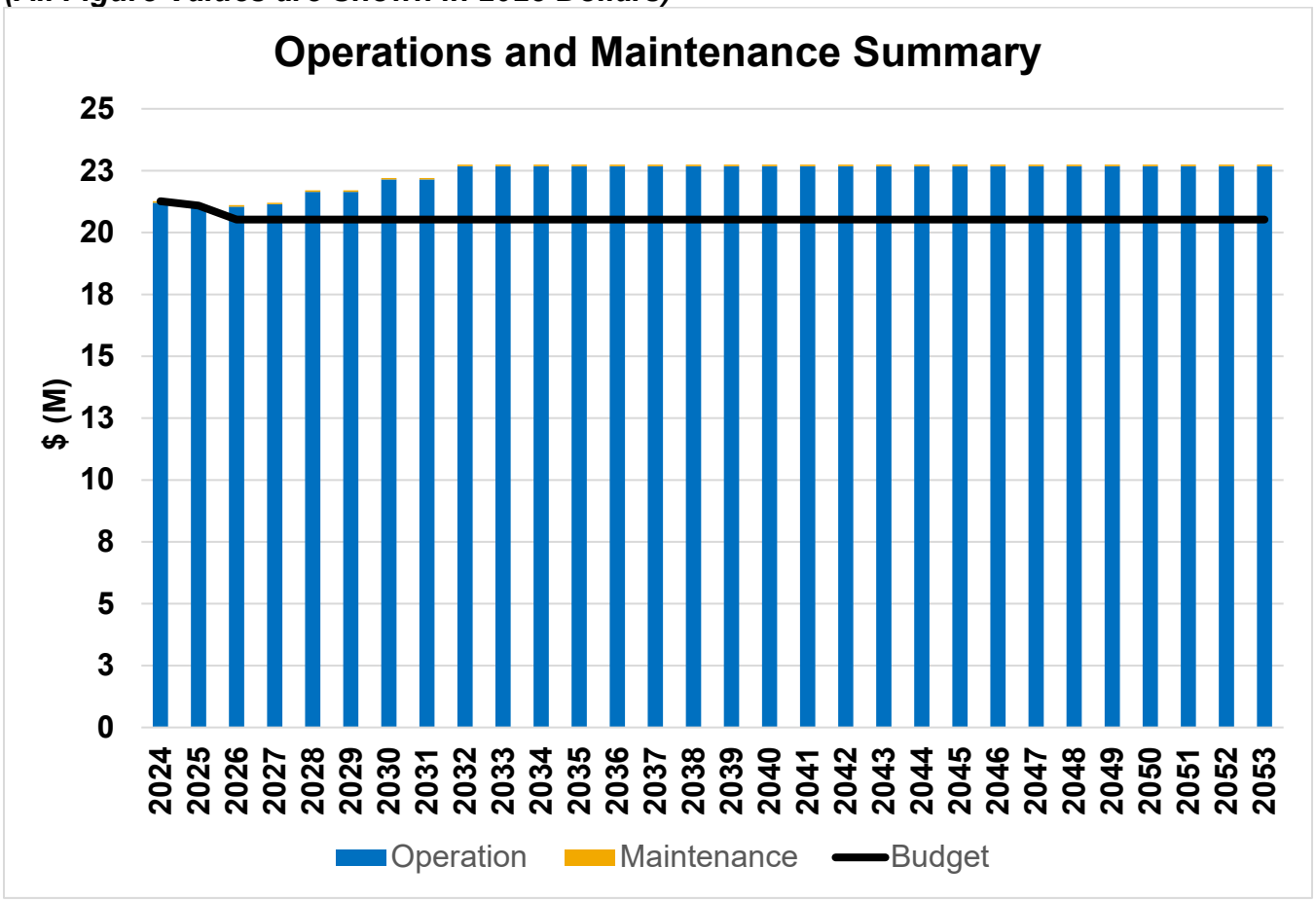


Figure 10 shows IT's Operations and Maintenance (O & M) budget compared to its O & M needs. The gap is attributed to the anticipated additional annual operating costs associated with the various operational requirements mentioned above as well as the acquisitions mentioned in ***Section 8.1***. The operating impacts of these projects are based on numbers provided by Corporate Finance and have been added to the above lifecycle management plan using an assumed phased-in approach.

8.3 RENEWAL PLAN

Renewal is major works which do not increase the asset's design capacity but restores, rehabilitates, replaces, or renews an existing asset to its original service potential. Works over and above restoring an asset to its original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs

Asset renewals are typically undertaken to either ensure the assets reliability or quality will meet the service requirements set out by the City. Renewal projects are often triggered by service quality failure and can often be prioritized by consequence of failure, usage, operational and maintenance costs and other deciding factors.

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in ***Table 25*** and are based on the estimated design life for this iteration. Future iterations of the plan will focus on the Lifecycle approach to ESL which can vary greatly from design life. Asset useful lives were last reviewed in 2023 however they will be reviewed annually until their accuracy reflects the City's current practices.

Table 23: Useful Lives of Assets

ASSET SUBCATEGORY	ESTIMATED SERVICE LIFE (YEARS)
Lister Block (Facility)	150
Central Public Library	75
Van	10
SUV	8
Networking Equipment	8
Datacentre Assets	8
IP Phones	6
Computers and Laptops	4-5
Mobile Devices	2

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

RENEWAL RANKING CRITERIA

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g., Facilities can process required volumes); or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g., Vehicles are reliable).[9]

Future methodologies may be developed to optimize and prioritize renewals by identifying assets that:

- Have a high consequence of failure;
- Have high use and the subsequent impact on users would be significant;
- Have higher than expected operational or maintenance costs; and,
- Have the potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[10]

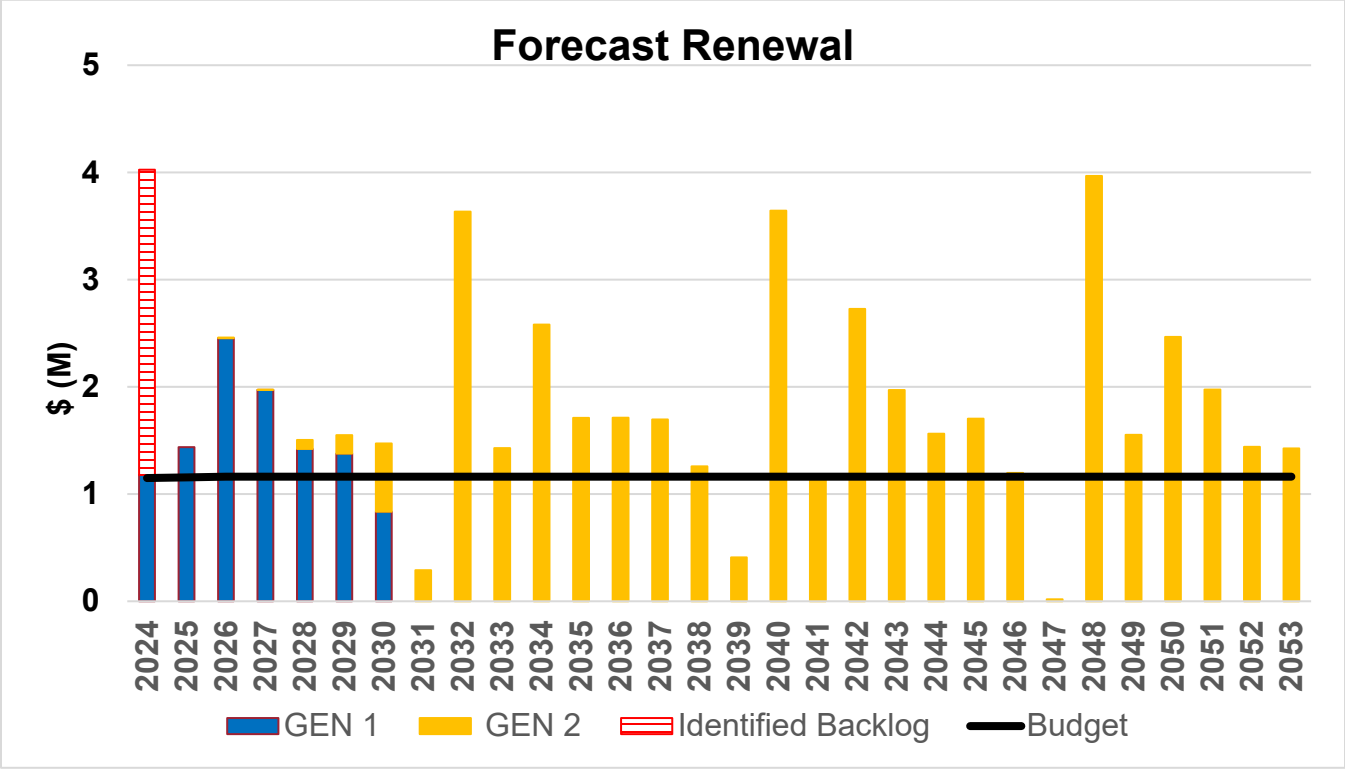
SUMMARY OF FUTURE RENEWAL COST

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in ***Figure 11.***

In the figure below, Generation 1 (Gen 1) costs refer to renewals that occur for the first time in the model based on the estimated service life and Generation 2+ (Gen 2+) costs refer to renewals that have occurred twice or more based on the estimated service life.

[9] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[10] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Figure 11: Forecast Renewal Costs
(All figure values are shown in 2023 dollars)



As can be seen in the figure above, due to the short service lives of IT hardware assets, the renewals repeat every 5 years in the renewal forecast. Currently, IT has an existing renewal backlog amount of approximately **$2.9 million**. The key elements of the renewal backlog include:

- **$1.6 million** for data centre assets; and,
- **$840k** for networking assets.

It is evident in the figure that the renewal needs considerably exceed the budgeted provision for renewals. The planned renewal works over the 10-year planning horizon include **$1.1 million per annum** for ongoing renewal of IT infrastructure, staff devices, and vehicles as they reach the end of their service lives. In comparison, the average renewal needs are estimated to be **$2.0 million per annum**. This gap is encompassed in the infrastructure gap explained in ***Section 9.1***. The IT Division plays a critical role in the City of Hamilton's service delivery to its residents as well as internal staff and therefore the renewal backlog of IT infrastructure and inadequate ongoing renewal funding needs redressing.

8.4 DISPOSAL PLAN

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, possible closure of service, decommissioning, disposal of asset materials, or relocation. Disposals will occur when an asset reaches the end of its useful life. The end of its useful life

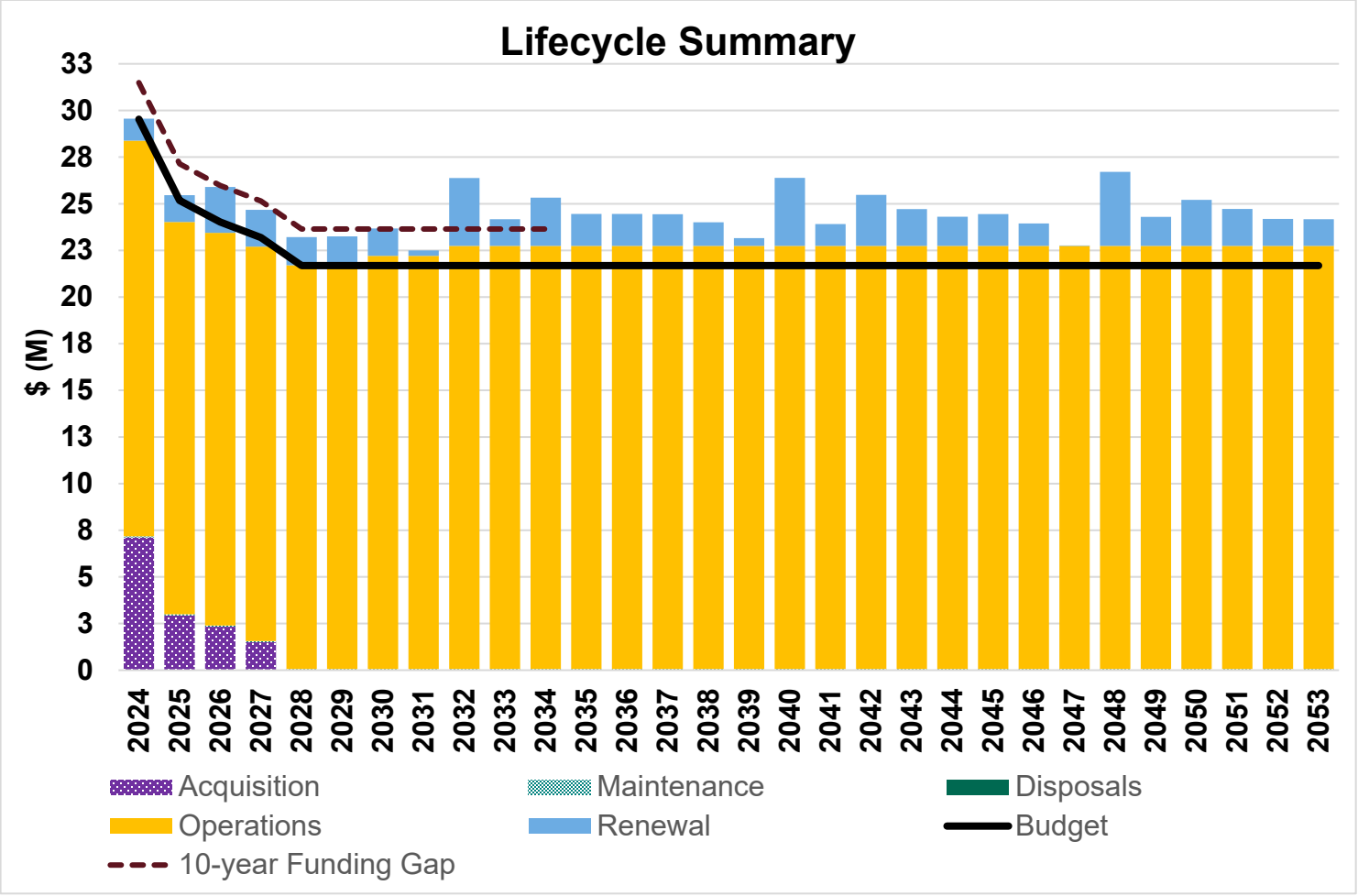
can be determined by factors such as excessive operation and maintenance costs, regulatory changes, obsolescence, or demand for the asset has fallen.

Currently, no assets have been identified for disposal by IT.

8.5 LIFECYCLE COST SUMMARY

The financial projections from this asset plan are shown in ***Figure 12***. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget. The bars in the graphs represent the forecast costs needed to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving a balance between costs, levels of service and risk to achieve the best value outcome.

Figure 12: Lifecycle Cost Summary



It is evident in ***Figure 12*** that the IT Division's needs are mostly composed of operational expenditures. This is due to the fact that many of the IT Division's services are either support-

based or comprised of intangible assets such as computer software. There are also significant upcoming annual renewal expenditures related to networking equipment and datacentre assets, as well as major upcoming acquisition projects for infrastructure asset management and cloud communication systems.

Based on the current financial data, there is sufficient budget to meet short-term needs in 2024 and 2025, but beginning in 2026, there will be insufficient budget for all currently identified future needs if additional budget is not requested. Therefore, it is expected that the levels of service will decrease over time if the budget does not increase to meet anticipated needs. The identified deficit is mostly comprised of unfunded renewal needs as well as the currently unfunded operating impact for anticipated capital projects outlined in ***Section 8.1*** and ***Section 8.2***. The lifecycle model is subject to change as the budget impact of identified demands (***Section 5***) and risks (***Section 6***) remains unquantified. Forecast reliability and confidence is further discussed in ***Section 9.7***.

9. FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this AM Plan. Effective asset and financial management will enable the City to ensure it provides 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.

Long-Term financial planning (LTFP) is critical for the City to ensure the networks lifecycle activities such as renewals, operations, maintenance, and acquisitions can happen at the optimal time. The City is under increasing pressure to meet the wants and needs of its customer while keeping costs at an affordable level and maintaining its financial sustainability.

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

Aligning the LTFP with the AM Plan is critical to ensure all of the networks needs will be met while the City is finalizing a clear financial strategy with measurable financial targets. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

9.1 SUSTAINABILITY OF SERVICE DELIVERY

There are two key indicators of sustainable service delivery that are considered within the AM Plan for this service area. The two indicators are the:

- Asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years); and,
- Medium-term forecast costs/proposed budget (over 10 years of the planning period).

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio[11] **59%**

The Asset Renewal Funding Ratio 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, the risk the City is prepared to accept and targeted service levels it wishes to maintain. The target renewal funding ratio should be ideally between **90% - 110%** over the entire planning period. A low indicator result generally indicates that service levels are achievable, however, the expenditures are below this level in some service areas predominantly

[11] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

due to underinvestment, including a lack of permanent infrastructure funding from senior levels of government, as well as large spikes of growth throughout the years.

Over the next 10 years IT expects to have **59%** of the funds required for the optimal renewal of assets. It is evident that the renewal needs considerably exceed the budgeted provision for renewals. Major contributors to unfunded renewals include data centre assets and networking assets.

If assets are not renewed in the appropriate timing, it will inevitably require difficult trade-off choices that could include:

- A reduction of the level of service and availability of assets;
- Increased complaints and reduced customer satisfaction;
- Increased reactive maintenance and renewal costs; and,
- Damage to the City's reputation and risk of fines or legal costs

The lack of renewal resources will be addressed in future AM Plans while aligning the plan to the LTFP. This will allow staff to develop options and long-term strategies to address the renewal rate. The City will review its renewal allocations once the entire inventory has been confirmed and amalgamated.

MEDIUM-TERM – 10-YEAR FINANCIAL PLANNING PERIOD

10-Year Operations, Maintenance and Renewal Financial Ratio 92%

Although this AM Plan includes forecast projections to 30 years, the higher confidence numbers are typically within the first ten (10) years of the lifecycle forecast. The 10-year Operations, Maintenance and Renewal Financial Ratio compares the Planned Budget with the Forecast for the optimal operation, maintenance, and renewal of assets to provide an agreed level of service over the next 10-year period. Similarly, to the Asset Renewal Funding Ratio (ARFR), the optimal ratio is also between **90-110%**. A low ratio would indicate that assets are not being funded at the rate that would meet the organization' risk and service level commitments.

The forecast operations, maintenance and renewal costs over the 10-year planning period is **$23.8 million** on average per year. Over time as improved information becomes available, it is anticipated to see this number change. The proposed (budget) operations, maintenance and renewal funding is $**21.8 million** on average per year giving a 10-year funding shortfall of **$2.0 million** per year or **$19.6 million** over the 10-year planning period. This indicates that **92%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget, which is within the ideal 90-110% range. Therefore, it can be concluded that IT is funding its assets at an acceptable rate. Note, that these calculations exclude acquired assets. The existing shortfall is made of unfunded renewal needs as well as the yet unfunded operating impact of anticipated capital projects.

Funding an annual funding shortfall or funding 'gap' should not be addressed immediately. The overall gap in funding city-wide will require vetting, 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 financial shock to customers. Options for managing the gap include;

- Financing strategies – increased funding, block funding for specific lifecycle activities, long-term debt utilization;
- Adjustments to lifecycle activities – increase/decrease maintenance or operations, increase/decrease frequency of renewals, limit acquisitions or dispose of underutilized assets; and,
- Influence level of service expectations or demand drivers.

These options and others will allow Hamilton to ensure the gap is managed appropriately and ensure the level of service outcomes the customers desire.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to eventually achieve a financial indicator of **90-110%** for the first years of the AM Plan and ideally over the 10-year life of the Long-Term Financial Plan.

9.2 FORECAST COSTS (OUTLAYS) FOR THE LONG-TERM FINANCIAL PLAN

Table 26 shows the forecast costs (outlays) required for consideration in the 30-year long-term financial plan.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the operational and capital budget. The City will begin developing its long-term financial plan (LTFP) to incorporate both the operational and capital budget information and help align the LTFP to the AM Plan which is critical for effective asset management planning.

A gap between the forecast outlays and the amounts allocated in the financial plan indicates further work is required on reviewing service levels in the AM Plan (including possibly revising the long-term financial plan).

The City will manage the ‘gap’ by continuing to develop this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community. Options to manage the gap include reduction and closure of low-use assets, increased funding allocations, reduce the expected level of service, utilize debt-based funding over the long term, adjustments to lifecycle activities, improved renewals and multiple other options or combinations of options.

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Table 24: Forecast Costs (Outlays) for Long-Term Financial Plan

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2024	$7,117,000	$21,203,486	$61,870	$1,177,748	$0
2025	$2,933,000	$21,028,896	$61,870	$1,437,714	$0
2026	$2,333,000	$21,043,424	$61,870	$2,460,490	$0
2027	$1,500,000	$21,143,424	$61,870	$1,971,871	$0
2028	$0	$21,643,424	$61,870	$1,504,513	$0
2029	$0	$21,643,424	$61,870	$1,548,806	$0
2030	$0	$22,143,424	$61,870	$1,471,716	$0
2031	$0	$22,143,424	$61,870	$290,025	$0
2032	$0	$22,683,424	$61,870	$3,634,687	$0
2033	$0	$22,683,424	$61,870	$1,428,661	$0
2034	$0	$22,683,424	$61,870	$2,580,115	$0
2035	$0	$22,683,424	$61,870	$1,710,997	$0
2036	$0	$22,683,424	$61,870	$1,711,794	$0
2037	$0	$22,683,424	$61,870	$1,695,577	$0
2038	$0	$22,683,424	$61,870	$1,258,913	$0
2039	$0	$22,683,424	$61,870	$409,650	$0
2040	$0	$22,683,424	$61,870	$3,642,563	$0
2041	$0	$22,683,424	$61,870	$1,163,442	$0
2042	$0	$22,683,424	$61,870	$2,726,886	$0
2043	$0	$22,683,424	$61,870	$1,970,694	$0
2044	$0	$22,683,424	$61,870	$1,562,669	$0
2045	$0	$22,683,424	$61,870	$1,703,453	$0
2046	$0	$22,683,424	$61,870	$1,197,444	$0

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2047	$0	$22,683,424	$61,870	$18,921	$0
2048	$0	$22,683,424	$61,870	$3,967,260	$0
2049	$0	$22,683,424	$61,870	$1,551,817	$0
2050	$0	$22,683,424	$61,870	$2,466,012	$0
2051	$0	$22,683,424	$61,870	$1,974,225	$0
2052	$0	$22,683,424	$61,870	$1,440,690	$0
2053	$0	$22,683,424	$61,870	$1,425,650	$0

9.3 FUNDING STRATEGY

The proposed funding for assets is outlined in the City's operational budget and 10 year capital budget.

These operational and capital budgets determine how funding will be provided, whereas the AM Plan typically communicates how and when this will be spent, along with the service and risk consequences. Future iterations of the AM plan will provide service delivery options and alternatives to optimize limited financial resources.

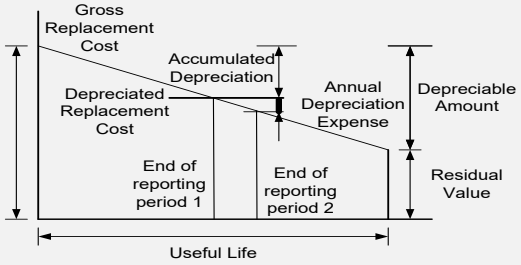
9.4 VALUATION FORECASTS

Asset values are forecast to increase as additional assets are added into service. As projections improve and can be validated with market pricing, the net valuations will likely increase significantly despite some assets being programmed for disposal that will be removed from the register over the 30-year planning horizon.

Additional assets will add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs due to future renewals. Any additional assets will also add to future depreciation forecasts. Any disposals of assets would decrease the operations and maintenance needs in the longer term and remove the high costs of renewal obligations. At this time, it is not possible to separate the disposal costs from the renewal or maintenance costs, however, this will be improved for the next iteration of the plan.

9.5 ASSET VALUATION

Replacement Cost (Gross)	**$25,205,458**
Depreciable Amount	**$25,146,727**
Depreciated Replacement Cost[12]	**$9,268,123**
Annual Depreciation	**$1,979,428**



9.6 KEY ASSUMPTIONS MADE IN FINANCIAL FORECASTS

In compiling this AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are:

- Operational forecasts are based on current budget allocations and are the basis for the projections for the 30-year horizon and do not address other operational needs not yet identified;
- Maintenance forecasts are based on current budget allocations and do not identify asset needs at this time. It is solely based on planned activities; and,
- Replacement costs were based on historical costing. They were also made without determining what the asset would be replaced with in the future.

9.7 FORECAST RELIABILITY AND CONFIDENCE

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is defined in the AMP Overview.

The estimated confidence level for and reliability of data used in this AM Plan is considered to be a **Low** to **Medium** confidence level.

[12] Also reported as Written Down Value, Carrying or Net Book Value.

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Table 25: Confidence Assessment

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand Drivers	Low	The impacts from the identified demand drivers were not quantified and added to the lifecycle model for this iteration of the AM plan.
Acquisition Forecast	Medium	Used IT's 10-Year Capital Plan for anticipated acquisitions which are subject to change especially as a result of the ongoing cybersecurity incident.
Operations Forecast	Medium	Based on IT's multiyear operating forecast.
Maintenance Forecast	Medium	Based on IT's multiyear operating forecast.
Renewal Forecast - Asset Values	Low-Medium	Renewal costs for hardware assets have come from the IT Division and for vehicles from the Corporate Fleet.
Renewal Forecast - Asset Useful Life	Low-Medium	Estimated service lives are based on IT's estimates.
Renewal Forecast - Condition Modelling	Low	The condition was not available for most assets.
Disposal Forecast	Not Applicable	No disposals were integrated into the forecast.

INFORMATION TECHNOLOGY 2024 ASSET MANAGEMENT PLAN

10. PLAN IMPROVEMENT AND MONITORING

10.1 STATUS OF ASSET MANAGEMENT PRACTICES[13]

ACCOUNTING AND FINANCIAL DATA SOURCES

This AM Plan utilizes accounting and financial data. The sources of the data are:

- 2023 IT 10-Year Capital Forecast;
- 2024 - 2026 Multi-Year Operating Forecast;
- Building Condition Assessment Reports;
- Asset Management Data Collection Templates;
- Financial Exports from internal financial systems; and,
- Historical cost and estimates of budget allocation based on SME experience.

ASSET MANAGEMENT DATA SOURCES

This AM Plan also utilizes asset management data. The sources of the data are:

- Data extracts from various city applications and management software;
- Asset Management Data Collection Templates;
- Tender documents, subdivision agreements and projected growth forecasts as well as internal reports;
- Condition assessments;
- Subject matter Expert Opinion and Anecdotal Information; and,
- Reports from the mandatory inspections, operational and maintenance activities internal reports.

10.2 IMPROVEMENT PLAN

It is important that the City recognize areas of the AM Plan and planning processes that require future improvements to ensure both effective asset management and informed decision-making. The tasks listed below are essential to improving the AM Plan and the City's ability to make evidence-based and informed decisions. These improvements span from improved lifecycle activities, improved financial planning and to plans to physically improve the assets.

The Improvement Plan ***Table 28*** below highlights proposed improvement items that will require further discussion and analysis to determine feasibility, resource requirements and alignment to current work plans. Future iterations of this AM Plan will provide updates on these improvement plans.

Table 26: Improvement Plan

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1.	Develop an asset register for all IT assets.	IT	Internal Resources	2025
2.	Determine replacement values for IT's intangible assets.	IT/Finance/CAM		2025
3.	Develop methodologies to determine asset conditions for IT's assets.	IT		2025
4.	Release a Customer Engagement Survey to develop customer values and customer levels of service.	IT/CAM		2025
5.	Improve confidence assessment of data used for financial forecast.	IT/Finance		Ongoing

10.3 MONITORING AND REVIEW PROCEDURES

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated on a regular basis to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget will be incorporated into the Long-Term Financial Plan once completed.

10.4 PERFORMANCE MEASURES

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan;
- The degree to which the one to ten-year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan;
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans; and,
- The Asset Renewal Funding Ratio (ARFR) achieving the Organizational target (this target is often 90 – 110%).

11. REFERENCES

(2021). *Census Profile, 2021 Census of Population.* Statistics Canada. Retrieved 2023, from https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/page.cfm?Lang=E&GENDERlist=1&STATISTIClist=1&HEADERlist=0&DGUIDlist=2021A00033525&SearchText=Hamilton

City of Hamilton. (2022, November 29). *CITY OF HAMILTON NAMED ONE OF HAMILTON-NIAGARA'S TOP REGIONAL EMPLOYERS FOR 2023*. Retrieved from Hamilton: https://www.hamilton.ca/city-council/news-notices/news-releases/city-hamilton-named-one-hamilton-niagaras-top-regional-0

City of Hamilton. (2022). *Digital Strategy: Improving Online/Digital Services Survey .* Information Technology. Hamilton: City of Hamilton. Retrieved May 14, 2024, from https://www.hamilton.ca/sites/default/files/2023-02/Digital-Strategy-Engagement-Summary.pdf

City of Hamilton. (2023). *City of Hamilton's Digital Strategy.* Hamilton: City of Hamilton. Retrieved from https://engage.hamilton.ca/digitalstrategy

City of Hamilton. (2023). *City of Hamilton's Digital Strategy.* Strategy, City of Hamiltin, Information Technology, Hamilton. Retrieved May 14, 2024, from https://www.hamilton.ca/sites/default/files/2023-01/hamilton-digital-strategy_0.pdf

City of Hamilton. (2024). *2024 Proposed Operating and Capital Budget Presentation.* City of Hamilton, Corporate Services, Hamilton. Retrieved May 14, 2024, from https://pub-hamilton.escribemeetings.com/filestream.ashx?DocumentId=393909

Government of Ontario. (2017). *Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure.* Ontario, Canada: e-Laws. Retrieved 2024, from Ontario.ca: https://www.ontario.ca/laws/regulation/r17588

ICLEI. (2021). *Escribe Meetings.* Retrieved from City of Hamilton: https://pub-hamilton.escribemeetings.com/filestream.ashx?DocumentId=325830

ICLEI Canada. (2021). *Climate Science Report for the City of Hamilton.* Retrieved from City of Hamilton: https://www.hamilton.ca/sites/default/files/2022-10/climate-change-impact-adapatation-plan-science-report.pdf

ICLEI Canada. (2022). *Climate Science Report for the City of Hamilton.* City of Hamilton, Hamilton, Ontario. Retrieved 2023, from https://www.hamilton.ca/sites/default/files/2022-10/climate-change-impact-adapatation-plan-science-report.pdf

Institute of Public Works Engineering Australasia. (2006). *International Infrastructure Management Manual.* Retrieved 2024, from Institute of Public Works Engineering Australasia: www.ipwea.org/IIMM

Institute of Public Works Engineering Australasia. (2008). *NAMS.PLUS Asset Management.* Retrieved 2024, from Institute of Public Works Engineering Australasia: www.ipwea.org/namsplus

Institute of Public Works Engineering Australasia. (2012). *Long-Term Financial Planning.* Sydney, Australia. Retrieved 2024, from https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn6

Institute of Public Works Engineering Australasia. (2014). *Levels of Service & Community Engagement.* Sydney, Australia. Retrieved 2024, from https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn8

Institute of Public Works Engineering Australasia. (2015). *Australian Infrastructure Financial Management Manual* (2nd ed.). Sydney, Australia. Retrieved 2024, from Institute of Public Works Engineering Australasia: www.ipwea.org/AIFMM

Institute of Public Works Engineering Australasia. (2015). *Australian Infrastructure Financial Management Manual.* Retrieved 2024, from www.ipwea.org/AIFMM

Institute of Public Works Engineering Australasia. (2015). *International Infrastructure Management Manual* (3rd ed.). Sydney, Australia. Retrieved 2024, from www.ipwea.org/IIMM

Institute of Public Works Engineering Australasia. (2018). *Climate Change Impacts on the Useful Life of Assets.* Sydney. Retrieved 2024

Institute of Public Works Engineering Australasia. (2020). *International Infrastructure Financial Management Manual.* Sydney, Australia. Retrieved 2024

International Organization for Standardization. (2014). ISO 55000: 2014 Overview, Principles and Terminology. ISO. Retrieved 2024

International Organization for Standardization. (2018). ISO 31000: 2018, Risk Management – Guidelines. ISO. Retrieved 2024

Kay, D., & Tehrani, C. (2023, November 24). Enterprise Data Management Update (City-wide). Hamilton, Ontario, Canada. Retrieved May 14, 2024, from https://www.hamilton.ca/sites/default/files/2023-12/comm-update-CS-enterprise-data-mgmt-update-2023.pdf

Newbold, C., Skidmore, S., Chessman , T., Imhoff, T., & McDowell, A. (2022). *ReCharge Hamilton.* Energy and Emissions Plan, City of Hamilton, Hamilton, Ontario. Retrieved 2023, from https://pub-hamilton.escribemeetings.com/filestream.ashx?DocumentId=335400