HAMILTON STREET RAILWAY ASSET MANAGEMENT PLAN 2024

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

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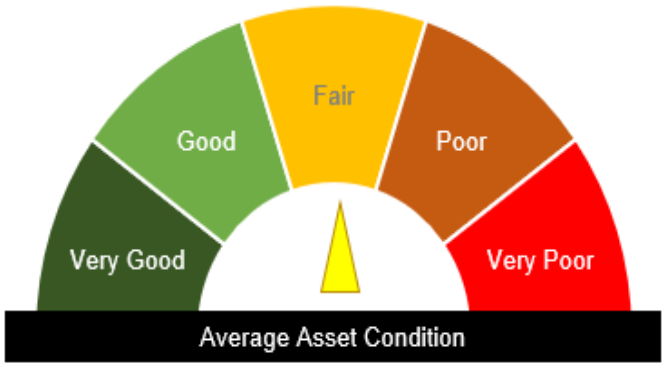
SUMMARY AND QUICK FACTS

SERVICE PROFILE

The purpose of Hamilton Street Railway (HSR) services is to provide, safe, accessible, reliable, and efficient public transit services across the City of Hamilton in accordance with Council and community expectations. Delivering seamless transportation is essential, as many customers rely on transit to support their quality of life.

ASSET SUMMARY

Replacement Value
$524.8M
FAIR CONDITION
Average Age of **14** years
or **50%** of the average
remaining service life



LEVEL OF SERVICE SUMMARY

- The majority of survey respondents felt that their transit was reliable and timely.
- Most survey respondents felt that bus operators were professional.
- Many survey respondents felt the inside of the bus was clean on their ride.
- Survey respondents were **SATISFIED** with how safe they felt during the trip (including bus stops, while riding the bus and while exiting the bus).

ASSET HIGHLIGHTS

ASSETS	QUANTITY	REPLACEMENT COST	AVERAGE CONDITION	STEWARDSHIP MEASURES
Buses	308	$308.2M	Fair	Regular Inspections
HSR Facilities	4	$140.7M	Good	Building Condition Assessments

DATA CONFIDENCE

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

DEMAND DRIVERS

Population change – Hamilton's population will continue to grow and HSR will likely see a significant ridership increase which will require additional buses and staff.

Climate Change - HSR has focused on ensuring that its fleet of vehicles is helping Hamilton meet its climate goals. HSR should complete its fleet transformation from diesel vehicles to Natural Gas vehicles within the next two years.

RISK

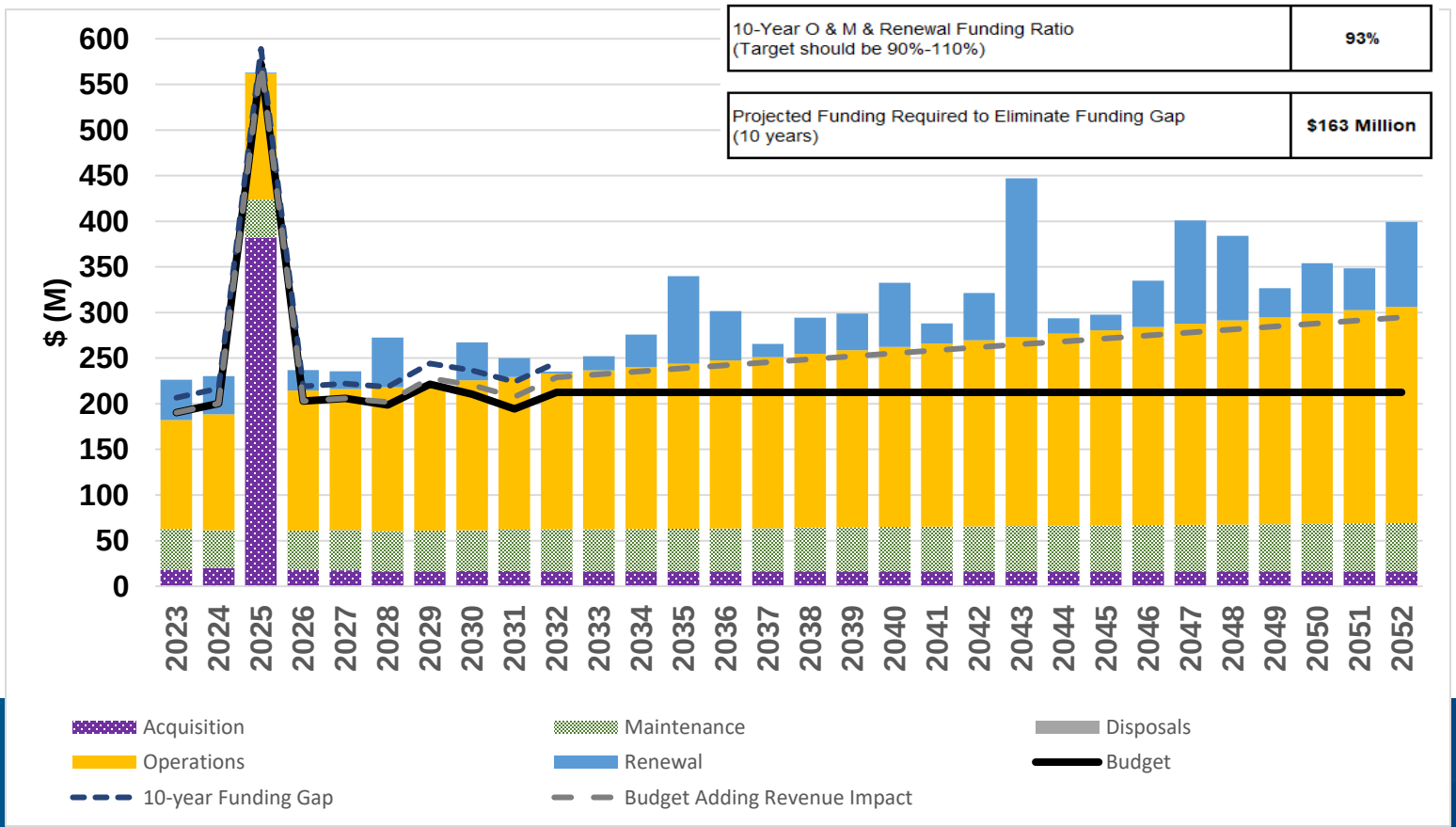
- Critical Assets are identified as the buses and HSR facilities.

CLIMATE CHANGE MITIGATION

- New Maintenance and Storage Facility specifications call for Net Zero design.
- Fleet transformation from diesel to natural gas vehicles and transitioning from compressed natural gas to renewable natural gas.

LIFECYCLE SUMMARY

Asset Renewal Funding Ratio (Target should be 90%-110%)	81%
10-Year O & M & Renewal Funding Ratio (Target should be 90%-110%)	93%
Projected Funding Required to Eliminate Funding Gap (10 years)	$163 Million



HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

1. INTRODUCTION

Hamilton Street Railway (HSR) exists to provide safe, accessible, reliable and efficient public transit services within the City. The purpose of this Asset Management (AM) Plan is to ensure that HSR has fulfilled the asset management planning requirements outlined in O. Reg 588/17 for current and proposed levels of service as well as ensure HSR has the required assets to deliver transit services in accordance with Council and community expectations.

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 2023 - 2052 planning period. The assets covered by this plan include the major components required to deliver effective HSR services to the City's residents.

It should be noted that at the time of report writing, the HSR (re)Designed network and corresponding Transit Growth Plan have not been finalized. Therefore, future updates of this document will reflect such changes. Additionally, the current asset management plan for HSR does not capture any associated costs with decarbonizing the transit fleet and migrating to hydrogen or electric vehicle propulsion technologies.

HSR has a variety of assets to support the delivery of public transportation within Hamilton. They range from:

- HSR facilities and maintenance equipment;
- Vehicles (revenue-generating and non-revenue-generating);
- On-street infrastructure, bus stops, and amenities; and,
- Technology such as hardware and software.

2. BACKGROUND

The information in this section is intended to give a snapshot in time of the current state of the HSR service area by providing background on the service, outlining legislative requirements, defining the asset hierarchy used throughout the report, and providing a detailed summary and analysis of existing inventory information as of 2023, including age profile, condition methodology, condition profile, and asset usage and performance for each of the asset classes. This section will provide the necessary background for the remainder of the plan.

2.1 SERVICE PROFILE

The service profile consists of four main aspects of the service:

- Service History;
- Service Function;
- Users of the Service; and,
- Unique Service Challenges

2.1.1 SERVICE HISTORY

On March 29th, 1873, a group of citizens petitioned the provincial legislature to enable the incorporation of public transportation in Hamilton. By May 1874, horse-drawn streetcars made their first trip on single tracks, with one route on James Street, from Stuart to King Street, and another on King Street from Locke to Wellington Street. As HSR continued to grow in 1880 the service erected its headquarters at Bay and Stuart Streets. The HSR headquarters housed 20 streetcars and provided care for its 50 horses. The horses worked four hours a day and typically travelled between 25 and 32 kilometres each day. The HSR horses were retired after five years of service.

HSR operated electric streetcars from 1884 to 1951 when the last transportation belt line was closed. The streetcars were soon replaced by electric trolley buses, with additional diesel buses supporting the transit route. By the end of 1992, all trolleybuses were replaced with diesel buses, with the Barton Street route being the last trolley bus route to be replaced. The HSR now operates 35 routes, covers 243 square kilometres, and provides approximately one million hours of service each year. The service utilizes 308 fully accessible buses, 20% of which operate using diesel petroleum, and 80% using compressed natural gas (CNG).

In the 1980s, the Region of Hamilton-Wentworth developed a Specialized Transit Program, jointly funded through the Region and the province, which was to be delivered through the non-profit contractor Disabled & Aged Regional Transportation System (DARTS). The Accessible Transportation Services (ATS) section within HSR, is the section responsible for oversight of specialized transit. ATS provides door-to-door shared ride service through the contractor and provides the Taxi Scrip Program. By the mid-1990s, the Region solely funded the service. Accessible Transit Services funding was assumed by the newly amalgamated City of Hamilton in 2001, and to date remains to be delivered by the same non-profit contractor. ATS continues

to service the boundaries of the amalgamated City limits, well beyond the HSR urban transit boundary.

HSR also offers a discounted taxi fare program, the Taxi Scrip Program, to specialized transit clients, to supplement ridership outside of the contracted services. The Taxi Scrip Program applies the same eligibility criteria used in determining eligibility for the contracted program. In 1996, the HSR acquired low-floor buses to assist in removing barriers for persons with mobility issues, and to increase ridership within its current service. As of 2009, all HSR buses became fully accessible.

HSR also provides transit services for large-scale community events, such as fairs and festivals. One such service of note is the shuttle service to and from Hamilton Tiger Cats games. The shuttle service provides express shuttles from three locations in the City to Tim Horton's Field. This service is provided by way of a reciprocal agreement between HSR and the Tiger Cats.

COVID-19 Pandemic 2020 – Today

During the global pandemic when most other City services were limited or temporarily halted, the HSR continued to deliver its critical services within the City and ensured that the City's most vulnerable customers remained able to access efficient and reliable transportation.

Because the HSR is self-sufficient insofar as it both operates and maintains its own fleet, it was able to respond quickly to the changing health and safety measures required to keep staff and customers safe. Further, because HSR maintains carefully monitored inventory levels, it was able to continue necessary repairs and maintenance activities.

The Accessible Transportation Services (ATS) section supported the City's public health efforts by providing isolation vehicles to COVID-19 testing and isolation centres for unhoused individuals and symptom-positive ATS customers requiring critical medical treatment, such as dialysis. During the pandemic, the HSR prioritized the implementation of the following safety measures on all HSR vehicles:

- Installation of custom Lexan Polycarbonate shields, which provided a barrier of protection for HSR operators;
- Distribution of Personal Protective Equipment (PPE) for all HSR operators: and,
- Applied social-distancing measures by adjusting the onboarding of customers by using the rear bus doors.

As the public health & and safety restrictions were lifted, HSR began the process of returning to its standard approach to transit services. HSR learned a great deal from the limitations in provisioning its services due to the COVID-19 pandemic. HSR has adapted the lessons learned to improve internal processes and how HSR can prepare for, and quickly respond to, future challenges in service delivery.

The COVID-19 pandemic had a significant and immediate impact on HSR ridership and highlighted the number of people for whom transit is an essential service. It also demonstrated how significantly marginalized persons bore the brunt of the economic impact of the pandemic, as historically, price sensitivity and affordability have always been identified as areas of concern among transit customers. The Public Health restrictions, namely the stay-at-home orders, significantly reduced ridership, slicing it by more than 50%. (21,659,000 trips in 2019 compared to 9,973,000 trips in 2021- a 56% decrease)

Eased health and safety restrictions in early 2022 allowed HSR to resume full-service transit operations, and by the end of 2022, HSR had recovered 82% of its pre-pandemic ridership. As of September 2023, ridership had reached 96% of pre-pandemic levels.

For Accessible Transportation Services, as of September 2023, ridership was at 63% of pre-pandemic levels.

These statistics show that ridership in Hamilton continues to recover. However, challenges remain as people continue to adapt to the post-pandemic climate. In addition, work-from-home or hybrid options may have a lasting impact on ridership.

2.1.2 SERVICE FUNCTION

The purpose of HSR's transit service is to provide safe, accessible, reliable, and efficient public transportation across the City of Hamilton. Delivering seamless transportation is essential, as many customers rely on transit to support their quality of life.

HSR services enable the public to get to school, work, sporting and social events, access medical care and facilitate access to necessities, like banking and grocery shopping. A high-quality public transit network is essential to the City of Hamilton; It ensures that the public is offered:

- Safe, clean, and environmentally conscious travel;
- Available and affordable travel;
- Accessible travel; and,
- Mode and mobility choices.

HSR's transit system supports all sectors of the City's economy, such as:

- Labour Force;
- Education;
- Culture;
- Tourism; and,
- Climate Mitigation.

While most economies have a dependency on public transit, HSR also contributes to the growth of our economic sectors by supplying accessible and affordable travel to all residents. Public transit allows for independent and equitable mobility city-wide, which can be attributed as a factor in the overall health and wellness of our community.

2.1.3 USERS OF THE SERVICE

The City of Hamilton's diverse population and many visitors account for HSR's diverse customer base. HSR user demographics range from students to seniors to professionals and tourists alike, who opt to use Hamilton's transit services to:

- Reliably travel across the City of Hamilton;
- Limit the environmental impact car travel has on the environment, such as greenhouse gases;
- Affordably travel or commute;
- Conveniently travel to appointments, shopping centres, sporting events; and,
- Assist in travel when physical mobility is a concern.

In ***Figure 1*** on the next page, you will see the detailed Conventional Transit services provided across Hamilton.

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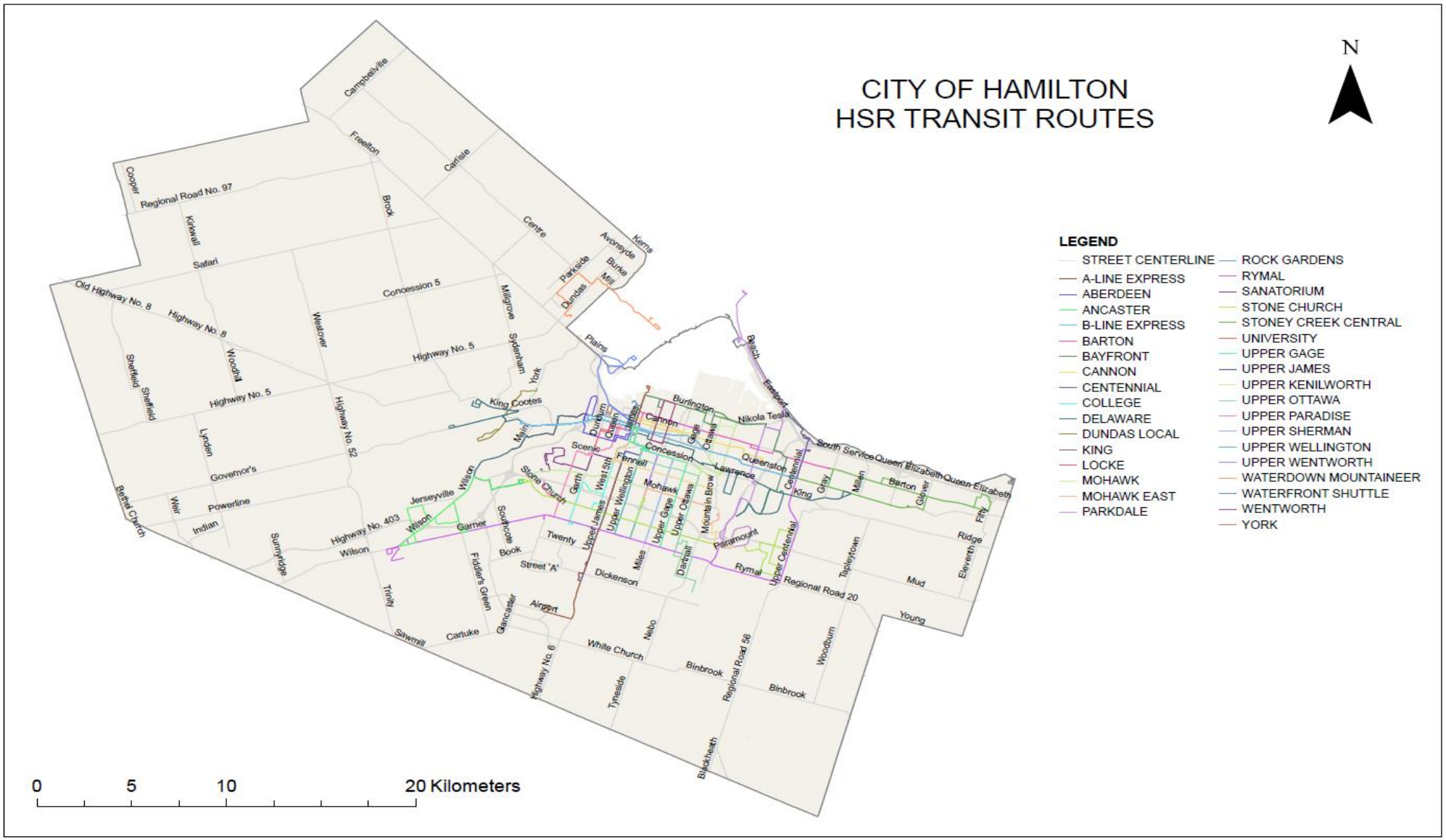
Figure 1: HSR Conventional Transit Services Overview Map



2.1.4 UNIQUE SERVICE CHALLENGES

Hamilton has a large geographic area to service, including both the urban area which is serviced by conventional transit as well as the urban and rural areas serviced by specialized transit. The larger the geographic area the more resources and assets are needed to deliver services at the desired levels of service. Given the recent growth in Hamilton, changing demographics, and changing priorities in how roads are used in our community, achieving, and maintaining the desired levels of service has become more difficult.

Investments in service have not been able to keep pace with this growth and these changes, so certain areas within Hamilton have not received service levels or access to service comparable to other areas. This is misaligned with community expectations, notably, that service levels should be equitable.

An additional unique service challenge for HSR relates to shelter vandalism which occurs on a regular basis. 2023 data from the contractor indicates that 73% of Hamilton's bus shelters experience vandalism of some form each year while 33% are subject to vandalism specific to smashed or etched glass. Of the five agencies in southwestern Ontario that this contractor serves, Hamilton has the highest number of damage calls per shelter when compared to the other agencies. This shelter vandalism includes graffiti, etching of glass, spray paint and smash sprees and can significantly impact budgets.

2.1.5 LEGISLATIVE REQUIREMENTS

The most significant legislative requirements that impact the delivery of the service 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
AODA Integrated Accessibility Standards Regulation (O.Reg. 191/11)	This regulation outlines Hamilton's responsibilities to deliver a specialized transit service and conditions of access to transit for specialized transit customers. O. Reg. 191/11 also includes accessibility requirements for conventional transit.

Hamilton is not required by legislation to offer transit services, however, by choosing to do so, there are legislative requirements the City must meet, notably, the regulation mandates that the City must also offer a specialized service. Specialized services are those that offer door-to-door travel, such as the external contracted program. Staff continuously monitor for changes to the regulation and measure their performance at delivering the specialized service.

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2.1.6 ASSET HIERARCHY

To deliver safe, accessible, reliable, and efficient public transportation services across the City of Hamilton, HSR requires assets. The Service Areas have been broken down into asset classes for the purpose of this AM Plan: Facilities, Vehicles, On-street Infrastructure, and Technology.

- **Facilities-** refers to any facilities required to deliver services, including the maintenance equipment;
- **Vehicles:** describes different types of vehicle assets (revenue-generating and other);
- **On-Street Infrastructure**: refers to assets related to bus stops; and,
- **Technology:** describes the different types of technology required to deliver the service including Information Technology (IT).

The asset class hierarchy outlining assets included in this section is shown below in ***Table 2***.

Table 2: Asset Class Hierarchy

SERVICE AREA	HAMILTON STREET RAILWAY			
ASSET CLASS	**FACILITIES**	**VEHICLES**	**ON-STREET INFRASTRUCTURE**	**TECHNOLOGY**
Asset	HSR Facilities	Revenue-generating	Bus stops and Amenities	Hardware
	Maintenance Equipment	Non-Revenue Generating		Software

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3. SUMMARY OF ASSETS

Table 3 displays the detailed summary of assets for the HSR service area. Sources of this data are a combination of different data included in the City's database systems. It is important to note that inventory information does change often and that this is a snapshot of information available as of year-end 2023.

The City owns approximately **$524.8 Million** in HSR assets, which are on average in **FAIR** condition. Assets are a weighted average of 14 years in age which is 50% of the average remaining service life.

For most assets, this means that the City should be completing preventative, preservation, and minor maintenance activities per the inspection reports as well as operating activities (e.g., inspection, cleaning) to prevent any premature failures.

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. It is also important to note that AM Plans only include asset information related to assets that the City owns. Finally, the assets included below are assets that are assumed and in service at the time of writing.

Data confidence associated with asset information is also presented in ***Table 3***. Data confidence descriptions are outlined on ***page 31***, in the AM Plan Overview. The replacement costs below are typically a medium data confidence level overall. For Facilities, these replacement costs are calculated using an internal tool which encompasses current market rates, building type and size. Technology assets are taken from the most recent purchase price for similar assets as well, but since some of these assets are not replaced as frequently, this was given a **medium** data confidence.

All assets have an itemized inventory with varying degrees of attribute information. A continuous improvement item identified in ***Table 29*** is to implement an asset registry for all HSR assets which includes key database fields and follows the newly developed City Data Standard.

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Table 3: Detailed Summary of Assets
****Weighted Average by Replacement Value***

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
VEHICLES				
Revenue-generating Vehicles	308	$308.2M	6.6 Years (47%)	3 - Fair
Data Confidence	High	High	High	Low
Non–revenue–generating vehicles	20	$720K	6 Years (20%)	4 - Poor
Data Confidence	High	High	High	Low
SUBTOTAL		**$308.9M**		
Data Confidence		**High**	**High**	**Low**
FACILITIES / ON STREET INFRASTRUCTURE / TECHNOLOGY				
Facilities	4	$140.7M	31.5 Years (48%)	2 - Good
Data Confidence	High	Medium	Medium	Low
Maintenance Equipment	80	$5.7M	8.3 Years (56%)	3 - Fair
Data Confidence	High	Medium	Medium	Low
On-street Infrastructure	2,323	$61M	9.5 Years (56%)	3 - Fair
Data Confidence	Low	Low	Low	Low
Technology	236	$8.5M	14.6 Years (20%)	3 - Fair
Data Confidence	High	Medium	Medium	Low
SUBTOTAL		**$215.9M**		
Data Confidence		**Medium**	**Medium**	**Low**
TOTAL		**$524.8M**	***14 Years* (50%*)**	***3 - FAIR***
Data Confidence		**MEDIUM**	**MEDIUM**	**LOW**

Generally, the asset register data has most of the data elements regarding the quantity of assets. However, there are data elements, such as conditions, which were missing. In some circumstances, age was used as a proxy for condition, which lowers the data confidence for that asset class. HSR has identified the following continuous improvement items as noted in ***Table 29*** to increase data confidence and quality in future plans:

- Improved collection of condition data;
- Timely updating of replacement cost/market price information; and,
- Ensuring accurate remaining useful life estimates.

3.1 ASSET CONDITION GRADING

Condition refers to the physical state assets are in, 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*** (on the next page) 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.

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Table 4: 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, has slight defects and shows signs of some deterioration but has no significant impact on the asset's usage. Minor/preventative maintenance may be required.	69.5% – 79.4%	< 5%
3-Fair	The asset is in sound condition but has minor defects. Deterioration has some impact on the asset's 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 the asset's 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 decommissioning is required.	<19.4%	>= 30%

The following conversion assumptions were made:

- For assets where a condition assessment was not completed, but age information was known, the condition was based on the % of remaining service life; and,
- Facilities Condition Index was based on ranges provided by the consultant who completed the Building Condition Assessment (BCA).

The majority of the assets did not have an initial condition to reference, and a continuous improvement item has been identified to ensure that condition is available for future iterations of the plan.

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. Typically, assets have an estimated service life (ESL) which can be used to plan 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.

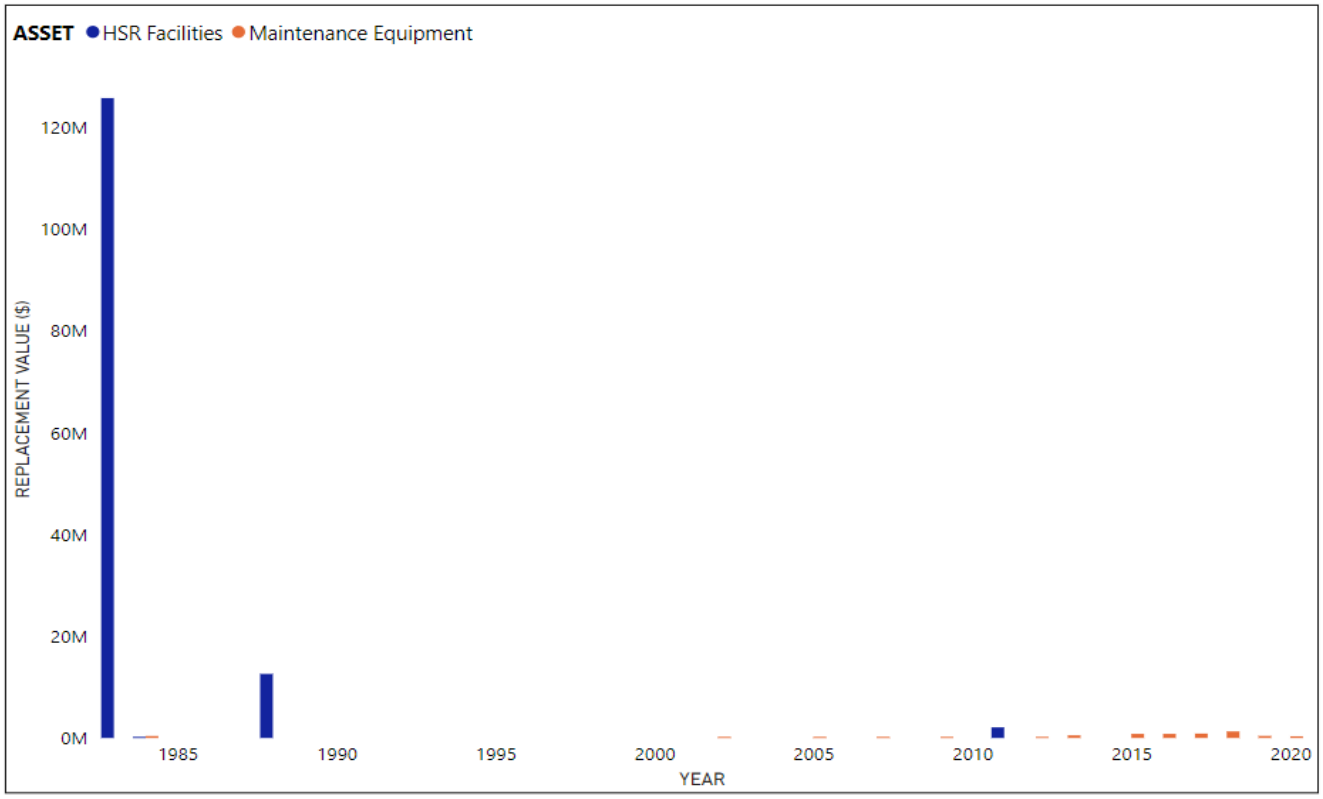
- Finally, there are often insufficient resources to address all known asset deficiencies, so performance issues may arise which are noted and prioritized in this AM Plan.

3.2.1 FACILITIES AND MAINTENANCE EQUIPMENT PROFILE

3.2.1.1 AGE PROFILE

Per ***Figure 2*** below, the age profile for HSR facilities shows the oldest asset is the Mountain Transit Centre built in 1983, with the other facilities assets being constructed between the years of 1984 and 2011. The oldest maintenance equipment asset was in 1983, with a reasonable distribution of age within the maintenance equipment inventory profile.

Figure 2: Facilities and Maintenance Equipment Age Profile



3.2.1.2 CONDITION METHODOLOGY & PROFILE

Condition for HSR facilities is determined based on the results of a Building Condition Assessment (BCA). BCAs are completed on HSR facilities every five years and output a score called a Facility Condition Index (FCI) which is considered to be a high confidence level source. The FCI is calculated based on a ratio of the cost of work required on the facility to the total replacement cost of the facility. The condition conversion from FCI to the standardized 5-point scale is used in the Asset Management Plan as shown in ***Table 4*****.**

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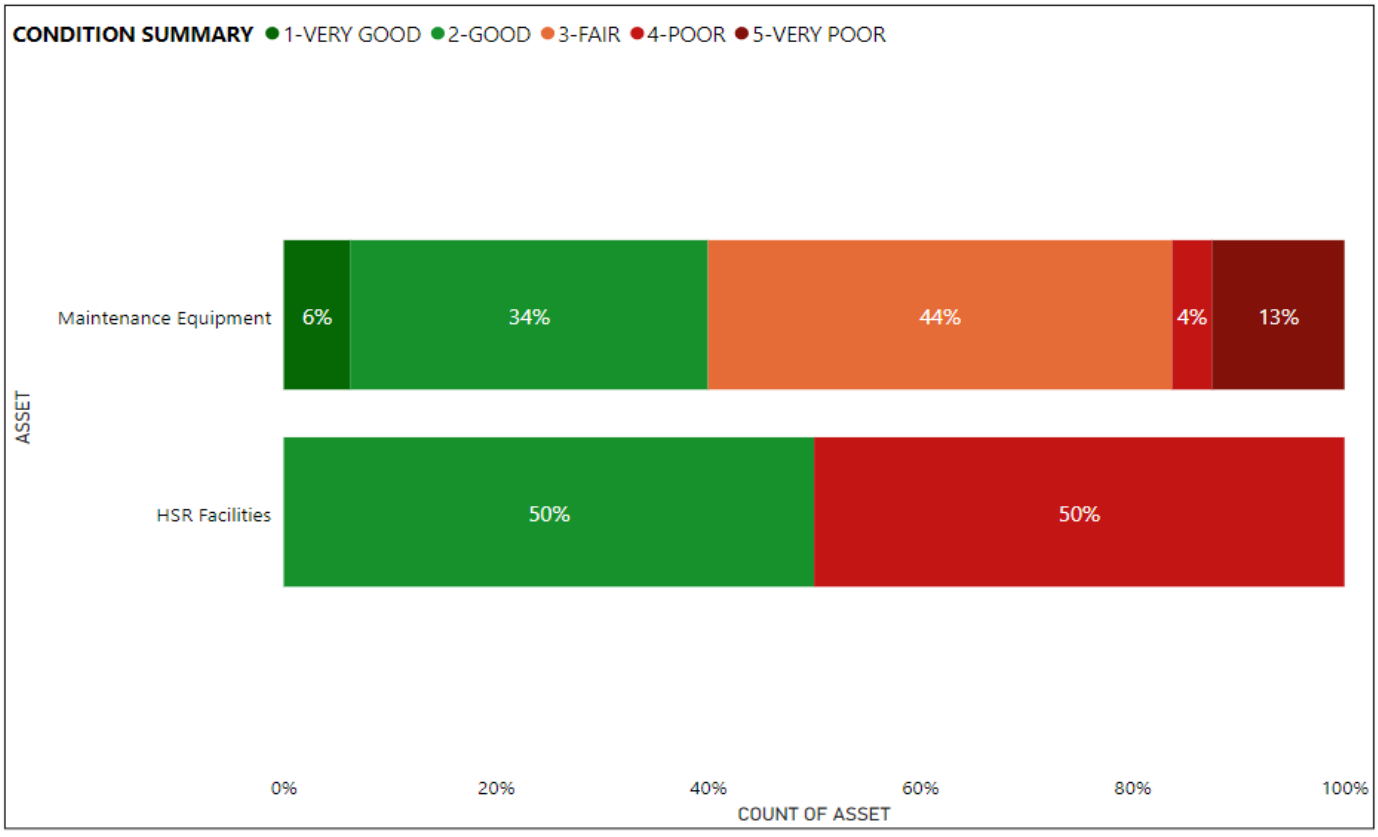
Table 5: Inspection and Condition Information

ASSET	INSPECTION FREQUENCY	LAST INSPECTION	CONDITION SCORE OUTPUT
HSR Facilities	Every 5 years	2019	Facility Condition Index (0% - 100%)
Maintenance Equipment	Various	Various	Certifications only

Per the BCA, half of HSR facilities are shown to be in **GOOD** condition with the other half showing in Poor condition. However, the BCA is a visual, surface level inspection which is typically a high confidence indicator of condition but does not involve detailed analysis such as cutting into walls or removing mechanical panels.

Currently, maintenance equipment assets do not have a formal method to determine condition and therefore age has been used to estimate the condition of these assets where age is known. This has been identified as a continuous improvement item in ***Table 29.***

Figure 3: HSR Facilities and Maintenance Equipment Asset Condition Distribution



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3.2.1.3 ASSET USAGE AND PERFORMANCE

As shown in ***Table 6***, the largest performance issue with HSR Facilities is a lack of space resulting in challenges with parking spaces for buses and staff, as well as impacting HSR's ability to have adequate space for maintaining buses. A direct result of the lack of space and large fleet complement is causing overuse of the hoists and equipment which impacts their expected useful life. Ultimately the new transit centre discussed in Acquisitions will help address this matter.

Table 6: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
FACILITY AND MAINTENANCE EQUIPMENT	**Mountain Transit Centre**	Lack of space	Lack of parking for buses and staff Lack of space for hoists to maintain buses
	Mountain Transit Centre	Exterior Windows	At the end of life resulting in greater heat loss
	Mountain Transit Centre	Deteriorating Floor finishes in Bus Bay and office areas	Concrete sealant is in poor condition in Bus Bay areas and tiles are chipped and cracked in office areas
	Maintenance Equipment	Overuse	Equipment is being used heavily and impacting the expected lifecycle

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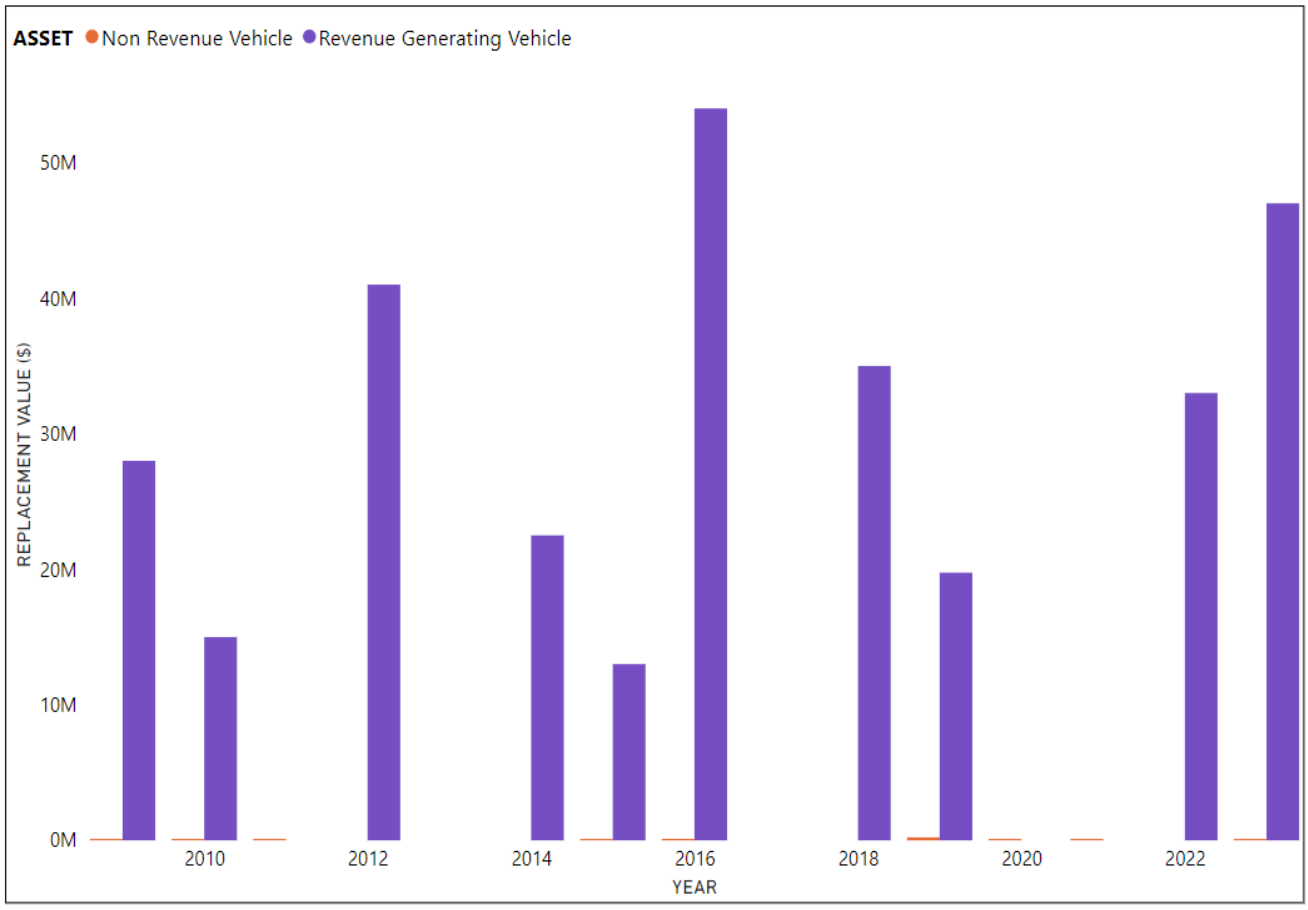
3.2.2 VEHICLES PROFILE

3.2.2.1 AGE PROFILE

Per ***Figure 4*** below, the age profile for HSR vehicles demonstrates the regular renewal of buses based on a 12-year estimated service life. Additionally, there is a reasonable distribution noted in the age profile indicating that HSR does an excellent job augmenting service levels and renewing assets.

Figure 4: Age Profile for HSR Vehicles



3.2.2.2 CONDITION METHODOLOGY & PROFILE

Since revenue-generating vehicles (buses) are a critical asset for HSR service, it is essential that these assets are kept in an acceptable state of repair to deliver reliable service. HSR inspects all buses as per the inspection frequency outlined in ***Table 7*** below. There is a reasonable distribution of asset age as they are currently replaced using an estimated service life of 12 years.

Table 7: Inspection and Condition Information

ASSET	INSPECTION TYPE	DESCRIPTION	FREQUENCY	CONDITION SCORE OUTPUT
REVENUE VEHICLES	**A**	Lube, oil, and filter change including a fluid level check. Check all major systems. Report any body damage. Road test vehicle.	7,500 km (6 weeks)	None
NON-REVENUE VEHICLES	**A**	Lube, oil, and filter change including a fluid level check. Check all major systems. Report any body damage. Road test vehicle.	5,000 km	None
REVENUE VEHICLES	**B**	Includes An inspection as well as rotating tires, recording brake measurements, and inspecting the overall vehicle against HSR standards.	Monthly	None
NON-REVENUE VEHICLES	**B**	Includes an inspection as well as rotating tires, recording brake measurement	15,000 - 20,000 km	None
REVENUE VEHICLES	**C**	Hinge Bolt Retorque & Check Main Bearing Hinge Inspection/Oil Change	140,000 km	None
NON-REVENUE VEHICLES	**C**	Includes An inspection as well as replacing fuel filter, and fluid change.	45,000 km	

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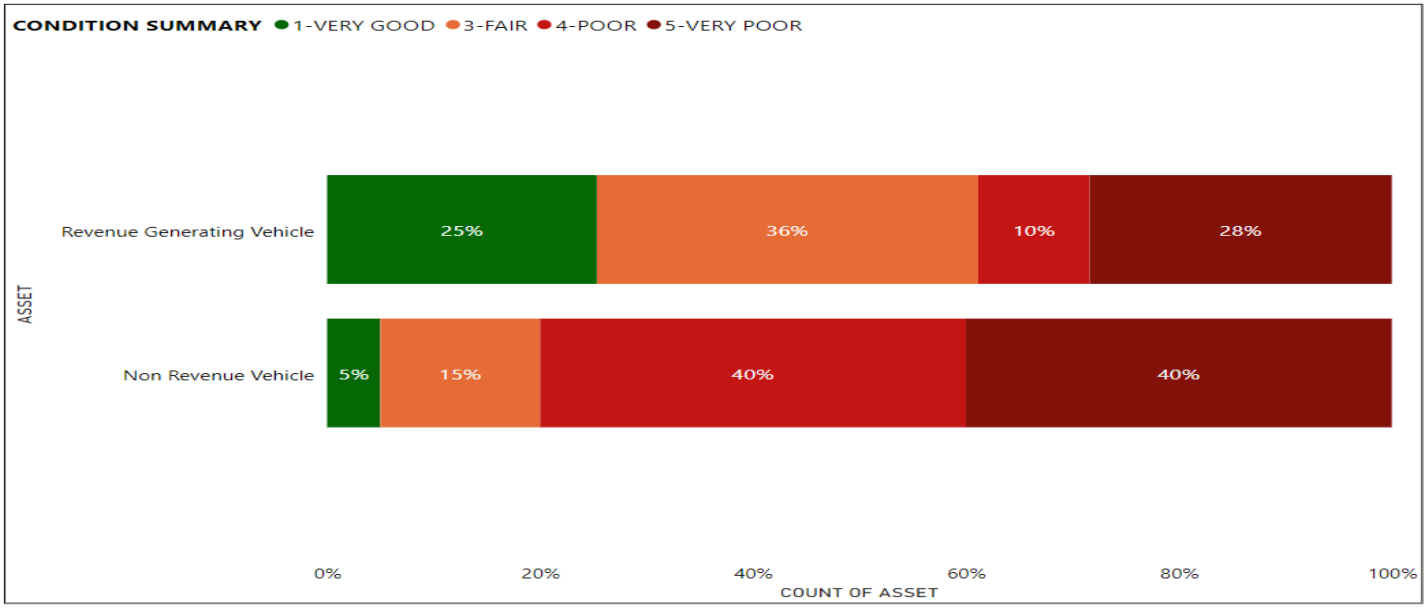
ASSET	INSPECTION TYPE	DESCRIPTION	FREQUENCY	CONDITION SCORE OUTPUT
REVENUE VEHICLES	**D**	Natural Gas P.R.D Inspection, Fire Suppression Inspection, Emission Test, MTO Inspection (147) 146 Done at six-month mark, Winter Prep/Inspection, Summer Prep/Inspection, Lube Major, C.N.G Fuel Tank Inspection, Farebox Rebuild Inspection I	every 12 months	None
NON-REVENUE VEHICLES	**D**	Includes An inspection as well as replacement of spark plugs and transaxle service or OEM recommendations.	75,000 km	
REVENUE VEHICLES	**E**	Diesel Tune-Up - Valve Sets	250,000 km	None
REVENUE VEHICLES	**F**	Natural Gas Tune Up - New Flyer and Nova	20,000 km	None
REVENUE VEHICLES	**G**	Natural Gas Tune Up - Vicinity - No Valve Adjustment	17,000 km	None
REVENUE VEHICLES	**H**	Natural Gas Tune Up - Vicinity - Valve Adjustment	51,000 km	None

Since there is no formal condition rating based on inspection, the condition was estimated based on the assumptions outlined in the condition conversion table in ***Table 4***. For revenue and non-revenue vehicles that were within the first 20% of their service life, they are considered to be in very good condition. If they are within their service life, they are considered to be in good condition. Any vehicles past their service life or mileage are considered to be in poor condition since they are considered deficient.

The condition profile for HSR non-revenue Vehicle assets is shown below in ***Figure 5***.

It is evident that the majority of HSR non-revenue vehicle assets are in Fair to Poor condition. Assets in Poor condition are generally lower criticality vehicles such as non-revenue generating vehicles but should be planned for replacement.

Figure 5: HSR Vehicles Condition Distribution



3.2.2.3 ASSET USAGE AND PERFORMANCE

As shown in ***Table 8***, the largest performance issues with HSR revenue-generating vehicles involve manufacturer adjustments to CNG vehicle engine estimated useful life resulting in impacts to engine life compared to a diesel vehicle. The impact on the lifecycle management of these vehicles is currently under further investigation.

Table 8: Known Service Performance Deficiencies

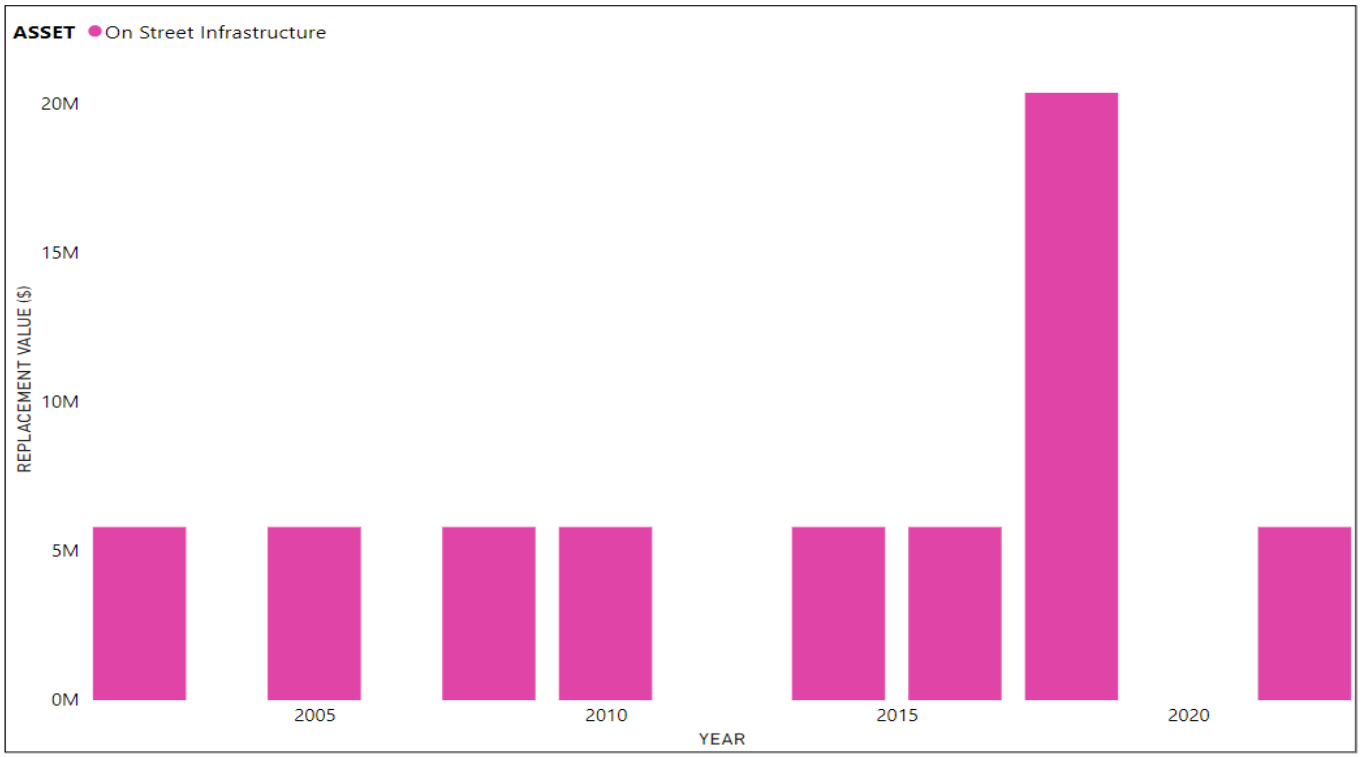
ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
REVENUE GENERATING VEHICLES	**Various**	Projections for service life for CNG engines are less than anticipated	Engine manufacturers have recognized that service life projections were overstated impacting engine life in comparison to a diesel engine.

3.2.3 ON-STREET INFRASTRUCTURE PROFILE

3.2.3.1 AGE PROFILE

The age profile of the **On-Street Infrastructure** assets is shown in ***Figure 6***. An analysis of the age profile is provided below.

Figure 6: On-Street Infrastructure Age Profile



As shown in ***Figure 6***, the network of on-street infrastructure has been regularly expanded. A significant renewal happened in 2018 due to a shelter replacement project that replaced almost the entire inventory of regular and canopy shelters (2018 through 2020). With the exception of 66 shelters along the LRT corridor which HSR replaced in 2021/2022.

3.2.3.2 CONDITION METHODOLOGY & PROFILE

Bus Stop and bus stop amenity assets are inspected as per the inspection frequency shown in ***Table 9***.

Currently, on-street infrastructure assets do not have a formal method to determine condition and therefore age has been used to estimate the condition of these assets where age is known. This has been identified as a continuous improvement item in ***Table 29.***

Table 9: Inspection and Condition Information

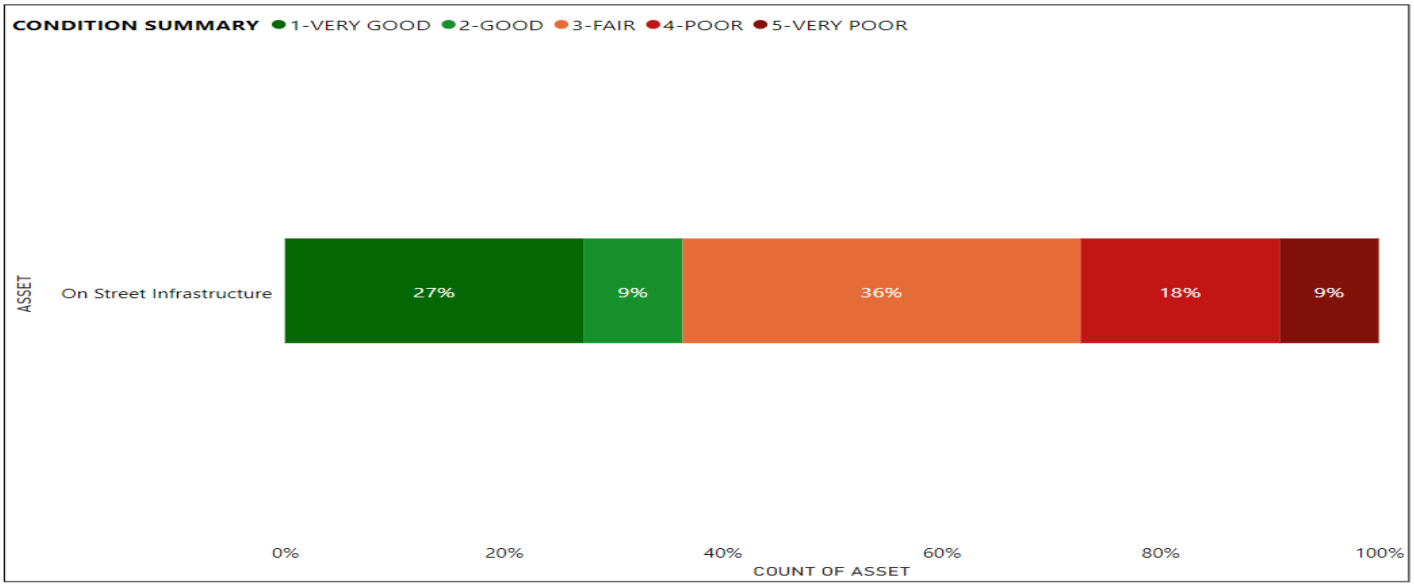
ASSET	INSPECTION TYPE	DESCRIPTION	FREQUENCY	CONDITION SCORE OUTPUT
Bus Stops and Amenities	**Inspection**	Visual assessment	Ad hoc	None

The condition profile for HSR On-street Infrastructure assets is shown below in ***Figure 7.***

It is evident that the majority of HSR On-street Infrastructure assets are in Very Good to Fair condition.

The original condition grades were converted to a standardized condition category for report consistency as per ***Table 4***.

Figure 7: On-Street Infrastructure Condition Distribution



3.2.3.3 ASSET USAGE AND PERFORMANCE

As shown in ***Table 10***, the largest performance issue with On-Street Infrastructure assets is vandalism including graffiti and damage to bus shelter enclosures.

Table 10: Known Service Performance Deficiencies

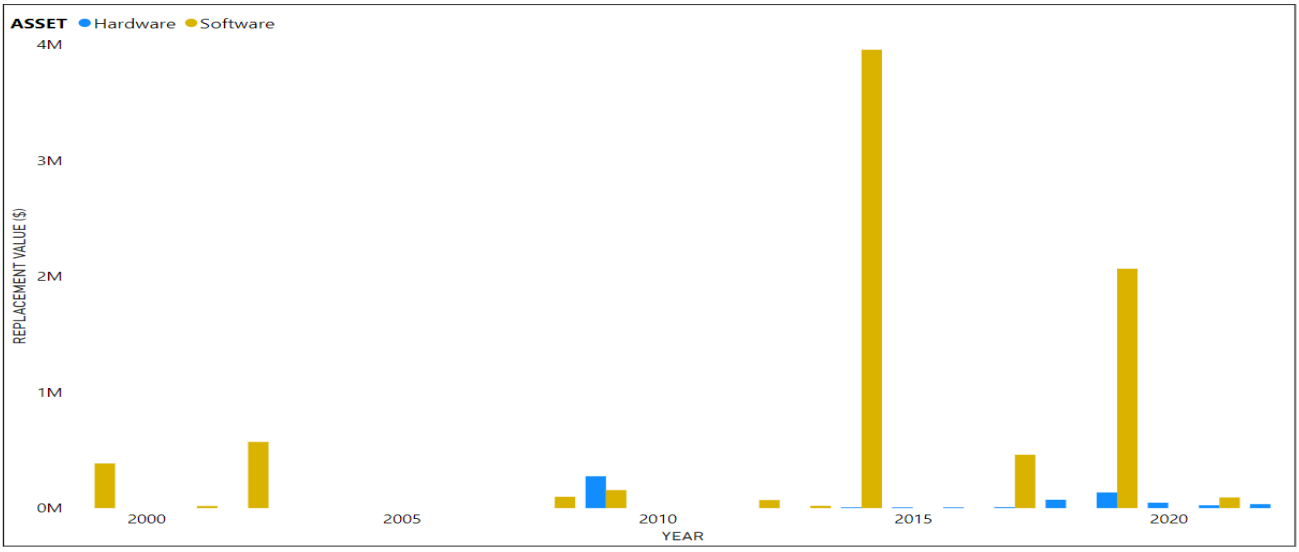
ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Bus Stops	**Various**	Vandalism	Graffiti and damage to bus shelter enclosures
Bus Stops	**Various**	Bus stop landing pads	Heaving due to trees, causing a potential tripping hazard
Bus Stop Amenities (shelter, bench, etc.)	**Various**	Vandalism	Graffiti and damage to bus stop amenities

3.2.4 TECHNOLOGY PROFILE

3.2.4.1 AGE PROFILE

The age profile of the **Technology** assets is shown in ***Figure 8***. The spike in 2014 is associated with the introduction of providing Real Time Information through our Computer Automated Design Automated Vehicle Locating (CAD AVL) system. This system allows for real-time tracking of bus locations to enhance operational performance. The second spike in 2019 relates to the acquisition of automated passenger count technology.

Figure 8: Technology Age Profile



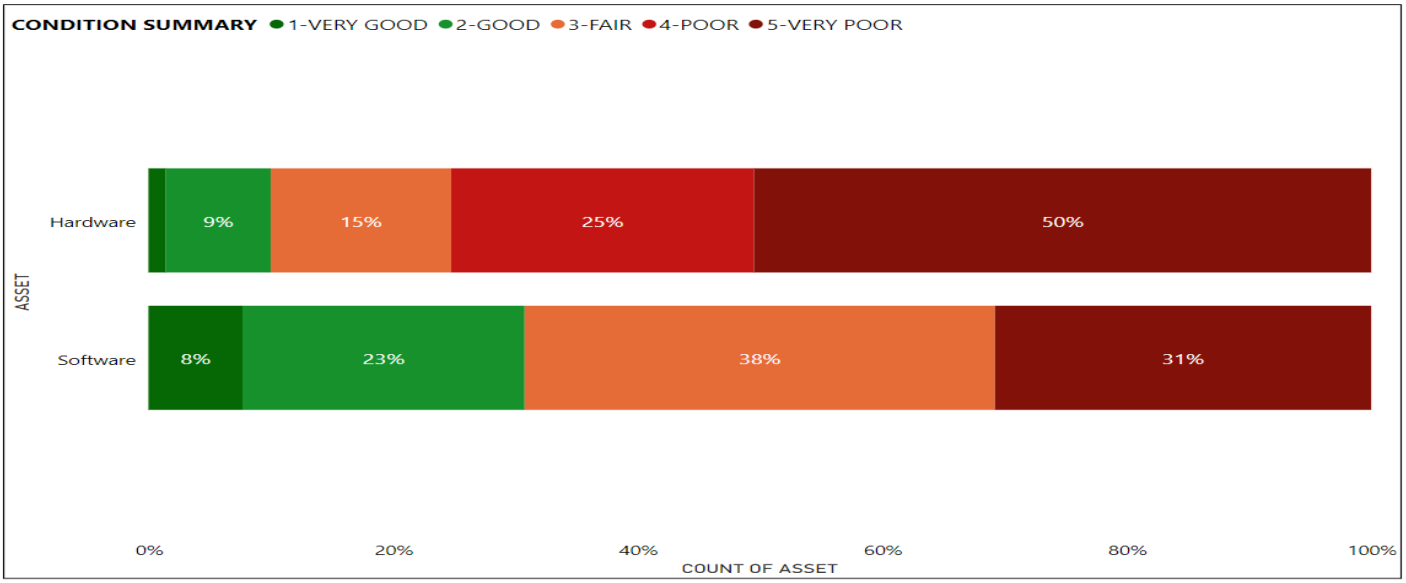
3.2.4.2 CONDITION METHODOLOGY & PROFILE

Currently, HSR does not determine the condition of Technology assets, therefore IT Equipment condition has been estimated based on age for this AM Plan. It is important to note that since the condition is based on age, there is low confidence in the condition for this asset group.

As shown below in ***Figure 9*** most of HSR Technology Equipment for Hardware is in Poor or Very Poor condition. This is because Hardware has short ESLs of four years, and the condition profile is based on age.

Most of HSR Technology Equipment for Software is in Fair or Very Poor condition. This is because Software has slightly longer ESLs and the condition profile is based on age.

Figure 9: Technology Condition Distribution



3.2.4.3 ASSET USAGE AND PERFORMANCE

As shown below in ***Table 11***, the largest performance issues with HSR Technology assets are capacity related to CAD AVL and its ability to support the volume of buses. HSR is planning to replace this technology in the next two years to ensure it can meet capacity demands in the future.

Table 11: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Hardware and Software	**Various**	Capacity	CAD AVL does not have the capacity to support the current volume of buses

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4. MUNICIPALLY DEFINED CURRENT 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 service outcomes the community desires, and the way that the City provides those services.

O. Reg 588/17 does not define levels of service for HSR 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 6.5*** of the AM Plan Overview.

Current Council-approved service standards for conventional transit are shown in ***Table 12*** below. It is important to note that the ATS service standards coverage area is the entire City, both urban and rural, and service hours are the same as conventional.

Table 12: HSR Service Standards

HSR Service Standards			
Coverage	**Weekday**	**Saturday**	**Sunday**
System Wide Minimum	90% of residents / workplaces within Urban Transit Area to be within 400 metres of Weekday Peak service.		
Span (Start of trip)	**Weekday**	**Saturday**	**Sunday**
Route Maximum	5:00 AM – 2:00 AM	5:00 AM – 2:00 AM	6:00 AM – 12:00 AM
Frequency (Time between buses)	**Weekday** Peak / Non-Peak/ Evening	**Saturday** AM / Day / Evening	**Sunday** AM / Day / Evening
Route Minimum	30 / 30 / 60	30 / 30 / 60	30 / 30 / 60
Productivity (Boardings per Service Hour)	**Weekday** Peak / Non-Peak/ Evening	**Saturday** AM / Day / Evening	**Sunday** AM / Day / Evening
Route Minimum	25 / 15 / 15	15 / 15 / 15	15 / 15 / 15
Loading (Expressed as Percentage of Seated Capacity)	**Weekday** Peak / Non-Peak/ Evening	**Saturday** AM / Day / Evening	**Sunday** AM / Day / Evening
Route Maximum	125 / 100 / 100	100 / 100 / 100	100 / 100 / 100

4.1 SURVEY METHODOLOGY

To develop customer values and customer levels of service, Customer Satisfaction Survey results were analyzed from October 2021 to September 2022 from the HSRNow app. The survey received 313 submissions and contained ten questions related to HSR's service delivery. While these surveys were used to establish customer values and customer performance measures, it is important to note that the number of survey respondents only represents a small portion of the population. However, based on the 2022 ridership of 15.2 million, the sample size target was 385, and 313 responses were achieved. Therefore, the results are reflective at a 95% confidence level and 6% margin of error.

The future intent is to increase the response volume to this survey to be able to measure the trends in customer satisfaction and ensure that HSR is providing the agreed level of service. It is the intent of HSR to continuously improve the survey and marketing strategy to increase the response volume. This has been noted in ***Table 29*** in the continuous improvement section. As well, continuous improvement items have been identified to establish the voice of the customer for ATS clients to assist with Levels of Service and to conduct TransCab Customer Satisfaction Surveys to identify customer demands and levels of service.

4.2 CUSTOMER VALUES

Customer values, as shown in ***Table 13***, are what the customer can expect from HSR and from their tax dollars and fare payments in "customer speak" which outlines what is important to the customer, whether they see value in the service, and the expected trend based on the ten-year budget. These values are used to develop the level of service statements.

Customer Values indicate:

- What aspects of the service are 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.

Table 13: Customer Values

SERVICE OBJECTIVE:			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
Trip routes and information are easy to access	HSR customer survey	Many survey respondents felt it was easy to access transit schedules; information	Maintain
Transit is reliable and timely	HSR customer survey	Some survey respondents felt that their transit was reliable and timely	Maintain
Excellent customer service	HSR customer survey	Most survey respondents felt that bus drivers were professional	Maintain
Comfortable transit ride	HSR Customer survey	Most survey respondents felt that the bus was not overcrowded	Maintain
The ride should be clean and appealing	HSR Customer Survey	Some survey respondents felt the inside of the bus was clean on their ride	Improve

4.2.1 CUSTOMER LEVELS OF SERVICE

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

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

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 ***Table 14*** 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 budget allocation.

Table 14: Customer Levels of Service

TYPE OF MEASURE	LEVEL OF SERVICE STATEMENT	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Condition	Ensure that HSR assets are kept in safe and acceptable repair and that issues are resolved in a timely manner	HSR customer satisfaction survey	54% of survey respondents felt the bus was clean during their trip	Meets some Needs	Improve
			Confidence level	Low	
Function	Ensure that HSR assets can provide reliable, timely and safe transportation for customers	HSR customer satisfaction survey	64 % of survey respondents felt safe during the trip (including bus stop, while riding the bus and while exiting the bus	Meets Needs	Maintain
			61% of survey respondents felt their bus driver was professional during their trip	Meets Needs	Maintain

TYPE OF MEASURE	LEVEL OF SERVICE STATEMENT	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
			52% of survey respondents felt their bus was on time/reliable	Meets some Needs	Improve
		Confidence level		Low	
Capacity	Ensure that there are sufficient assets to accommodate travel without overcrowding	HSR customer satisfaction survey	61% of survey respondents felt the bus was not overcrowded during their trip	Satisfied	Maintain
		Confidence level		Low	

Future iterations of the plan will utilize the Hamilton-specific methodology for gathering customer feedback on the Condition, Function and Capacity elements of HSR services. At the time of writing this plan, Hamilton had altered its approach to delivering its customer satisfaction survey and will be updated in future iterations with this plan as well as with the public engagement information currently being gathered for the HSR (Re)Envision project to avoid confusion of engaging twice with the public for the same service at the same time.

4.2.2 TECHNICAL LEVELS OF SERVICE

Technical levels of service are operational or technical measures of performance, which measure how HSR plans to achieve the desired customer outcomes and demonstrate effective performance, compliance, and management. The metrics should demonstrate how HSR 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. HSR will measure specific lifecycle activities to demonstrate how HSR is performing in 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 service outcomes.[1]

Table 15 shows the activities expected to be provided under the current ten-year planned budget allocation and the forecast activity requirements being recommended in this AM Plan.

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

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

Table 15: Current Technical Levels of Service

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE *	CURRENT TARGET PERFORMANCE **	PROPOSED 10-YEAR PERFORMANCE ***
Acquisition	Meet and strive to exceed accessibility standards	% of buses that are accessible as outlined in AODA standards	100%	100%	100%
	Improve the quality of shelters for comfort, cleanliness, safety, and accessibility	% of Bus stops that have a shelter installed	32%	Under Development	TBD
	Meet and strive to exceed accessibility standards	% of Bus stops that are accessible by AODA standards	64%	100%	TBD
	Improve the quality of bus stops for comfort, cleanliness, safety, and accessibility	% of bus stops that are lit at night	61%	Under development	TBD
	Improve the quality of bus stops for comfort, cleanliness, safety, and accessibility	% of bus stops that have a garbage receptacle	33%	Under Development	TBD
		Budget	**Maintain**	**To be developed**	**To be developed**

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE *	CURRENT TARGET PERFORMANCE **	PROPOSED 10-YEAR PERFORMANCE ***
Operation	Provide safe and reliable assets	% of bus stops inspected annually for the state of good repair	100%	100%	100%
		% of shelters cleaned bi-weekly	100%	100%	*100%*
		# of commendations per 1000 specialized trips	0.8	1	1
		# of specialized trip complaints per 1000 trips	8.3	1	<1
		% of total ATS trips delivered vs requested	65%	100%	100%
		% of buses receiving an A rating from the annual- MTO inspection	100%	100%	100%
		% of specialized trips delivered by the Contractor arriving within 15 minutes of service standard	97.2%	95%	> 95%
		% of bus interiors inspected daily for state of good repair	100%	100%	100%
		% of Contractor specialized transit trips requested that were denied	3.6%	5<5%	<1%

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE *	CURRENT TARGET PERFORMANCE **	PROPOSED 10-YEAR PERFORMANCE ***
		% of transit service considered 'on time' (within 2 mins early or 5 mins late of scheduled times)	88%	95%	>95%
		% of buses' interiors deep cleaned twice monthly	100%	100%	100%
		Budget	**Maintain**	**To be developed**	**To be developed**
Maintenance *	Ensure the fleet is maintained in a state of good repair and meets MTO requirements	The target mean distance between mechanical failures is met or exceeded	7500 KM	6500 Km	TBD
		Budget	**Maintain**	**To be developed**	**To be developed**

Note: * Current activities related to Planned Budget.
**** Current internal target**
***** Expected performance related to forecast lifecycle costs.**

4.2.3 PROPOSED LEVELS OF SERVICE DISCUSSION

It is evident per ***Table 15*** that HSR is often meeting technical standards with some exceptions. It has been assumed for this first iteration of the HSR AM Plan that the current levels of service will be the proposed levels of service moving forward past 2025 in accordance with O. Reg 588/17. Proposed levels of service will be further refined through the (Re)envision initiative.

CONDITION

Based on ***Table 14*** above, survey respondents were somewhat satisfied with the condition of HSR assets. Customers value the cleanliness of the assets whether that be a bus stop or the inside of the bus as they take their trip. 54% of respondents felt that the buses were clean during their trip which indicates they are somewhat satisfied. As a continuous improvement item in ***Table 29***, HSR will set a goal to improve customer satisfaction with the cleanliness of buses and will determine the resources required to achieve the goal from both a staffing and financial perspective.

FUNCTION

Based on ***Table 14***, survey respondents were satisfied with how HSR assets functioned. 64% of respondents felt that they were safe during their trip and 61% felt that their driver was professional during their trip as well. While limited by the survey's number of respondents with such a small sample size it does indicate that the majority of customers are satisfied with how the transit service functions.

CAPACITY

Based on ***Table 14***, survey respondents were satisfied with HSR asset capacity. Based on the customer survey, 61% of respondents felt that the bus on their trip was not overcrowded. At the current ridership that bodes well for capacity however as Hamilton aims to increase its ridership, it is essential that HSR set a target for this capacity measurement. A continuous improvement item has been identified in ***Table 29*** to understand what the ideal target is for capacity on the bus as well as another item to expand HSR's measurement of capacity with other assets and services.

Another issue of capacity is noted with the technical levels of service as only 65 % of the specialized transit trips that were requested of the ATS contractor (which includes no-shows and requested but cancelled trips) were delivered, which indicates a capacity concern. This capacity concern relates more to the impact on vehicle productivity when there are late cancellations and/or no-shows which results in unused spots that could have been used by other service users. HSR would ideally target to fill all these requested trips and with 35% not being delivered it will require a continuous improvement item to explore options to improve this target with a fulsome understanding of the resources that will be required.

HSR should explore what additional questions may be beneficial to include in the customer engagement survey to determine satisfaction with additional HSR assets such as bus stops and transit facilities. Exploring customer expectations will allow HSR to develop its modelling and estimate future improvement costs.

A continuous improvement item has been created as shown in ***Table 29*** to add an additional level of service metrics for acquisition, renewal and disposals as well as ensuring that the current performance measurements are in line with customer values. As Hamilton's asset management maturity increases, and with the implementation of the Enterprise Asset Management (EAM) system, HSR will also have more capacity to measure additional metrics.

5. FUTURE DEMAND

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

The needs and desires of the residents change over time and HSR will continually monitor the demands for its services to ensure that it can respond proactively to these changes. As population increases there will be a greater need for the service, and as environmental concerns increase there will be an increased desire to mitigate greenhouse gases.

5.1 DEMAND DRIVERS

For HSR the key drivers are population change (***per page 45)*** in the AM Plan Overview, it is evident that Hamilton's population will continue to grow to 2051), council-driven targets (e.g., increase modal split to 12%) and climate change. With the City's future implementation of Light Rail Transit (LRT), further investigation of the impact on HSR will be required. [2]Additionally, with 27% of the Canadian population identifying as having a disability, plans for ATS to pilot the business cases for demand management outlined in response to AUD20009 will be key. A future continuous improvement item is to identify additional demand drivers and develop an effective and sustainable approach to meeting the demands.

5.2 DEMAND FORECASTS

The high-level 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.*** At this time, specific projections have not been calculated and will be updated in the 2025 AM Plan per the timelines stated in the AMP Overview. In addition, growth projections have been shown in the AMP Overview.

5.3 DEMAND IMPACT AND MANAGEMENT PLAN

The impact of demand drivers that may affect future service delivery and use of assets is shown in ***Table 16.***

Demand for new services will be managed through a combination of managing existing assets, upgrading 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.

[2] Statistics Canada, *Canadian Survey on Disability, 2017 to 2022*(December 1, 2023), https://www150.statcan.gc.ca/n1/daily-quotidien/231201/dq231201b-eng.htm

Opportunities identified to date for demand management are shown in ***Table 16***. Climate change adaptation is included in ***Table 29***. Further opportunities will be developed in future revisions of this AM Plan, as identified in ***Table 29*** in the continuous improvement section.

Table 16: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION 10-YEAR HORIZON	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Population	543,667	660,000 (2051 Growth is projected to be 820,000)	Likely to see a significant ridership increase which **will require:** 42 additional buses, 126 FTE's 159,000 service hours $19.1 Million operating costs	Obtain approval for additional fleet 18 months in advance to staff appropriately. Explore options for financial commitments which can include council contributions or possible use of debt
Council Target Increase Modal Split to 12%	7-9% Modal Split	12%	**Will require**; 104 additional buses, 312 FTEs 530,000 service hours $63.6 Million operating costs Additional facility in 2031 with undetermined costs as of the writing of the report.	Explore options for financial commitments which can include council contributions or possible use of debt
Climate Change	% of Fleet that is CNG 60%	100% by 2026	Reduction of GHG emissions and reduction of fuel costs	All bus renewals or acquisitions will be alternative fuel sources

5.4 ASSET PROGRAMS TO MEET DEMAND

The new assets required to meet HSR's demand will either be acquired, donated or constructed.

At this time there will be several new assets required over the ten-year planning horizon. The current demand forecasts would require Hamilton to acquire approximately 146 additional buses as well as another HSR facility and an overflow facility by 2031. Acquiring new assets would commit HSR to significant ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing 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[3].

The City has released 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 also identifies the likelihood of those risks occurring, and the consequences should the event occur which calculates a risk rating. Risk options are then evaluated, and a risk treatment plan is created which will be initiated with the release of this plan and has been identified as a continuous improvement item in ***Table 29***.

6.1 CRITICAL ASSETS

Critical assets are defined as those that 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 17***. Failure modes may include physical failure, collapse, or essential service interruption.

Table 17: Critical Assets

CRITICAL ASSET(S)	FAILURE MODE	IMPACT
Revenue Generating Vehicles	Mechanical Failures/Accidents	While spares exist, when a breakdown or accident occurs there is an immediate impact on the service
HSR Facilities	Natural Disaster/Fire	Significant harm to the service if there is any major impact on the two major HSR facilities. Maintenance and operations would be impacted and widely felt.

[3] ISO 31000:2009, p 2

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 18. 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 29*** in the Continuous Improvement Section of the plan.

HSR has a variety of risks, and it would be impractical to list them all through the plan. As such, we are only reporting some of the high and medium risks in this plan. As costing becomes available through continuous improvement exercises this will improve the risk reporting for HSR Assets.

Table 18: Risks and Treatment Plans
Note * The Residual Risk Is the Risk Remaining After the Selected Risk Treatment Plan Is Implemented.

SERVICE OR ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING	RISK TREATMENT PLAN	RESIDUAL RISK *	TREATMENT COSTS
Revenue-generating Vehicles	Accident or Mechanical Breakdown	High	Driver license vetting, driver training and supervision, vehicle preventative maintenance, regular inspections at least monthly, daily pre-trip checks, bus type geared to conditions (e.g., no articulated-on Mountain Accesses in slippery conditions)	Medium	Lost Revenue

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SERVICE OR ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING	RISK TREATMENT PLAN	RESIDUAL RISK *	TREATMENT COSTS
Non-Revenue Vehicles	Accident	High	Driver training, daily maintenance check and cleaning, public reporting via complaints process during business hours, public reporting via CCC outside of business hours, on-board cameras, operator reporting	Medium	Operational Budget
End of the Line Washrooms	Damaged	Medium	regular patrol of washrooms, staff reporting, preventative maintenance and regular cleaning,	Low	Operational Budget
Presto Device	Damaged	Medium	Operator training and supervision, daily pre-trip checks, preventive maintenance, Operator reporting	Low	Operational Budget
ATS Contractor and Subcontractor Vehicles	Accident	High	Managed by the contractor: Driver license vetting, driver training and supervision, vehicle preventative maintenance, regular inspections at least monthly, daily pre-trip checks, cancel service if weather is too bad. Managed by ATS: contract oversight, all responses to Auditor General recommendations in AUD22007 including but not limited to random vehicle inspections and vehicle records inspections.	Medium	Operational Budget
Bus Shelter	Vandalism / Hate Speech	High	Maintenance of shelters, a regular patrol of stops, public reporting via complaints process during business hours, public reporting via CCC outside of business hours, operator reporting	Medium	Operational Cost

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 HSR 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 HSR to withstand any service disruptions, act appropriately and effectively in a crisis, absorb shocks and disturbances as well as adapt 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 of achieving the optimum benefits from the available resources. HSR service and risk tradeoffs will be determined in future plans as shown below in ***Table 19.***

Table 19: Service and Risk Trade-offs

WHAT WE CANNOT 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?)
To be determined in future plans		

7. CLIMATE CHANGE MITIGATION & ADAPTATION

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 29.***

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.

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.

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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 AMP, 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 29.***

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.

Table 20: Climate Change Mitigation Transformation

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE/ASSET	DEMAND MANAGEMENT PLAN
Transforming our buildings	By 2050, all new municipal buildings achieve net-zero emissions.	Any new builds must be designed to Net Zero standards which is an increased cost to HSR to construct but provides lower operating costs including energy savings.	Gather estimates from other Net Zero facilities to quantify the cost.
Transforming our buildings	By 2050, all municipal buildings are retrofitted to achieve 50% energy efficiency relative to 2016.	Any renewals of HVAC material will be with energy-efficient equipment. Lighting renewals will be to LED lighting.	Use Building Condition Assessments to plan for renewals and budget accordingly. Investigate grants for energy-efficient conversions.
Changing how we move	Decarbonize the transit fleet by 2035. 100% of new municipal small and light-duty vehicles are electric by 2040. 100% of new municipal heavy-duty vehicles switch to clean hydrogen by 2040.	HSR has focused on ensuring that its fleet of vehicles is helping Hamilton meet its climate goals. It should complete its fleet transformation from diesel vehicles to Natural Gas vehicles within the next five years.	Continue to prepare for conversion to electric vehicles for light-duty vehicles by investigating grant funding and installing charging stations for non-revenue vehicles. Complete the planned conversion to NG Vehicles. Monitor feasibility and business planning to undertake the transition to clean hydrogen by 2040.

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

MITIGATION RISK ANALYSIS

Additionally, 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 AMP for not completing climate mitigation projects (ICLEI Canada, 2021).

CURRENT MITIGATION PROJECTS

Mitigation projects HSR is currently pursuing are outlined below in ***Table 21.*** These projects may already be included in the budget and may be quantified in the lifecycle models.

Table 21: Asset Climate Mitigation Projects

PROJECT	CLIMATE CHANGE MITIGATION TRANSFORMATION	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT
CNG Vehicles	Changing how we move	100% New revenue-generating vehicles	Reduce emissions associated with vehicles.
Maintenance and Storage Facility	Transforming our buildings	Proposed Maintenance and Storage Facility (MSF) specifications call for Net Zero design.	Reduce emissions associated with facility operation.
Social Marketing Campaigns	Changing how we move	Marketing campaigns designed to encourage new behaviours to build ridership and convert car trips into bus trips	Reduced emissions associated with vehicles.

CLIMATE MITIGATION DISCUSSION

At this time, HSR has already made progress toward some of the modelled target transformations as discussed below.

TRANSFORMING OUR BUILDINGS

HSR is beginning to move toward the *Transforming our Buildings* targets. The Maintenance and Storage Facility (MSF) that is scheduled for construction in 2025 was designed using Leadership in Energy and Environmental Design (LEED) guidelines. LEED provides a framework for the construction of green buildings by addressing carbon, energy, water, waste, transportation, materials, health and indoor environmental quality (USGBC, 2023).

CHANGE HOW WE MOVE

HSR conducts regular social marketing campaigns designed to encourage new behaviours by building ridership and converting single-rider car trips into bus trips resulting in a reduction in emissions associated with single occupancy vehicles.

7.2 CLIMATE CHANGE ADAPTATION

Climate Adaptation refers to the process of adjusting to actual or expected climate and its effects (e.g. building stormwater pipes under roads that will handle forecasted increased stormwater capacity and reduce regular road flooding).

The impacts of climate change may have a significant impact on the assets we manage and the services we 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.[4]

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.

ADAPTATION DEMAND ANALYSIS

The impacted areas were incorporated into the climate change adaptation analysis for this service area by:

- Identifying the asset-specific adaptation impact statements that affected the service areas;
- Discussing the potential impacts on the asset/service using the projected change in climate using the RCP4.5 Scenario; and,
- Proposing a preliminary demand management plan to adapt to these impacts.

It is important to note that due to the high level of uncertainty with the demand management plans, the cost of the demand impacts below has not been included in the lifecycle and financial models at this time. The demand management plans discussed in this section should be explored by asset owners in more detail following the AM Pan, and new projects should consider these adaptation impacts during the planning and design processes. Once the demand management plans are more finalized, the information will be incorporated into future iterations of the AMP. This has been identified as a continuous improvement item in ***Table 29.***

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 adaptation projects.

Similarly, to the exercise above and using the risk process, 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,

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

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

- If the risk was identified as high, the asset owner produced a preliminary risk adaptation plan shown below in ***Table 22.***

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.

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

Table 22: Managing the Demand of Climate Change on Assets and Services

ADAPTATION IMPACT STATEMENT	BASELINE** (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Dryer, hotter and longer summers may affect the health and safety of local vulnerable populations.	71.6 days average length of the hot season	102 days average length of the hot season	Potential decrease in ridership due to more favourable weather for other active modes of transportation.	Monitor trends and continue to promote ridership
Changes in precipitation resulting in erosion of natural systems (i.e., water banks, escarpment erosion) leading to washouts of bridges and roadways.	25.8 heavy precipitation days (10 mm)	27.6 heavy precipitation days (10 mm)	Flooding on HSR routes could impact service delivery	Monitor trends and prepare alternate route maps in areas prone to flooding

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

ADAPTATION IMPACT STATEMENT	BASELINE** (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns.	187mm average total winter precipitation	204mm average total winter precipitation	Potential of loss of essential services (i.e., communications) due to power outage.	Monitor trends and investigate alternate power sources for critical communications equipment

*RCP4.5 Scenario: Moderate projected GHG concentrations, resulting from substantial climate change mitigation measures. It represents an increase of 4.5 W/m2 in radiative forcing to the climate system. RCP 4.5 is associated with 580-720ppm of CO2 and would more than likely lead to 3°C of warming by the end of the 21st century.
**Baseline and Projected numbers based on the 2021 Climate Science Report.

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.

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 as shown in ***Table 23***, 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.

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Table 23: Adapting to Climate Change

ADAPTATION IMPACT STATEMENT	SERVICE OR ASSET AT RISK DUE TO IMPACT	WHAT CAN HAPPEN	RISK RATING	RISK ADAPTATION PLAN
Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns.	HSR Facilities	Potential loss of essential services (i.e., communications) due to power outage.	High	Investigate redundancy locations for critical communications equipment. Ensure proper maintenance of the backup power system.
Increased intensity and frequency of ice storms leading to increased hazardous roads, pathways, and sidewalk conditions.	Vehicles	Increase in motor vehicle collisions, inability for staff to get to work	High	Plan to ensure vehicles are maintained and in working condition and staff are available. Ensure that spare ratios are appropriately maintained and reviewed frequently Ensure snow-clearing contracts are in place to clear parking lots, pathways, and sidewalks. Plan for work-from-home options when applicable.

CURRENT ADAPTATION PROJECTS

Currently, HSR does not have any current or past climate change adaptation-specific projects identified. The impact of climate change on assets and how the City will adapt is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

CLIMATE ADAPTATION DISCUSSION

Currently, HSR has focused their climate change efforts on mitigation efforts and not yet on adaptation methods. This is because climate effects are more difficult to assess on HSR services and assets and need to be investigated further which has been identified as a continuous improvement item in ***Table 29***.

INCREASED TEMPERATURE

There are many projections related to increased temperature which include heat waves, rising temperatures, increase in average temperatures, and longer summers. One demand result of hot weather is an increase in cooling costs for low-income households. As stated in ***Table 23***, one of the Adaptation Impact Statements shows that hot weather affects health and safety for households without access to reliable air-conditioning and the homeless. During these events, this could lead to an increase in the need for public transit as a means of accessing air conditioning. HSR should investigate this correlation to ensure appropriate staff and assets are available as the climate continues to shift.

INCREASE IN ICE STORMS

An increase in ice storms can lead to increased motor vehicle collisions and power outages throughout the City which can lead to impacts on delivery of HSR services and increased ridership. Ice storms could also increase motor vehicle collisions for HSR vehicle assets and the availability of staff. HSR should investigate this correlation to ensure that appropriate staff and assets are available as climate change continues to affect the service.

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 budgets. 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. A continuous improvement item included in ***Table 29*** is to complete the lifecycle analysis of vehicles and facilities to ensure data quality improves. In addition, a continuous improvement item has been added to ***Table 29*** to complete a whole-life cost analysis of ATS costing if door-to-door shared ride trips were to be delivered as an in-house service rather than by a Contractor. 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. A continuous improvement item included in ***Table 29*** is to modify the budget sheets to incorporate lifecycle stages so that the results can be more accurate in the next iteration of the plan.

At the time of writing, HSR creates a Capital forecast for ten years into the future, but the forecast only currently includes costs to 2026, with higher confidence values in the first four years. The remainder of the forecast was assumed based on predicted demands and averages. A continuous improvement item identified in **Table 29** is to continue to complete a ten-year Capital forecast. The Operating budget is created annually, but there is an additional estimated three-year projection which was used to estimate the operational budget increase for the first three years for HSR, after which, the budget was assumed to be flatlined.

8.1 ACQUISTION 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. In HSR, assets are generally purchased or constructed.

CURRENT PROJECT DRIVERS – 10-YEAR PLANNING HORIZON

The City prioritizes capital projects based on various drivers to help determine ranking for project priorities and investment decisions as shown in ***Table 24***. As part of future AM Plans, the City will continue to develop its understanding of how projects are prioritized and ensure that multiple factors are being considered to drive investment decisions in the next iteration of the AM Plan. These drivers will include legal compliance, risk mitigation, O&M impacts, growth impacts, health and safety, reputation, and others. These drivers should be reviewed during each iteration of the AM Plan to ensure they are appropriate and effective in informing decision-making.

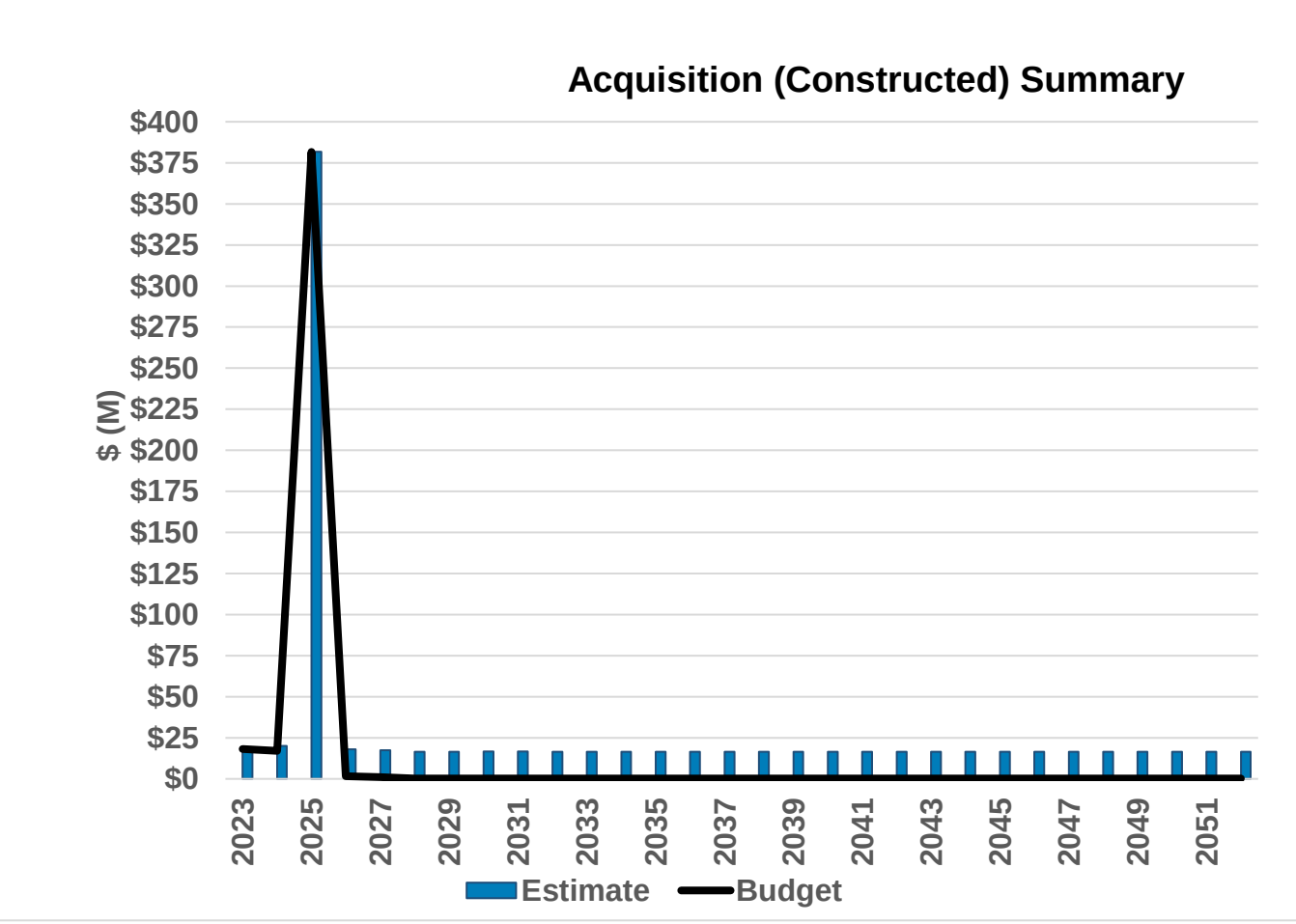
Table 24: Priority Ranking Criteria

CRITERIA	WEIGHTING
Age	***80%***
Condition	***20%***
Total	***100%***

CONSTRUCTED OR PURCHASED ACQUISITIONS

For HSR, assets are typically acquired through the purchase or construction of new assets which are mostly related to population growth, Council targets or Climate Change as discussed in the Demand section. ***Figure 10*** below shows the estimated acquisitions for HSR over the 30-year planning period.

Figure 10: Acquisition (Constructed) Summary
All Figure Values Are Shown In 2023 Dollars.



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Over the next 30-year planning period the City will acquire approximately **$868.5 Million** of constructed HSR assets which can either be new assets which did not exist before or expansion of assets when they are to be replaced. Major acquisition expenditures over the next ten years include:

- **$365.5 Million** for New Maintenance and Storage Facility;
- **$479.7 Million** for the HSR bus expansion program (estimating 15 additional buses per year from 2026 onward);
- **$4.5 Million** for A-line bus corridor;
- **$3.0 Million** for the new LimeRidge Terminal;
- **$1.2 Million** for Mountain Transit Centre parking expansion for buses;
- **$5.0 Million** for Integrated Transit Accessible vehicles; and,
- **$2.1 Million** for Bus Shelter Expansions.

The majority of the constructed assets costs peak between 2023 and 2027. This may change in the future once the HSR (re) Envision project, and its corresponding (re)Designed HSR network form the basis of the forthcoming Transit Growth Plan. When completed, future iterations of this plan will be updated. As AM knowledge, practices and abilities mature within the City, then in all likelihood there will be significant projects with equally significant costs that will appear within the later years of the 30-year planning horizon.

Hamilton does not have a sufficient budget for its planned acquisitions at this time. It will become critical to understand that through the construction or procurement of new assets, the City will be committing to funding the ongoing operations, maintenance and renewal costs which are very significant. Hamilton will need to address how to best fund these ongoing costs as well as the costs of constructing the assets while seeking the highest level of service possible.

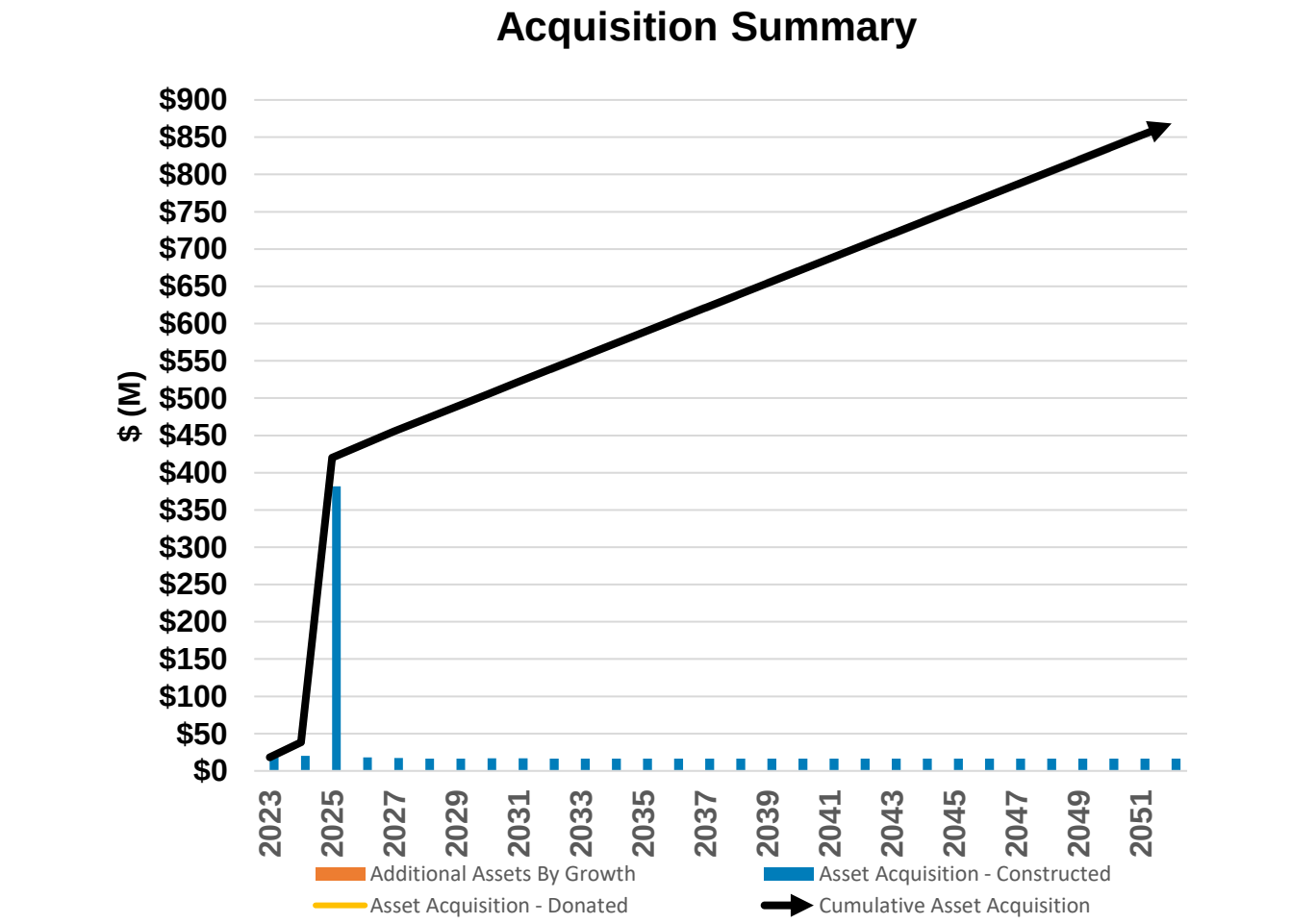
Hamilton will continue to monitor its constructed assets annually and update the AM Plan when new information becomes available.

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

ACQUISITIONS SUMMARY

Forecast acquisition asset costs are summarized in ***Figure 11*** and show the cumulative effect of asset assumptions over the next 30-year planning period.

Figure 11: Acquisition Summary
All Figure Values Are Shown In 2023 Dollars.



When Hamilton commits to constructing new assets, the municipality must be prepared to fund future operations, maintenance, and renewal costs. Hamilton must also account for future depreciation when reviewing long-term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by Hamilton. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in ***Figure 11*** above. It should be noted that the acquisition costs of the new Maintenance and Storage Facility (MSF) in 2025, are still under review and are subject to change pending Council approval.

Over the next 30-year planning period Hamilton will acquire approximately **$868.5 Million** of HSR assets. Most of these acquisitions are for the new Maintenance and Storage Facility and the expansion of bus services approved by the Council.

Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options and integrating the HSR (re)Envision project. 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.

8.2 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. Examples of typical operational activities include operating assets, utility costs, inspections, and the necessary staffing resources to perform these activities. HSR examples include:

- Bus Cleaning;
- Fuel;
- Insurance;
- Inspections; and,
- Driver training.

A continuous improvement item identified as shown in ***Table 29*** is to review staffing needs to cover sick time cancellations to reduce cancellations or route delays which impact service.

Additionally, a continuous improvement item was identified to complete a whole life and risk analysis for the maintenance of bus shelters to understand the costs and implications of changes to the current ad/maintenance contract structure. 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 it reaches 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 facilities maintenance, equipment repairs, vehicle repairs as well as the 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 the transportation network is reliable and can achieve the desired level of service.

HSR will need to begin reviewing building condition assessments to ensure a proactive approach to maintenance as identified in the condition reports and to work collaboratively with Facilities to program and budget for maintenance needs to ensure the buildings are maintained in an appropriate condition. Most of HSR's maintenance expenses come from maintaining multiple assets such as vehicles and on-street infrastructure. As shown in ***Table 29***, a continuous improvement was identified to review bus maintenance employee hour allocations to improve service knowledge of planned maintenance and inspections. These investments for maintenance are intended to allow these assets to reach their estimated service life and

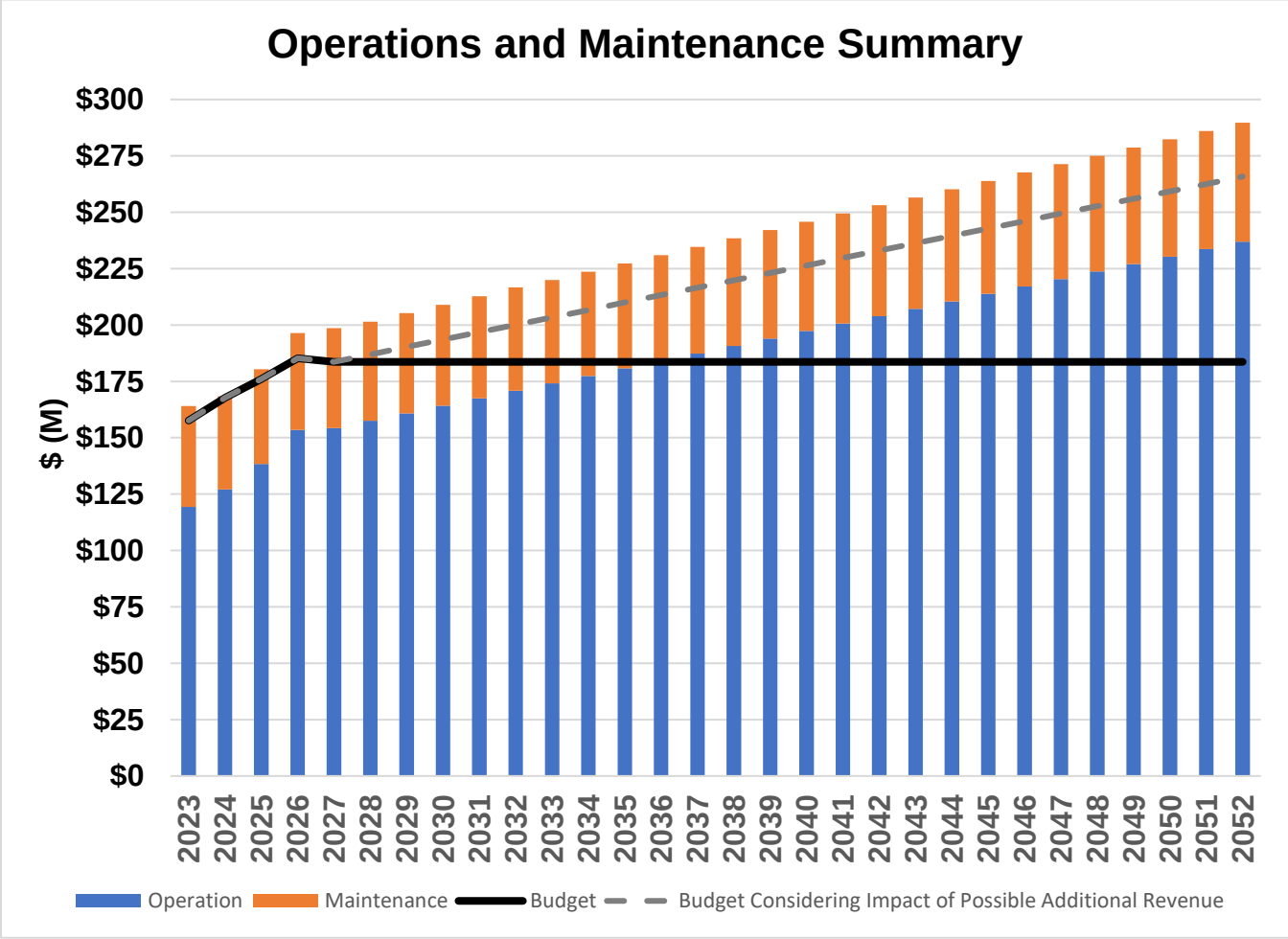
minimize reactive maintenance costs. It should be acknowledged that these forecast costs do not yet fully include the recommended works that need to be undertaken to ensure the entire inventory of assets will achieve their desired service lives and level of service. These forecast costs are likely underestimated at this time.

Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) will be included in the infrastructure risk management plan in future iterations once those works have been identified and prioritized.

Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement.

Forecast operations and maintenance costs vary in relation to the total value of the asset registry. When additional assets are acquired, future operations and maintenance costs are forecast to increase. When assets are disposed of, the forecast operation and maintenance costs are reduced. ***Figure 12*** shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 12: Operations and Maintenance Summary
All Figure Values Are Shown In 2023 Dollars.



Transit receives funding from a number of sources including Gas Tax and it is likely that increased routes and operating hours will contribute to an increase in revenues. Those revenues can be used to support an estimated increase in the operating budget. Based on a review of the 2023-2027 budgets and calculating the difference between Net and Gross operating budgets in the line called "*Financial Charges & General Revenue*" to determine the estimated annual amount being offset by these items. It is estimated that an increase of **$3.29 Million** can be added to the operating budget annually. This is modelled in ***Figure 12*** above as shown with the grey dashed line. The solid black line is the budget without any assumed increases. It can be seen that even with this estimated forecast increase the budget remains below the estimated forecast costs.

The increase in forecast O&M costs above budget is largely driven by:

- Staffing at new MSF Facility (estimated at 50% in 2025 and 100% in 2026 onwards);
- Vehicle Operators for the 15 new expansion buses acquired annually from 2026 onwards;
- Maintenance and Fuel costs for 15 new buses acquired annually from 2026 onwards; and,
- Maintenance and operating costs for Bus Stop Shelter Expansion;

The forecast costs include all 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 must both be consolidated for the AM Plans.

The forecast of operations and maintenance costs are increasing steadily over time, and it is clear that the City has insufficient budget to achieve all of the work required to ensure that assets will be able to achieve their estimated service life at the desired level of service**.** It is anticipated that at the current budget levels, there will be insufficient budget to address all operating and maintenance needs over the 30-year planning horizon. The graph above illustrates that without increased funding or changes to lifecycle activities, there is a shortage of funding which will lead to:

- Higher cost reactive maintenance;
- Possible reduction to the availability of the assets;
- Impacts on private property; and,
- Increased financial and reputational risk.

This shortfall is primarily due to insufficient budget allocations to accommodate the rapid growth and expansion of services. The additional operating and maintenance is due to additional operating and maintenance costs associated with the new buses including fuel cost and staffing. Costs associated with FTE needs for the New Maintenance and Storage Facility have also been included. Adding additional assets over time significantly impacts the operational and maintenance resources required to sustain the expected or mandatory level of service. It should be noted that a significant amount of operational and maintenance expenditures is mandatory due to legislative requirements and cannot simply be avoided or deferred.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated this operation and maintenance forecasts will increase significantly. Where maintenance budget allocations will result in a lesser level of service, the service consequences and risks have been identified and are highlighted in the ***Risk Section 6***.

Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) will be included in the infrastructure risk management plan for the next iteration.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated these operation and maintenance forecasts will change. Future iterations of this plan will provide a more thorough analysis of operations and maintenance costs including types of expenditures for training, mandatory certifications, insurance, staffing costs and requirements, equipment, and maintenance activities.

8.3 RENEWAL PLAN

Renewal is major work which does 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 those that have the highest consequence of failure, have high usage, have high 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 of the AM Plan. 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 2022 however they will be reviewed annually until their accuracy reflects the City's current practices.

Table 25: Useful Lives of Assets

ASSET (SUB)CATEGORY	EXPECTED USEFUL LIFE (YEARS)
Revenue Generating Vehicles (Buses)	12
Non-Revenue Generating Vehicles	5-7
Hardware	4-6
Maintenance Equipment	Various
Servers	15 – 20
Software	25

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ASSET (SUB)CATEGORY	EXPECTED USEFUL LIFE (YEARS)
HSR Facilities	60
On-street infrastructure (Bus Shelters and amenities)	15

The estimates for renewals in this AM Plan were based on the register method which utilizes the data from the City's asset registry to analyze all available lifecycle information and then determine the optimal timing for renewals based on the ESL. The alternate method was also used to quantify renewals for future anticipated acquisitions.

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., replacing a bridge that has a load limit); or,
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g., condition of a culvert).[5]

[5] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

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

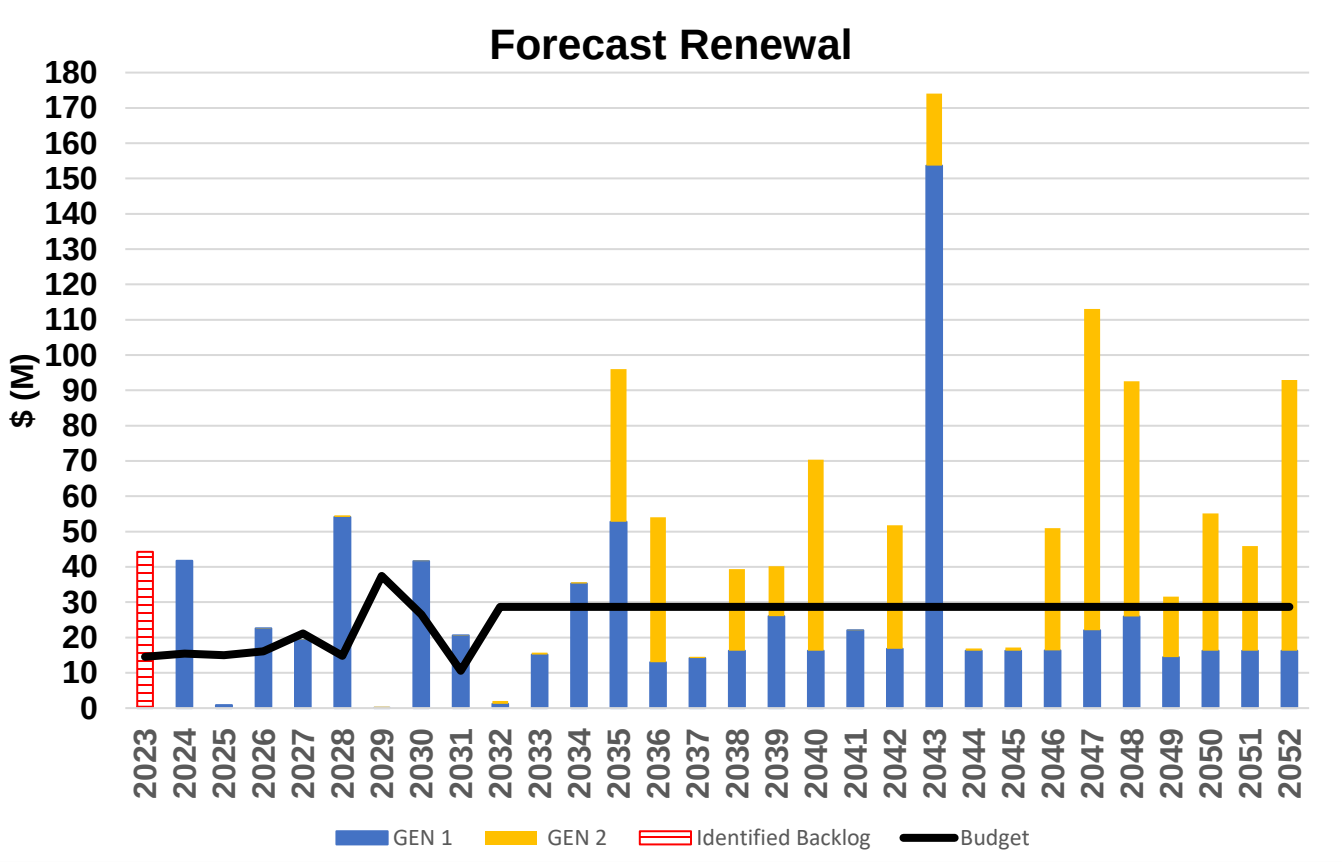
- Have a high consequence of failure;
- Have high use and the subsequent impact on users would be significant;
- Have higher than expected operational or maintenance costs, and,
- Have the potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[6]

SUMMARY OF FUTURE RENEWAL COSTS

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 13.***

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.

Figure 13: Forecast Renewal Costs
All Figure Values Are Shown In 2023 Dollars.



[6] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

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The significant amount highlighted in 2023 represents the cumulative backlog of deferred work needed to be completed that has been either identified through its current estimated condition or age per ***Table 4*** when the condition was not available. This backlog represents nearly **$43.9 Million** of deferred works. A continuous improvement item was identified as shown in ***Table 29*** to review building condition assessments to identify necessary actions and determine their priority to be included in budgets.

Backlog items include:

- **$43 Million** in revenue-generating vehicles (2021 and 2022 End of Life estimates*);
- **$0.4 Million** in maintenance equipment; and,
- **$0.3 Million** in non-revenue generating vehicles.

*Some of the revenue-generating vehicles backlogs might have already been addressed due to the data cut-off dates and the date of the AM Plan preparation. The backlog is largely due to vehicles that have an identified end of-life of 2021 and 2022.

Deferred renewals (assets identified for renewal and not funded) are included and identified within the risk management plan. Prioritization of these projects will need to be funded and managed over time to ensure renewal occurs at the optimal time.

There is a sufficient budget to support the planned projects only. Without additional funding, the backlog will remain and continue to grow as future projects outside of the ten-year planning horizon continue to move forward into the ten-year scope. Continued deferrals of projects will lead to significantly higher operational and maintenance costs and will affect the availability of services in the future and impact levels of service.

The expected renewal works over the ten-year budget cycle include **$ 191.4 Million** for bus replacements with another $**1.3 Million** for non-revenue vehicle renewals. Additionally, **$1.6 Million** is allocated for bus shelter rehabilitation and **$1.1 Million** towards terminal and end-of-line rehabilitation. As the growth of HSR continues it will continue to need additional funding to ensure the renewals can be funded properly.

Deferring renewals creates risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. Ultimately, continuously deferring renewals works ensures Hamilton will not achieve intergenerational equality. If Hamilton continues to push out necessary renewals, there is a high risk that future generations will be unable to maintain the level of service the customers currently enjoy. It will burden future generations with significant costs that inevitably they will be unable to sustain.

Properly funded and timely renewals will ensure the assets perform as expected and it is recommended to continue to analyze asset renewals based on criticality and availability of funds for future AM Plans.

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

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 structure has fallen.

Assets identified for possible decommissioning and disposal are shown in ***Table 26***. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in ***Table 26***. Any costs or revenue gained from asset disposals is included in future iterations of the plan and the long-term financial plan.

As a continuous improvement, there will be a review of the estimate service life for assets and this section will be updated in the next iteration of this AM plan.

Table 26: Assets Identified for Disposal

ASSET	REASON FOR DISPOSAL	TIMING	DISPOSAL COSTS	OPERATIONS AND MAINTENANCE ANNUAL SAVINGS
Bus	End of Life	Annual	($5,000)	To be determined

8.5 SUMMARY OF CURRENT ASSET FORECAST COSTS

The financial projections from this asset plan are shown in ***Figure 14***. 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.

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

Figure 14: Lifecycle Summary
All Figure Values Are Shown In 2023 Dollars.

Asset Renewal Funding Ratio (Target should be 90%-110%)	81%
10-Year O & M & Renewal Funding Ratio (Target should be 90%-110%)	93%
Projected Funding Required to Eliminate Funding Gap (10 years)	$163 Million

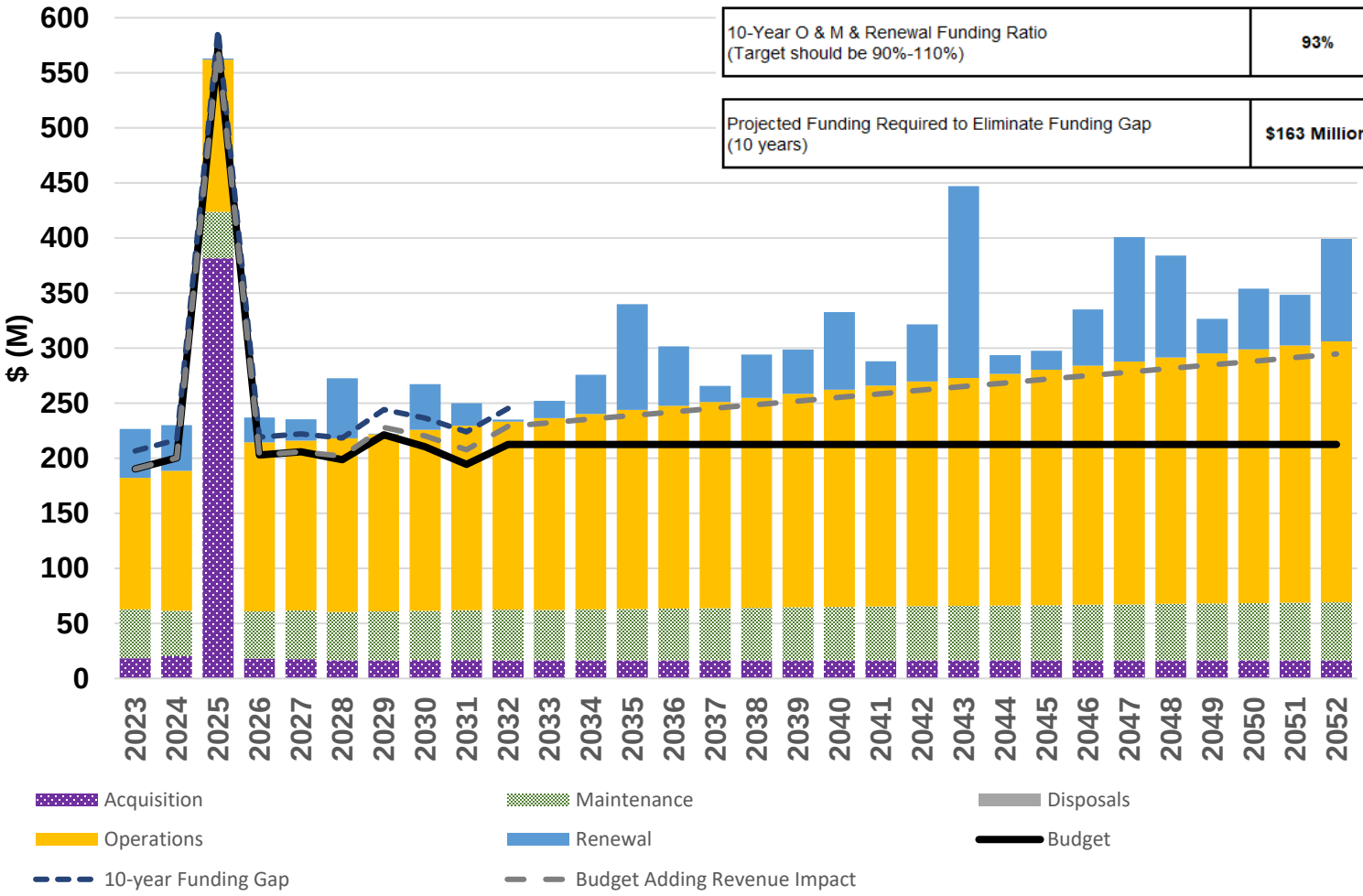

Figure 14 above shows a budget that is flatlined (the black line) and also a potential budget that includes an increase in the operating budget of **$3.28 Million annually** (the grey dashed line) as explained in the Lifecycle Operating and Maintenance section of the AM Plan. The ARFR is not impacted by this increase as the change impacts the O&M budgets. The 10-year O & M & Renewal funding and the projected funding gap shown in ***Figure 14*** are calculated using the increased revenue values. If the flat-lined budget (black line) is used, or if the revenue does not materialize then the 10 Year O & M & Renewal Ratio would be 90% and the Projected Funding Required to eliminate the Funding Gap (10 years) would be **$212 Million**.

There is typically a sufficient budget to address most of the planned operational and maintenance activities for the planning period for current assets. However, with the procurement of assets and their increased costs over time, there may be impacts on the service itself. Without some adjustment to available funds or other lifecycle management decisions, there will be insufficient budget to address all planned lifecycle activities.

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Hamilton currently has insufficient budget to address the large backlog of renewal work projected by the plan over the 30-year horizon. When deferring of renewals occurs, Hamilton runs the risk of higher cost reactive maintenance, service interruptions, decreased satisfaction, harm to its reputation along with other risk costs such as legal fees. Deferring renewals is not the optimal recommendation and Hamilton would benefit from seeking out long-term financing strategies to enable a more rapid renewal plan.

Without sufficient funding, the City has little option but to defer these necessary lifecycle activities. Deferring important lifecycle activities is never recommended. The City will benefit from allocating sufficient resources to developing its long-term financial plan to ensure that over time the City can fully fund the necessary lifecycle activities. Funding these activities helps to ensure the assets are compliant, safe, and effectively deliver the service the customers need and desire.

Renewing at a greater rate and increasing major maintenance projects would allow Hamilton to mitigate ever-decreasing transit conditions proactively. With **$524.8 Million** of assets to manage it is imperative that Hamilton optimize its renewal and major maintenance planning so that over time, high-cost reactive maintenance will be avoided or deferred to a later date.

The lack of funding allocated for the backlog of renewals and the necessary lifecycle activities creates an additional issue which is intergenerational equity. Each year the City defers necessary lifecycle activities, it pushes the ever-increasing financial burden on future generations. It is imperative the City begin addressing the lack of consistent and necessary funding to ensure that intergenerational equity will be achieved. Over time, allocating sufficient funding on a consistent basis ensures that future generations will be able to enjoy the same standards being enjoyed today.

Over time the City will continue to improve its lifecycle data, and this will allow for informed choices as to how best to mitigate those impacts and how to address the funding gap itself. This gap in funding future plans will be refined over the next three years and improve the confidence and accuracy of the forecasts in future revisions of this AM Plan.

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

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 its Transportation network 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 network 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 customers while keeping costs at an affordable level and maintaining its financial sustainability.

Without funding asset activities properly for its Transportation network; 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 network's 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 ten years/forecast renewal costs for next ten years); and,
- Medium-term forecast costs/proposed budget (over ten years of the planning period).

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio[7] **81%**

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 because the City is reluctant to fund the necessary work or prefers to maintain low levels of debt.

Over the next ten years, the City expects to have **81%** of the funds required for the optimal renewal of assets. This is a low number and should be addressed through this plan in the next

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

iteration. By only having sufficient funding to renew **81%** of the required assets in the appropriate timing it will inevitably require difficult trade-off choices that could include:

- A significant reduction in the level of service and availability of assets;
- Increased complaints and reduced customer satisfaction;
- Substantially 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

O&M and Renewal Ratio 93%

Although this AM Plan includes forecast projections to 30 years, the higher confidence numbers are typically within the first ten years of the lifecycle forecast. The ten-year Lifecycle Financial Ratio compares the Planned Budget with the Lifecycle Forecast for the optimal operation, maintenance, and renewal of assets to provide an agreed level of service over the next ten-year period. Similarly, to the AARF, 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's risk and service level commitments.

The forecast operations, maintenance and renewal costs over the ten-year planning period is **$220.1 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 **$203.8 Million** on average per year (including the 50% of funding provided by the province) giving a 10-year funding shortfall of **$16.3 Million** per year or **$163 Million** over the ten year planning period. This indicates that **93%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget, which is not within the 90-110% range. Therefore, it can be concluded that HSR is not funding their assets at an acceptable rate. Note, that these calculations exclude acquired assets.

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;
- Influence level of service expectations or demand drivers; and,

- As a revenue-generating organization, HSR can look to adjust the balance between Fares and Rate levy to manage the gap.

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 ten-year life of the Long-Term Financial Plan.

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

Table 27 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, utilization of debt-based funding over the long term, adjustments to lifecycle activities, improved renewals and multiple other options or combinations of options.

These options will be explored in the next AM Plan and the City will provide analysis and options for Council to consider going forward.

Table 27: Forecast Costs (Outlays) For the Long-term Financial Plan
Forecast Costs Are Shown In 2023 Dollar Values.

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2023	$18,248,000	$119,366,208	$44,638,752	$44,237,608	$0
2024	$20,130,500	$127,093,080	$41,257,536	$41,695,052	$0
2025	$381,639,008	$138,306,512	$42,132,200	$853,665	$0

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YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2026	$17,995,000	$153,488,352	$42,924,272	$22,622,012	$0
2027	$17,445,000	$154,221,312	$44,334,852	$19,463,700	$0
2028	$16,530,000	$157,536,528	$43,970,068	$54,555,528	$0
2029	$16,530,000	$160,850,736	$44,416,692	$432,494	$0
2030	$16,710,000	$164,164,960	$44,816,476	$41,721,104	$0
2031	$16,710,000	$167,480,704	$45,234,692	$20,684,142	$0
2032	$16,530,000	$170,796,464	$45,900,156	$2,004,456	$0
2033	$16,530,000	$174,110,704	$45,801,392	$15,682,320	$0
2034	$16,530,000	$177,424,960	$46,178,704	$35,649,748	$0
2035	$16,530,000	$180,739,216	$46,556,028	$96,005,192	$0
2036	$16,530,000	$184,053,488	$46,933,368	$54,035,608	$0
2037	$16,530,000	$187,367,760	$47,310,720	$14,500,426	$0
2038	$16,530,000	$190,682,048	$47,688,088	$39,373,756	$0
2039	$16,530,000	$193,996,336	$48,065,472	$40,221,832	$0
2040	$16,530,000	$197,310,624	$48,442,864	$70,359,216	$0
2041	$16,530,000	$200,624,928	$48,820,276	$22,133,552	$0
2042	$16,530,000	$203,939,248	$49,197,704	$51,802,824	$0
2043	$16,470,000	$207,154,464	$49,396,888	$174,035,280	$0
2044	$16,470,000	$210,467,456	$49,771,888	$16,927,352	$0
2045	$16,470,000	$213,780,464	$50,146,888	$17,160,844	$0
2046	$16,470,000	$217,093,472	$50,521,888	$50,965,340	$0
2047	$16,470,000	$220,406,464	$50,896,888	$113,055,864	$0
2048	$16,470,000	$223,719,456	$51,271,888	$92,546,784	$0

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2049	$16,470,000	$227,032,464	$51,646,888	$31,566,776	$0
2050	$16,470,000	$230,345,472	$52,021,888	$55,144,392	$0
2051	$16,470,000	$233,658,464	$52,396,888	$45,914,320	$0
2052	$16,470,000	$236,971,456	$52,771,888	$92,890,808	$0

9.3 FUNDING STRATEGY

The proposed funding for assets is outlined in the City's operational budget and ten-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

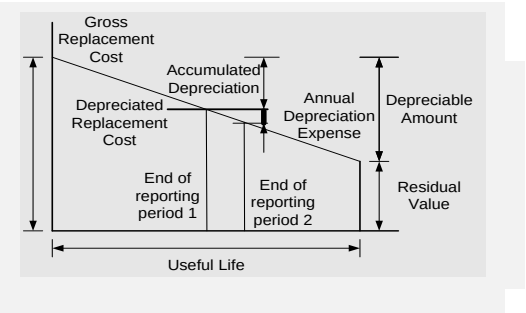
Asset values are forecast to increase as additional assets are added into service. As projections improve and can be validated with market pricing, the net valuations will increase significantly despite some assets being programmed for disposal that will be removed from the register over the 30-year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

The best available estimate of the value of assets included in this AM Plan is shown below. The assets are valued at estimated replacement costs:

Replacement Cost (Current/Gross)	**$524,868,384**
Depreciable Amount	**$524,868,384**
Depreciated Replacement Cost[8]	**$239,154,432**
Depreciation	**$ 31,657,828**



The current replacement cost is the most common valuation approach for specialized infrastructure assets. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets) and useful lives, determining the appropriate depreciation method, testing for impairments, and determining remaining useful life.

As the City matures its asset data, it is highly likely that these valuations will fluctuate significantly over the next three years, and they should increase over time based on improved market equivalent costs.

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 ten-year horizon and do not address other operational needs not yet identified; exceptions include the following:
  - Estimated Operations costs associated with the acquisition of 15 new buses per year have been incorporated into the plan (including employee costs and related direct costs, fuel);
  - Estimated Operating impacts associated with the new Maintenance Storage Facility have been included in this AM Plan (operating and employee-related costs);
- Maintenance forecasts are based on current budget allocations and do not identify asset needs at this time. It is solely based on planned activities;
  - Estimated maintenance costs associated with the acquisition of 15 new buses per year have been incorporated into the plan (including annual parts, direct maintenance, and labour costs);

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

- Lifecycle renewal of acquired revenue-generating vehicles has been incorporated in the plan;
- Replacement costs were based on a mixture of historical costing and recent purchase tenders depending on the asset class. Some assets were also made without determining what the asset would be replaced with in the future, with HSR fleet vehicles being the exception and the replacement was a known variable;
- Future electrification costs have not been incorporated into this AM Plan; and,
- This plan assumes that HSR utilizes 9.63% of the space at the Wentworth Facility.

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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 and data confidence for these is shown in ***Table 28***. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is defined in the AMP Overview.

Table 28: Data Confidence Assessment for Data Used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand Drivers	Low – Medium	Further analysis of drivers is essential when the HSR (re) Envision Project is complete to ensure that the confidence can be increased.
Growth Projections	Low – Medium	Current growth projections are of low - medium confidence however with the (re) Envision Project for HSR growth projections will need to be updated to align with the new growth requirements.
Acquisition Forecast	Low – Medium	HSR vehicles are of low - medium confidence however with the (re) Envision project the AM Plan will need to be updated to align with new acquisitions. This could also be impacted by the LRT system being installed as ownership of the LRT has not been determined. Regardless of ownership of LRT, it will have an impact on HSR assets and operations.
Operation Forecast	Medium	Further lifecycle analysis and staffing analysis are required to improve future forecasts. A continuous improvement item has been identified and input into the plan.
Maintenance Forecast	Low	Effort and analysis are still required to ensure that maintenance forecasting is accurate. A lifecycle analysis is required to improve the plan's confidence. This has been identified as a continuous improvement within this plan
Renewal Forecast - Asset Values	Medium	The renewal forecast for vehicles is of a medium confidence however with the current (re)Envision project of HSR services, HSR will need to complete a full renewal analysis once a future plan has been finalized.
- Asset Useful Lives	Medium	Currently, the vehicle useful lives are accurate within one year however the other asset lives should be updated through the continuous improvement item identified within this plan
- Condition Modelling	Low	Age is often the default variable for replacement timing. Actual conditions should be assessed in future plans to ensure that it can be a primary driver for replacement costing and ESL accuracy.

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DATA	CONFIDENCE ASSESSMENT	COMMENT
Disposal forecast	Medium	Most HSR vehicles are known within a year of accuracy for replacement timing. Facility assets should be reviewed for ESL

The estimated confidence level for the reliability of data used in this AM Plan is considered to be a **Low - Medium** confidence level. Several continuous improvement items are identified to help improve the overall confidence of the HSR AM Plan. If the continuous improvement plans are funded and completed it would raise the data confidence of the plan to a **Medium** or **Medium – High** confidence which is ideal for implementing an evidence-based approach for future HSR planning.

10. PLAN IMPROVEMENT AND MONITORING

10.1 STATUS OF ASSET MANAGEMENT PRACTICES[9]

ACCOUNTING AND FINANCIAL DATA SOURCES

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

- 2023 Capital & Operating Budgets;
- Asset Management Data Collection Templates;
- Building Condition Assessment Reports;
- Audited Financial Statements and Government Reporting (FIR, TCA, etc.);
- 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;
- 10-Year Local Transit Strategy;
- (Re) Envision;
- Ongoing customer satisfaction survey results;
- 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 biennial inspection, 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 plans to physically improve the assets.

The Improvement Plan shown in ***Table 29*** below, highlights proposed improvement items that will require further discussion and analysis to determine feasibility, resource requirements and

[9] ISO 55000 Refers to this as the Asset Management System

alignment to current work plans. Future iterations of this AM Plan will provide updates on these improvement plans.

Table 29: Improvement Plan
****p.a – per annum***

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1.	Conduct Transcab Customer Satisfaction Survey to identify customer demands and Levels of Service	**CXI,** AM	**$8,400 of Staff time** (Internal resources)	**Complete by the end of 2023**
2.	Establish Voice of the Customer for ATS/ clients to assist with Levels of Service	**CXI, ATS,** AM	**$3,500 of Staff time** (Internal resources)	**Complete by the end of 2023**
3.	Review Bus Maintenance FTE hour allocations to improve service knowledge of planned maintenance and inspections	**Fleet Maintenance,** Asset Management	**$5,500 of Staff Time** (internal resources)	**Complete by the end of 2024**
4.	Review Asset Registry to improve data quality and verify quantities, condition, Replacement Costs, Age and ESL	**HSR,** Finance Asset Management	**$6,500 of Staff Time** (internal resources)	**Complete by the end of 2024**
5.	Complete Lifecycle analysis of Vehicles and Facilities to ensure data quality improves	**AM**, HSR	**$7,000 of Staff time** (Internal Resources)	**Complete by the end of 2024**
6.	Complete a whole-life cost analysis of ATS costing if door-to-door shared ride trips were to be delivered as an in-house service rather than by the Contractor	**AM,** ATS, Finance, Operations	**$15,000 of Staff Time** (Internal Resources)	**Complete by the end of 2024**
7.	Review staffing needs to cover sick time cancellations Reduce cancellations or Route delays	**Operations,** AM, Union Representation	**$5,000 Staff time** (Internal resources)	**Complete by mid-2024**
8.	Complete a whole life and risk analysis for the maintenance of bus shelters to understand the costs and implications of changes to the current ad/maintenance contract structure.	**Operations, AM**	**$3,500 of Staff time** (Internal resources)	**Complete by the end of 2025**

HAMILTON STREET RAILWAY (HSR) ASSET MANAGEMENT PLAN

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
9.	Review Building condition assessments to identify necessary actions and determine their priority to be included in budgets.	**Operations, AM**	**$1,500 of Staff time** (Internal resources)	**Complete by the end of 2024**
10.	Develop Technical LOS metrics and associated budget for Acquisitions, Renewals and Disposals ensuring that the performance measurements are in line with customer values	**Operations, AM**	**$3,500 of Staff time** (Internal resources)	**Complete by the end of 2024**
11.	Expand the promotion of the Customer Satisfaction Survey and add outreach to target non-digital customers and in-person intercepts to increase survey participation.	**CXI, AM**	**$2,000/year of Staff time** (Internal resources)	**Commence in 2023**
12.	Improve customer levels of service by identifying costs, budget and program improvements	**CXI**	**TBD**	**TBD**
13.	Modify any 3-point condition scales currently being utilized to a 5-point scale	**Operations**	**TBD**	**TBD**
14.	Establish a metric for satisfaction levels for bus cleanliness to determine the resources required to achieve this goal from a staffing and financial perspective	**CXI**	**TBD**	**Commence in 2023**
15.	Investigate what the ideal target is for capacity on the bus and expand HSR's measurement of capacity with other assets and services	**CXI**	**TBD**	**Complete by the end of 2023**
16.	Identify additional demand drivers and develop a sustainable approach to meeting the demands	**HSR**	**$3,000 Internal staff time**	**Annually**
17.	Initiate the Risk Treatment Plan created in this AM Plan	**HSR**	**TBD**	**TBD**
18.	Develop additional risks and report to Management	**HSR**	**TBD**	**TBD**

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
19.	Quantify the effects of the proposed demand management and risk adaptation plans to ensure associated levels of service and cost will be addressed in future iterations of the AM Plan	**HSR**	**TBD**	**TBD**
20.	Incorporate climate mitigation projects into future demand management plans	**HSR**	**TBD**	**TBD**
21.	Incorporate climate adaptation projects into future demand management plans	**HSR**	**TBD**	**TBD**
22.	Investigate climate effects on HSR assets and services	**HSR**	**TBD**	**TBD**
23.	Modify budget sheets to incorporate lifecycle stages	**HSR, Finance**	**TBD**	**TBD**
24.	Complete a 10-year capital forecast	**HSR, Finance**	**TBD**	**Complete by the end of 2024**
25.	Complete a review of estimated service lives for Assets	**HSR**	**TBD**	**TBD**

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 achieving the Organizational target (this target is often 90 – 100%

Hamilton Fire Department Asset Management Plan 2024

Hamilton

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

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SUMMARY AND QUICK FACTS

SERVICE PROFILE

Hamilton Fire Department is dedicated to preserving life, property, and the environment throughout the City of Hamilton through an integrated program of Fire Protection and Rescue services and Emergency Management.

ASSET SUMMARY

Replacement Value
$252 Million
Average Age of 26 Years
or 54% of life remaining.

LEVEL OF SERVICE SUMMARY

Customer

- Customers feel the Hamilton Fire Department has performed **GOOD** overall in the last 24 months in all service areas.
- Customers feel the Hamilton Fire Department **EXCEEDS NEEDS** when meeting service needs overall.
- Customers feel the Hamilton Fire Department has performed **GOOD** providing good value for money when providing infrastructure and services.

Technical

- The Hamilton Fire Department provides three distinct levels of service throughout the City:
  full-time, volunteer, and composite.
- Overall effective firefighting and rescue force response times in 2022 were:
  - Full-time (urban): 9.7 minutes
  - Composite: 15.87 minutes
  - Volunteer (rural): 20.51 minutes

MAJOR ASSET HIGHLIGHTS

MAJOR ASSETS	QUANTITY	REPLACEMENT COST	AVERAGE CONDITION	STEWARDSHIP MEASURES
Fire Stations	26	$110M	FAIR	Building Condition Assessments are completed every five years.
Emergency Response Vehicles	80	$76.5M	GOOD	Vehicles and related equipment are certified for road worthiness annually.

DATA CONFIDENCE

VERY HIGH — MEDIUM — VERY LOW

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Key Demand Drivers

Demographic Shift: Hamilton's demographics will continue to grow and shift to 2052. The Hamilton Fire Department determine their vehicle and staffing requirements using community risk and is pursuant to the Establishing and Regulating By-law 19-034 and the Fire Protection and Prevention Act, 1997.

Technological Changes: Canadian Radio-television and Telecommunications Commission (CRTC) has mandated that all municipalities replace Canada's aging E911 emergency services network and cutover to the new Next Generation-911 (NG-911) platform by March 4, 2025, this is a large change that the Hamilton Fire Department as well as Hamilton Police have been preparing for with the assistance of the Information Technology division.

RISK

- Critical Assets are identified as the Dispatch System, Emergency Response Vehicles, Personal Protective Equipment, Apparatus Equipment and Facilities.

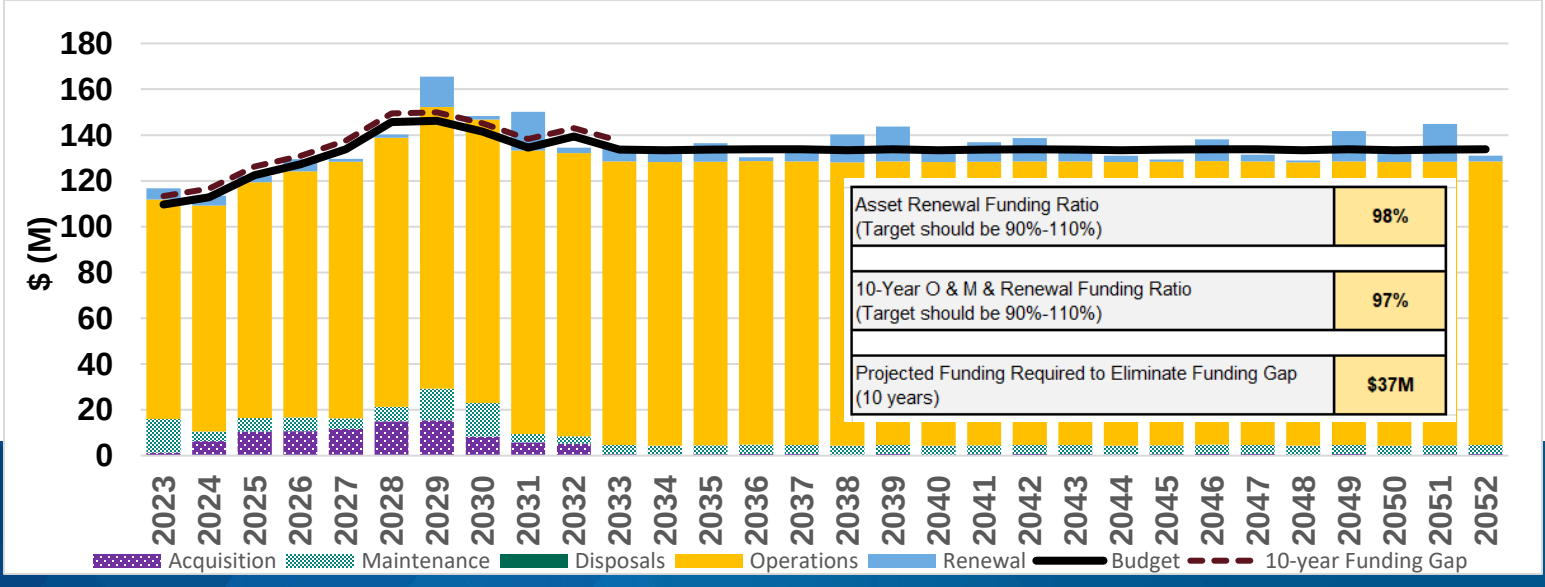
CLIMATE CHANGE

Mitigation

- Proposed Waterdown Station to be built using net-zero and Leadership in Energy and Environmental Design (LEED) principles.
- Fire Apparatus Anti-Idling Technology being considered to reduce Greenhouse Gas Emissions.

Adaptation

- Fire Apparatus Intake has been customized since the early 2000s to be able to traverse high water which is an adaptation for potential increases in road flooding.



HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

1. INTRODUCTION

Hamilton Fire Department is dedicated to preserving life, property, and the environment throughout the City of Hamilton through an integrated program of Fire Protection and Rescue services and Emergency Management. The purpose of this Asset Management (AM) Plan is to ensure that the Hamilton Fire Department has fulfilled the Asset Management Planning requirements outlined in O. Reg 588/17 for current and proposed levels of service as well as ensure that the Hamilton Fire Department has the required assets and funding to deliver sustainable Fire Protection and Rescue Services and Emergency Management over the 2023 - 2052 planning period that meets the needs of City of Hamilton residents in accordance with the *Fire Protection and Prevention Act, 1997*.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

2.0 BACKGROUND

The information in this section is intended to give a snapshot in time of the current state of the Hamilton Fire Department by providing background on the service, outlining legislative requirements, and defining the asset hierarchy used throughout the report. As well, providing a detailed summary and analysis of existing inventory information as of December 2022, including age profile, condition methodology, condition profile, and asset usage and performance for each of the asset classes. This section will provide the necessary background for the remainder of the plan.

2.1 SERVICE PROFILE

The service profile consists of four main aspects of the service:

- Service History;
- Service Function;
- Users of the Service; and,
- Unique Service Challenges.

2.1.1 SERVICE HISTORY

Rising from the ashes of a tragedy on November 16, 1832, the Hamilton Fire Department has evolved from a citizen's bucket brigade into an organization that includes 599 Full-time Firefighters, Dispatchers, Fire Prevention, Training and Mechanical staff and 300 Volunteer Firefighters protecting our urban and rural communities. In 1879, Hamilton was the first fire department in Canada to implement a *firefighter's pole* so that firefighters were able to respond to emergency calls faster than by using a standard staircase.

In 2001, the communities of Ancaster, Dundas, Flamborough, Glanbrook, Stoney Creek and Hamilton merged to become the 'new' City of Hamilton, and the Hamilton Fire Department grew from 12 stations to 26 and became a composite department which included both full-time and volunteer firefighters, and today serves approximately 570,000 residents.

2.1.2 SERVICE FUNCTION

According to the *Fire Protection and Prevention Act*, 1997 Section 2, subsection (1), every municipality shall:

(a) Establish a program in the municipality which must include public education with respect to fire safety and certain components of fire prevention; and,
(b) Provide such other fire protection services as it determines may be necessary in accordance with its needs and circumstances.

In discharging its responsibilities under Section 2, subsection (1), a municipality shall,

(a) Appoint a community fire safety officer or a community fire safety team; or,
(b) Establish a Fire Department

If a Fire Department is established for the whole or a part of a municipality or for more than one municipality, the council of the municipality or the councils of the municipalities (whichever the case may be) shall appoint a Fire Chief for the Fire Department. The fire chief is the person who is ultimately responsible to the council of a municipality that appointed him or her for the delivery of fire protection and rescue services.

Fire protection services includes:

(a) Fire suppression, fire prevention and fire safety education;
(b) Mitigation and prevention of the risk created by the presence of unsafe levels of carbon monoxide and safety education related to the presence of those levels;
(c) Rescue and emergency services;
(d) Communication in respect of anything described in (a) to (c);
(e) Training of persons involved in providing anything described in (a) to (d); and,
(f) The delivery of any service described in (a) to (e).

In order to deliver effective fire protection services, The Hamilton Fire Department uses a range of assets. Some of the ways assets support the delivery of services include:

- Reliable vehicles to arrive at emergency incidents in a timely manner;
- Reliable technology to ensure required means of communication are always available to accept calls for emergencies, record information, dispatch vehicles and provide for incident communication;
- Adequate facilities across the city (see ***Figure 1)*** to house and maintain vehicles, personnel, and equipment in preparation to respond to emergencies; and
- Specialized equipment for firefighters to use to protect themselves and others while responding to and actively mitigating emergency situations.

2.1.3 USERS OF THE SERVICE

The Hamilton Fire Department provides service to over 570,000 Hamilton residents and visitors to the City. Hamilton has a diverse population with a density of approximately 509.1 people per square kilometre.

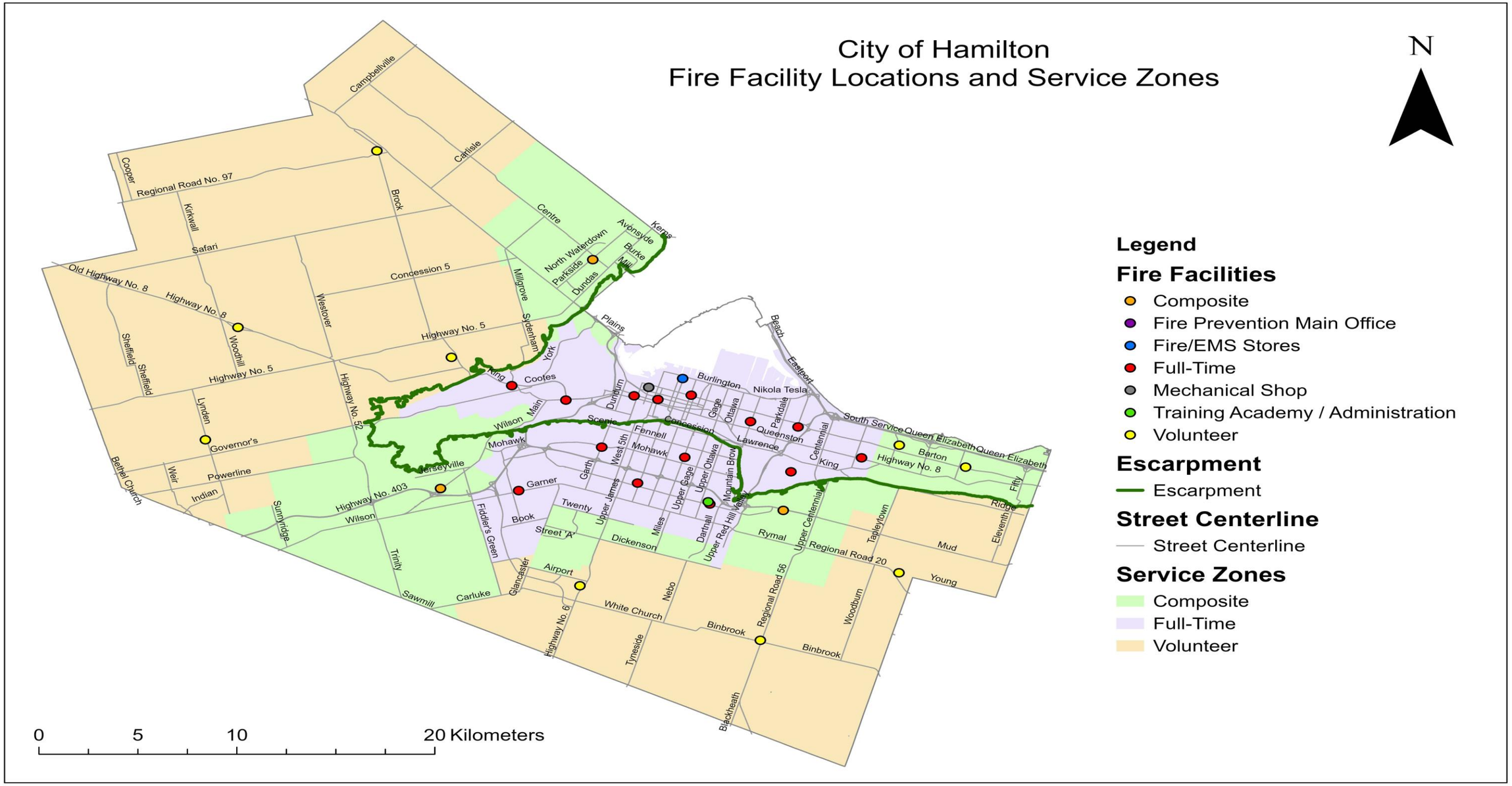
As shown in ***Figure 1***, the Hamilton Fire Department provides three distinct levels of service throughout the City currently utilizing 26 Fire Stations: 14 full-time, 9 volunteer, and 3 composite. The three levels of service are defined as:

- **Full-Time** (urban areas of the City): Incident response is provided by full-time firefighters, operating on a scheduled four-platoon, 24-hour shift schedule;
- **Volunteer** (rural areas of the City): Incident response is provided by volunteer firefighters who are on call 24/7/365 and paged out to respond as required for emergency incidents. Volunteer firefighters are paid an hourly amount for time spent at emergency incidents, training sessions and station duties; and,
- **Composite** (suburban areas of the City): Incident response is provided by both full-time and volunteer firefighters.

Since rural areas of the City are growing due to plans for development, Hamilton Fire Department is continuously evaluating changes in risk to ensure appropriate response models (full-time, composite, volunteer) are employed in these areas.

HAMILTON FIRE DEPARTMENT
ASSET MANAGEMENT PLAN

Figure 1 : Hamilton Fire Facility Locations and Service Zones



2.1.4 UNIQUE SERVICE CHALLENGES

The Hamilton Fire Department has some unique service challenges which will be discussed throughout this report.

Given the size of the fire apparatus that the fire department operates to deliver time-sensitive service, any change including traffic patterns/flow, drive lane road width, transportation network changes and route circumvention pose a challenge. Some of these challenges are summarized below and identified as demands on the service in ***Sections 5.0 and 7.0:***

- During large City events (e.g., Supercrawl), the fire department responses may be less efficient due to increased congestion, street closures and response route changes;
- During winter months, snow piles create narrower streets which can increase travel times or the inability to access a street. Narrow streets are becoming more prevalent throughout the City and with the addition of on-street parking, bike lanes and traffic calming measures the concern noted above can become more frequent; and,
- Any Escarpment closures which may occur due to erosion, weather and/or accident may affect response routes.

In addition, due to vehicle supply chain issues exacerbated by the COVID-19 pandemic, the Hamilton Fire Department has experienced delays procuring vehicles using the established procurement process. The time it takes to acquire new, or replacement apparatus has increased significantly (i.e., pre-COVID once an order was placed it took one to one and a half years to receive the apparatus and in 2023 it took three years. This could affect the fire department's service delivery over time if this issue remains unmitigated and is identified as a risk in ***Section 6.0.***

2.2 LEGISLATIVE REQUIREMENTS

The most significant legislative requirements that impact the delivery of the fire protection and rescue services and emergency management 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
Fire Protection and Prevention Act, 1997	Sets out the legislative and regulatory framework for the establishment of fire protection in Ontario, which is a mandated municipal responsibility.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

LEGISLATION OR REGULATION	REQUIREMENT
O. Reg 343/22 Firefighter Certification NFPA Codes & Standards (NFPA: National Fire Prevention Association)	All firefighters must meet minimum competency standards to be able to perform their assigned duties. This competency is achieved through training and certification, promotes, and improves methods of fire protection and prevention, electrical safety, and other related safety goals; obtains and circulates information and promotes education and research on these subjects; and secures the cooperation of its members and the public in establishing proper safeguards against loss of life and property.
Establishing and Regulating By-law 19-34	By-law which ensures the City of Hamilton is compliant with the Fire Protection and Prevention Act, 1997 and enshrines the current Council-approved structure, capacity, type, and nature of service delivery provided by the Hamilton Fire Department.
O. Reg. 332/12: Building Code	Any facilities considered “Post-disaster”, like Hamilton Fire Department facilities, must include additional provisions for seismic loading.
O.Reg.378/18: Community Risk Assessments	Every municipality, and every fire department must complete and review a community risk assessment no later than 5 years from the day the previous community risk assessment was completed. The municipality and fire department must use the community risk assessment to inform decisions about the provision of fire services.
O. Reg 380/04: Emergency Management and Civil Protection Act	In developing its emergency management program, every municipality shall identify and assess the various hazards and risks to public safety that could give rise to emergencies and identify the facilities and other elements of the infrastructure that are at risk of being affected by emergencies.

2.3 ALIGNMENT WITH HAMILTON FIRE DEPARTMENT GUIDING PRINCIPLES

As indicated in ***Table 2*** below, this Asset Management Plan is in alignment with the four guiding principles identified in the 2019 – 2020 Hamilton Fire Department 10-Year Service Delivery Plan. These guiding principles were developed considering City of Hamilton's Corporate Cultural Values.

Table 2: Hamilton Fire Department Guiding Principles

HFD Guiding Principles	AM Plan Alignment
Optimized Service Delivery	The Asset Management Plan outlines service profile demands on the service, levels of service, lifecycle management, and financial sustainability. Asset Management Plan also outlines the assets required to deliver optimal service.
Exceptional People and Performance	Asset Management Plan outlines customer and technical levels of service to provide a holistic view of service performance.
Robust Collaboration and Integration	Asset Management Plan uses a consistent template across the organization so all service areas can be evaluated in the same way.
Reduced Risk for a Healthier and Safer Community	Asset Management Plan incorporates findings from the Community Risk Assessment and Hazard Identification and Risk Assessment (HIRA) as well as incorporating other risks found during plan development.

2.4 ASSET HIERARCHY

As previously mentioned, to deliver fire protection and rescue services and emergency management, Hamilton Fire Department requires assets. The fire department's Asset Management Service Area has been broken down into four asset classes for the purpose of this Asset Management Plan: Facilities, Vehicles, Equipment, and Technology.

- **Facilities:** refers to any City-owned facilities necessary to deliver fire protection and services and emergency management.
- **Vehicles:** describes different types of vehicles which are used for either firefighting and rescue operations, fire prevention, mechanical/stores, administrative or training purposes, and any required tools to maintain these assets.
- **Equipment**: refers to all equipment a firefighter or apparatus requires to protect the public as well as themselves.

- **Information & Communications Technology** describes the different type of technology required to deliver the service including communications, IT, desktop, and mobile equipment.

The asset class hierarchy outlining assets included in this section is shown below in ***Table 3***.

Table 3: Asset Class Hierarchy

SERVICE AREA	HAMILTON FIRE DEPARTMENT			
ASSET CLASS	**FACILITIES**	**VEHICLES**	**EQUIPMENT**	**INFORMATION & COMMUNICATIONS TECHNOLOGY**
	• Shared & Fire Stations • Administrative • Fire Prevention Offices • Mechanical Facility • Storage Facility	• Heavy Response Vehicles • Light Response Vehicles • Non-Response Vehicles • Trailers	• Respiratory Protection Gear • Bunker Gear & Uniforms • Apparatus Equipment • Specialty Teams Equipment	• Communications Technology • Technology Equipment • Information Technology

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

3. SUMMARY OF ASSETS

Table 4 displays the detailed summary of assets for the Hamilton Fire Department service area. The data is sourced from a combination of datasets included in the fire department's databases. It is important to note that inventory information does change often, and that this is a snapshot of information available as of December 2022.

The City owns approximately **$252 Million** in Hamilton Fire Department assets which are on average in **Good** condition. Assets are a weighted average of **26 years** in age which represents **54%** of the average remaining service life which are weighted using only Facility and Vehicle assets due to gaps in the Equipment and Information & Communications Technology data. For most assets this means that the City should be completing preventative maintenance activities per the inspection reports as well as essential operating activities (e.g. inspection, cleaning).

Data confidence descriptions are outlined on ***page 32*** of the Asset Management Plan Overview. The replacement costs below are typically a **Medium** data confidence level overall. For Facilities, replacement costs are calculated using an internal Corporate Facilities and Energy Management tool which encompasses current market rates, building type and size and were escalated to include additional soft costs. Vehicle replacement costs were gathered from the most recent purchase price for similar assets and are typically High confidence. Equipment and Information & Communications Technology assets' replacement costs were based on the Hamilton Fire Department renewal schedule, but the inventory could not be confirmed and therefore is considered to be a **Medium** data confidence. A continuous improvement item identified in ***Table 28*** is to implement an asset registry for all fire department assets which includes key database fields as well as metadata and follows the newly developed City Data Standard. In addition, improving the process for collecting unit costs for fire department assets has also been identified as a continuous improvement item.

The Corporate Asset Management 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. It is also important to note that Asset Management Plans only include asset information related to assets that the City owns. Facilities leased from other bodies are incorporated into operational costs but are not incorporated into the total replacement cost for the service. Finally, the assets included below are assets that are assumed and in service at the time of writing. A continuous improvement item identified in ***Table 28*** is to improve and add/track new fire department data that helps inform decisions related to Asset Management by identifying gaps in data and prioritizing what can be improved and/or tracked.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Table 4: Detailed Summary of Assets
****Weighted Average based on Replacement Cost***

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% Remaining Service Life)	AVERAGE EQUIVALENT CONDITION
FACILITIES				
Shared Stations	17[1]	$76.4M	37 years (51%)	3-FAIR
Data Confidence	Very High	Medium	Very High	High
Fire Stations	8[1]	$33.6M	41 years (45%)	2-GOOD
Data Confidence	Very High	Medium	Very High	High
Administration Facilities (MATC)	3	$26.4M	8 years (89%)	2-GOOD
Data Confidence	Very High	Medium	Very High	High
Mechanical Facility	1	$8.1M	56 years (25%)	4-POOR
Data Confidence	Very High	Medium	Very High	High
Stores (Storage) Facility	1	$2.0M	83 years (0%)	3-FAIR
Data Confidence	Very High	Medium	Very High	High
Fire Prevention Offices	3	$11.0M	34 years (55%)	3-FAIR
Data Confidence	Very High	Medium	Very High	High
SUBTOTAL		**$157.6M**	**35 years* (54%)**	**3-FAIR***
Data Confidence		**Medium**	**Very High**	**High**

[1] The Hamilton Fire Department operates a total of 26 stations, but Station 14 is a leased facility and has not been included in the replacement value calculations.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Table 4: Detailed Summary of Assets
****Weighted Average based on Replacement Cost***

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
VEHICLES				
Heavy Response Vehicle	64	$74.6M	10 years (52%)	2-GOOD
Data Confidence	High	High	Very High	Low
Light Emergency Response	16	$1.9M	1 years (85%)	2-GOOD
Data Confidence	High	High	Very High	Low
Non-Emergency Response	18	$1.5M	7 years (35%)	3-FAIR
Data Confidence	High	High	Very High	Low
Trailers	4	$0.5M	8 years (53%)	3-FAIR
Data Confidence	High	High	Very High	Low
SUBTOTAL		**$78.5M**	**9 years* (54%)**	**2-GOOD***
Data Confidence		**High**	**Very High**	**Low**

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Table 4: Detailed Summary of Assets
****Weighted Average based on Replacement Cost***

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
EQUIPMENT				
Respiratory Protection Gear (PPE)		$1.5M	Minimal Data - grouped information.	
Data Confidence		Medium		
Bunker Gear & Uniforms (PPE)		$3.7M		
Data Confidence		Medium		
Apparatus Equipment (e.g., hose, cameras, defibrillators)		$2.9M		
Data Confidence		Medium		
Specialty Teams Equipment (e.g., extrication equipment, hazmat, rescue equipment)		$2.2M		
Data Confidence		Medium		
SUBTOTAL		**$10.3M**	**Minimal Data**	
Data Confidence		**High**	**Very Low**	

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Table 4: Detailed Summary of Assets
****Weighted Average based on Replacement Cost***

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
INFORMATION & COMMUNICATIONS TECHNOLOGY				
Communication Technology (e.g., mobile radios, portable radios, pagers)		$4.7M	Minimal Data - grouped information.	
Data Confidence		Medium		
Technology Equipment (e.g., Tablets, Remotely Piloted Aircraft System)		$0.6M		
Data Confidence		Medium		
Information Technology (e.g., Desktop, Laptop) Assets		$0.4M	4 years (5%)	4-POOR
Data Confidence		High	High	Low
SUBTOTAL		**$5.7M**	**Minimal Data**	
Data Confidence		**High**	**Very Low**	
TOTAL		**$252.0M**	**26 years*[2] (54%)**	**2-GOOD*[2]**
Data Confidence		**Medium**	**High**	**Medium**

[2] Based on replacement value weighting of only Facilities and Vehicles due to data availability.

3.1 ASSET CONDITION GRADING

Condition refers to the physical state assets are in, 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 5*** 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 5: Equivalent Condition Conversion Table
**** Weighted Average Based on Replacement Costs***

EQUIVALENT CONDITION GRADING CATEGORY	CONDITION DESCRIPTION	INFORMATION TECHNOLOGY	VEHICLES	FACILITIES CONDITION INDEX (FCI)
1-Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	>79.5% Remaining Service Life	>79.5% Remaining Service Life: Much lower-than-average likelihood for unscheduled repair.	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% Remaining Service Life	69.5% - 39.5% Remaining Service Life: Lower than average to average likelihood for unscheduled repair	< 5% Unplanned component failure highly unlikely. Operations and maintenance costs are predictable. The building will provide a clean and functional environment.
3-Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	39.5% - 69.4% Remaining Service Life	39.5% - 0% Remaining Service Life: Higher than average to much higher-than-average likelihood for unscheduled repair.	>= 5% to < 10% Unplanned building component failure is unlikely. There may be some variability in operations and maintenance costs. The building will meet most operational needs with minor complaints.
4-Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4% Remaining Service Life	<0% Remaining Service Life: Vehicles that are deemed to not be road worthy.	>= 10% to <30% Unplanned building component failure is likely. Unplanned repairs will likely occur, and operations and maintenance costs will be high. Facility will look worn with serious signs of deterioration.
5-Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4% Remaining Service Life	N/A	>= 30% Unplanned component failure will occur. Emergency repairs will likely occur, and operations and maintenance costs will be high. Facility will look worn with serious signs of deterioration. Functionality of the entire building will be compromised.

The following conversion assumptions were made:

- Vehicles condition was based on the probability of required repairs based on % remaining service life. The Estimated Service Life for condition for heavy emergency response vehicles was modified to 25 years for condition estimation purposes;
- Facilities Condition Index was based on ranges provided by the consultant who completed the Building Condition Assessment which corresponds to a 4-Point scale; therefore, facilities will not be able to attain a score of 1;
- Facilities Condition Index was reviewed and updated by the City's Corporate Facilities and Energy Management division in January 2024; and
- For Information Technology assets, the condition was based on the % of remaining service life.

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 assets typically have an estimated service life where the asset can be expected to be in service before the condition has degraded and requires 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;

- As previously mentioned, 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; and,

- Finally, performance issues are also identified because there are often insufficient resources to address all known asset deficiencies, and therefore these issues must be noted and prioritized.

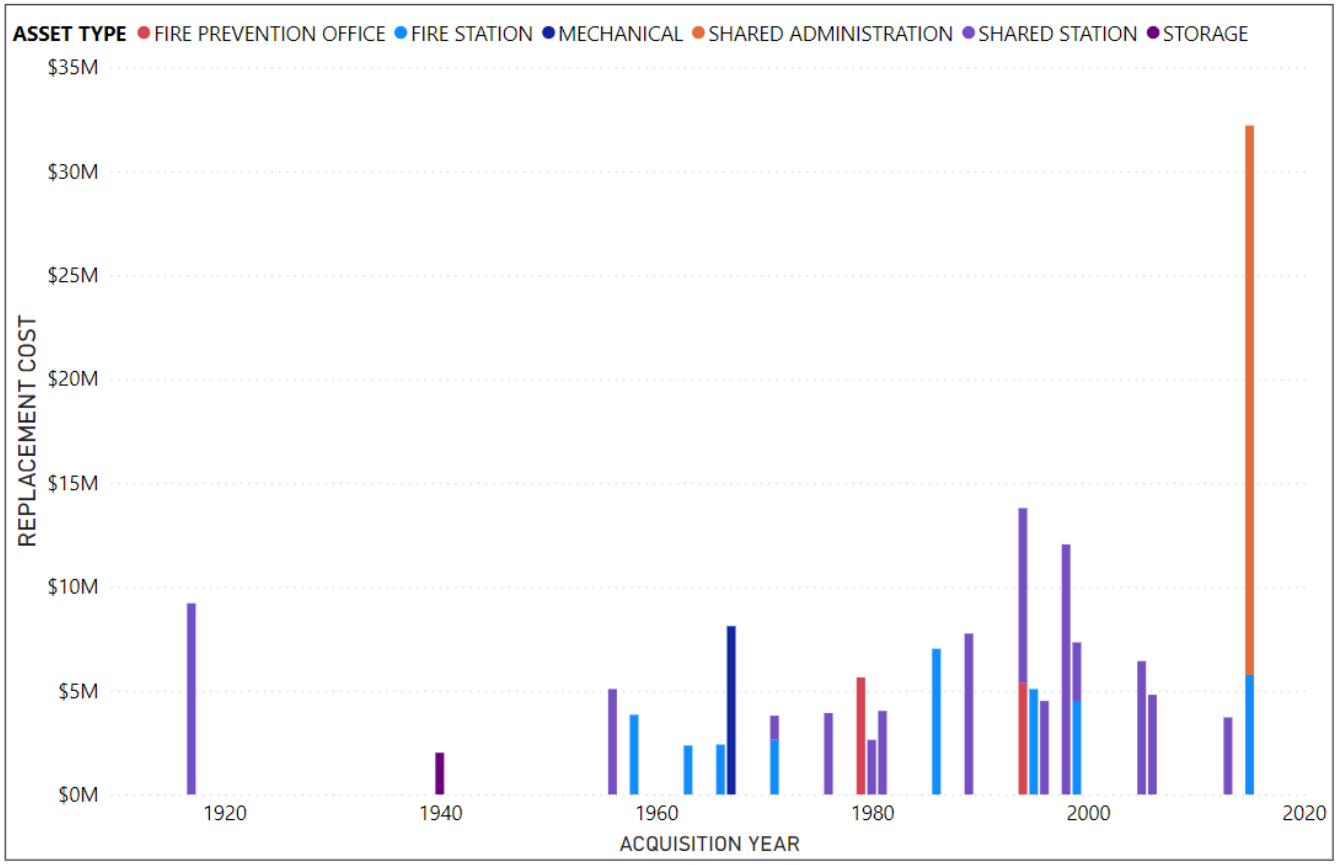
3.2.1 FACILITIES PROFILE

The Hamilton Fire Department share the majority of their current stations with the Hamilton Paramedic Service and the administrative facility the Multi Agency Training Complex with Hamilton Paramedic Service and Hamilton Police Service. For the purposes of this report, facilities where the fire department is the sole occupier of the space, have been considered Fire Stations or Fire Prevention Offices, and for shared facilities, the replacement values have been allocated based on the portion of the building that fire department staff are currently occupying and are referred to as Shared Stations, Mechanical/Stores (Storage), or Shared Administration Multi Agency Training Complex facilities.

3.2.1.1 AGE PROFILE

The age profile for Hamilton Fire Department assets is shown in ***Figure 2.*** For the fire department Facility assets, the data confidence for age is typically Very High because this information was recorded during the construction of the facilities.

Figure 2: Facilities Age Profile



Most Hamilton Fire Department facilities have an Estimated Service Life of 75 years and therefore any facilities built before 1948 would be beyond its Estimated Service Life. The only fire station beyond this Estimated Service Life is Fire Station 1 which was built in 1917 and is

located on John Street North. However, the building was renovated in 2003 and is shown to be in Fair condition per the Building Condition Assessment and is therefore not being considered for replacement.

The other building beyond its service life in the figure below is Station 30 which was built in 1940 and is used by the fire department for the stores/logistics division (Storage). The majority of this facility is occupied by Hamilton Paramedics Service and is therefore discussed further in the Hamilton Paramedics Service Asset Management Plan.

The Multi Agency Training Complex on Stone Church Road -shared by the Hamilton Fire Department, Hamilton Police Service and Hamilton Paramedic Service -is the most expensive facility the fire department occupies. The Hamilton Fire Department is the predominant tenant. in the campus that was constructed as part of the 2009 Federal/Provincial/Municipal infrastructure program and opened in 2011. It houses a fire station, shared administrative offices for all three emergency services, Hamilton Fire Department Dispatch, the City's Emergency Operations Centre, Fire, Police and Paramedic training areas and classrooms.

3.2.1.2 CONDITION METHODOLOGY & PROFILE

Condition for Hamilton Fire Department facilities is determined based on the results of a Building Condition Assessment completed by the Corporate Facilities and Energy Management Division. The Building Condition Assessment identifies necessary major and minor maintenance activities in a 10-year forecast with projected costs, and outputs a detailed report outlining methodology, overall findings, and condition.

Building Condition Assessments are completed on fire department facilities every five years and output a score called a Facility Condition Index which is considered to be a high confidence level source for condition. The Facility Condition Index is a ratio of total cost for required repairs, renewal, or upgrades to replacement value of building components. The 10-year forecast from the Building Condition Assessments were incorporated into the maintenance plan shown in **Section 8.2**.

A summary of the Facilities' condition methodology is provided in ***Table 6***. The condition conversion from Facility Condition Index to the standardized 5-point scale used in Asset Management is shown in ***Table 5.***

Table 6: Inspection and Condition Information

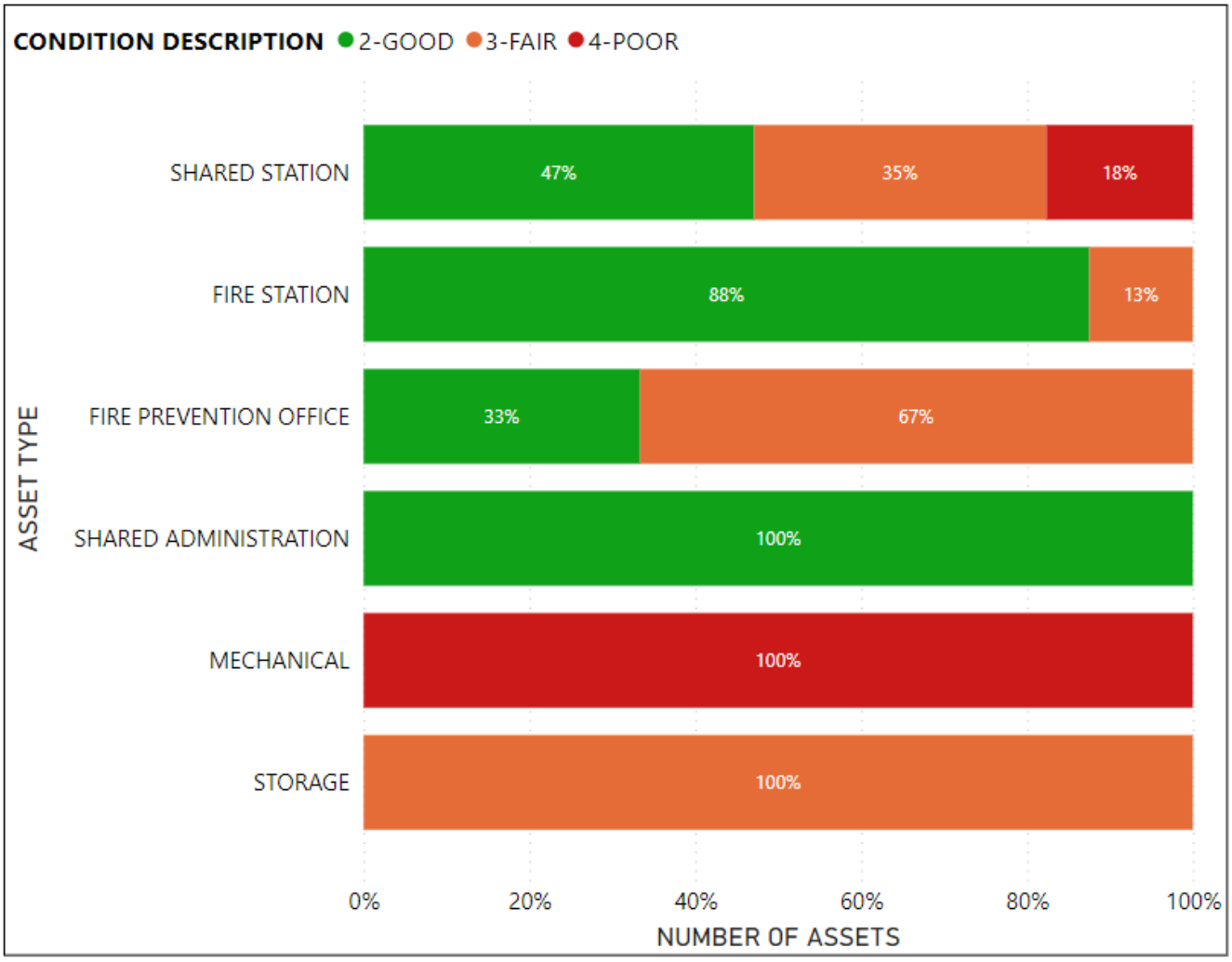
ASSET	INSPECTION FREQUENCY	LAST INSPECTION	CONDITION SCORE OUTPUT
All Facilities	Every 5 years	2019	Facility Condition Index (0% - 100%)

The condition profile for Hamilton Fire Department Facilities assets is shown below in ***Figure 3.*** It is evident that many of the Shared Stations are indicated to be in **Good or Fair** condition based on the results of the Building Condition Assessments.

Since the Hamilton Fire Department is a critical service, it is essential that facilities are kept in a state of good repair. The fire department and Corporate Facilities and Energy Management have ensured facilities are kept in a safe working condition but acknowledge that a significant amount of facility maintenance needs will be required in the next 10 years as shown in **Section 8.2,** and if certain items are not completed, it could result in facilities reaching Poor condition. It is also important to note that the Building Condition Assessments were completed in 2019, and while the forecasted works have been updated in the Corporate Facilities and Energy Management database, a future Building Condition Assessment will be completed in 2024 and therefore these condition ratings may change in the next year.

Although it is well within its Estimated Service Life of 75 years, Fire Station 14 is the only facility considered to be in Very Poor condition per the Building Condition Assessment. Since it is a leased building, it has not been included in the figure below, however, the lease agreement for this facility does require that the City maintain this facility and therefore the large maintenance costs associated with this facility have been incorporated into the Operations and Maintenance Plan in **Section 8.2**. There is also a future acquisition planned to replace Station 14 in **Section 8.1.** Both of these costs have been assumed to be required at this time because it is unclear what condition the City must leave the facility in after occupancy.

Figure 3: Facilities Asset Condition Distribution



3.2.1.3 ASSET USAGE AND PERFORMANCE

The largest performance issues with Facilities involve poor condition of major (high cost or high criticality) facility components. The known service performance deficiencies in ***Table 7*** were identified using information from the 2019 Building Condition Assessment (BCA).

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Table 7: Known Service Performance Deficiencies

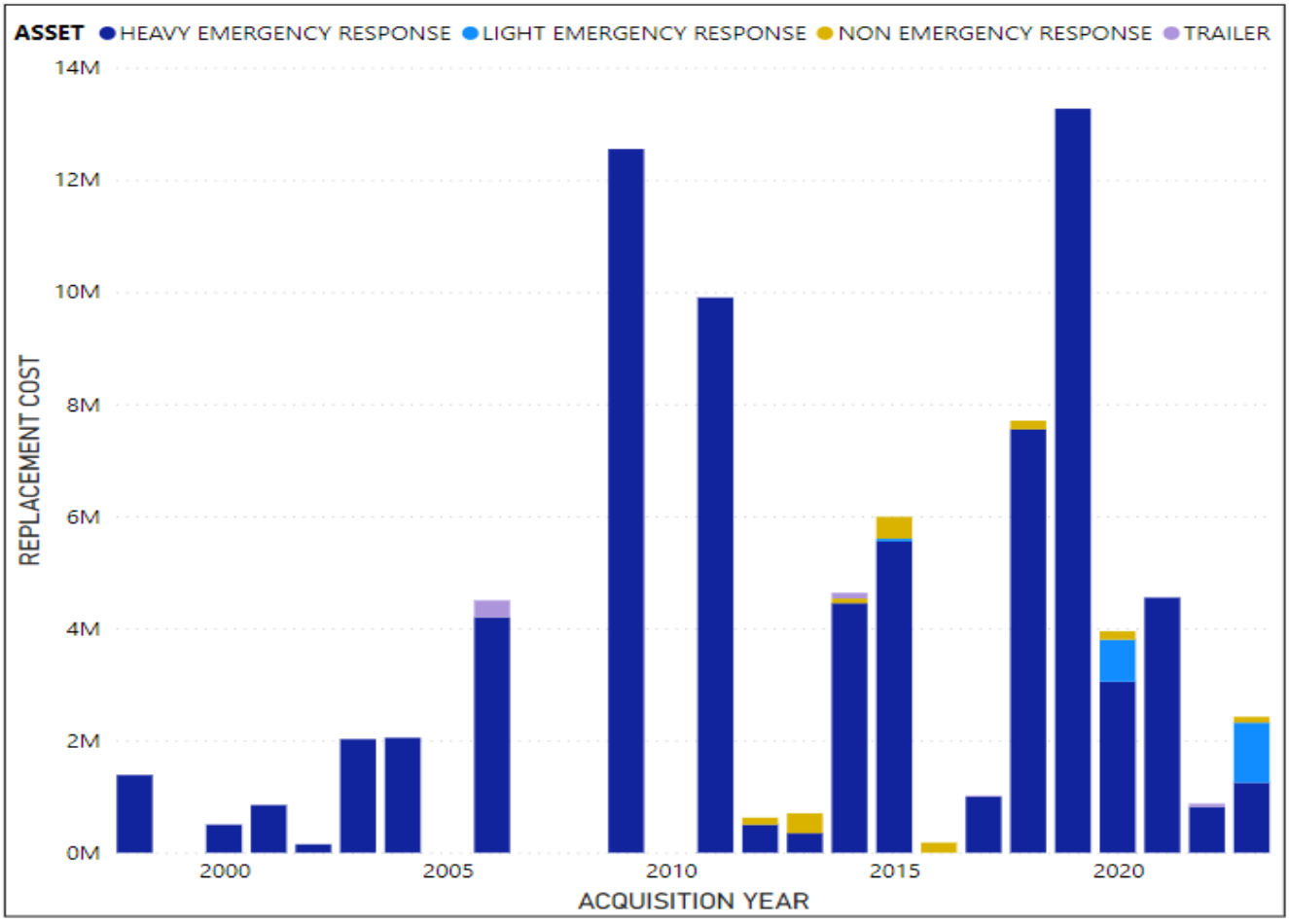
ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Facility	**Stations 4, 12, 14, 18, 20, 24, 25, 28**	Roof Replacement Required	It is recommended to replace the roof as required, at the end of its life cycle.
	Fire Prevention Office 1		
	Stations 11, 14, 15, 16, 19, 21, 24, 25	Parking Lot Replacement Required	It is recommended that the parking lot asphalt be repaired or replaced as required, at the end of its life cycle.
	Stations 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 15, 16, 17, 18, 19, 21, 23	Replace Engine Exhaust Extraction System	It is recommended to replace the extraction system at the end of its life expectancy.
	Stations 4, 12, 24	Passenger Elevator Replacement	It is recommended to replace the elevator at the end of its life expectancy to maintain proper barrier free access through the building.

3.2.2 VEHICLES PROFILE

3.2.2.1 AGE PROFILE

The age profile of the Hamilton Fire Department Vehicle assets is shown in ***Figure 4***. For Vehicle assets, the data confidence for age is typically High because asset's ages are formally tracked, and many assets are replaced based on age.

Figure 4: Vehicles Age Profile



Per ***Figure 4***, there are acquisition spikes in 2009, 2011, and 2019 for heavy emergency response vehicles (i.e., rescue, pumper, engine, ladder, and tanker apparatus). Since these vehicles have an estimated service life Estimated Service Life of 20 years, there will be spikes in renewals in 2029, 2031 and 2039 as discussed in **Section 8.3.**

3.2.2.2 CONDITION METHODOLOGY & PROFILE

Hamilton Fire Department vehicles are inspected, and maintenance activities are conducted at specific intervals throughout the asset's lifecycle as shown in ***Table 8***. Fire Department staff are also responsible for maintaining vehicles for Hamilton Paramedics Service and there is a service level agreement between these two departments to perform these activities at specific intervals. Due to a recent change in Hamilton Paramedics Service legislation and an increase in Hamilton Paramedics Service vehicles, the fire department may not be able to continue hitting all inspection targets for both Hamilton Fire Department and Hamilton Paramedics Service vehicles without additional resourcing, which is shown in **Section 5.3**. Vehicles on the road are generally considered to be in acceptable working condition while they are in service, but this may not be sustainable over time without additional resourcing which should be investigated following this plan.

Table 8: Vehicle Inspection and Maintenance Activities

ASSET	INSPECTION DESCRIPTION	FREQUENCY	CONDITION SCORE OUTPUT
Vehicles	Ensure all vehicles and their related equipment (i.e., pumps) are certified for road worthiness and technical functionality	Annual	No output – MTO Certification

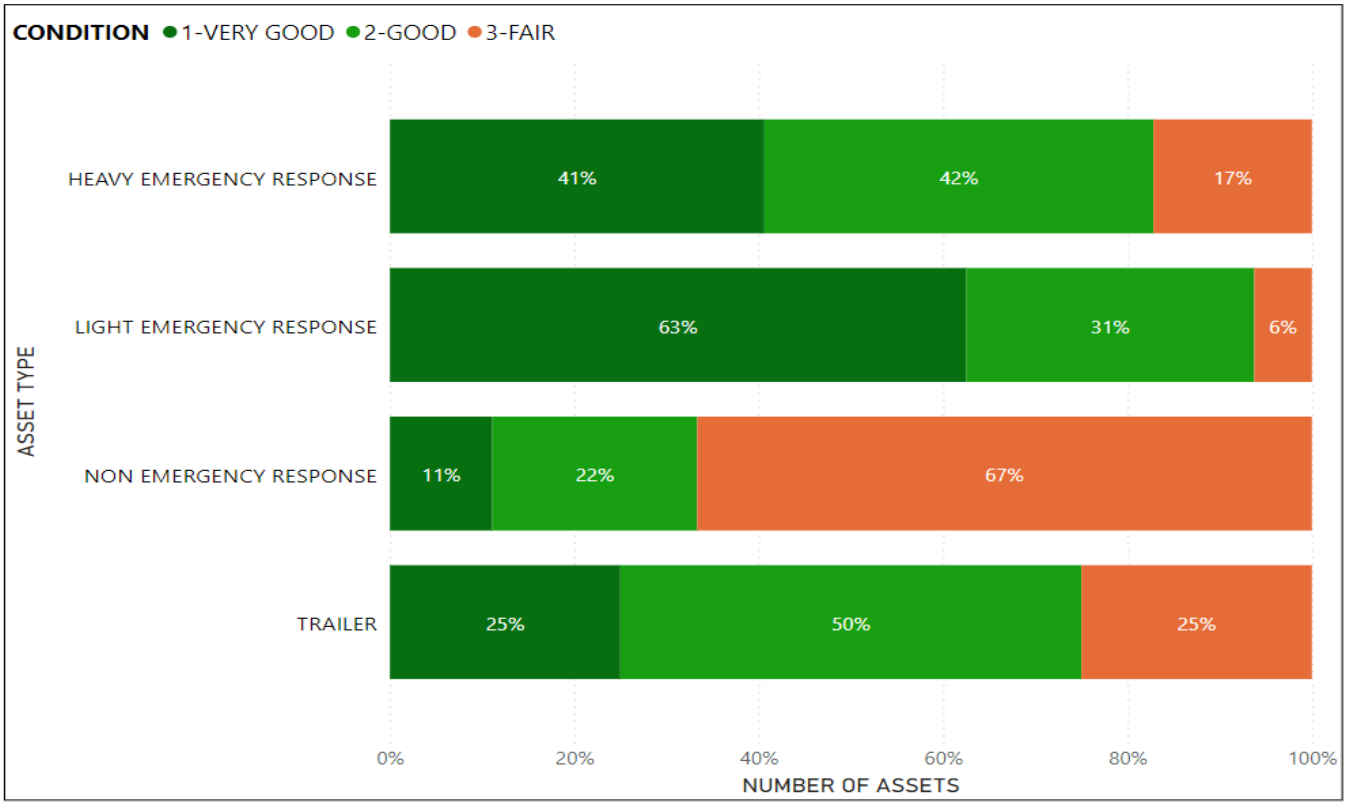
Although vehicles are inspected, there is currently no formal condition rating assigned to each vehicle. A continuous improvement item identified in ***Table 28*** is to incorporate a condition rating during regular vehicle inspection/maintenance activities since there are often indicators during these inspections that can predict the remaining useful life of the asset which will assist Hamilton Fire Department with capital forecasting for all vehicles. In addition, collecting this data will allow the fire department to confirm or revisit the vehicle replacement frequency as there is typically a point in a vehicle's lifecycle where it is more costly to operate and maintain the asset than it is to renew.

The condition profile of Hamilton Fire Department's vehicle assets is shown in ***Figure 5.*** At this time the average condition of the heavy emergency response vehicle assets is considered to be **Good** based on a condition estimated by maintenance probability based on age and weighted by replacement cost.

The large number of non-emergency response vehicles showing **Fair** condition below indicates many of these vehicles are approaching their Estimated Service Life. This is due to a current supply chain shortage as a result of COVID-19 and these vehicles are scheduled for renewal per the renewal plan in **Section 8.3**. Even though a vehicle has reached its Estimated Service Life, it does not mean that the vehicle is not in acceptable working condition, but it does mean

that the vehicle will require replacement in the near future and the likelihood of a mechanical breakdown can increase.

Figure 5: Vehicles Asset Condition Distribution



3.2.2.3 ASSET USAGE AND PERFORMANCE

The largest performance issues with Hamilton Fire Department vehicles involve assets approaching their Estimated Service Life or not being inspected at the recommended frequency. The known service performance deficiencies in ***Table 9*** were identified using staff input.

Table 9: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Vehicle	**Various**	Vehicles approaching service life recommendations	Microchip shortage caused by COVID-19 pandemic causing difficulty in replacing assets at desired frequency. Procurement policies can also limit Hamilton Fire Department vendor access.

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
		Not all vehicles inspected at recommended frequency or detail	Current demand increases on mechanical staff to maintain both Hamilton Fire Department and Hamilton Paramedic Service vehicles. At the time of writing of this report, the fire department does not currently have enough bays, mechanics, and equipment to maintain all vehicles at the highest standard.

3.2.3 EQUIPMENT PROFILE

At the time of writing this Asset Management Plan, not all individual Equipment assets had readily available information relating to their individual age, condition, or a condition methodology formally tracked and therefore age, condition profiles, and a condition methodology could not be accurately created following Asset Management methodology. In addition, there are no known performance issues with these assets. A continuous improvement item identified in **Table 28** is to formally track age and create condition methodologies for major assets using the Asset Management 5-point scale shown in ***Table 5.***

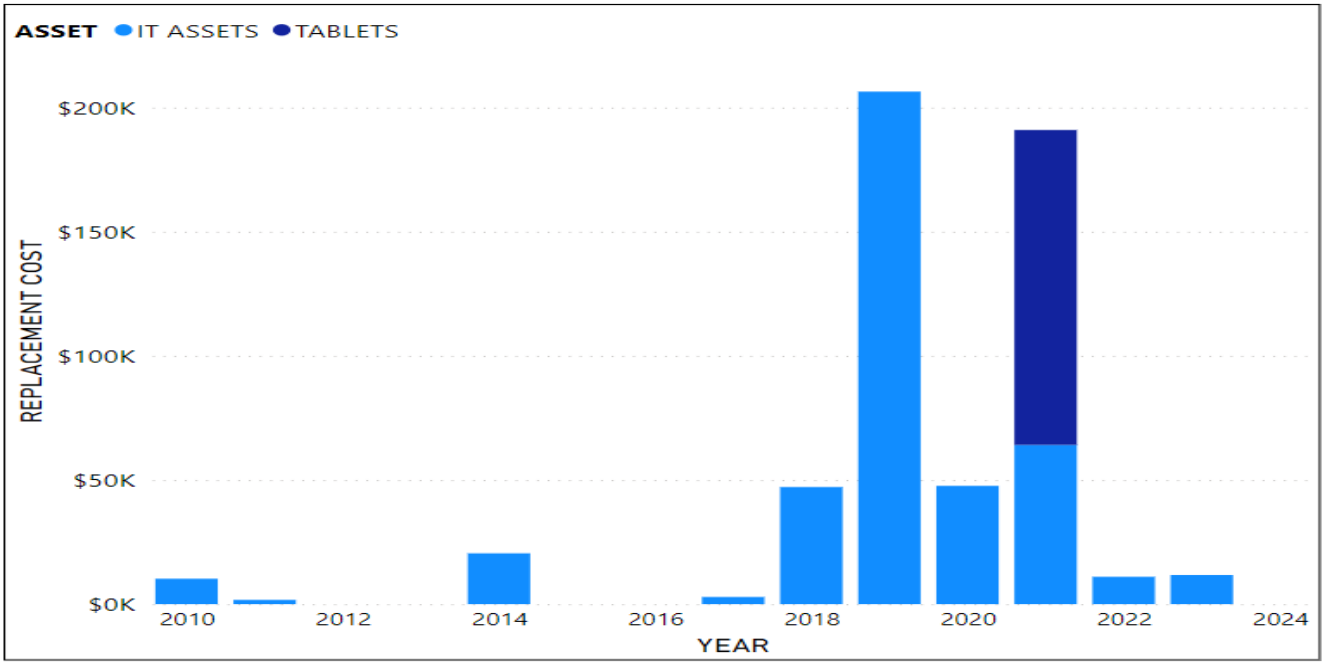
3.2.4 TECHNOLOGY PROFILE

3.2.4.1 AGE PROFILE

At the time of writing this Asset Management Plan, as with Equipment assets many high value Information & Communications Technology assets do not have age formally readily tracked for each individual item. The age profile for assets where this information is available is shown in **Figure 6**. Similarly, to above, a continuous improvement item identified in ***Table 28*** is to formally track age and create condition methodologies for major assets using the Asset Management 5-point scale shown in ***Table 5.***

The Information & Communications Technology assets with known ages have estimated service lives of four years. Since these assets have relatively short Estimated Service Lives, they will repeat throughout the renewal forecast shown in **Section 8.3.** It is evident from the figure below that there are assets beyond their Estimated Service Life and therefore these assets will also appear in the renewal backlog in **Section 8.3**. However, since the costs of these assets are far less than Facility and Vehicle assets, they are not the most significant driver for renewals.

Figure 6: Information & Communications Technology Age Profile

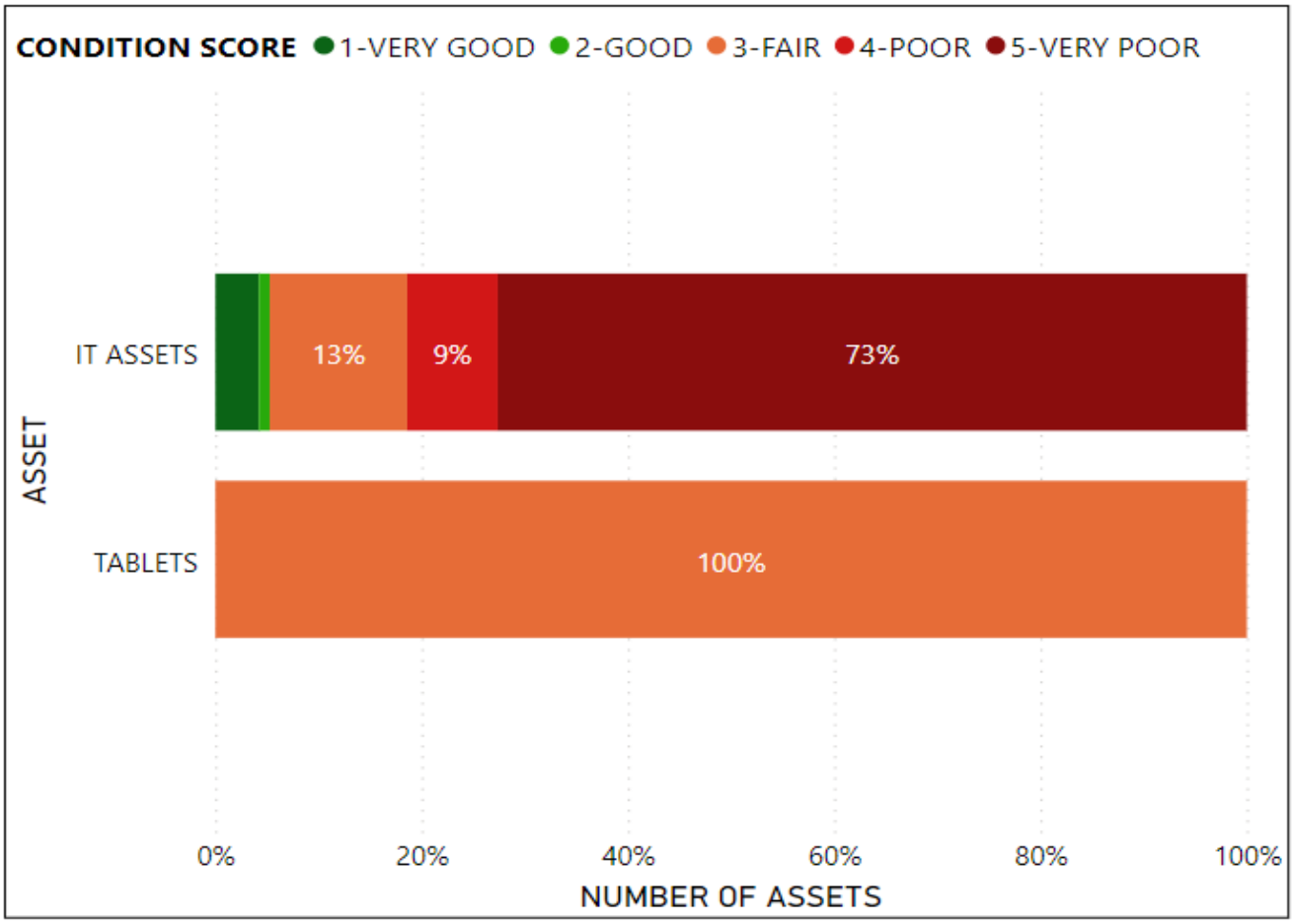


3.2.4.2 CONDITION METHODOLOGY & PROFILE

Currently, Information and Communications Technology assets do not have a formal method to determine condition and therefore age has been used to estimate the condition of these assets where age is known. This has been identified as a continuous improvement item in ***Table 28.***

The condition profile of the City's assets is shown in **Figure 7**. At this time, the average condition of Information & Communications Technology assets is considered to be Unknown since the highest value assets do not have age information available. Due to the condition methodology, many Information & Communications Technology assets have a significant amount of assets showing poor or very poor condition because they are approaching or beyond their Estimated Service Life, but this does not mean they are not in acceptable working condition.

Figure 7: Information and Communications Technology Asset Condition Distribution



3.2.4.3 ASSET USAGE AND PERFORMANCE

The largest performance issues with Information and Communications Technology assets involve obsolete or unsupported technology. The known service performance deficiencies in ***Table 10*** were identified using staff input.

Table 10: Known Service Performance Deficiencies

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Pagers	Obsolete Technology	Pagers are beginning to be an unsupported technology which are becoming expensive to maintain. There are modern alternatives which utilize existing mobile services which are also more dependable. Pagers are currently being investigated for disposal.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Mobile & Portable Radios	Assets becoming unsupported	Mobile and Portable radios are currently proposed to be replaced because these assets are beginning to become unsupported by the vendor. Radios are replaced in bulk to reduce risk and ensure everyone is trained on the same system.

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 Hamilton Fire Department 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 Asset Management Plan Overview.

4.1 SURVEY METHODOLOGY

To develop customer values and customer levels of service, a Customer Engagement Survey entitled *Let's Connect, Hamilton – City Services & Assets Review: Hamilton Fire Department* was released on July 24, 2023 on the Engage Hamilton platform and closed on August 28, 2023. The survey results can be found in Appendix "A".

The survey received submissions from 92 respondents and contained 20 questions related to the Hamilton Fire Department delivery of service. For the purposes of this report, data has been evaluated from a confidence level perspective (margin of error at 95% confidence in sample size) and a data consistency (standard deviation) perspective per ***Table 11*** below.

Table 11: Data Confidence Levels

GRADE	DATA CONSISTENCY (STANDARD DEVIATION)	CONFIDENCE LEVEL (MARGIN OF ERROR AT 95% CONFIDENCE IN SAMPLE SIZE)
Very High	0 to 0.5 – results are tightly grouped with little to no variance in response	0% to 5% - minimal to no error in results, can generally be interpreted as is
High	0.5 to 1.0 – results are fairly tightly grouped but with slightly more variance in response	5% to 10% - error has becoming noticeable, but results are still trustworthy
Medium	1.0 to 1.5 – results are moderately grouped together, but most respondents are generally in agreeance	10% to 20% - error is a significant amount and will cause uncertainty in final results
Low	1.5 to 2.0 – results show a high variance with a fair amount of disparity in responses	20% to 30% - error has reached a detrimental level and results are difficult to trust
Very Low	2.0+ - results are highly variant with little to no grouping	30%+ - significant error in results, hard to interpret data in a meaningful way

Based on an approximate population size of 570,000 and the table above, a sample size of 92 correlates to a 10.3% margin of error at 95% confidence, and therefore these survey results correspond with a maximum Medium confidence level. It is important to note that respondents were allowed to opt out of questions, and as such, different questions may have different confidence levels depending on the opt out rate for that question. Therefore, the confidence levels presented differ throughout this section and are often in the Low range. In addition, approximately 87% of survey respondents had not used Hamilton Fire Department's service, so many of the performance-based responses are likely based on the reputation of the fire department and not the fire department's actual performance.

Although the sample size correlates to a maximum medium confidence level, the data consistency also differed between questions. A high data consistency means that respondents came to the same conclusion more often for a question, whereas a low data consistency means that there is a split in respondent's opinions. Therefore, while Corporate Asset Management may be able to improve survey confidence levels over time by increasing the survey sample size, it may not be possible to improve data consistency over time as this depends on the opinions of the respondents, and may require additional insight on why respondents opinions are split. A low consistency of data does not mean the data is bad, but it does mean that it is difficult to make decisions using that information. Overall, Hamilton Fire Department's data consistency was typically medium across all questions indicating most respondents are generally in agreeance.

While these surveys were used to establish customer values and customer performance measures, it is important to note that there were also limitations to the survey methodology which may also reduce the confidence level in the survey data. The survey was only released using an online platform and did not include telephone surveys and consequently there is no way to confirm the identity information provided in the survey. In addition, the survey did not control for IP addresses, and therefore it is possible that respondents could complete the survey more than once and skew the survey results.

When reviewing the demographic responses for the survey, there was no clear evidence that the survey results had been skewed. When comparing the age and postal code demographics from the survey, to the age and postal code demographics for the City, there does not appear to be a significant over-representation of any age or postal code demographic within the survey. In addition, the responses were distributed across the City with responses from most communities, however, there were limited responses from minority self-identifications. When assessing the spikes in respondents per day, the results were distributed across different ages and postal codes.

Therefore, although there are limitations to the survey methodology, it does appear that these results can be used to provide some context about the feelings of customers on the services the Hamilton Fire Department provides, but decisions should not be made based on this survey alone.

The future intent is to release this survey on a more regular basis to measure the trends in customer satisfaction over time and ensure that the City is providing the agreed level of service. In addition, the next survey will have an improved marketing and surveying strategy by both incorporating telephone surveys and/or IP controls to improve confidence levels in the survey responses. In addition, these results will be reviewed and improved upon for the next iteration of the Asset Management Plan. This has been noted in ***Table 28*** in the continuous improvement section.

4.2 CUSTOMER VALUES

Customer values are what the customer can expect from their tax dollar in "customer speak" which outlines 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 *Let's Connect, Hamilton – City Services & Assets Review: Hamilton Fire Department* survey.

Table 12: Customer Values

SERVICE OBJECTIVE:			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
Fighting Fires and Rescue Operations are Very Important services provided by HFD.	2023 Hamilton Fire Department City Services & Assets Review Survey	The average survey respondent rated fighting fires and rescue operations as the most important services that Hamilton Fire Department should be responsible for providing with a high data consistency.	Maintain

SERVICE OBJECTIVE:			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
All services offered by Hamilton Fire Department **are important to the community.**		Survey respondents indicated all services Hamilton Fire Department provides as Important or greater.	Maintain
The majority of respondents were aware of Hamilton Fire Department **response models.**		Over half (59%) of survey respondents were aware that Hamilton Fire Department has three models for fire and emergency response.	Maintain
Customers prefer that Hamilton Fire Department **maintain their current service level.**		The average survey respondent indicated that they would like Hamilton Fire Department to maintain the current service level with a medium data consistency.	Maintain
Overall customers would recommend Hamilton Fire Department **to others.**		The majority (75.8%) of survey respondents would recommend Hamilton Fire Department to others especially with respect to fighting fires and rescue operations.	Maintain

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 level of service measurements relate to how the customer feels about the Hamilton Fire Department in terms of their quality, reliability, accessibility, responsiveness, sustainability and over 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 under used? Do we need more or less of these assets?

In ***Table 13*** under each of the service measures 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 currentt budget allocation.

It is important to note that many of Hamilton Fire Department customers are internal customers (e.g., staff) as they are the main users of most of fire department assets (i.e. facilities, vehicles, equipment, communications & information technology). For this first iteration of the Asset Management Plan the focus was on external customers (i.e. the Public), and as a result there are some gaps within the alignment between customer and technical levels of service as discussed in **Section 4.5**.

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	Provide adequate fire protection services in accordance with municipality needs and circumstances.	2023 Hamilton Fire Department City Services & Assets Review Survey	Average survey respondent opinion on how Hamilton Fire Department has performed overall in the last 24 months in all service areas	Good	Maintain
		Confidence level		Low	
		Data Consistency		Medium	
	Be fiscally responsible when delivering services.	2023 Hamilton Fire Department City Services & Assets Review Survey	Average survey respondent opinion on if Hamilton Fire Department is providing good value for money when providing infrastructure and services.	Good	Maintain
		2023 Hamilton Fire Department City Services & Assets Review Survey	Average survey respondent opinion on if they felt safe and comfortable accessing Hamilton Fire Department services.	Comfortable	Maintain
		Confidence level		Low	
		Data Consistency		Medium	
Function	Provide adequate fire protection services in accordance with municipality needs and circumstances.	2023 Hamilton Fire Department City Services & Assets Review Survey	Average survey respondent opinion on if Hamilton Fire Department is meeting service needs overall	Exceeds Needs	Maintain
		Confidence level		Low	
		Data Consistency		Medium	
	Ensure Hamilton Fire Department can reliably respond to emergency calls within an acceptable timeframe.	2023 Hamilton Fire Department City Services & Assets Review Survey	Average survey respondent opinion on if Hamilton Fire Department response times for an Effective Firefighting and Rescue Force are meeting service needs overall (Urban)	Meets Need (Less than 10 minutes desired)	Maintain
		2023 Hamilton Fire Department City Services & Assets Review Survey	Average survey respondent opinion on if Hamilton Fire Department response times for an Effective Firefighting and Rescue Force are meeting service needs overall (Composite)	Does Not Meet Needs (Less than 10 minutes desired)	Maintain
		2023 Hamilton Fire Department City Services & Assets Review Survey	Average survey respondent opinion on if Hamilton Fire Department response times for an Effective Firefighting and Rescue Force are meeting service needs overall (Rural)	Does Not Meet Needs (Less than 10 minutes desired)	Maintain
		Confidence level		Medium	
		Data Consistency		High	
Capacity	Ensure Hamilton Fire Department services are accessible to the public when required.	2023 Hamilton Fire Department City Services & Assets Review Survey	Average survey respondent opinion on if Hamilton Fire Department services are satisfied with their ability to be accessed overall	Neutral	Maintain
		Confidence level		Very Low	
		Data Consistency		Low	

4.3.1 CUSTOMER INDICES

The three indices calculated to assess how customer expectations are aligning with the perceived performance for Hamilton Fire Department are listed below in ***Table 14.*** These indices are explained and analyzed in detail in the sections below and will eventually be included for all assets (when available) in the overall measures in the Asset Management Plan Overview.

Table 14: Customer Indices

CUSTOMER INDICES	AVERAGE RESULT
Service Importance Versus Performance Net Differential	-5
Net Promoter Score (%)	62

As previously mentioned, since the survey had a sample size corresponding to a maximum medium confidence level there is a minimum margin of error throughout the survey results of 10%. In addition, approximately 87% of survey respondents had not used any aspect of Hamilton Fire Department's service, meaning that many of the results are based on public perception of the service and not a customer's experience of Hamilton Fire Department's performance. Therefore, it is difficult to make any conclusive decisions based on this survey alone. The information below is intended to provide context around the survey results to assist Hamilton Fire Department with areas to further investigate before proposing any new levels of service.

SERVICE IMPORTANCE VERSUS PERFORMANCE INDICE

The Service Importance versus Performance indices is used to determine if a service's importance correlates with the perceived performance. Service areas where the average importance rating exceeds the average performance rating by 20 points is indicative of a mismatch between expectations and service levels, equal to one point on the Likert scale.

Per **Figure 8** below, the net differential does not exceed 20 points for any of services with a medium data consistency meaning that typically there is a match between the importance of the service and how Hamilton Fire Department is perceived to be performing in that aspect of the service. The services with the largest mismatch are the City Emergency Preparedness Program, Fire Prevention Public Education Programs, and Inspection and Fire Code Enforcement, which are areas were the Hamilton Fire Department could investigate improving performance if the fire department were to consider proposing different levels of service. To reduce the net differential, the Hamilton Fire Department would have to increase their performance to Very Good for these services, which they would accomplish by altering their Technical Levels of Service explained in ***Section 4.4***. However, since on average 87% of respondents had not used any aspect of the Hamilton Fire Department service, these results are based on the customer's perception of Hamilton Fire Department's 's performance, and not customer experience with Hamilton Fire Department performance.

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Figure 8: Importance versus Performance Index Score

Service Area	Importance (index score)	Performance (index score)	Net Differential	Opt Out %
Total	**86**	**80**	**-5**	**20%**
Fighting Fires	97	88	-8	9%
Rescue Operations	93	88	-4	11%
Response to Gas Leaks	90	86	-4	21%
Inspection and Fire Code Enforcement	88	78	-10	23%
Hazardous Materials Operations	88	80	-8	24%
City Emergency Preparedness Program	87	73	-14	23%
Fire Prevention Public Education Programs	87	75	-11	20%
Responses to Life-Threatening Medical Calls	83	83	0	10%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	79	74	-4	26%
Fire Station Tours, Fire Truck School, Visits	78	76	-2	23%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	74	73	-1	31%

NET PROMOTER SCORE INDICE

The Net Promoter Score indices outline how likely an individual is to recommend a service to another person and measures customer loyalty. For municipal services, this score is difficult to interpret because often individuals do not have many alternatives for utilizing different services and there may be internal biases for certain service areas, however, this score does provide 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 4 are considered to be 'Detractors' meaning that they would not recommend the service. While scores of 5 are considered 'Promoters' who would recommend the service. Scores of 4 are considered 'Passive' which means they do not have strong feelings about the service and as such 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 Standard Deviation (σ) is also calculated in a percentage, the same units as the Net Promoter Score.

Based on the results below in ***Figure 9,*** Hamilton Fire Department has a net positive net promoter score indicating that on average customers would recommend HFD services to others. The three lowest scoring aspects of the service are Fee-Based Services, City Emergency Preparedness Program, and Fire Permits.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Figure 9: Net Promoter Score (NPS)

Service Area	σ	NPS	Detractors	Passives	Promoter
All Service Areas	**20.87**	**62.18**	**96**	**75**	**535**
Fighting Fires	17.79	75.68	5	8	61
Rescue Operations	18.30	70.00	7	7	56
Hazardous Materials Operations	22.05	68.33	7	5	48
Response to Gas Leaks	17.74	66.67	7	8	51
Fire Station Tours, Fire Truck School, Visits	22.50	63.49	8	7	48
Fire Prevention Public Education Programs	20.96	62.12	10	5	51
Inspection and Fire Code Enforcement	18.81	60.32	9	7	47
Responses to Life-Threatening Medical Calls	24.44	60.00	11	8	56
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	19.99	55.36	10	5	41
City Emergency Preparedness Program	23.42	49.15	11	8	40
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	21.48	46.30	11	7	36

SERVICE RATES VERSUS VALUE FOR MONEY INDICE

The Service Rates versus Value for Money indice is used to determine if the rate an individual is paying for a service correlates with the perceived value for money. Service areas where rate level ratings exceed value for money ratings by 20 points is indicative of a mismatch between expectations and service levels, equal to one point on the Likert scale. Positive Net Differential values indicate that 'Value for Money' was greater than willingness for 'Rates'. Low index scores in 'Rates' indicate that respondents are not willing to pay increased rates for the service area. All values were calculated and then rounded to the nearest whole number.

This indice was not measured for this iteration of the Hamilton Fire Department *Asset Management Plan.*

4.4 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.[3]

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

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Table 15 shows the activities expected to be provided under the current 10-Year Planned Budget Allocation and the Forecast activity requirements being recommended in this Asset Management Plan. Currently, these values are estimated based on the budget, but were not perfectly delineated in the capital and operating budgets and forecasts and may change in future iterations of the plan.

Table 15: Technical Levels of Service

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE (2022)	CURRENT TARGET PERFORMANCE (2022)	PROPOSED 10-YEAR PERFORMANCE
Acquisition	Ensure Hamilton Fire Department services are accessible to the public when required.	Number of new facility acquisitions	0	0	7
		Budget	**$0**	**$0**	**$81.5M**
Operation	Provide adequate fire protection services in accordance with municipality needs and circumstances.	% of Firefighters who have completed medical training (CPR/Dfib)	81%	75%	100%
		% of Firefighters who have completed Self Contained Breathing Apparatus training (mask drill)	87%	98%	98%
		% of Firefighters completed required annual FitTest (2022)	88%	98%	98%
		% of Ladder Truck Non Destructive Testing (safety testing)	100	100	100
		% of Pump Tests	100	100	100
		Average # of days to close a file (inspections) to bring properties	33.71	35	35

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE (2022)	CURRENT TARGET PERFORMANCE (2022)	PROPOSED 10-YEAR PERFORMANCE
Operation		into compliance for files that are one specific high priority type (i.e., Action Requests: fire suppression action requests as coded in the records management system)			
		Average # of days to assign/respond Action Request type files.	3.55	3	3
		% Vulnerable occupancy inspections (in 2022 there were 124 vulnerable occupancy buildings, and all were inspected)	100%	100%	100%
		Budget	**$178K (2023)**	**Not yet quantified**	
	Ensure Hamilton Fire Department can reliably respond to emergency calls within an acceptable timeframe.	Overall effective firefighting and rescue force composite response times (mins)	15.87	< 18.89	< 18.89
		Overall effective firefighting and rescue force urban response times (mins)	9.7	< 10.9	< 10.9

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE (2022)	CURRENT TARGET PERFORMANCE (2022)	PROPOSED 10-YEAR PERFORMANCE
		Overall effective firefighting and rescue force rural response times (mins)	20.51	< 20.75	< 20.75
	Be fiscally responsible when delivering services.	Actual Operating Expenditures vs Planned Budget	101%	90 – 100%	90 – 100%
		Budget	**$96.1M (2022)**	**Not yet quantified**	
Maintenance	Ensure Hamilton Fire Department assets are maintained in acceptable condition.	Average downtime for Vehicles sent for repairs in 2022 (in days)	Not yet measured	Not yet measured	Not yet measured
		Average days vehicles sent out for warranty repairs	Not yet measured	Not yet measured	Not yet measured
		Vehicles hitting maintenance targets	Not yet measured	Not yet measured	Not yet measured
		Budget	**Not yet quantified**		
Renewal	Ensure Hamilton Fire Department assets are maintained in acceptable condition.	Average Facility Condition Index of Fire Occupied Stations	8.9%	Currently no target	Currently no target
		Budget	$808K (2023)	Not yet quantified	
		% of in-service vehicles over replacement frequency target	26%	Currently no target	Currently no target
		Budget	$5.2M (2023)	$5.2M (2023)	$37.9M (2023 – 2032)

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

It is important to note that these metrics were created specifically for this 2023 Asset Management Plan with available data and some of these metrics are not yet being measured. Many of these metrics should be improved to include a target to be in line with SMART objectives identified on **Page 43** of the Asset Management Plan Overview. The Hamilton Fire Department will work to improve upon their lifecycle platforms by working towards the creation of one tool that will track performance metrics. This has been identified as continuous improvement items in ***Table 28.***

4.5 PROPOSED LEVELS OF SERVICE DISCUSSION

It is evident per ***Table 15*** that Hamilton Fire Department is often meeting technical standards with some exceptions. However, customer preferences and expectations do not always match internal technical targets. Since the confidence level associated with the survey is a maximum of medium, and most survey respondents were not actual users of the service, it is difficult to make any conclusive decisions based on this initial survey. Therefore, Hamilton Fire Department will need to collect more consumer data before proposing any new levels of service. Therefore, it has been assumed in the interim that the current levels of service will be the proposed levels of service moving forward past 2025 in accordance with O. Reg 588/17.Therefore, the information below is intended to provide context to direct Hamilton Fire Department to areas for further investigation before proposing any new levels of service.

In addition, as previously mentioned, many of Hamilton Fire Department's asset customers are internal customers (e.g. staff) as they are the main users of fire department assets. For this first iteration of the Asset Management Plan the focus was on external customers (i.e., the Public), and as a result there are some gaps in the information below with respect to internal customers. This has been identified as a continuous improvement item in ***Table 28***.

CONDITION / QUALITY

Based on the Customer Levels of Service **Table 13** and Technical Levels of Service **Table 15**, it is evident that typically customer expectations match Hamilton Fire Department's service levels.

Survey respondents thought that Hamilton Fire Department had good performance overall and they felt comfortable using Hamilton Fire Department's services. Hamilton Fire Department's technical targets indicate that fire department hit most of their training, testing, and inspection targets for 2022 showing a match in customer expectations and technical targets.

In terms of providing good value for money, customers rated that the Hamilton Fire Department provided good value for money, and when comparing that to technical levels of service, there is only a 1% budget variance in 2022 showing a match in customer expectations and technical targets.

As previously mentioned, the Hamilton Fire Department does not yet have an internal survey to survey internal staff on the condition of assets, and the fire department does not yet have measures or targets for maintaining assets in acceptable condition. This has been identified as a continuous improvement item in ***Table 28.***

FUNCTION

Survey respondents thought that the Hamilton Fire Department was exceeding service needs overall. However, when asked about response times, there was a mismatch in customer expectations and fire department service delivery.

The Hamilton Fire Department measures their response times by how quickly they can respond on site as an Effective Firefighting and Rescue Force. It is important to note that an Effective Firefighting and Rescue Force is distinctly different from the first truck on scene. An Effect Firefighting and Rescue Force refers to having a minimum of four fire trucks and 16 firefighters on site and includes the time for dispatchers to receive the call, gather information and alert fire stations, as well as for firefighters to dress in protective clothing, board fire trucks, and then travel from the fire station to the emergency scene. Depending on where the emergency is in the City (i.e. urban, composite, rural), the response model may involve career firefighters who are stationed at the station and can immediately respond, or composite or volunteer models where firefighters need to travel to the station to respond.

Per **Table 13,** regardless of location in the City, customers expected the Hamilton Fire Department to respond as an effective firefighting and rescue force in less than 10 minutes. Currently, per **Table 15**, urban models are meeting that expectation at 9.7 minutes, but their target is currently just over 10 minutes (90th percentile of 10.9 minutes). In areas of the City rated for composite or volunteer models, the Hamilton Fire Department's targets are a 90th percentile of 18.89 and 20.75 minutes respectively. Therefore, if the Hamilton Fire Department were to propose a different level of service, this is an area where the focus should be. However, it is difficult to make this decision with the limited customer data available in this Asset Management Plan.

Although rural areas typically have a longer effective firefighting and rescue force time, the Hamilton Fire Department has worked to provide rural areas with an adequate level of service. Rural areas in the City do not have fire flow as part of their water system, but the Hamilton Fire Department has worked to receive "Superior Tanker Shuttle" accreditation by Fire Underwriter Survey for the non-hydrant areas in the City, which is considered as equivalent to hydrant protection. This means that rural areas are paying the same in fire insurance as urban areas with hydrants.

CAPACITY

Customers rated their satisfaction with their ability to access services as predominately neutral but were instructed to choose "Can't Say" if they had not used the service. Based on this stipulation, it became apparent that 87% of survey respondents had not used the service, and therefore these results have a very low confidence level.

The Hamilton Fire Department is currently working toward acquiring additional assets such as Waterdown Station as well as expanding and/or renovating existing stations which are indicated in **Section 8.1**. This may result in changes to the current levels of service which are difficult to quantify at this time, but the intent of these projects is to maintain the current levels of service, and it is not anticipated these acquisitions will affect the Hamilton Fire Department's response model.

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 and identify the best way of meeting the current demand while also 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 (assumption of assets due to service needs) and types of service required (e.g., Next Generation 911).

5.1 DEMAND DRIVERS

For the Hamilton Fire Department service area, the key drivers are population change, and technological changes.

- Demographic Shift
  - Per the Asset Management Plan Overview, Hamilton's population will continue to grow to 2051, and per the HFD 10 Year Service Delivery Plan, it is evident that Hamilton's demographics will also continue to shift to 2028. The Hamilton Fire Department determine their vehicle and staffing requirements using community risk because typically responses are behaviour based and is pursuant to the Establishing and Regulating By-law 19-034 and the Fire Protection and Prevention Act, 1997.

- Technological Changes:
  - At this time, the Canadian Radio-Television and Telecommunications Commission (CRTC) has mandated that all municipalities replace Canada's aging E911 emergency services network and cutover to the new Next Generation-911 (NG-911) platform by March 4, 2025, this is a large change that the Hamilton Fire Department as well as Hamilton Police and Hamilton Paramedics Services have been preparing for with the assistance of the Information Technology division.

  - The Building Stock is currently changing. Newer buildings burn hotter and faster due to material changes. In addition, vertical combustible buildings used to be limited to 4-storeys before requiring fire resistant materials (i.e., concrete), and now the building code has changed to allow five and six-storey buildings to be built with these materials. As customer preference for the "vertical city" continues, more of these buildings will continue to be built.

- Legislative Changes
  - Office of Fire Marshal of Ontario is now dictating that all Hamilton Fire Department staff require official certification to National Fire Protection Association (NFPA) standards whereas before there was no official certification process in Ontario.

A continuous improvement item identified in **Table 28** is to align the Asset Management Demand Drivers work with the data and community risks identified in core Hamilton Fire Department planning documents.

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***. Growth projections have been shown on ***Page 45*** in the AM Plan Overview document.

Where costs are known, these additional demands as well as anticipated operations and maintenance costs have been encompassed in the Lifecycle Management Plans in **Section 8.0.**

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 ***Table 16.*** 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.*** Climate change mitigation and adaptation demands are included in **Section 7.0**. Many of these demands are difficult to predict at this time and therefore they are not included in the Lifecycle Management Plan. This has been identified as a continuous improvement item in ***Table 28*****.**

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Table 16: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Demographic Shift: Community Risk Profile Change **Demographic Shift: Community Risk Profile Change**	570,000	820,000 (2051)	Increased number of incidents/ responses. Type of development may alter the relative risk profile which would drive a change in service delivery (i.e., a change from volunteer to composite, composite to fulltime etc.). In addition, growth may lead to increased traffic affecting response times.	Update emergency response procedures for higher risk occupancies based on the Hazzard Identification and Risk Assessment and the Community Risk Assessment. Investigate change of level of response in key areas. Construct a new station in Waterdown and relocate fulltime Hamilton Fire Department resources from existing Parkside location. Increase number of volunteer firefighters at volunteer stations.
Technological Change: Building Stock	Majority of buildings built using traditional materials	Building stock changing to new building materials, and vertical buildings now being permitted to be constructed with light construction.	Increased risk for fires and property damage impacting services of suppression, prevention, and inspections.	Conduct pre-tactical surveys of all risk occupancies and store these in an Hamilton Fire Department database currently being collected during Community Risk Assessment.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Legislative Change: Office of Fire Marshal of Ontario (OFM)	Training followed National Fire Protection Association standards, but no formal certification.	Ontario Fire Marshal recognize and require full certification as per National Fire Protection Association criteria.	Impact on staffing requirements and training needs.	Proposed business case is being brought forward in 2024 for more training staff.
Legislative Change: Paramedic Vehicles	Ambulances need inspection every. 10,000 km or 120 day whichever occurs first and every 12 months there is an Ministry of Transportation inspection which we try to do concurrently with a 10k inspection.	Ambulances need inspection every 10,000 kms	Impact on mechanical staffing and asset requirements.	Proposed business case is being brought forward in 2024.
Technological & Legislative Change: Next Generation (NG)-911	Legacy 911	New proposed NextGeneration-911 from Canadian Radio-television and Telecommunications Commission (CRTC).	Requires change out for technology to process emergency calls. Significant changes to facilities: primary and secondary site required.	Staffing study should be conducted to quantify operating requirements for New Generation-911 technology. Modifications and upgrades are currently being investigated.

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Customer Preference: Light Rail Transit	Status quo road width on Main and King St.	Road width reduced on Main and King St.	May impact response times because fire apparatus will not be able to maneuver as quickly.	Investigate changing fire apparatus specifications.

5.4 ASSET PROGRAMS TO MEET DEMAND

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

At this time there are approximately **$90.2 Million** in assets acquired over the next 10 years as discussed in **Section 8.1**. Acquiring new assets will commit the Hamilton Fire Department to ongoing operations, maintenance and renewal costs for the amount of time that the service is required. These future costs have been estimated when possible using available information in the Lifecycle Management Plans in **Section 8.0**, 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'4[4].

The City has released 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 also identifies the likelihood of those risks occurring, and the consequences should the event occur which calculates a risk rating. Risk options are then evaluated, and a risk treatment plan is created which will be initiated after the release of this plan and has been identified as a continuous improvement item in ***Table 28.***

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 25**. Failure modes may include physical failure, collapse or essential service interruption.

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.

It is important to note that the Hamilton Fire Department's critical assets have several existing risk controls built in and it is unlikely that these assets would approach the failure modes or impacts identified below. The credible risks associated with these assets which were identified during this iteration of the AM Plan have been presented in **Section 6.2.**

Table 17: Critical Assets

CRITICAL ASSET(S)	FAILURE MODE	IMPACT
Dispatch System	Essential Service Interruption	Loss of essential communications service.
Emergency Response Vehicles	Physical Failure	Increased response time due to not enough capacity.

[4] ISO 31000:2009, p 2

CRITICAL ASSET(S)	FAILURE MODE	IMPACT
Personal Protective Equipment	Physical Failure	Injury or death to firefighter on duty.
Apparatus Equipment	Physical Failure	Inability to fulfill purpose during emergency situation.
Facilities	Physical Failure	Loss of essential service.

6.2 RISK ASSESSMENT

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and 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 is shown in **Table 18**. It is essential that these critical risks and costs are reported to management.

A continuous improvement item in ***Table 28*** is to identify more existing controls for fire apparatus, which could involve or impact staffing levels to maintain and operate this asset AND the process of acquisition and/or renewal of this asset.

Table 18: Risks and Treatment Plans
Note * The Residual Risk Is The Risk Remaining After The Selected Risk Treatment Plan Is Implemented.

SERVICE OR ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING	RISK TREATMENT PLAN	RESIDUAL RISK *	TREATMENT COSTS
Vehicles	Asset delivery delays due to supply chain issues with vendors and impacts to fleet.	High	Investigate procurement process to reduce barriers for emergency services acquisitions.	Medium	Internal Resources
Mechanical Facility	Potential service disruption due to poor condition facility	High	Acquire mobile mechanical unit. Investigate back-up location. Investigate future new facility.	Medium	$600,000 (mobile mechanical unit) $14.5M estimated for future new facility from 2028-2032

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.

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.

We do not currently measure our resilience in service delivery and this will be included in the next iteration of the Asset Management Plan.

6.4 SERVICE AND RISK TRADE-OFFS

The decisions made in Asset Management Plans are based on the objective to achieve the optimum benefits using the available resources. Currently the Hamilton Fire Department does not have any service or risk trade-offs to report.

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've already begun to experience (adaptation). At a minimum the City must consider how to manage our existing assets given 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. As such, 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 Green House Gas emissions or enhance Green House Gas removals (e.g. electric vehicles, net-zero buildings). The City of Hamilton's Community Energy + Emissions Plan (Community Energy + Emissions Plan includes five Low-carbon Transformations necessary to achieve the City's target of net-zero Green House Gas emissions by 2050:

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

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 previously mentioned, due to the high level of uncertainty with the demand management plans for climate change, the cost of the demand impacts below are not included in the lifecycle models or levels of service at this time unless they were previously identified. 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 Green House Gas emissions reductions 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 Asset Management Plan Overview will assess projects based on these targets and will assist with the prioritization of climate mitigation projects.

Since the Hamilton Fire Department possesses Facilities and Vehicles, the transformations that relate to *transforming our buildings*, *changing how we move, growing green, and revolutionizing renewables* are the key modelled targets that the Hamilton Fire Department will have to accommodate as shown in ***Table 19*** below.

Table 19: Asset Climate Mitigation Projects

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE/ASSET	DEMAND MANAGEMENT PLAN
Transforming our buildings	By 2050, all new municipal buildings achieve net-zero emissions.	Higher initial capital cost for net zero facilities. Conversion to heat pump may not be feasible and may be costly.	Newest station (Waterdown) will be built using net-zero and LEED principles. Similar new build standards will use Waterdown Station as example. Other facilities will need to be assessed to figure out the feasibility of the proposed conversion. Funding will need to be acquired to retrofit buildings. Staff will need to be trained on new systems.
	By 2050, all municipal buildings are retrofitted to achieve 50% energy efficiency relative to 2016.		
	Post-retrofits, switch buildings to heat pumps for space and water heating by 2050.		

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE/ASSET	DEMAND MANAGEMENT PLAN
Changing how we move	100% of new municipal small and light-duty vehicles are electric by 2040. 100% of new municipal heavy-duty vehicles switch to clean hydrogen by 2040.	Significant challenges to navigate to ensure redundancy and resiliency of fire's fleet and maintaining levels of service alongside venturing into new technology. Electric Vehicle Chargers will need to be installed at all Fire Facilities, and electricity grid capacity will need to be investigated. Compensation for staff who charge City vehicles at home will need to be considered. Initial upfront capital costs for electric vehicles will be higher. National Fire Protection Association committee has not considered green vehicles in the standard	Review of business case for changing all or certain % of light-duty vehicles to electric as they age-out of the fleet and determine full-life cycle costs. Direction from the National Fire Protection Association for heavy-duty vehicles solutions will be required. Staff anticipate the following: capital and operating cost will be higher, implementation will require phases and review of risks and costs, operating costs will need to consider setting up mechanical support, training, and education/certification to maintain new types of vehicles.
Growing Green	Planting 50,000 trees a year through 2020	Adding trees may add more operating costs	Review existing facilities to determine which ones could be potential options for additional trees. For any new facilities' trees will be incorporated into the plans.
Revolutionizing renewables	By 2050, 50% of municipal buildings will add rooftop solar PV, covering 30% of	Not all facilities are a fit for rooftop solar PV and may be costly to add.	Determine timing to start reviewing potential facilities and costs to add rooftop solar PV to existing or yet to be built

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE/ASSET	DEMAND MANAGEMENT PLAN
	the building's electrical load.		facilities. Work with utility provider to ensure grid feasibility.

MITIGATION RISK ANALYSIS

Since the Hamilton Fire Department's vehicle assets are critical assets to deliver their service and the technology available is currently untested, there are risks associated with applying the *"changing how we move*" climate mitigation transformation. These risks are outlined below in ***Table 20*** and refer to the potential risks if the Hamilton Fire Department were to proceed with the above identified "*changing how we move*" climate mitigation projects.

Table 20: Adapting to Climate Change

CLIMATE MITIGATION TRANSFORMATION	SERVICE OR ASSET AT RISK DUE TO IMPACT	WHAT CAN HAPPEN	RISK RATING	RISK ADAPTATION PLAN
Changing how we move	**Response Vehicles**	Green Apparatus could be unreliable in Canadian climate and fire apparatus must be reliable.	Medium	Ensure any acquired vehicles are tested in Canadian climates and endorsed by National Fire Protection Agency.
Changing how we move	**Response Vehicles**	Electric vehicle fires can occur and be more difficult to put out than gas vehicles.	Medium	Create/implement procedures for extinguishing electric vehicle fires including fire apparatus.
Changing how we move	**Response Vehicles**	May not be able to adjust battery/intake on green apparatus to tolerate high water levels.	Medium	Prior to acquiring green apparatus, ensure the specifications allow for this capability.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

CURRENT MITIGATION PROJECTS

The Hamilton Fire Department is currently working toward climate mitigation goals. Mitigation projects the Hamilton Fire Department is currently pursuing are outlined below in ***Table 21***. The Waterdown Station project is included in the budget and quantified in the lifecycle models, but the fire apparatus anti-idling technology funding request has not yet been approved at the time of writing.

Table 21: Asset Climate Mitigation Projects

PROJECT	CLIMATE CHANGE MITIGATION TRANSFORMATION	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT
New Waterdown Station Construction	Transforming our buildings	Proposed Waterdown Station specifications call for Net Zero design.	Reduce emissions associated with facility operation.
Fire Apparatus Anti-Idling Technology Funding Request	Changing how we move	Funding has been requested from the City of Hamilton's Climate Change Reserve to install new battery powered Auxiliary Power Units which would allow Fire Apparatus to idle using battery power instead of diesel. The Hamilton Fire Department currently has over 50 apparatus that could be converted to employ this anti-idling technology.	Unlike diesel-powered Auxiliary Power Units, battery powered units emit zero Green House Gas emissions. On an annual basis, using battery powered Auxiliary Power Units to eliminate 2hrs of idling per day would result in a reduction of 40,000 lbs. of greenhouse gas emissions per vehicle. Over the lifespan of a fire apparatus (20 years), this equates to 800,000 lbs. fewer Green House Gas emissions.

CLIMATE MITIGATION DISCUSSION

At this time, the Hamilton Fire Department has already made progress toward some of the modelled target transformations as discussed below.

CHANGING HOW WE MOVE

Currently, this modelled target is a challenge for the Hamilton Fire Department because of the specific requirements for the Hamilton Fire Department vehicles. As discussed in ***Table 21***, there are currently no reliable clean fuel options for heavy response vehicles, resulting in a lot of unknowns for what infrastructure will be required for these vehicles and the potential lifecycle cost. It is anticipated that over the next decade with provincial mitigation targets, that more information will become available to assist with planning purposes, but at this time replacement costs for vehicles in the lifecycle models are based on the existing 2022 cost for gas powered vehicles. A continuous improvement item identified in **Table 28** is to review the feasibility and costs of switching Fire's heavy-duty apparatus to clean hydrogen or other clean source.

TRANSFORMING OUR BUILDINGS & GROWING GREEN

the Hamilton Fire Department is beginning to move toward the *Transforming our Buildings* targets. As shown in **Table 21**, the proposed Waterdown Station is currently being designed to Net Zero standards which is in line with the City facility's net-zero 2050 target, but at this time the total costing associated with this is unknown and will be subject to Council approval.

Finally, the Growing Green transformation, which will involve planting trees, will eventually be incorporated as part of the Facilities' initiatives as discussed in **Table 19**.

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.[5]

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.

ADAPTATION DEMAND ANALYSIS

The impact areas were incorporated into the climate change adaptation analysis for this service area by:

- Identifying the asset specific adaptation impact statements that affected the service areas;

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

- Discussing the potential impacts on the asset/service using the projected change in climate using the RCP4.5 Scenario; and,
- Proposing preliminary demand management plans to adapt to these impacts.

It is important to note that 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 and financial models at this time. The demand management plans discussed in this section should be explored by asset owners in more detail following the Asset Management Plan, and new projects should consider these adaptation impacts during the planning and design processes. Once the demand management plans are finalized, the information will be incorporated into future iterations of the Asset Management Plan. This has been identified as a continuous improvement item in ***Table 28*.**

Moving forward, a Climate Lens tool is currently being developed which will assess projects based on these targets and will assist with the prioritization of climate adaptation projects.

The adaptation impact statements identified by the Hamilton Fire Department staff which will have a potential impact on assets and services include temperature increases, and ice storms as shown in ***Table 22*** below.

Table 22: Managing the Demand of Climate Change on Assets and Services

ADAPTATION IMPACT STATEMENT	BASELINE** * (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Dryer, hotter and longer summers may affect the health and safety of local vulnerable populations.	71.6 days average length of hot season	102 days average length of hot season	Dryer and hotter summers could increase risk of outdoor grass fires and provincial impacts of forest fires outside of Hamilton resulting in fire bans due to air quality, which results in higher calls and potential enforcement for open burn.	Continue to track trends and review through the 2024 Community Risk Assessment that captures these trends and then changes would be proposed through the potential revisions to the 10-year Fire Service Delivery Plan in 2024/2025. Impacts to costs

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

ADAPTATION IMPACT STATEMENT	BASELINE** (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
More frequent and intense heatwaves will increase instances of heat-related health and safety issues, particularly for households without access to reliable air-conditioning and the homeless	2.1 average annual heat waves	4.7 average annual heat waves	Heat advisories impact staff activities (i.e. training). The 2022 Hazard Identification Risk Assessment identified extreme heat as a Moderate risk for Hamilton.	could include need for additional staffing for prevention and enforcement of bans and emergency response as fires in summer increase. Urban interface vehicles, all-wheel drive (brush trucks) meant to have capacity to go off road to assist with wild land firefighting. Will continue to investigate capability.
Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.	6.7 total heavy precipitation days (20 mm)	7.7 total heavy precipitation days (20 mm)	Flooding on roads will impact routes to respond to various emergencies. Increased flooding may result in higher number or severity of water-rescue emergencies. The 2022 Hazard Identification Risk Assessment identified flooding as a Moderate risk for Hamilton.	Begin tracking roads/routes that are regularly impacted by flooding to determine (where possible) alternate routes. Determine mechanism where Dispatch can be made aware of roads that are significantly flooded/impacted.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

ADAPTATION IMPACT STATEMENT	BASELINE** (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Changes in precipitation resulting in resulting in erosion of natural systems (i.e. water banks, escarpment erosion) leading to washouts of bridges and roadways.	844 mm average annual total precipitation	886 mm average annual total precipitation	Erosion was identified by Fire in its 2022 Hazard Identification Risk Assessment as a top 10 hazard in Hamilton with a moderate risk. Increased erosion will impact routes/roads. Increased erosion may also impact the number, frequency, and severity of rope rescue incidents.	Consider impact to costs related to training, staffing, and apparatus/equipment as frequency increases.
Increased intensity and frequency of ice storms leading to increased hazardous roads, pathways, and sidewalk conditions.	187 mm average total winter precipitation	204 mm average total winter precipitation	Increased intensity and frequency of ice storms will directly impact the number, frequency and severity of vehicle accidents Fire responds to.	Continue to track trends and review through the 2024 Community Risk Assessment that captures these trends and then changes would be proposed through the potential revisions to the 10-year Fire Service Delivery Plan in 2024/2025. Consider impact to costs related to training, staffing, and apparatus/equipment

ADAPTATION IMPACT STATEMENT	BASELINE** (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
				as frequency increases.

***RCP4.5 Scenario: Moderate projected Green House Gas concentrations, resulting from substantial climate change mitigation measures. It represents an increase of 4.5 W/m2 in radiative forcing to the climate system. RCP 4.5 is associated with 580-720ppm of CO2 and would more than likely lead to 3°C of warming by the end of the 21st century.
****Baseline and Projected numbers based on 2021 Climate Science Report.

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.

Similar to the exercise above and using the risk process in Section 1.6, 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 came up with a preliminary risk adaptation plan shown below in ***Table 23.***

It is important to note that due to the high level of uncertainty with the climate change risk adaptation plans, the cost of the mitigating the risks below have 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 Asset Management Plan, and new projects should consider these risks during the planning and design processes. Future changes will be incorporated into future iterations of the Asset Management Plan. Moving forward, the Climate Lens tool will assess projects based on these targets and will assist with the prioritization of climate adaptation projects.

Table 23: Adapting to Climate Change

ADAPTATION IMPACT STATEMENT	SERVICE OR ASSET AT RISK DUE TO IMPACT	WHAT CAN HAPPEN	RISK RATING	RISK ADAPTATION PLAN
Changes in precipitation resulting in resulting in erosion of natural systems (i.e. water banks, escarpment erosion) leading to washouts of bridges and roadways.	Emergency Response	Increased escarpment erosion may impact routes/roads.	Medium	Investigate planning routes in the event of sudden escarpment closures.
Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.	Emergency Response	Increased flooding	Medium	Investigate training staff on swift/open water rescue and potentially acquiring equipment.

CURRENT ADAPTATION PROJECTS

The Hamilton Fire Department completed a past climate change adaptation specific project which is identified below. The impact of climate change on assets and how the City will adapt is a new and complex discussion and further opportunities will be developed in future revisions of this Asset Management Plan.

Table 24: Asset Climate Mitigation Projects

PROJECT	ADAPTATION IMPACT STATEMENT	PROJECT DESCRIPTION OF CLIMATE CHANGE ADAPTATION
Fire Apparatus Intake Specification	Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.	Hamilton Fire Department apparatus have been customized since the early 2000s. The height for intake has been modified to be high mounted to reduce vehicle damage when going through high water. This was completed because the Hamilton Fire Department was experiencing challenges with City roads flooding in the past.

CLIMATE ADAPTATION DISCUSSION

INCREASED TEMPERATURE

There are many projections related to increased temperature with include heat waves, rising temperatures, increase in average temperatures, and longer summers. One demand result of hot weather is an increase in emergency response. As stated in ***Table 22***, one of the Adaptation Impact Statements shows that hot weather affects health and safety for households without access to reliable air-conditioning and unhoused individuals. During these events, this would lead to an increase in calls for emergency services. The Hamilton Fire Department and other emergency services should investigate this correlation to ensure appropriate staff and assets are available as the climate continues to shift.

Another demand result is an increase in grass fires. Urban interface vehicles with all-wheel drive capability (i.e. brush trucks) are being investigated to assist with wild land firefighting.

INCREASE IN PRECIPITATION LEADING TO EROSION AND FLOODING

Increased precipitation may lead to flooding and erosion of the escarpment which may impact routes/roads for emergency vehicle response. As mentioned in ***Table 24***, apparatus have been modified to be high mounted to reduce vehicle damage when going through high water, but there is currently no solution for potential erosion issues, which should be investigated following this Asset Management Plan.

Increase erosion and may also impact the number, frequency, and severity of rope rescue incidents. The Hamilton Fire Department and other emergency services should investigate this correlation to ensure appropriate staff and assets are available as the climate continues to shift.

INCREASE IN ICE STORMS

An increase in ice storms can lead to increased motor vehicle collisions and power outages throughout the City which can lead to more emergency response calls. Ice storms could also increase motor vehicle collisions for the Hamilton Fire Department Vehicle assets and availability of staff. The Hamilton Fire Department should investigate this correlation to ensure that appropriate staff and assets are available as climate change continues to affect the service.

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 includes costs from both the Capital and Operating budgets. Asset management focuses on how taxpayer or ratepayer dollars are invested by lifecycle stage (i.e., acquisition, operations, maintenance, renewal, disposal), and not by capital or operating budget allocation. Since both budgets contain various asset activities within different lifecycle stages, these activities have been consolidated and separated by lifecycle stage 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 stage. Future Asset Management Plans will focus on improving the understanding of Whole Life Costs and funding options. However, at this time the plan is limited on 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. A continuous improvement item included in ***Table 28*** is to modify the budget sheets to incorporate lifecycle stages so that the results can be more accurate in the next iteration of the plan.

At the time of writing, the following budgets were used to develop the budget component of the lifecycle management plan:

- the Hamilton Fire Department maintains a Capital forecast budget for 10 years into the future for asset renewals, acquisitions, and major maintenance activities for vehicle and equipment assets;
- the Hamilton Fire Department also maintains a four-year multi-year operating budget which is revisited annually which typically contains operations, minor maintenance, and minor renewal activities;
- Corporate Facilities & Energy Management maintains a 10-year capital forecast budget for Hamilton Fire Department Facility maintenance and deliver citywide programs to replace major facility components (e.g. roof replacements) which sometimes include fire department facilities. These budget amounts have been included where known; and
- The remainder of the 30-year forecast budget was either assumed based on the status quo or the 10-year average.

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.

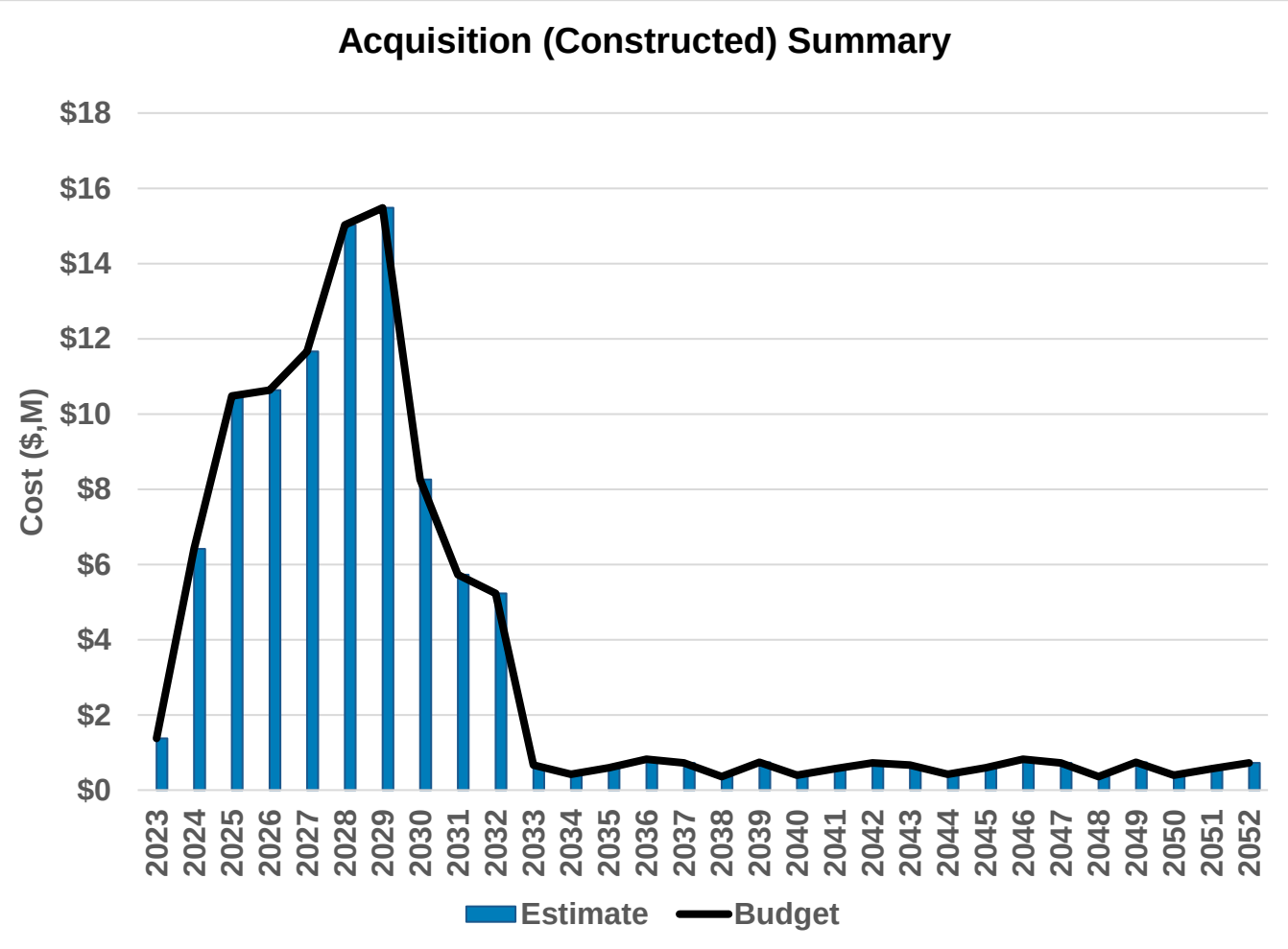
CURRENT PROJECT DRIVERS – 10-YEAR PLANNING HORIZON

Typically the Hamilton Fire Department determines acquisitions and renewals based on the level of risk to the community and makes Council requests for funding as these findings occur.

CONSTRUCTED OR PURCHASED ACQUISITIONS

For Hamilton Fire Department, assets are typically acquired through the purchase or construction of new assets which are mostly related to population growth, risk assessment, demographic shifts or technological changes as discussed in the Demand section. Over the next ten (10) Year planning period, the Hamilton Fire Department will acquire approximately **$90.2M** of purchased or constructed assets as shown below ***in Figure 10***. Hamilton will continue to monitor its constructed and purchased assets annually and update the Asset Management Plan when new information becomes available.

Figure 10: Acquisition (Constructed) Summary
All Figure Values Are Shown In 2023 Dollars.



The major acquisition expenditures over the next ten years include:

- **$65.0 Million** from 2025 – 2032 for New Station 14 acquisition, Mechanical facility relocation, and Station 6, 10, 17, and 19 renovations & additions as well as assets required to support additional staff to maintain current levels of service;
- **$16.5 Million** from 2024-2027 for Shared Waterdown Station;
- **$1.6 Million** from 2023 – 2028 in NG-911 technology assets (*this is included as a multi-year budget item from 2023-2028 in the Information Technology Budget, but has been included in the Hamilton Fire Department Asset Management Plan because the Hamilton Fire Department is considered the asset owner); and,*
- **$1.1 Million** in 2024 for NG-911 Facility Upgrades (*this is included as a multi-year budget item from 2021-2023 in the Facilities Budget but has been included in the Hamilton Fire Department's Asset Management Plan because HFD is considered the asset owner).*

.

Since many Facilities are currently in Fair condition per **Section 3.2.1** and it is predicted, the City will continue to experience rapid population growth and demographics shifts per **Section 5.0**, the Hamilton Fire Department is planning on completing major investments to renovate and/or add additions to fire department facilities as shown above. These expanded stations will require additional vehicles and equipment acquisitions to operate, which are included in the figure above and are all assumed to be funded at the time of writing. In addition, some of these upcoming projects may improve the Hamilton Fire Department's overall Facility Condition Index for existing facilities.

In addition, the Shared Waterdown Station explained in **Section 5.0** is included in ***Figure 10*** above which is being acquired to maintain levels of service.

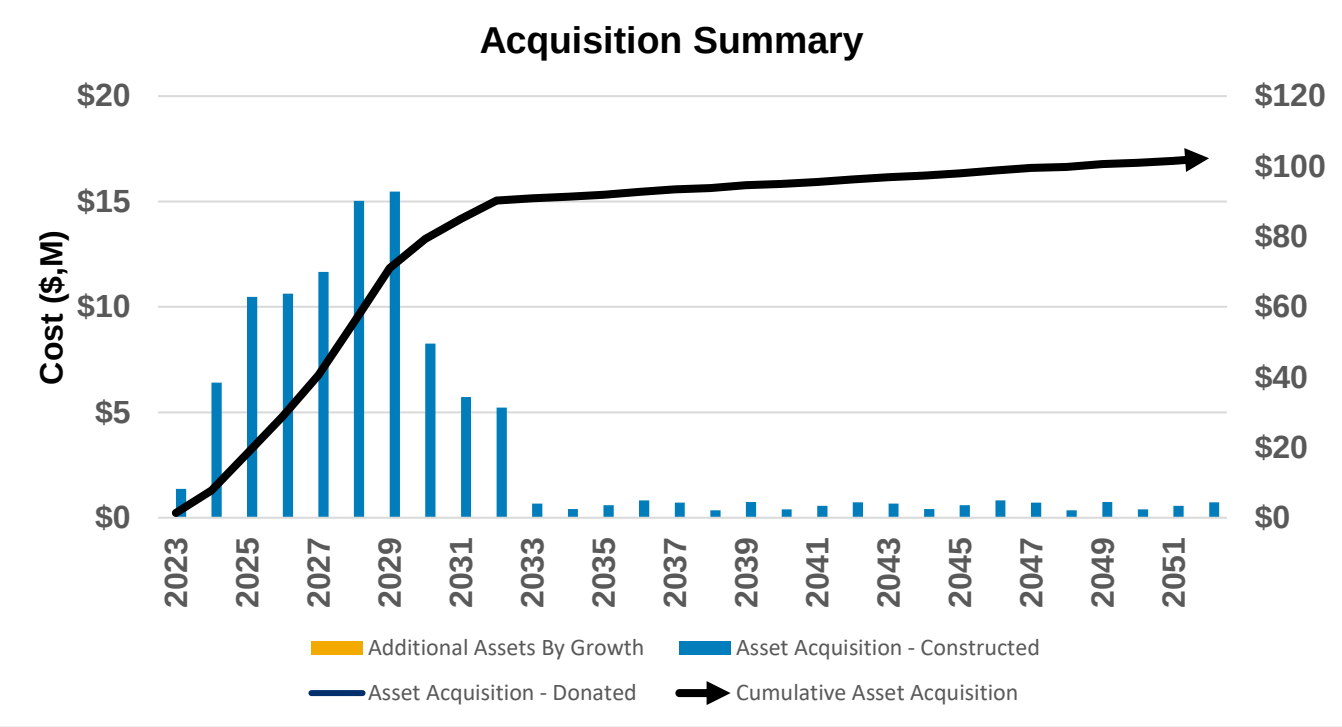
Finally, ***Figure 10***, also includes the required Facility Upgrades to support the NG-911 project explained in ***Section 5*** as well as the NG-911 technology assets allocated to the Hamilton Fire Department which are currently in the Information Technology budget.

In addition, as Asset Management knowledge, practices and abilities mature within the City, there will likely be significant projects with equally significant costs that will appear within the later years of the 30-year planning horizon in future iteration of the Asset Management Plan.

ACQUISITIONS SUMMARY

Forecast acquisition asset costs are summarized in ***Figure 11*** and show the cumulative effect of asset assumptions over the next 10-year planning period.

Figure 11: Acquisition Summary
All Figure Values Are Shown In 2023 Dollars.



When Hamilton commits to constructing or purchasing new assets, the municipality must be prepared to fund future operations, maintenance, and renewal costs, which are estimated in the sections below. Hamilton must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by Hamilton. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown in ***Figure 11***. City of Hamilton will need to address how to best fund these ongoing costs as well as the costs to construct the assets while seeking the highest level of service possible.

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. Examples of typical operational activities include operating assets, utility costs, inspections, and the necessary staffing resources to perform these activities.

Since the Hamilton Fire Department is a largely a people driven service as opposed to an asset driven service, the majority of costs required to deliver the service are employee related costs. Some of the major operational investments over the next 10 years include:

- **$90.8 Million** allocated for employee related costs in 2023 (i.e. salaries, wages, benefits, contractual agreement etc.); and,
- **$0.3 Million** allocated in 2023 for additional operating costs for the Next Generation-911 project.

Maintenance should be viewed as the ongoing management of asset deterioration. The purpose of planned maintenance is to ensure that the correct interventions are applied to assets in a proactive manner and to ensure it reaches its 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 for the Hamilton Fire Department include building component replacements, and vehicle repairs along with appropriate staffing and material resources required to perform these activities.

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

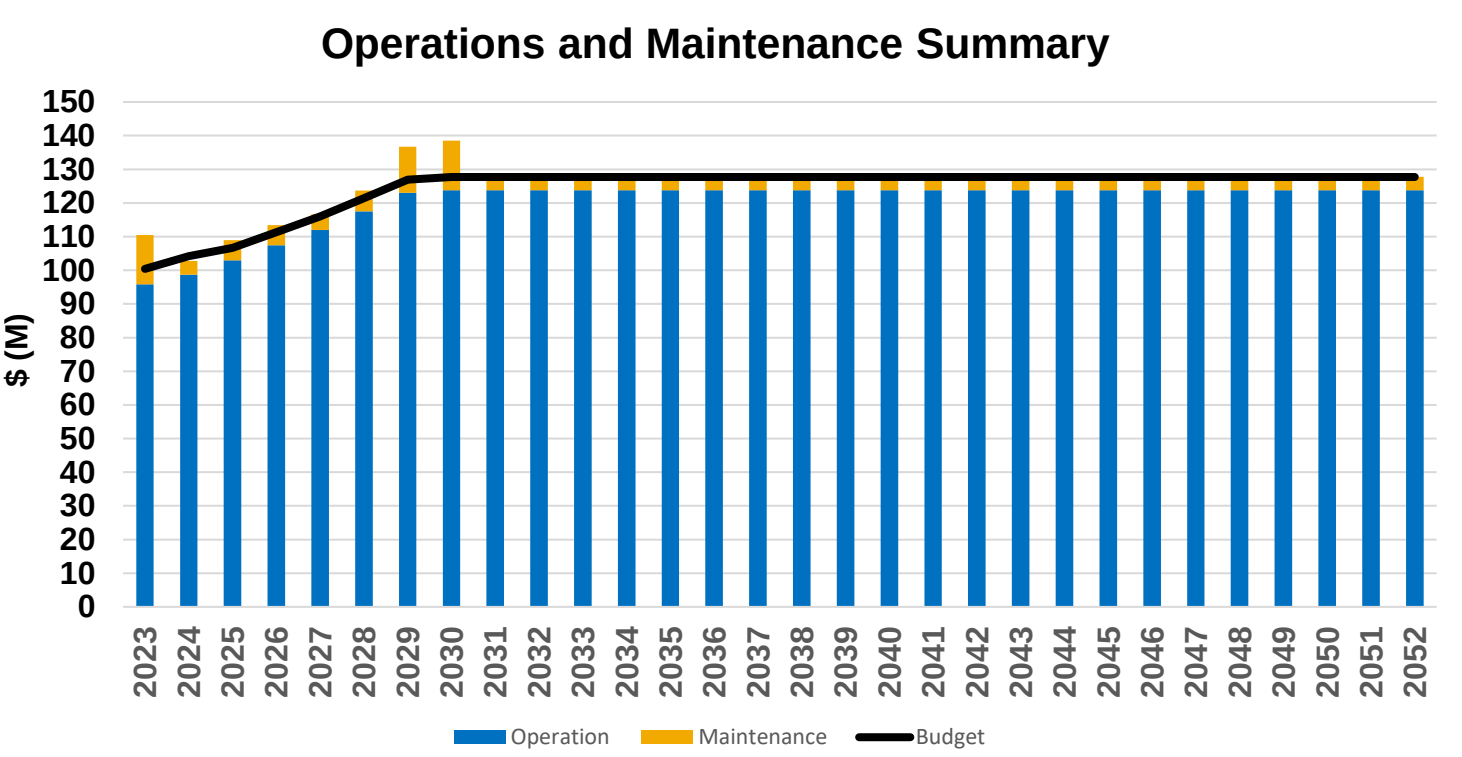
Major maintenance projects the City plans to complete over the next 10 years include:

- **$0.8 Million** allocated in 2023 for facility upgrades; and,
- **$0.7 Million** allocated in 2023 for vehicle maintenance.

Forecast operations and maintenance costs vary in relation to the total value of the asset registry. When additional assets are acquired, the future operations and maintenance costs are forecast to increase. When assets are disposed of the forecast operation and maintenance costs are reduced. ***Figure 12*** shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Figure 12: Operations and Maintenance Summary
All Figure Values Are Shown In 2023 Dollars.



Per ***Figure 12*** above, it is evident that operations and maintenance needs are growing for the Hamilton Fire Department over the next 10 years due to anticipated growth within the City. The Hamilton Fire Department is typically fully funded by the City and these additional operational requirements have been assumed to be funded.

However, facilities maintenance amounts in 2023, 2029 and 2030 are assumed currently to be unfunded. The amount in 2023 is considered a maintenance backlog because it includes deferred maintenance due to budget constraints within the Corporate Facilities and Energy Management division over time. This backlog should be investigated following the completion of this Asset Management Plan to ensure critical components have been prioritized in the Corporate Facilities and Energy Management and the Hamilton Fire Department budget forecasts. This has been identified as a Continuous Improvement item in ***Table 28.*** Since needs have only been projected for the next 10 years, and it is unclear if current trends will continue at the same rate past 2032, the figure above has assumed a constant need past 2032, but it is anticipated that the need for the Hamilton Fire Department will continue to grow over time.

The Figure above includes estimates for the energy and water costs for the proposed Waterdown Station based on utility costs from a similar existing station (i.e., Station 5) but does not yet include all anticipated costs associated with the operations and maintenance of the facility. In addition, since not all proposed facility designs have been finalized, the figure above does not

account for any additional Operations & Maintenance costs other than staff associated with the additional $65M of anticipated facility acquisitions explained in **Section 8.1**. Therefore, it is anticipated there may be additional expenditure required which has not yet been quantified.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated these operation and maintenance forecasts will change. Future iterations of this plan will provide a more thorough analysis of operations and maintenance costs including types of expenditures for training, mandatory certifications, insurance, staffing costs and requirements, equipment, and maintenance activities.

8.3 RENEWAL PLAN

Renewal is major work which does not increase the assets design capacity but restores, rehabilitates, replaces, or renews an existing asset to its original service potential. Works over and above restoring an asset to 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 those that have the highest consequence of failure, have high usage, have high 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 estimated design life for this iteration of the Asset Management Plan. Future iterations of the plan will focus on the Lifecycle approach to Estimated Service Life 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.

Since the Hamilton Fire Department maintains a detailed renewal schedule, but does not yet have a detailed asset registry for all assets, the renewals for many assets were based on the budget renewal forecast which was developed using subject matter expert opinion.

Table 25: Useful Lives of Assets

ASSET (SUB)CATEGORY	AVERAGE ESTIMATED SERVICE LIFE (YEARS)
All Facilities	75
Heavy Response Vehicle	20
Light Emergency Response Vehicle	10
Non-Emergency Response Vehicle	11
Trailer	18
Respiratory Protection Gear (PPE)	Based on Budget Forecast

ASSET (SUB)CATEGORY	AVERAGE ESTIMATED SERVICE LIFE (YEARS)
Bunker Gear	Based on Budget Forecast
Uniform	Based on Budget Forecast
Apparatus Equipment	Based on Budget Forecast
Hazmat Vehicle	Based on Budget Forecast
Specialty Teams Equipment	Based on Budget Forecast
Communication Technology (e.g., mobile radios, portable radios)	Based on Budget Forecast
Information Technology (e.g., Desktop, Laptop) Assets	4

The estimates for renewals in this Asset Management Plan were based on the register method which utilizes the data from the City's asset registry to analyse all available lifecycle information and then determine the optimal timing for renewals based on the Estimated Service Life.

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., vehicles are able to respond to emergency); or,
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g., PPE is in acceptable condition).[6]

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

- Have a high consequence of failure;
- Have high use and subsequent impact on users would be significant;
- Have higher than expected operational or maintenance costs; and,
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[7]

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

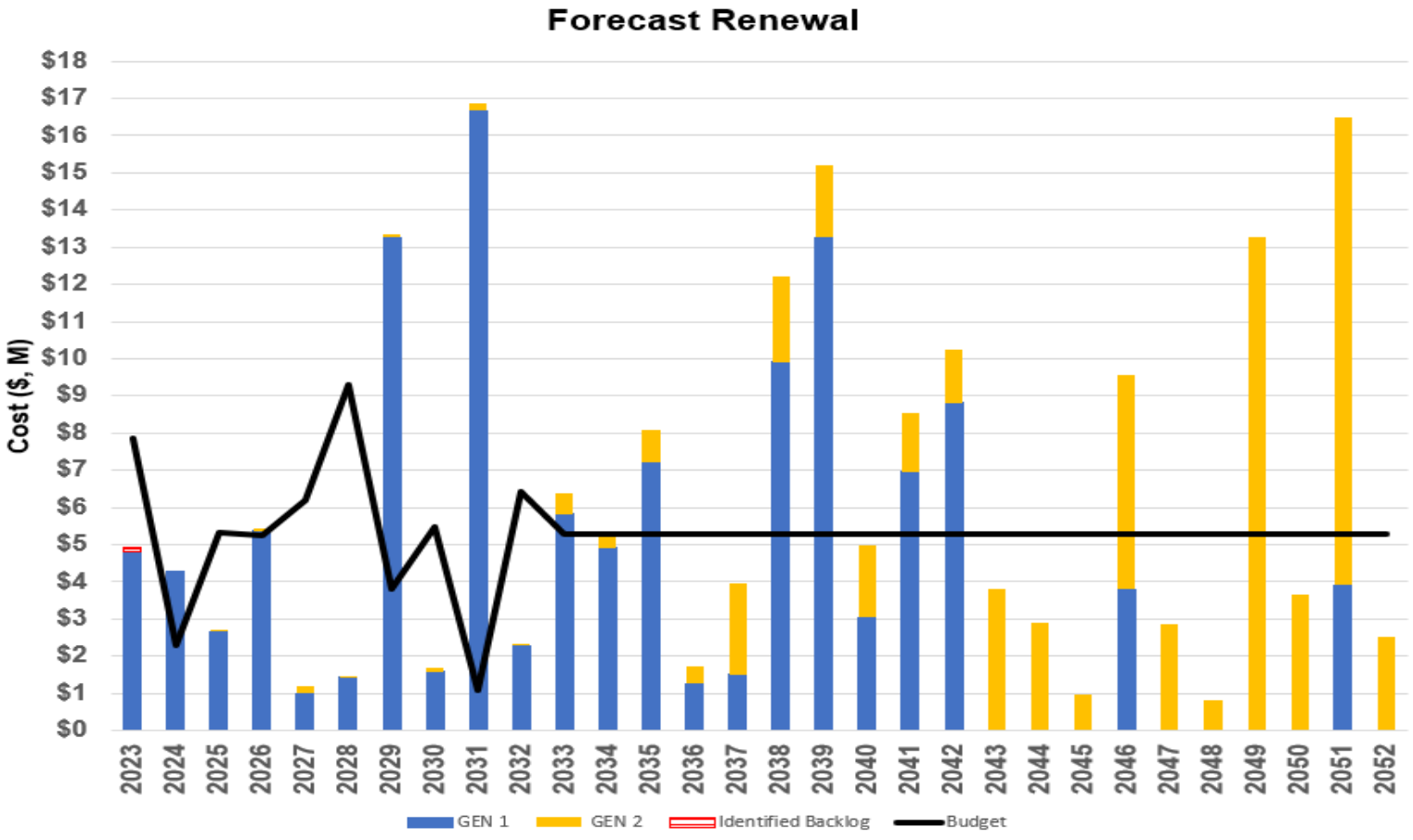
HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

SUMMARY OF FUTURE RENEWAL COSTS

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 13.***

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.

Figure 13: Forecast Renewal Costs
All Figure Values Are Shown In 2023 Dollars.



Currently, the Hamilton Fire Department has a very minor backlog amount of $80,000 represented for Information Technology equipment which will be investigated following the Asset Management Plan.

The Hamilton Fire Department maintains a robust renewal schedule forecast for vehicles, equipment and technology which replace assets on a prescribed timeline which is often regulated per National Fire Protection Association Guidelines. Per Figure 13 above, there are years where the budget exceeds the need, and years where the need exceeds the budget, but these discrepancies balance out over the forecast. Since asset ages and conditions are not formally inventoried for equipment and technology assets, the renewal figure above was created using the renewal schedule. Following this Asset Management Plan, the Hamilton Fire Department should investigate developing an asset registry for all assets so that the renewal schedule can be validated which has been identified as a continuous improvement item in ***Table 28***.

The Hamilton Fire Department does not currently have renewals planned for any facilities, because typically the Hamilton Fire Department and Corporate Facilities and Energy Management work to maintain facilities in acceptable condition. Fire Station 14 is in Very Poor condition per the Building Condition Assessments, but since it is a leased facility, it is not included in the renewal figure above. However, it is an anticipated future City acquisition in Section 6.1.5.

The planned renewal works over the 10-year planning horizon include**:**

- Replacement of vehicles as they reach the end of useful life; and,
- Replacement of equipment and technology as they reach the end of useful life.

Since properly funded and timely renewals ensures the assets perform as expected, the Hamilton Fire Department is performing satisfactorily by replacing assets at the suggested interval with an appropriate budget. Deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. It is recommended to continue to analyze asset renewals based on criticality and availability of funds for future Asset Management Plans.

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 structure has fallen.

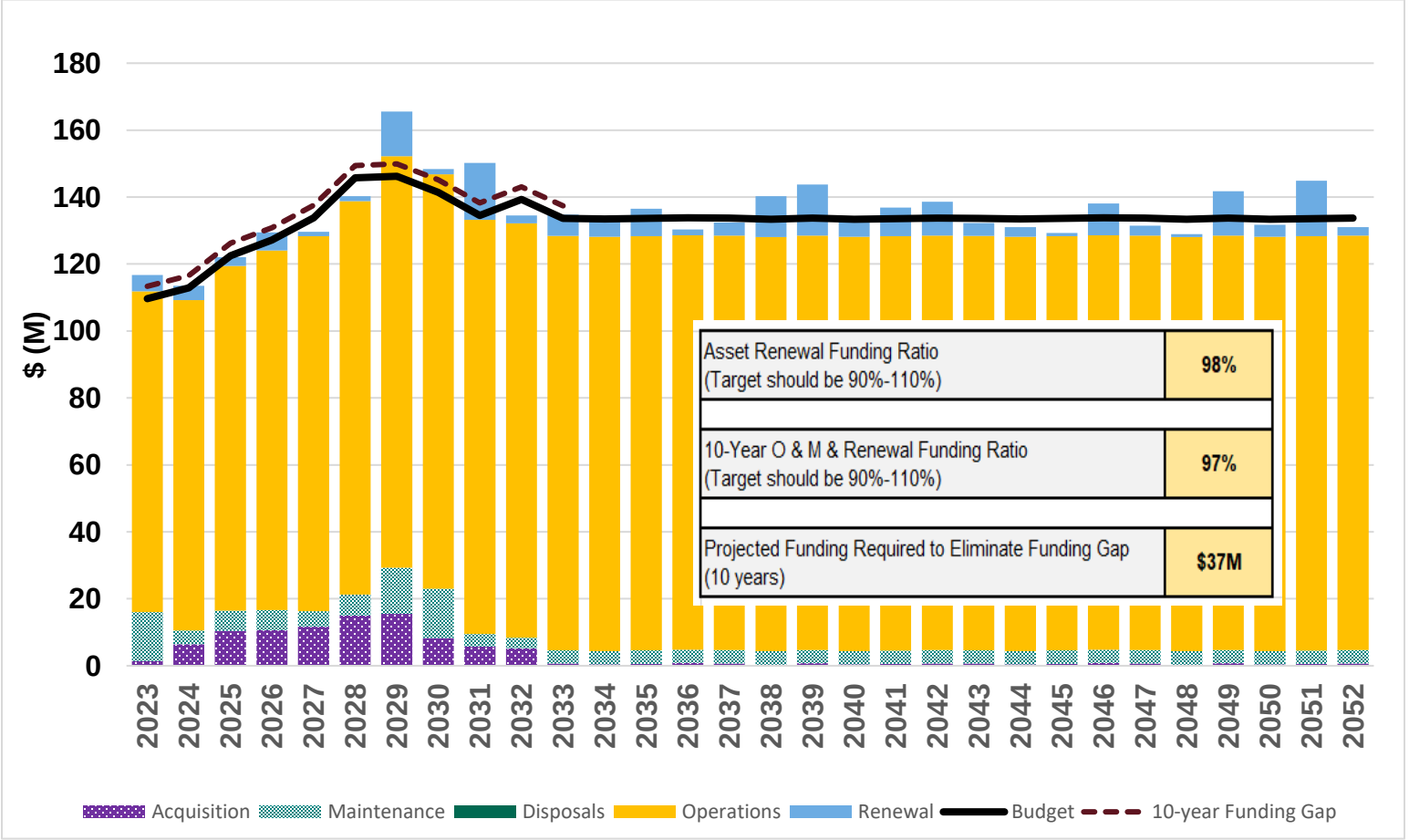
There are no disposals currently identified at this time.

8.5 LIFECYCLE COST SUMMARY

The financial projections from this asset plan are shown in ***Figure 14***. 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 balance between costs, levels of service and risk to achieve the best value outcome.

Figure 14: Lifecycle Summary
All Figure Values Are Shown In 2023 Dollars



There is typically sufficient budget to address the planned lifecycle activities for the 2023-2028 planning period, with the exception of the unfunded facilities maintenance amounts which should be addressed over time. The Hamilton Fire Department will need to increase their operating budget beyond the status quo from 2027-2030 to account for the additional staff and assets to support both the proposed facility renovations/additions, as well as the new Shared Waterdown

Station and Station 14. These are currently assumed to be fully funded in the figure above. The large number of acquisitions from 2024-2032 will also commit the Hamilton Fire Department to funding ongoing operations, maintenance and renewal costs throughout the forecast, which have not all yet been quantified in this model.

The City will continue to improve its lifecycle data, and this will allow for informed choices as how best to mitigate impacts and how to address the funding gap itself. This gap in funding for future plans will be refined over the next three years to improve the confidence and accuracy of the forecasts.

9. FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this Asset Management Plan. Effective asset and financial management will enable the City to ensure The Hamilton Fire Department 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 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 customers while keeping costs at an affordable level and maintaining its financial sustainability.

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

Aligning the Long-Term financial planning with the Asset Management Plan is critical to ensure all the network's 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 Asset Management 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[8] **97.8%**

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.

Over the next 10 years the City expects to have 97.8% of the funds required for the optimal renewal of assets, which is within the 90-110% threshold, and shows that the Hamilton Fire

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

Department's renewals are well funded with the only current renewal shortfall involving IT equipment.

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 Long-Term financial planning. 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 Lifecycle Financial Ratio 98%

Although this Asset Management Plan includes forecast projections to 30-years, the higher confidence numbers are typically within the first 10years of the lifecycle forecast. The 10-year Lifecycle Financial Ratio compares the Planned Budget with the Lifecycle Forecast for the optimal operation, maintenance, and renewal of assets to provide an agreed level of service over the next 10-year period. Similar to the AARF, the optimal ratio is also between **90-110%**. A low ratio would indicate that the service is 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 **$126 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 **$122 Million** on average per year giving a 10-year funding shortfall of **$3.7 Million** per year or **$37 Million** over the 10-year planning period. This 10-year funding shortfall is predominately due to the facilities maintenance needs identified in the Building Condition Assessments mentioned in **Section 3.2.1** which are currently not fully funded and should be prioritized based on the criticality of components.

This indicates that **98%** of the forecast costs needed to provide the services documented in this Asset Management Plan are accommodated in the proposed budget, which is within the 90-110% range. Therefore, it can be concluded that the Hamilton Fire Department is funding their service at an acceptable rate and that the service will be sustainable over time. Note, these calculations exclude acquisition costs.

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 Asset Management 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 10-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 Asset Management Plan which is critical for effective asset management planning.

These options will be explored in the next Asset Management Plan and the City will provide analysis and options for Council to consider going forward.

Table 26; Forecast Costs (Outlays) For the Long-Term Financial Plan
Forecast Costs Are Shown In 2023 Dollar Values.

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2023	$1,373,090	$95,827,408	$14,629,936	$4,904,969	$-
2024	$6,412,554	$98,654,152	$4,157,640	$4,289,113	$-
2025	$10,481,774	$102,928,880	$5,991,743	$2,654,108	$-
2026	$10,635,881	$107,415,424	$6,029,058	$5,370,836	$-

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2027	$11,658,601	$112,027,440	$4,621,263	$1,286,470	$-
2028	$15,028,625	$117,468,256	$6,261,318	$1,478,866	$-
2029	$15,478,613	$122,989,088	$13,772,738	$13,330,543	$-
2030	$8,254,989	$123,766,336	$14,741,072	$1,599,741	$-
2031	$5,725,100	$123,766,336	$3,744,478	$16,962,060	$-
2032	$5,231,680	$123,766,336	$3,150,499	$2,329,935	$-
2033	$669,090	$123,766,336	$3,976,498	$6,373,228	$-
2034	$417,980	$123,766,336	$3,976,498	$5,243,961	$-
2035	$594,774	$123,766,336	$3,976,498	$8,155,000	$-
2036	$820,881	$123,766,336	$3,976,498	$1,726,238	$-
2037	$723,303	$123,766,336	$3,976,498	$3,950,206	$-
2038	$359,139	$123,766,336	$3,976,498	$12,128,257	$-
2039	$743,162	$123,766,336	$3,976,498	$15,268,602	$-
2040	$395,800	$123,766,336	$3,976,498	$4,977,458	$-
2041	$569,900	$123,766,336	$3,976,498	$8,520,714	$-
2042	$726,480	$123,766,336	$3,976,498	$10,164,327	$-
2043	$669,090	$123,766,336	$3,976,498	$3,876,037	$-
2044	$417,980	$123,766,336	$3,976,498	$2,896,363	$-
2045	$594,774	$123,766,336	$3,976,498	$966,672	$-
2046	$820,881	$123,766,336	$3,976,498	$9,490,724	$-
2047	$723,303	$123,766,336	$3,976,498	$2,959,150	$-
2048	$359,139	$123,766,336	$3,976,498	$800,583	$-
2049	$743,162	$123,766,336	$3,976,498	$13,278,506	$-

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2050	$395,800	$123,766,336	$3,976,498	$3,579,616	$-
2051	$569,900	$123,766,336	$3,976,498	$16,557,306	$-
2052	$726,480	$123,766,336	$3,976,498	$2,539,113	$-

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 Asset Management Plan typically communicates how and when this will be spent, along with the service and risk consequences. Future iterations of the Asset Management plan will provide more detailed 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 increase significantly.

Additional assets will add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs for 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 would remove the high costs 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.

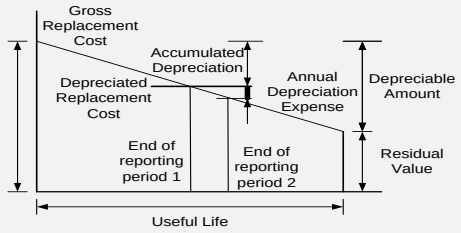
HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

9.5 ASSET VALUATIONS

The best available estimate of the value of assets included in this Asset Management Plan are shown below. The assets are valued at estimated replacement costs:

Figure 15: Asset Valuations

Replacement Cost (Current/Gross)	**$ 251,971,308**
Depreciable Amount	**$ 251,971,308**
Depreciated Replacement Cost6F[9]	**$ 144,742,144**
Depreciation	**$ 7,493,644**



The current replacement cost is the most common valuation approach for specialized infrastructure assets. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets) and useful lives, determining the appropriate depreciation method, testing for impairments, and determining remaining useful life.

As the City matures its asset data, it is highly likely that these valuations will fluctuate significantly over the next three years, and they should increase over time based on improved market equivalent costs as well as anticipated cost changes due to climate change mitigation and adaptation strategies.

9.6 KEY ASSUMPTIONS MADE IN FINANCIAL FORECASTS

In compiling this Asset Management Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this Asset Management 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 Asset Management Plan are:

- Operational forecasts are based on current budget allocations and encompass additional operational need estimates where already quantified;
- Maintenance forecasts are based on current budget allocations and encompass anticipated needs where known;
- Replacement costs were based on current pricing. They were also made without determining what the asset would be replaced with in the future (e.g., hydrogen vehicles were not encompassed in replacement costs).

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

9.7 FORECAST RELIABILITY AND CONFIDENCE

The forecast costs, proposed budgets, and valuation projections in this Asset Management 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 on ***Page 32*** in the Asset Management Plan Overview.

Table 27: Data Confidence Assessment for Data Used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand Drivers	Medium	Values for Next Generation-911 and anticipated acquisitions required to support service were included, but other demand drivers were not able to be quantified at this time.
Acquisition Forecast	Medium	Used current pricing for proposed Waterdown Station and Next Generation-911 Upgrades which are subject to change. Used current estimates for anticipated acquisitions provided by the Hamilton Fire Department which are subject to change.
Operation Forecast	Medium	Staff costs for all new acquisitions were quantified. Projected future energy and water & sewer pricing for proposed Waterdown Station was included based on square footage and energy intensity which is lower confidence. Other operational costs for new facility acquisitions were not included.
Maintenance Forecast	Medium	Maintenance forecast in this Asset Management Plan are typically based on the results of the Building Condition Assessment which have been updated by the Corporate Facilities and Energy Management division, are assumed to be a medium confidence. Maintenance needs for new facilities have not yet been included. It was also assumed for this analysis that the “Fire Facility Upgrade” amount in the Corporate Facilities and Energy Management Capital Budget was used for Fire, Shared Stations, and Shared Administrative Facilities and not Hamilton Paramedic Stations (i.e., Station 30 and 32).

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

DATA	CONFIDENCE ASSESSMENT	COMMENT
Renewal Forecast - Asset Values	Medium	Market pricing was used for renewal replacement costs for vehicles and IT equipment which have high confidence, but facilities replacement costs were of medium confidence and are a high value asset which affected the overall confidence. In addition, since there was minimal age and replacement cost data available for equipment and technology, the existing Hamilton Fire Department fourteen-year equipment budget forecast (2019-2032) for equipment, technology and communications was used to project the future needs and estimate replacement cost.
Renewal Forecast - Asset Useful Lives	Medium	Estimated service lives are typically adhered to for vehicle assets and there is high confidence in vehicle age data. Estimated service lives for facilities renewals were less confident and there was minimal age data for equipment which affected the overall confidence. In addition, renewals for newly acquired assets were excluded from this analysis.
Renewal Forecast - Condition Modelling	Medium	Condition information was only known for Facilities. Vehicle's condition was based on probability of repairs based on age.
Disposal Forecast	Very Low	No disposals were integrated into the forecast.

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

10. PLAN IMPROVEMENT AND MONITORING

10.1 STATUS OF ASSET MANAGEMENT PRACTICES

ACCOUNTING AND FINANCIAL DATA SOURCES

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

- 2019 Hamilton Fire Department 10 Year Service Delivery Plan;
- 2023 Hamilton Fire Department Capital & Operating Budgets;
- 2024-2027 Hamilton Fire Department Multi Year Budget;
- 2019-2032 Equipment Renewal Forecast Schedule;
- 2017-2032 Projected Vehicle Budget;
- 2023 – 2032 Projected Next Generation-911 Costs from Information Technology Budget;
- 2023 Corporate Facilities and Energy Management Capital Budget;
- 2024 Corporate Facilities and Energy Management Capital Budget;
- Building Condition Assessment reports;
- Various internal 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 databases;
- Asset Management Data Collection Templates;
- Development Charges Collection Template;
- Condition assessments; and,
- Subject matter Expert Opinion and Anecdotal Information.

10.2 IMPROVEMENT PLAN

It is important that the City recognize areas of the Asset Management 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 Asset Management Plan and the City's ability to make evidence based and informed decisions. These improvements span from improved lifecycle activities and improved financial planning to plans to physically improve the assets.

The Improvement Plan, ***Table 28***, highlights proposed improvement items that will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. Future iterations of this AM Plan will provide updates on these improvement plans. The costs and resources to complete each of these tasks has not been included in the lifecycle models to data, and resource requirements would need to be reviewed for internal resource driven projects.

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Table 28: Improvement Plan

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1.	Implement an asset registry for all Hamilton Fire Department assets which includes key database fields and follows the newly developed City Data Standard. This may involve the procurement and implementation of an inventory management software system that will further assist with efficiencies. Hamilton Fire Department staff will leverage this work to assist with the Asset Management Plan.	Hamilton Fire Department Mechanical Division and Administration	Internal Resources	2024-2028
2.	Improve and add/track new data that helps inform decisions related to Asset Management. Identify gaps in data and prioritize what can be improved and/or tracked. Potential to connect with replacement of the department's data management system project and dashboard.	Hamilton Fire Department Administration	Internal Resources	TBD
3.	Incorporate a condition rating during regular vehicle inspection/maintenance activities using Asset Management 5-point scale	Hamilton Fire Department Mechanical	Internal Resources	Q4 2025
4.	Formally track age and create condition methodologies for major equipment and technology assets using AM 5-point scale	Hamilton Fire Department Administration	Internal Resources	2024-2028
5.	Improve the marketing strategy by both incorporating telephone surveys and IP controls to improve confidence levels in the survey responses	Corporate Asset Management	Internal Resources	Q4 2025
6.	Review results from 2023 survey and improve upon the first iteration.	Hamilton Fire Department Administration	Internal Resources	Q4 2024

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
7.	Improve upon Lifecycle platforms/systems that track metrics: work towards the creation of one tool that helps track metrics Project to review and determine software and systems. More closely review average # of days to close a file (inspections) to bring high-priority type incidents or properties into compliance. Create categories and benchmarking as a starting point.	Hamilton Fire Department Mechanical Division and Administration	Internal Resources	Q4 2024
8.	Create survey for internal Hamilton Fire Department customers who are the main users of the assets.	Corporate Asset Management / Hamilton Fire Department Administration	Internal Resources	Q4 2025
9.	Initiate risk treatment plans for risks identified in this plan.	Hamilton Fire Department Administration	Internal Resources	Q4 2025
10.	Identify more existing controls for fire apparatus, which could involve or impact staffing levels to maintain and operate this asset AND the process of acquisition and/or renewal of this asset.	Hamilton Fire Department Mechanical Division and Administration	Internal Resources	Q1 2026
11.	Implement the demand and risk management plans associated with climate mitigation and adaptation and include in future iterations of Asset Management Plan.	Corporate Asset Management / Hamilton Fire Department Administration	Internal Resources	Q4 2025
12.	Review the feasibility and costs of switching Fire's heavy-duty apparatus to clean hydrogen or other clean source.	Hamilton Fire Department Mechanical Division and Administration	Internal Resources	2040

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
13.	Align the Asset Management Demand Drivers work with the data and community risks identified in core Hamilton Fire Department planning documents.	Hamilton Fire Department Administration	Internal Resources	Q4-2024
14.	Quantify demands and risks and incorporate them into future lifecycle models.	Corporate Asset Management / Hamilton Fire Department Administration	Internal Resources	Q4 2025
15.	Modify budget sheets to incorporate lifecycle stages so that the results can be more accurate in the next iteration of the plan.	Corporate Asset Management /Finance	Internal Resources	Q4 2024
16.	Investigate maintenance backlog for Facilities assets to ensure critical components are being prioritized in capital forecast.	Corporate Facilities and Energy Management / Hamilton Fire Department Administration	Internal Resources	Q4 2024
17.	Improve process to collect unit costs for assets.	Hamilton Fire Department Administration	Internal Resources	Q4 2025

10.3 MONITORING AND REVIEW PROCEDURES

This Asset Management 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 Asset Management 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 Asset Management Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this Asset Management Plan are incorporated into the long-term financial plan;
- The degree to which the one to 10-year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the Asset Management 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 achieving the Organizational target (this target is 90 – 110%).

HAMILTON FIRE DEPARTMENT ASSET MANAGEMENT PLAN

Appendix A – Survey Analysis

Hamilton
Corporate Asset Management

Hamilton Fire Service

Survey Period: July, 24 - August 28, 2023

September 2023

City Services & Asset Review

Hamilton Fire Services

September 2023

Hamilton Fire Service

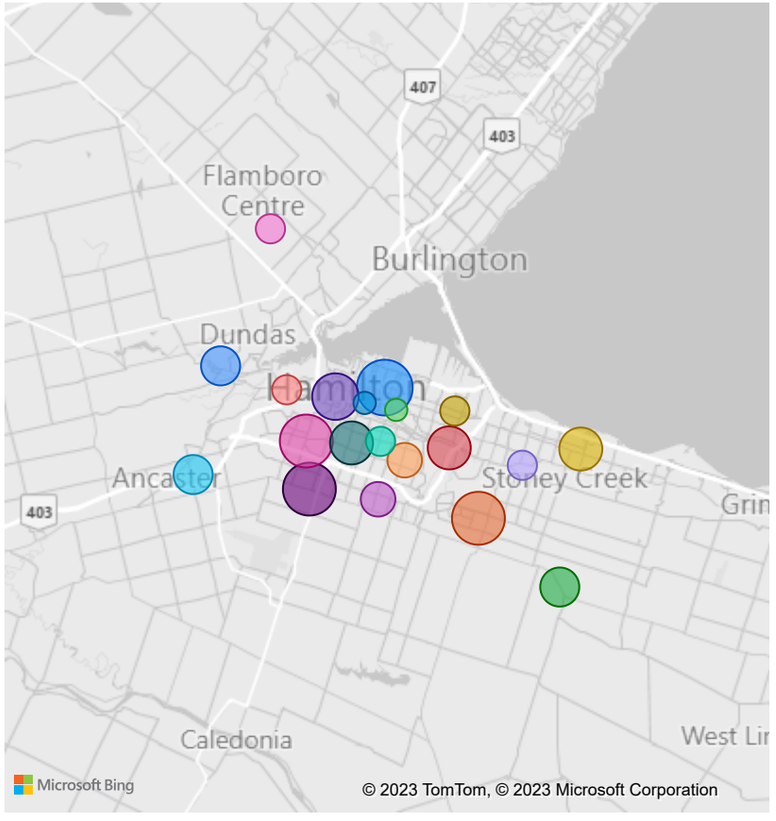
Survey Response Demographics

07/24/2023 to 08/28/2023

92	104	5	8787	454
Respondents	Survey Questions	Demographic Questions	Survey Responses	Demographic Responses

Postal Code	Respondents	% of Respondents	Population
L8L	9	9.78%	50,110
L8J	8	8.70%	42,665
L9B	8	8.70%	38,295
L9C	8	8.70%	64,505
L8P	6	6.52%	42,655
L8E	5	5.43%	64,835
L8K	5	5.43%	52,085
L9A	5	5.43%	40,750
L0R	4	4.35%	123,805
L9G	4	4.35%	38,540
L9H	4	4.35%	50,480
L8T	3	3.26%	31,140
L8W	3	3.26%	39,195
L8B	2	2.17%	38,035
L8G	2	2.17%	36,075
L8H	2	2.17%	41,715
L8S	2	2.17%	26,295
L8V	2	2.17%	34,910
L8M	1	1.09%	22,530
L8N	1	1.09%	26,220

% Respondents by FSA

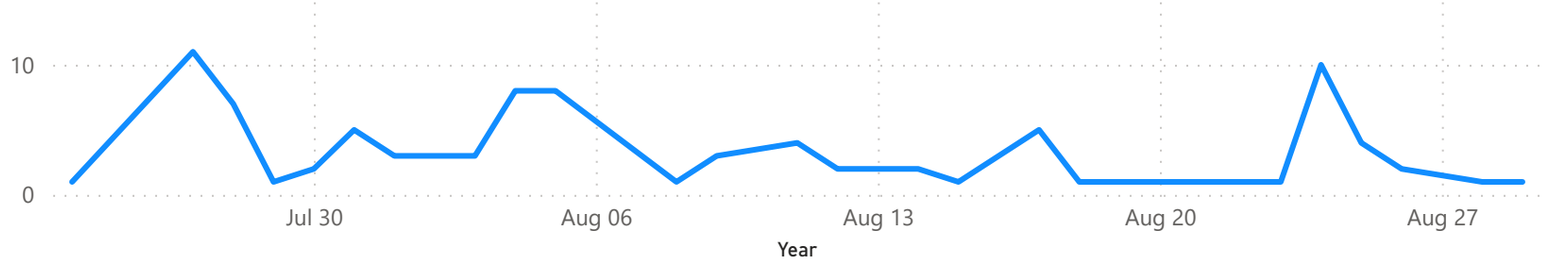


Age	% Pop. by Age	% Respondents	Respondents
18 to 24	6.80%	2.17%	2
25 to 34	15.30%	13.04%	12
35 to 44	13.80%	18.48%	17
45 to 54	13.20%	19.57%	18
55 to 64	14.70%	23.91%	22
65 to 79	14.30%	18.48%	17
80+	5.20%	1.09%	1

Gender	% of Respondents	Respondents
Female	45.65%	42
Male	44.57%	41
Prefer not to answer	8.70%	8
Other	1.09%	1

Residency	Respondents
I live in Hamilton	76
I work in Hamilton	35
I am retired	18
Prefer not to Answer	5
I run a Hamilton based business	4
I run a business outside of Ham	1

Respondents by Day



Value	Respondents
I do not identify with any of the above groups	55
Prefer not to Answer	17
2SLGBTQIA+	8
Persons with disabilities	6
Immigrant arrived in Canada mor	5
Racialized (i.e. Black People o	3
Indigenous	1

City Services & Asset Review

Hamilton Fire Services

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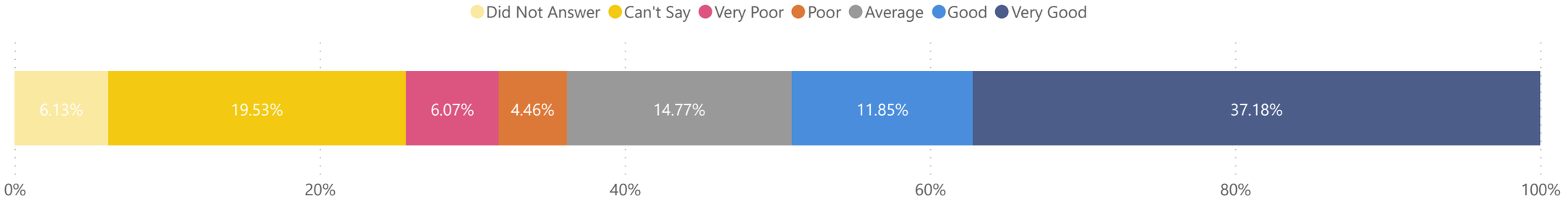
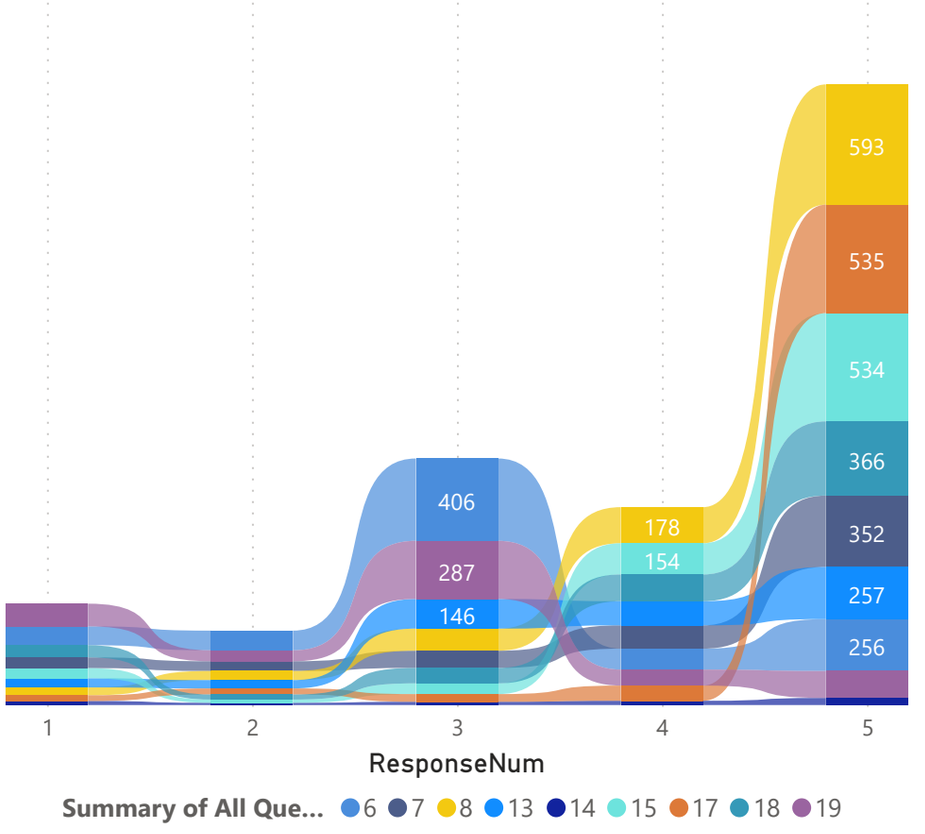
Summary of Survey Results

Responses
6120

Respondents
92



Questions	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.29**	**3.94**	**57.30**	**2483**	**27.26%**
Q17 Recommend to Others	1.04	4.50	61.21	226	22.33%
Q15 Safe and Comfortable Access	1.11	4.37	68.75	157	15.51%
Q8 Importance of Services	1.09	4.29	81.32	30	2.96%
Q18 Value for Money	1.28	4.09	51.11	243	24.01%
Q7 Overall Performance	1.30	4.02	51.44	338	33.40%
Q13 Services Meeting Needs	1.25	3.83	49.65	270	29.35%
Q14 Satisifaction With Services	1.52	3.39	45.99	875	86.46%
Q6 Awareness of Services	1.25	3.35	62.89	42	4.15%
Q19 Service Level Changes	1.29	3.10	34.87	302	27.36%



City Services & Asset Review

Hamilton Fire Services

September 2023

Responses

6212

Respondents

92

Survey Question Summary

Question #	Survey Question	n	σ (Consistency)	Margin of Error (Confidence Level ±)
6	The Hamilton Fire Department provides multiple services for its citizens. Are you aware of these services?	87	1.25	26%
7	Over the last 24 months, how do you feel the Hamilton Fire Department has performed overall in the following services?	59	1.30	28%
8	How important should the following services be as responsibility for the Hamilton Fire Department?	88	1.09	23%
11	How many minutes do you think is acceptable for this process to take place, including the arrival on-scene of an Effective Firefighting and Rescue Force?	84	0.74	15%
13	Do the following services provided by the Hamilton Fire Department meet your needs	55	1.25	27%
14	In the last 24 months if you have used Hamilton Fire Department's services, how satisfied are you with your ability to access these services? If you have not used these services, in the past 24 months, please select "Have Not Used This Service".	9	1.52	52%
15	Do you feel comfortable and safe accessing services provided by the Hamilton Fire Department?	73	1.11	23%
17	How likely would you be to recommend these services to others?	64	1.04	23%
18	Based on the chart above and any additional knowledge or experience you have, how would you rate the Hamilton Fire Department in providing good value for the services provided to your community?	60	1.28	29%
19	Are there any services being provided that you feel need a service level change?	60	1.29	29%

Hamilton

City Services & Asset Review

Hamilton Fire Services

September 2023

Question

6

Awareness of Services

The Hamilton Fire Department provides multiple services for its citizens. Are you aware of these services?

Responses

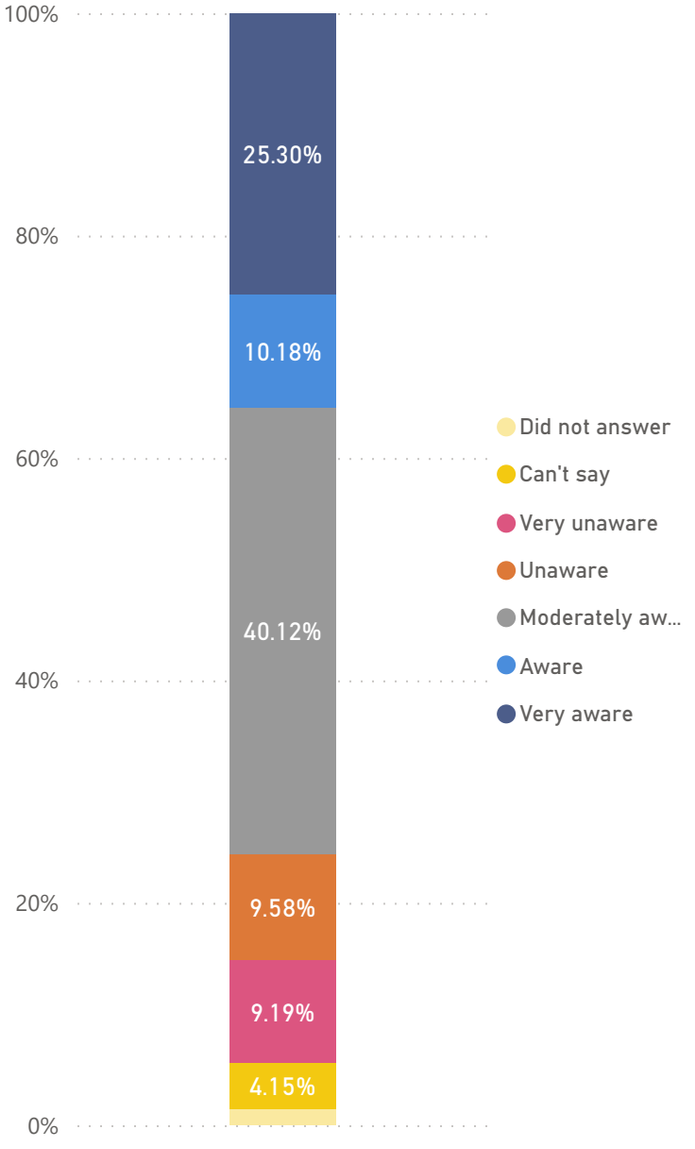
955

Respondents

90

Service Area	Very unaware	Unaware	Moderately aware	Aware	Very aware
Total	**93**	**97**	**406**	**103**	**256**
Responses to Life-Threatening Medical Calls	6	2	41	14	26
Response to Gas Leaks	5	10	40	10	22
Rescue Operations	6	2	46	7	26
Inspection and Fire Code Enforcement	8	3	40	9	28
Hazardous Materials Operations	7	10	39	6	24
Fire Station Tours, Fire Truck School, Visits	10	16	30	9	22
Fire Prevention Public Education Programs	9	7	34	13	24
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	10	8	38	9	21
Fighting Fires	6	2	35	8	34
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	16	22	29	5	14
City Emergency Preparedness Program	10	15	34	13	15

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**3.35**	**66.95**	**1.25**	**42**	**4.2%**
Fighting Fires	3.73	74.59	1.21	6	6.5%
Responses to Life-Threatening Medical Calls	3.58	71.69	1.13	3	3.3%
Inspection and Fire Code Enforcement	3.52	70.45	1.22	2	2.2%
Rescue Operations	3.52	70.34	1.14	4	4.3%
Fire Prevention Public Education Programs	3.41	68.28	1.26	3	3.3%
Response to Gas Leaks	3.39	67.82	1.15	3	3.3%
Hazardous Materials Operations	3.35	66.98	1.23	4	4.3%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	3.27	65.35	1.25	4	4.3%
Fire Station Tours, Fire Truck School, Visits	3.20	63.91	1.31	4	4.3%
City Emergency Preparedness Program	3.09	61.84	1.21	4	4.3%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	2.76	55.12	1.28	5	5.4%



Hamilton

Question

7

Overall Performance

Over the last 24 months, how do you feel the Hamilton Fire Department has performed overall in the following services?

Responses

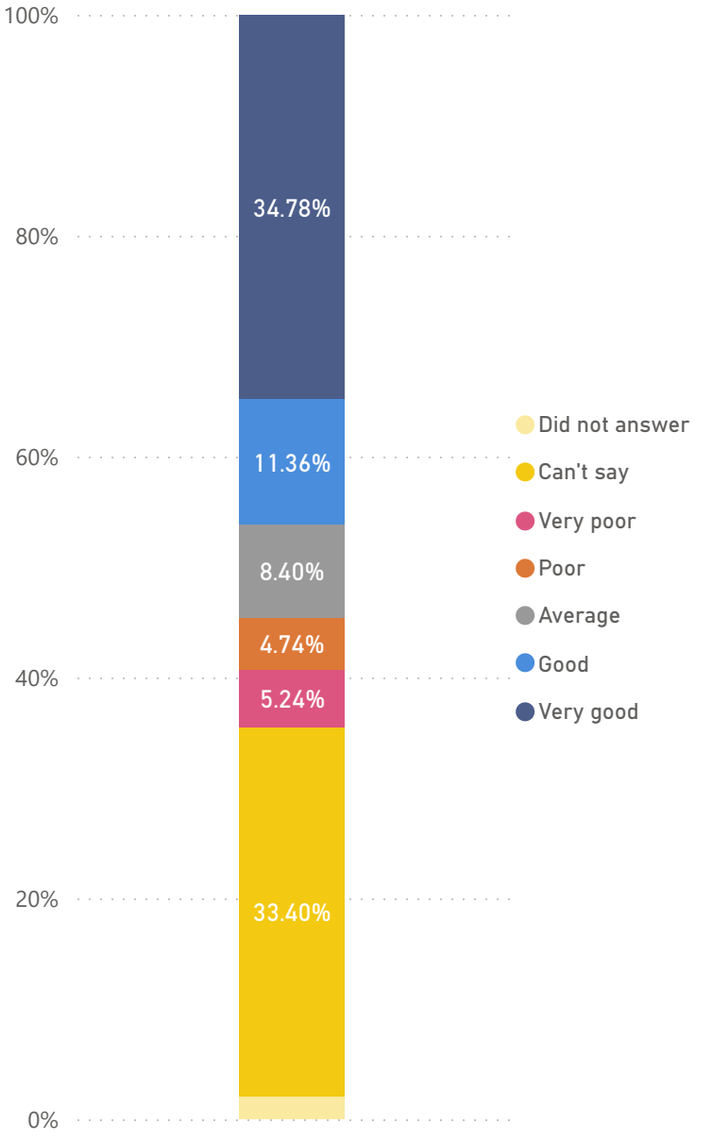
653

Respondents

82

Service Area	Very poor	Poor	Average	Good	Very good
Total	**53**	**48**	**85**	**115**	**352**
Responses to Life-Threatening Medical Calls	6	3	9	11	46
Response to Gas Leaks	1	4	6	11	34
Rescue Operations	1	1	10	16	45
Inspection and Fire Code Enforcement	4	7	6	10	27
Hazardous Materials Operations	3	7	6	10	28
Fire Station Tours, Fire Truck School, Visits	7	5	7	9	26
Fire Prevention Public Education Programs	8	3	9	14	25
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	6	7	6	7	24
Fighting Fires	4		8	14	52
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	7	4	6	7	20
City Emergency Preparedness Program	6	7	12	6	25

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**4.02**	**80.37**	**1.30**	**338**	**33.4%**
Rescue Operations	4.41	88.22	0.87	18	19.6%
Fighting Fires	4.41	88.21	1.03	13	14.1%
Response to Gas Leaks	4.30	86.07	1.03	32	34.8%
Responses to Life-Threatening Medical Calls	4.17	83.47	1.26	16	17.4%
Hazardous Materials Operations	3.98	79.63	1.28	35	38.0%
Inspection and Fire Code Enforcement	3.91	78.15	1.34	36	39.1%
Fire Station Tours, Fire Truck School, Visits	3.78	75.56	1.45	36	39.1%
Fire Prevention Public Education Programs	3.76	75.25	1.39	31	33.7%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	3.72	74.40	1.47	40	43.5%
City Emergency Preparedness Program	3.66	73.21	1.42	35	38.0%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	3.66	73.18	1.51	46	50.0%



Hamilton

City Services & Asset Review

Hamilton Fire Services

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Responses

1985

Respondents

74

Awareness of Services

Service areas where importance exceeds performance by 20 points is indicative of a mismatch between expectations and service levels, equal to one point on the Likert scale used.

Service Area	Importance (index score)	Performance (index score)	Net Differential	Opt Out %
Total	**86**	**80**	**-5**	**20%**
Fighting Fires	97	88	-8	9%
Rescue Operations	93	88	-4	11%
Response to Gas Leaks	90	86	-4	21%
Inspection and Fire Code Enforcement	88	78	-10	23%
Hazardous Materials Operations	88	80	-8	24%
City Emergency Preparedness Program	87	73	-14	23%
Fire Prevention Public Education Programs	87	75	-11	20%
Responses to Life-Threatening Medical Calls	83	83	0	10%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	79	74	-4	26%
Fire Station Tours, Fire Truck School, Visits	78	76	-2	23%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	74	73	-1	31%

Performance — *Q7 Over the last 24 months, how do you feel the Hamilton Fire Department has performed overall in the following services?*

Importance — *Q8 How important should the following services be as responsibility for the Hamilton Fire Department?*

Hamilton

City Services & Asset Review

Hamilton Fire Services
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Question
8

Importance of Services

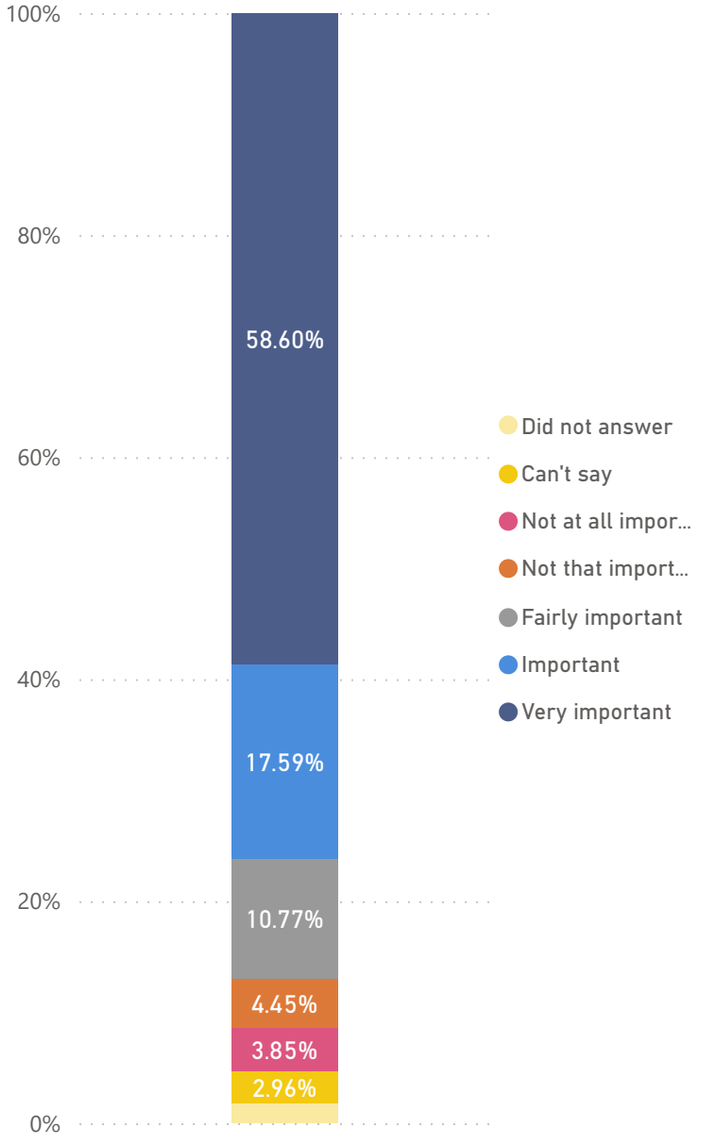
How important should the following services be as responsibility for the Hamilton Fire Department?

Responses
964

Respondents
90

Service Area	Not at all important	Not that important	Fairly important	Important	Very important
Total	**39**	**45**	**109**	**178**	**593**
Responses to Life-Threatening Medical Calls	8	5	6	17	54
Response to Gas Leaks	3	5	4	11	66
Rescue Operations	2	2	2	15	69
Inspection and Fire Code Enforcement	2	1	12	17	56
Hazardous Materials Operations	3	1	11	16	54
Fire Station Tours, Fire Truck School, Visits	5	9	12	26	36
Fire Prevention Public Education Programs	2	4	10	19	54
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	3	6	23	16	38
Fighting Fires	3			3	84
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	7	8	19	17	32
City Emergency Preparedness Program	1	4	10	21	50

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**4.29**	**85.75**	**1.09**	**30**	**3.0%**
Fighting Fires	4.83	96.67	0.73	1	1.1%
Rescue Operations	4.63	92.67	0.82		
Response to Gas Leaks	4.48	89.66	1.04	1	1.1%
Inspection and Fire Code Enforcement	4.41	88.18	0.92	3	3.3%
Hazardous Materials Operations	4.38	87.53	0.99	5	5.4%
City Emergency Preparedness Program	4.34	86.74	0.94	5	5.4%
Fire Prevention Public Education Programs	4.34	86.74	0.99	1	1.1%
Responses to Life-Threatening Medical Calls	4.16	83.11	1.29	1	1.1%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	3.93	78.60	1.14	4	4.3%
Fire Station Tours, Fire Truck School, Visits	3.90	77.95	1.21	2	2.2%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	3.71	74.22	1.29	7	7.6%



City Services & Asset Review

Hamilton Fire Services

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Question

10

Geographic Areas

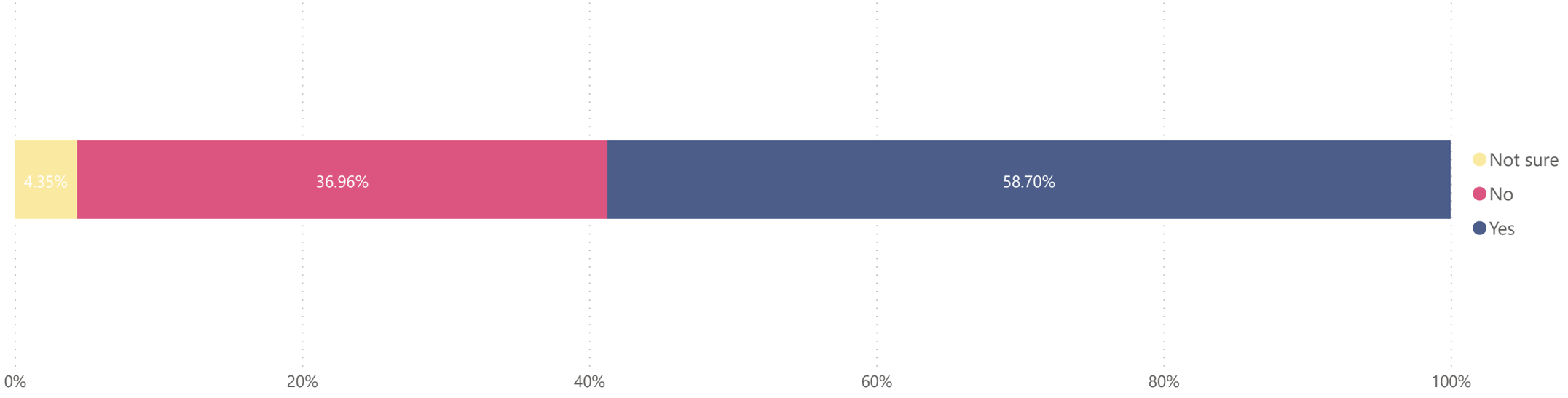
Are you aware that Hamilton has three (3) models for fire and emergency response based on geographic area?

Responses

92

Respondents

92



Service Area	Not sure	No	Yes	Opt Out	Opt Out %
Total	**4**	**34**	**54**	**4**	**4.35%**
Are you aware that Hamilton has three models for fire and emergency response based on geographic area?	4	34	54	4	4.35%

Hamilton

Question

11

On-Scene Arrival Time

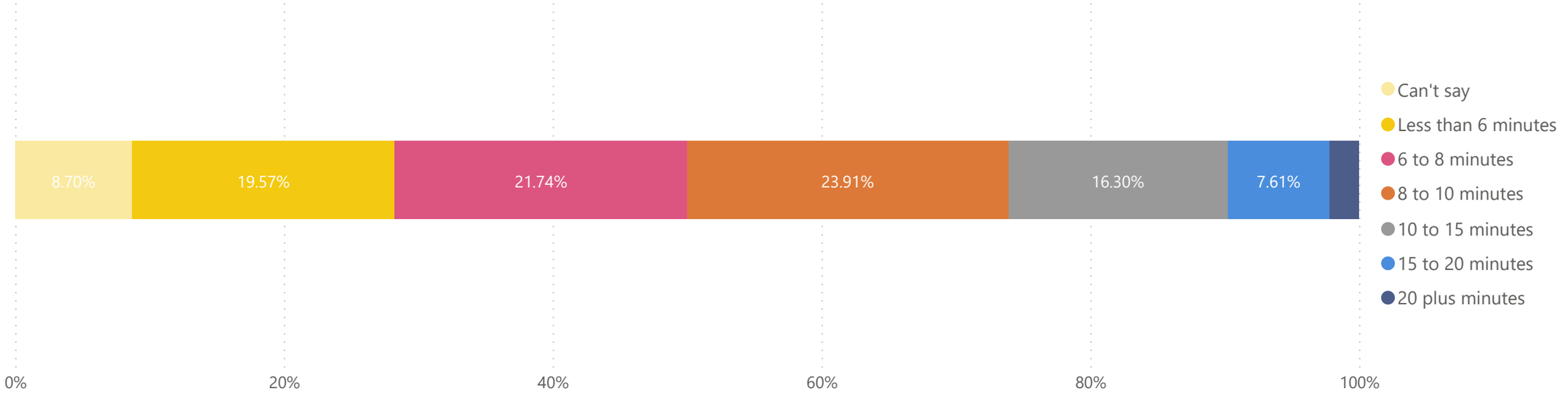
How many minutes do you think is acceptable for this process to take place, including the arrival on-scene of an Effective Firefighting and Rescue Force?

Responses

84

Respondents

84



Service Area	Less than 6 minutes	6 to 8 minutes	8 to 10 minutes	10 to 15 minutes	15 to 20 minutes	20 plus minutes	Opt Out	Opt Out %
Total	**18**	**20**	**22**	**15**	**7**	**2**	**8**	**8.70%**
How many minutes do you think is acceptable for this process to take place, including the arrival on-scene of an Effectivce Firefighting and Rescue Force?	18	20	22	15	7	2	8	8.70%

City Services & Asset Review

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Question

13

Services Meeting Needs

Do the following services provided by the Hamilton Fire Department meet your needs

Responses

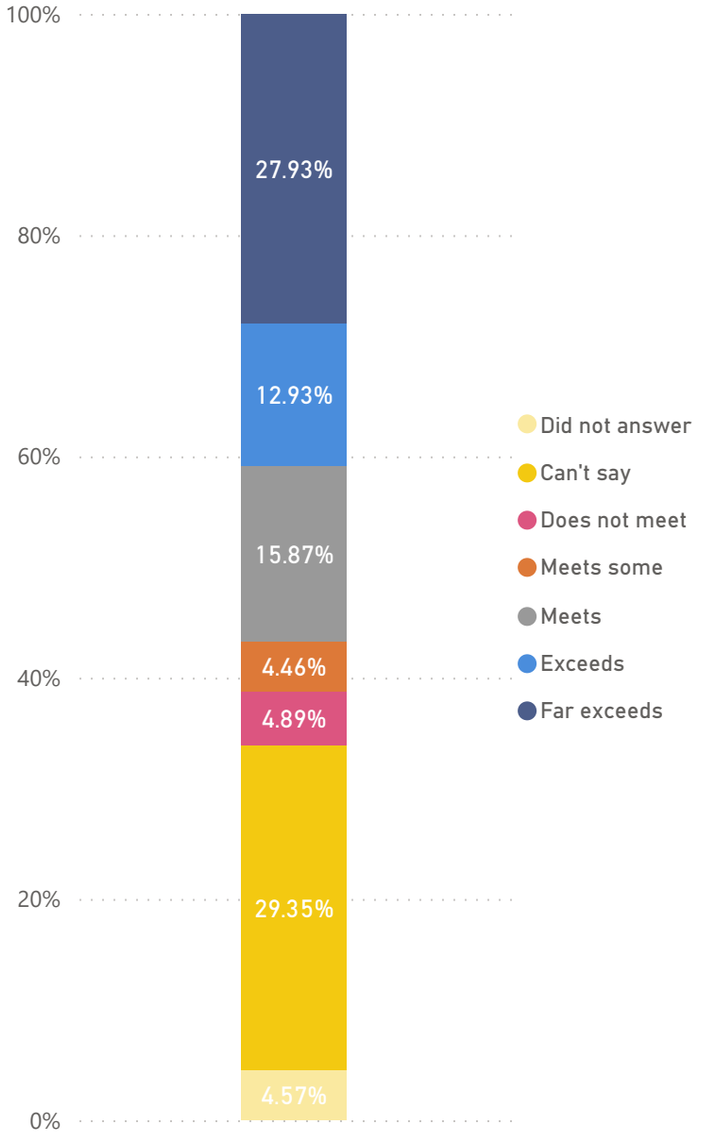
608

Respondents

80

Service Area	Does not meet	Meets some	Meets	Exceeds	Far exceeds
Total	**45**	**41**	**146**	**119**	**257**
Responses to Life-Threatening Medical Calls	7	5	17	13	31
Rescue Operations	1	2	16	14	31
Inspection and Fire Code Enforcement	5	5	14	12	22
Hazardous Materials Operations	3	3	13	12	23
Fire Station Tours, Fire Truck School, Visits	5	6	12	13	23
Fire Prevention Public Education Programs	7	4	16	11	25
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	5	5	13	8	24
Fighting Fires	2	4	13	17	40
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	4	2	16	6	19
City Emergency Preparedness Program	6	5	16	13	19

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**3.83**	**76.51**	**1.25**	**270**	**29.3%**
Fighting Fires	4.17	83.42	1.06	12	13.0%
Rescue Operations	4.13	82.50	0.99	24	26.1%
Hazardous Materials Operations	3.91	78.15	1.17	34	37.0%
Responses to Life-Threatening Medical Calls	3.77	75.34	1.32	15	16.3%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	3.75	74.91	1.34	33	35.9%
Fire Station Tours, Fire Truck School, Visits	3.73	74.58	1.30	28	30.4%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	3.72	74.47	1.27	41	44.6%
Inspection and Fire Code Enforcement	3.71	74.14	1.29	30	32.6%
Fire Prevention Public Education Programs	3.68	73.65	1.34	24	26.1%
City Emergency Preparedness Program	3.58	71.53	1.29	29	31.5%



City Services & Asset Review

Hamilton Fire Services

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Question

14

Responses

103

Respondents

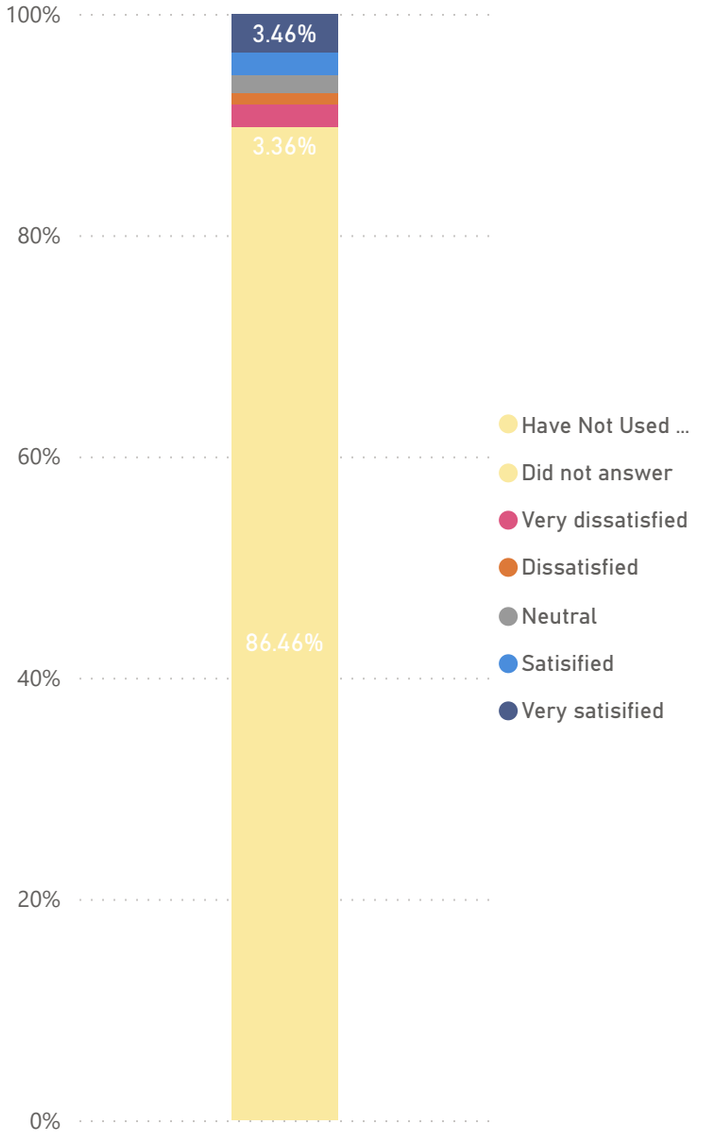
33

Satisifaction With Services

In the last 24 months if you have used Hamilton Fire Department's services, how satisfied are you with your ability to access these services? If you have not used these services, in the past 24 months, please select "Have Not Used This Service".

Service Area	Have Not Used This Service	Very dissatisfied	Dissatisfied	Neutral	Satisified	Very satisified
Total	**875**	**20**	**11**	**16**	**21**	**35**
Responses to Life-Threatening Medical Calls	73	2	1	1	3	9
Response to Gas Leaks	82		2	1	1	2
Rescue Operations	86	1		1		1
Inspection and Fire Code Enforcement	79	3	1	1	4	1
Hazardous Materials Operations	86	1		1	1	
Fire Station Tours, Fire Truck School, Visits	72	1	2	3	3	8
Fire Prevention Public Education Programs	71	3	1	2	4	7
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	79	3	2	2	1	2
Fighting Fires	82	1		1	2	3
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	86	2		2		
City Emergency Preparedness Program	79	3	2	1	2	2

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**3.39**	**67.77**	**1.52**	**875**	**86.5%**
Responses to Life-Threatening Medical Calls	4.00	80.00	1.41	73	79.3%
Fire Station Tours, Fire Truck School, Visits	3.88	77.65	1.28	72	78.3%
Fighting Fires	3.86	77.14	1.36	82	89.1%
Fire Prevention Public Education Programs	3.65	72.94	1.49	71	77.2%
Response to Gas Leaks	3.50	70.00	1.26	82	89.1%
Rescue Operations	3.00	60.00	1.63	86	93.5%
Inspection and Fire Code Enforcement	2.90	58.00	1.45	79	85.9%
City Emergency Preparedness Program	2.80	56.00	1.54	79	85.9%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	2.70	54.00	1.49	79	85.9%
Hazardous Materials Operations	2.67	53.33	1.25	86	93.5%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	2.00	40.00	1.00	86	93.5%



Hamilton

City Services & Asset Review

Hamilton Fire Services

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Question

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Safe and Comfortable Access

Do you feel comfortable and safe accessing services provided by the Hamilton Fire Department?

Responses

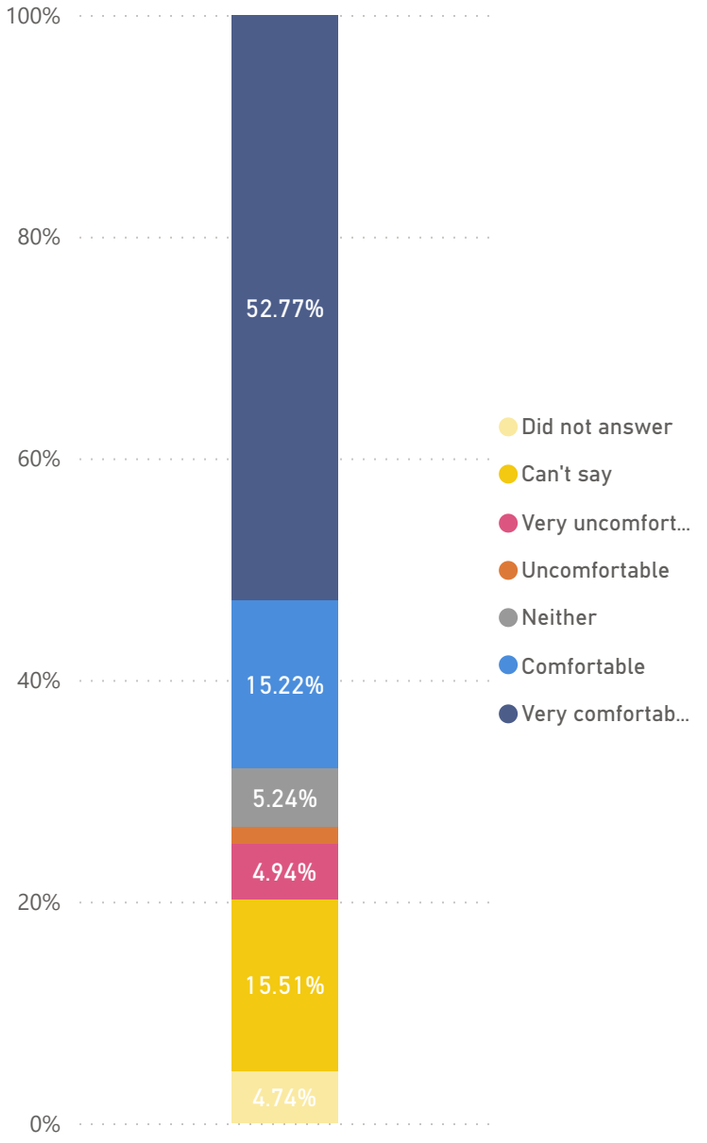
807

Respondents

86

Service Area	Very uncomfortable	Uncomfortable	Neither	Comfortable	Very comfortable
Total	**50**	**16**	**53**	**154**	**534**
Responses to Life-Threatening Medical Calls	8	2	3	17	55
Response to Gas Leaks	4	1	5	14	52
Rescue Operations	3		5	15	56
Inspection and Fire Code Enforcement	4	1	6	13	46
Hazardous Materials Operations	5	1	3	14	49
Fire Station Tours, Fire Truck School, Visits	5	2	6	12	46
Fire Prevention Public Education Programs	5	1	5	14	50
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	4	2	5	14	41
Fighting Fires	4	1	3	13	62
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	4	2	5	14	35
City Emergency Preparedness Program	4	3	7	14	42

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**4.37**	**87.41**	**1.11**	**157**	**15.5%**
Fighting Fires	4.54	90.84	0.99	5	5.4%
Rescue Operations	4.53	90.63	0.91	9	9.8%
Response to Gas Leaks	4.43	88.68	1.04	11	12.0%
Hazardous Materials Operations	4.40	88.06	1.11	17	18.5%
Fire Prevention Public Education Programs	4.37	87.47	1.12	13	14.1%
Inspection and Fire Code Enforcement	4.37	87.43	1.08	17	18.5%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	4.30	86.06	1.13	21	22.8%
Fire Station Tours, Fire Truck School, Visits	4.30	85.92	1.18	15	16.3%
Responses to Life-Threatening Medical Calls	4.28	85.65	1.24	3	3.3%
City Emergency Preparedness Program	4.24	84.86	1.15	19	20.7%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	4.23	84.67	1.16	27	29.3%



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Question

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Recommend to Others

How likely would you be to recommend these services to others?

Responses

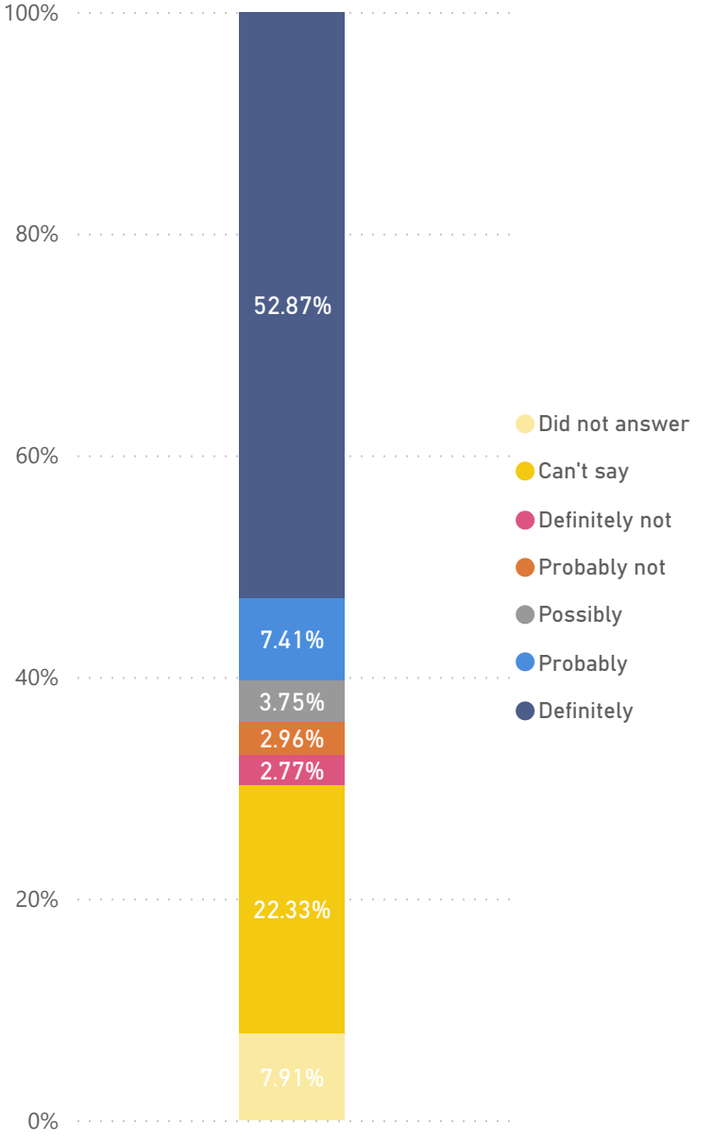
706

Respondents

78

Service Area	Definitely not	Probably not	Possibly	Probably	Definitely
Total	**28**	**30**	**38**	**75**	**535**
Responses to Life-Threatening Medical Calls	6	3	2	8	56
Response to Gas Leaks	1	3	3	8	51
Rescue Operations	2	2	3	7	56
Inspection and Fire Code Enforcement	1	3	5	7	47
Hazardous Materials Operations	4	1	2	5	48
Fire Station Tours, Fire Truck School, Visits	4	2	2	7	48
Fire Prevention Public Education Programs	2	4	4	5	51
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	1	3	6	5	41
Fighting Fires	2	3		8	61
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	2	2	7	7	36
City Emergency Preparedness Program	3	4	4	8	40

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**4.50**	**90.00**	**1.04**	**226**	**22.3%**
Fighting Fires	4.66	93.24	0.89	12	13.0%
Rescue Operations	4.61	92.29	0.91	14	15.2%
Response to Gas Leaks	4.59	91.82	0.89	20	21.7%
Hazardous Materials Operations	4.53	90.67	1.10	22	23.9%
Inspection and Fire Code Enforcement	4.52	90.48	0.94	22	23.9%
Fire Prevention Public Education Programs	4.50	90.00	1.05	19	20.7%
Fire Station Tours, Fire Truck School, Visits	4.48	89.52	1.12	21	22.8%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	4.46	89.29	1.00	29	31.5%
Responses to Life-Threatening Medical Calls	4.40	88.00	1.22	11	12.0%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	4.35	87.04	1.07	30	32.6%
City Emergency Preparedness Program	4.32	86.44	1.17	26	28.3%



Hamilton

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Question
17

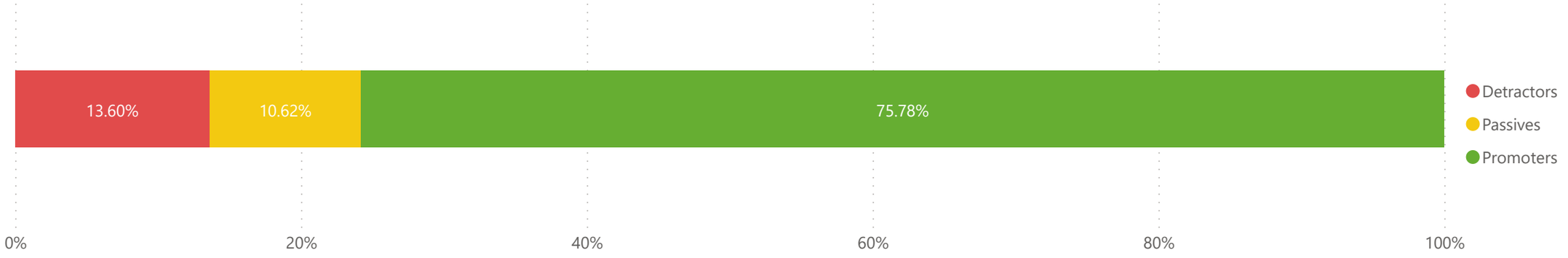
Net Promoter Score

Typically the Net Promoter Score is used to measure customer loyalty.

How likely would you be to recommend these services to others?

Responses
706

Respondents
78



Service Area	σ	NPS	Detractors	Passives	Promoter
All Service Areas	**20.87**	**62.18**	**96**	**75**	**535**
Responses to Life-Threatening Medical Calls	24.44	60.00	11	8	56
Response to Gas Leaks	17.74	66.67	7	8	51
Rescue Operations	18.30	70.00	7	7	56
Inspection and Fire Code Enforcement	18.81	60.32	9	7	47
Hazardous Materials Operations	22.05	68.33	7	5	48
Fire Station Tours, Fire Truck School, Visits	22.50	63.49	8	7	48
Fire Prevention Public Education Programs	20.96	62.12	10	5	51
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	19.99	55.36	10	5	41
Fighting Fires	17.79	75.68	5	8	61
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	21.48	46.30	11	7	36
City Emergency Preparedness Program	23.42	49.15	11	8	40

Hamilton

Likert choices less than 4 are considered 'Detractors' while 5s are considered 'Promoters' and 4s are 'Passive'. Respondents who opted out by not answering or selecting 'Can't Say' were removed from the sample. Net Promoter score is calculated by subtracting (% Detractors) from (% Promoters). σ (Standard Deviation) is calculated in percent, the same units as the Net Promoter Score.

City Services & Asset Review

Hamilton Fire Services
September 2023

Question
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Responses
659

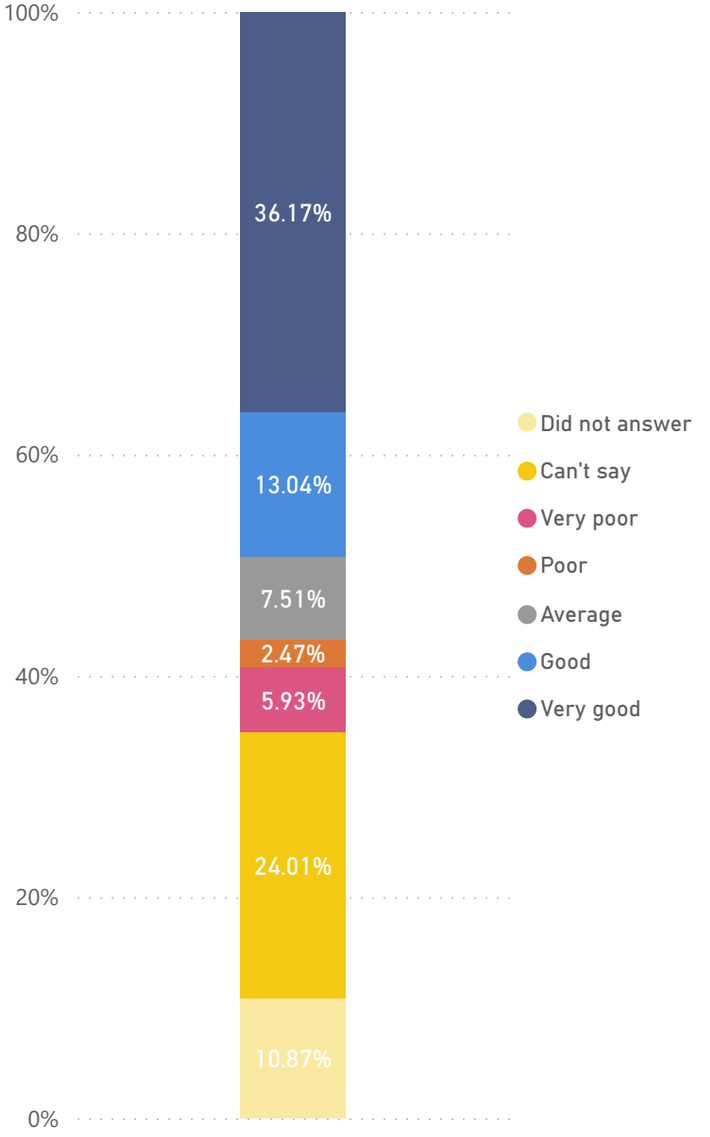
Respondents
74

Value for Money

Based on the chart above and any additional knowledge or experience you have, how would you rate the Hamilton Fire Department in providing good value for the services provided to your community?

Service Area	Very poor	Poor	Average	Good	Very good
Total	**60**	**25**	**76**	**132**	**366**
Responses to Life-Threatening Medical Calls	8	3	4	20	38
Response to Gas Leaks	4	2	7	14	35
Rescue Operations	2	3	4	15	43
Inspection and Fire Code Enforcement	6	4	7	11	29
Hazardous Materials Operations	5	1	5	15	31
Fire Station Tours, Fire Truck School, Visits	6	1	8	9	34
Fire Prevention Public Education Programs	7	2	11	8	32
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	6	3	9	6	26
Fighting Fires	3	2	4	16	48
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	6	1	6	9	24
City Emergency Preparedness Program	7	3	11	9	26

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**4.09**	**81.82**	**1.28**	**243**	**24.0%**
Fighting Fires	4.42	88.49	1.01	10	10.9%
Rescue Operations	4.40	88.06	0.99	15	16.3%
Response to Gas Leaks	4.19	83.87	1.16	21	22.8%
Hazardous Materials Operations	4.16	83.16	1.21	24	26.1%
Fire Station Tours, Fire Truck School, Visits	4.10	82.07	1.31	23	25.0%
Responses to Life-Threatening Medical Calls	4.05	81.10	1.31	10	10.9%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	3.96	79.13	1.38	35	38.0%
Fire Prevention Public Education Programs	3.93	78.67	1.38	23	25.0%
Inspection and Fire Code Enforcement	3.93	78.60	1.36	25	27.2%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	3.86	77.20	1.41	31	33.7%
City Emergency Preparedness Program	3.79	75.71	1.40	26	28.3%



City Services & Asset Review

Hamilton Fire Services

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Question

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Service Level Changes

Are there any services being provided that you feel need a service level change?

Responses

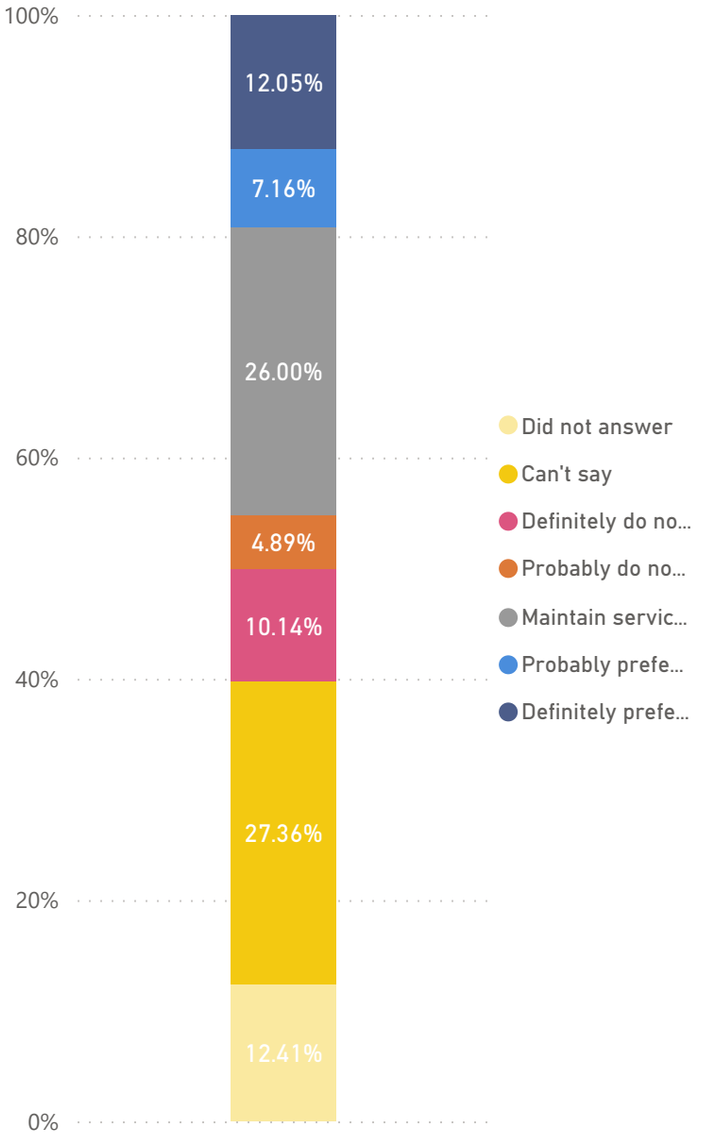
665

Respondents

78

Service Area	Definitely do not prefer service level change	Probably do not prefer service level change	Maintain service level	Probably prefer service level change	Definitely prefer service level change
Total	**112**	**54**	**287**	**79**	**133**
Responses to Life-Threatening Medical Calls	14	3	22	5	17
Response to Gas Leaks	13	7	44	19	34
Rescue Operations	12	7	24	7	10
Inspection and Fire Code Enforcement	7	8	22	6	12
Hazardous Materials Operations	11	2	27	5	7
Fire Station Tours, Fire Truck School, Visits	7	5	26	7	8
Fire Prevention Public Education Programs	8	5	25	8	10
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	7	5	25	4	9
Fighting Fires	19	3	25	6	8
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	6	4	25	5	8
City Emergency Preparedness Program	8	5	22	7	10

Service Area	Avg.	Avg. %	σ	Opt Out	Opt Out %
Total	**3.10**	**62.02**	**1.29**	**302**	**27.4%**
Response to Gas Leaks	3.46	69.23	1.27	51	27.7%
Inspection and Fire Code Enforcement	3.15	62.91	1.27	25	27.2%
Responses to Life-Threatening Medical Calls	3.13	62.62	1.47	19	20.7%
Fire Prevention Public Education Programs	3.13	62.50	1.23	24	26.1%
City Emergency Preparedness Program	3.12	62.31	1.27	27	29.3%
Fee-Based Services (i.e., Inspections: Daycare, Commercial, Film Services)	3.10	62.08	1.16	32	34.8%
Fire Station Tours, Fire Truck School, Visits	3.08	61.51	1.16	26	28.3%
Fire Permits (i.e., Open Air Burn Permits, Family Fireworks Sale Permits)	3.06	61.20	1.21	30	32.6%
Rescue Operations	2.93	58.67	1.30	21	22.8%
Hazardous Materials Operations	2.90	58.08	1.23	27	29.3%
Fighting Fires	2.69	53.77	1.35	20	21.7%



Hamilton

Definition and Ranking of Consistency and Confidence

Data Grading Scales

City Services & Asset Review

Hamilton Fire Services

September 2023

Grade		Data Consistency Standard Deviation (σ, Consistency of Responses)	Confidence Level Margin of Error (at 95% Confidence in Sample Size)
A	Very High	0 to 0.5 - results are tightly grouped with little to no variance in response	0% to 5% - Minimal to no error in results, can generally be interpreted as is
B	High	0.5 to 1.0 - results are fairly tightly grouped but with slightly more variance in response	5% to 10% - Error has become noticeable, but results are still trustworthy
C	Medium	1.0 to 1.5 - results are moderately grouped together, but most respondents are generally in agreeance	10% to 20% - Error is a significant amount and will cause uncertainty in final results
D	Low	1.5 to 2.0 - results show a high variance with a fair amount of disparity in responses	20% to 30% - Error has reached a detrimental level and results are difficult to trust
E	Very Low	2.0+ - results are highly variant with little to no grouping	30%+ - Significant error in results, hard to interpret data in much of a meaningful way

Here we attribute a lower value of consistency of response (Standard Deviation) to a higher confidence grade, but it does not necessarily mean that the data is "better". In reality we receive more insight in the data regardless. With a high consistency we can tell that respondents more often come to the same conclusion on a response for a question, whereas with low consistency we would see a split in people's opinion, some with a very high rating and others with a very low rating. Knowing this and then understanding why is the most important thing.

$$\text{Margin of error} = z \times \frac{\sigma}{\sqrt{n}}$$

The margin of error is calculated using 3 factors:
z - z-score, σ - standard deviation, n - sample size
The margin of error mainly tells us whether the sample size of the survey is appropriate. This is because in the calculation above, sample size would be the largest factor and thus have the biggest impact. The margin of error is represented as a percentage and indicates the range above and below the calculated average the true value is likely to fall. A smaller margin of error indicates a more precise estimate and vice versa.

Hamilton Paramedic Service Asset Management Plan 2024

Hamilton

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Hamilton Paramedic Service (HPS) is the designated sole provider of paramedic services for the City of Hamilton. HPS provides pre-hospital advanced medical care, trauma care and the transport of patients from emergency incidents to health-care facilities. HPS also provides community paramedic programs, public education, health care and safety promotion, and risk prevention activities including the provision and maintenance of public access defibrillators across the City.

ASSET SUMMARY

Replacement Value
$62.7M
Average Age
27 Years or 43% of life

LEVEL OF SERVICE SUMMARY

Customer

- Phone survey respondents feel HPS has performed **VERY GOOD to EXCELLENT** in overall service delivery.
- For life-threatening emergencies, the majority of phone respondents feel that paramedics should arrive in **SEVEN MINUTES OR LESS**.
- Just over half of phone respondents thought HPS **HAD OR SOMEWHAT HAD** adequate resources to provide reliable, timely, quality care to residents.

Technical

- HPS 90th Percentile Response time to Code 4 (life-threatening emergency) calls is **12 minutes 34 seconds** and the target is **10 minutes.**
- HPS **acquired 7 additional ambulances in 2023** to support peak service demands.
- With growing demands on the service, HPS is **proposing to acquire 8 additional facilities** in the next 10 years to support peak service demands.

Major Asset Highlights

MAJOR ASSETS	QUANTITY	REPLACEMENT COST	AVERAGE CONDITION	STEWARDSHIP MEASURES
HPS Stations	18	$32.6M	FAIR	Building Condition Assessments are completed every 5 years.
Ambulances	53	$13.3M	GOOD	Ambulances are inspected every 10,000km.

DATA CONFIDENCE

Key Demand Drivers

Demographic Shift: Hamilton's population is projected to increase to approximately 680,000 by 2031 with seniors being the fastest growing segment of the population. By 2031, almost 22% of Hamilton's population will be 65 years old or older. This forecasted increase in the senior population will significantly increase the demand for services provided by HPS over the next ten years and beyond.

Legislative Changes: Legislation shifts frequently for HPS, and often requires immediate compliance which can be costly. The most recent legislative change relates to Personal Protective Equipment (PPE), which is now a requirement for the City to maintain. In addition, the Ontario Building Code also requires all new HPS facilities to fulfil the OBC Post Disaster Seismic Requirement.

RISK

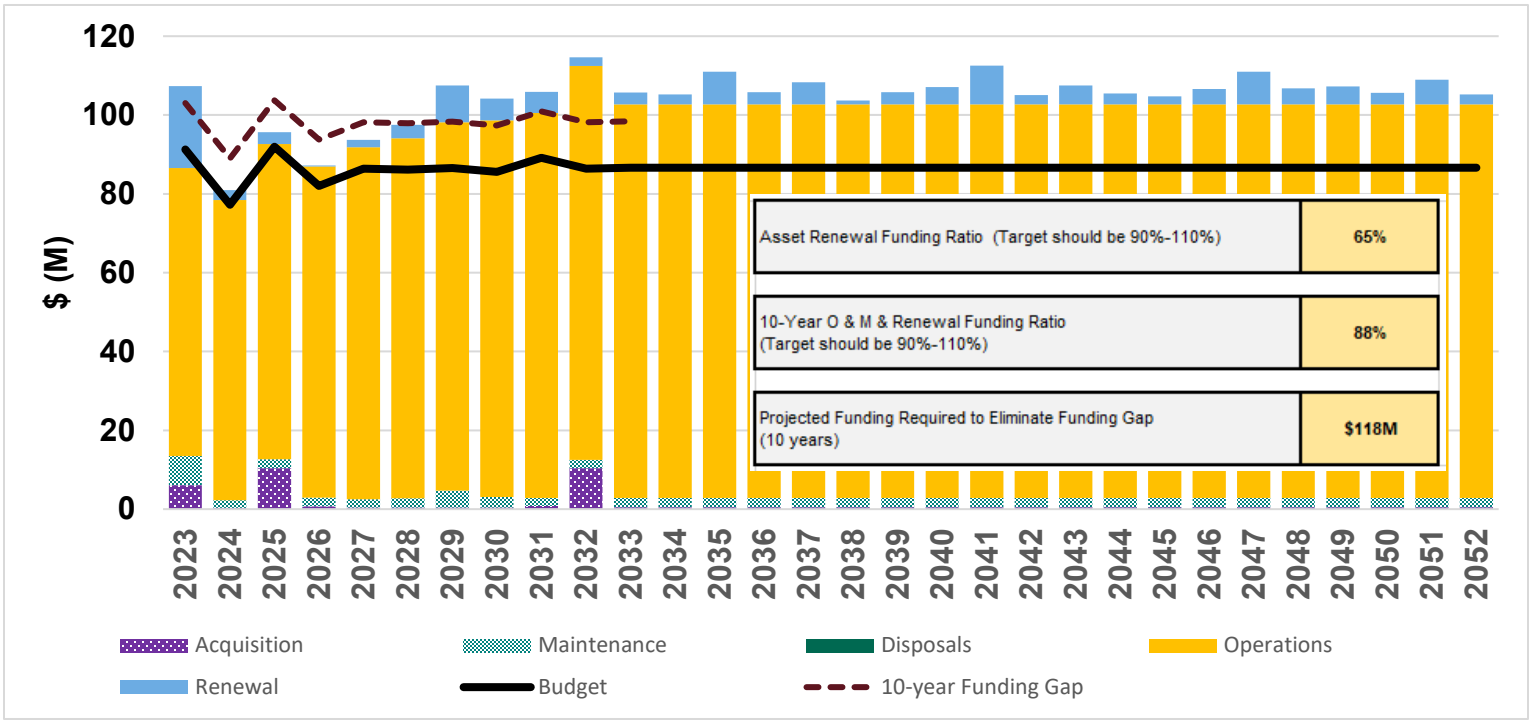
- Critical Assets are identified as the Ambulances, Facilities, Fuel System, 911 Communications and Medical Equipment.

CLIMATE CHANGE

Mitigation

- HPS currently has 2 hybrid ambulances which have been on trial use since 2018.
- All HPS vehicles have been equipped with anti-idling technology.

LIFECYCLE SUMMARY



1. INTRODUCTION

Hamilton Paramedic Service (HPS) is the designated sole provider of paramedic services for the City of Hamilton. HPS provides pre-hospital advanced medical care, trauma care and the transport of patients from emergency incidents to healthcare facilities. HPS also provides community paramedic programs, public education, health care and safety promotion, and risk prevention activities including the provision and maintenance of public access defibrillators across the city. As well, with community partners, HPS responds to healthcare crises in the community such as the opioid crisis and the COVID-19 pandemic. The Purpose of this Asset Management Plan (AM Plan) is to ensure that HPS has the required assets to deliver safe and effective paramedic 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 2023-2052 planning period.

2. BACKGROUND

The information in this section is intended to give a snapshot in time of the current state of Hamilton Paramedics Service (HPS) service areas by providing background on the service, outlining legislative requirements, defining the asset hierarchy used throughout the report, and providing the detailed summary and analysis of the existing inventory information as of February 2023 including age profile, condition methodology, condition profile, and asset usage and performance for each of the asset classes. 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; and,
- Hamilton Paramedic Service Master Plan 2022-2031.

Additional financial-related documents are identified in ***Section 10.1,*** Plan Improvement and Monitoring.

2.1.1 SERVICE HISTORY

Following the transfer of paramedic responsibility from the provincial government to local municipalities, in 2000, the Hamilton Paramedic Service (HPS) became the designated sole provider of paramedic services for the City of Hamilton. HPS provides emergency response pre-hospital advanced medical and trauma care, in addition to transporting patients to appropriate healthcare facilities. HPS also undertakes demand mitigation activities including community paramedic activities, public education, health care and safety promotion and risk prevention activities in neighbourhoods and public facilities including provision and maintenance of public access defibrillators across the City. As well, with community partners, HPS responds to healthcare crises in the community such as the opioid crisis and the COVID-19 pandemic.

2.1.2 SERVICE FUNCTION

As mandated by the Ambulance Act, R.S.O. 1990, c. A.19, and overseen by the Ministry of Health (MOH), the City of Hamilton is responsible for “ensuring the proper provision of land ambulance services in the municipality in accordance with the needs of persons in the municipality.” Specifically, the municipality is responsible to: a) select persons to provide land ambulance services in the municipality in accordance with the Act; b) entering into such agreements as are necessary to ensure the proper management, operation and use of land ambulance services by operators; and c) ensure the supply of vehicles, equipment, services, information, and any other thing necessary for the proper provision of land ambulance services in the municipality by this Act and the regulations

The Ambulance Act directs municipalities to either select persons pursuant to a request for proposals issued by the municipality; or provide land ambulance services itself directly. On January 1, 2000, the City of Hamilton assumed responsibility for the direct delivery of land ambulance services. Because this responsibility was transferred to the municipality, the

provincial government currently provides 50% funding from the previous year's approved budget to the City of Hamilton for paramedic services, while the remaining 50% comes from the local tax levy.

In addition, the Province (Ministry of Health and Ministry of Long-Term Care), and other partners including Ontario Health, provide 100% funding for non-mandated programs that HPS delivers such as Community Paramedicine (Mobile Integrated Health), High-Intensity Support, Social Navigator Program, dedicated offload nursing, and dedicated high acuity interfacility transport teams (neonatal and pediatric intensive care transfer units).

In order to deliver effective paramedic services, HPS requires a range of assets. Some ways assets support the delivery of the service include:

- Reliable vehicles and staff that will arrive at medical and other emergencies in a timely manner as well as at planned or scheduled appointments;
- Reliable technology to ensure communication lines are always available to accept calls for medical assistance, record patient information, and dispatch ambulances[1];
- Adequate facilities across the city (see map of Coverage Zones) to house and maintain vehicles and equipment in preparation to respond to medical calls; and,
- Required medical equipment for ambulances to provide adequate patient care according to standards of practice[2].

All radio and dispatching equipment, as well as dispatch staff, are provided by the Ontario Government and provided at no cost for use in accordance with the obligations of the Ministry of Health (Ambulance Act, ***Section 4***).

2.1.3 USERS OF THE SERVICE

HPS provides service to almost 570,000 Hamilton residents as well as visitors to Hamilton. Hamilton has a diverse population with a density of approximately 509.1 people per square kilometre. The following are the demographic attributes of more frequent users of HPS due to social determinants of health as identified in the Hamilton Paramedic Service Master Plan 2022-2031.

[1] All radio and dispatching equipment, as well as dispatch staff are provided by the Ontario Government and provided at no cost for use in accordance with the obligations of the Ministry of Health (Ambulance Act, Section 4).

[2] All required medical and other equipment as specified are in accordance with the Ontario Land Ambulance Equipment Standards issued pursuant to the Ambulance Act, Section 22.

- Age: Based on the 2021 Census results[3], the median age of Hamilton's population is 40.8 years. Hamilton's population is aging with just over 18% of residents, or about 104,000 people, aged 65 years or older. Seniors make up the highest percentage of HPS's total call volume and are the highest percentage of people who call multiple times in a year.

- Income & Social Status: Average total income of households in 2020 was $108,700. In impoverished neighbourhoods, the rates of emergency room visits and consequently ambulance calls are higher as compared to the wealthier neighbourhoods due to food and housing insecurity, childhood experiences, unemployment, lack of education, environmental pollutants, lack of social supports, unhealthy behaviours, and access to health services.

- Housing: In 2022, the median house price in Hamilton was $830,000 compared to $500,000 in 2017, and average rent continues to increase. As a result of social, economic and health inequities which escalated during the pandemic, there has been a rise in the establishment of encampments in Hamilton and an increase in calls for paramedics for medical response as well as outreach activities. In partnership with Hamilton Police Services, HPS provides supports to people living in encampments through the Social Navigator Program[4].

- Pre-existing Conditions: In 2016, rates of diabetes (7.2%), heart disease (3.7%) and cancer (1.2%) in residents of Hamilton aged 12 years and older were similar to the provincial rates. However, Hamilton had a higher rate of high blood pressure with just over 20% as compared to the province with approximately 18%. Residents with pre-existing conditions are more likely to access the service. In 2022 there were 885 calls for stroke and 156 calls for STEMI (heart attacks).

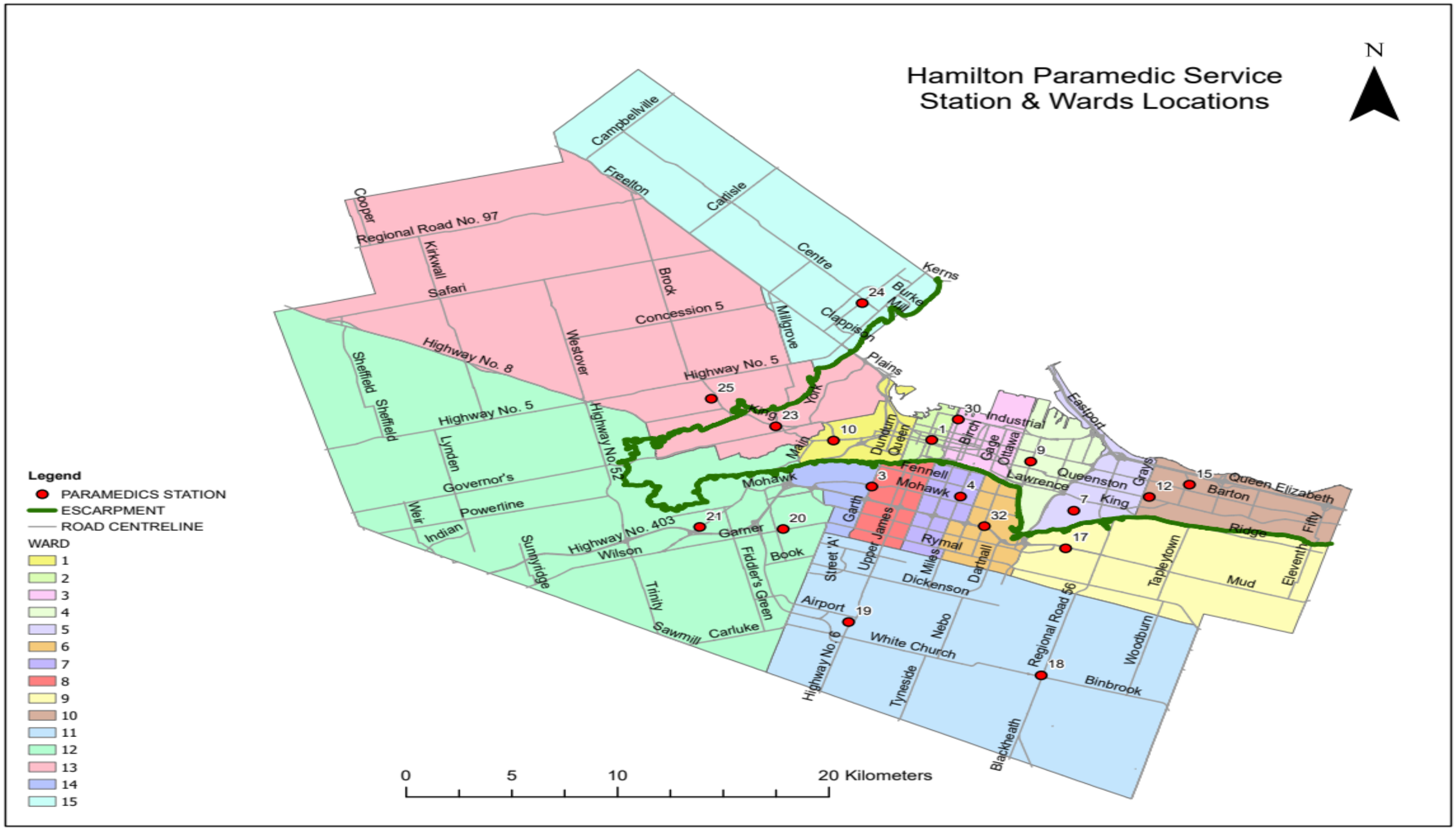
Additional social determinants of health are discussed in more detail in the Hamilton Paramedic Service Master Plan 2022-2031. HPS has a robust Mobile Integrated Health (MIH) program that provides services to vulnerable residents where they reside. The focus of these services is on chronic health and social determinants of health which may contribute to a resident needing to use 911 on multiple occasions.

HPS currently has 18 Stations which are located throughout the City as shown in ***Figure 1***. All but two of these Stations are Shared stations with the Hamilton Fire Department as discussed in ***Section 3.2.1***.

[3] 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

[4] https://creastats.crea.ca/mls/hami-median-price

Figure 1: Hamilton Paramedic Service Station & Ward Locations



2.1.4 UNIQUE SERVICE CHALLENGES

In recent years the call volume has increased substantially in Hamilton due to growth, an opioid crisis, and the COVID-19 pandemic. This change in call volume led to the following issues, which are discussed in more detail throughout the report, especially in ***Section 5***.

- **Code zero events** – Events where there is one or no ambulances available for response due to a combination of high call volume and offload delays.
    - In 2023, HPS received additional budget to add additional assets and staff to address the demand during peak hours including projected growth. This minimized the deficit from previous years, and code zero events have substantially been reduced in 2023[5]. The Hamilton Paramedic Service Master Plan 2022-2031 identifies a need to add each year through 2031, subject to annual council budget approvals, additional ambulances, and staff to deal with call volume growth, which have been included in the Lifecycle Management Acquisition Plan in ***Section 8.1***.

- **Facility Space** - HPS is the secondary user for the majority of the facilities they occupy with Hamilton Fire Department (HFD), and many of these facilities are aging. HFD has also indicated there is no additional space at any of their 26 stations (including those where HPS is currently co-located) for any additional HPS functions, and therefore HPS has been looking at other facility options to support their growing service. The Hamilton Paramedic Service Master Plan 2022-2031 also identifies the need for additional facilities which have been included in the Lifecycle Management Acquisition Plan in ***Section 8.1***

- **Vehicle Supply Chain** – Issues with the supply chain due to the COVID-19 pandemic persist, and HPS has had recent difficulty acquiring new ambulances in a timely manner. All ambulances used by the service must meet the certification requirements outlined in the Ministry of Health Land Ambulance and Emergency Response Vehicle Standards issued pursuant to the Ambulance Act ***Section 22***. There is little to no competition in the marketplace for provision of ambulances as there are currently only two ambulance manufacturers certified to provide ambulance vehicles for use in the Province of Ontario. Both manufacturers are subsidiaries of a single corporation. In the interim, HPS has been restoring ambulances which are beyond their service life to a useable condition, but this is not financially feasible over time.

[5] https://city-dashboard-spatialsolutions.hub.arcgis.com/pages/code-zeros

2.2 LEGISLATIVE REQUIREMENTS

The most significant legislative requirements that impact the delivery of HPS 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
Ambulance Act R.S.O. 1990, Chapter A.19, last amended Oct 19, 2021	Outlines requirements around providing an ambulance service including definitions, provincial and municipal responsibilities for paramedic services, delivery agents, land and air ambulance services, certifications, and general information.
Coroner's Act, R.S.O. 1990, c. C.37	Outlines the process to treat deceased persons in the field, and legislative obligations to provide information to the coroner's office and their designate.
Mental Health Act, R.S.O. 1990, c. M.7	Details parameters for the transport of patients suffering a mental health crisis who can be voluntarily or involuntarily assessed by a healthcare professional.
Healthcare Consent Act, 1996	Outlines the process for informed consent, substitute decision makers for treatment without consent situations, and emergency situations.
Personal Health information Protection Act (PHIPA)	This Act outlines process for privacy health information and documentation, consent for collection and disclosure, correction rights, security safeguards, and mandatory reporting.
O. Reg. 332/12: Building Code	Any facilities considered "Post-disaster", like HPS facilities, must include additional provisions for seismic loading.

HPS also have many standards that must be followed to provide patient care, which are discussed below in ***Table 2.***

Table 2: HPS Standards

STANDARD	REQUIREMENT
Land Ambulance Certification Standard	Standards for the application to operate a land ambulance service, initial certification, recertification, the operational requirements, staffing and deployment plans, response time performance plans, base hospital interactions, Identification cards, communications services, patient care, continuing medical education, paramedic and EMS qualifications,

STANDARD	REQUIREMENT
	documentation, equipment and supplies, vehicles, and quality assurance
Basic Life Support Patient Care Standards (BLSPCS)	The BLSPCS outlines the standards that paramedics must follow in their conduct, response, assessment, care, reporting, and transportation of patients at the basic level (applicable to all paramedics). These standards also drive requirements for equipment and training
Advanced Life Support Patient Care Standards (ALSPCS)	The ALSPCS outlines the standards that paramedics must follow with respect to advanced care procedures which are acts in the practice of medicine that must be delegated to the paramedic by a physician in accordance with the College of Physicians and Surgeons delegation guidelines. These standards also drive requirements for equipment and training.
Ambulance Call Report Completion Manual	Outlines the full details of what must be recorded in the completed patient care report for each patient care contact including instances where patients are not transported and where they are transported. The requirements are extremely detailed.
Patient Care Transportation Standards	The PCTS outlines the requirements for ambulances and ERV's, designation of advanced care ambulances, continuing education completion, various certification and re-certification requirements, vehicle operation and conduct, patient restraint, infection control, communicable disease management and safety measures, compliance with the direction of the dispatcher, destination determination, and equipment restraint.
Patient Care Model Standards	The PCMS outlines the requirements for submission and approval of proposals that allow paramedics to transport patients to destinations other than a hospital (alternate destination, treat and refer, treat and release).
Ambulance Service Communicable Disease Standards	Requirements for vaccination against preventable diseases as outlined in the table (certificate, proof of contraindication)
Provincial Equipment Standards	This standard sets out the minimal requirements for(a) what equipment must be carried in an ambulance or an emergency response vehicle (ERV); and (b) the minimal criteria and specifications for every piece of equipment that is carried within an ambulance or an emergency response vehicle

STANDARD	REQUIREMENT
Land Ambulance and Emergency Response Vehicle Standard	This standard sets out the minimum standards for ambulance and emergency response vehicles including the materials for construction, exterior identification, construction and design details, heating, ventilation and air conditioning, electrical systems, emergency warning systems, radio systems, oxygen systems, suction apparatus, accommodation and storage, safety equipment, interior signage, chassis specification, Ministry model certification standards, and ambulance performance standards. No vehicle may be utilized as an ambulance or as an ERV that does not meet the standards outlined within the document.

2.3 ASSET HIERARCHY

To deliver reliable and timely paramedic services, HPS requires a wide range of assets. HPS Assets have been broken down into the following asset classes for the purpose of this AM Plan section:

- **Facilities:** refers to any structures required to deliver the service.
- **Vehicles:** describes different means of transportation required to deliver the service.
- **Equipment**: refers to any equipment required to deliver the service.
- **Technology:** refers to any computer hardware required to deliver the service.

The asset class hierarchy outlining assets included in this report is shown below in ***Table 3***.

Table 3: Asset Class Hierarchy

SERVICE AREA	HAMILTON PARAMEDIC SERVICE			
ASSET CLASS	**FACILITIES**	**VEHICLES**	**EQUIPMENT**	**TECHNOLOGY**
Asset	Paramedic Stations	Ambulances	Carbon Monoxide (CO) Detector	IT Equipment
	Administrative Facility	Emergency Response Vehicles	Fixed Assets (includes Stretchers, Loading Devices, Kits, Public Access Defibrillator, Emergency Shelter, Trailers, ATV)	
		Administrative Vehicles	Medical Equipment (includes Autopulse, Zoll Monitor, Portable Suction Unit)	

SERVICE AREA	HAMILTON PARAMEDIC SERVICE			
ASSET CLASS	**FACILITIES**	**VEHICLES**	**EQUIPMENT**	**TECHNOLOGY**
		Mobile Integrated Health (MIH) Vehicles	Other Equipment (includes MIH Assets, Training Equipment)	
		Bicycles	Oxygen Delivery Support (includes Flowmeter, Tank Regulators)	
			Toughbook	

3. SUMMARY OF ASSETS

Table 4 displays the detailed summary of assets for the HPS service area. The sources for this data are a combination of data sources included in the City's database information provided by the HPS, Facilities & Energy Management and Information Technology divisions. It is important to note that inventory information changes often, and that this is a snapshot of information available as of February 2023.

The City owns approximately **$63M** in HPS assets which are on average in Fair condition. Assets are a weighted average by replacement cost of **27 years** in age which indicates there is an average of **43%** remaining service life (RSL) for these assets. The majority of the weighting for these averages comes from the **Facilities** asset class. For most assets, this means that the City should be completing preventative, preservation and minor maintenance activities per the inspection reports as well as operating activities (e.g., inspection, cleaning) to prevent any premature failures.

Data confidence descriptions are outlined on ***Page 31*** of the AM Plan Overview. The replacement costs below are typically a Medium data confidence level overall. For Facilities, replacement costs are calculated using an internal Corporate Facilities and Energy Management tool which encompasses current market rates, building type and size and were escalated to include additional soft costs. Vehicle, Equipment and Technology replacement costs were gathered from the most recent purchase price for similar assets and are typically High confidence.

For the majority of assets, the age and condition of assets is recorded during regular operations conducted by HPS and maintained in a software called Operative IQ. The asset registry data confidence for Facilities and Vehicles is overall High for age and condition, but there is missing age information for some Equipment assets and missing condition information for Technology assets which should be tracked moving forward and has been identified as a continuous improvement item in ***Table 29***. More details can be found in ***Section 3.2.***

Although HPS maintains an asset registry, it was discovered during the development of this AM Plan that it was not always considered the best source of information, and data clean-up was required to accurately reflect the assets for this AM Plan. Therefore, a continuous improvement item identified in ***Table 29*** is ensuring the data in Operative IQ is accurate and includes key database fields as well as metadata and follows the newly developed City Data Standard.

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.

Table 4: Detailed Summary of Assets
****Weighted Average based on Replacement Cost***

FACILITIES				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
HPS Stations	2	$14.4M	56 years (25%)	3-FAIR
Data Confidence	Very High	Medium	Very High	High
Shared Fire Station	16	$18.2M[6]	32 years (57%)	3-FAIR
Data Confidence	Very High	Medium	Very High	High
Administrative Facility (MATC)	1	$5.0M[6]	8 years (89%)	2-GOOD
Data Confidence	Very High	Medium	Very High	High
SUBTOTAL	**$37.6M**		**42 years* (44%)**	**3-FAIR***
DATA CONFIDENCE	Medium		High	High

[6] This represents the replacement value for the area of the shared facilities currently occupied by HPS, and would be the amount the City would pay if they were to build a new facility with this amount of area.

VEHICLES				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Ambulance	53	$13.3M	5 years (17%)	2-GOOD
Data Confidence	High	High	High	High
Emergency Response Vehicle (ERV)	17	$1.9M	6 years (2%)	3-FAIR
Data Confidence	High	High	High	High
Administrative Vehicles	9	$0.8M	10 years (0%)	3-FAIR
Data Confidence	High	High	High	High
Mobile Integrated Health Vehicles	6	$0.2M	2 years (73%)	2-GOOD
Data Confidence	High	High	High	High
Bicycle Unit	6	$5.9K	2 years (78%)	2-GOOD
Data Confidence	High	High	High	High
SUBTOTAL	**$16.1M**		**5 years* (15%)**	**2-GOOD***
DATA CONFIDENCE	**High**		**High**	**High**

EQUIPMENT				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Fixed Assets	1958	$4.8M	7 years (23%)	3-FAIR
Data Confidence	High	High	High	Medium
Medical Equipment	266	$3.1M	3 years (61%)	2-GOOD
Data Confidence	High	High	High	High
Toughbook	124	$0.6M	5 years (0%)	3-FAIR
Data Confidence	High	High	High	High
Other Equipment	15	$0.2M	7 years (0%)	3-FAIR
Data Confidence	High	High	High	High
Oxygen Delivery Support	380	$0.1M	N/A	2-GOOD
Data Confidence	High	High		High
Carbon Monoxide Detector	77	$0.04M	6 years (14%)	3-FAIR
Data Confidence	High	High	High	High
SUBTOTAL	**$8.8M**		**4 years* (54%)**	**2-GOOD***
DATA CONFIDENCE	**High**		**High**	**High**

TECHNOLOGY[7]				
ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
IT Equipment (e.g. laptops, desktops)	182	$0.02M	7 years (0%)	4-POOR
Data Confidence	High	High	High	Low
SUBTOTAL		**$0.02M**	**7 years* (0%)**	**4-POOR***
DATA CONFIDENCE		**High**	**High**	**Low**
TOTAL		**$62.7M**	**27 years* (43%)**	**3-FAIR***
Data Confidence		**Medium**	**High**	**High**

[7] Currently Automatic Vehicle Locator (AVL) equipment is not included in the HPS inventory, and asset owner responsibility is being investigated. This has been identified as a Continuous Improvement Item in Table 29.

3.1 ASSET CONDITION GRADING

Condition refers to the physical state of 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 5*** 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. A continuous improvement item identified in ***Table 29,*** is to review existing internal condition assessments and ensure they are revised to report on the same 5-point scale with equivalent descriptions.

Table 5: Equivalent Condition Conversion Table

EQUIVALENT CONDITION GRADING CATEGORY	CONDITION DESCRIPTION	INTERNAL CONDITION SCORE	IT TECHNOLOGY	FACILITIES CONDITION INDEX (FCI)
1 Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	N/A	>79.5% RSL	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.	GOOD	69.5% – 79.4% RSL	< 5%
3 Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	FAIR	39.5% - 69.4% RSL	>= 5% to < 10%
4 Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	POOR	19.5% -39.4% RSL	>= 10% to <30%
5 Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	N/A	<19.4% RSL	>= 30%

The following conversion assumptions were made:

- HPS assesses their assets on a 3-Point condition scale, and therefore these assets will not be able to attain a score of 1 or 5 in this report.
- Facilities Condition Index was based on ranges provided by the consultant who completed the Building Condition Assessment (BCA) which corresponds to a 4-Point scale; therefore, facilities will not be able to attain a score of 1;
- Facilities Condition Index was reviewed and updated by the City's Corporate Facilities and Energy Management (CFEM) division in January 2024; and
- For Technology assets, the condition was based on the % of remaining service life.

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 are noted and prioritized in this AM Plan.

3.2.1 FACILITIES PROFILE

Hamilton Fire Department share the majority of their current stations and their administrative facility with HPS as secondary users, however there are two stations where HPS occupies all or most of the space (Stations 30 and 32).

For the purposes of this report, Facilities where HPS occupies most of the space, have been considered Hamilton Paramedics Service (HPS) stations, and facilities where HPS is the secondary user were considered Shared Fire Stations. The replacement values for these Facilities have been allocated based on the portion of the building that paramedics are currently occupying. Since this square footage allocation changes regularly, a continuous improvement item identified in ***Table 29*** is to implement a process to keep up to date on facilities and square footage for HPS.

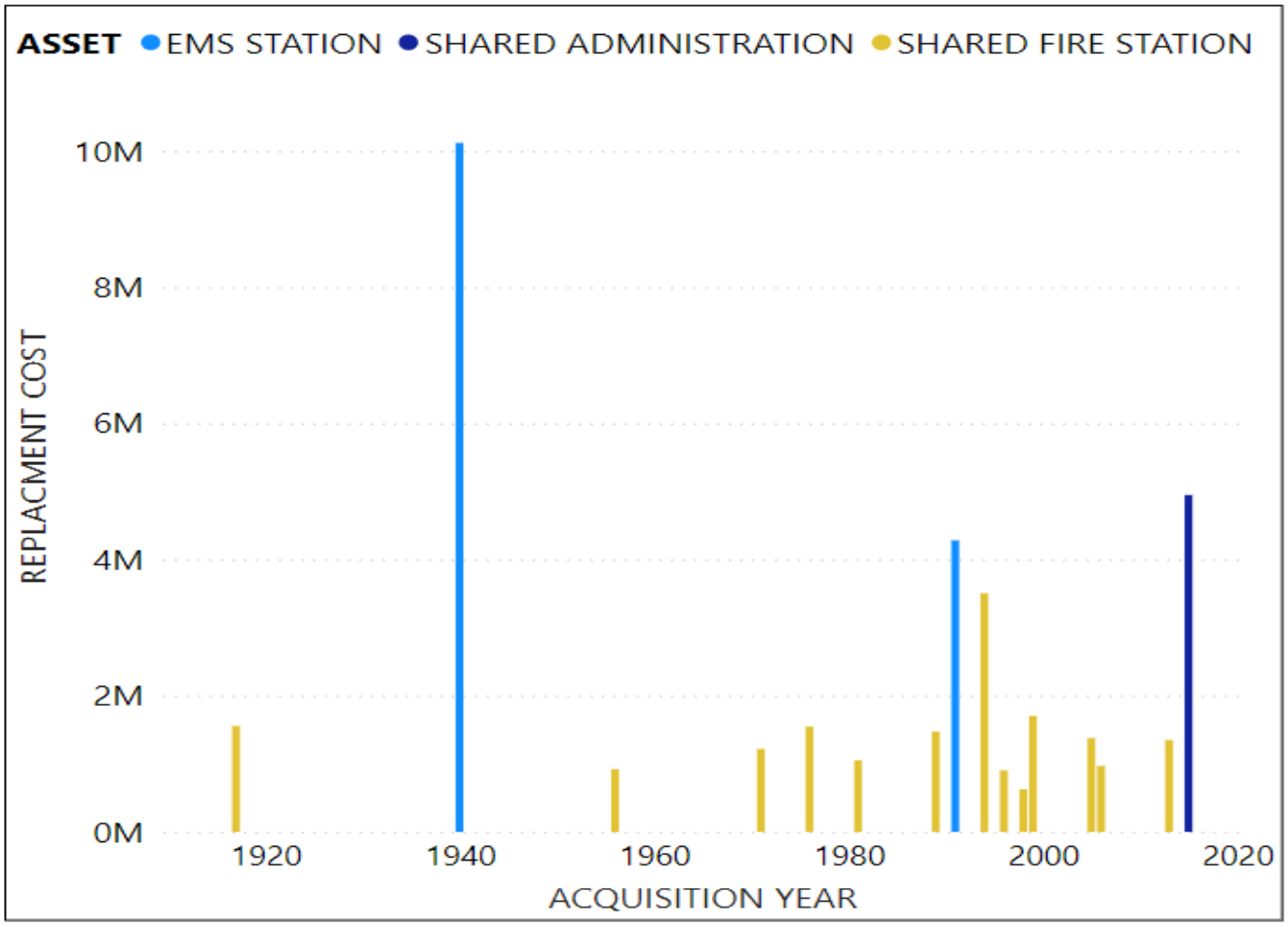
With the anticipated growth in number of responses discussed in ***Section 5***, HPS is beginning to run out of space in these shared facilities and is investigating adding additional facilities.

3.2.1.1 AGE PROFILE

The age profile for HPS Facilities assets is shown in ***Figure 2***. For Facility assets, the data confidence for age is typically “Very High”, because this information was recorded during the construction of the facilities.

The majority of HPS occupied stations were built between 1988 and 2000. The oldest shared station is Fire Station 1 built in 1917 and located on John Street North, which had a major renovation in 2003, and is not currently planned for renewal. The large spike in 1940 represents Station 30 which is the largest occupancy HPS Station and was previously repurposed from a private truck repair and maintenance facility in the 1940s, acquired by the City in 1988, and transferred for HPS usage in 2000. It is beyond its ESL and will appear in the backlog in ***Section 8.3.***

Figure 2 : Facilities Age Profile



3.2.1.2 CONDITION METHODOLOGY & PROFILE

Condition for HPS facilities is determined based on the results of a Building Condition Assessment (BCA). BCAs are completed on HPS facilities every five years and output a score called a Facility Condition Index (FCI) which is considered to be a high confidence level source. The FCI is a financial indicator of condition and is calculated based on a ratio of the cost of work required on the facility to the total replacement cost of the facility. The condition conversion from FCI to the standardized 5-point scale used in this AM Plan is shown in ***Table 6.***

Table 6: Inspection and Condition Information

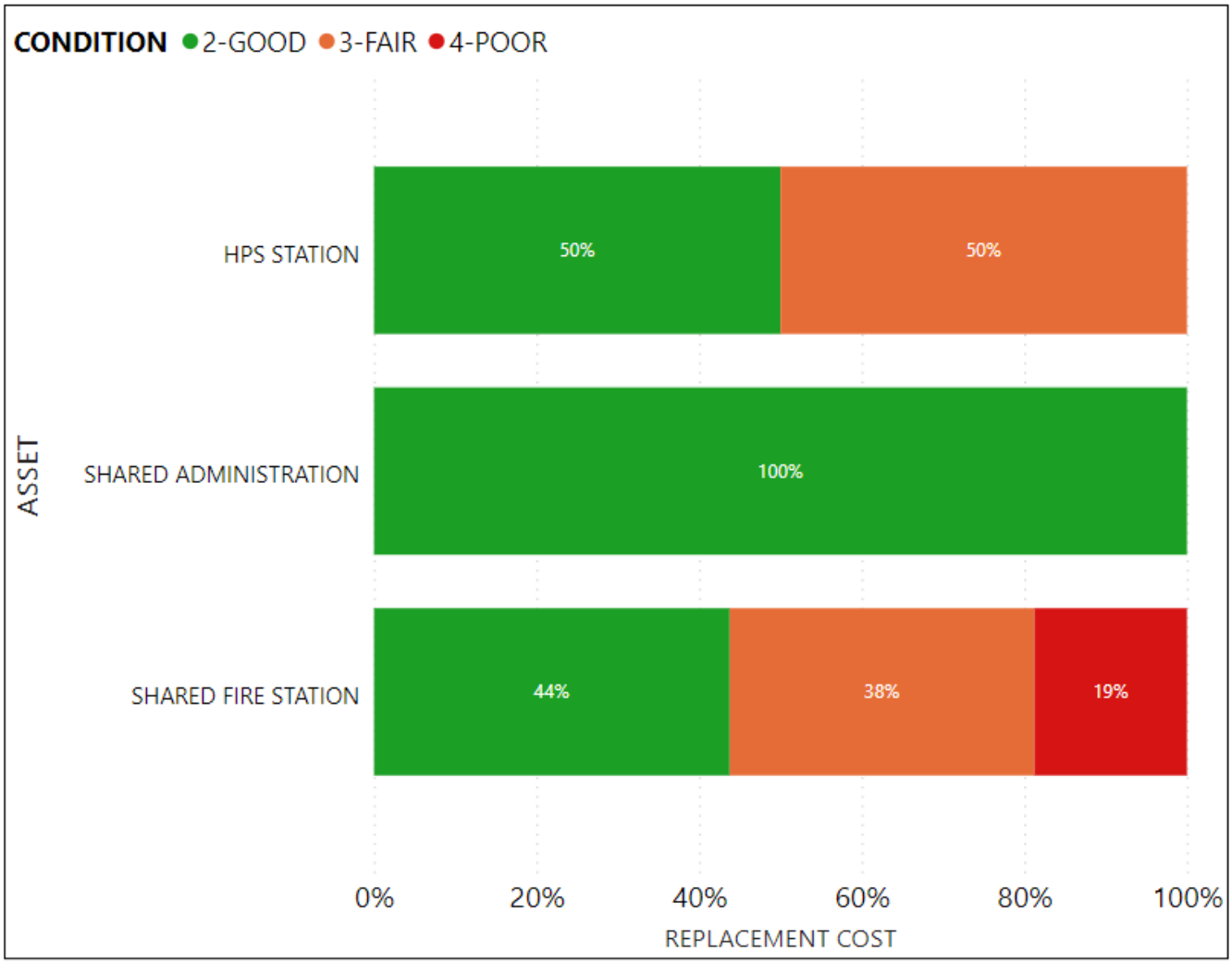
ASSET	INSPECTION FREQUENCY	LAST INSPECTION	CONDITION SCORE OUTPUT
All Facilities	5 years	2019	Facilities Condition Index

The condition profile for HPS Facilities assets is shown below in ***Figure 3.*** It is evident that many of the stations that HPS occupy (HPS Stations and Shared Facilities) are indicated to be in fair or worse condition based on the results of the BCA. It is important to note that the BCA's were completed in 2019, and while the forecasted works have been updated in the CFEM database, a future BCA will be completed in 2024 and therefore these condition ratings may change in the next year.

Per the BCA results, Station 30 has been identified as being in Fair condition but is currently beyond its service life of 75 years and is anticipated to require a lot of major maintenance work in the next 10 years. Since the FCI is a financial indicator of condition, if this work is not completed, it could result in the facility reaching a poor FCI as early as 2028. Similarly, Station 32 is considered to be in good condition per the BCA, but if work on this facility is not prioritized, the FCI could drop to poor as early as 2025. Many of the identified needs are due to components being at the end of their service life as explained under specific performance deficiencies in ***Table 7.***

Since HPS are the secondary users of the shared facilities, most of these facilities will be discussed in more detail in the Hamilton Fire Department AM Plan.

Figure 3: Facilities Condition Distribution



3.2.1.3 ASSET USAGE AND PERFORMANCE

As previously mentioned, HPS are the secondary user for the shared facilities (i.e., Shared Station and Shared Administration). As a result, the deficiencies below will be focused on the two HPS Stations and performance issues with the Shared Fire Stations & Administration Facility will be discussed in the Hamilton Fire Department Asset Management Plan.

The largest performance issues with HPS Stations involve components at the end of their service life or being in poor condition. The significant service performance deficiencies for Facilities in ***Table 7*** were identified using information from the BCA considering cost and consequences of failure. At this time, many of these deficiencies have not yet been incorporated into the capital budget and are an outstanding need.

Table 7: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
FACILITY	**Station 32**	Roof approaching the end of service life	It is recommended to replace the roof as it is approaching the end of its service life.
	Station 30	Parking Lot in Poor Condition	It is recommended to replace the asphalt parking lot as it is in poor condition.
	Station 30	Generator Upgrade required	The generator has likely not been upgraded since the original construction. Replacement of the Generator and ATS is recommended at the conclusion of their expected useful life to ensure a standby power supply to the building in the event of a power failure. Replacement can be anticipated within the next 3 to 5 years.
	Stations 30 and 32	Overhead Doors at end of service life	It is recommended to replace the overhead doors as required, at the end of their life cycle.
		Interior Lighting	Existing interior lighting appears to be original to construction and past expected life. LED fixtures are recommended to improve energy saving.
		Electrical Service at end of service life	The electrical service equipment likely has not been upgraded since the original construction. Given the expected life of 30 years for the service equipment. Replacement can be anticipated within the next 3 to 5 years.
		Industrial Air Filtration Units at end of service life	It is recommended to replace the air filtration units at the end of their life expectancy to maintain proper ventilation.

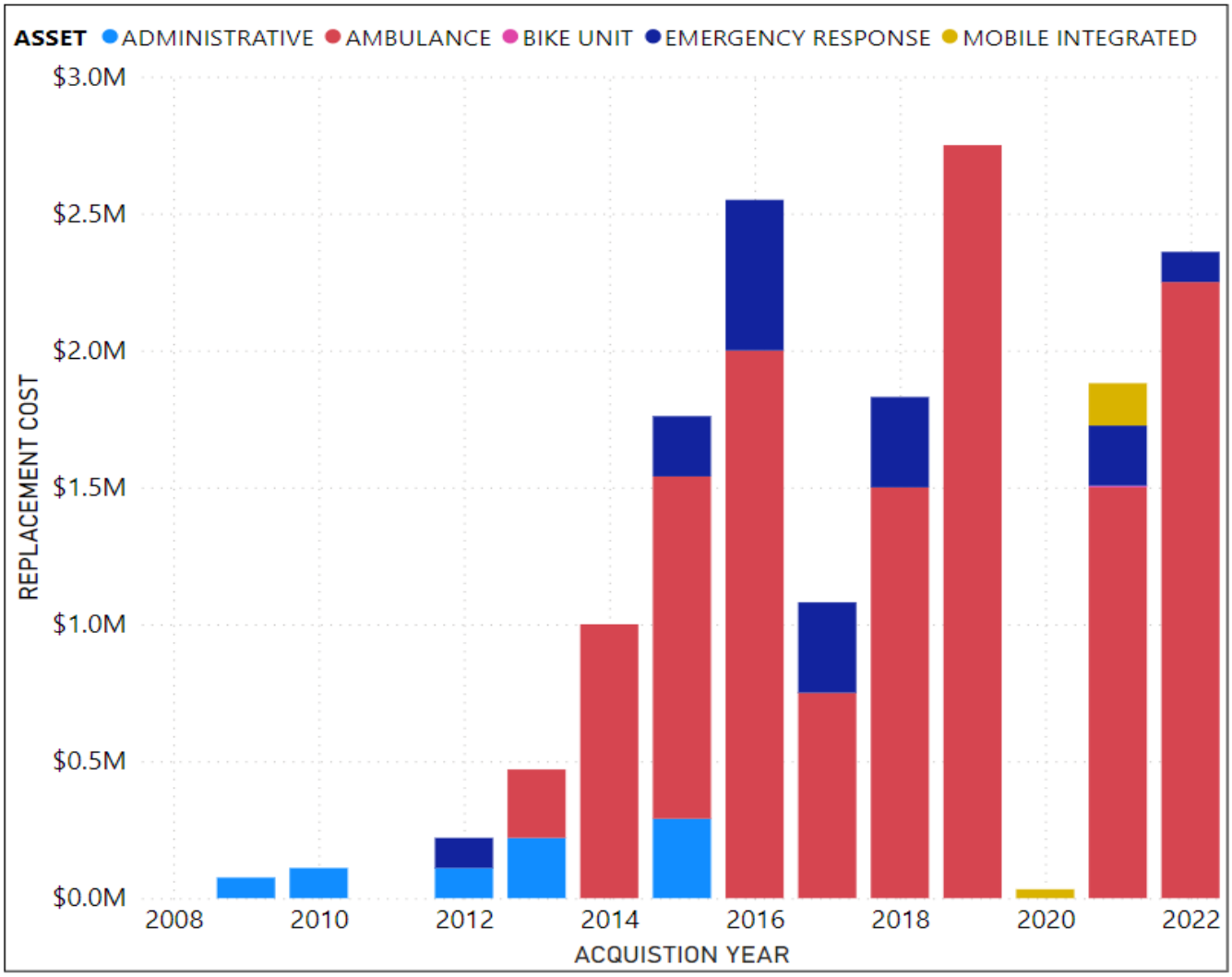
3.2.2 VEHICLES PROFILE

3.2.2.1 AGE PROFILE

The age profile for HPS Vehicles assets is shown in ***Figure 4***. For Vehicle assets, the data confidence for age is typically High because this information is formally recorded, and vehicle models typically include the year of manufacture. Ambulances are replaced on a 6-year cycle, and therefore any ambulances purchased before 2016 in the figure below are past their estimated service life.

Due to supply chain issues exacerbated by the COVID-19 pandemic, HPS has been working to restore end-of-life ambulances' condition to extend the service life. However, this is a costly endeavor costing 20% of the ambulance replacement cost, and typically only extends the life by two years. These supply chain issues are still in effect and may continue to result in increased maintenance costs and an increased backlog for vehicle replacement needs in the coming years.

Figure 4: Vehicle Age Profile



3.2.2.2 CONDITION METHODOLOGY & PROFILE

Since Ambulances are a critical asset for the HPS service, it is essential that these assets are kept in an acceptable state of repair to deliver reliable service. HPS inspects all vehicles per the inspection frequency outlined below and uses these inspections to output a 3-point condition scale as shown below in ***Table 8.*** This 3-point scale has been converted to the 5-point AM Condition Scale for consistency as discussed in ***Section 3.1.***

A continuous improvement item identified in ***Table 29*** is to modify the 3-point condition scale into a 5-point scale for future consistency.

Table 8: Inspection and Condition Profile

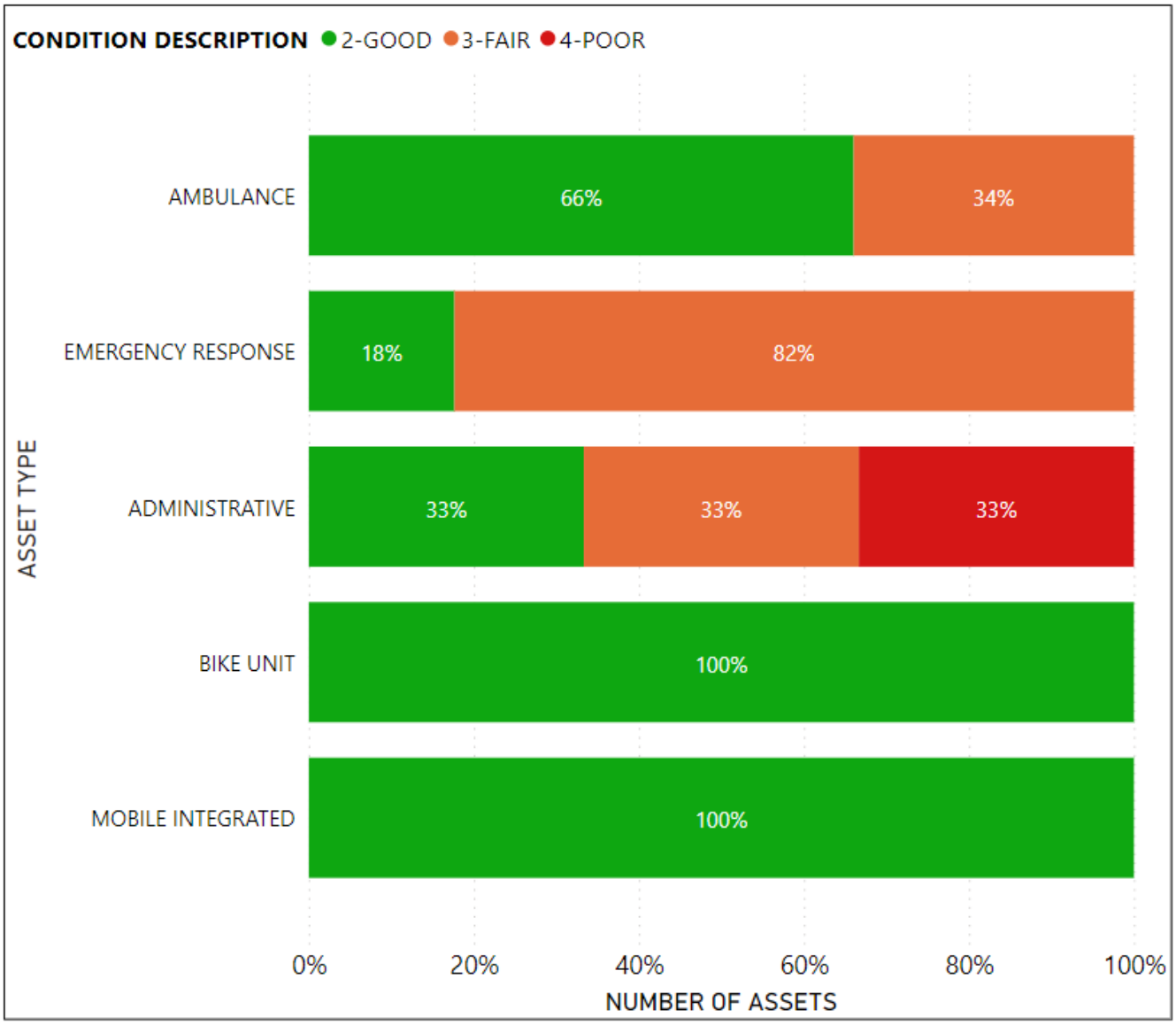
ASSET	INSPECTION TYPE	DESCRIPTION	FREQUENCY	CONDITION SCORE OUTPUT
Ambulance, Emergency Response Vehicle, Administration Vehicle, MIH Vehicle	All vehicles have a complete assessment every 90 days by the HPS logistics team	Vehicles are reset to Standardized templates / inspected/sent for Preventative Vehicle Maintenance on schedules	Based on Mileage or Time passed whichever comes first	3-Point Scale (Good, Fair, Poor)
Bike Unit	Yearly PM Cycles	Sent for spring reconditioning and tune-ups	Yearly or as needed	3-Point Scale (Good, Fair, Poor)

The condition profile for HPS Vehicle assets is shown below in ***Figure 5.***

It is evident that the majority of HPS assets are in Good to Fair condition. Assets in Poor condition are generally lower criticality vehicles such as vehicles used by administrators but should be planned for replacement.

As mentioned in ***Section 3.1***, the original condition grades were converted to a standardized condition category for report consistency.

Figure 5: Vehicles Condition Profile



3.2.2.3 ASSET USAGE AND PERFORMANCE

The largest performance issues with Vehicle assets involve Poor-condition assets. The known service performance deficiencies in ***Table 9*** were identified using the Condition Scores discussed above.

Table 9: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Administrative Vehicles	**Various**	Poor Condition	The asset has been identified to be in Poor condition and requires replacement. The process to replace has started but has been delayed due to supply chain issues.

3.2.3 EQUIPMENT PROFILE

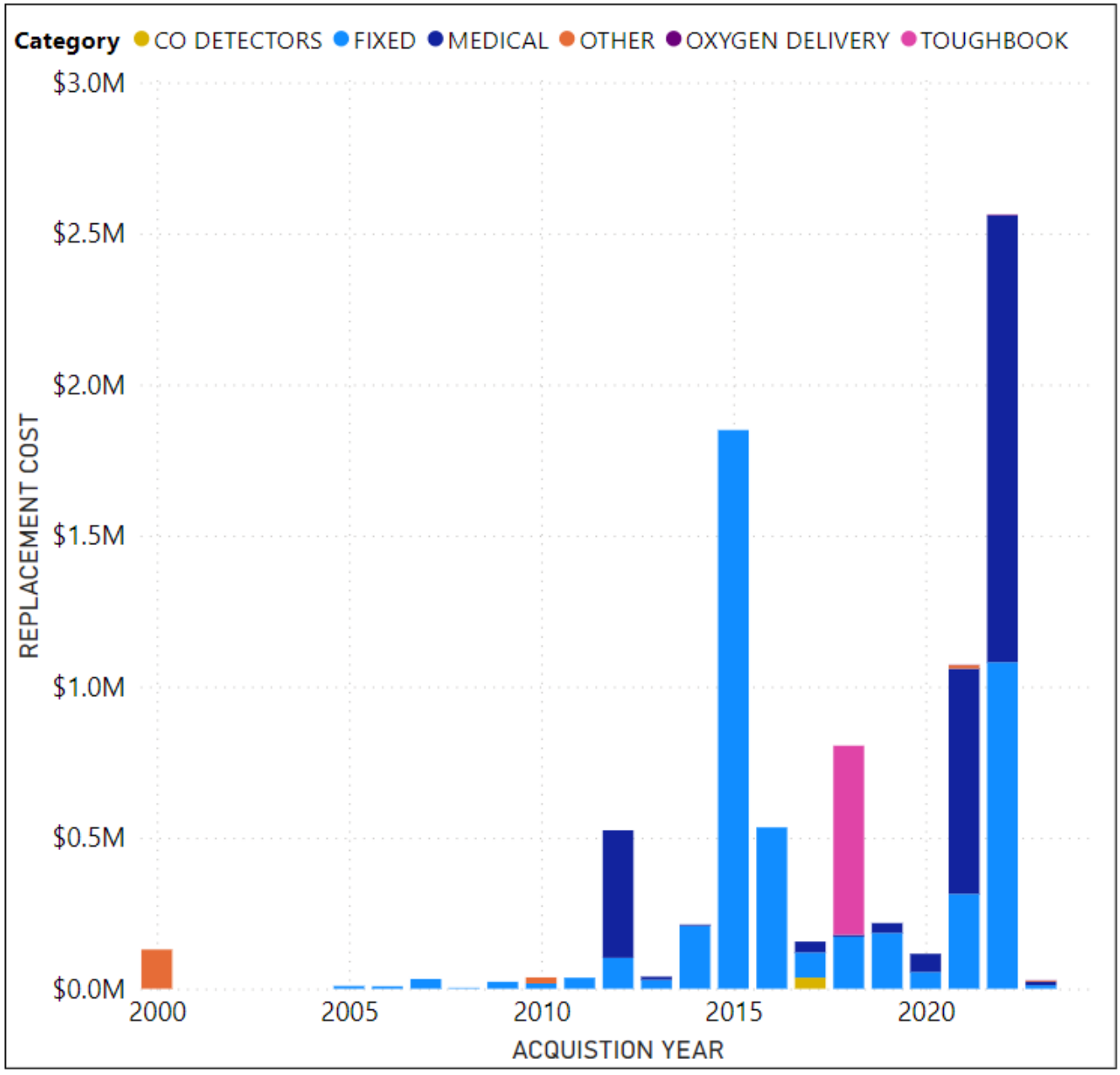
3.2.3.1 AGE PROFILE

The age profile for HPS Equipment assets is shown in ***Figure 6***. Overall, the majority of HPS equipment is within its estimated service life (ESL). However, any assets in the age profile below purchased in or before 2015 are likely past their ESL and will appear in the renewal backlog in **Section 8.3**. It is evident there was a spike in purchases in 2015 for Fixed Assets which were due to a bulk purchase of Power Load Devices and Stretchers both of which have ESLs of 7 years and so these assets will appear in the renewal backlog in ***Section 8.3*** since they were due for replacement in 2022.

In addition, there was another spike in purchases in 2022 for Fixed Assets consisting of Stretchers and Medical Equipment consisting of Zoll Monitors, therefore with an ESL of 7 and 9 years respectively, there will be spikes in the renewal forecast in ***Section 8.3*** in 2029 and 2031.

The oldest equipment was purchased in 2000 and refers to Training Equipment which has been identified to be in Poor condition and should be replaced.

Figure 6: Equipment Age Profile



3.2.3.2 CONDITION METHODOLOGY & PROFILE

Since the majority of HPS equipment is critical to their service delivery, these assets are inspected during regular operations, and given a condition score on a 3-point scale. HPS inspects equipment assets per the inspection frequency outlined below and uses these inspections to output a 3-point condition scale as shown below in ***Table 10.***

This 3-point scale has been converted to the 5-point AM Condition Scale for consistency as discussed in ***Section 3.1.*** A continuous improvement item identified in ***Table 29*** is to modify the 3-point condition scale into a 5-point scale for future consistency.

Table 10: Inspection and Condition Information

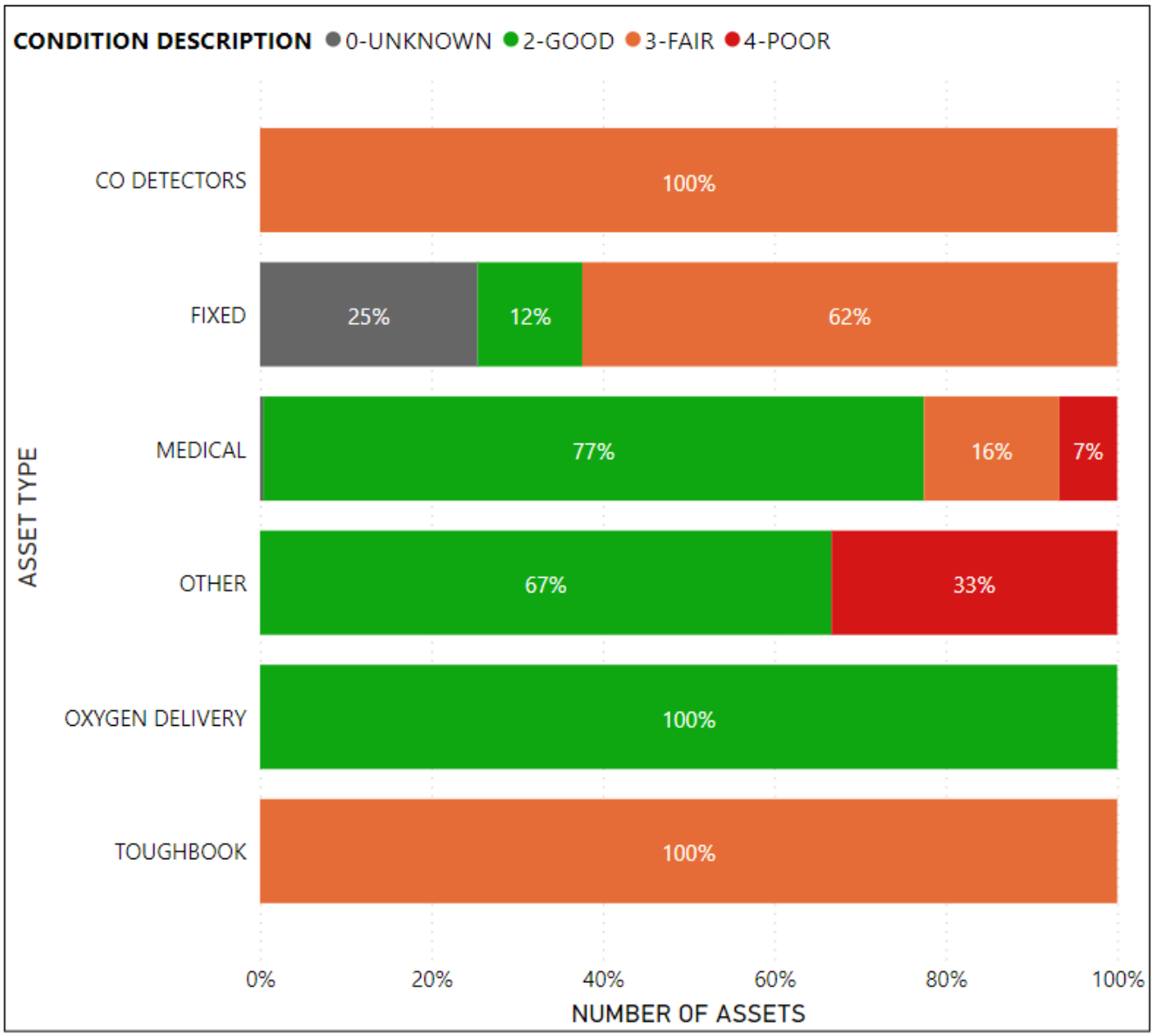
ASSET	INSPECTION FREQUENCY	LAST INSPECTION	CONDITION SCORE OUTPUT
CO Detectors	All assets are inspected and have preventative maintenance completed on a 90-day cycle	Last 90 days	Three Point Scale
Fixed Assets			
Medical Equipment			
Other Equipment			
Oxygen Delivery Equipment			
Toughbook	Annual	2022	Three Point Scale

The condition profile for HPS Equipment assets is shown below in ***Figure 7.***

It is evident that the majority of HPS assets are in Good to Fair condition. Assets in Poor condition are generally lower criticality equipment such as training equipment (under Other Equipment) or portable suction units (under Medical Equipment) but should be planned for replacement. Unknown conditions refer to the Public Access Defibrillator program which are assets that are inspected monthly and are replaced immediately if they do not function properly and can be assumed to be in working condition.

As mentioned in ***Section 3.1***, the original condition grades were converted to a standardized condition category for report consistency.

Figure 7: Equipment Condition Distribution



3.2.3.3 ASSET USAGE AND PERFORMANCE

The largest performance issues with Equipment assets involve Poor condition assets. The known service performance deficiencies in ***Table 11*** were identified using the Condition Scores discussed above.

Table 11: Known Service Performance Deficiencies

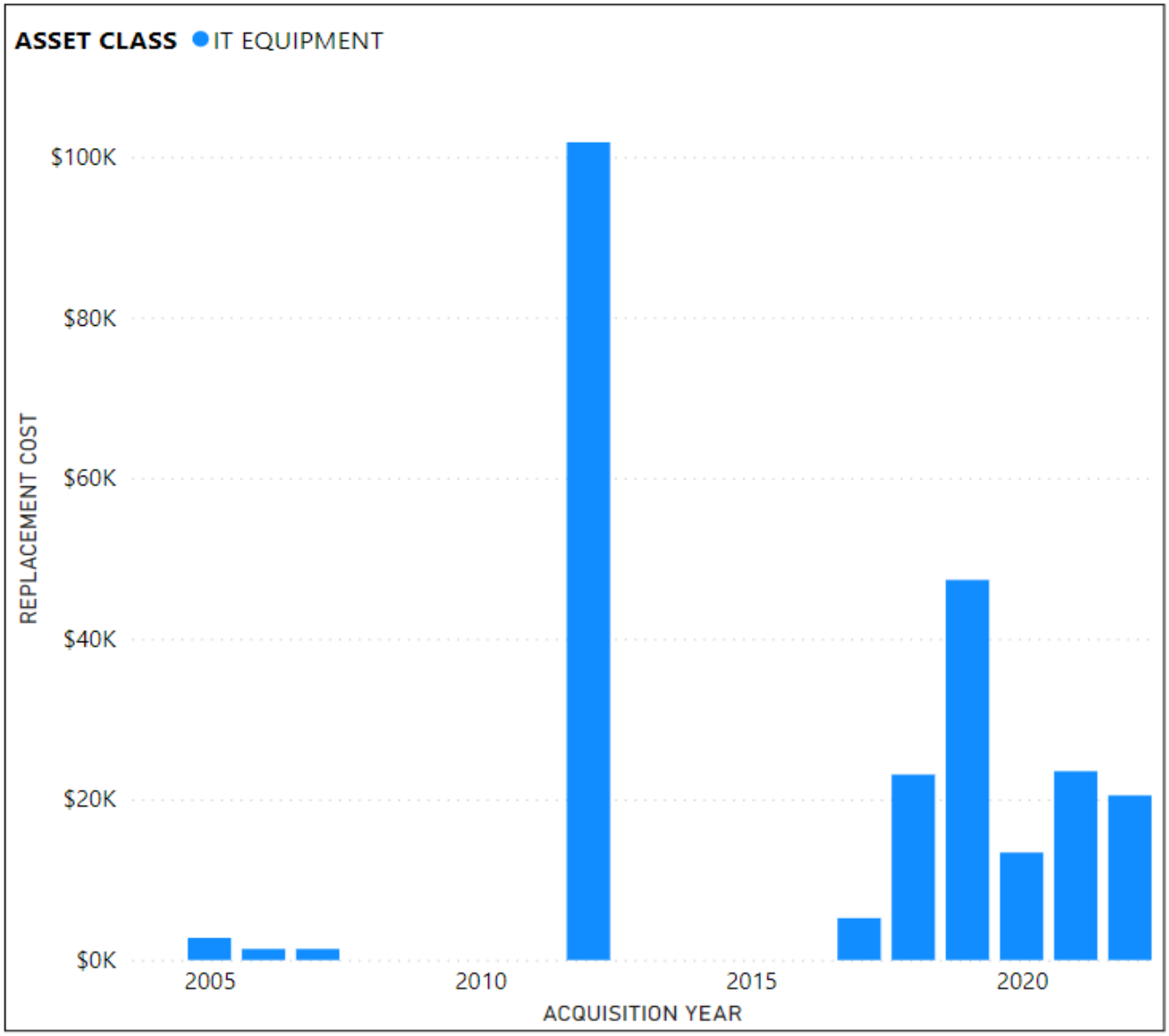
ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Training Equipment (under Other Equipment)	**Various**	Poor Condition	Assets have been identified to be in Poor condition per inspection and should be planned for replacement.
Portable Suction Units (under Medical Equipment)	**Various**		

3.2.1 TECHNOLOGY PROFILE

3.2.1.1 AGE PROFILE

The age profile for HPS Technology assets is shown in ***Figure 8.*** IT Equipment on average has an estimated service life (ESL) of 5 years, meaning any equipment purchased before 2018 is beyond its estimated service life, indicating that most of the IT Equipment is beyond its ESL. Since IT Equipment does not have a regular inspection program, the condition has been estimated based on the age of the asset, and therefore IT Equipment will show as Very Poor in the condition profile.

Figure 8: Technology Age Profile



3.2.1.2 CONDITION METHODOLOGY & PROFILE

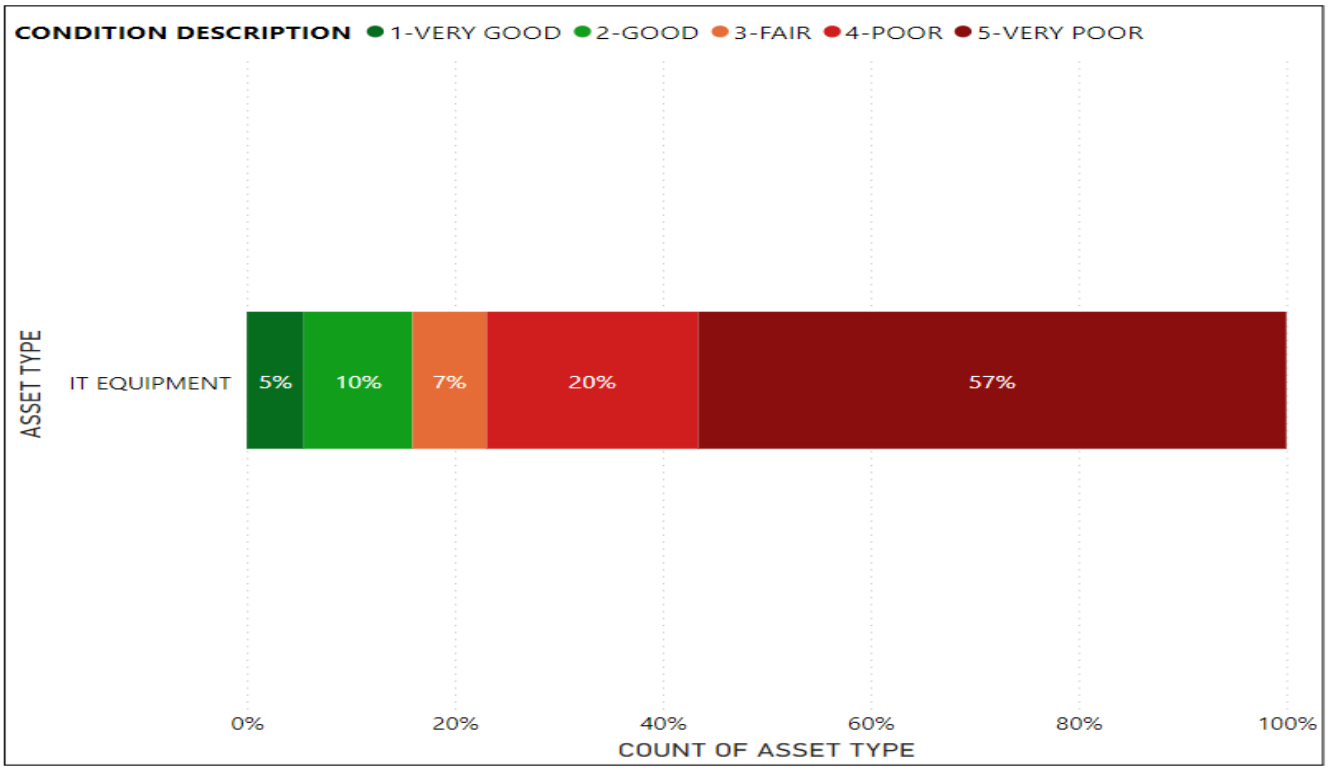
As discussed above, currently, HPS does not determine condition on Technology assets, therefore IT Equipment condition has been estimated based on age for this AM Plan. It is important to note that since the condition is based on age, there is low confidence in the condition for this asset group.

Table 12: Inspection and Condition Information

ASSET	INSPECTION FREQUENCY	CONDITION SCORE OUTPUT
IT Equipment	None	None - Based on Age

Most of IT Equipment is in Poor or Very Poor condition this is because as mentioned IT Equipment has a short ESLs of four years, and as previously mentioned, the condition profile is based on age.

Figure 9: Technology Condition Distribution



3.2.1.3 ASSET USAGE AND PERFORMANCE

The largest performance issues with IT Equipment assets involve assets beyond their estimated service life. The known service performance deficiencies in ***Table 13*** were identified using the Age information discussed above.

Table 13: Known Service Performance Deficiencies

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
IT EQUIPMENT	Various purchased before 2018	Beyond Service Life

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 HPS 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 **AM Plan Overview**.

4.1 SURVEY METHODOLOGY

To develop customer values and customer levels of service, a Customer Engagement Survey entitled Hamilton Paramedic Service (HPS) Resident Survey 2023 was conducted from March 1, 2023, to March 31, 2023. This survey did not use the standard CAM questions and therefore this section may look different from other AM Plans. The survey results can be found in Appendix "A".

Residents of Hamilton were contacted by telephone and also had the option of completing the survey online on the City's Engage Hamilton website. The telephone survey was conducted by a third-party vendor who randomly selected Hamilton-based land and cellular phone lines proportionate to the City's population by ward to ensure statistical significance. The vendor collected 550 completed telephone responses with a confidence level of 95% with a margin of error of +/- 4.2%, which corresponds to a Very High confidence per ***Table 14***. An identical online survey was also released which supplemented the telephone survey. The online survey was advertised via social media on the day it launched and garnered 200 responses. For the purposes of presenting the results in this AM Plan, the phone survey results were used as they more accurately represent Hamilton's population.

The survey sought feedback from residents on whether or not they had used paramedic services, in an effort to better understand what services are important to them and their level of satisfaction with current HPS service delivery. The future intent is to release this survey on a regular basis to monitor the trends in customer value and satisfaction related to the provision of paramedic services.

In addition, since the majority of HPS Resident Survey 2023 survey respondents had not used the Mobile Integrated Health program, the 2019 Community Paramedic Clinic Survey was also used to determine the performance of the Mobile Integrated Health program in the sections below. Since there were only 24 responses to this survey, and the sample size of the program could not be determined, there is Unknown confidence in this data.

Table 14: Data Confidence Levels

Grade	Data Consistency (Standard Deviation)	Confidence Level (Margin of Error at 95% Confidence in Sample Size)
Very High	0 to 0.5 – results are tightly grouped with little to no variance in response	0% to 5% - minimal to no error in results, can generally be interpreted as is
High	0.5 to 1.0 – results are tightly grouped but with slightly more variance in response	5% to 10% - error has becoming noticeable, but results are still trustworthy
Medium	1.0 to 1.5 – results are moderately grouped together, but most respondents are generally in agreeance	10% to 20% - error is a significant amount and will cause uncertainty in results
Low	1.5 to 2.0 – results show a high variance with a fair amount of disparity in responses	20% to 30% - error has reached a detrimental level and results are difficult to trust
Very Low	2.0+ - results are highly variant with little to no grouping	30%+ - significant error in results, hard to interpret data in a meaningful way

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 Hamilton Paramedic Service (HPS) Resident Survey 2023 and the 2019 Community Paramedic Clinic Survey and are shown in ***Table 15*** on the next page.

Table 15: Customer Values

SERVICE OBJECTIVE			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
Updated equipment and technology and sufficient number of staffed ambulances are more important than reducing the carbon footprint and improving ride comfort.	2023 Resident Engagement Survey	Significantly more phone survey respondents feel it is very important for the City to allocate tax dollars to update technology and medical equipment to optimize service delivery (81%) and to increase the number of ambulances (73%) than to improve comfort of the ride in ambulances for patients (32%) or reduce HPS's environmental footprint (28%).	Maintain
HPS levels of service should not be reduced.		Almost all phone survey respondents (97%) reported that HPS should not deliver fewer paramedics services even if it means a decrease in municipal taxes.	Maintain
Providing outreach care to vulnerable residents is important.		A high proportion of phone survey respondents (88%) feel that it is very to moderately important for HPS to provide outreach care to vulnerable residents.	Maintain

SERVICE OBJECTIVE			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
Workforce diversity and considering cultural beliefs and values when providing care is very important.		The majority of phone survey respondents indicated it is moderately important or greater that the HPS workforce reflects the diversity of the residents they serve (73%), and the cultural beliefs and values of patients/clients should be considered when delivering paramedic care (78%).	Maintain
Providing information and education promoting health and safety of residents is more important than participating in community events.		A significantly higher proportion of phone survey respondents feel that it is very or moderately important for HPS to provide information and education to promote health and safety of residents (87%) compared to supporting the community by organizing/participating in charitable events, fundraisers, food, and toy drives (63%).	Maintain

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 level of service measurements relate to how the customer feels about the service in terms of their quality, reliability, accessibility, responsiveness, sustainability and over 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 under used? Do we need more or less of these assets?

In ***Table 16*** under each of the service measures 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 currentt allocation.

It is important to note that many of HPS' customers are internal customers (e.g., staff) as they are the main users of most of HPS assets (i.e., facilities, vehicles, equipment, & technology). For this first iteration of the AM Plan the focus was on external customers (i.e. the Public), and as a result there are some gaps within the alignment between customer and technical levels of service as discussed in **Section 4.5**.

Table 16: Customer Levels of Service

TYPE OF MEASURE	LEVEL OF SERVICE STATEMENT	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Quality/ Condition	Ensure paramedics provide a service that meets the needs of the municipality.	Hamilton Paramedic Service (HPS) Resident Survey 2023	Majority (65%) of phone survey respondent opinion on the overall service rating	Very Good to Excellent	Maintain
		Confidence level		Very High	
		2019 Community Paramedic Clinic Survey	A significantly high proportion (83%) of survey respondent opinion on the Community Paramedic Program	Excellent	Maintain
		Confidence levels		Unknown	

TYPE OF MEASURE	LEVEL OF SERVICE STATEMENT	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Function	Provide reasonable response times which are in line with legislative requirements and the needs of the municipality. (O.Reg. 267/08 requirements. Council Approval Report HES12014)	Hamilton Paramedic Service (HPS) Resident Survey 2023	For life-threatening emergencies, the majority (66%) of phone respondents feel that paramedics should arrive in seven minutes or less.	Does not meet needs. (Currently achieving 12:34mins for Code 4 calls)	Maintain
		Confidence levels		Very High	
Capacity	Ensure paramedics have the resource capacity to reliably respond to emergencies in a timely manner.	Hamilton Paramedic Service (HPS) Resident Survey 2023	Just over half (54%) of respondents thought HPS had or somewhat had adequate resources to provide reliable, timely, quality care to residents, while a quarter (25%) of respondents thought that HPS did not have adequate resources.	Meets some needs.	Maintain
		Confidence levels		Very High	

4.4 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.[8]

Table 17 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 17 : Technical Levels of Service

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE (2022)	CURRENT TARGET PERFORMANCE (2022)	PROPOSED 10-YEAR PERFORMANCE (2023 – 2032)
Acquisition	Ensure paramedics have the capacity to reliably respond to emergencies in a timely manner.	Number of new ambulances purchased due to growth/demand	7 (2023)	7 (2023)	15 ambulances
		Budget	**$1.3M**	**$1.3M**	**$3.8M**
		Number of new facilities required to meet 10-year growth and demand	0	0	1 operation hub 5 two-bay stations
		Budget	**$0**	**$0**	**$23.5M**
Operation	Provide reasonable response times which are in line with legislative requirements.	HPS 90th Percentile Response time to Code 4 (life threatening emergency) calls (minutes)	12:34	10:00	10:00

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

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE (2022)	CURRENT TARGET PERFORMANCE (2022)	PROPOSED 10-YEAR PERFORMANCE (2023 – 2032)
	(O.Reg. 267/08 requirements. Council Approval Report HES12014)	Average number of Code Zero Events (weekly)	0.6 (2023)	0	0
		Budget	**$69.7M (2023 operating budget)**	**To Be Determined**	**To Be Determined**
	Apply a Lifecycle Approach to ensure optimum costs are achieved over the whole life of the asset.	Actual supply/ maintenance expenditures vs planned budget.	101%	90-100%	90-100%
Maintenance	Ensure paramedics assets are maintained in acceptable condition.	All vehicle and patient care equipment maintenance items meet or exceed current MOH Land Ambulance Certification Standard	2022 Certification Criteria Met	Meet certification criteria	Meet certification criteria
		Budget	**$400K (2023)**	**$400K (2023)**	**$7.6M**
	Ensure paramedics have enough reliable assets to respond to emergencies.	Average number of days vehicles are out of service waiting for maintenance or repair	Not yet measured	Not yet measured	Not yet measured
		Budget	**Not yet measured**	**Not yet measured**	**Not yet measured**
	Ensure paramedics assets are maintained in acceptable condition	Number of times vehicles not receiving Preventative Maintenance as scheduled in the	Condition of SLA fulfilled	Condition of SLA fulfilled	Condition of SLA fulfilled

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE (2022)	CURRENT TARGET PERFORMANCE (2022)	PROPOSED 10-YEAR PERFORMANCE (2023 – 2032)
		current Service Level Agreement			
		Budget	**Not yet measured**	**Not yet measured**	**Not yet measured**
Renewal	Ensure that paramedics assets are maintained in good condition.	% of in-service ambulances over replacement frequency target (6 years)	34%	0%	0%
	Ensure paramedics have enough reliable assets to respond to emergencies.	Number of times paramedics are on duty without an available vehicle to work due to equipment shortage	0	0	0
	Ensure that paramedics assets are maintained in good condition.	**Budget**	**$4.2M (2023)**	**$6.0M (2023)**	**$23.3M**
		Number of AEDs in the system that have not received the required check within the timeframe (timeframe TBD when Bill 141 activated)	0	0	0

4.5 PROPOSED LEVELS OF SERVICE DISCUSSION

It is evident per ***Table 17*** that HPS is often meeting technical standards with some exceptions. However, customer preferences and expectations do not always match internal technical targets. It has been assumed in the interim that the current levels of service will be the proposed levels of service moving forward past 2025 in accordance with O. Reg 588/17. The information below is intended to provide context to direct HPS to areas for further investigation before proposing any new levels of service which may not occur before 2025.

In addition, as previously mentioned, many of HPS's asset customers are internal customers (e.g., staff) as they are the main users of HPS assets. For this first iteration of the AM Plan the focus was on external customers (i.e., the Public), and as a result there are some gaps in the information below with respect to internal customers. This has been identified as a continuous improvement item in ***Table 29***.

CONDITION / QUALITY

Per ***Table 16***, the majority of phone survey respondents rated the overall service as Very Good to Excellent with a Very High confidence level. In addition, users of the Mobile Integrated Health (Community Paramedicine) Program in 2019 also indicated their opinion of the program was Excellent with an Unknown confidence level.

When comparing customer expectations to the technical levels of service measurements that correspond with the asset condition or quality of the service, HPS is currently meeting certification criteria per the Land Ambulance Certification Standard, AEDs are checked within the correct timeframe, and the Service Level Agreement with Hamilton Fire Department is being fulfilled. Currently, 34% of ambulances are over their replacement target, but as previously mentioned this is due to supply chain issues discussed in **Section 6** and these ambulances are considered to be in Fair condition and roadworthy. Measurements with respect to amount of time vehicles are out of service is not currently being measured and will be measured in future iterations of the AM Plan which has been identified as a Continuous Improvement Item in ***Table 29***.

Therefore, at this time customer expectations align with technical performance for asset condition and quality of the service.

FUNCTION

Per ***Table 16***, with respect to function of the service, phone survey respondents expect HPS to arrive in seven minutes or less for life threatening emergencies with a Very High confidence level.

When comparing customer expectations to technical performance, currently HPS is not meeting customer expectations for life threatening emergency response. However, a 7-minute response time is significantly lower than the industry standard of 8 minutes and 59 seconds 90% of the

time, and HPS is currently working to achieve a 10-minute response time 90% of the time. Per the Hamilton Paramedic Service 2022 Annual Report and ***Table 17*** above, the 90th percentile response time to Code 4 or life-threatening calls is 12 minutes and 34 seconds, and the target performance is 10 minutes. This amount of time represents the period from when dispatch assigns the call to paramedics until paramedics arrive on scene, and 90th percentile means that 90% of calls will meet or be lower than that response time. It is important to note that in some areas of the City, HPS is achieving industry standard, but there are challenges in lower density and lower demand areas in the City.

Therefore, there is currently a mismatch between customer expectations and technical performance with respect to the function of the service. Currently, HPS is proposing to add more resources as discussed in ***Section 5*** to meet current targets.

When investigating proposing new levels of service, improving response times would be an area to explore. Currently, HPS continues to evaluate how to improve response times in the Hamilton Paramedic Service Master Plan 2022-2031.

CAPACITY

Per ***Table 16***, just over half of phone survey respondents felt that HPS had or somewhat had adequate resources, whereas 25% felt that HPS did not with a Very High confidence indicating that some needs were being met.

When comparing this to technical performance, it is evident that HPS is proposing to add additional resources (e.g., facilities, ambulances, and staff) to meet the expected demand to maintain current levels of service, but that currently there is no equipment shortage.

Therefore, customer expectations and HPS technical performance currently match with respect to service capacity.

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 service required.

5.1 DEMAND DRIVERS

For the HPS service area, the key drivers are:

- Population Growth and Demographic Shift: Hamilton's population is projected to increase to approximately 680,000 by 2031 with seniors being the fastest growing segment of the population. By 2031, almost 22% of Hamilton's population will be 65 years old or older. Hamilton's population is forecasted to grow to approximately 820,000 by 2051. This forecasted increase in the senior population will significantly increase the demand on services provided by HPS over the next ten years and beyond.
- Social Determinants of Health: Different social demographics may use HPS services more frequently, and these demographics may continue to shift. This is discussed in more detail in ***Section 2.1.3.***
- Legislative Changes: Legislation shifts frequently for HPS, and often requires immediate compliance which can be costly. The most recent legislative change relates to Personal Protective Equipment (PPE), which is now a requirement for the City to maintain. In addition, the Ontario Building Code also requires all new HPS facilities to fulfill the OBC Post Disaster Seismic Requirement.

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 18.*** Growth projections have been shown on ***Page 45 in the AM Plan Overview document.***

Where costs are known, these additional demands as well as anticipated operations and maintenance costs have been encompassed in the Lifecycle Management Plans 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 ***Table 18***. 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 18***. Climate change demands are included in ***Section 7.***

Table 18: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Population Growth	565,000	680,000	Increased in call demand by 4.1% each year increased vehicles, equipment, medics, and support staff and training increased inspections, cleaning, stocking of vehicles, equipment enhanced inventory management	Additional 1 ambulance/year and 10FTE/ambulance plus equipment (growth demand), 2 spare ambulances (2026 and 2031), addition of 7 ambulances at peak demand periods plus 34 FTE (current demand), addition of 4 + logistic technicians, and addition of 3 supervisors
Age Demographic Shift	97,591 response volume	146,082 response volume		
Population Growth	18 stations	23 stations + 2 Fleet centres	Increased capital costs increased resources increased demand on logistics staff	Addition of 5 2-bay stations Addition of 2 larger Fleet Centres (which are currently in the 2024 capital budget but have not been captured in this AM Plan) Addition of logistics staff.
Social Determinants of Health	**Per Hamilton Spectator Code Red Series**		Increased demand on emergency response and Mobile Integrated Health programs	Addition of growth demand vehicles (1/year) Advocate for provincial funding for sustaining and expanding MIH programs

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Legislative/ Regulatory Changes	HPS manages own PPE stock	HPS managing core stock of PPE levels for multiple service areas (i.e. Hamilton Police, Hamilton Fire, Public Health, Lodges, and HPS) as per Bill 106 Emergency Management Act	Potential for HPS to manage centralized emergency medical supplies increased resources facility space and infrastructure	Addition of logistics staff additional space required.
Legislative/ Regulatory Changes	Current Facilities are Normal Construction	Any new or newly occupied HPS Facilities required to fulfill Ontario Building Code Post Disaster Seismic Requirement	Any new builds or new leases must fulfill this seismic requirement, which is costly, and may limit HPS' ability to easily acquire additional space.	Consider this additional cost in future facility cost estimates. Complete cost benefit analysis when comparing new builds versus new leases.

5.4 ASSET PROGRAMS TO MEET DEMAND

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

At this time there are approximately **$30.2M** in anticipated assets acquired over the next 10 years. Acquiring new assets will commit HPS 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 Management Plans in ***Section 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'[9].

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 19.*** Failure modes may include physical failure, collapse or essential service interruption.

Table 19: Critical Assets

CRITICAL ASSET	FAILURE MODE	IMPACT
Fuel System	Essential service interruption, Physical Failure to Fuel System	Inability to provide service, have 24 hours before running out of fuel in ambulances.
911 Communications	Essential service interruption, IT malfunction, phone system failure	Cannot receive the call from dispatch for information related to incident and address. Increase in morbidity, mortality, and patient suffering

[9] ISO 31000:2009, p 2

CRITICAL ASSET	FAILURE MODE	IMPACT
Facilities	Overcrowded facilities	Failure to meet Ministry standard - vehicles to be stored in climate-controlled area; facilities in which to clean and maintain vehicle and equipment
Ambulance	Essential Service Interruption, funding, vehicle shortage, vehicle failure	Reduction in Operable vehicles available to meet call demand and call growth. Increase in morbidity, mortality, and patient suffering
Medical Equipment (conveyance, defibrillator)	Funding, equipment shortage, equipment failure	Failure to meet Ministry standard - equipment to be available and operable on every truck. Increase in morbidity, mortality, and patient suffering

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, development of a risk rating, evaluation of the risk and 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 is shown in ***Table 20***. It is essential that these risks and costs are reported to management.

Table 20: Risks and Treatment Plans

SERVICE OR ASSET AT RISK	WHAT COULD HAPPEN	RISK RATING	RISK TREATMENT PLAN	RESIDUAL RISK	TREATMENT COSTS
Ambulance	Supply Chain Issue	High	Extend Service Life of Ambulance by doing major maintenance	Low	$360K
Fuel System	Equipment Failure	Medium	Plan to have ARI Cards in Vehicles	Low	$1.2K
Facilities	Overcrowding	High	Add more facilities	Low	$23.5M
Facilities	Power Outage	Medium	Confirm back-up power capability at each station and regular testing program.	Low	Within existing capacity.

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.

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.

A major service delivery resiliency issue within HPS is narrowed ambulance resources including code zero events as a result of hospital offload delays and peak demand periods. Code zero events refer to times where there are no ambulances available to respond to an emergency, and offload delays refer to the amount of time an ambulance spends at the hospital waiting to offload a patient. However, with the additional ambulances and staff approved in 2023, and the increased Ministry of Health funding for dedicated offload nurse programs at hospitals, the trends have improved substantially, and HPS has become more resilient. The table below outlines the current resilience approach for HPS.

THREAT / HAZARD	ASSESSMENT METHOD	CURRENT RESILIENCE APPROACH
Code Zero Events	Average 0.6 Code Zero Events Weekly as of April 30 2023	Trend is improving
Offload Delays	Average 565 Hours weekly as of April 30 2023	Trend is improving

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 HPS cannot afford to do over the next 10 years with their existing budget and provides the associated service and risk tradeoffs.

Table 21: Service and Risk Trade-offs

WHAT WE CANNOT DO (What can we not afford over next 10 years?)	SERVICE TRADE-OFF (How will not completing this affect our service?)	RISK TRADE-OFF (What risk consequences are we undertaking?)
5-2 bay stations	Continue to see less than optimal response times. Lack of space for staff.	Health and Safety Risks, Reputational Risks, Increased maintenance costs.

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've already begun to experience (adaptation). At a minimum the City must consider how to manage our existing assets given 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 29.***

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 reduces need for car travel). The City of Hamilton's Community Energy + Emissions Plan (CEEP includes five (5) 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.

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 22*** 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 reductions 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 29.***

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 22: 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. 100% of new municipal heavy-duty vehicles switch to clean hydrogen by 2040.	Required to purchase hybrid vehicles leading to increased capital costs increased retrofit costs (update infrastructure) increased demand on logistics staff, additional training reduced fuel costs	Acquire hybrid or electric vehicles charging infrastructure at each station (22). Rapid charging stations within facilities addition of logistics staff

CURRENT MITIGATION PROJECTS

Mitigation projects which HPS already pursued are outlined below in ***Table 23.***

Table 23: Asset Climate Mitigation Projects

PROJECT	CLIMATE CHANGE MITIGATION TRANSFORMATION	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT
Anti-Idling Technology	Changing How We Move	All vehicles have been equipped with anti-idling technology.	Greenhouse Gas emissions reduction.
Hybrid Vehicles	Changing How We Move	Two hybrid ambulances were on trial use since 2018. This trial has ended as previously reported to Council as the two ambulances had to be removed from service due to suppliers going out of business. The two ambulances were converted back to normal drive train. However, HPS is not abandoning the possibility of future hybrid or electric ambulances, but these are currently not feasible. Four OEM hybrid ERVs were recently acquired in 2023.	Greenhouse Gas emissions reduction.

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.[10]

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

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

Change Impact Adaptation Plan (CCIAP) (ICLEI, 2021). The BARC Framework identified thirteen high impact areas.

Adaptation Demand Analysis

Climate adaptation demands for HPS are shown below in ***Table 24***.

Table 24: Managing the Demand of Climate Change on Assets and Services

ADAPTATION IMPACT STATEMENT	BASELINE	AVERAGE PROJECTED CHANGE	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Dryer, hotter and longer summers may affect the health and safety of local vulnerable populations.	71.6 days average length of hot season	102 days average length of hot season	Increased call volume	Addition of 1 ambulance/year to address call growth
More frequent and intense heatwaves will increase instances of heat-related health and safety issues, particularly for households without access to reliable air-conditioning and the homeless	2.1 average annual heat waves	4.7 average annual heat waves	Increased call volume	Addition of 1 ambulance/year to address call growth
Increased intensity and frequency of ice storms leading to increased hazardous roads, pathways, and sidewalk conditions.	187 mm average total winter precipitation	204 mm average total winter precipitation	Increased call volume Potential delay in response time	Addition of 1 ambulance/year to address call growth
Increased temperatures and changes in precipitation increasing incidences of infectious diseases and vector borne diseases as result of longer transmission periods or changes in geographic distribution of disease vectors.	52.2 number of ice days (temperature below 0 degrees Celsius)	35.7 number of ice days (temperature below 0 degrees Celsius) extending breeding season of mosquitos/ticks.	Increased call volume	Addition of 1 ambulance/year to address call growth

ADAPTATION IMPACT STATEMENT	BASELINE	AVERAGE PROJECTED CHANGE	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns	187 mm average total winter precipitation	204 mm average total winter precipitation	Increased call volume Lack of power at facilities	Addition of 1 ambulance/year to address call growth Generators at facilities Installation of generators at all facilities

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 25.***

It is important to note that due to the high level of uncertainty with the climate change risk adaptation plans, the cost of the mitigating the risks below have not been included in the lifecycle and financial plans 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 which 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.

Table 25: Adapting to Climate Change

ADAPTATION IMPACT STATEMENT	SERVICE OR ASSET AT RISK DUE TO IMPACT	WHAT COULD HAPPEN	RISK RATING	RISK ADAPTATION PLAN
Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns	**Facilities**	Prolonged power outages due to increase in ice storms	High	Work with Facilities and Fire to review condition of and/or install generators
Reduced capacity of flood protection measures and water storage caused by an increase in rainfall intensity leading to flooding.	**Facilities**	Increase in rainfall intensity leading to flooding	High	Facilities requirements for new buildings to include stricter storm water management

CURRENT ADAPTATION PROJECTS

HPS is not currently completing any climate change adaptation specific projects. The impact of climate change on assets and how the City will adapt is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

CLIMATE ADAPTATION DISCUSSION

There are many projections related to increased temperature which include heat waves, rising temperatures, increase in average temperatures, and longer summers. One demand result of hot weather is an increase in emergency response. As stated in ***Table 24***, one of the Adaptation Impact Statements shows that hot weather affects health and safety for households without access to reliable air-conditioning and unhoused individuals. During these events, this would lead to an increase in calls for emergency services. HPS and other emergency services should investigate this correlation to ensure appropriate staff and assets are available as the climate continues to shift.

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 includes 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 on 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 with the City or through the construction of new assets which are mostly related to population growth.

CURRENT PROJECT DRIVERS – 10 YEAR PLANNING HORIZON

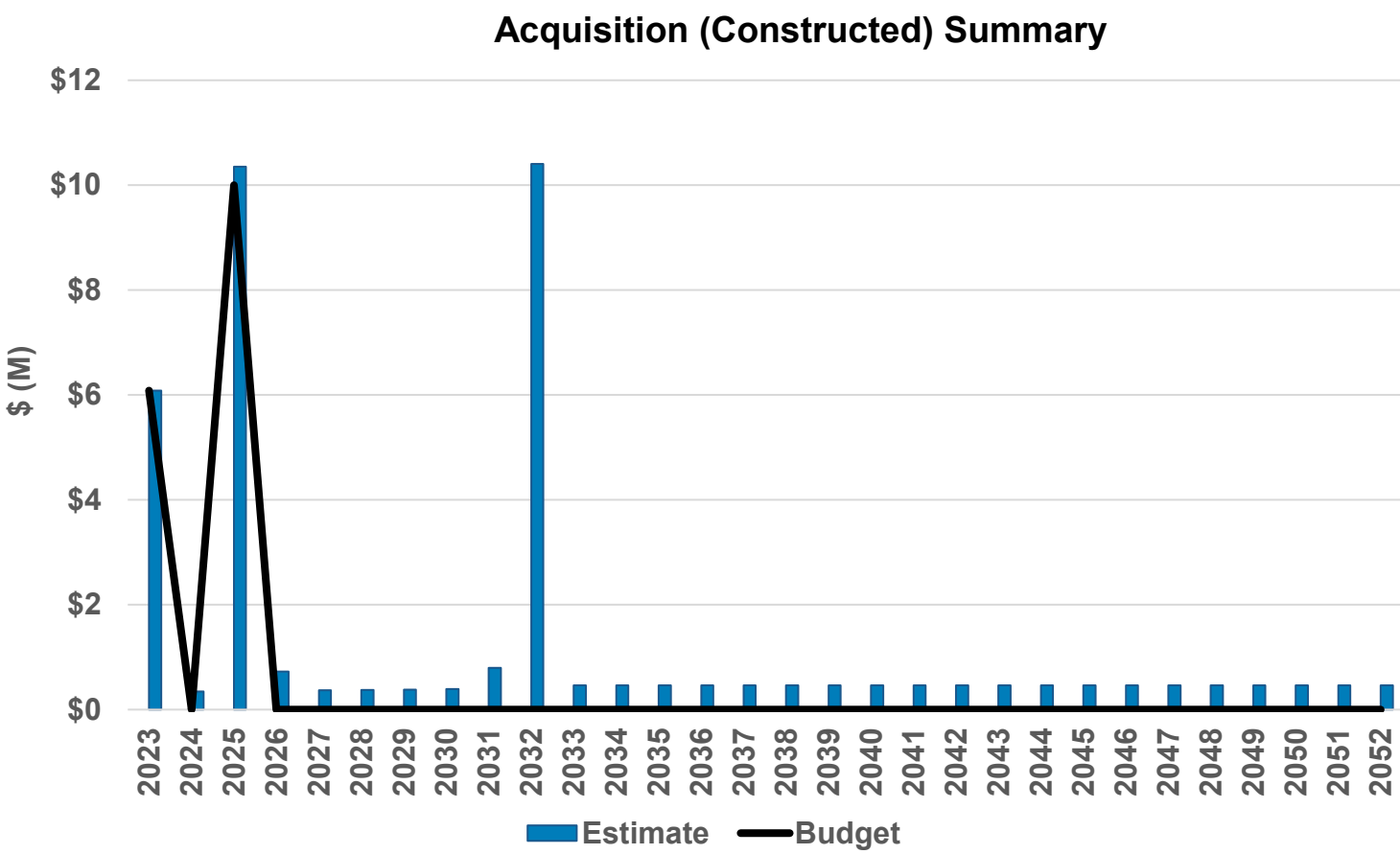
The City prioritizes capital projects based on various drivers to help determine ranking for project priorities and investment decisions. As part of future AM Plans, the City will be continuing to develop its understanding of how projects are prioritized and ensures that multiple factors are being considered to drive investment decisions in the next iteration of the AM Plan. These drivers will include legal compliance, risk mitigation, O&M impacts, growth impacts, health and safety, reputation, and others. These drivers should be reviewed during each iteration of the AM Plan to ensure they are appropriate and effective in informing decision making.

Typically, HPS determines acquisitions and renewals based on the level of risk to the community and makes Council requests for funding as these findings occur.

CONSTRUCTED OR PURCHASED ACQUISITIONS

For HPS, assets are typically acquired through the purchase or construction of new assets which are mostly related to population growth, demographic shifts, social determinants of health or technological changes as discussed in the Demand section. Over the next 10-year planning period, HPS will acquire approximately **$30.2M** of purchased or constructed assets as shown below in ***Figure 10*** and explained further below. Hamilton will continue to monitor its constructed and purchased assets annually and update the AM Plan when new information becomes available.

Figure 10: Acquisition (Constructed) Summary
All Figure Values Are Shown In 2022 Dollars. x

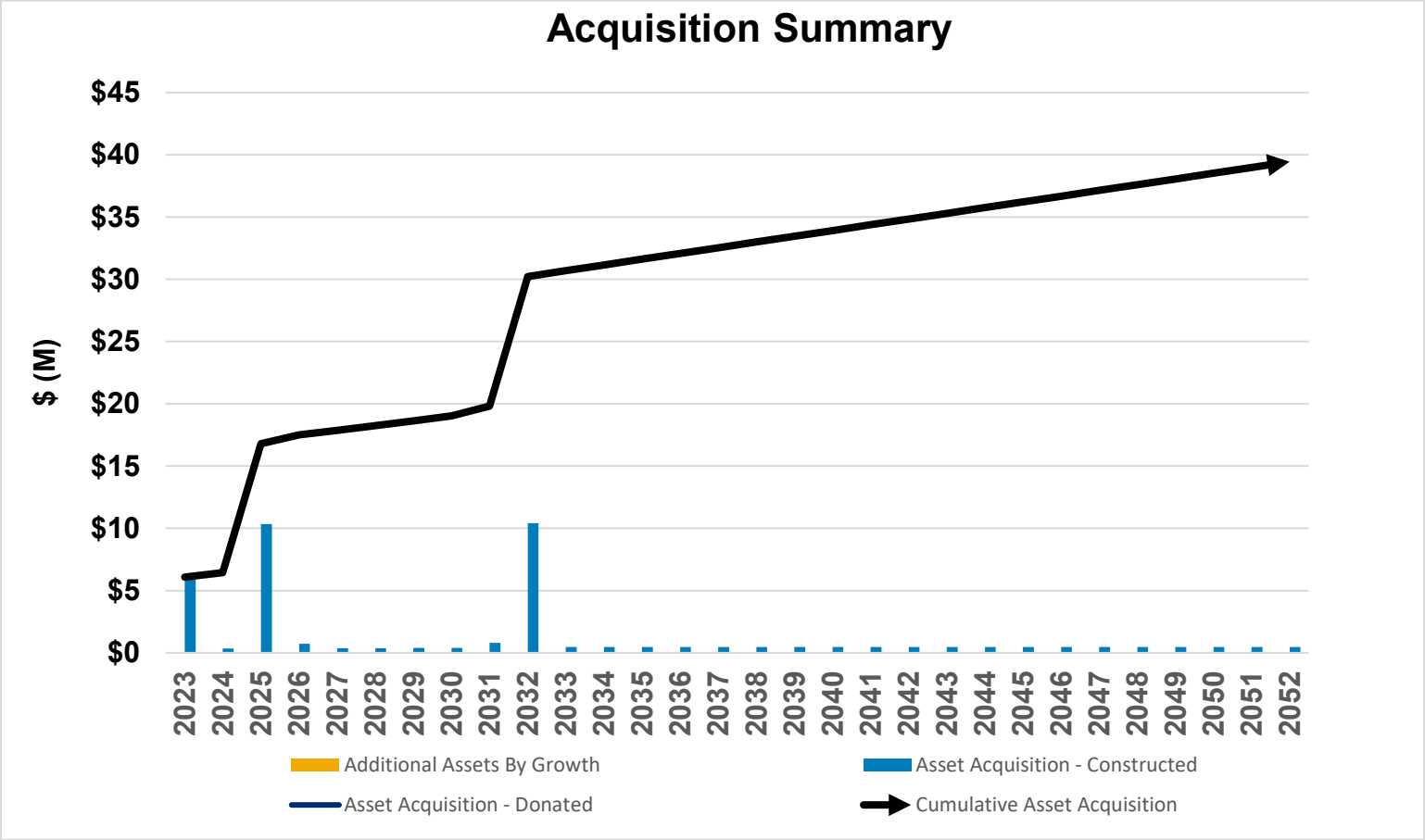


ACQUISITIONS SUMMARY

When Hamilton commits to constructing new assets, the municipality must be prepared to fund future operations, maintenance, and renewal costs. Hamilton must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in ***Figure 10*** above.

Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options. However, at this time the plan is limited on 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.

Figure 11: **Acquisition Summary**
All Figure Values Are Shown In 2022 Dollars.



Per ***Figure 11***, major acquisition expenditures over the next ten years include:

- **$2.4 Million for seven new ambulances and equipment in 2023** to meet existing service demands during peak demand periods;
- **$4.1 Million for additional vehicles from 2024-2032** to meet anticipated service demands, which are not yet budgeted;
- **$10.0 Million for New Facility in 2025** which will be an operational hub that includes a response station, logistics capabilities and a warehouse space for the centralization of medical supplies for the City of Hamilton divisions providing health care, $3.5 Million has also been allocated in 2023 for pre-engineering;
- **$10 Million for five 2-bay stations in 2032** to address the needs of a growing service and ensure optimal performance in the future as the City's urban boundary is expanded.

It is important to note that the cost estimates for the new facilities identified above are expected to substantially increase due to the increased construction costs associated with the COVID-19

pandemic as well as the new Ontario Building Code Post Disaster Seismic requirement which is required on any HPS new builds.

HPS mostly has sufficient budget for its planned constructed acquisitions at this time, with the exception of the 5-2 bay stations in 2023 which have not yet been Council endorsed. Although the additional vehicles are shown to be unbudgeted, these assets have been included in the Hamilton Paramedic Service Master Plan 2022-2031 which was received by Council.

At the time of writing, a new ATV is currently in the process of being acquired and converted which is estimated to be approximately $100K in total but was not integrated into these figures.

With competing needs for resources across the entire city there will be a need to investigate trade-offs and design options to further optimize asset decisions and ensure intergenerational equity can be achieved. Hamilton will continue to monitor its constructed assets annually and update the AM Plan when new information becomes available.

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.

- **$61.0 Million** in employee related costs allocated for employee related costs in 2023 (i.e., salaries, wages, benefits, etc.);
- **$2.5 Million** in material & supply (i.e., medical supplies, uniforms and clothing, prescribed medication supply etc.); and
- **$1.2 Million** in vehicle expenses (i.e., fuel, services call's etc.)

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 it reaches its 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 HPS can achieve the desired level of service.

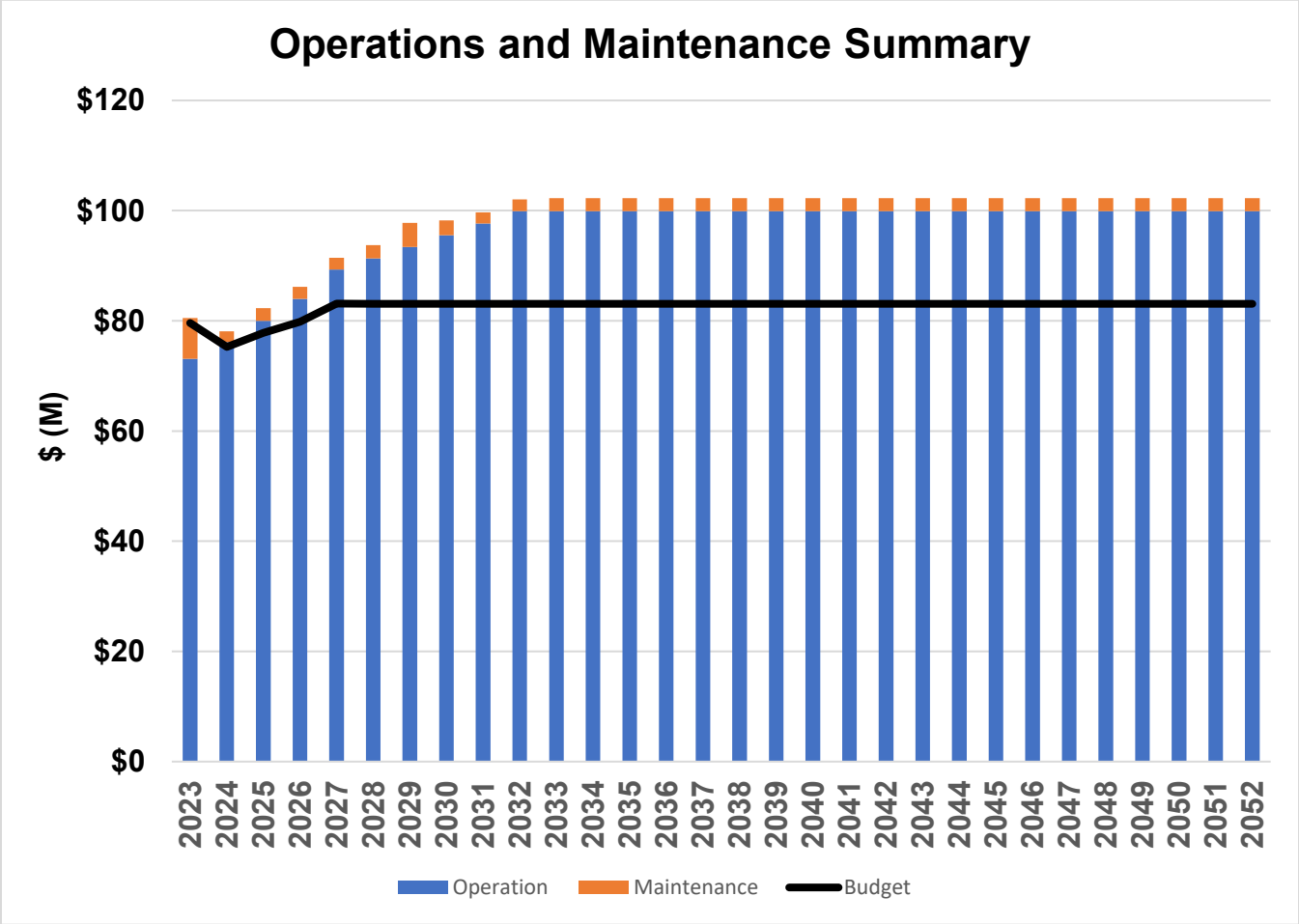
Major maintenance projects the City plans to complete over the next 10 years include:

- **$3.5 Million** allocated in 2023 for Station 30 Design;
- **$0.9 Million** allocated in 2023 for Station 30 Roof Replacement; and,
- **$1.4 Million** allocated in 2023 for Station 30 Renovations and Upgrades.

These investments for maintenance are intended to allow these assts to reach their estimated service life and minimize reactive maintenance costs. It should be acknowledged that these forecasted costs do not yet fully include the recommended works that need to be undertaken to ensure the entire inventory of assets will achieve their desired service lives and level of service.

Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) will be included in the infrastructure risk management plan in future iterations once those works have been identified and prioritized.

Figure 12: Operations and Maintenance Summary
All Figure Values Are Shown In 2022 Dollars.



Per ***Figure 12*** above, it is evident that operations and maintenance requirements are growing for HPS over the next 10 years due to anticipated demands within the City as explained in **Section 5**, and if budget increases are not approved to keep up with this demand, it may result in a decrease in levels of service over time. Since currently needs have only been projected for the next 10 years, and it is unclear if current trends will continue at the same rate past 2032, the figure above has assumed a constant need past 2032, but it is anticipated that the need for HPS services will continue to grow over time.

The additional operations and maintenance shown above were based on the estimates in the Hamilton Paramedic Service Master Plan 2022-2031. Additional estimates were included for the energy and water costs for the proposed 5-2 bay stations based on the anticipated energy and water usages for these sites based on proposed building footprint as well utility costs but does not yet include all anticipated costs associated with the operations and maintenance of these facilities.

8.3 RENEWAL PLAN

Renewal is major works which does not increase the assets design capacity but restores, rehabilitates, replaces, or renews an existing asset to its original service potential. Works over and above restoring an asset to 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 those that have the highest consequence of failure, have high usage, have high 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 26*** and are based on 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 2022 however they will be reviewed annually until their accuracy reflects the City's current practices.

Table 26: Useful Lives of Assets

ASSET SUBCATEGORY	ESTIMATED SERVICE LIFE (YEARS)
All Facilities	75
Administrative Vehicles	8
Ambulance	6
Bicycle Unit	9
CO Detectors	7
Emergency Response Vehicle	6
Fixed Assets	9
IT Equipment	5
Medical Equipment	9
MIH Vehicles	8
Oxygen Delivery Support	6
Other Equipment	7
Toughbook	5

The estimates for renewals in this AM Plan were based on the register method which utilizes the data from the City's asset registry to analyse all available lifecycle information and then determine the optimal timing for renewals based on the ESL.

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).[11]

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

- Have a high consequence of failure;
- Have high use and subsequent impact on users would be significant;
- Have higher than expected operational or maintenance costs; and,
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[12]

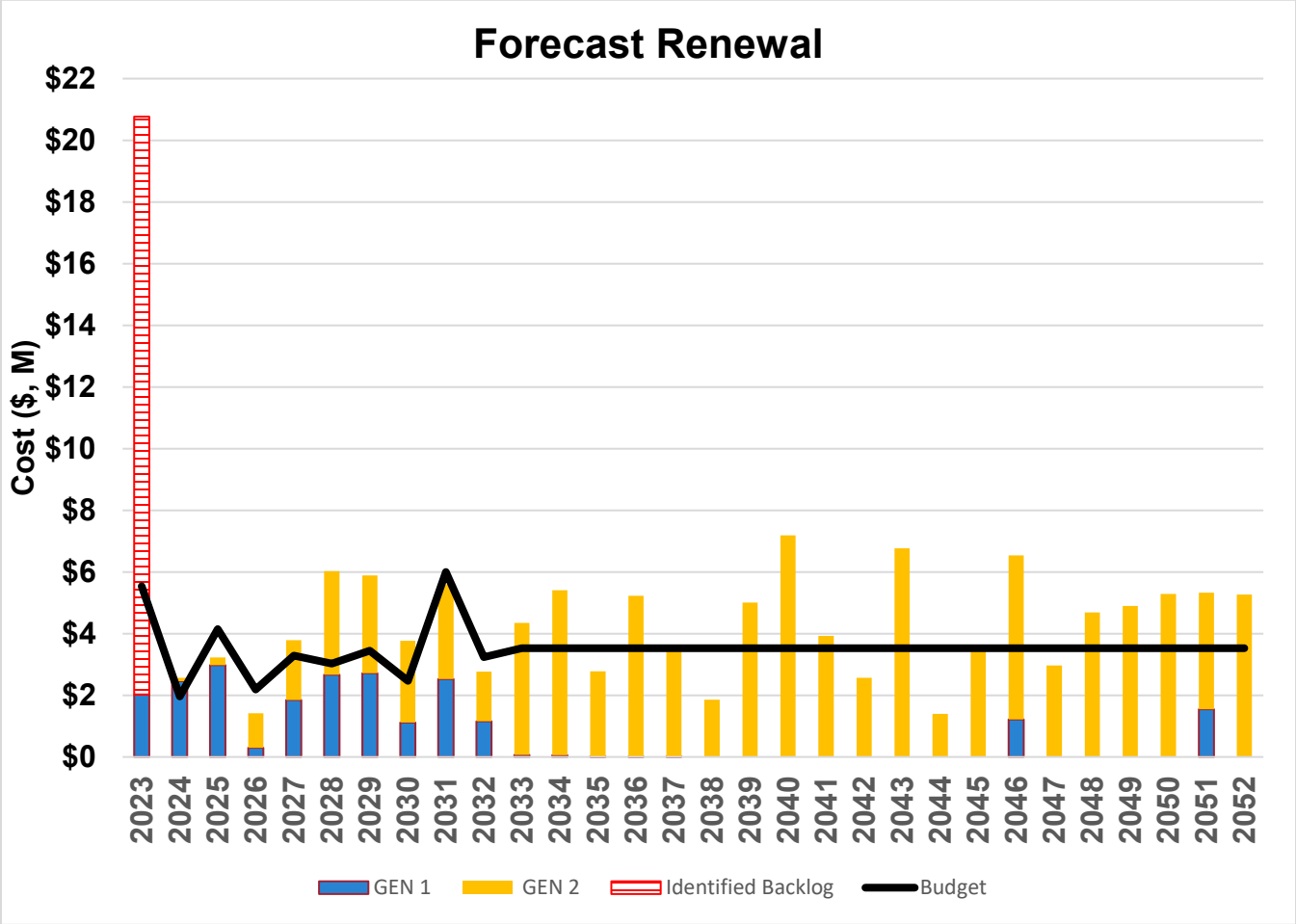
SUMMARY OF FUTURE RENEWAL COST

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 13.***

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.

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

Figure 13: Forecast Renewal Costs
All figure values are shown in 2022 dollars.



Currently, HPS has a backlog amount of approximately $18.7 Million. The major backlog items include:

- $10 Million for Station 30 Renewal which is in Poor condition and beyond 75-year ESL. This estimate is currently low confidence and will likely increase substantially due to inflation and seismic requirements per ***Table 18.***
- $4.5 Million for ambulances beyond their six-year ESL
- $1.9 Million for Power Load Device and Stretchers beyond seven-year ESL
- $1.5 Million for Emergency Response Vehicle and Admin Vehicles beyond six-to-seven-year ESL

HPS maintains an inventory of assets with condition categories and estimated service lives which are adhered to and forecasted within their capital budget. Per ***Figure 13*** above, there are years where the budget exceeds the need, and years where the need exceeds the budget, but these discrepancies typically balance out over the forecast apart from the backlog amount.

Renewals associated with anticipated vehicle acquisitions from 2024-2032 were excluded from this forecast because the funding for these acquisitions is not currently secured.

HPS's approach to maintaining facilities is to work with Hamilton Fire Department and Corporate Facilities & Energy Management divisions to complete the major maintenance activities to improve the condition rating over time per the Operations and Maintenance Plan in ***Section 8.2***. Only Station 30 which is under the purview of HPS is included above in the renewal backlog as it is not meeting the needs of HPS and is anticipated to require a large amount of maintenance in the next 10 years.

The planned renewal works over the 10-year planning horizon include**:**

- Replacement of vehicles as they reach the end of useful life; and,
- Replacement of equipment and technology as they reach the end of useful life.

A continuous improvement item identified in ***Table 29*** is to determine the appropriate spare vehicle ratio for operational needs and contingencies.

Since properly funded and timely renewals ensures the assets perform as expected, HPS is performing satisfactorily by replacing assets at the suggested interval with an appropriate budget. Deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. It is recommended to continue to analyze asset renewals based on criticality and availability of funds for future AM Plans.

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.

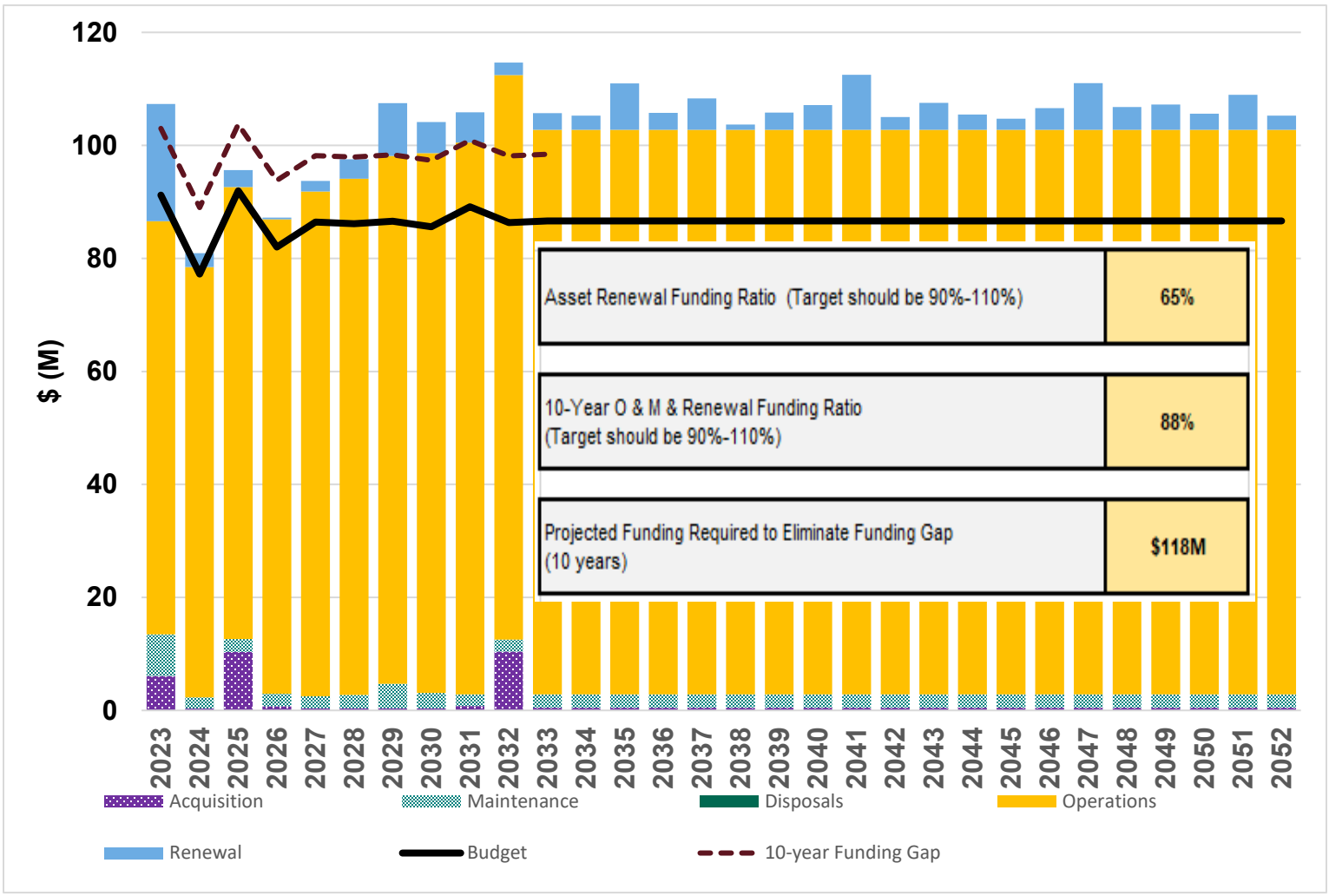
There are no disposals currently identified at this time.

8.5 LIFECYCLE COST SUMMARY

The financial projections from this asset plan are shown in ***Figure 14***. 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 balance between costs, levels of service and risk to achieve the best value outcome.

Figure 14: Lifecycle Summary
All Figure Values Are Shown In 2022 Dollars



The figure above indicates that there is insufficient budget to address the planned lifecycle activities for the 2023-2032 planning period. However, this is mostly due to the forecasted need for operations funds for additional staff and supplies to support the anticipated 10-year demands on the service, including the new operational hub facility proposed in 2025. Although HPS has not yet requested the budget for these additional staff, HPS has identified these needs in their Hamilton Paramedic Service Master Plan 2022-2031 which was received by Council.

Therefore, if the City continues to endorse the requested HPS budget on an annual basis, it is predicted that there will likely be sufficient operating budget to deliver the service at the current service level.

Conversely, there is a renewal backlog amount in 2023 mostly associated with the replacement of Station 30 and vehicles beyond their ESL. These needs have not been identified in other reports and are anticipated to be unfunded at this time.

The City will continue to improve its lifecycle data, and this will allow for informed choices as how best to mitigate impacts and how to address the funding gap itself. This gap in funding for future plans will be refined over the next three years to improve the confidence and accuracy of the forecasts.

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 its services are providing 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 customers while keeping costs at an affordable level and maintaining its financial sustainability.

Without funding asset activities properly for its services; 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 HPS 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[13] **65.1%**

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 high indicator result generally indicates that service levels are achievable, however the expenditures are below this level in some service areas predominantly 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.

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

It is important to note that this ratio is heavily influenced by the need for a Station 30 replacement. If Station 30 were fully funded, the ARFR would be closer to 80%.

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 Lifecycle Financial Ratio 88%

Although this AM Plan includes forecast projections to 30-years, the higher confidence numbers are typically within the first 10 years of the lifecycle forecast. The 10-year Lifecycle Financial Ratio compares the Planned Budget with the Lifecycle 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 AARF, 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 anticipated to be **$96.4 Million** on average per year. Over time as improved information becomes available, it is anticipated this number will change. The proposed (budget) operations, maintenance and renewal funding is **$84.7 Million** on average per year (including the 50% of funding provided by the Province) giving a 10-year funding shortfall of **$11.8 Million** per year or **$118 Million** over the 10-year planning period. This indicates that **88%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget, which is just outside of the 90-110% range.

It is important to note that a large portion of this funding gap is due to a need for increased staff due to anticipated demands as explained in **Section 5** which have currently been assumed to be unfunded because these budget amounts have not yet been requested. If budget increases requested by HPS are continued to be supported, this gap will shrink over time. Therefore, it can be concluded that HPS is funding their service at an acceptable rate. Note, these calculations exclude acquired assets.

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 27 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.

Table 27: Forecast Costs (Outlays) For the Long-Term Financial Plan
Forecast Costs Are Shown In 2022 Dollar Values.

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2023	$6,082,500	$73,128,448	$7,361,541	$20,757,248	$-
2024	$347,500	$76,146,808	$1,960,965	$2,456,279	$-
2025	$10,354,300	$80,019,232	$2,270,660	$2,972,604	$-
2026	$722,800	$83,983,552	$2,218,171	$299,449	$-
2027	$368,600	$89,304,016	$2,148,260	$1,876,132	$-
2028	$375,900	$91,356,640	$2,381,962	$3,418,830	$-
2029	$383,300	$93,433,200	$4,334,620	$9,345,259	$-
2030	$390,800	$95,534,008	$2,687,931	$5,533,507	$-
2031	$796,800	$97,687,736	$2,028,880	$5,350,797	$-
2032	$10,406,100	$99,924,400	$2,098,157	$2,224,794	$-
2033	$460,678	$99,919,320	$2,361,250	$2,967,897	$-
2034	$460,678	$99,919,320	$2,361,250	$2,517,337	$-
2035	$460,678	$99,919,320	$2,361,250	$8,228,127	$-
2036	$460,678	$99,919,320	$2,361,250	$3,035,635	$-
2037	$460,678	$99,919,320	$2,361,250	$5,589,926	$-
2038	$460,678	$99,919,320	$2,361,250	$950,318	$-
2039	$460,678	$99,919,320	$2,361,250	$3,056,369	$-
2040	$460,678	$99,919,320	$2,361,250	$4,384,336	$-
2041	$460,678	$99,919,320	$2,361,250	$9,758,171	$-
2042	$460,678	$99,919,320	$2,361,250	$2,284,615	$-
2043	$460,678	$99,919,320	$2,361,250	$4,790,218	$-
2044	$460,678	$99,919,320	$2,361,250	$2,735,288	$-
2045	$460,678	$99,919,320	$2,361,250	$1,985,631	$-

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2046	$460,678	$99,919,320	$2,361,250	$3,863,781	$-
2047	$460,678	$99,919,320	$2,361,250	$8,253,369	$-
2048	$460,678	$99,919,320	$2,361,250	$4,044,206	$-
2049	$460,678	$99,919,320	$2,361,250	$4,502,673	$-
2050	$460,678	$99,919,320	$2,361,250	$2,867,470	$-
2051	$460,678	$99,919,320	$2,361,250	$6,205,840	$-
2052	$460,678	$99,919,320	$2,361,250	$2,500,469	$-

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 determines 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.

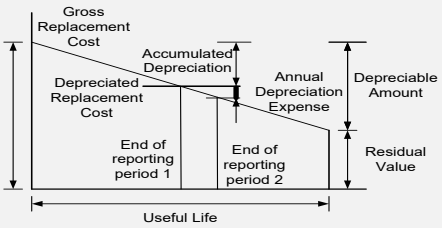
9.4 VALUATION FORECASTS

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 removes the high costs 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 (Current/Gross)	**62,736,648**
Depreciable Amount	**62,736,648**
Depreciated Replacement Cost[14]	**31,412,106**
Depreciation	**4,345,642**



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. These forecasts encompass anticipated needs where known, but do not address other operational needs not yet identified;
- Maintenance forecasts are based on current budget allocations and forecasted needs and encompass anticipated needs where known; and,
- Replacement costs were based on historical costing. They were also made without determining what the asset would be replaced with in the future (e.g., hydrogen vehicles were not encompassed in replacement costs).

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 **Medium-High** confidence level.

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

Table 28: Data Confidence Assessment for Data Used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand Drivers	High	These costs were based on the estimates in the Hamilton Paramedic Service Master Plan 2022-2031.
Growth Projections	High	These costs were based on the estimates in the Hamilton Paramedic Service Master Plan 2022-2031.
Acquisition Forecast	High	These costs were based on the estimates in the Hamilton Paramedic Service Master Plan 2022-2031. Estimates do not yet contain the additional vehicle and equipment requirements to support the 5-2 bay stations.
Operation Forecast	Medium	These costs were based on the estimates in the Hamilton Paramedic Service Master Plan 2022-2031. Projected future energy and water & sewer pricing for proposed 5-2 bay stations based on square footage, but do not yet have additional staffing requirements.
Maintenance Forecast	Medium	Maintenance forecast in this AM Plan are typically based on the results of the Building Condition Assessment which have been updated by the Corporate Facilities and Energy Management division, are assumed to be a medium confidence. Maintenance needs for new facilities have not yet been included. It was also assumed for this analysis that the "EMS Facility Upgrade" amount in the CFEM Capital Budget was used for HPS Stations only and not Shared Stations or Shared Administrative Facilities.

DATA	CONFIDENCE ASSESSMENT	COMMENT
Renewal Forecast. **- Asset values**	Medium	Renewal market pricing was used which has high confidence, and estimated service lives are typically adhered to for vehicle assets. In addition, renewals for newly acquired assets were excluded from this analysis. Facilities renewal costs were lower confidence which lowered the confidence.
- Asset Useful Lives	High	Estimated service lives are typically adhered to for vehicle, equipment, and technology assets, but facilities ESLs were less confident.
- Condition Modelling	High	Condition was included based on internal condition scoring, which was complete.
Disposal Forecast	Very Low	No disposals were integrated into the forecast.

10. PLAN IMPROVEMENT AND MONITORING

10.1 STATUS OF ASSET MANAGEMENT PRACTICES[15]

ACCOUNTING AND FINANCIAL DATA SOURCES

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

- Hamilton Paramedic Service Master Plan 2022-2031;
- 2023 Approved HPS Operating Budget;
- 2024-2027 Multi-Year HPS Operating Forecast;
- 2023 Approved HPS Capital Budget;
- 2023 Corporate Facilities and Energy Management Capital Budget;
- 2024 Corporate Facilities and Energy Management Capital Budget;
- 2023-2032 Equipment Renewal Forecast Schedule;
- 2023-2032 Vehicle Renewal Forecast Schedule;
- Building Condition Assessment Reports;
- Asset Management Data Collection Templates;
- Audited Financial Statements and Government Reporting (FIR, TCA etc.);
- 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;
- Development Charges Collection Template;
- Condition assessments; and,
- Subject matter Expert Opinion and Anecdotal Information.

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

The costs and resources to complete each of these tasks has not been included in the Lifecycle Management Plans to data, and resource requirements would need to be reviewed for internal resource driven projects.

Table 29: Improvement Plan

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1	Begin to track age information for Equipment Assets	Logistics Lead and Logistics Staff	Within existing capacity	Q4 2023
2	Ensuring the data in Operative IQ is accurate and includes key database fields as well as metadata and follows the newly developed City Data Standard	Logistics Lead and Logistics Staff	Within existing capacity	Q4 2023
3	Modify condition ratings for assets to align on a 5-point scale instead of a 3-point scale	Logistics Lead	Within existing capacity	Q4 2023
4	Implement a process to keep up to date on facilities and square footage for HPS	Logistics Lead with HFD and Corporate Facilities	Within existing capacity	Q2 2024
5	Quantify costs to propose levels of service for different response time options	Logistics Lead	Within existing capacity	Q1 2025
6	Gather technical levels of service measurements that are not currently being measured.	Logistics Lead	Within existing capacity	Q1 2025
7	Quantify costs of climate change demand management and risk adaptation plans.	Logistics Lead	Within existing capacity	Q1 2025
8	Investigate asset costs for future climate change mitigation targets to be presented during budget process	Logistics Lead with Corporate Climate Change Group	Within existing capacity	2024 - 2026
9	Staff survey for input regarding station quality, suitability	Logistic Lead, SPM	Within existing capacity	Q3-4 2023

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
10	Confirm back up power capability at each station and regular testing program	Logistics Lead with HFD and Corporate Facilities	Within existing capacity	Q1 2024
11	Back-up plan in case of fuel system disruption (ARI cards, manual system)	Logistics Lead with Corporate	Within existing capacity	Q3 2023
12	Determine the appropriate spare vehicle ratio for operational needs and contingencies	Logistics Lead	Within existing capacity	Q1 2024
13	Investigate AVL inventory and assign responsibility.	Logistics Lead	Within existing capacity	Q4 2024

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 10-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 achieving the Organizational target (this target is often 90 – 110%).

Appendix A – Survey Analysis

Hamilton Paramedic Service (HPS) Resident Survey 2023

~ Summary Report

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

CONTENTS

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

SURVEY SUMMARY

Purpose and Background

In 2018, the Hamilton Paramedic Service (HPS) conducted its first resident survey to collect residents' expectations and satisfaction with services provided by HPS. The findings from the 2018 survey were used to inform the development of the Hamilton Paramedic Service Master Plan 2022-2031.

As part of HPS's continuous improvement work, a second iteration of the HPS Resident Survey was conducted in 2023. The 2023 survey incorporates some of the same questions from 2018 and also includes new questions to help inform current HPS initiatives. The 2023 survey collected information from residents about:

- rating of HPS overall
- response and service expectations
- priorities and ratings of HPS programs and services
- the HPS Public Access Defibrillator program
- cultural diversity at HPS

The HPS Resident Survey 2023 questions can be found in Appendix A.

Methods and Administration

A third-party vendor, Forum Research Inc. was contracted using a competitive procurement process to conduct the survey using Computer Assisted Telephone Interviews (CATI). Hamilton based residential and cellular phone lines were randomly called and people were invited to participate in the phone survey. To qualify for participation in the survey, the respondent had to be age 16 years or over residing in Hamilton. The phone surveys were conducted between March 1, 2023 and March 31, 2023.

To supplement the phone surveys and allow more residents to participate in the survey, an online version of the survey was made available on the Engage Hamilton website. The online survey was active between March 1, 2023 and March 31, 2023.

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Both the phone and online versions of the survey were available in English and French.

The phone and online survey was promoted on the Frontline which aired on March 16, 2023 on Cable 14. Social media (i.e. Instagram, Twitter) was used to raise awareness about the online survey and encourage participation from residents.

Survey Response

The phone survey conducted by Forum Research Inc. called 24,472 randomly selected Hamilton based phone numbers and collected 550 completed responses. The phone surveys were conducted to ensure all Wards in Hamilton were fairly represented by the survey sample. This was achieved by aligning the respondent sample proportions by Ward with the 2016 city of Hamilton population proportions by Ward.

The results of the 550 phone survey are accurate to +/-4.2%, 19 out of 20 times (95% confidence interval) for the 2021 population of city of Hamilton residents. Data for subgroups of the total respondent universe or by Ward would have larger margins of error. The larger margins of error means it would be difficult to draw accurate conclusions of the data at the Ward level or for some subgroups.

The online survey collected 200 surveys where a response was provided for at least one (1) survey question.

Report Notes

- This report primarily focuses on the findings from the statistically representative sample of the city of Hamilton population collected through the phone survey.
- The results of the online survey are provided as a supplementary source of information. While the online survey expanded the opportunity for residents to participate in the survey, this survey methodology may be subject to self-selection bias. Multiple survey responses may also be submitted online by the same respondent. Hence, the online surveys cannot be determined to be a statistically representative sample of the population. The results from the phone survey and the online survey should not be compared due to the differences in survey methodologies.

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

- For both the phone and online survey, respondents did not always provide a response to every question or may have responded “don’t know”. The universe of respondents (n) is provided.
- Data shown may not add up to 100% due to rounding. For some questions, respondents were allowed to select multiple responses in which case the totals would exceed 100%.

Key Summary of Phone Survey Results

- Over one in three respondents rated the Hamilton Paramedic Service (HPS) as excellent in 2023, which is a significant increase from the one in four respondents who rated HPS as excellent in 2018.
- For life-threatening emergencies, the majority of respondents feel that paramedics should arrive in less than five (5) minutes (33%) or between five to seven minutes (33%).
- For non-life threatening emergencies, the proportion of respondents who feel paramedics should arrive within five (5) minutes has significantly decreased from 8% in 2018 to 2% in 2023.
- An overwhelming 87% majority of respondents indicated it would be acceptable for paramedics to settle them in the emergency room and then leave to prepare to respond to another 911 emergency call.
- Over half (55%) of respondents have not heard of any of the services provided by the HPS Mobile Integrated Health Program. Only 3% of phone survey respondents have used at least one (1) service provided by the HPS Mobile Integrated Health Program.
- The majority of respondents feel it is very important to allocate tax dollars to increase the number of ambulances and paramedics for a more timely response (73%) and to update technology and medical equipment to optimize service delivery (81%).
- Just over half (51%) of respondents indicated the City should maintain municipal taxes to maintain current paramedic service levels while 46% feel the City should increase municipal taxes to improve or deliver more paramedic services.
- The majority of respondents (73%) indicated being aware of or having seen public Automatic External Defibrillators (AEDs).

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

- Over one in three respondents would not feel comfortable using a public AED to assist someone in cardiac arrest and the most common reason given was not having training or knowing how to use the device.

- The majority of respondents (78%) indicated that it is very or moderately important that the cultural beliefs and values of patients/clients are considered when delivering patient care and 73% indicated it is very or moderately important that the HPS workforce reflects the diversity of residents they serve.

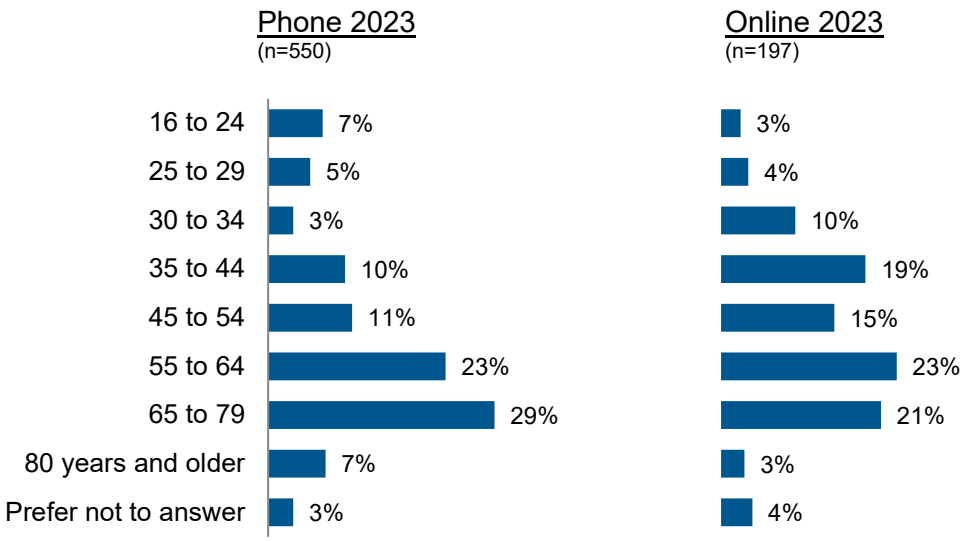
Detailed Survey Results

This section provides the detailed results of each survey question. The universe of respondents (n) is provided in brackets for each question.

The Respondents

The majority (59%) of phone survey respondents were age 55 or older.

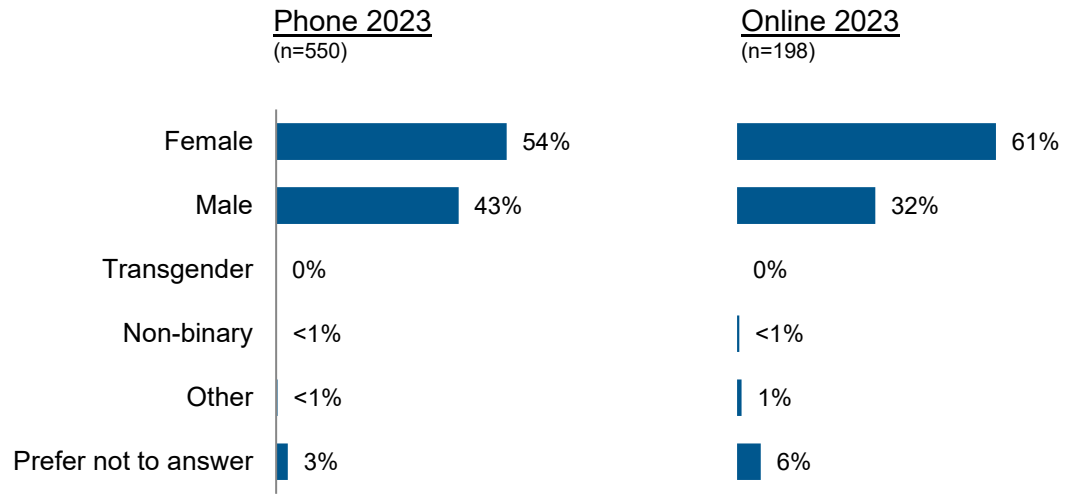
Age



Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

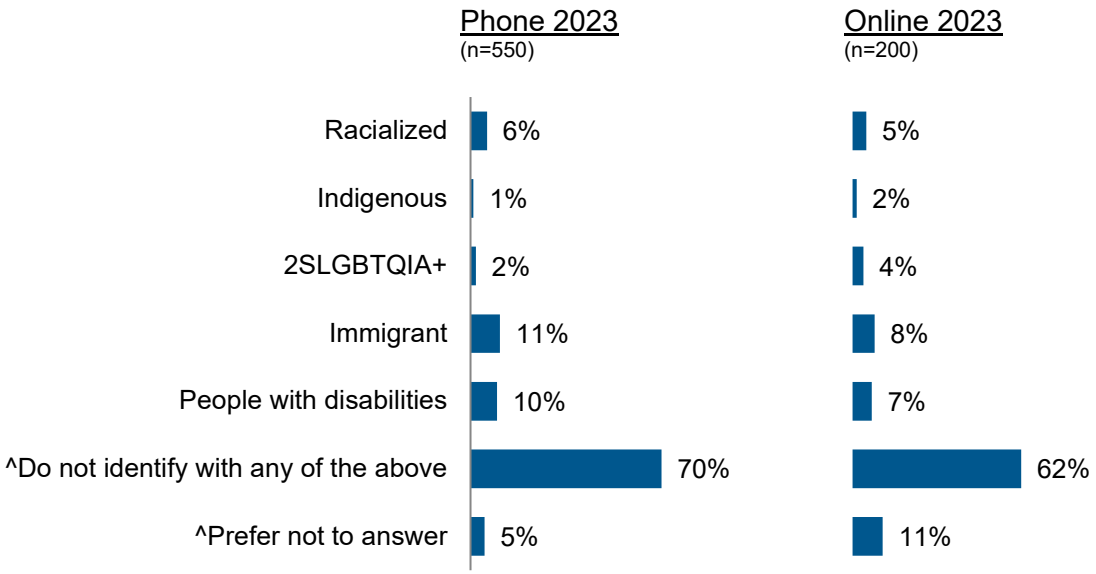
There were more female than male phone survey respondents.

Gender



The survey respondent sample included a range of different individuals that identify as either as racialized, Indigenous, 2SLGBTQIA+, immigrants or a person with disabilities.

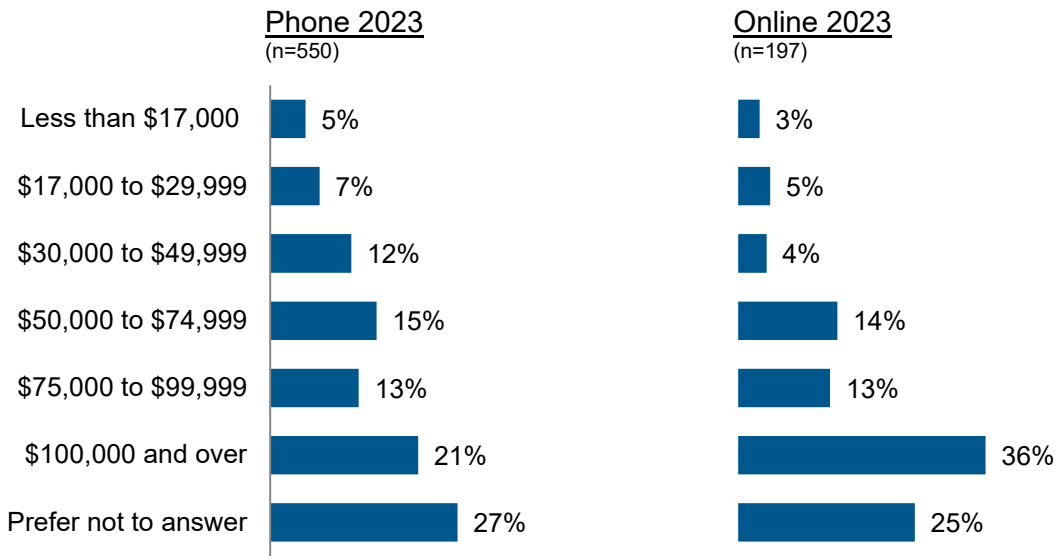
Groups



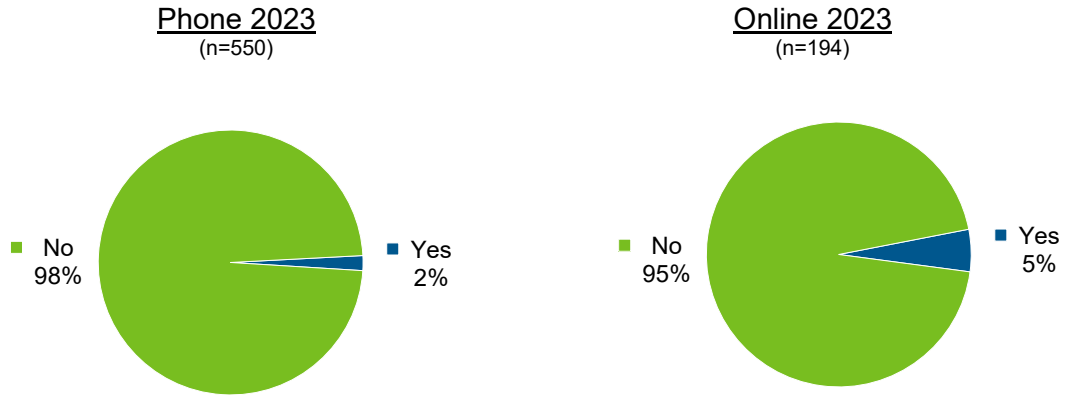
Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

There were fewer survey respondents in the lower income groups than in the higher groups.

Household Income



Do you, or any member of your household, currently work for paramedic services?

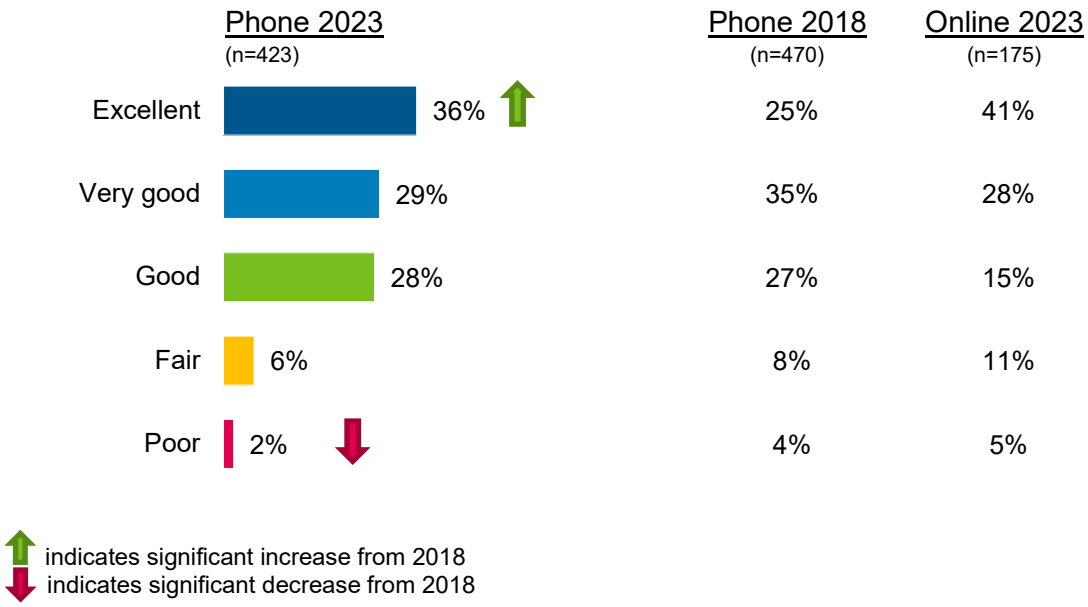


Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Overall Service Rating

Almost two-thirds (65%) of phone survey respondents rate the Hamilton Paramedic Service as excellent or very good. The proportion of respondents who rate services provided by HPS as excellent has significantly increased from 25% in 2018 to 36% in 2023.

Based on your experience or knowledge, overall, how would you rate the services provided by the Hamilton Paramedic Service?



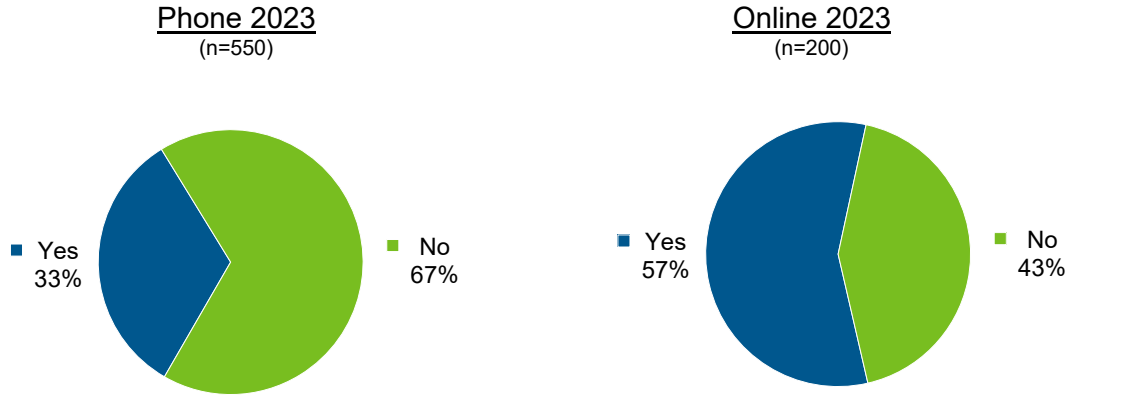
Respondents who rated the Hamilton Paramedic Service as poor were asked to explain their rating. The most common reasons for a poor rating given by respondents from both the phone and online survey were related to incidences or experiences respondents had with HPS and references to slow response times.

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Response Expectations

Approximately one in three phone survey respondents indicated having called 911 for an ambulance in the past 2 years either for themselves or someone they know.

Have you called 911 for an ambulance in the past 2 years, either for yourself or someone you know?

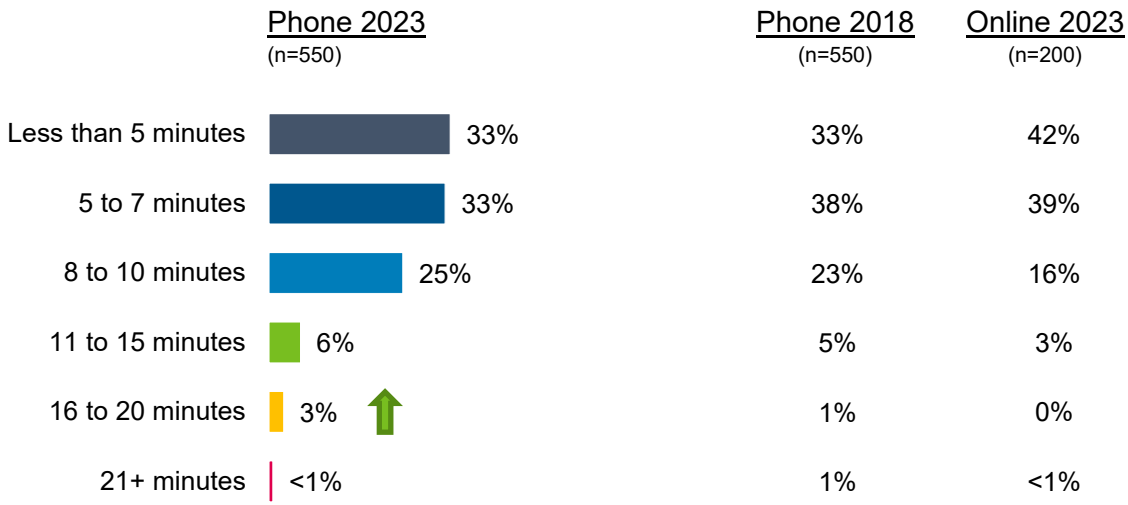


For life-threatening emergencies, the majority of phone survey respondents feel that paramedics should arrive in less than 5 minutes (33%) or between 5 to 7 minutes (33%).

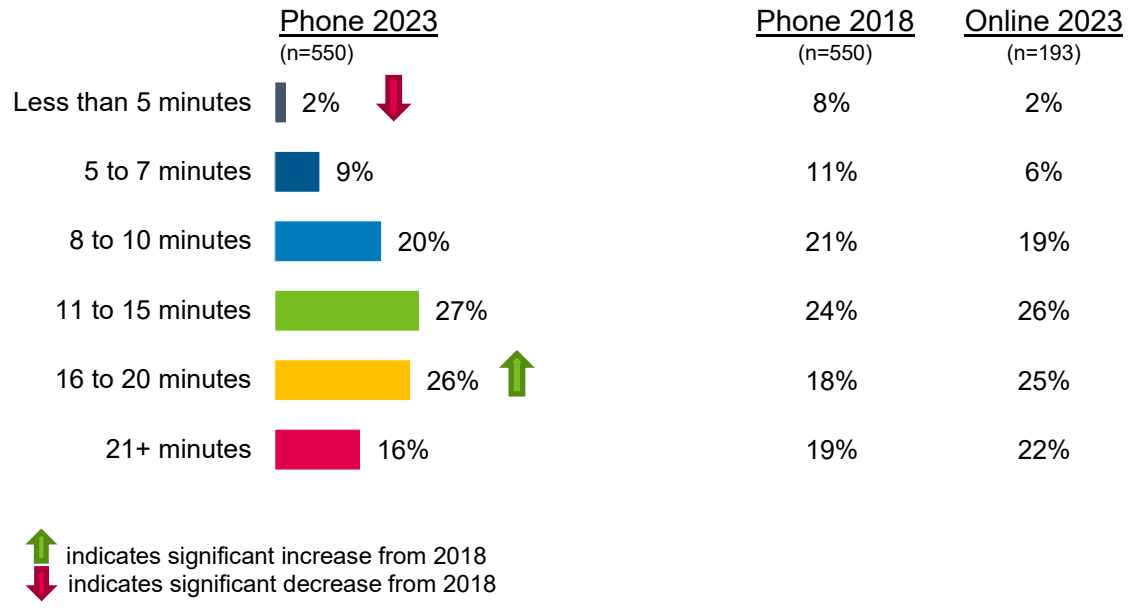
For non-life-threatening emergencies the majority of phone survey respondents feel that paramedics should arrive between 11 to 15 minutes (27%) or between 16 to 20 minutes (26%). The proportion of respondents who feel paramedics should arrive within 5 minutes has significantly decreased from 8% in 2018 to 2% in 2023.

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Considering driving time and traffic, how many minutes do you think is acceptable for paramedics to arrive for a life-threatening emergency?



Considering driving time and traffic, how many minutes do you think is acceptable for paramedics to arrive for a non-life-threatening emergency?

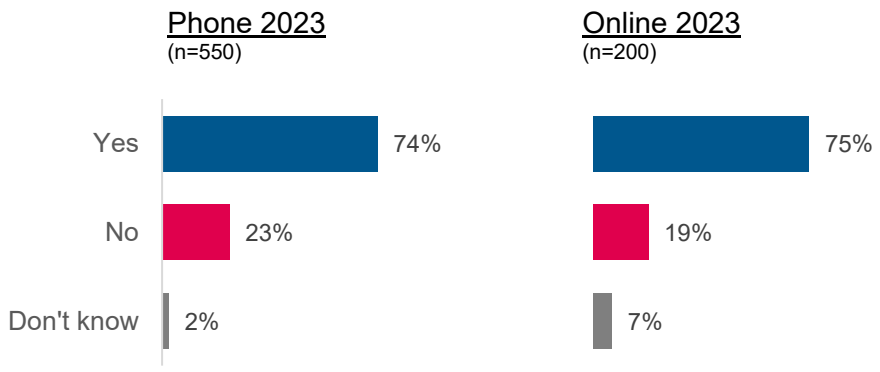


Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

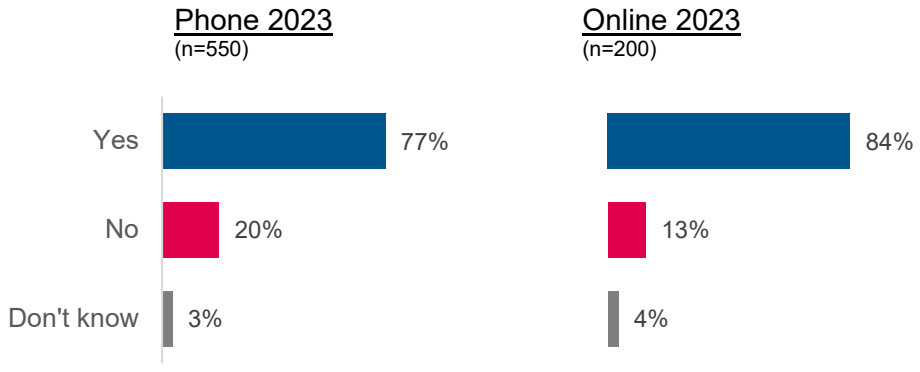
In a scenario where they have called an ambulance for a minor injury or illness, the majority of respondents feel it is acceptable:

- to receive care instructions over the phone from the paramedic dispatcher, including referrals to a medical professional to assist them, rather than sending an ambulance.
- for the paramedics who arrive on scene to provide treatment, then refer them to another medical professional, rather than taking them to the hospital.
- for the paramedics to settle them in the emergency waiting room and then leave so they can prepare to respond to another 911 emergency call.

Do you feel it is acceptable to receive care instructions over the phone from the paramedic dispatcher, including referrals to a medical professional to assist you, rather than sending an ambulance?

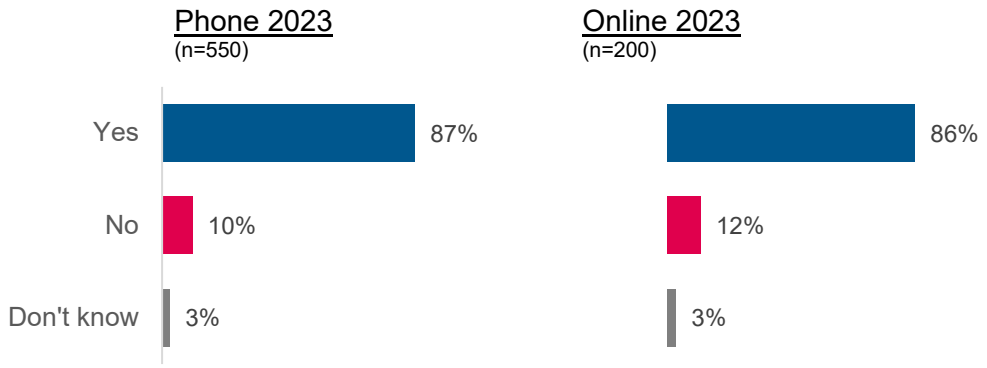


Do you feel it is acceptable for the paramedics who arrive on scene to provide treatment, then refer you to another medical professional, rather than taking you to the hospital?



Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

If you are taken to the hospital, do you feel it is acceptable for the paramedics to settle you in the emergency waiting room and then leave so they can prepare to respond to another 911 emergency call?



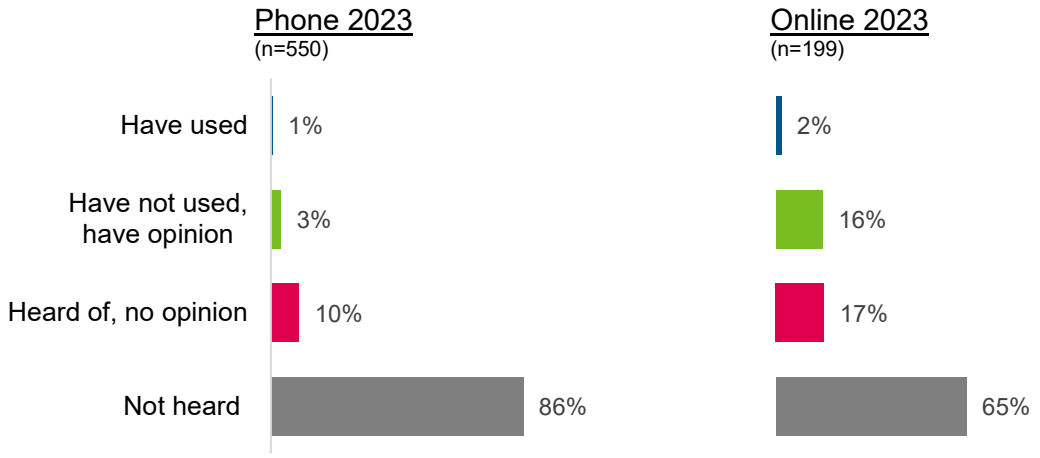
Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

HPS Mobile Integrated Health Program

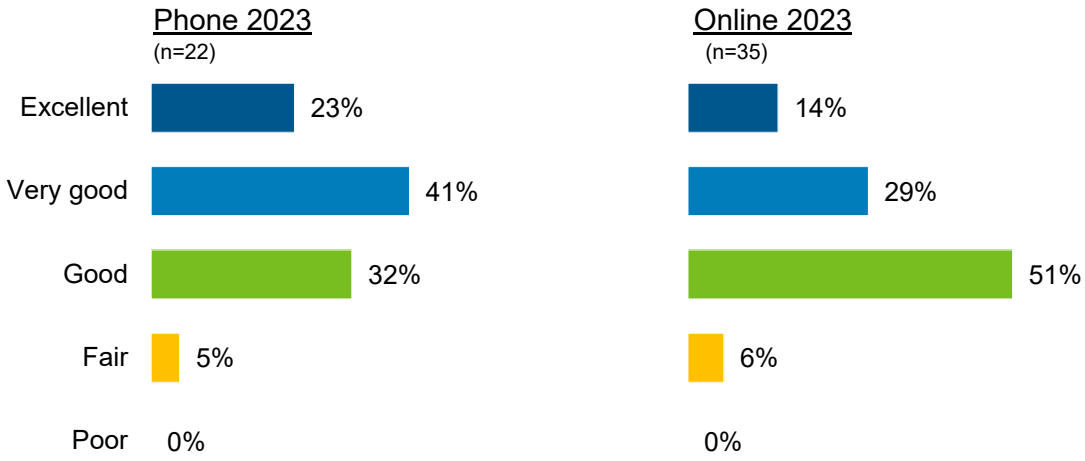
Overall, very few phone survey respondents have used or have an opinion about the services provided by the HPS Mobile Integrated Health Program.

Less than 1% of respondents have used the Community Paramedic @ Clinic Seniors Program. For respondents who have used or have an opinion about the Community Paramedic @ Clinic Seniors Program, the majority (64%) felt the program was excellent or very good.

Community Paramedic @ Clinic Seniors Program – familiarity with service



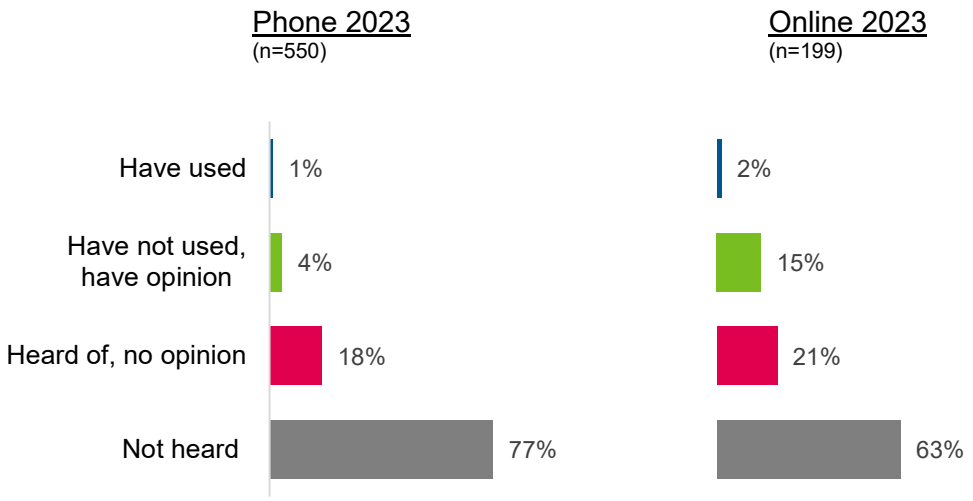
Community Paramedic @ Clinic Seniors Program - rating of service



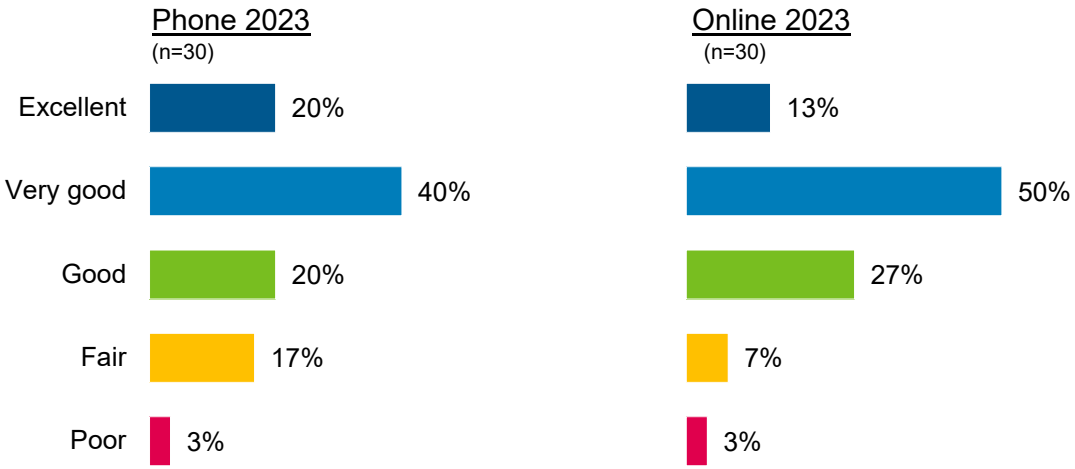
Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Less than 1% of respondents have used the Remote Patient Monitoring service. For respondents who have used or have an opinion about the Remote Patient Monitoring service, the majority (60%) felt the program was excellent or very good.

Remote Patient Monitoring - familiarity with service



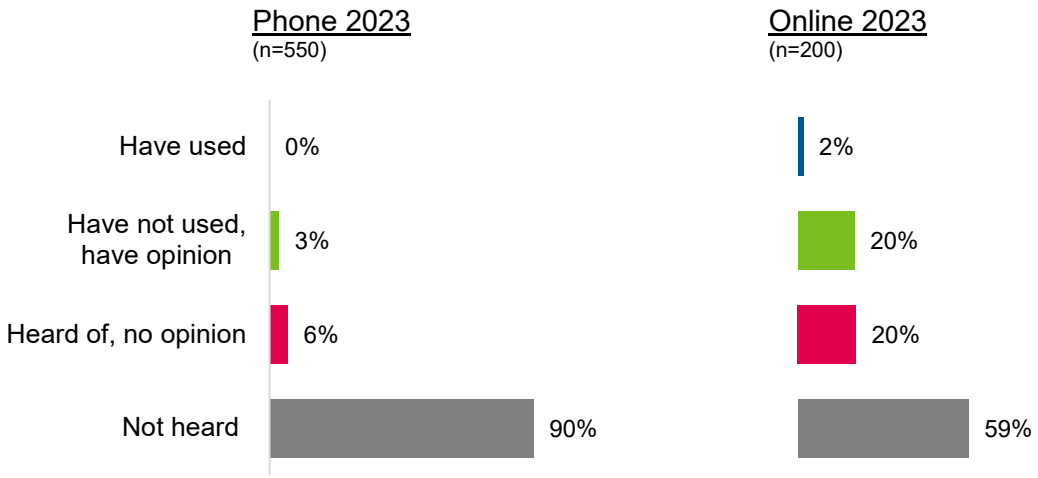
Remote Patient Monitoring - rating of service



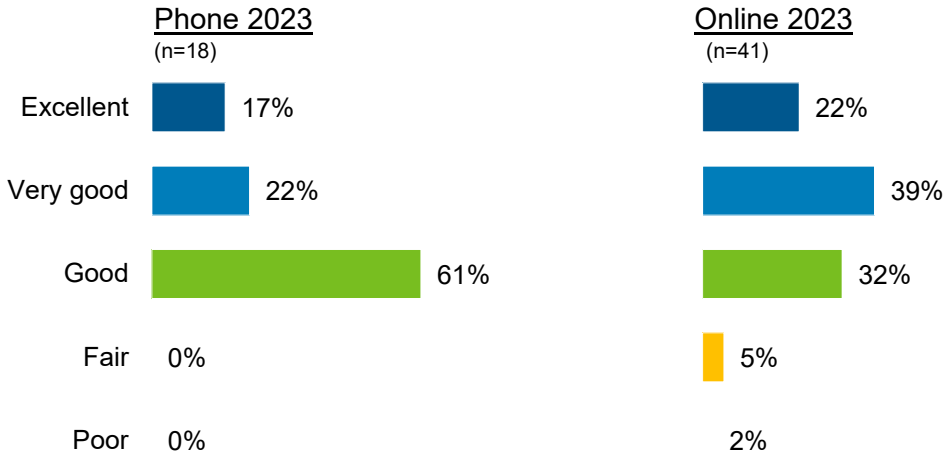
Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

No phone survey respondents indicated having used the Social Navigator Program. For respondents who have not used but have an opinion about the Social Navigator Program, the majority (61%) felt the program was good.

Social Navigator Program - familiarity with service



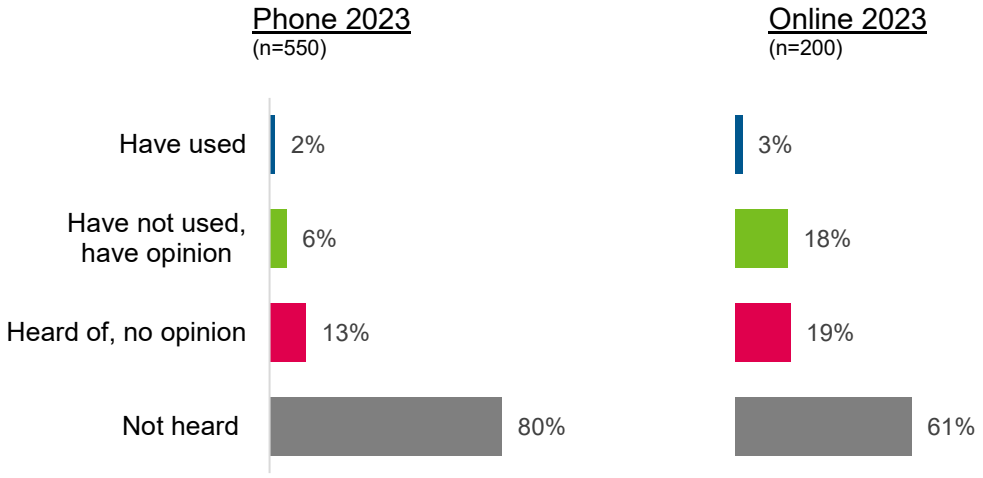
Social Navigator Program - rating of service



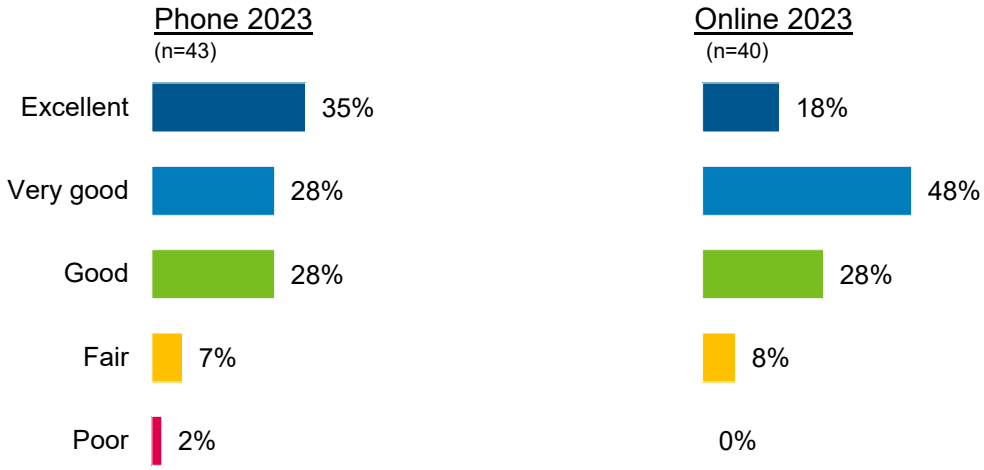
Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Approximately 2% of phone survey respondents have used the Community Paramedic @ Home Visiting Program. For respondents who have used or have an opinion about the Community Paramedic @ Home Visiting Program, the majority (63%) felt the program was excellent or very good.

Community Paramedic @ Home Visiting Program – familiarity with service



Community Paramedic @ Home Visiting Program - rating of service

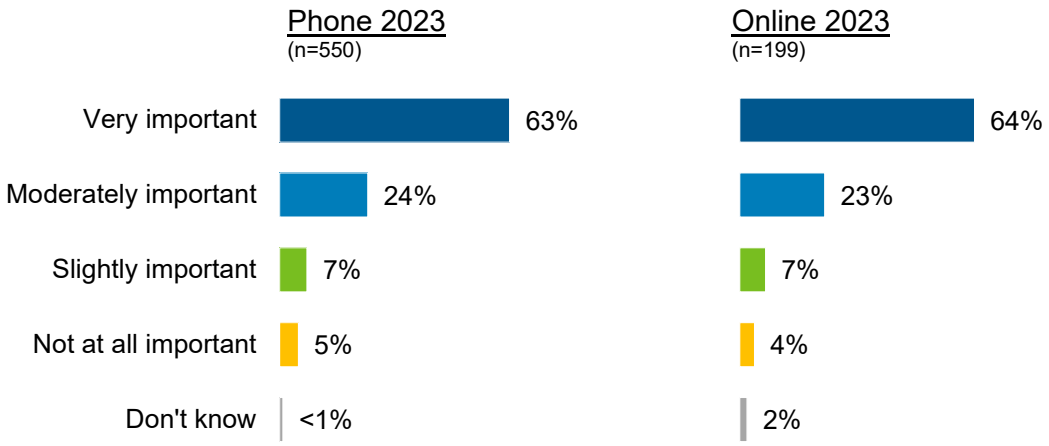


Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

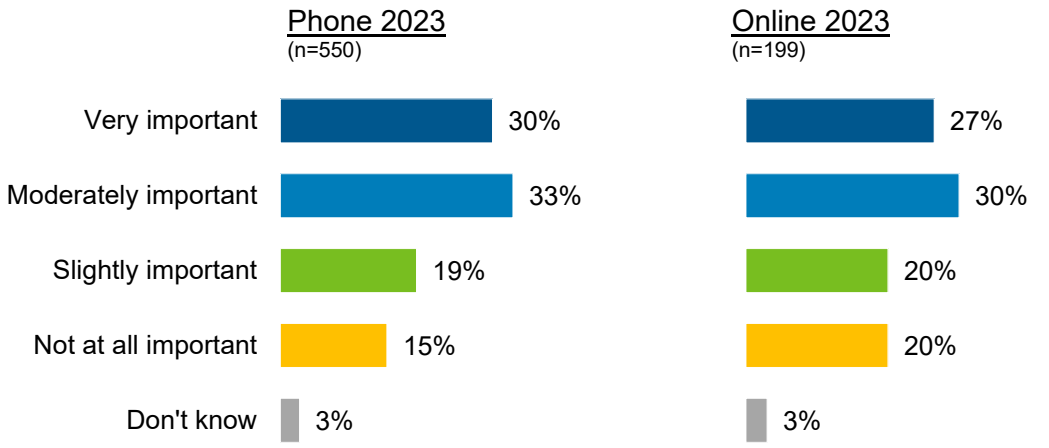
HPS Services

A significantly higher proportion of phone survey respondents feel that it is very or moderately important for HPS to provide information and education to promote health and safety of residents (87%) and provide outreach care to vulnerable residents (88%) compared to supporting the community by organizing/participating in charitable events, fundraisers, food and toy drives (63%).

How important is it for the Hamilton Paramedic Service to provide information and education to promote health and safety of residents e.g., stroke awareness campaign (Face Arm Speech Time), opioid overdose prevention education, tips and advice on social media?

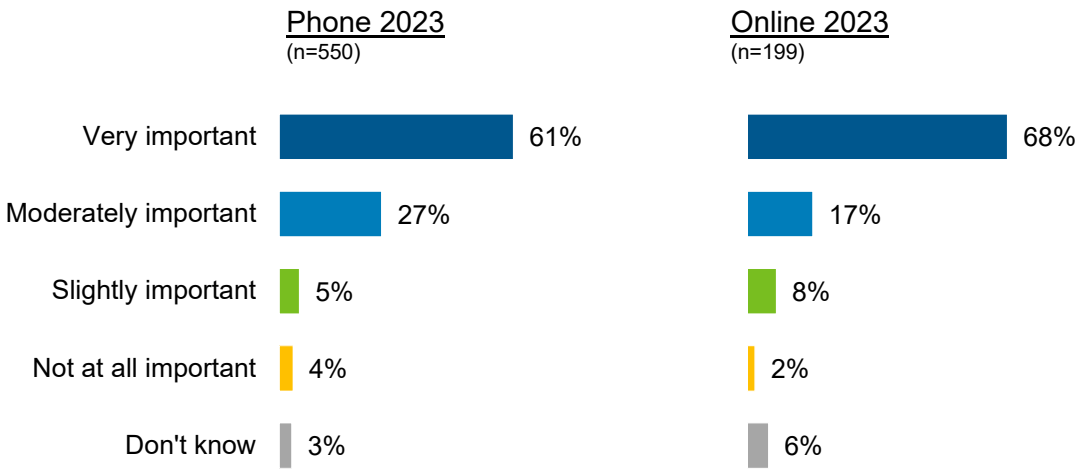


How important is it for the Hamilton Paramedic Service to support the community by organizing/participating in charitable events, fundraisers, food and toy drives



Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

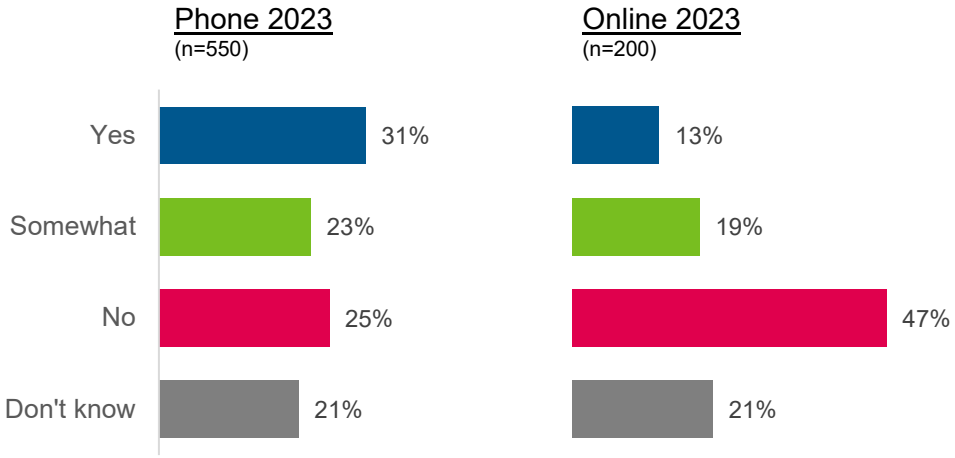
How important is it for the Hamilton Paramedic Service to provide outreach care to vulnerable residents?



Service Quality

One in four phone survey respondents (25%) do not feel that HPS has adequate resources to provide reliable, timely, quality care to residents.

Do you think the Hamilton Paramedic Service has adequate resources (vehicles, equipment, trained staff, etc.) to provide reliable, timely, quality care to residents?



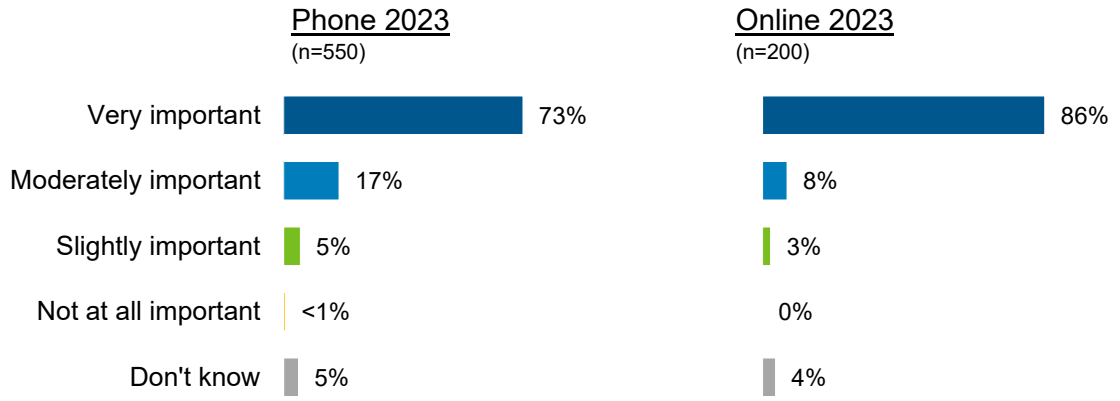
Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Respondents who felt HPS somewhat has or does not have adequate resources to provide reliable, timely, quality care to residents were asked to explain their response. The most common responses provided included references to offload delays, issues with response times, lack of funding and incidences of code zero.

Willingness to Pay

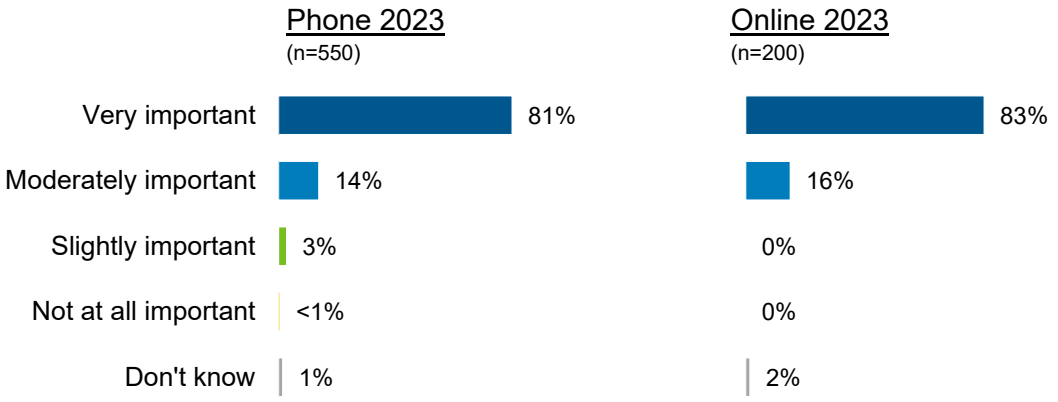
Significantly more phone survey respondents feel it is very important for the City to allocate tax dollars to update technology and medical equipment to optimize service delivery (81%) or to increase the number of ambulances (73%) than to improve comfort of the ride in ambulances for patients (32%) or reduce HPS's environmental footprint (28%)

How important do you feel it is for the City to allocate tax dollars to increase the number of ambulances and paramedics for a more timely response?

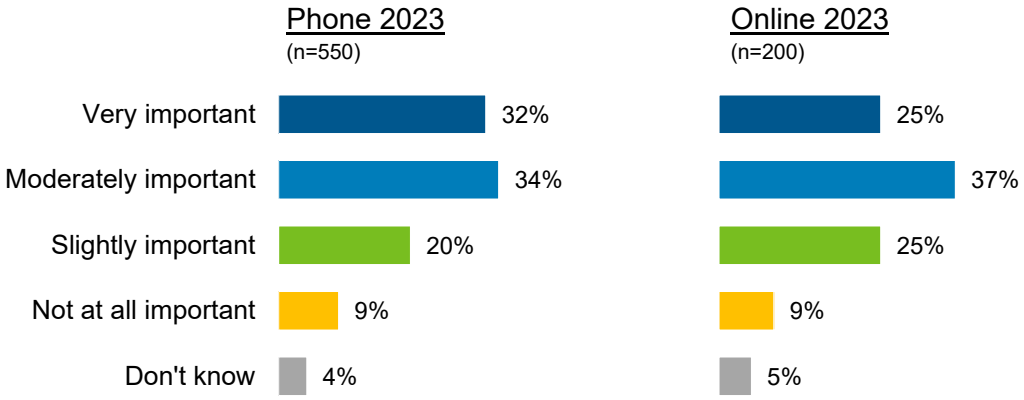


Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

How important do you feel it is for the City to allocate tax dollars to update technology and medical equipment to optimize service delivery?

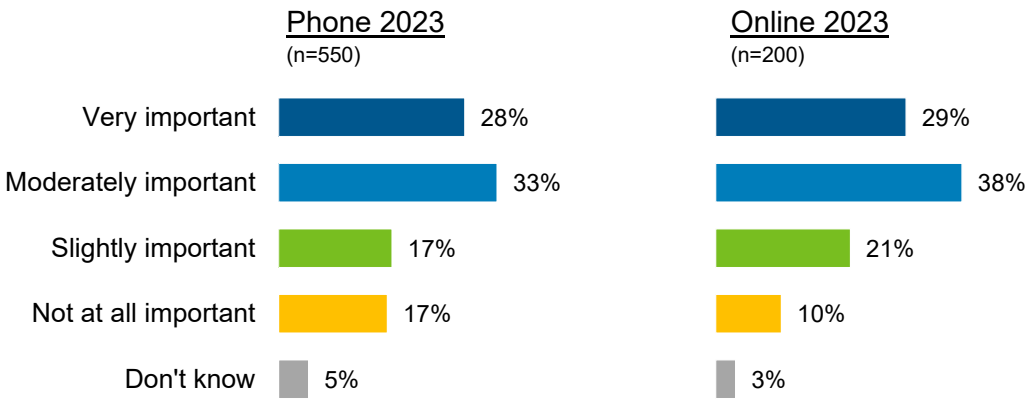


How important do you feel it is for the City to allocate tax dollars to improve the comfort of the ride in an ambulance for patients?



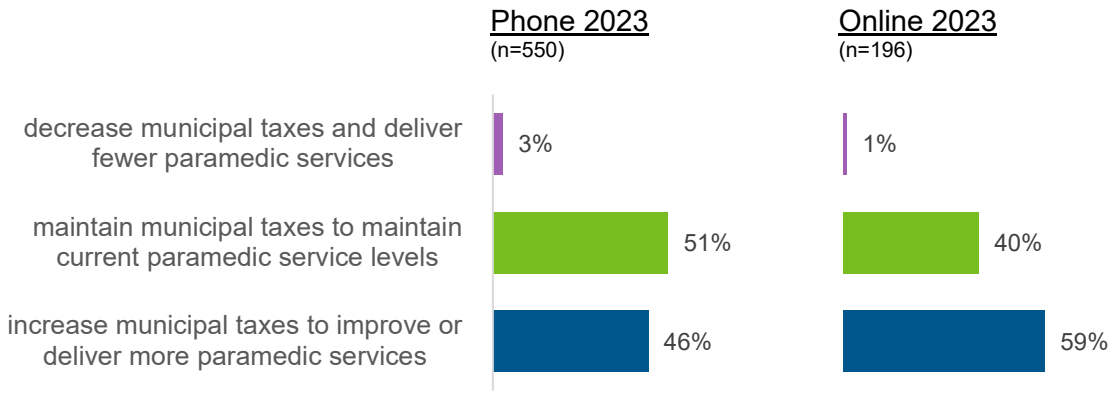
Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

How important do you feel it is for the City to allocate tax dollars reduce Hamilton Paramedic Service's environmental footprint?



Just over half (51%) of phone survey respondents indicated the City should maintain municipal taxes to maintain current paramedic service levels while 46% feel the City should increase municipal taxes to improve or deliver more paramedic services.

Which of the following 3 options comes closest to your opinion. The City should…



Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

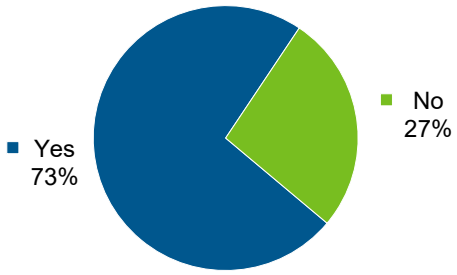
Automatic External Defibrillators (AEDs)

Approximately 73% of phone survey respondents indicated being aware of or having seen public AEDs and 65% would feel comfortable using a public AED to assist someone in cardiac arrest.

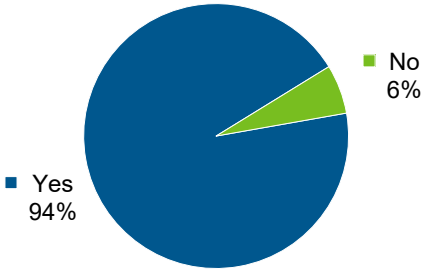
Automatic External Defibrillators (AEDs) are medical devices that help people experiencing sudden cardiac arrest. The Hamilton Paramedic Service Public Access Defibrillator program provides AEDs for public use in places such as shopping malls, recreation centres, senior centres, schools and libraries.

Before this moment, were you aware of or have you seen public AEDs?

Phone 2023
(n=550)

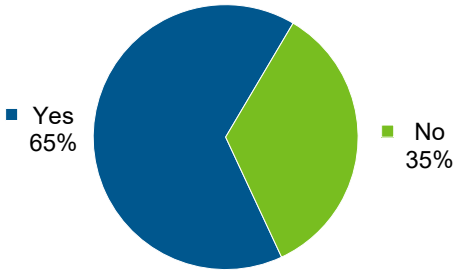


Online 2023
(n=200)

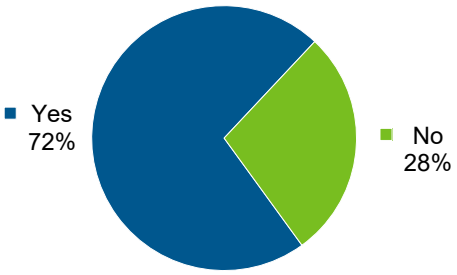


Would you feel comfortable using a public AED to assist someone in cardiac arrest?

Phone 2023
(n=550)



Online 2023
(n=200)



Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

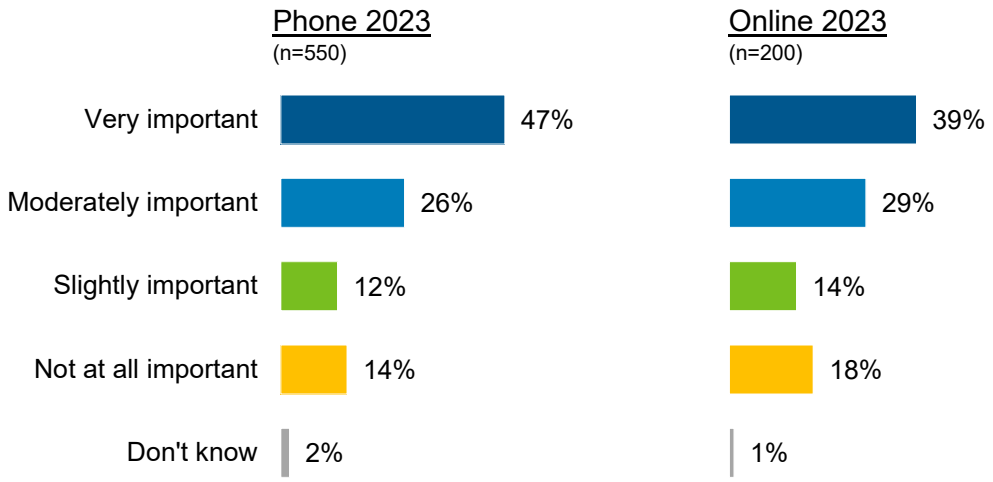
The most common reasons respondents provided for not feeling comfortable using a public AED to assist someone in cardiac arrest include:

- not being trained or not knowing how to use, never used
- concerns of making a mistake, causing harm

Cultural Diversity

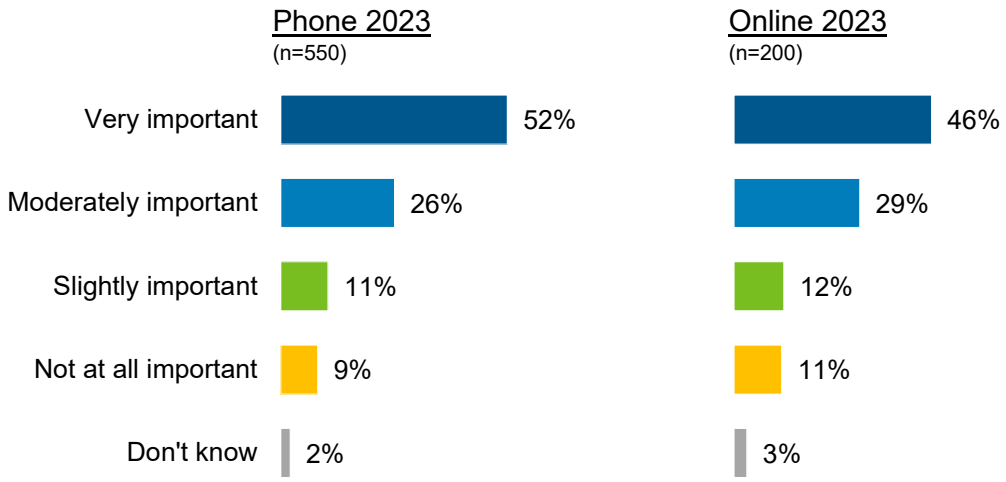
The majority of phone survey respondents indicated it is very or moderately important that the HPS workforce reflects the diversity of the residents they serve (73%) and the cultural beliefs and values of patients/clients should be considered when delivering paramedic care (78%).

How important is it that the Hamilton Paramedic Service workforce reflects the diversity of the residents they serve?



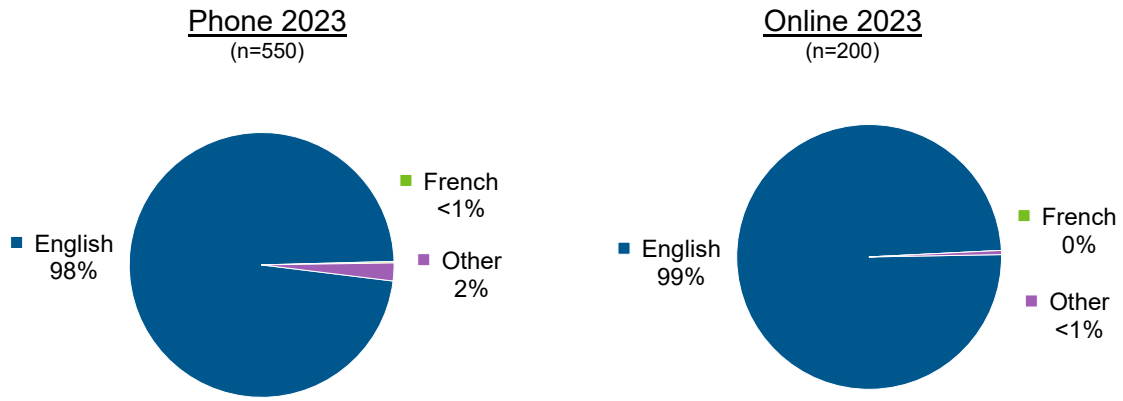
Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

How important is it that the cultural beliefs and values of patients/clients are considered when delivering paramedic care?



Almost all respondents indicated preferring or feeling most comfortable using English to communicate needs and concerns to paramedics.

What language would you prefer or feel most comfortable using to communicate your needs and concerns to paramedics?



Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

APPENDIX A: SURVEY TOOL

Hamilton Paramedic Service Resident Survey 2023

OVERALL SERVICE RATING

Q01 Based on your experience or knowledge, overall, how would you rate the services provided by the Hamilton Paramedic Service?

- ○ Poor
- ○ Fair
- ○ Good
- ○ Very good
- ○ Excellent
- ○ Don't Know

➤ If response = poor proceed to Q2, otherwise, skip to Q3

Q02 Please explain why you rated the services as "poor".

RESPONSE EXPECTATIONS

Q03 Have you called 911 for an ambulance in the past 2 years, either for yourself or someone you know?

- ○ Yes
- ○ No

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

Considering driving time and traffic, how many minutes do you think is acceptable for paramedics to arrive for …

Q04 a **life-threatening** emergency such as cardiac arrest or seizures?

- ○ Less than 5 minutes
- ○ 5 to 7 minutes
- ○ 8 to 10 minutes
- ○ 11 to 15 minutes
- ○ 16 to 20 minutes
- ○ 21+ minutes

Q05 a **non-life-threatening** emergency such as a broken bone?

- ○ Less than 5 minutes
- ○ 5 to 7 minutes
- ○ 8 to 10 minutes
- ○ 11 to 15 minutes
- ○ 16 to 20 minutes
- ○ 21+ minutes

Consider the scenario where you have called for an ambulance for a minor injury or illness.

Q06 Do you feel it is acceptable to receive care instructions over the phone from the paramedic dispatcher including referrals to a medical professional to assist you, rather than sending an ambulance?

- ○ Yes
- ○ No
- ○ Don't Know

Q07 Do you feel it is acceptable for the paramedics who arrive on scene to provide treatment then refer you to another medical professional rather than taking you to the hospital?

- ○ Yes
- ○ No
- ○ Don't Know

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

Q08 If you are taken to the hospital, do you feel it is acceptable for the paramedics to settle you in the emergency waiting room and then leave so they can prepare to respond to another 911 emergency call?

- ○ Yes
- ○ No
- ○ Don't Know

HPS PROGRAMS AND SERVICES

Please indicate your familiarity with each of the following services provided by the Hamilton Paramedic Service's Mobile Integrated Health program.

Q09a Community Paramedic@ Clinic Seniors Program

- ○ Have used the program
- ○ Have not used but know enough about it to have an opinion
- ○ Have heard of program but do not know enough about it to have an opinion
- ○ Have not heard of program

➤ If response = "have used the program" OR "have not used but know enough about it to have an opinion", include Q10a

Q09b Remote Patient Monitoring

- ○ Have used the program
- ○ Have not used but know enough about it to have an opinion
- ○ Have heard of program but do not know enough about it to have an opinion
- ○ Have not heard of program

➤ If response = "have used the program" OR "have not used but know enough about it to have an opinion", include Q10b

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

Q09c Social Navigator Program

- ○ Have used the program
- ○ Have not used but know enough about it to have an opinion
- ○ Have heard of program but do not know enough about it to have an opinion
- ○ Have not heard of program

➤ If response = "have used the program" OR "have not used but know enough about it to have an opinion", include Q10c

Q09d Community Paramedic @ Home Visiting Program

- ○ Have used the program
- ○ Have not used but know enough about it to have an opinion
- ○ Have heard of program but do not know enough about it to have an opinion
- ○ Have not heard of program

➤ If response = "have used the program" OR "have not used but know enough about it to have an opinion", include Q10d

Q10a How would you rate Community Paramedic @ Clinic Seniors Program?

- ○ Poor
- ○ Fair
- ○ Good
- ○ Very good
- ○ Excellent

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

Q10b How would you rate Remote Patient Monitoring ?

- ○ Poor
- ○ Fair
- ○ Good
- ○ Very good
- ○ Excellent

Q10c How would you rate the Social Navigator Program?

- ○ Poor
- ○ Fair
- ○ Good
- ○ Very good
- ○ Excellent

Q10d How would you rate the Community Paramedic @ Home Visiting Program

- ○ Poor
- ○ Fair
- ○ Good
- ○ Very good
- ○ Excellent

How important is it for the Hamilton Paramedic Service to ...

Q11 provide information and education to promote health and safety of residents e.g., stroke awareness campaign (Face Arm Speech Time), opioid overdose prevention education, tips and advice on social media

- ○ Very important
- ○ Moderately important
- ○ Slightly important
- ○ Not at all important

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

Q12 support the community by organizing/participating in charitable events, fundraisers, food and toy drives

- ○ Very important
- ○ Moderately important
- ○ Slightly important
- ○ Not at all important

Q13 provide outreach care to vulnerable residents

- ○ Very important
- ○ Moderately important
- ○ Slightly important
- ○ Not at all important

SERVICE QUALITY

Q14 Do you think the Hamilton Paramedic Service has adequate resources (vehicles, equipment, trained staff, etc.) to provide reliable, timely, quality care to residents?

- ○ Yes
- ○ Somewhat
- ○ No

➤ If response = "Somewhat" or "No" proceed to Q15, otherwise, skip to Q16

Q15 Please explain why you believe the Hamilton Paramedic Service does not have adequate resources to provide reliable, timely, quality care to residents.

Hamilton Paramedic Service Resident Survey 2023

WILLINGNESS TO PAY

In delivering paramedic services to you and the community, the City typically pays for resources through both provincial and municipal taxes.

How important do you feel it is for the City to allocate tax dollars to...

Q16 increase the number of ambulances and paramedics for a more timely response

- O Very important
- O Moderately important
- O Slightly important
- O Not at all important

Q17 update technology and medical equipment to optimize service delivery

- O Very important
- O Moderately important
- O Slightly important
- O Not at all important

Q18 improve the comfort of the ride in an ambulance for patients

- O Very important
- O Moderately important
- O Slightly important
- O Not at all important

Q19 implement green technologies to reduce Hamilton Paramedic Service's environmental footprint

- O Very important
- O Moderately important
- O Slightly important
- O Not at all important

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

Q20 Do you think the City should:

- ○ decrease municipal taxes and deliver fewer paramedic services
- ○ maintain municipal taxes to maintain current paramedic service levels
- ○ increase municipal taxes to improve or deliver more paramedic services

Automatic External Defibrillators (AEDs)

Automatic External Defibrillators (AEDs) are medical devices that help people experiencing sudden cardiac arrest. The Hamilton Paramedic Service Public Access Defibrillator program provides Automatic External Defibrillators (AEDs) for public use in places such as shopping malls, recreation centres, senior centres, schools and libraries.

Q21 Are you aware of or have you seen public AEDs?

- ○ Yes
- ○ No

Q22 Would you feel comfortable using a public AED to assist someone in cardiac arrest?

- ○ Yes
- ○ No

➤ If response = "No" go to question Q23
= "Yes" skip to Q24

Q23 Please explain why you would not feel comfortable using a public AED to assist someone in cardiac arrest

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

CULTURAL DIVERSITY

Hamilton is a very diverse city with residents from many ethnic and cultural groups.

Q24 How important is it that the Hamilton Paramedic Service workforce reflects the diversity of the residents they serve?

- O Very important
- O Moderately important
- O Neutral
- O Slightly important
- O Not at all important

Q25 How important is it that the cultural beliefs and values of patients/clients are considered when delivering paramedic care?

- O Very important
- O Moderately important
- O Neutral
- O Slightly important
- O Not at all important

Q26 What language would you prefer or feel most comfortable using to communicate your needs and concerns to paramedics?

RESPONDENT DESCRIPTORS

If you're comfortable, please tell us a little about you and your household.

Q27 What is your postal code? _____

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

Q28 How would you describe yourself?

- ○ Male
- ○ Female
- ○ Transgender
- ○ Nonbinary
- ○ Other
- ○ Prefer not to answer

Q29 Do you identify as a member of the following groups

Select all that apply

- ☐ Racialized (i.e., Black, people of colour)
- ☐ Indigenous
- ☐ 2SLGBTQIA+
- ☐ Immigrant
  - ➢ year arrived in Canada _____
- ☐ People with disabilities
- ☐ I do not identify with any of the above groups
- ☐ Prefer not to answer

Q30 What is your age?

- ○ 18 to 24
- ○ 25 to 29
- ○ 30 to 34
- ○ 35 to 44
- ○ 45 to 54
- ○ 55 to 64
- ○ 65 to 79
- ○ 80 years and older
- ○ Prefer not to answer

Hamilton Paramedic Service (HPS) Resident Survey 2023 ~ Summary Report

Hamilton Paramedic Service Resident Survey 2023

Q31 What is your household's total income before taxes?

- ○ Less than $17,000
- ○ $17,000 to $29,999
- ○ $30,000 to $49,999
- ○ $50,000 to $74,999
- ○ $75,000 to $99,999
- ○ $100,000 and over
- ○ Prefer not to answer

Corporate Real Estate Office Asset Management Plan 2024

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

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CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

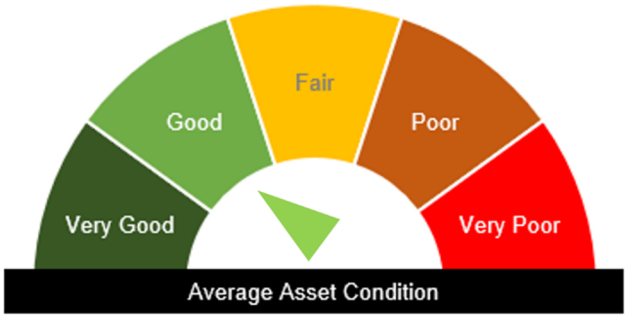
SUMMARY AND QUICK FACTS

SERVICE PROFILE

The Corporate Real Estate Office (CREO) is responsible for the management of the City of Hamilton's (the "City") real estate assets and portfolio. CREO business activities include real property transactions, property valuation services, strategic and portfolio planning, and client/program support in conjunction with the delivery of efficient and effective City services.

ASSET SUMMARY

Replacement Value
$56.7K



LEVEL OF SERVICE SUMMARY

No customer levels of service were identified in this iteration of the Asset Management Plan.

Technical Levels of Service will be included in the next iteration of the Asset Management Plan.

Asset Highlights				
MAJOR ASSETS	**QUANTITY**	**REPLACEMENT COST**	**AVERAGE CONDITION**	**STEWARDSHIP MEASURES**
Land Assets	1,900	N/A*	N/A*	The condition of land assets was not included in this AM Plan.
Administrative Assets	24	$56.7 K	GOOD	Computers are replaced at the end of their useful lives.

*Replacement costs and Condition were not included for land assets

DATA CONFIDENCE

VERY GOOD **MEDIUM** **VERY LOW**

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Key Demand Drivers

Program Requirements: The Corporate Real Estate Office (CREO) offers services throughout the entire corporation, with demand being dictated by the program requirements of client groups. This encompasses the growing demand for city services and program needs, which may lead to adjustments in CREO's land asset portfolio. Additionally, the housing prioritization directed by Council could potentially necessitate additional staff resources for CREO.

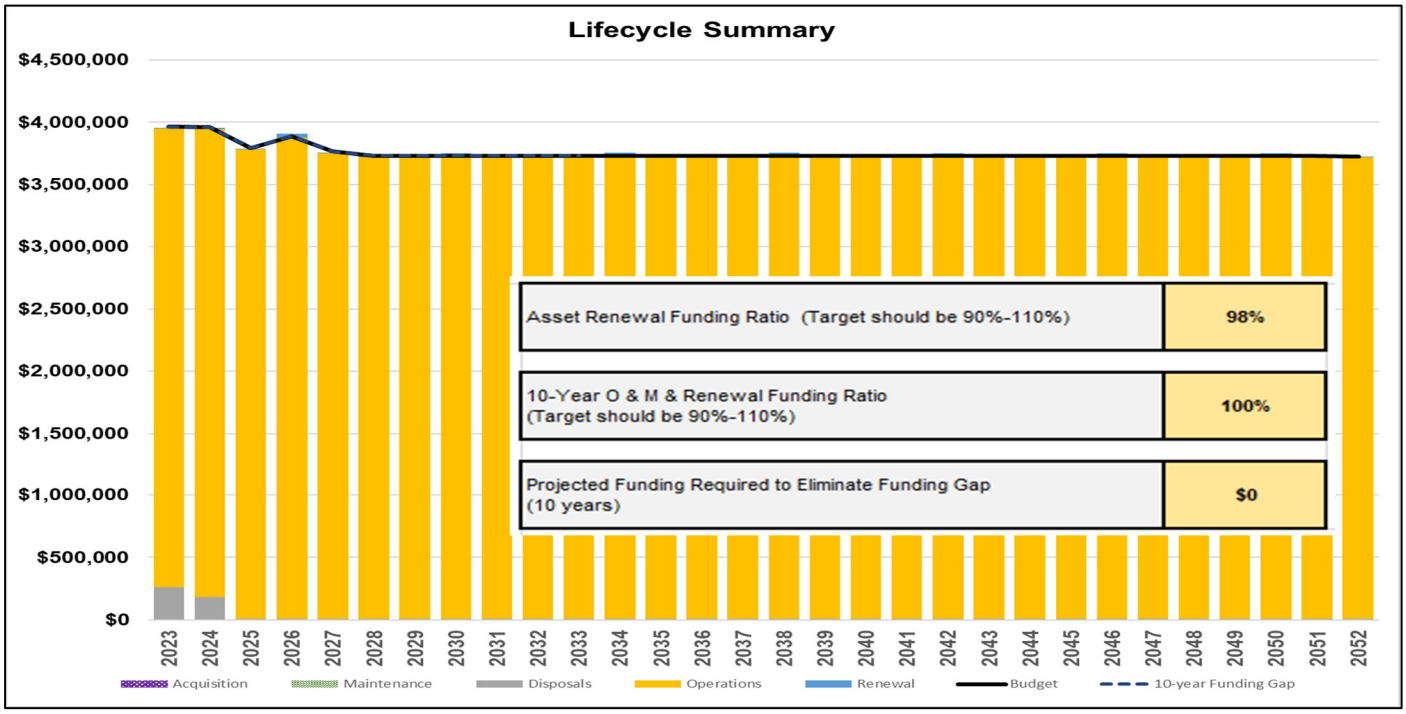
RISK

- No critical assets identified for CREO.

CLIMATE CHANGE

- Currently there are no climate change mitigation and adaptation projects being pursued by CREO.

LIFECYCLE SUMMARY*



*This Lifecycle model includes operational activities (CREO staff salaries), Administrative Assets renewals and some land asset disposals. Acquisitions are excluded from this model.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

1. INTRODUCTION

The Corporate Real Estate Office (CREO) is responsible for the management of the City of Hamilton's (City) real estate assets and portfolio. CREO business activities include real property transactions, property valuation services, strategic and portfolio planning, and client/program support in conjunction with the delivery of efficient and effective City services.

2. BACKGROUND

This Asset Management Plan (AM Plan) intends to communicate the requirements for the sustainable delivery of services through the management of assets, in compliance with the regulatory requirements and required funding to provide the appropriate levels of service over the 2023 - 2052 planning period. The assets covered by this plan include the major components required to deliver effective real estate services to the City.

2.1 SERVICE PROFILE

The service profile consists of four main aspects of the service:

- Service History;
- Service Function;
- Users of the Service; and,
- Unique Service Challenges.

2.1.1 SERVICE HISTORY

After amalgamation in 2001, the Facilities and Real Estate Division underwent restructuring. Following the reorganization of departments and divisions within the new city structure, Facility Management functions were transferred to the Public Works department, while the Real Estate functions moved to the Planning and Economic department.

2.1.2 SERVICE FUNCTION

The Corporate Real Estate Office (CREO) is a corporate function that resides in the Economic Development Division and provides services across the entire corporation. These services include transactions (e.g., property sales, acquisitions, leases, licences, renewals), valuations, portfolio planning, portfolio reviews and strategic project support. CREO offers real estate-related advice to staff and Council members. CREO's primary objective is to efficiently maximize the value of the City's real estate interests while delivering good customer service. CREO has a primary responsibility for the City's real estate inventory and portfolio of properties.

Generally, CREO acquires properties on behalf of a division to support various municipal uses/programs, such as linear infrastructure (e.g., roads), community services (e.g., recreation centre), and corporate services (e.g., office space). Prior to acquisition, property needs are determined with the client division. Once a property is acquired, it is then transferred to the division to operate and maintain.

CREO has responsibility for providing property valuations as required for numerous purposes, including establishing appropriate market value for transactions, parkland dedication, decision making, budget purposes and to support other municipal programs such as downtown incentive programs, development charges, and community benefit charges.

CREO also oversees the City's property portfolio strategy. CREO performs ongoing property reviews to ensure properties are used for their intended purpose and efficiently. As part of the review, any identified underutilized properties are evaluated for potential repurposing or disposition.

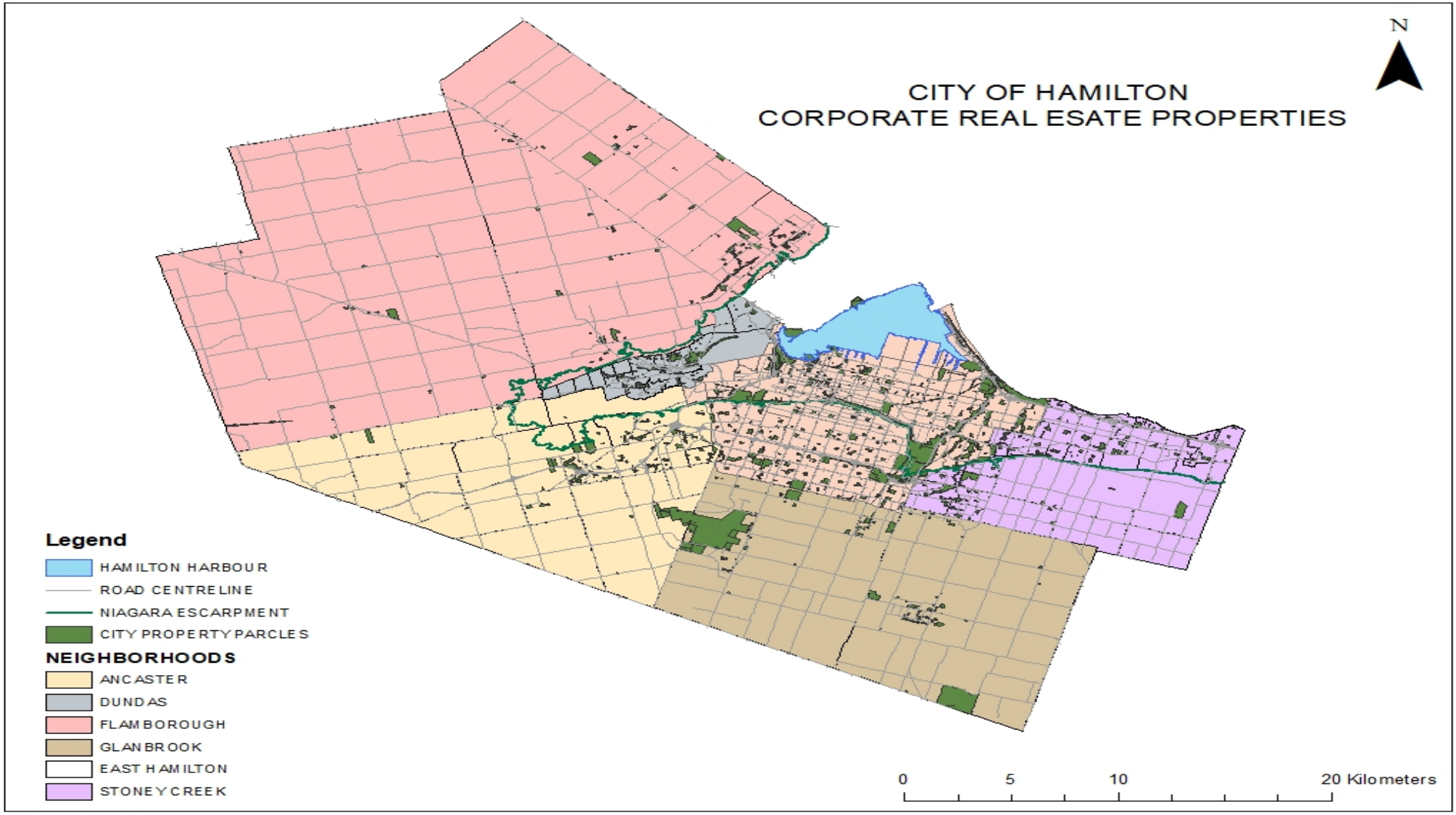
2.1.3 USERS OF THE SERVICE

The Corporate Real Estate Office's clients and stakeholders include:

- All City Departments, Divisions, and Agencies;
- Senior Leadership Team;
- City Council; and,
- Participants in the Development and Real Estate Industries.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Figure 1: Map of City of Hamilton Corporate Real Estate Properties (Public GIS Data as of Aug 2023)



CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

2.2 LEGISLATIVE REQUIREMENTS

The most significant legislative requirements that impact the delivery of the service 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 Act, S,O. 2001, c. 25	This outlines the powers and responsibilities of municipalities, including their ability to acquire, hold, and dispose of real property and its obligations related to Anti-bonusing, Municipal Capital Facilities, and Property Taxation.
Sale of Land Policy By-law 14-204	The City of Hamilton follows this policy for the sale and other dispositions of land.
Expropriations Act R.S.O. 1990, c. E26.	In Ontario, municipalities under the Expropriations Act have the authority to expropriate land of interest for municipal infrastructure projects.

2.3 COUNCIL PRIORITIES

As referenced in the AM Plan Overview in ***Section 5.4,*** Strategic Alignment, the City's strategic goals and objectives are shaped by internal drivers such as Council-approved strategies and plans, as well as external forces such as citizen expectations, and legislative and regulatory requirements. The specific legislative and regulatory requirements for service areas are provided in each AM Plan.

City objectives provide asset owners with direction regarding levels of service and asset investment priorities. This AM Plan will demonstrate how the City's objectives for core assets can influence levels of service and direct asset expenditures.

2.4 ASSET HIERARCHY

To deliver effective and adequate real estate services, the Corporate Real Estate Office requires assets. For the purpose of this Asset Management Plan, CREO assets have been divided into two asset classes: Land Assets (including various real property interests), and Administrative assets.

- **Land Assets:** refers to any city-owned or leased or other interest in land that is used in the provision of a service, such as water, wastewater, parks, cemeteries, recreation centres, road allowance etc.
- **Administrative Assets:** refers to the type of technology required for the provision of the service, such as laptops and tablets.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

The Asset Class Hierarchy outlines assets included in this section, as shown below in ***Table 2***:

Table 2: Asset Class Hierarchy

SERVICE AREA	CORPORATE REAL ESTATE OFFICE	
ASSET CLASS	**LAND ASSETS**	**ADMINISTRATIVE ASSETS**
Asset	Civic Assets (e.g., City Hall, Offices)	Laptops and tablets
	Protective/Strategic Assets (e.g., Buffer lands, Future road lands, Vacant lands, Industrial Park,)	
	Public Care/Use Assets (e.g., Cemeteries, Community Centres, Parks, Parking lots)	
	Public Service Delivery Assets (e.g., EMS, Fire, Police stations)	
	Public Service Support Assets (e.g., Service yards, Storage)	
	Utility Infrastructure (e.g., Recycling facilities, Stormwater ponds, Water towers)	

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

3. SUMMARY OF ASSETS

Table 3 displays the detailed summary of assets for the CREO service area. The sources for this data are a combination of data provided by CREO and other available data from the City's database information. It is important to note that inventory information does change often, and that this is a snapshot of information available as of August 2023.

The City of Hamilton owns 1,900 properties, equal to 9,423 acres of land. The City also plays dual roles by leasing/licensing out its own land as a landlord/licensor and renting land for its services as a tenant/licensee. Easements and Encroachments are not discussed in this report. Currently, the City has 106 leases and licenses in place where the City is the tenant or licensee and 235 leases and licenses where the City is the landlord or licensor.

Given the complexity of land valuation, the replacement cost for the City's land assets were not examined as part of this AM Plan. Land has an indefinite age and an indefinite Estimated Service Life (ESL), making these traditional asset management parameters difficult to use. Both age and ESL of land were not examined in this AM Plan. This is also consistent with the Tangible Capital Assets (TCA) guidelines which dictate that land is not depreciated over time. The replacement value of land was also not calculated in this iteration of the AM Plan. Real Estate values are constantly changing, and each parcel is unique, as such the value below is only administrative assets. This is consistent with other City of Hamilton AM Plans that have also not calculated a land replacement value. A continuous improvement item has been identified in ***Table 14*** to Investigate the potential for calculating land replacement values for future AM Plans

The Condition of land assets is also not included in this iteration of the AM Plan as there is not a standard or process to determine the condition of land assets at this time. A continuous improvement item has been identified in ***Table 14*** to evaluate if a conditioning process could be developed for future AM Plans.

CREO owns **$56.7K** in administrative assets. CREO's administrative assets are on average in **GOOD** condition. The administrative assets are an average of one year in age, with **70 %** Remaining Service Life (RSL).

Data confidence descriptions are outlined on ***Page 31*** in the AM Plan Overview. For Land assets, the quantities and land size were taken from the CREO property inventory.

Administrative assets were valued by the most recent purchase price for similar assets and were assigned a ***MEDIUM*** data confidence level.

The Corporate Asset Management Office (CAM) acknowledges that some work and projects are ongoing, and the deficiencies noted may be resolved at the time of publication. As well, the assets included below are assets that are assumed and in service at the time of writing this AM Plan.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Table 3: Detailed Summary of Assets
****Weighted Average***

LAND ASSETS		
ASSET CATEGORY	**NUMBER OF PARCELS**	**ACRE**
Civic Assets	99	1,139
Protective / Strategic Assets	280	658
Public Care / Use Assets	1,128	5,182
Public Service Delivery Assets	22	24
Public Service Support Assets	42	1,071
Utility Infrastructure	329	1,349
Data Confidence	Medium	Medium
SUBTOTAL	**1,900**	**9,423**
DATA CONFIDENCE	**MEDIUM**	**MEDIUM**

ADMINISTRATIVE ASSETS				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Laptops and tablets	24	$56.7 K	1 year (70%)	2-GOOD
Data Confidence	High	Medium	Medium	Medium
SUBTOTAL		**$56.7 K**	**1 year (70%)**	**2-GOOD**
DATA CONFIDENCE		**MEDIUM**	**MEDIUM**	**MEDIUM**

Complete data for Land assets consists of attributes such as parcel location, land size, service area with land use and status and Roll Number and Property Identification Numbers (PIN). Data is formatted per parcel of land. All land parcel data entries contained varying degrees of attribute information.

Table 3 identifies the implementation of an asset registry for all CREO assets, including the City's Land assets and leases currently missing from the data set, as a continuous improvement item. This work is already underway and will improve the data attributes of parcels.

3.1 LEASED PROPERTIES

The City of Hamilton can lease space for its use (rather than purchasing land), or the City may allow third parties (i.e., businesses) to lease City-owned land (rather than selling the land or where there may be a strategic need to retain ownership). In a few cases where the City is the landlord, the lease in place is a Land Lease (typically a long-term lease where the landlord leases the land to the tenant and the tenant owns the building/facility over the term of the lease and is responsible for the cost of maintenance, and operation of the building/facility). A few examples of the major long-term leases for the City of Hamilton include the lease agreements for the John C. Munro Hamilton International Airport and properties covered under the Hamilton Urban Precinct Entertainment Group (HUPEG) agreement.

In the case of the Hamilton International Airport, Trade Port International Corporation was selected by the City of Hamilton to operate and manage the John C. Munro Hamilton International Airport. In 1996, Trade Port International Corporation signed a 40-year lease agreement with the City and is responsible for the ongoing management and development of the airport including the maintenance, repair and replacement of the airport's assets and improvements.

Similarly, HUPEG, is responsible for the maintenance, repair, upgrade and renovation of First Ontario Arena, Hamilton Convention Centre, and First Ontario Concert Hall along with specific obligations relating to some other properties included in the agreement.

If these lease agreements ended, the City of Hamilton would need to execute new agreements with new service providers or resume Asset Management Lifecycle Activities of the assets at additional costs.

3.2 STRATEGIC LAND BANKING ACQUISITIONS

Land banking is an economic development tool funded by local governments to acquire, develop, and sometimes sell land for residential and non-residential purposes. A land bank can be a powerful locational incentive, which can be used to encourage new developments in the city in both new business parks and redevelopment of older industrial areas where there are no available employment lands, and similarly where the City is trying to stimulate affordable housing opportunities. While a land bank provides long-term economic benefits in terms of assessment and job creation, it can also act as a tool for planning long-term community development.

For the City of Hamilton, Council may acquire land from time to time and it may then hold, sell, or lease the land for the purpose of various program needs, affordable housing and economic development.

3.3 INDUSTRIAL BUSINESS PARKS

The City of Hamilton has ten industrial business parks and employment areas. It is important that the City has an adequate supply of shovel-ready industrial lands to allow industries to locate and expand within our community. Shovel-ready is a site that already has the necessary Official Plan designation, zoning, permits, and municipal servicing/utility infrastructure in place. By working with landowners, municipal departments, agencies, and all levels of government, CREO is committed to obtaining all of the necessary approvals (e.g., Environmental Assessment, Official Plan designations, zoning, etc.) and ensuring that the necessary municipal infrastructure is available to service the industrial lands. In creating shovel-ready City-owned land, the City of Hamilton is responsible for costs of acquisitions and costs associated with making land "shovel-ready" (i.e., costs of servicing, grading, stormwater management), maintenance costs of lands, and other front-end servicing costs.

A status update on shovel-ready industrial land can be found in the 2020 Employment Area Inventory Report[1]. The report includes a snapshot of shovel-ready employment lands inventory in Hamilton.

3.4 ASSET CONDITION GRADING

Condition refers to the physical state of CREO assets. It 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 6 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.

The following conversion assumptions were made:

- For Administrative assets where a condition assessment was not completed, but age information was known, the condition was based on the percent of remaining service life; and,
- For Land assets, the condition was not determined in this iteration of the AM Plan.

[1] https://www.hamilton.ca/sites/default/files/2023-05/employment-area-inventory-2020.pdf

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Table 4: Equivalent Condition Conversion Table

EQUIVALENT CONDITION GRADING CATEGORY	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE	ADMINISTRATIVE ASSETS
1-Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance is required only.	>79.5%	Very Good
2-Good	The asset is adequate and has slight defects and shows signs of some deterioration that has no significant impact on the asset's usage. Minor/preventative maintenance may be required.	69.5% – 79.4%	Good
3-Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	39.5% - 69.4%	Fair
4-Poor	The asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance is required in the next year.	19.5% -39.4%	Poor
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%	Very Poor

3.5 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 assets typically have an estimated service life (ESL) where the asset can be expected to be in service before the condition has degraded and requires 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 ten-year forecast to predict degradation.

- As previously mentioned, 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 is noted in this section.

3.6.1 LAND ASSETS PROFILE

3.6.1.1 AGE PROFILE

The age of land assets is considered indefinite and is not determined for this AM Plan.

3.6.1.2 CONDITION PROFILE

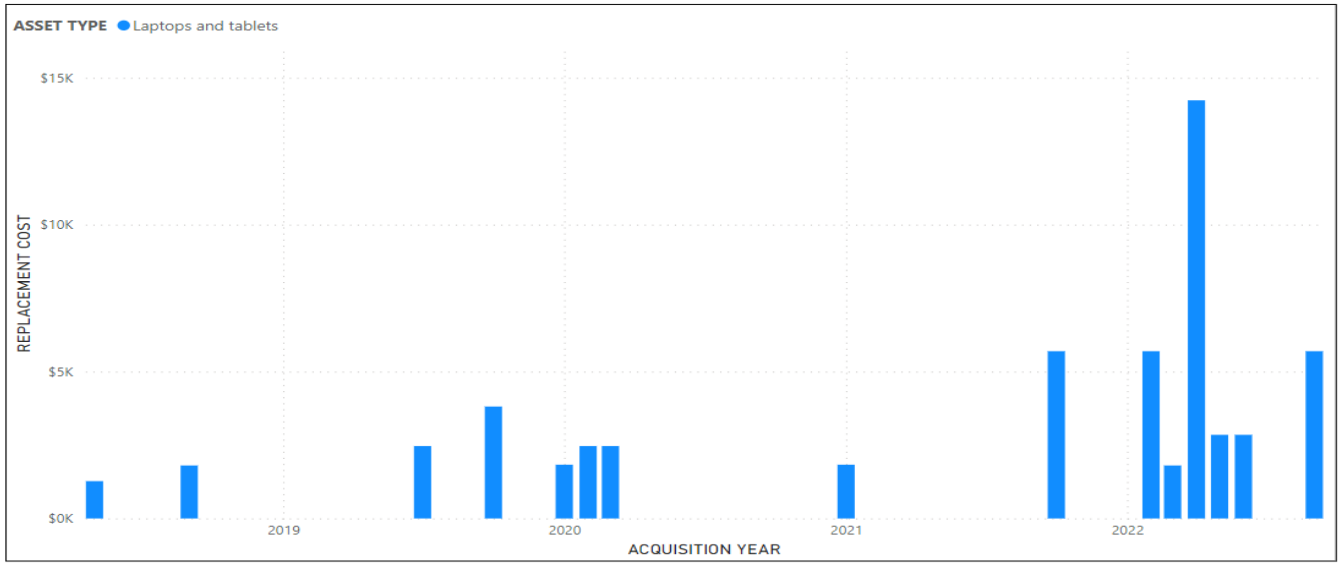
The condition of land assets was not determined in this AM Plan. A continuous improvement item identified in ***Table 33***, is to develop a 5-point condition scale for land assets based on land functionality parameters identified by CREO.

3.6.2 ADMINISTRATIVE ASSETS PROFILE

3.6.2.1 AGE PROFILE

The age profile of CREO Administrative assets is shown in ***Figure 2***.

Figure 2: Administrative Assets Age Profile



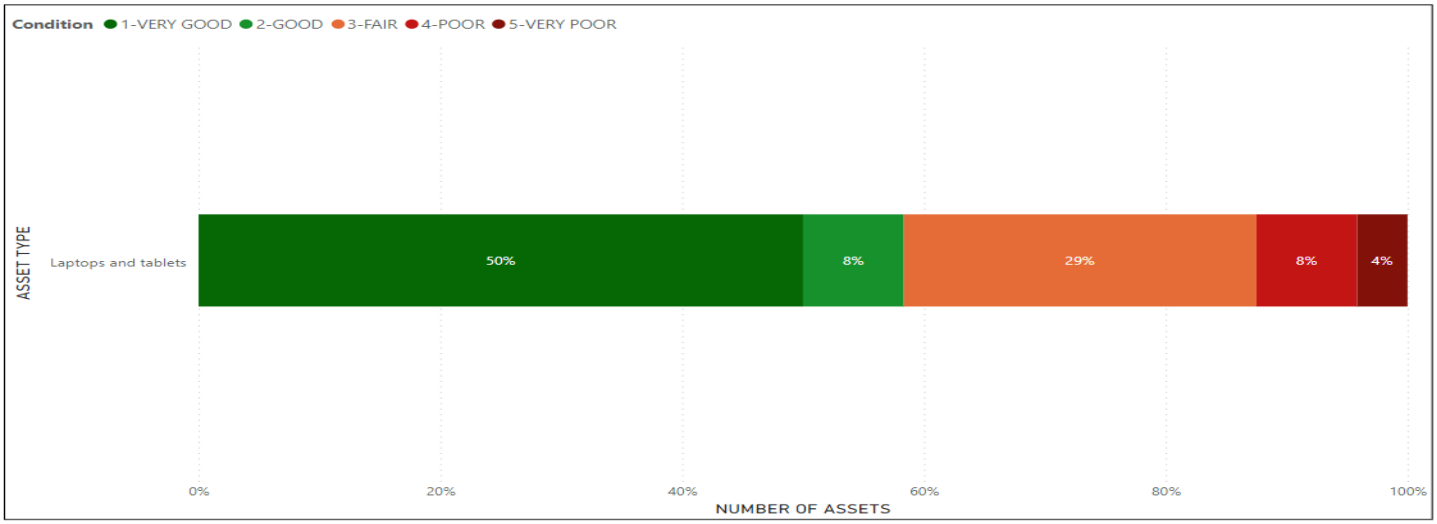
Generally, laptop and tablet assets that exceed four to five years of age are beyond their estimated service life.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

3.6.2.2 CONDITION PROFILE

The condition profile of CREO's Administrative assets is shown in ***Figure 3***. As mentioned in ***section 2.1.2,*** the original condition grades were converted to a standardized condition category for report consistency.

Figure 3: Administrative Assets Condition Distribution



Generally, the Laptop and tablet condition profile shows the majority of assets in Fair or better condition.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

4. MUNICIPALLY DEFINED CURRENT 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 service outcomes the customer desires, and the way that the city provides those services.

O. Reg 588/17 does not define Levels of Service for CREO assets and therefore the City has developed municipally defined levels of service. Levels of service are typically 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 CUSTOMER VALUES AND LEVELS OF SERVICE

A customer survey was not conducted for CREO as the department receives requests from internal city staff and has a finite number of internal customers. A future internal survey may be conducted for future versions of the AM Plan. At this time, we are not able to develop customer values or customer levels of service.

4.1.1 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.

A continuous improvement item has been identified in ***Table 14*** to investigate and identify potential Technical Levels of Service, or Key Performance Indicators (KPI) for CREO that can be developed for the next iteration of the AM Plan.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

5. FUTURE DEMAND

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

The ability of the city to be able to predict future demand for services enables the city to plan 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

The demand drivers for CREO services generally come from other divisions and relate to the development and implementation of their master plans and other strategic initiatives. The key demand drivers affecting the need to acquire municipal property or enter into other real estate transactions could include population change, and customer preferences and expectations driven by the need to support the delivery of city programs and services across the corporation.

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 22.*** Growth projections have been shown on ***page 45*** of the AM Plan Overview document. Where costs are known, these additional demands as well as anticipated operations and maintenance costs have been encompassed in the Lifecycle Models in ***Section 8***.

CREO relies on the following tools to forecast demand:

- Program, capital and operating budgets;
- Program strategic/master plans;
- Program asset management plans;
- Infrastructure Environmental Assessments;
- Portfolio Planning Initiatives;
- City's Strategic and Official Plan; and,
- Council priorities and directed initiatives.

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 ***Table 5.*** Demand for new services will be managed through a combination of managing existing assets, upgrading 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 5***. Climate change adaptation is included in ***Table 23***.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Table 5: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Program Requirements	98 new property files assigned in 2022	Increasing demand for city services and program requirements (LRT (Light Rail Transit), water and wastewater, Parks etc), resulting in changes to the portfolio of land assets.	No impact if the department is fully staffed	Minimize Duration of Staff Vacancies (this may be inconsistent with gapping targets)
Program Requirements	Housing prioritization	Supply of affordable housing is an urgent societal issue for which Council has directed action respecting City-owned properties.	1-3 additional staff resources will be required to work on this portfolio	A program has been established to review the city real estate portfolio to identify opportunities to achieve affordable housing.

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[2].

The City has released a formalized risk assessment process to identify credible risks associated with service delivery and to implement proactive strategies to mitigate risk to tolerable levels. The risk assessment process 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 also identifies the likelihood of those risks occurring, and the consequences should the event occur which calculates a risk rating. Risk options are then evaluated, and a risk treatment plan is created which will be initiated after the release of this plan and has been identified as a continuous improvement item in ***Table 13.***

6.1 CRITICAL ASSETS

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. There were no critical assets identified for CREO.

Where there are risks identified with critical program infrastructure and/or service delivery that involves the respective property, those risks and related mitigation measures are addressed in commensurate program AM Plans where identified by the service area. CREO is typically engaged by the respective program area to support efforts to manage the land assets and related risks.

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.

[2] ISO 31000:2009, p 2

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Table 6: Risks And Treatment Plans
Note * The Residual Risk Is the Risk Remaining After the Selected Risk Treatment Plan Is Implemented.

SERVICE OR ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING	RISK TREATMENT PLAN	RESIDUAL RISK *	TREATMENT COSTS
Land parcel	Land contamination	High	SOP development for standardizing Environmental Assessment for new land purchases	Medium	TBD
Land parcel	Trespassing, dumping, or encampment	High	Fencing Surveillance	Medium	TBD
Land parcel	Encroachment	Medium	Patrolling (done by other service areas)	Medium	TBD
Staffing risk	Insufficient staff resources leading to missed opportunities	High	Staff retention plan and compensation policies	High	TBD
Service risk	The current process requires council approval for transactions over $250K leading to missed opportunities.	High	Increase delegated authority level.	Medium	TBD
Service risk* *City-wide risk not unique to CREO	Inconsistent oversight on lease contracts under different departments may result in failure to ensure contractual obligations are met.	High	CREO is in the process of establishing a consolidated Lease Administration program that would see all Lease/License work be brought under one streamlined process and system.	Medium	TBD

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.

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.

We do not currently measure our resilience in service delivery and this will be included in the next iteration of the AM Plan.

6.4 SERVICE AND RISK TRADE-OFFS

The decisions made in AM Plans are based on the objective of achieving the optimum benefits using the available resources.

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

Table 7: Service and Risk Trade-Offs

WHAT WE CANNOT 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?)
Not acquiring required properties due to budgets and resource limitations	Fewer acquisitions completed; priorities not being met	Delayed property acquisitions which may delay capital projects

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.

7.1 CLIMATE CHANGE MITIGATION

Climate Mitigation refers to human intervention to reduce GHG emissions or enhance GHG removals (e.g., electric vehicles, net-zero buildings). 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 previously mentioned, due to the high level of uncertainty with the demand management plans for climate change, the cost of the demand impacts below may not have been included in the lifecycle models or levels of service at this time unless they were previously identified. 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.

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

Since CREO acquires and possesses real property assets on behalf of corporate and program needs and plans, CREO will be required to respond to the land requirements identified by its client groups. At the time of this plan preparation, the following climate change mitigation transformations that have been identified, as an example are shown in ***Table 8*** below.

Table 8: Climate Change Mitigation Transformation

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE/ASSET	DEMAND MANAGEMENT PLAN
Growing Green	Planting 50,000 trees a year through 2020	Trees will be incorporated in new build landscapes, without comprising security.	The requesting division can identify the location, size, and acceptable land conditions to plant trees.
Growing Green	Planting 50,000 trees a year through 2020	Acquisitions completed to conserve land	The demand to acquire property for land conservation is directed by Council.

CURRENT MITIGATION PROJECTS

Currently, there are no climate change mitigation projects being pursued by CREO.

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.[3]

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 13 high-impact areas.

Adaptation Demand Analysis

The impact areas were incorporated into the climate change adaptation analysis for this service area by:

- Identifying the asset-specific adaptation impact statements that affected the service areas;
- Discussing the potential impacts on the asset/service using the projected change in climate using the RCP4.5 Scenario; and,
- Proposing preliminary demand management plans to adapt to these impacts.

It is important to note that due to the high level of uncertainty with the demand management plans, the cost of the demand impacts below has not been included in the lifecycle and financial models 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 consider these adaptation impacts during the planning and design processes. Once the demand management plans are finalized, the information will be incorporated into future iterations of the AM Plan.

Moving forward, a Climate Lens tool is currently being developed which will assess projects based on these targets and will assist with the prioritization of climate adaptation projects.

The adaptation impact statements identified by CREO staff which will have a potential impact on assets and services include temperature increases, and ice storms as shown in ***Table 9*** on the next page.

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

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Table 9: Managing the Demand of Climate Change on Assets and Services

ADAPTATION IMPACT STATEMENT	BASELINE** (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.	6.7 heavy precipitation days (20 mm)	7.7 heavy precipitation days (20 mm)	Properties located near floodplains may be more prone to future flooding	The property Acquisition process ensures circulation to subject matter experts who can comment on flood risk concerns, if any, as part of their regular review.
More frequent and intense heatwaves will increase instances of heat-related health and safety issues, particularly for households without access to reliable air-conditioning and the homeless	2.1 average annual heat waves	4.7 average annual heat waves	Increasing demand to build public amenities (such as recreation centers, and libraries) that can be used as cooling centers. Increasing demand to build more social housing.	Support the City in implementing cooling centers and social housing by completing Real Estate Tasks related to acquiring properties or real estate agreements for these purposes.

*RCP4.5 Scenario: Moderate projected GHG concentrations, resulting from substantial climate change mitigation measures. It represents an increase of 4.5 W/m2 in radiative forcing to the climate system. RCP 4.5 is associated with 580-720ppm of CO2 and would more than likely lead to 3°C of warming by the end of the 21st century.

**Baseline and Projected numbers based on the 2021 Climate Science Report.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

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.

Similar to the exercise above and using the risk process in ***Section 1.6***, 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 came up with a preliminary risk adaptation plan shown below in ***Table 10.***

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.

Table 10: Adapting to Climate Change

Adaptation Impact Statement	Service or Asset at Risk Due to Impact	What Can Happen	Risk Rating	Risk Adaptation Plan
Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.	Land assets	Land situated in flood plains may experience flooding during extreme rainfall events.	High	Property Management processes ensure that subject matter experts are consulted on flood risk concerns, if any, as part of their regular portfolio reviews and decision-making respecting the use of City properties.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

CURRENT ADAPTATION PROJECTS

Currently, CREO does not have any current or past climate change adaptation-specific projects identified. The impact of climate change on assets and how the City will adapt is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

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 this plan are from 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 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 in 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.

ACQUISITION PROCESS

Any land acquisition goes through a process which involves Council approval (or Delegated Authority for real estate market value transactions less than $250,000). Typically, the client divisions work with CREO to identify property needs and financial requirements from which funding approval is sought and obtained prior to initiating the acquisition process. Once the project funding has been approved, the CREO team initiates the acquisition process. The acquisition process includes property searches, due diligence (e.g., site visits, reviews, comparisons, market research), negotiations, and obtaining authority for the transaction itself. Each transaction will have a different timeline depending on the requirements and complexity of the file. With today's dynamic real estate market, there is a risk that the initial funding approved is no longer sufficient to purchase the desired property. The funding for acquisitions is typically held in the budgets of the area requesting the property as such acquisition costs and forecast needs are generally represented in those other individual AM Plans.

SELECTION CRITERIA

Proposed acquisition of new property assets are identified from various sources such as council priorities, divisional requests, proposals identified by strategic plans (master plans) or partnerships with third parties.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

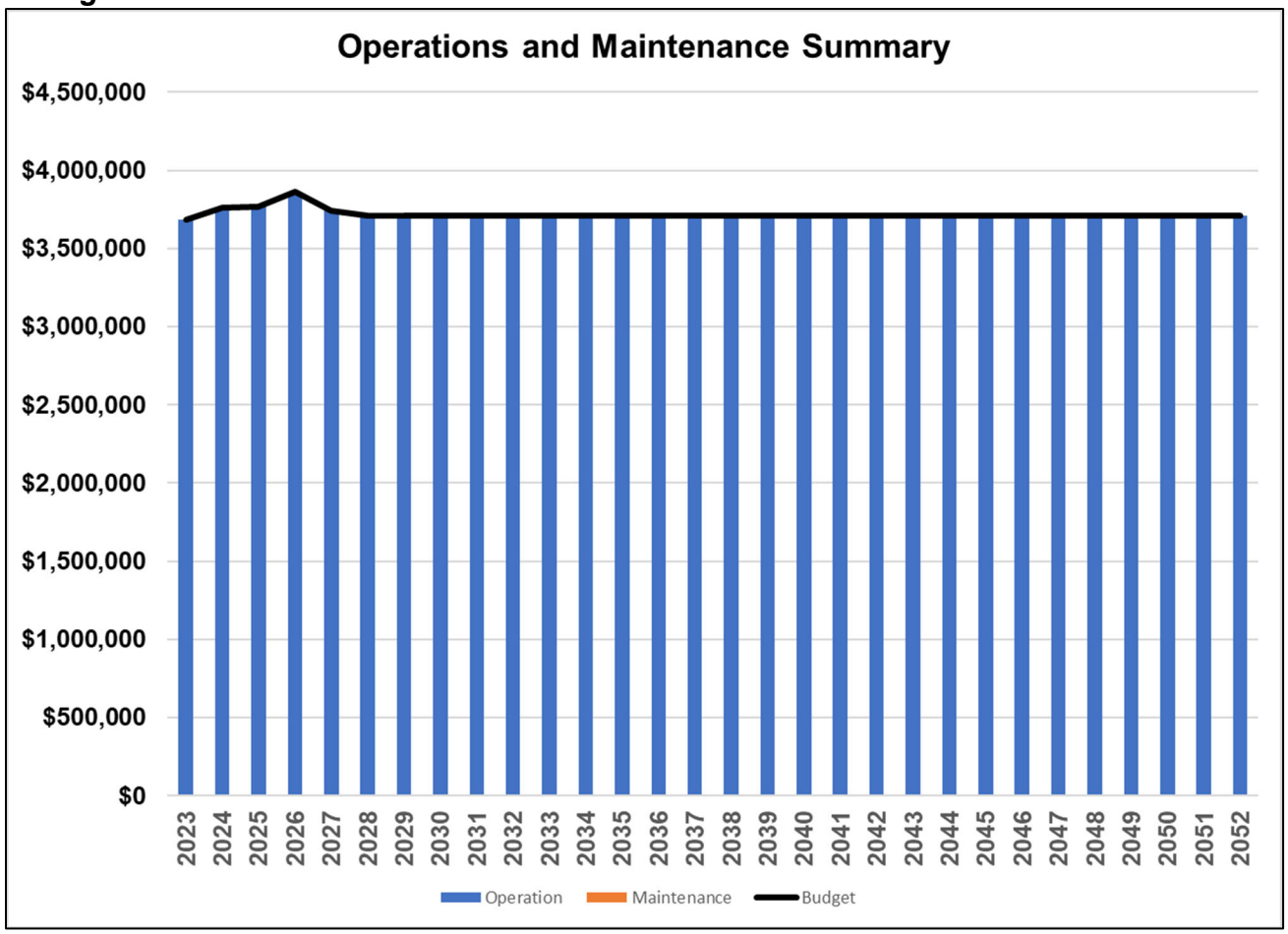
8.2 OPERATIONS AND MAINTENANCE PLAN

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. Examples of typical operational activities include the following:

- **$2.74M** allocated for employee-related costs in 2023 (i.e., salaries, wages, benefits, contractual agreement etc.); and,
- **$0.21M** allocated annually starting in 2023 for materials, third-party services and administrative assets operating costs.

There are no maintenance activities identified for CREO as it is an operationally focused group.

Figure 4: Operations and Maintenance Summary
All Figure Values Are Shown In 2023 Dollars.



CREO budgets consist mainly of operation activities and have sufficient operating budget for these activities, there is no funding gap identified for operational activities.

8.3 RENEWAL PLAN

Renewal is major works which does 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 asset's 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 those that have the highest consequence of failure, have high usage, have high 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 11*** 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.

Table 11: Useful Lives of Assets

ASSET SUBCATEGORY	ESTIMATED SERVICE LIFE (YEARS)
Land Assets	N/A
Laptops and Tablets	4-5

The estimates for renewals in this AM Plan were based on the register method which utilizes the data from the City's asset registry to analyze all available lifecycle information and then determine the optimal timing for renewals based on the ESL.

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).[4]

Future methodologies may be developed to optimize and prioritize renewals by identifying assets or asset groups 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.[5]

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

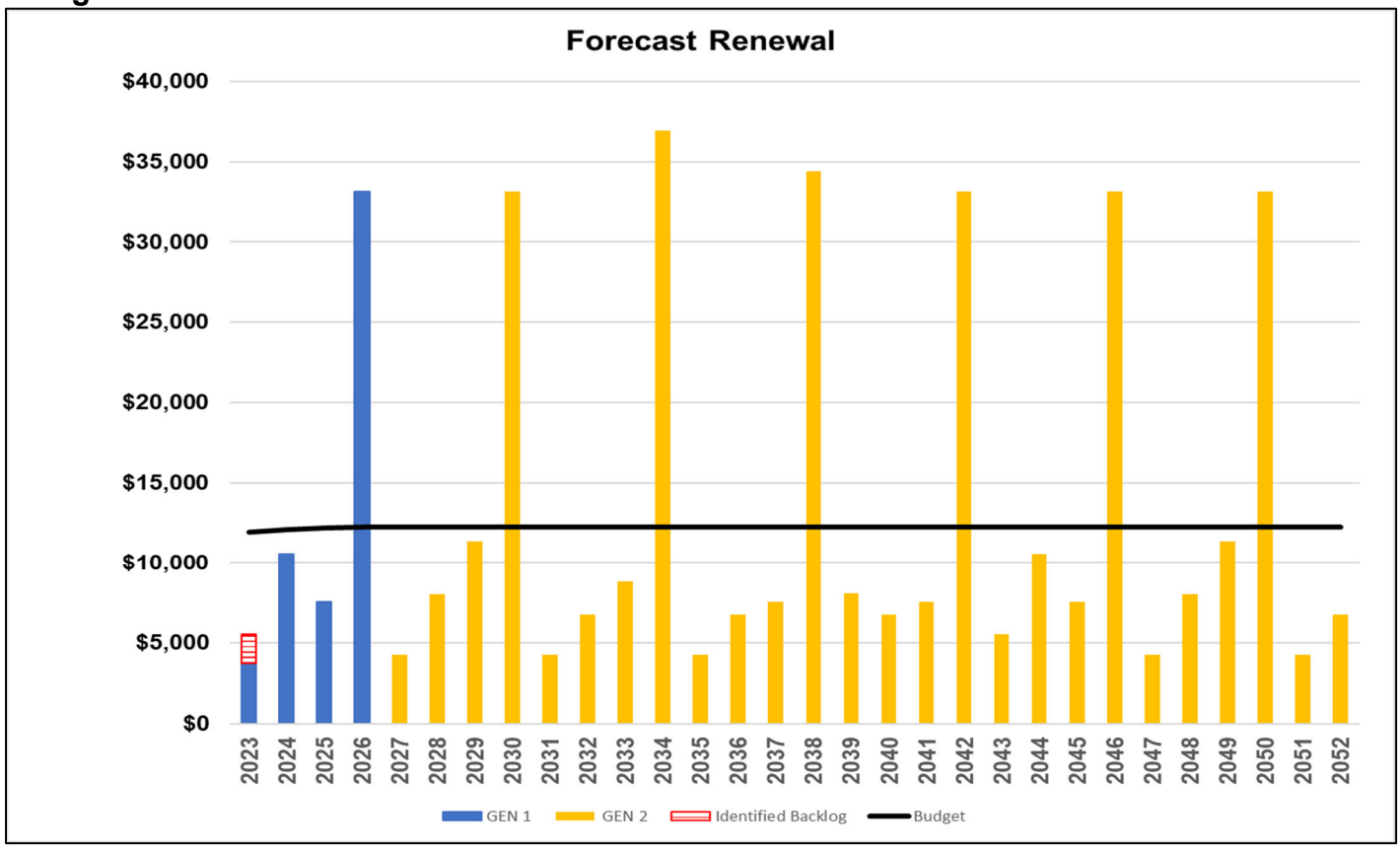
CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

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 5.***

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.

Figure 5: Forecast Renewal Costs
All figure values are shown in 2023 dollars.



The amount in the model above highlighted in red in 2023 represents the cumulative backlog of deferred renewals. The backlog represents $1,803 of deferred renewals.

The renewal costs, backlog and forecast relate to Administrative Assets only. There is a sufficient budget to support the planned renewals.

8.4 DISPOSAL PLAN

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, possible closure of service, decommissioning, or relocation.

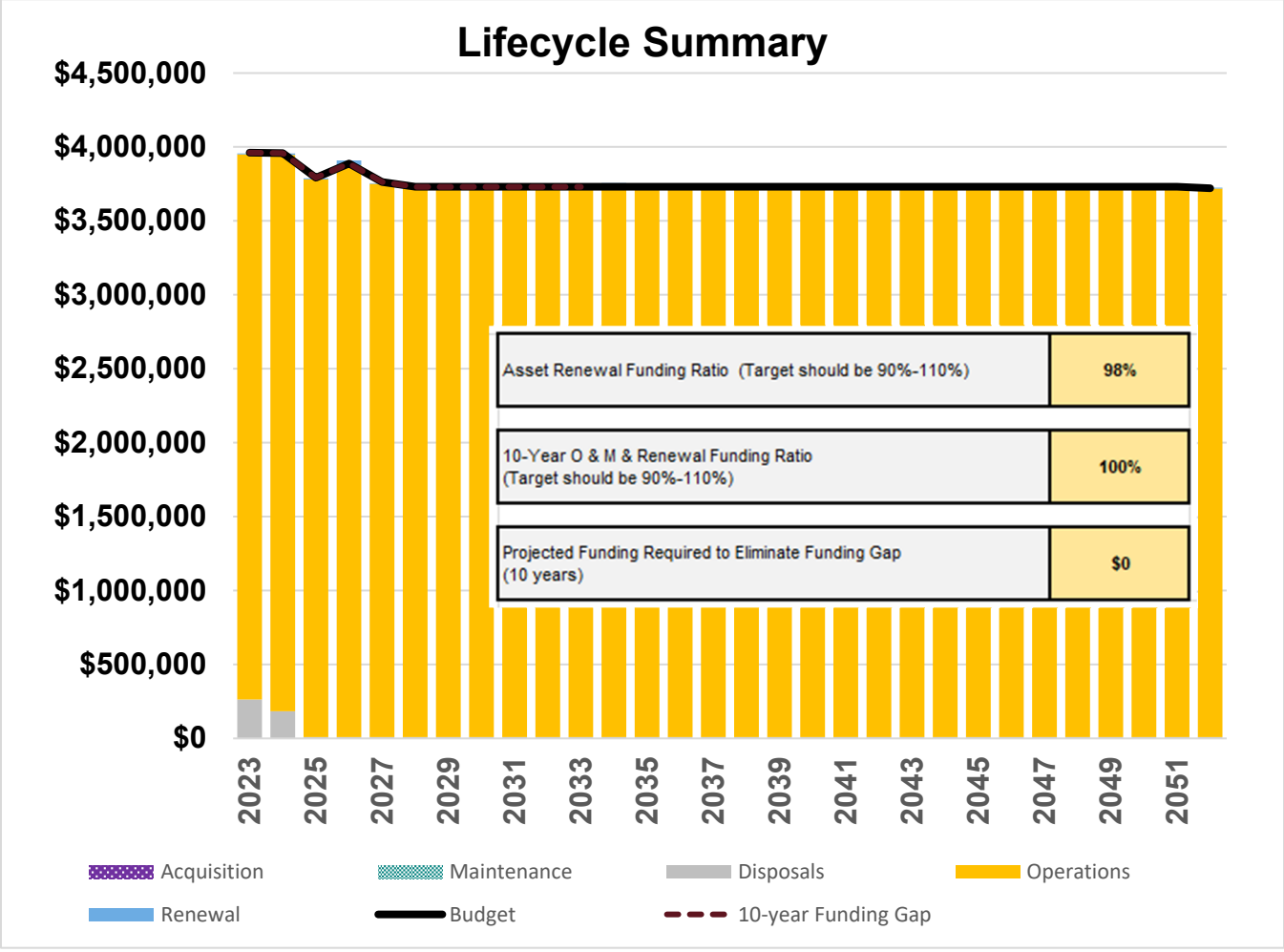
CREO regularly reviews all City-owned properties and evaluates which of these assets should be repurposed and if no suitable use is available, disposed of through sale or lease. The property is also reviewed to determine whether any action is required such as Official Plan amendments, rezoning, servicing, or other activities that would be appropriate and necessary to achieve the highest and best use of the land and to maximize the highest net return. If a land parcel has been identified as surplus to the current department's needs, the land parcel listing is circulated to all City Departments to determine interest. The feedback received from the circulation is discussed at the Portfolio Management Committee and a direction is determined by that committee. If the decision is to dispose of the property, a report is submitted to the General Issues Committee and Council, seeking approval to declare the property surplus. The report will also include a recommended manner of disposal (e.g., sell the property on the open market at fair market value, sell to the adjacent property owner, etc.).

8.5 LIFECYCLE COST SUMMARY

For ongoing projects, the assumption was that the projected funding requirements match the available funding, resulting in no identified gap between the forecasted needs and the proposed budget. While there could be a potential funding shortfall or gap for the service area, due to data constraints, it is not able to be populated for this iteration of AM Plan.

There is sufficient budget to address the planned lifecycle activities for the 2023-2052 planning period, under current assumptions. The City will continue to improve its lifecycle data, and this will allow for informed choices as to how best to estimate the planned budget required for acquisitions, how to expedite transactions for high priority projects and to improve overall business process to aid in smooth transactions.

Figure 6: Lifecycle Summary
All Figure Values are shown in 2023 Dollars.



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 CREO 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.

It is key to understand that CREO budgets only relate to its service delivery activities. Costs and budgets related to meeting demand, ensuring supply, quality, suitability, and ongoing maintenance of real property are managed within client/program budgets. Henceforth, maintaining appropriate levels of CREO services to enable the City to achieve its goals and objectives is not addressed in this AM Plan, rather is a function of annual operating and capital budgeting processes.

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

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio[6] **98%**

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 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.

If assets are not renewed at the appropriate time, 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.

[6] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p9.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Asset renewal funding ratio is based only on Administrative assets for CREO as property assets have an indefinite estimated service life and do not undergo a usual asset lifecycle, as discussed in ***Section 1.1.***

MEDIUM-TERM – 10 YEAR FINANCIAL PLANNING PERIOD

10-Year Operating, Maintenance & Renewal Ratio **100%**

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 Lifecycle Financial Ratio compares the Planned Budget with the Lifecycle 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 AARF, 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's risk and service level commitments.

The forecast operations, maintenance and renewal costs over the 10-year planning period is **$3.75M** 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 **$3.75M** on average per year giving a 10-year funding shortfall of **$0** per year. This indicates that 100% of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget, which is inside of the 90-110% range. Therefore, it can be concluded that CREO is funding its assets at an acceptable rate. Note, that these calculations exclude acquired assets and land values at this time.

While no funding gap has been identified in the current iteration of the AM Plan, it's acknowledged that a potential gap may emerge in future iterations. CREO is actively enhancing its asset lifecycle data, forecasting needs, and estimating planned budgets to address this. Over the next three years, efforts will be directed at refining this potential gap, aiming to boost confidence and accuracy to align with O. Reg. 588/17 requirements. The goal is to present proposed levels of service and a funding strategy in the subsequent iteration of the AM Plan.

If the funding shortfall or funding gap is identified, it does not need to 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.

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

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 ten-year life of the Long-Term Financial Plan

9.2 FORECAST COSTS (OUTLAYS) FOR THE LONGTERM FINANCIAL PLAN

Table 11 shows the forecast costs (outlays) required for consideration in the 10-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.

These options will be explored in the next AM Plan and the city will provide analysis and options for Council to consider going forward.

Table 12: Forecast Costs (Outlays) For the Long-Term Financial Plan
**** Forecast Costs Are Shown In 2023 Dollar Values**

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2023	$ -	$ 3,687,234	$ -	$ 11,942	$ 262,741
2024	$ -	$ 3,762,270	$ -	$ 12,060	$ 183,233
2025	$ -	$ 3,770,390	$ -	$ 12,179	$ 9,299
2026	$ -	$ 3,866,099	$ -	$ 12,217	$ 9,299
2027	$ -	$ 3,741,197	$ -	$ 12,217	$ 9,299
2028	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2029	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2030	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2031	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2032	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2033	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2034	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2035	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2036	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2037	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2038	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2039	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2040	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2041	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2042	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2043	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2044	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2045	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2046	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2047	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2048	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2049	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2050	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2051	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299
2052	$ -	$ 3,708,608	$ -	$ 12,217	$ 9,299

CREO council approved net budget is $415K but as CREO is a revenue-generating service area, its $3.48 M is generated by CREO through the sale of municipal assets, reported in-house cost savings, administrative cost recoveries from capital projects and, a portion of the Planner's cost, through the Development Fee Stabilization Reserve. These offsetting revenues and cost allocations self-fund CREO operational costs as $2.7M employee-related costs shown in ***Section 8.2.***

9.3 FUNDING STRATEGY

The proposed funding for assets is outlined in the city's operational budget and 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 more detailed service delivery options and alternatives to optimize limited financial resources.

9.4 VALUATION FORECAST

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 (Current/Gross)	**$56,739***
Depreciable Amount	**$56,739***
Depreciated Replacement Cost[7]	**$31,045***
Depreciation	**$13,930***

***These valuations do not include land asset value**

The current replacement cost is the most common valuation approach for specialized infrastructure assets. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets) and useful lives, determining the appropriate depreciation method, testing for impairments, and determining remaining useful life.

As the City matures its asset data, it is highly likely that these valuations will fluctuate significantly over the next three years, and they should increase over time based on improved market equivalent costs as well as anticipated cost changes due to climate change mitigation and adaptation strategies.

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:

- For this iteration of the AM Plan, future needs were assumed to be equal to the planned budget, and no funding gap was identified; and,
- Operational forecasts are based on the current budget and are the basis for the projections for the 10-year horizon and encompass additional operational needs that were known and on anticipated budget proportions when unknown.

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

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 on ***Page 31*** in the AM Plan Overview.

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

Table 13: Data Confidence Assessment for Data Used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand Drivers	Low	Expected demand drivers of program area growth are implemented in the report.
Operation Forecast	Low	The first four years are accurate, the remaining 26 are projected forward based on the 2024-2026 multi-year operation budget.
Renewal Forecast – Asset Values	High	Asset Values are based on information from the IT group.
-Asset Useful Lives	High	Useful Lives are based on information from the IT group.
-Condition Modelling	Low	Administrative Assets are based on age only.
Disposal Forecast	Low	High-level disposal forecast estimated for this AM Plan. A good understanding of disposal forecast will improve future iterations of this AM Plan.
Asset Useful Lives	Medium	Administrative Assets are not always replaced per their renewal schedule, and so these may need to be reviewed in future.

10. PLAN IMPROVEMENT AND MONITORING

10.1 STATUS OF ASSET MANAGEMENT PRACTICES[8]

ACCOUNTING AND FINANCIAL DATA SOURCES

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

- 2023 Capital & Operating Budgets;
- 2024 – 2026 Multi-Year Operating Forecast;
- Various internal reports;
- Asset Management Data Collection Templates;
- Financial Exports from internal financial systems; and,
- Historical cost and estimates of budget allocation based on Subject Matter Expert (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 databases;
- Asset Management Data Collection Templates;
- Development Charges Collection Template; and,
- Subject matter Expert Opinion and Anecdotal Information.

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 tasks span from improved lifecycle activities and improved financial planning to physically improving the assets.

The Improvement Plan ***Table 14*** 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. The costs and resources to complete each of these tasks have not been included in the lifecycle models to data, and resource requirements would need to be reviewed for internal resource-driven projects.

[8] ISO 55000 Refers to this as the Asset Management System

CORPORATE REAL ESTATE OFFICE ASSET MANAGEMENT PLAN

Table 14: Improvement Plan
****– per annum***

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1.	**Develop Technical Levels of Service (KPIs) in the future iteration of the AM Plan**	CREO/CAM	$2000 Internal Resources or 15 FTE hours Management	2024-2025
2.	**Investigate the potential for calculating land replacement values for future AM Plans**	CREO	TBD	TBD
3.	**Reconcile Real Estate portfolio in GIS to ensure all properties are captured in one dataset**	CREO	$40,000 Internal Resources or 1000 FTE hours and student hours	2024-2025
4.	**Implement a Lease Administration Management program**	CREO	TBD	2025
5.	**Request an Increase in Delegated Authority levels from Council**	CREO	TBD	TBD
6.	**Identify any additional risks and trade-offs/shortfalls and develop detailed risk management plans with treatment costs through an annual risk review process**	CAM / CREO	TBD	TBD
7.	**Alignment of asset management with a portfolio management framework**	CAM / CREO	TBD	TBD
8.	**Develop a 5-point condition scale for land assets based on land functionality parameters identified by CREO**	CREO	TBD	TBD

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; and,
- The degree to which the one to ten-year detailed works programs, budgets, business plans and corporate structures consider the 'global' work 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.

Hamilton Public Library Asset Management Plan 2024

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Tables and Figures

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

SUMMARY AND QUICK FACTS

SERVICE PROFILE

Hamilton Public Library (HPL) seeks to provide comprehensive and efficient public library services that reflect Hamilton's unique needs.

ASSET SUMMARY

Replacement Value: $424.9M
Average Age: 29 Years or **59%** of life remaining

LEVEL OF SERVICE SUMMARY

Customer Values

- Clean and well-maintained **library facilities**
- Convenient **checkout and renewal process**

Customer Level of Service

On average, customers feel:

- HPL has performed **GOOD** overall in the last 24 months in all service areas.
- HPL **EXCEEDS** at meeting overall service needs.
- Customers are **SATISIFED** with their ability to access HPL services overall.

Technical Level of Service

- **100%** of addresses in Hamilton are within a 15-minute drive time of a HPL library.
- **27%** of Hamilton Residents are members.
- Average weekly open hours: **1,364**
- Average wait time for holds: **29 days.**

MAJOR ASSET HIGHLIGHTS

MAJOR ASSETS	QUANTITY	REPLACEMENT COST	AVERAGE CONDITION	STEWARDSHIP MEASURES
Facilities	19	$369.3M	Good	Building Condition Assessments are completed every 5 years
Collection Materials	944,430	$34.9M	Not determined: Continuous Improvement Item	Weeding guidelines are used to remove worn, outdated and low use material

DATA CONFIDENCE

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

DEMAND DRIVERS

Population Growth: More branches and more hours required to deliver current levels of service.

Increased Immigration Levels: More programs and services required for newcomers to Canada.

Technological Changes: Customer expect HPL to quickly adapt to and provide access to emerging technologies. Many customers also use library computers as their sole means to access digital government services.

Customer Preferences: Customers are returning materials to the library at a slower pace after the elimination of overdue fines and replacement fines resulting in increased wait times for holds**.**

RISK

Critical Assets are identified as the Central Library, Regional Branches, Integrated Library Software, Local History and Archives Collections and Digital Technology Infrastructure

Major Risks include inadequate funding to meet facilities maintenance needs, risk of permanent loss of local history collections without adequate preservation, and major technology assets nearing end of service lives.

CLIMATE CHANGE

Mitigation Projects

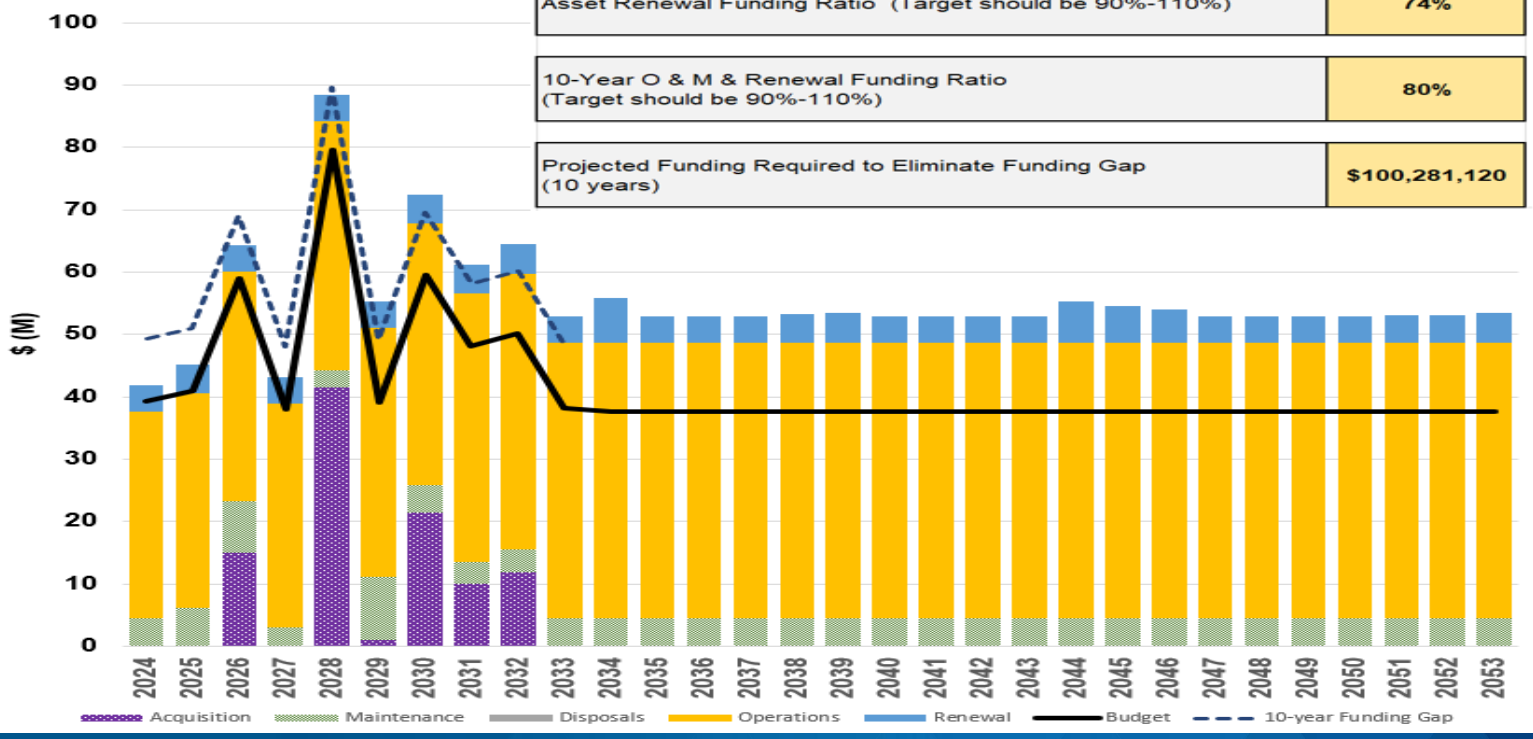
- Replacement of Bookmobiles with electric or hybrid vehicles

Adaptation Impacts

- Increasing demand for HPL branches to serve as cooling and warming spaces for the community including multiple branches offering extended access hours.

LIFECYCLE SUMMARY

Asset Renewal Funding Ratio (Target should be 90%-110%)	74%
10-Year O & M & Renewal Funding Ratio (Target should be 90%-110%)	80%
Projected Funding Required to Eliminate Funding Gap (10 years)	$100,281,120



1. INTRODUCTION

Hamilton Public Library (HPL) is one of Canada's busiest and most innovative library systems and provides public library services to the City of Hamilton's diverse population. The purpose of this Asset Management (AM) Plan is to ensure that HPL has fulfilled the Asset Management Planning requirements outlined in O. Reg 588/17 for current and proposed levels of service as well as to ensure HPL has the required assets to deliver an equitable and accessible library service in accordance with the Public Libraries Act.

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.

2. BACKGROUND

The information in this section is intended to give a snapshot in time of the current state of the HPL service area by providing background on the service, outlining legislative requirements, defining the asset hierarchy used throughout the report, and providing a detailed summary and analysis of existing inventory information as of August 2023, including age profile, condition methodology, condition profile, and asset usage and performance for each of the asset classes. This section will provide the necessary background for the remainder of the plan.

2.1 SERVICE PROFILE

The service profile consists of four main aspects of the service:

- Service History;
- Service Function;
- Users of the Service; and,
- Unique Service Challenges.

2.1.1 SERVICE HISTORY

The Hamilton Public Library (HPL) is one of the oldest public library systems in Ontario, dating back to 1889 when the citizens of Hamilton voted to fund a free public library. In 1890, the first library board was appointed along with the opening of the first library. In 2001, during the City's amalgamation, the Hamilton, Wentworth, and Dundas library systems merged to form the modern HPL which still exists today.

Today, HPL is proud to be considered an innovative leader among North American library systems related to its many service improvements which include automated materials handlings systems, self-checkout units, online card registration, and eliminating fines and fees as a barrier to service. HPL has also rolled out an innovative "Extended Access Hours" model and "After Hours Study Hall" services to ensure its locations are open and available to the community it serves as much as possible.

2.1.2 SERVICE FUNCTION

As with all public libraries in Ontario, HPL is governed by the Public Libraries Act (PLA)[1]. The PLA has many requirements for the HPL Board to fulfill including administrative requirements. Key requirements from the PLA referring to the minimum services the HPL Board must offer include:

- Provide a comprehensive and efficient public library service that reflects the community's unique needs;
- Provide library services in the French language, where appropriate;

[1] https://www.ontario.ca/laws/statute/90p44

- Operate one or more libraries and ensure that they are conducted in accordance with this Act and the regulation;
- Libraries must not charge admission for the use of the library or its materials, and shall allow the public to reserve and borrow circulating materials and use reference and information services;
- The board may charge for the use of services when spaces are not being used for public library purposes or the library services are being used by persons who do not reside in the board's jurisdiction.

The purpose of HPL and libraries in general is to provide equitable access to, and support for, knowledge and creativity. Libraries play an essential role in local communities by providing access to information and resources, supporting literacy and education, promoting lifelong learning, and serving as community gathering spaces. In today's digital world, libraries also play a vital role in providing access to digital resources and advancing digital literacy.

The library is intended to be a place where people have the freedom to belong and discover. HPL is a vibrant and welcoming community place where people can learn, connect, share, and discover. From children learning how to read and developing a habit of life-long learning, to students researching and having spaces for individual and group study, to adults looking to learn a new skill, advance their employment opportunities, or just relax and enjoy, to newcomers looking for resources to adapt to their new home, to seniors looking to keep in touch with each other and meet new friends. In sum, the importance of libraries is experienced by all community members.

Based on the HPL's 2022 Community Survey and 2023 HPL City Services and Assets Review Survey, the top five areas customers expressed as priorities in the community were:

1. Clean, accessible, and well-maintained library facilities;
2. Convenient renewal and checkout processes;
3. Free Wi-Fi;
4. Relevant collection material; and,
5. Relevant programs and classes.

In order to deliver comprehensive and efficient public library services, HPL requires assets. Some ways assets support the delivery of the service include:

- Accessible and well-maintained library facilities to host physical collection materials, provide library spaces, and run programs and classes;
- Reliable vehicles including bookmobiles to make library services more accessible and utility vehicles to manage library operations;
- Variety of relevant collection material that meets the requirements and interests of a diverse demographic;
- Well-preserved Local History and Archive material for researchers and the general public; and,
- Reliable technology to provide a seamless user experience.

2.1.3 USERS OF THE SERVICE

Today, HPL operates 23 physical branches and two Bookmobiles as well as significant online services which service the entire city. HPL currently offers 1,364 weekly open hours at physical branches, and online access is available 24 hours a day. HPL has 170,000 active members and an average of 60,000 in-person visits per week meaning that nearly one in three people in the city are active library users.

HPL offers a wide range of programs, both in-person and virtual, that cater to its broad user base which includes children and youth, teenagers, adults, seniors, students, professionals, newcomers, and life-long residents. In 2022, HPL offered over 3,000 programs that were attended by 65,000 people. In 2022, HPL program offerings were limited while the larger community was still recovering from the pandemic, but in a typical year, HPL offers about 9,000 programs attended by 185,000 people.

Typically, HPL sees about 3,500,000 visits across the system per year. While the reasons for visiting are varied as outlined above, many residents need HPL's service offerings because they are unable to access certain amenities otherwise such as computer and internet access or warming and cooling spaces. HPL typically sees over 750,000 computer sessions per year with well over one million WI-FI sessions. Computer and WI-FI usage are usually higher at branches situated within lower income neighbourhoods.

HPL's 23 facilities are spread throughout Hamilton with branches in 14 of the 15 wards. These library locations, along with the two Bookmobiles allow HPL to provide services to users from across Hamilton. ***Table 1*** shows, for each HPL branch, its location, category, catchment area, and the population served. ***Figure 1*** and ***Figure 2*** show maps of HPL's branch locations and Bookmobile stops respectively.

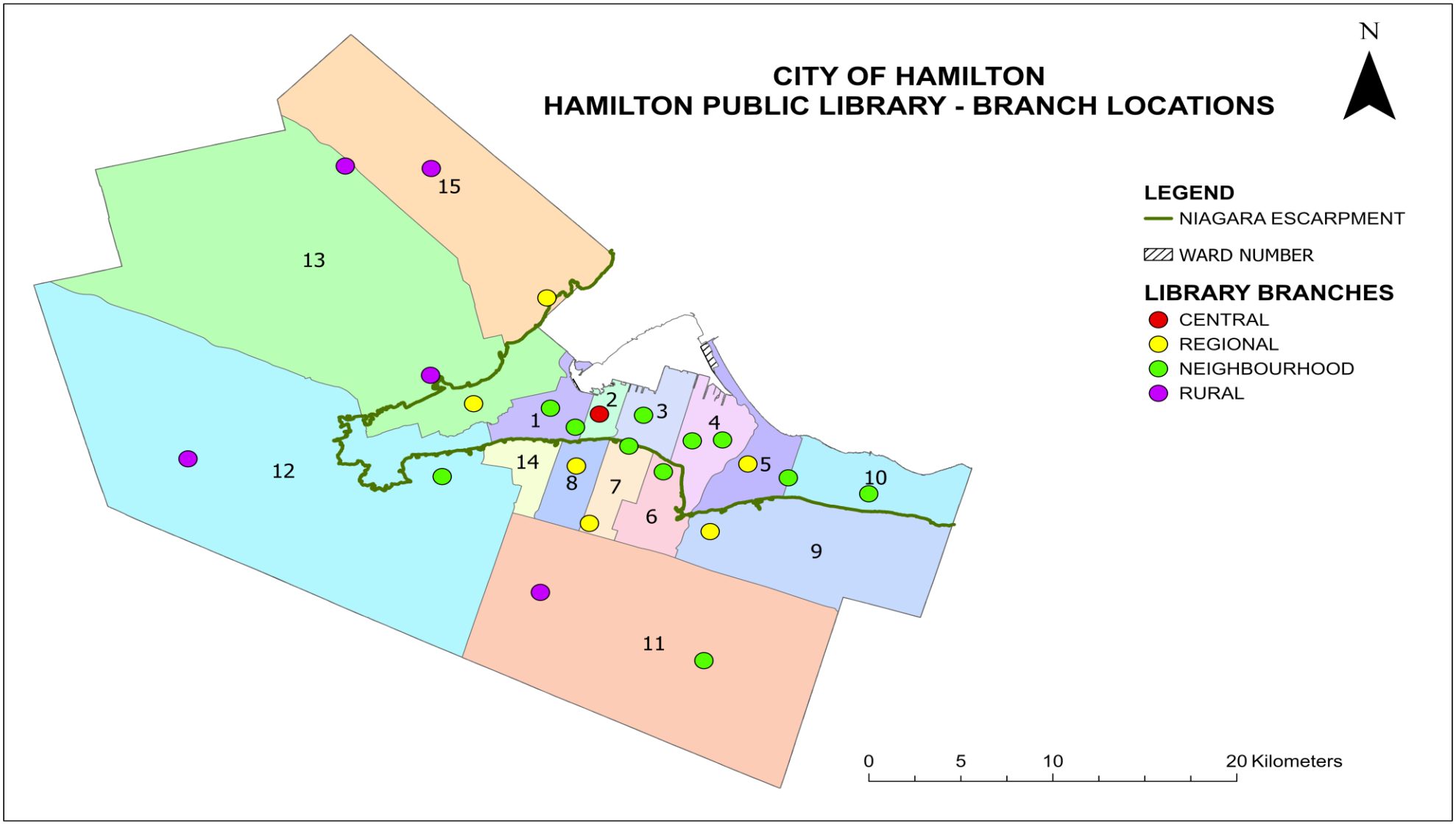
Table 1: Hamilton Public Library Branches

HPL BRANCH	CATEGORY	WARD NO.	BRANCH CATCHMENT AREA (KM^2)	POPULATION SERVED
Ancaster Branch	Neighbourhood	12	243.4	44,630
Barton Branch	Neighbourhood	3	10	11,365
Binbrook Branch	Neighbourhood	11	127.6	14,490
Carlisle Branch	Rural	15	107.5	6,050
Central Library	Central	2	16.9	66,770
Concession Branch	Neighbourhood	7	4.3	13,315
Dundas Branch	Regional	13	100.7	27,025
Freelton Branch	Rural	13	161.8	4,735
Greensville Branch	Rural	13	41.3	2,740
Kenilworth Branch	Neighbourhood	4	29	37,415

HPL BRANCH	CATEGORY	WARD NO.	BRANCH CATCHMENT AREA (KM^2)	POPULATION SERVED
Locke Branch	Neighbourhood	1	5.4	8,915
Lynden Branch	Rural	12	252.9	5,375
Mount Hope Branch	Rural	11	124.5	8,090
Parkdale Branch	Neighbourhood	4	10.8	13,145
Red Hill Branch	Regional	5	16.9	22,960
Saltfleet Branch	Neighbourhood	5/10	18.2	38,395
Sherwood Branch	Neighbourhood	6	13.8	33,340
Stoney Creek Branch	Neighbourhood	10	35.4	19,725
Terryberry Branch	Regional	8	20.1	45,510
Turner Park Branch	Regional	7	36.3	69,105
Valley Park Branch	Regional	9	113.4	36,725
Waterdown Branch	Regional	15	54.3	24,955
Westdale Branch	Neighbourhood	1	10.5	15,105

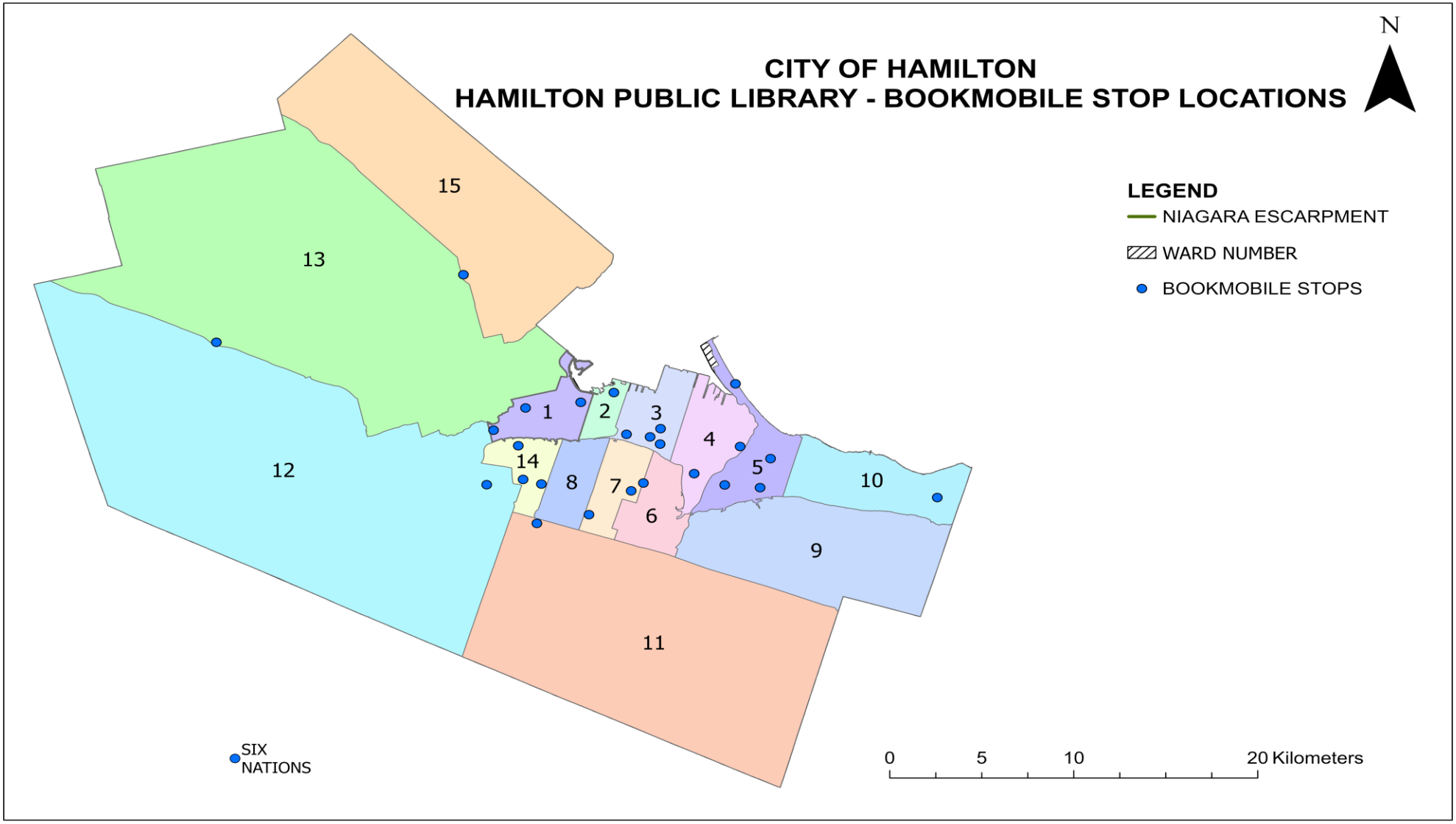
HAMILTON PUBLIC LIBRARY
ASSET MANAGEMENT PLAN

Figure 1: Hamilton Public Library Locations



HAMILTON PUBLIC LIBRARY
ASSET MANAGEMENT PLAN

Figure 2: Hamilton Public Library Bookmobile Stop Location



2.1.4 UNIQUE SERVICE CHALLENGES

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

- Inadequate maintenance budget to meet Building Condition Assessment (BCA) forecasted maintenance needs especially roof repairs and window leaks;
- Almost $100 Million of acquisitions are planned over the next ten years and are expected to significantly increase operations and maintenance budget needs (by approximately $10 Million annually);
- Increasing rates of security and behaviour related issues at HPL branches may make libraries seem potentially less safe and accessible. Feedback from Corporate Asset Management (CAM) survey also suggests that customers desire more measures to be implemented to improve safety and security;
- Demands including demographic change, customer preferences, and technological advancement means HPL must continue adapting programs and services to meet needs;
- Climate change poses an additional threat by potentially increased maintenance costs;
- Additional importance of libraries as heating/warming centres. Unmet facility maintenance needs may also impact this service;
- Additional importance of Central Library as hosting city's data centre. Unmet facility maintenance needs may also impact this service;
- Bookmobiles are in poor condition and need replacement. The bookmobiles are expected to be replaced in 2026;
- Local History and Archive's digitization equipment, systems and protocols are not adequate to serve contemporary access needs. Lack of preservation system and protocols for non-digital archival records risks irreversible loss of heritage materials; and,
- The rapid pace of technological evolution presents libraries with challenges in managing IT infrastructure and services. Device upgrades and technology implementations pose risks of compatibility issues, financial strain, and demand staff training. Each technological shift introduces concerns about data security, while maintaining a seamless user experience

2.2 LEGISLATIVE REQUIREMENTS

The most significant legislative requirements that impact the delivery of the library service are outlined in ***Table 2***. These requirements are considered throughout the report, and where relevant, are included in the levels of service measurements.

Table 2: Legislative Requirements

LEGISLATION OR REGULATION	REQUIREMENT
Public Libraries Act	Ontario's Public Libraries Act (PLA) is the key piece of legislation governing Ontario's public libraries. It supports the provision of equal and universal access to information and establishes free public library services in Ontario through governance and regulations.
Bylaw to Establish Library Board HPL 2001	Under the PLA, public libraries in Ontario must be operated under the management and control of a public library board. The board has the authority to formulate policies concerning the operations and services of the public library. Once established by municipal by-law, a public library board is responsible for the operation of its library system.

2.3 ALIGNMENT WITH HPL BOARD'S STRATEGIC PRIORITIES

The HPL Board is comprised of nine citizen members and two councillors. Although the Library Board sets its own priorities, these priorities are generally in alignment with Council priorities. ***Table 3*** presents HPL Board's strategic priorities as outlined in the Hamilton Public Library Board Strategic Plan 2023-2026 and how they align with the asset management plan.

Table 3: Hamilton Public Library Board Strategic Priorities

HPL STRATEGIC PRIORITIES	DESCRIPTION	ALIGNMENT WITH AM PLAN
Connecting to Community	The Hamilton Public Library welcomes everyone and strives to create spaces where people feel respected and included. We will continue to be a leader in fostering belonging and enhancing mutual understanding. Our physical and digital spaces will be inviting and accessible. Our collections, programs and services will be reflective of the communities we work with. We will actively pursue partnerships with aligned organizations to increase our impact sustainably.	The AM plan includes a community engagement survey to ask what customers value about the service, how customers feel about the service, and how HPL is performing. The survey results guide the development of levels of service.

HPL STRATEGIC PRIORITIES	DESCRIPTION	ALIGNMENT WITH AM PLAN
Relevant and Responsive	The Hamilton Public Library advances our core library values as we embrace our evolving role in supporting digital access and literacy. We maintain strong physical collections as we grow digital services. Our spaces will be modern, accessible, and increasingly energy efficient, as we use our operations to model sustainable solutions. We are engaged provincially and nationally as a leading library that works collaboratively to create policies and agreements which ensure fair access to copyrighted works in all formats.	The AM Plan identifies unique service challenges, major demand drivers, and critical risks faced by HPL in delivering its services. The AM Plan assesses required resources to ensure that HPL continues to deliver agreed upon levels of service. The AM Plan also assesses the quality of the service from a customer and technical perspective.
Learning Organization	The Hamilton Public Library continuously seeks more effective ways to create a resilient and learning organization. Staff development is a continuous focus, so that we can meet the changing societal, technological and information needs of residents. We continue to focus on reducing barriers and ensuring our services are simple to navigate. We look for new ways to do outreach and promote the awareness and use of our services.	Continuous improvement is a core tenet of asset management. As part of this plan, a list of continuous improvement items has been identified with timelines and resources required.

2.4 ASSET HIERARCHY

As previously mentioned, to deliver equitable and accessible library services, HPL requires assets. The HPL service area has been broken down into five asset classes for the purpose of this AM Plan: Facilities, Vehicles, Collection Material, Local History and Archives, and Technology.

- **Facilities:** refers to City-owned facilities required for the provision of HPL services;
- **Vehicles:** describes different types of vehicles used for the provision of library services;
- **Collection Materials**: refers to all physical and digital library collections including books, music, movies, and various learning and educational resources;
- **Local History and Archives:** refers to all Local History and Archive collections, corporate art, as well as the digitization and environmental equipment required to preserve these assets;

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- **Technology:** describes the different type of technology required to deliver library services including infrastructure, devices, machinery, and intangible assets.

The asset class hierarchy outlining assets included in this section is shown below in ***Table 4***.

Table 4: Asset Class Hierarchy

SERVICE AREA	HAMILTON PUBLIC LIBRARY				
ASSET CLASS	**FACILITIES**	**VEHICLES**	**COLLECTION MATERIAL**	**LOCAL HISTORY AND ARCHIVES**	**TECHNOLOGY**
	• Library Buildings	• Bookmobiles • Utility Vehicles	• Physical • Digital	• Archives and Special Collections • Corporate Art • Digitization Equipment • Environmental Equipment	• Digital Technology Infrastructure • Staff Equipment • Public Computers and Machinery • Intangible Assets

3. SUMMARY OF ASSETS

Table 5 displays the detailed summary of assets for the HPL service area. The data is sourced from a combination of datasets included in HPL's databases. It is important to note that inventory information does change often, and that this is a snapshot of information available as of August 2023.

The City owns approximately **$425 Million** in HPL assets which are on average in **GOOD** condition. Assets are a weighted average of **29 years** in age which is **59%** average remaining service life (RSL). For most assets this means that the City should be completing preventative, preservation and minor maintenance activities per the inspection reports as well as operating activities (e.g. inspection, cleaning) to prevent any premature failures. Gaps shown in the data are discussed in ***Section 3.2.***

Data confidence descriptions are outlined on ***page 32*** of the AM Plan Overview. The replacement costs below are typically a **Medium** data confidence level overall. For Facilities, replacement costs are calculated using an internal Corporate Facilities and Energy Management tool which encompasses current market rates, building type and size and were escalated to include additional soft costs. Vehicles, Collection Materials and Technology replacement costs were gathered from the most recent purchase price for similar assets and are typically **Medium** confidence. Due to the nature of heritage assets, Local History and Archives assets were difficult to quantity and have a **Very Low** confidence for replacement values. A continuous improvement item identified in ***Table 31*** is to appraise Local History and Archives assets to improve confidence.

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. It is also important to note that AM Plans only include asset information related to assets that the City owns. Facilities leased from other bodies are incorporated into operational costs but are not incorporated into the total replacement cost for the service. Finally, the assets included below are assets that are assumed and in service at the time of writing. Continuous improvement items identified in ***Table 31*** include developing methodologies to determine asset condition for Technology and Local History and Archives assets.

Table 5: Detailed Summary of Assets
(Weighted Average based on Replacement Cost)

FACILITIES				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% REMAINING SERVICE LIFE)**	**AVERAGE EQUIVALENT CONDITION**
Central Library	1	$143.2M	39 Years (48%)	2 – GOOD
Data Confidence	Very High	Medium	High	High
Regional Libraries	5	$138.2M	19 Years (77%)	2 – GOOD
Data Confidence	Very High	Medium	High	High
Neighbourhood Libraries	8	$67.4M	36 Years (62%)	3 – FAIR
Data Confidence	Very High	Medium	High	High
Rural Libraries	5	$20.5M	47 Years (62%)	2 – GOOD
Data Confidence	Very High	Medium	High	High
SUBTOTAL		**$369.3M**	**31 Years (62%)**	**2 – GOOD**
DATA CONFIDENCE		**Medium**	**High**	**High**

VEHICLES				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% REMAINING SERVICE LIFE)**	**AVERAGE EQUIVALENT CONDITION**
Bookmobiles	2	$2.4M	14 Years (0%)	4 – POOR
Data Confidence	Very High	Medium	High	Medium
Utility Vehicles	6	$656k	7 Years (21%)	2 – GOOD
Data Confidence	Very High	Medium	High	Medium
SUBTOTAL		**$3.1M**	**12 Years (5%)**	**4 - POOR**
DATA CONFIDENCE		**Medium**	**High**	**Medium**

COLLECTION MATERIALS				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% REMAINING SERVICE LIFE)**	**AVERAGE EQUIVALENT CONDITION**
Physical Collection Material	830,468	$29.5M	7 Years (32%)	No Data
Data Confidence	Very High	Medium	High	
Digital Collection Material	113,962	$5.4M	Not Applicable	Not Applicable
Data Confidence	Very High	Medium		
SUBTOTAL		**$34.9M**		**No Data**
DATA CONFIDENCE		**Medium**		

LOCAL HISTORY AND ARCHIVES				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% REMAINING SERVICE LIFE)**	**AVERAGE EQUIVALENT CONDITION**
Archives and Special Collection	3,000 linear metres	$12.1M	No Data	No Data
Data Confidence	Medium	Very Low		
Corporate Art	300 items	$230k	No Data	No Data
Data Confidence	Medium	Very Low		
Environmental Equipment	6	$295k	10 Years (47%)	3-FAIR
Data Confidence	High	Medium	Medium	Medium
Digitization Equipment	5	$114k	13 Years (40%)	2-GOOD
Data Confidence	High	Medium	High	Medium
SUBTOTAL		**$12.7M**	**No Data**	**No Data**
DATA CONFIDENCE		**Very Low**		

TECHNOLOGY				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% REMAINING SERVICE LIFE)**	**AVERAGE EQUIVALENT CONDITION**
Digital Technology Infrastructure	146	$895k	No Data	4-POOR
Data Confidence	High	Medium		Medium
Staff Equipment	934	$532k	No Data	3-FAIR
Data Confidence	High	Medium		Medium
Public Computers and Machinery	1087	$3.4M	No Data	2-GOOD
Data Confidence	High	Medium		Medium
Intangible Assets	1	Assigning value to intangible assets is a *Continuous Improvement* item	Not Applicable	Not Applicable
Data Confidence	Medium			
SUBTOTAL		**$4.9M**	**No Data**	**3-FAIR**
DATA CONFIDENCE		**Medium**		**Medium**

TOTAL	**$424.9M**	**29 Years (59%)**	**2 - GOOD**
DATA CONFIDENCE	**Medium**	**High**	**Medium**

3.1 ASSET CONDITION GRADING

Condition refers to the physical state assets are in, 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 6*** 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.

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Table 6: 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 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's usage. Minor to significant maintenance is required.	39.5% - 69.4%	>= 5% to < 10%
4 Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4%	>= 10% to <30%
5 Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4%	>= 30%

The following conversion assumptions were made:

- Facilities Condition Index was based on Building Condition Assessment (BCA) reports; and,
- For Technology assets, the condition ratings are based on subject matter expert's opinion;
- For assets where a condition assessment was not completed, but age information was known, the condition was based on the % of remaining service life.

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 assets typically have an estimated service life (ESL) where the asset can be expected to be in service before the condition has degraded and requires replacement. Some lower cost or non-critical 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.

- As previously mentioned, 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 therefore performance issues may arise which must be noted and prioritized.

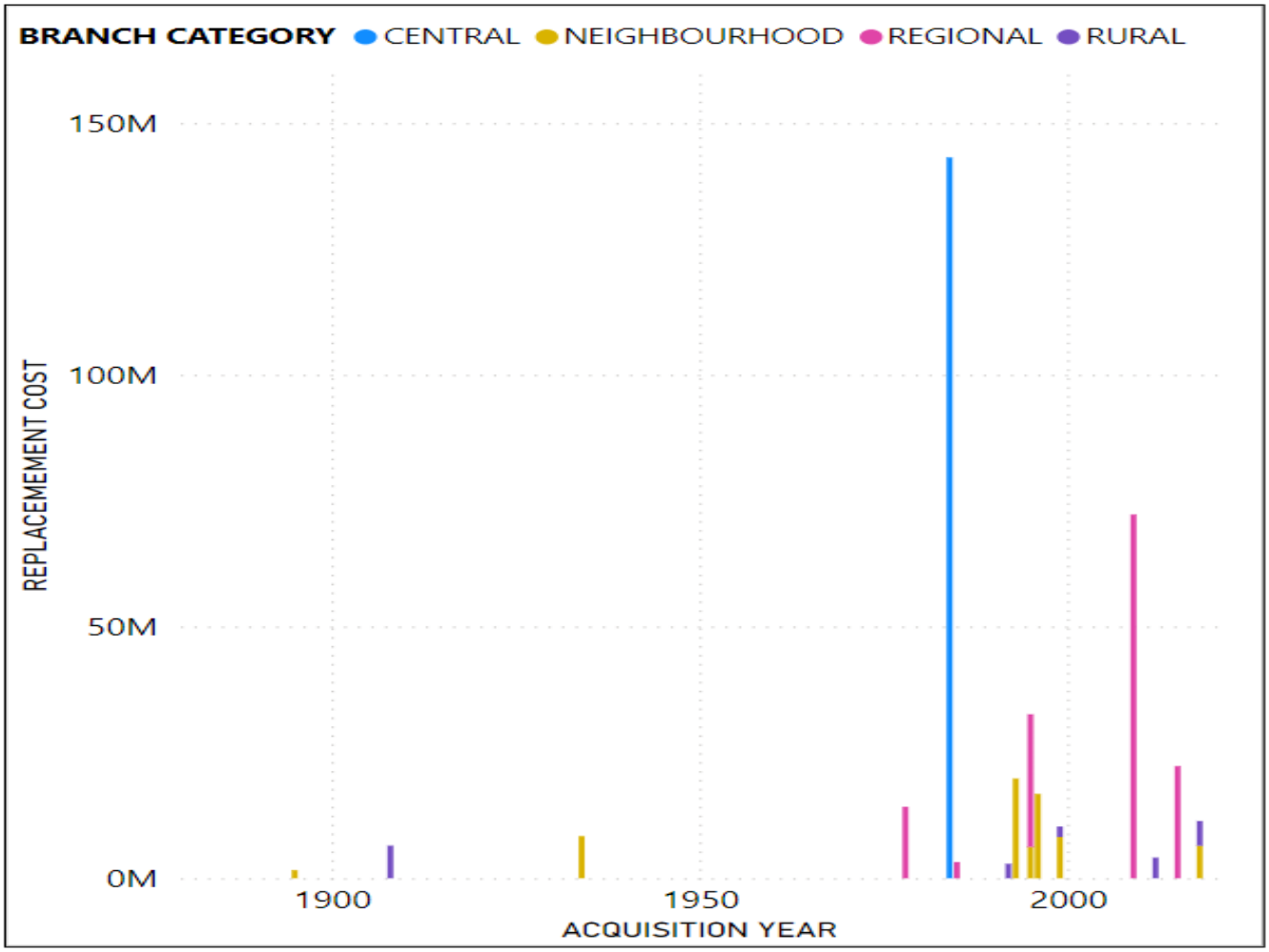
3.2.1 FACILITIES PROFILE

As previously mentioned, HPL operates and maintains 23 branches across the city. Four of these are leased while the rest are owned by the City. The sections below provide asset specific information on these assets.

3.2.1.1 AGE PROFILE

The age profile for HPL assets is shown in ***Figure 3.*** For HPL Facility assets, the data confidence for age is typically High because this information was recorded during the construction of the facilities.

Figure 3: Facilities Age Profile



Most HPL facilities have an Estimated Service Life (ESL) of 75 years except for the four heritage facilities (i.e., Kenilworth, Locke, Mount Hope and Dundas) which were assumed to have an ESL of 150 years. The oldest library building is Locke Branch which opened in 1895 whereas Binbrook and Greensville Branches opened as recently as 2018. All HPL facilities are within their service life and will not appear in the Renewal Forecast in Section 8.3.

3.2.1.2 CONDITION METHODOLOGY AND PROFILE

Condition for HPL 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, overall findings, and condition.

BCAs are completed on HPL 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 total cost for required repairs, renewal, or upgrades to replacement value of building components. The 10-year forecast from the BCAs were incorporated into the maintenance plan shown in **Section 8.2**.

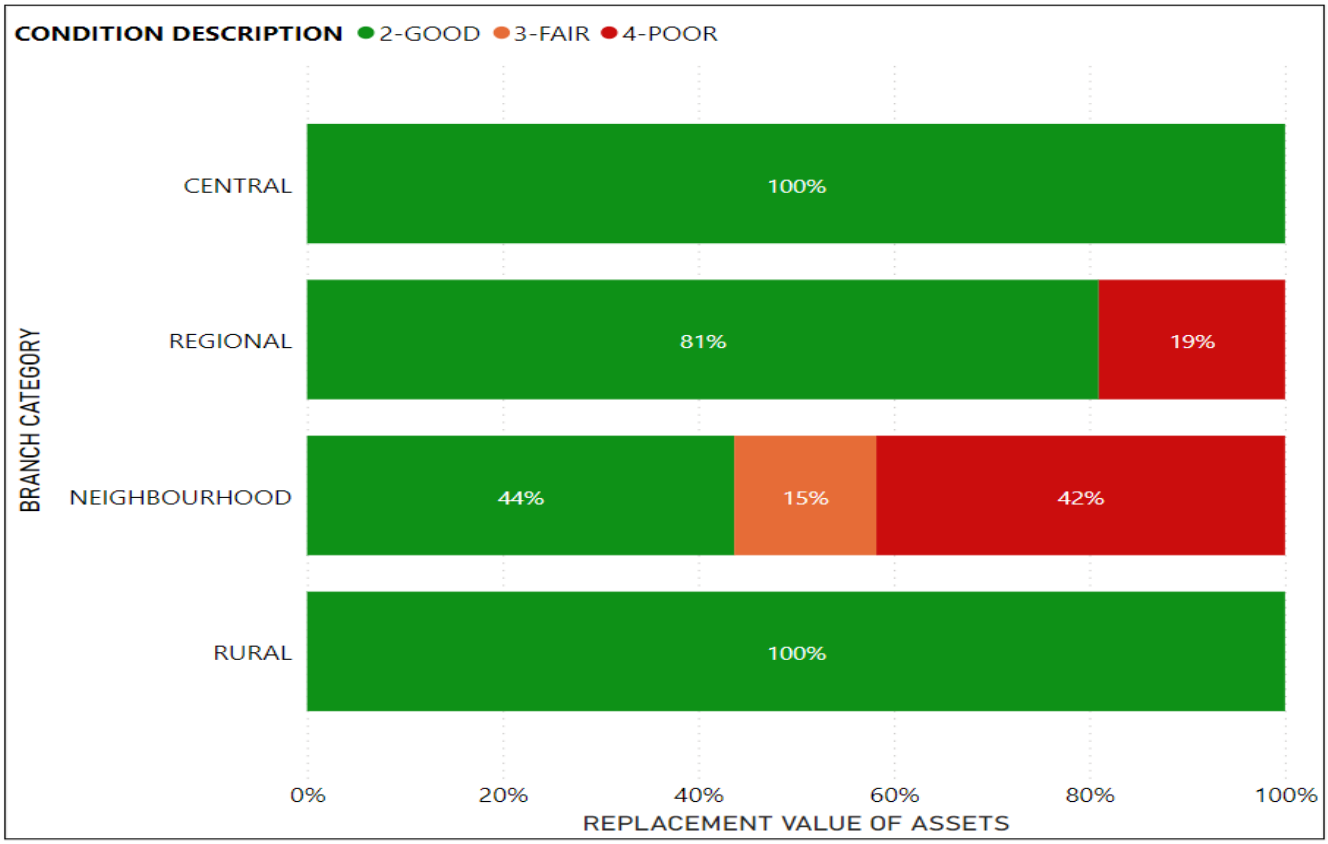
A summary of the Facilities' condition methodology is provided in ***Table 7***. The condition conversion from FCI to the standardized 5-point scale used in Asset Management is shown in ***Table 6.***

Table 7: Inspection and Condition Information

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

The condition profile for HPL Facilities assets is shown on the next page in ***Figure 4.*** While most libraries are considered to be in **Good** condition, it is evident that many of the neighborhood libraries are indicated to be in **Fair or Poor** condition based on the results of the BCA. The facilities that are in POOR condition are Concession, Kenilworth, Terryberry and Westdale Branches. HPL and CFEM have ensured facilities are kept in a safe working condition but acknowledge that a significant amount of facility maintenance needs will be required in the next 10 years to maintain current levels of service as indicated in ***Section 3.2.1.3.***

Figure 4: Facilities Asset Condition Distribution



3.2.1.3 ASSET USAGE AND PERFORMANCE

The largest performance issues with Facilities involve poor condition of major (high cost or high criticality) facility components. The known service performance deficiencies in ***Table 8*** were identified using information from the 2021 Building Condition Assessment (BCA). Major needs across branches relate to roofing, exterior windows, wall and floor finishes, air distribution systems and electrical service and distribution.

Table 8: Known Service Performance Deficiencies

HPL FACILITY	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Ancaster	Furnaces in poor condition	Upon inspection, the electric furnace was in poor condition and due for replacement.
Barton	Roof in poor condition	Upon inspection, the roof was in poor condition with reports of leaks, excess ponding and algae. Replacement is recommended.

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HPL FACILITY	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Central	Air compressor in poor condition	The compressor was noted to be in poor condition due to frequent oil leaks
	Water heater in poor condition	The water heater has passed its expected useful life and is due for replacement. The water heater has been noted to be in poor condition
	Heating pumps in poor condition	The pumps have passed their expected useful lives and are due for replacement. The pumps have been noted to be in poor condition overall.
	Air handling unit in critical condition	It has been noted that the unit experiences many critical issues on a regular basis. It is recommended that the unit be replaced/overhauled as many of the issues could not be resolved.
	Steam humidifier in poor condition	The humidifier cannot maintain optimal relative humidity and presents a challenge for the survival of the books in the library. The humidifier is considered to be not functional. Replacement of the humidifier is recommended.
	Fire alarm system in critical condition	It has been reported that the panel has frequent short circuits and malfunctions on a regular basis. Replacement of the main fire panel has been recommended
Concession	Exterior doors in poor condition	Surface corrosion was noted at the base of the doors and frames. The doors are considered to be in poor condition overall.
	Fire alarm panels in poor condition	The fire panels are considered to be passed their expected useful life and are due for replacement. The panel has been noted to be in poor condition overall.
Dundas	Exterior windows in poor condition	Building representatives have stated that the windows have completely lost their thermal resistance. Replacement of the original windows is recommended to maintain the building's thermal resistance envelope.
	Flooring in poor condition	Flooring in electrical and mechanical rooms was found to be in poor condition.

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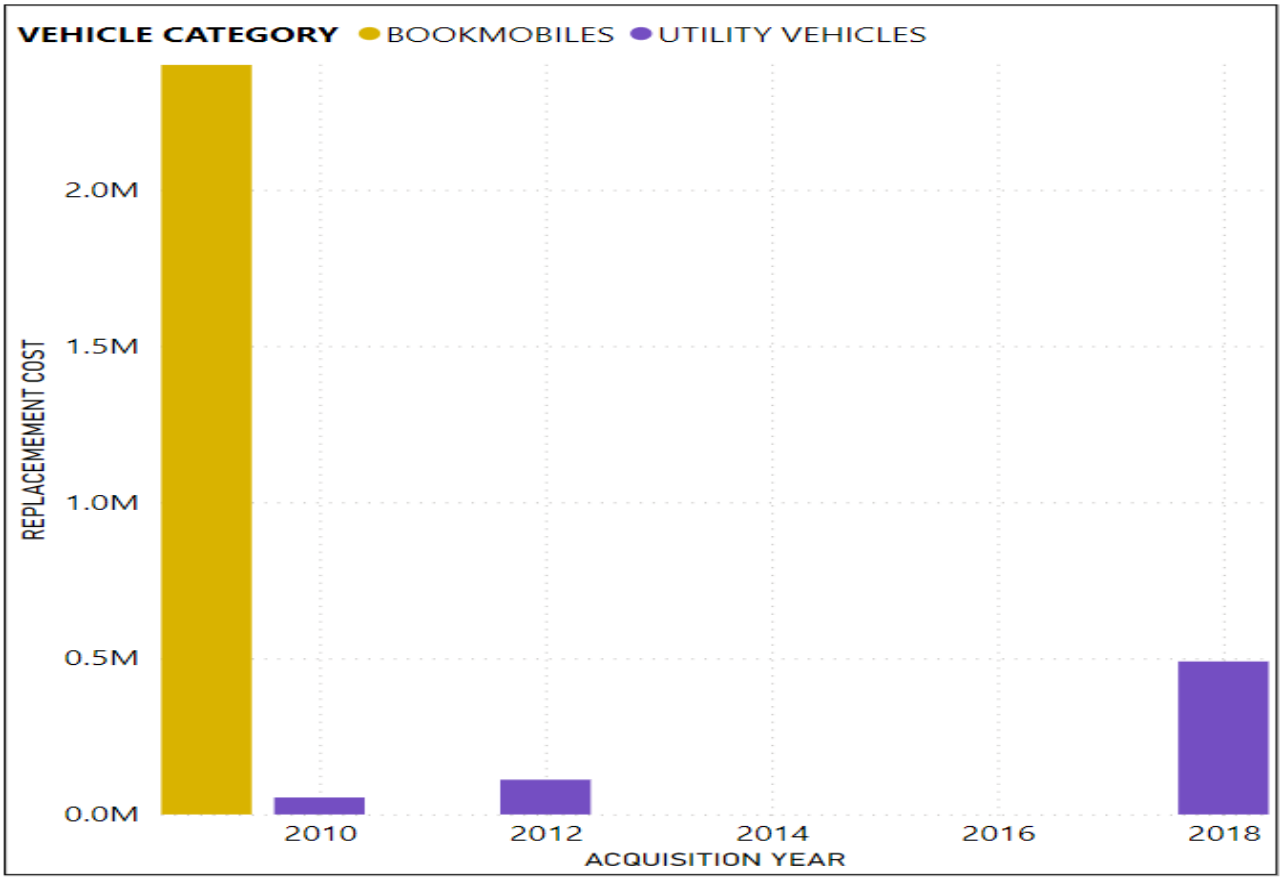
HPL FACILITY	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
	Distribution transformer in poor condition	At the time of inspection, the transformer was emitting high levels of heat and producing a constant hum. The transformer was noted to be in poor condition overall.
	De-icing system not in use	De-icing system is not used due to operational complications.
Freelton	Asphalt paving in poor condition	The paving appeared to be in poor condition with heaving and alligator cracking throughout.
Kenilworth	Smoke detectors in critical condition	The smoke detectors need immediate replacement.
Locke	Crawl space in poor condition	It is reported that the crawl space experiences a significant amount of moisture infiltration and dampness.
	Roof drainage in poor condition	The eaves troughs and downspouts are considered to be in poor condition causing overflow issues.
Mount Hope	Roof in poor condition	The roof was noted to be very dirty and was observed to be in poor condition overall with many areas of asphalt seeping through the gravel surface.
Turner Park	Roof in fair condition	The most recent BCA calls the roof as being in fair condition. However, HPL has identified Turner Park branch's roof to be problematic.
Waterdown	Window leaks	Exterior windows are leaking and should be repaired.
Westdale	Sanitary sewer system in poor condition	Clogging issues in men’s washroom.

3.2.2 VEHICLES PROFILE

3.2.2.1 AGE PROFILE

The age profile for HPL Vehicle assets is shown in ***Figure 5***. For Vehicle assets, the data confidence for age is typically High because asset's ages are formally tracked, and many assets are replaced based on age.

Figure 5: Vehicles Age Profile



Per ***Figure 5***, there is an acquisition spike in 2009 for Bookmobiles. Since these vehicles have an estimated service life (ESL) of 10 years, these vehicles are beyond their ESL and will contribute to the backlog of renewals in 2024, in ***Section 8.3*****.** The boom lifts and utility vehicles acquired in 2010 and 2012 respectively are also beyond their ESLs are part of the backlog.

3.2.2.2 CONDITION METHODOLOGY AND PROFILE

Condition of HPL vehicles is based on a recommended life cycle that considers criteria such as age, condition, and compliance with legislated safety standards. Vehicles are on preventive maintenance schedules and CVOR (Commercial Vehicle Operator's Registration) vehicles (e.g. Bookmobiles, courier trucks, IT and facility utility vehicles) undergo annual inspections to meet legislated safety requirements. The result of a CVOR inspection is either a Pass or Fail. A vehicle failing an inspection will be required to undergo all necessary repairs and will be re-inspected

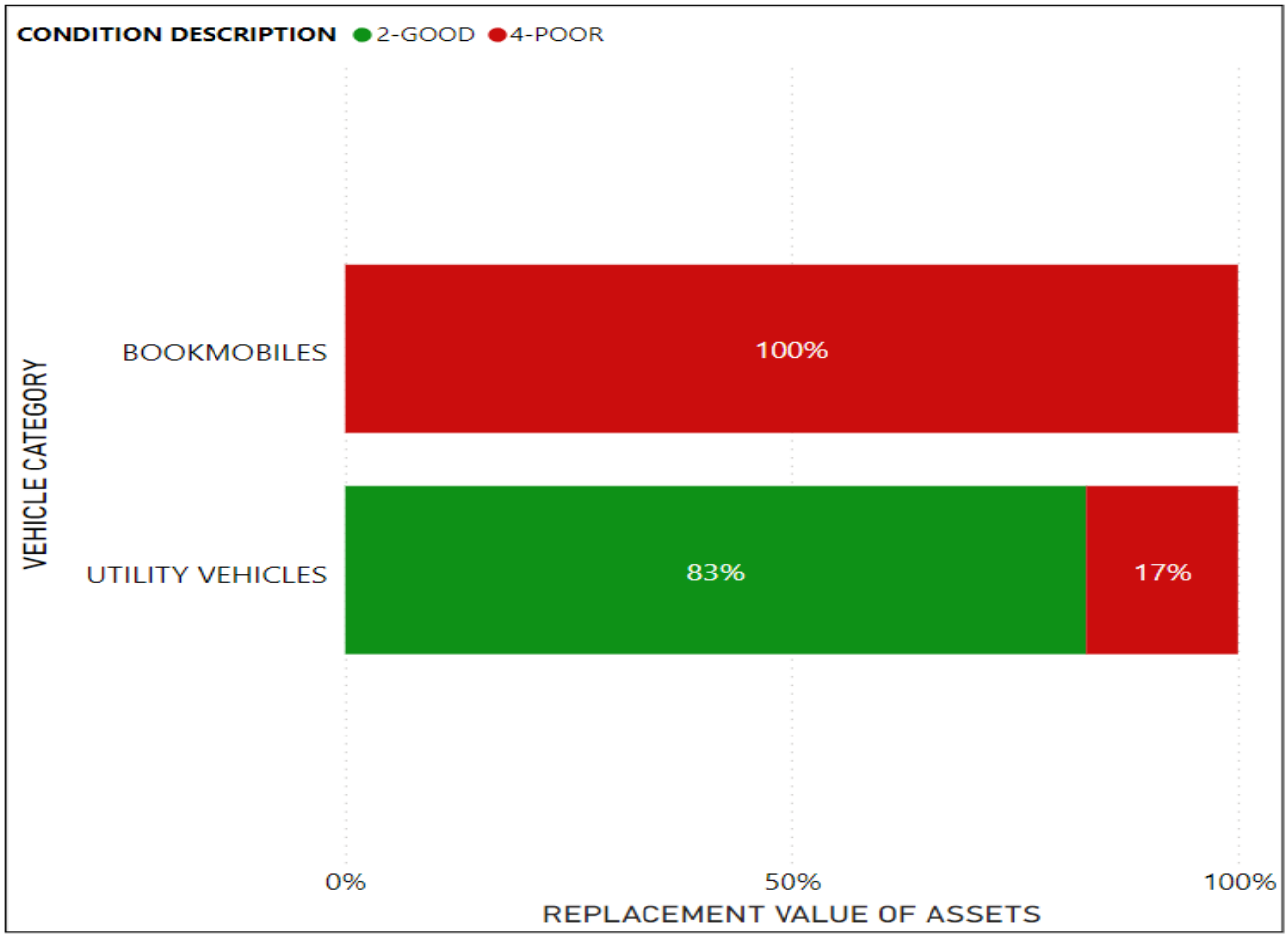
before being issued a CVOR certificate. A vehicle that requires major and/or more frequent maintenance is rated with a higher condition score on the 5-point scale.

Table 9: Condition Methodology for Vehicles

ASSET	INSPECTION TYPE	DESCRIPTION	FREQUENCY	CONDITION SCORE OUTPUT
All CVOR Vehicles	**CVOR**	Legislated inspection in accordance with the Ontario Highway Traffic act, CVOR legislation and applicable federal and provincial legislation	Annual	Pass/Fail
All Vehicles	**Preventative Maintenance**	Maintenance activities including oil changes, tire rotations, etc.	Quarterly	N/A
All Vehicles	**Daily Pre-trip inspection**	Vehicle operator performs a pre-trip inspection and reports any defects or deficiencies in accordance with the instructions on the inspection sheet.	Daily, before operation	Pass/Fail

The condition profile of HPL's vehicle assets is shown in ***Figure 6.*** At this time, the average condition of vehicle assets is Poor based on age and subject matter expert's opinion and weighted by replacement cost. Bookmobiles have by far the highest replacement cost in this asset category and hence their Poor condition most significantly impacts the overall condition score. These vehicles are used by HPL to deliver library services to areas that have less access to HPL branches and are scheduled for replacement in 2026.

Figure 6: Vehicles Asset Condition Distribution



3.2.2.3 ASSET USAGE AND PERFORMANCE

The largest performance issues with HPL vehicles involve key vehicle component failures. The known service performance deficiencies in ***Table 10*** were identified using staff input.

Table 10: Known Service Performance Deficiencies

HPL VEHICLE	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Bookmobile	Driver's Seat	Hydraulic seat consistently needs repairs to the air tubes. Air leaks frequently occur in the tubes.
Bookmobile	Leaks – Liquid	Coolant occasionally leaks (repaired by fleet), wheelchair lift fluid leaks, radiator leaks.

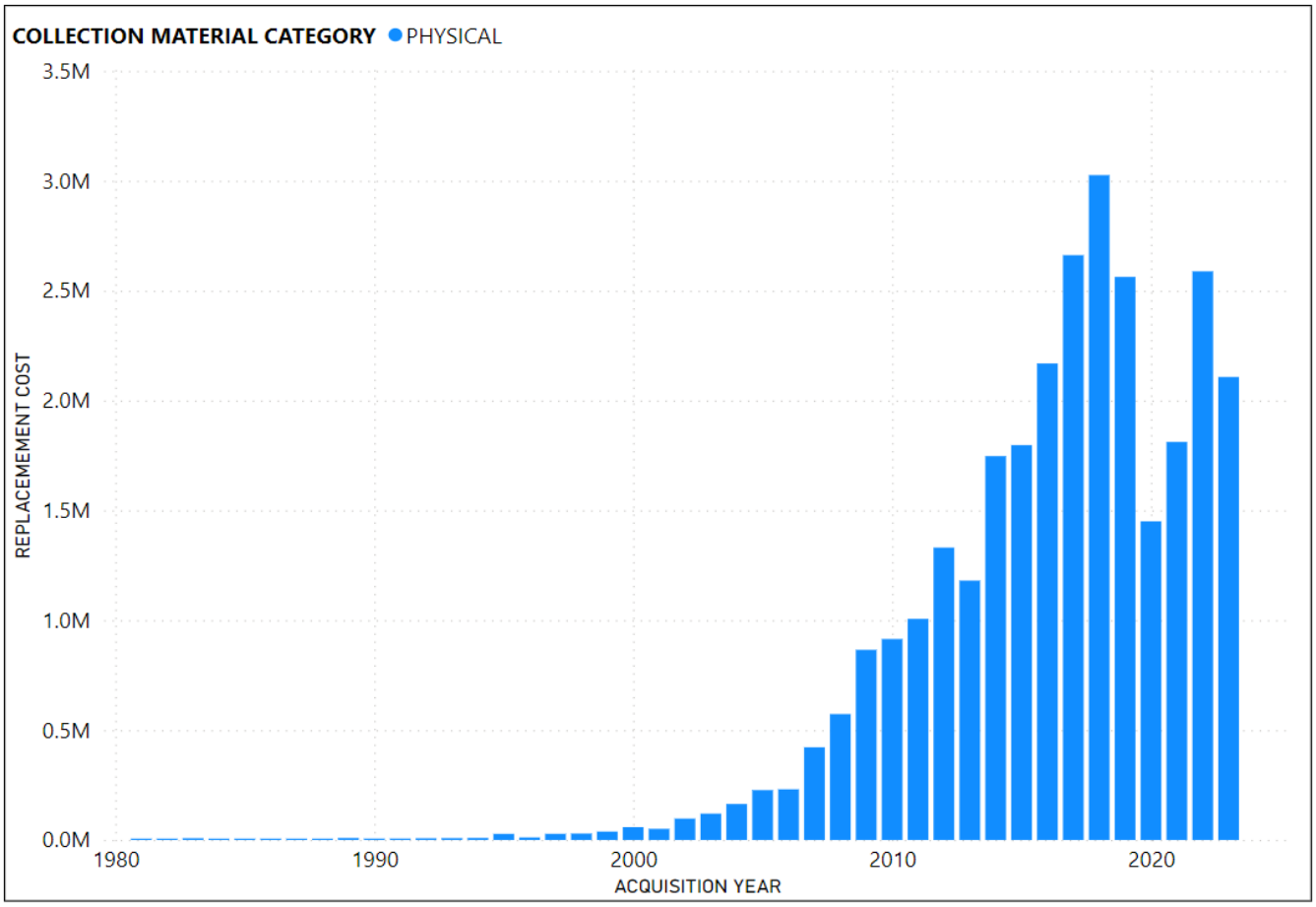
Bookmobile	Replacement Parts frequently needed	In the past year, bookmobiles have had the following parts replaced: the radiator, the driver's side seat belt buckle, passenger side mirror, battery and AC unit.

3.2.3 COLLECTION MATERIALS PROFILE

3.2.3.1 AGE PROFILE

The age profile for HPL Physical Collection Material is shown in ***Figure 7***. For Collection Material assets, the data confidence for age is typically High because asset's ages are formally tracked, and many assets are replaced based on age. Digital asset ages are not included in the age profile.

Figure 7: Collection Material Age Profile



Collection assets typically have estimated service lives (ESL) of eight years. Since these assets have relatively short ESLs, they will repeat throughout the renewal forecast shown in ***Section 8.3.*** The average age of physical collection materials is seven years.

3.2.3.2 CONDITION METHODOLOGY AND PROFILE

All physical collection material is weeded by condition. There are several categories into which the damaged items may fall. These categories include water damage, stains, torn and/or missing pages, broken spine, defacement or vandalism, and foul odour.

3.2.3.3 ASSET USAGE AND PERFORMANCE

The largest performance issue with HPL Collection Materials is the increased wait times for hold fulfilment on high use items caused by increase in market costs for circulating materials and material replacement. The known service performance deficiencies in ***Table 11*** were identified using staff input.

Table 11: Known Service Performance Deficiencies

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Physical Collection	Increase in market cost of circulating materials.	Due to inflation, and various market trends, the cost of physical materials (books and audio/visual materials) have been on a steady incline since 2020.

3.2.4 LOCAL HISTORY AND ARCHIVES PROFILE

Local History and Archives (LHA) dates back to 1891. At the time of writing this AM Plan, these assets did not have readily available information relating to their individual age, condition, or a condition methodology and therefore age and condition profiles could not be accurately created.

3.2.4.1 ASSET USAGE AND PERFORMANCE

The most significant performance issue with Local History and Archives is the lack of adequate preservation systems and protocol. The known service performance deficiencies in ***Table 12*** were identified using staff input.

Table 12: Known Service Performance Deficiencies

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
All Local History and Archives assets	Lack of adequate preservation systems and protocols	The current Digital Asset Management system is end-of-life and in need of immediate replacement; there is currently no preservation system for born-digital archival material; the lack of modern digitization equipment leads to an inadequate digitization rate.

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Digitization Equipment	Digitization equipment is past their service lives	This equipment is needed to digitize and enable greater access as well as preserve the Local History and Archives collections. Needs immediate replacement: scanners, computers, storage options.

3.2.5 TECHNOLOGY PROFILE

At the time of writing this AM Plan, Technology assets did not have readily available information relating to their individual age or condition, and therefore age and condition profiles could not be accurately created.

3.2.5.1 CONDITION METHODOLOGY

IT infrastructure condition methodology contains multiple factors to assess improvement, prioritize tasks, and plan for future upgrades. The assessment criteria cover the following considerations: system performance metrics, IT security measures, application scalability, and compliance with industry standards. A few universally recognized frameworks (e.g., ITIL) are used as HPL references or guidelines when assessing the performance of each IT infrastructure component.

ITIL (Information Technology Infrastructure Library) provides guidance on service strategy, design, transition, operation, and continual improvement.

Per subject matter expert opinion, assets are in an average of Fair condition. Networking equipment assets are in Poor condition are in the process of being replaced.

3.2.5.2 ASSET USAGE AND PERFORMANCE

The most significant issues with Technology assets involve end of life or unsupported technology. The known service performance deficiencies in ***Table 13*** were identified using staff input.

Table 13: Known Service Performance Deficiencies

ASSET	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Self-check Units	Aging hardware: the existing units have performance issues	Need firmware upgrade to improve the performance of the self-service machines. The vendor stopped service support on the firmware.

Switches and Routers	Most equipment has past their service lives	HPL switches and routers passed the end-of-life vendor support date. The potential risk on part failure or poor performance will be lack of vendor supply and support. It will create major service disruption at the library.
Makerspace Equipment	Certain Makerspace equipment is past their service lives.	Need replacement to newer models to keep up with demand.
Web Application	HPL.ca is built on an end-of-life web application.	The web application is aged and needs to be rebuilt on more current web technology.

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 HPL 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 AM Plan Overview.

4.1 SURVEY METHODOLOGY

To develop customer values and customer levels of service, the results of two customer engagement surveys were utilized. The first of these was the *2022 Hamilton Public Library Community Survey* which was conducted by HPL. The second survey entitled *Let's Connect, Hamilton – City Services and Assets Review: Hamilton Public Library* was released on September 5, 2023, on the Engage Hamilton platform and closed on October 10, 2023.

The two surveys received 4,962 and 84 responses, respectively. For the purposes of this report, data has been evaluated from a confidence level perspective (margin of error at 95% confidence in sample size) and a data consistency (standard deviation) perspective per ***Table 14*** below.

Table 14: Data Confidence Levels

GRADE	DATA CONSISTENCY (STANDARD DEVIATION)	CONFIDENCE LEVEL (MARGIN OF ERROR AT 95% CONFIDENCE IN SAMPLE SIZE)
Very High	0 to 0.5 – results are tightly grouped with little to no variance in response	0% to 5% - minimal to no error in results, can generally be interpreted as is
High	0.5 to 1.0 – results are tightly grouped but with slightly more variance in response	5% to 10% - error has becoming noticeable, but results are still trustworthy
Medium	1.0 to 1.5 – results are moderately grouped together, but most respondents are generally in agreeance	10% to 20% - error is a significant amount and will cause uncertainty in results
Low	1.5 to 2.0 – results show a high variance with a fair amount of disparity in responses	20% to 30% - error has reached a detrimental level and results are difficult to trust
Very Low	2.0+ - results are highly variant with little to no grouping	30%+ - significant error in results, hard to interpret data in a meaningful way

Based on an approximate population size of 570,000 and the table above, sample sizes of 4,962 and 84 correlate to margin of errors of 1% and 11% respectively at 95% confidence level. The *2022 HPL Community Survey* results therefore correspond to a Very High confidence level whereas the *2023 City Services and Assets Review: HPL* survey results correspond to a Medium confidence level. It is important to note that respondents were allowed to opt out of questions, and as such, different questions may have different confidence levels depending on the opt out rate for that question.

For the *2023 City Services and Assets Review: HPL* survey, although the sample size correlates to a medium confidence level, the data consistency also differed between questions. A high data consistency means that more often respondents came to the same conclusion for a question, whereas a low data consistency means that there is a split in respondent's opinions. Therefore, while CAM may be able to improve survey confidence levels over time by increasing the survey sample size, it may not be possible to improve data consistency over time as this depends on the opinions of the respondents and may require additional insight on why respondents' opinions are split. A low consistency of data does not mean the data is "bad", but it does mean that it is difficult to make decisions using that information.

While the survey was used to establish customer values and customer performance measures, it is important to note that there are limitations to the survey methodology which may also reduce the confidence level in results. The survey was released using an online platform and paper copies were made available at multiple locations across the City. However, there is no way to confirm the identity information provided in the survey. In addition, the survey did not control for IP addresses, and therefore it is possible that respondents could complete the survey more than once and skew the survey results.

When reviewing the demographic responses for the survey, there was no clear evidence that the survey results had been skewed. When comparing the age and postal code demographics from the survey to the age and postal code demographics for the City, there does not appear to be a significant over-representation of any age or postal code demographic within the survey. In addition, the responses were distributed across the city with responses from most communities as well as from a variety of self-identifications. The only demographic over-representation was of 70% of respondents identifying as female, compared to only 23% respondents identifying as male.

Therefore, although there are limitations to the survey methodology, it does appear that these results can be used to provide some context about the feelings of customers on the services HPL provides, but decisions should not be made based solely on the *2023 City Services and Assets Review: HPL* survey. The 2022 HPL community survey, had enough responses to give high confidence level in the results. These results are used to evaluate the importance and performance of different HPL services as well as to calculate the net differential for service performance versus importance.

The future intent is to release the CAM survey on a more regular basis to measure the trends in customer satisfaction over time and ensure that the City is providing the agreed level of service. In addition, the next survey will have an improved marketing and surveying strategy by both

incorporating telephone surveys and/or IP controls to improve confidence levels in the survey responses. In addition, these results will be reviewed and improved upon for the next iteration of the AM Plan. This has been noted in ***Table 31*** in the continuous improvement section.

4.2 CUSTOMER VALUES

Customer values are what the customer can expect from their tax dollar in "customer speak" which outlines 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 *2022 Hamilton Public Library Community Survey* and the *2023 Let's Connect, Hamilton – City Services and Assets Review: Hamilton Public Library.*

Table 15: Customer Values

SERVICE OBJECTIVE:			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
HPL facilities should be accessible and well-maintained	2023 HPL City Services and Assets Review Survey	Based on survey responses, customers value clean, accessible, and well-maintained library spaces with very high data consistency.	Decrease (Maintenance budget is inadequate to meet BCA identified needs and security related incidents unless brought in control can make facilities less accessible).

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SERVICE OBJECTIVE:			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
Convenient reservation and renewal of collection material is a very important service	HPL's 2022 Community Survey	Based on survey responses, online reservation and renewal of collection material is a very important service for customers with high data consistency.	Maintain (HPL offers online reservation and renewal of collection material. However physical self-checkout units in most HPL branches are nearing end of service life).
Free Wi-Fi at HPL branches is a very important service		Based on survey responses, free Wi-Fi at HPL branches is a very important service for customers with medium data consistency.	Maintain
Collection material is important for customers		Based on survey responses, collection materials are important for customers with high data consistency.	Maintain
Library locations, programs and classes, and public computers are all important services for the customers		Based on survey responses, library locations, programs and classes, and public computers are all important services for customers with high data consistency.	Maintain

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 level of service measurements relate to how the customer feels about the HPL Service in terms of its quality, reliability, accessibility, responsiveness, sustainability, and cost. The City will continue to measure these customer levels of service to ensure a clear understanding of how the customers feel about the services and the value for their tax dollars.

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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 under used? Do we need more or less of these assets?

In ***Table 16*** 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 budget allocation.

Table 16: Customer Levels of Service

TYPE OF MEASURE	LEVEL OF SERVICE STATEMENT	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Quality/ Condition	Provide comprehensive and efficient public library services.	HPL's 2022 Community Survey	Average survey respondent opinion on how HPL has performed overall in the last 24 months in all service areas	Good Performance	Maintain
		Confidence Level		Very High	
		Data Consistency		High	
		2023 HPL City Services and Assets Review Survey	Average survey respondent opinion on if accessing library services felt comfortable overall	Comfortable	Decrease (Maintenance budget is inadequate to meet BCA identified needs and security related incidents unless brought in control can make facilities less accessible)
		Confidence Level		Medium	
		Data Consistency		High	

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TYPE OF MEASURE	LEVEL OF SERVICE STATEMENT	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
	Be fiscally responsible when delivering services.	2023 HPL City Services and Assets Review Survey	Average survey respondent opinion on if HPL is providing good value for money when providing infrastructure and services	Good Performance	Maintain
		Confidence Level		Medium	
		Data Consistency		High	
Function	Provide comprehensive and efficient public library services.	2023 HPL City Services and Assets Review Survey	Average survey respondent opinion on if HPL is meeting overall service needs	Exceeds Needs	Maintain
		Confidence Level		Medium	
		Data Consistency		Medium	
Capacity	Ensure public library services are accessible to the public.	2023 HPL City Services and Assets Review Survey	Average survey respondent opinion on if they are satisfied with their ability to access HPL services overall	Satisfied	Increase (Several new HPL branch openings are planned in the next ten years)
		Confidence Level		Medium	
		Data Consistency		High	
		2023 HPL City Services and Assets Review Survey	Average survey respondent opinion on if placement of HPL branches meets needs	Meets Needs	Increase (Several new HPL branch openings are planned in the next ten years)
		Confidence Level		Medium	
		Data Consistency		High	

4.3.1 CUSTOMER INDICES

The three indices calculated to assess how customer expectations are aligning with the perceived performance for HPL are listed below in ***Table 17***. These indices are explained and analyzed in detail in the sections below and will eventually be included for all assets (when available) in the overall measures in the AM Plan Overview.

Table 17: Customer Indices

CUSTOMER INDICES	AVERAGE RESULT
Service Importance Versus Performance Net Differential	-3
Net Promoter Score (%)	49
Service Rates Versus Value for Money Net Differential	21

SERVICE IMPORTANCE VERSUS PERFORMANCE INDICE

The Service Importance versus Performance indices is used to determine if a service's importance correlates with the perceived performance. Service areas where the average importance rating exceeds the average performance rating by 20 points is indicative of a mismatch between expectations and service levels, equal to one point on the Likert scale.

Per **Figure 8** on the next page, the net differential does not exceed 20 points for any of services meaning that typically there is a match between the importance of the service and how HPL is perceived to be performing in that aspect of the service. The service with the largest mismatch is the checkout and renewal process. Users rate ease of checkout and renewals including online service very highly. The performance of HPL in the delivery of this service is Good but the net differential can be reduced by improving it to Very Good. Note that HPL provides online renewal service but self check-out units in some branches are near end of life and need replacement.

Overall, with a net differential of close to zero (-3), customers rate performance very close to the importance that they assign to different HPL services indicating a match in importance and performance. Note that the importance vs performance net differential is based on the results of just the *2022 HPL Community Survey* results which gives it a very high confidence. However, HPL services such as library locations and spaces, public computers, and connecting customers to information are not included in the calculation as respondents were not asked to rate importance or performance of these services in that survey.

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Figure 8: Importance versus Performance Index Score

Service Area	Performance	Importance	Net Differential
Checkout and Renewal process	81.39	95.11	-13.71
Free Wi-Fi	78.24	80.54	-2.29
Programs and Classes	70.31	70.06	0.25
Collection Material	73.90	70.06	3.84

NET PROMOTER SCORE INDICE

The Net Promoter Score indices outline how likely an individual is to recommend a service to another person and measures customer loyalty. For municipal services, this score is difficult to interpret because often individuals do not have many alternatives for utilizing different services. Also, there may be internal biases for certain service areas, however, this score does provide 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 Standard Deviation (σ) is also calculated in a percentage, the same units as the Net Promoter Score.

Based on the results below in ***Figure 9,*** HPL has a high positive net promoter score indicating that on average customers would vastly recommend HPL services to others. The two lowest scoring aspects of the service are programs and classes and public computers whereas checkout and renewal process top the list.

Figure 9: Net Promoter Score

Service Area	σ	NPS	Detractors	Passives	Promoter
All Service Areas	**19.6%**	**49.24**	**70**	**93**	**296**
Checkout and Renewal Process	17.7%	62.82	9	11	58
Free Wi-Fi	20.8%	56.45	9	9	44
Collection Materials	16.8%	52.00	10	16	49
Library Locations and Spaces	19.1%	48.05	10	20	47
Connecting Customers to Information and Community Resources	18.3%	44.64	8	15	33
Programs and Classes	23.1%	38.46	11	10	31
Public Computers	21.0%	35.59	13	12	34

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SERVICE RATES VERSUS VALUE FOR MONEY INDICE

The Service Rates versus Value for Money indices is used to determine if the rate an individual is paying for a service correlates with the perceived value for money. Service areas where rate level ratings exceed value for money ratings by 20 points is indicative of a mismatch between expectations and service levels, equal to one point on the Likert scale. Positive Net Differential values indicate that 'Value for Money' was greater than willingness for 'Rates'. Low indices scores in 'Rates' indicate that respondents are not willing to pay increased rates for the service area. All values were calculated and then rounded to the nearest whole number.

Based on the results below in ***Figure 10,*** survey respondents have indicated that HPL provides overall Very Good value for money, but customers also desire rates to be maintained. HPL is known for being innovative, the public perception of the service is positive, and customers think they are getting good value for money. However, since there is an interest in maintaining rates, it appears that there isn't a growth mindset with the public. Therefore, it is recommended that HPL explore promoting and seeking agreement from the public for potential innovations they are proposing in future. Another potential reason for customers to not favor rate increases could be that inflation is causing people to not want to pay for additional services at this time.

Figure 10: Rates versus Value for Money index Score

Service Area	Rates (Index Score)	Value for Money (Index Score)	Net Differential
Total	**67**	**88**	**21**
Programs and Classes	66	83	17
Library Locations and Spaces	69	87	18
Collection Materials	69	88	18
Public Computers	66	89	23
Connecting Customers to Information and Community Resources	64	87	23
Free Wi-Fi	67	91	24
Checkout and Renewal Process	68	92	24

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.[2]

Table 18 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.

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

Table 18: Technical Levels of Service

LIFECYCLE ACTIVITY	LEVEL OF SERVICE	ACTIVITY MEASURE	CURRENT ACTUAL PERFORMANCE (2023)	CURRENT TARGET PERFORMANCE (2023)	PROPOSED 10-YEAR PERFORMANCE
Acquisition	Ensure public library services are accessible to the public.	Average time to travel to nearest library	100% of address points in Hamilton are covered within 15-minute driving time	15-minute travel time to nearest branch	15-minute travel time to nearest branch
Operation	Ensure public library services are accessible to the public.	# of Weekly Open Hours	1,364	1,364	1,700
	Provide comprehensive and efficient public library services.	% of Residents that are active library users	27%	35%	35%
		Budget	$36M annual operating budget	Unknown	$55M annual operating budget
	Provide comprehensive and efficient public library services.	# of behavioral related incident per 10,000 visits	5 per 10,000	2 per 10,000	2 per 10,000
		Budget	$577K	$1.0M	
	Provide comprehensive and efficient public library services.	Wait times for holds	29 days	21 days	21 days
		Budget	$2.4M	$3.7M	$5.2M
Maintenance	Ensure that HPL assets are maintained in good condition	Frequency of HPL facilities cleaning	Once per day	Once per day	Once per day
		Budget	$37K	$400K	$500K
		Average Facility Condition Index	3.48%	< 5%	< 5%
		Budget	$600K (Combined HPL and CFEM)	$2.0M	TBD

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

It is important to note that these metrics were created specifically for this 2023 AM Plan with available data. Many of these metrics should be improved to include a target to be in line with SMART objectives identified on ***Page 43*** of the AM Plan Overview. In addition, performance measure data should be both easy to extract and measured over time, and a data collection process may likely need to be created. These have been identified as continuous improvement items in ***Table 31***.

4.3.3 PROPOSED LEVELS OF SERVICE DISCUSSION

Based on the Customer Levels of Service **Table 16** and Technical Levels of Service **Table 18**, it is evident that typically customer expectations match HPL's service levels. Since the *2023 City Services and Assets Review: Hamilton Public Library* results have only a medium level of data confidence, it is difficult to make any conclusive decisions based on the initial survey. Due to this lack of high data confidence in the current levels of service information, HPL will need to collect more data before proposing any new levels of service. Although the 2022 HPL Community Survey had results with very high data confidence, it did not look into customer's perception of value for money or rate changes. It has been assumed in the interim that the current levels of service will be the proposed levels of service moving forward past 2025 in accordance with O.Reg 588/17.Therefore, the information below is intended to provide context to direct HPL to areas for further investigation before proposing any new levels of service

CONDITION / QUALITY

Survey respondents thought that HPL had *good* performance overall and they felt *comfortable* accessing HPL's services. However, the current maintenance budget is inadequate to meet BCA identified needs and security related incidents, unless brought in control, can make customers feel less comfortable accessing services. Currently HPL meets its performance targets for cleanliness of facilities and the current Facility Condition Index is also within the target range. HPL is also looking to increase its security budget which should help to address access and comfort issues.

In terms of providing good value for money, customers rated that HPL provided good value for money. However, when asked if they would like to see rate changes to increase or decrease service levels, customers on average preferred no change. If HPL is looking to add more services or increase level of service for existing services, it should consider that customers favour rates to be maintained. In this scenario, HPL should consider promoting and seeking agreement from the public for potential innovations they are proposing in future. Survey results suggest that customers are satisfied with current level of service.

FUNCTION

Survey respondents thought that HPL currently exceeds at meeting overall service needs. The survey results align well with HPL meeting its branch open hours target of close to 1,300 hours

per week. In the coming years, with HPL planning to acquire multiple new branches, the number of system wide branch-hours are expected to increase to 1,700. Based on this, it is expected that HPL will continue to exceed needs in this aspect to the service. At the same time, customers have indicated a desire to maintain rates. HPL should investigate further if the acquisition of $100 Million worth of new facilities and the corresponding increase in operation and maintenance expenditure estimated to be around $11.0 Million annually is something that would align with customer's preferences.

CAPACITY

Customers were *satisfied* with their ability to access HPL services and responded that placement of library branches across the city met needs overall. With an increased focus on digital resources and online resources, as well as the addition of the planned eight new HPL branches, service accessibility is poised to increase. Furthermore, currently every address in Hamilton lies within a 15-minute driving time of an HPL branch which is the target travel time. The average transit travel time to a library branch in urban areas is currently not available and its calculation has been identified as a continuous improvement item in ***Table 31***.

The current average wait time for holds is 29 days which is more than the HPL target of 21 days. HPL will need to invest more resources to reduce wait times. However, as customers have indicated a desire to maintain rates, HPL should investigate further if the customers are in fact satisfied with current wait times.

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 and identify the best way of meeting the current demand while also 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 (assumption of assets due to development growth) and types of service required.

5.1 DEMAND DRIVERS

For the HPL service area, the key drivers are:

- Population Growth;
- Increased Immigration Levels;
- Variable Economic Conditions;
- Technological Changes; and,
- Increased focus on sustainability.

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 31.***

Where costs are known, these additional demands as well as anticipated operations and maintenance costs have been encompassed in the Lifecycle Models 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 ***Table 19***. 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.

Table 19: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION (10 Years)	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Population Growth	570,000	680,000	• More/ expanded branch locations to maintain current levels of service. • Increased open hours	• Capital Budget funding to build new or expand existing branches. • Increased operating funding to add FTE to staff new and expanded spaces. • FTE required would depend on size of branch and open hours.
Increased Immigration Levels	10,000 per year	100,000 newcomers over 10 years	• More services/ programs for newcomers. Language and integration services.	• Increased FTE and spaces for Newcomer Learning type programs. • Currently have three FTE aided by federal grant funding. • Would likely need another FTE just to keep pace with growth assuming the three FTE that HPL has now is sufficient for community needs.
Customer Preferences	Overdue fines and replacement fees were eliminated in 2020. This has resulted in materials returning to a library at a slower pace.	Overdue fines and replacement fees will not be reintroduced.	• Most books are returned within two loan periods instead of one. • Hold placed by members take longer to fulfill. • More copies are needed to bring down wait times for high use items.	• HPL has adjusted its performance metrics and has invested more funds in the fulfilment of holds to adequately meet member demands in a timely fashion. • HPL would need to increase budget for collection materials from the current $2.4M to an estimated $3.7M to reduce wait times to target levels.

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DEMAND DRIVER	CURRENT POSITION	PROJECTION (10 Years)	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Economic Conditions	Stable	Variable	• During economic downturns people are more likely to turn to the library to access free or low-cost services. Use of the library to help with upskilling and job search. • During prosperous times people are more likely to turn to the library to help with business start-up help, upskilling, access to specialized skills enhancement.	• Build flexibility into space plans and collection/ programming to meet community needs as appropriate. • This flexibility should be a prime consideration when designing or redesigning space.
Technological Changes	Rapid Changes	Even faster Exponential Changes	• Ever increasing importance and ability to quickly adapt to and provide access to changing technologies	• Having budgets that are sufficiently funded to enable HPL to provide the community with access to the latest technological resources and to train staff to navigate and be successful in whatever that new reality will be. • HPL currently has a $24,000 annual budgeted provision to reserve. This should be $100,000 annual to keep up with pace of change.
Sustainability	High Focus	Increased Desire for providing services in an environmentally sustainable way	• Expectation that sustainability is a main factor not an after-thought for new builds and facility renewals	• Capital Budget and Operational funding to enable sustainability to be built into new designs. • In some cases, this may reduce operating costs over the long term

5.4 ASSET PROGRAMS TO MEET DEMAND

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

At this time there are approximately **$100.8 Million** in assets acquired over the next 10 years as discussed in **Section 8.1**. Acquiring new assets will commit HPL to ongoing operations, maintenance and renewal costs for the amount of time that the service is required. These future costs have been estimated when possible using available information in the Lifecycle Management Plans in **Section 8.0**, 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'[3].

The City has released 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 reductions in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences. The risk assessment process also identifies the likelihood of these risks occurring, and the consequences should the event occur which calculates a risk rating. Risk options are then evaluated, and a risk treatment plan is created which will be initiated after the release of this plan and has been identified as a continuous improvement item in ***Table 31***.

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 20***. Failure modes may include physical failure, collapse or essential service interruption.

Table 20: Critical Assets

CRITICAL ASSET(S)	FAILURE MODE	IMPACT
Central Library	Physical Failure	• Overall library system processing functions would be significantly reduced. • Central Library offers extended hours as a warming centre as part of City's Winter Response Strategy. This service would be affected. • City's main data centre is hosted in the Central Library. Physical damage to data centre equipment would likely affect the effective provision of all city services
Regional Branches	Physical Failure	• Public would lose access to space including warming/ cooling center and critical library services.

[3] ISO 31000:2009, p 2

CRITICAL ASSET(S)	FAILURE MODE	IMPACT
Integrated Library Software	Essential Service Interruption	• Public will lose access to physical and digital collection materials. • System processing functions will be significantly reduced. • Public computer access and print authentication will be lost.
New Collection Materials And Perennial Favorites	Essential Service Interruption	• Public will lose access to core library services. • Some customers and members will be lost as a result. • Hold fulfilment will be impacted.
Local History And Archives Collection	Physical Failure	• Hamilton will permanently lose unique materials. • This will result in loss of heritage and organization reputation.
Digital Technology Infrastructure	Physical Failure	• Customers will lose access to collection materials, digital collections, and databases. • Customers will lose access to public computers.

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, development of a risk rating, evaluation of the risk and 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 reductions 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 is shown in ***Table 21***. It is essential that these critical risks and costs are reported to management.

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Table 21: Risks and Treatment Plans
Note * The Residual Risk Is the Risk Remaining After the Selected Risk Treatment Plan Is Implemented.

SERVICE OR ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING	RISK TREATMENT PLAN	TREATMENT COSTS
Central Library	Roof and/or window leaks, HVAC out or order, or other service interruption. These can happen due to heavy rainfall, windy conditions and/or deferred maintenance. Data centre hosted in the Central Library may get damaged. Collection materials and/or local history and archives may get damaged causing permanent loss to the City's cultural heritage. Library service hours will be affected as well as capacity of branches to function as warming/cooling centres.	Very High	More frequent inspections. Increased budget for lifecycle renewal and maintenance.	$33.1 million BCA identified needs over next 10 years
Security Incidents	There exists a possibility of serious security incidents happening, especially at Central Library due to its Downtown Hamilton location.	Very High	On going vendor management. Explore partnership opportunities with the City	To be Determined
Local History Archives (LHA) Analog Collections	Damage and/or deterioration due to leaks, temperature and humidity fluctuations, malfunction of fire	High	Regular inspection of equipment. Inspection of roof in overhead areas of LHA.	To Be Determined

	suppression equipment, and pests.		Disaster plan. Active pest management.	
Information Security attacks	Privacy breach/ sabotage/ extortion/ theft.	High	Investment in up-to-date protection. FTE funding for cyber security position.	To Be Determined
LHA Systems	Deterioration and/or loss of LHA digital collections due to lack of digital preservation system and protocols, loss of access to digital assets held by third party partners or bit rot due to lack of check sum measures.	High	Invest in digital preservation system. Migration from obsolete formats. Up-to-date digital preservation procedures and staff training.	Exact costing is unknown; however, a rough estimate could be about $200,000 startup with yearly ongoing costs $20,000 for the platform alone. Additional staffing would be required on at least a temporary basis to migrate obsolete formats. Digital Preservation, policy, procedures, and training could be done in-house or with a mix of contract staff. Would require work with HPL DT and City of Hamilton IT teams.
Digital Technology (DT) Infrastructure	Downtime and loss of data due to out-of-date equipment/ software.	High	Replace end of life switches and Routers. Upgrade staff computers every 5 years. Keep software licensing management up to date. Conduct regular maintenance to sorters, servers, and self-check machines.	$1.4M budget for Switches replacement. Plan $1M every year for computer and software licensing renewal and replacement. $0.5M budget to replace end-of-life Drupal 7 web application.

			Redesign the HPL.ca website with more current web platform application.	
Lower government funding	Loss of funding at municipal, provincial or federal governments due to change in council priorities or government spending cutbacks.	High	Ensuring budgets are managed in a responsible manner. Continued value/impact assessments. ROI or value calculator reviews.	Internal Resources
Restrictive Licensing Terms and Embargos on Digital and Streaming Content	Digital content licensing models create challenges for development and retention of HPL's digital collections. Metered access, high pricing, embargoes that limit or delay access.	High	Continued advocacy. Pooling library resources to increase buying power. Seek alternative solutions to delivery and retention of digital content.	To Be Determined
Staff Technology Skills Gap	Staff skills not keeping pace with technological change.	High	Incorporate technology skills in recruitment strategy. Monitor training requirements.	Internal Resources
Intellectual freedom challenges	Risk associated with finding the right balance between upholding intellectual freedom and advancing inclusion.	High	Collaboration with other libraries. Staff training. Review of protocols.	Internal Resources

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.

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.

We do not currently measure our resilience in service delivery, and this will be included in the next iteration of the AM Plan.

6.4 SERVICE AND RISK TRADE-OFFS

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

Table 22 outlines what activities HPL cannot afford to do over the next 10 years with their existing budget and provides the associated service and risk trade-offs.

Table 22: Service and Risk Trade-offs

WHAT WE CANNOT 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?)
Central Library Roof and Mechanical Repairs	Staff and customers may be uncomfortable in the building. Central Library is a Warming and Cooling Centre, so service may be reduced. Data centre may be impacted. May require closed if roof repairs do not occur.	More reactive repairs, library may need to close. Delayed repairs may end up becoming more costly and eventually result in a renewal. Potential health and safety risk with roof repair requirement.
Turner Park Roof Replacement	May require closure if roof replacement does not occur.	Potential health and safety risk with roof replacement requirement. Reactive costs and reputational risk.
Waterdown Window Leak Repair	Less library space will be available for service.	Repairs may end up becoming more costly and eventually result in a renewal. Reputational risk if not addressed.
HPL Switches and Routers replacement	Low network efficiency or no network connection due to equipment failure. Lost library services which are dependent on Network connection.	Lack of part and service support due to end-of-life vendor support. Big reputational risk on library service delivery.

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WHAT WE CANNOT 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?)
Staff Computer upgrade every 5 years	Low productivity on service delivery and daily office operation due to out-of-date or incompatible application and hardware support.	Slow computer performance and high cost of finding support for out-of-date applications. Reputational risk if staff computers result in low productivity.
Materials Handling Sorters Replacement	Delays in materials for public. More staff intervention to run the service if can't rely on automation.	Health and safety risk with equipment that is prone to failure. Reputational risk if machines are not working.
Self-Check Units Replacement	Delays in checkouts for public. More staff intervention to run the service if we can't rely on automation.	Reputational risk if machines are not working.
Microsoft licensing exponential pricing increase (potential)	Currently HPL gets education licensing from Microsoft which is at a reduced price compared to business or non-profit licensing. Microsoft may put public libraries under Non-profit licensing which would significantly increase the licensing costs for Software assurance, Office 365 and system centre licensing	Over 300% increase in licensing and subscription costs from Microsoft if HPL is no longer able to get education licensing and has to get non-profit licensing instead

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've already begun to experience (adaptation). At a minimum, the City must consider how to manage our existing assets given potential climate 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 and 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 31***.

7.1 CLIMATE CHANGE MITIGATION

Climate Mitigation refers to human intervention to reduce GHG emissions or enhance GHG removals (e.g., electric vehicles, net-zero buildings). 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.

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 previously mentioned, due to the high level of uncertainty with the demand management plans for climate change, the cost of the demand impacts below may not have been included in the lifecycle models or levels of service at this time unless they were previously identified.

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 reductions 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 31.***

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

Since HPL possesses Facilities and Vehicles, the transformations that relate to *transforming our buildings*, *changing how we move, and growing green* are the key modelled targets that HPL will have to accommodate as shown in ***Table 23*** below.

Table 23: Climate Change Mitigation Transformation

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE/ASSET	DEMAND MANAGEMENT PLAN
Transforming Our Buildings	By 2050, all municipal buildings are retrofitted to achieve 50% energy efficiency	Capital funds will need to be secured and plans developed to retrofit existing buildings to achieve energy efficiency. Facilities may need to be closed for a period to perform the work.	Will result in higher capital costs required to achieve the goal. Grant funding may help to offset some costs. Plans will need to be developed to provide service alternatives for longer renovation periods.
Changing How We Move	100% of new municipal small and light-duty vehicles are electric by 2040. 100% of new municipal heavy-duty vehicles switch to clean hydrogen by 2040.	Digital Technology & Maintenance Vans are already being procured as electric. Existing bookmobiles planned to be replaced with electric Sprinter type vehicle and Electric Bus. Two Courier Trucks will be due for replacement by 2028. Charging stations will need to be installed to support this change. Higher expected upfront cost to procure electric vehicles.	Business Case for electric vehicles. Higher upfront costs however lower expected operating costs. The cost of climate impact risk of not doing so should be considered. Be on the lookout for grant funding opportunities to help offset costs.

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE/ASSET	DEMAND MANAGEMENT PLAN
Revolutionizing Renewables	By 2050, 50% of municipal buildings will add rooftop solar PV, covering 30% of the building's electrical load.	Capital funds will need to be secured and plans developed to retrofit existing buildings. Facilities may need to be closed for a period to perform the work.	Will result in higher capital costs required to achieve the goal. Grant funding may help to offset some costs. Plans will need to be developed to provide service alternatives for longer renovation periods.
Growing Green	Planting 50,000 trees a year through to 2050	May be an opportunity to plant trees on library properties. Would increase funds needed for landscaping to ensure premises remain clean and tidy.	Higher operating costs to maintain ground. Needs to be planned for.

MITIGATION RISK ANALYSIS

Since the risk of not completing climate change mitigation projects was 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 climate mitigation projects (ICLEI Canada, 2021).

CURRENT MITIGATION PROJECTS

Mitigation projects HPL is currently pursuing are outlined below in **Table 24**. These projects may already be included in the budget and may be quantified in the lifecycle models.

Table 24: Asset Climate Mitigation Projects

PROJECT	CLIMATE CHANGE MITIGATION TRANSFORMATION	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT
Replacement of Vehicles	Changing how we move	Replacement of Bookmobiles with EV or Hybrid models. Facility Vehicles being replaced with EV's.	Reduce emissions associated with vehicle operation.
Valley Park Renovation	Transforming our buildings	First LEED (Leadership in Energy and Environmental Design) branch.	Reduce emissions associated with facility operation.

PROJECT	CLIMATE CHANGE MITIGATION TRANSFORMATION	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT
Mount Hope Renovation	Transforming our buildings	Mount Hope: the federal grant was not approved.	Reduce emissions associated with facility operation.
Replacement of Central Library windows and of lights to low-energy LEDs.	Transforming our buildings	Low E Glass installed around the entire facade to assist in heat/cooling loss. All Branches converted high use/common area lighting to LEDs for energy savings.	Reduce emissions associated with facility operation.

CLIMATE MITIGATION DISCUSSION

Transforming our Buildings and Growing Green

HPL has made some progress on this target as certain branches have been LEED certified whereas LED lights have replaced more traditional and energy inefficient lights in library branches.

Changing How We Move

This is another area HPL is making progress in trying to mitigate climate change impacts. HPL will be replacing its two Bookmobiles with electric or hybrid vehicles. These vehicles are expected to arrive in 2026.

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.[4]

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.

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

Adaptation Demand Analysis

The impact areas were incorporated into the climate change adaptation analysis for this service area by:

- Identifying the asset specific adaptation impact statements that affected the service areas;
- Discussing the potential impacts on the asset/service using the projected change in climate using the RCP4.5 Scenario; and
- Proposing preliminary demand management plans to adapt to these impacts.

It is important to note that 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 and financial models 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 consider these adaptation impacts during the planning and design processes. Once the demand management plans are finalized, the information will be incorporated into future iterations of the AM Plan. This has been identified as a continuous improvement item in ***Table 31.***

Moving forward, a Climate Lens tool is currently being developed which will assess projects based on these targets and will assist with the prioritization of climate adaptation projects.

The adaptation impact statements identified by HPL staff which will have a potential impact on assets and services include temperature increases, and ice storms as shown in ***Table 25*** below.

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

Table 25: Managing the Demand of Climate Change on Assets and Services

ADAPTATION IMPACT STATEMENT	BASELINE** (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Increased instances of heat-related issues due to extreme heat.	16.1 average days where temperature is 30 degrees Celsius or more	34.4 average days where temperature is 30 degrees Celsius or more	Increase in requests for Libraries to open on closed days to allow for more public spaces for people to use as respite from heat or cold resulting in increased operating costs. Increase in HVAC equipment operation, maintenance, and replacement.	Prioritizing locations to be used as extreme heat/cold shelters. Adjust PM schedules as required.
Increased intensity of rainfall leading to increasing runoff into rivers and lakes, and washing of sediment, nutrients, pollutants, and other materials.	25.8 heavy precipitation days (10 mm)	27.6 heavy precipitation days (10 mm)	More and heavy rainfall will strain roofing and drainage systems of buildings leading to more frequent repairs needed and earlier replacement of roof and drainage infrastructure. May result in service disruptions if not addressed.	More frequent condition assessments may be needed along with more capital dollars to address problems otherwise backlog and service disruptions will increase.
Increased intensity and frequency of ice storms leading to increased hazardous roads, pathways, and sidewalk conditions.	187 mm average total winter precipitation	204 mm average total winter precipitation	More frequent, intense storms would lead to more weather closures. This would limit the ability of people to access services.	Increase staff ability to provide as much remote or digital services on these days.

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

ADAPTATION IMPACT STATEMENT	BASELINE** (1976 - 2005)	AVERAGE PROJECTED** CHANGE IN 2021-2050 (ASSUMING RCP4.5* SCENARIO)	POTENTIAL IMPACT ON ASSETS AND SERVICES	DEMAND MANAGEMENT PLAN
Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.	6.7 heavy precipitation days (20 mm)	7.7 heavy precipitation days (20 mm)	Possible damage to assets including roofs, below grade levels which service hours might be reduced and may lead to loss of reputation.	Continue to work with City partners that manage and prioritize these projects.

*RCP4.5 Scenario: Moderate projected GHG concentrations, resulting from substantial climate change mitigation measures. It represents an increase of 4.5 W/m2 in radiative forcing to the climate system. RCP 4.5 is associated with 580-720ppm of CO2 and would more than likely lead to 3°C of warming by the end of the 21st century.
**Baseline and Projected numbers based on 2021 Climate Science Report.

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.

Similar to the exercise above and using the risk process in ***Section 6.2,*** 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 came up with a preliminary risk adaptation plan shown below in ***Table 26***.

It is important to note that due to the high level of uncertainty with the climate change risk adaptation plans, the cost of the mitigating the risks below have 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.

Table 26 : Adapting to Climate Change

ADAPTATION IMPACT STATEMENT	SERVICE OR ASSET AT RISK DUE TO IMPACT	WHAT CAN HAPPEN	RISK RATING	RISK ADAPTATION PLAN
Increased instances of heat-related issues due to extreme heat.	DT Infrastructure	DT Infrastructure may get affected. Increased energy to meet needs for temperature and humidity control.	High	Project recently completed. No disaster recovery system. Data backup available. Cloud based disaster recovery an option.
More frequent and intense heatwaves will increase instances of heat-related health and safety issues, particularly for households without access to reliable air-conditioning and the homeless.	Library Buildings	Buildings need to remain open longer to act as Warming and Cooling centers e.g., Central Library due to increased instances of heat and cold alerts.	High	Budget for more security guard hours. Further services may be required if volumes warrant it.
Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.	Library Buildings	Service interruptions experienced due to roof leaks and drainage issues. Caused by Increased levels of precipitation, storm events.	High	Increased budget for capital replacements, increased inspection frequency addressing failed areas before they spread.

ADAPTATION IMPACT STATEMENT	SERVICE OR ASSET AT RISK DUE TO IMPACT	WHAT CAN HAPPEN	RISK RATING	RISK ADAPTATION PLAN
				Increased budget for capital and major repairs.
Rising summer temperatures and extreme heat will increase energy demand for air conditioning, causing a financial burden for low-income households.	Library Buildings	HVAC Malfunction, premature wear, and tear. Caused by increased energy demand for air conditioning.	High	Increase preventive maintenance schedule during warmer periods. Re-assess replacement or upgrade intervals.

CURRENT ADAPTATION PROJECTS

Table 27: Asset Climate Adaptation Projects

PROJECT	ADAPTATION IMPACT STATEMENT	PROJECT DESCRIPTION OF CLIMATE CHANGE ADAPTATION
City's Winter Response Strategy and Heat Response Strategy	i) Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns. ii) More frequent and intense heatwaves will increase instances of heat-related health and safety issues, particularly for households without access to reliable air-conditioning and the homeless.	Increasing demand for HPL branches to serve as cooling and warming spaces for the community including multiple branches offering extended access hours.

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

CLIMATE ADAPTATION DISCUSSION

INCREASED TEMPERATURE and INCREASE IN ICE STORMS

HPL is making its facilities available for the community as warming and cooling spaces in winter and summer months respectively.

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 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 and separated by lifecycle activity in this section.

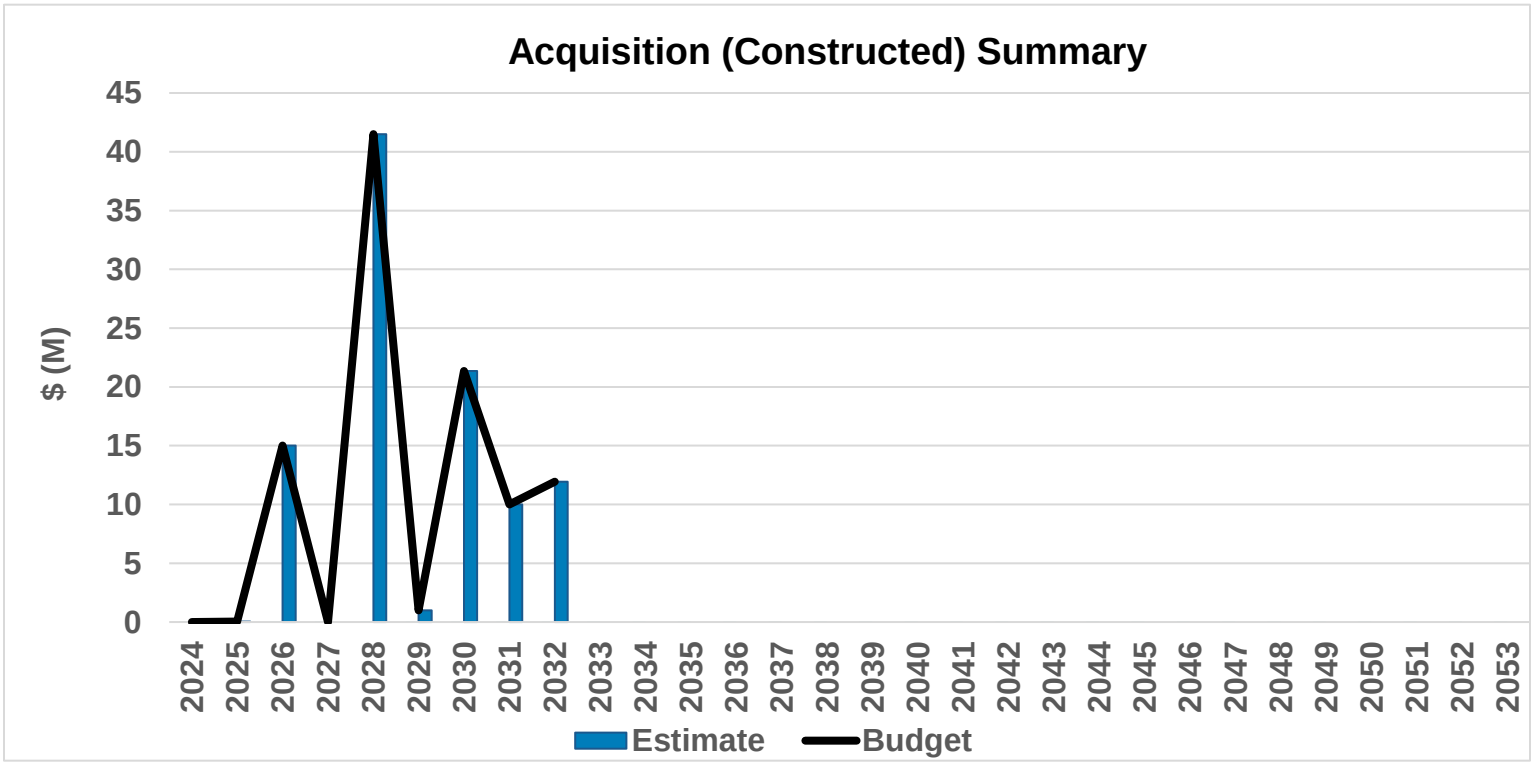
As a result of this new process, there may be some areas where the budget was not able to be broken down perfectly by lifecycle activity. Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options. However, at this time the plan is limited on those aspects. Expenditure 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,

CONSTRUCTED OR PURCHASED ACQUISITIONS

Figure 11 : Acquisition (Constructed) Summary
All Figure Values Are Shown In 2023 Dollars.



The major acquisition expenditures over the next ten years include:

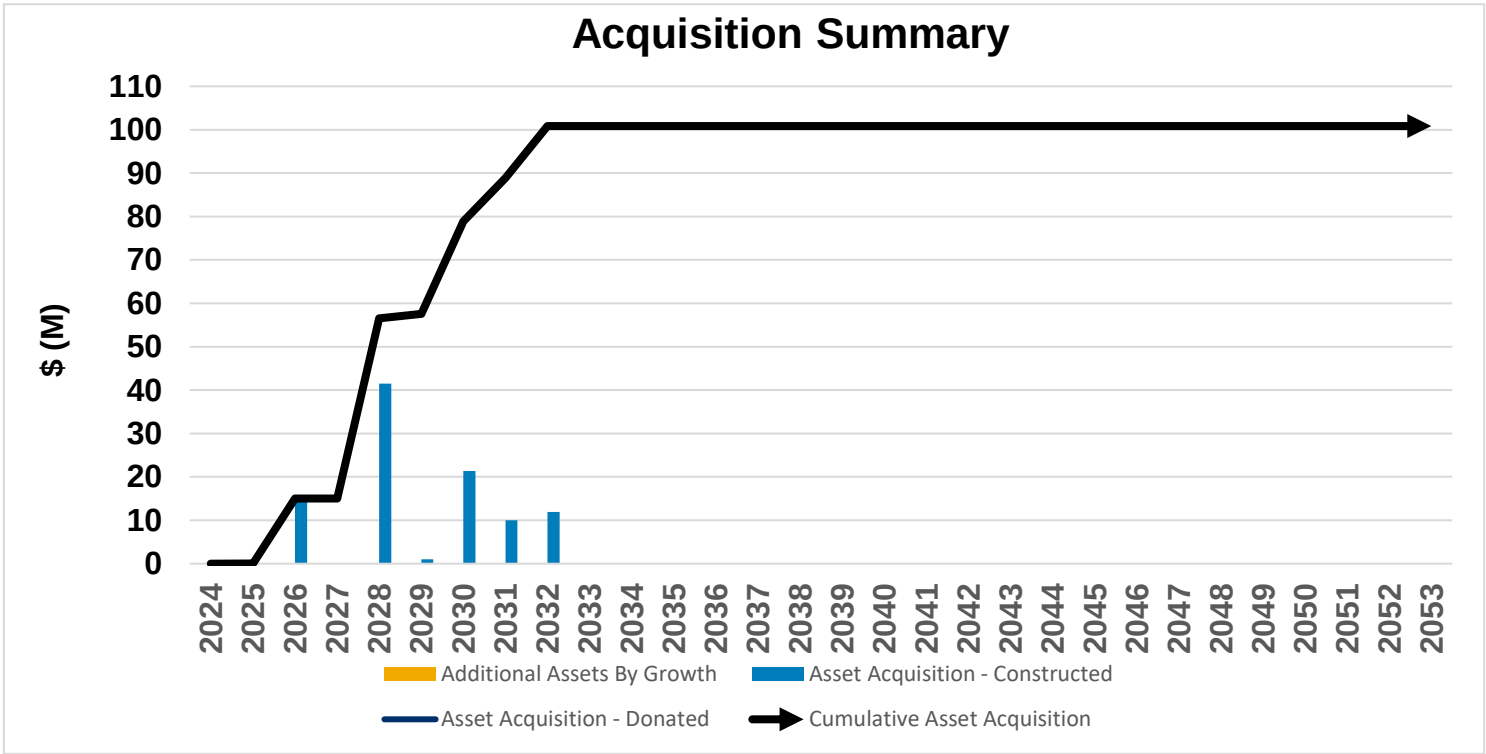
- **$19.0 Million** for Downtown Stoney Creek Library in 2028
- **$15.0 Million** for Library Discovery Centre and Feasibility Study in 2026
- **$14.0 Million** for East Hamilton Replace and Expand in 2028
- **$11.9 Million** for Elfrida Library in 2032
- **$11.0 Million** for Winona/ Stoney Creek Library Construction in 2030
- **$10.4 Million** for Lower City New/ Expanded Library in 2030
- **$10.0 Million** for Ancaster Expansion in 2031
- **$8.5 Million** for West Mountain Branch in 2028
- **$1.0 Million** for New Bookmobile in 2029
- **$48.9 thousand** for new Maintenance Van

Total of **$99.8 Million** in facility acquisitions and **$1.0 Million** for vehicles over 10 years. Facilities acquisitions include **$66.5 Million** for new branches and **$33.5** Million for expansion projects. All of these acquisitions are geared towards increasing system wide branch-hours to maintain and possibly improve current levels of service.

ACQUISITIONS SUMMARY

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 12 : Acquisition Summary
All Figure Values Are Shown In 2023 Dollars



When Hamilton commits to constructing or purchasing new assets, the municipality must be prepared to fund future operations, maintenance, and renewal costs. Hamilton must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by Hamilton. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown in ***Figure 12***. Hamilton will need to address how to best fund these ongoing costs as well as the costs to construct the assets while seeking the highest level of service possible.

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. Examples of typical operational activities include operating assets, utility costs, inspections, and the necessary staffing resources to perform these activities.

Some of the major operational investments over the next 10 years include:

- **$24.9 Million** allocated for employee related costs in 2024 (i.e., salaries, wages, benefits, contractual agreement etc.)

Maintenance should be viewed as the ongoing management of asset deterioration. The purpose of planned maintenance is to ensure that the correct interventions are applied to assets in a proactive manner and to ensure it reaches its 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 for HPL include building component replacements, and vehicle repairs along with appropriate staffing and material resources required to perform these activities.

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

Major maintenance projects the City plans to complete over the next 10 years include:

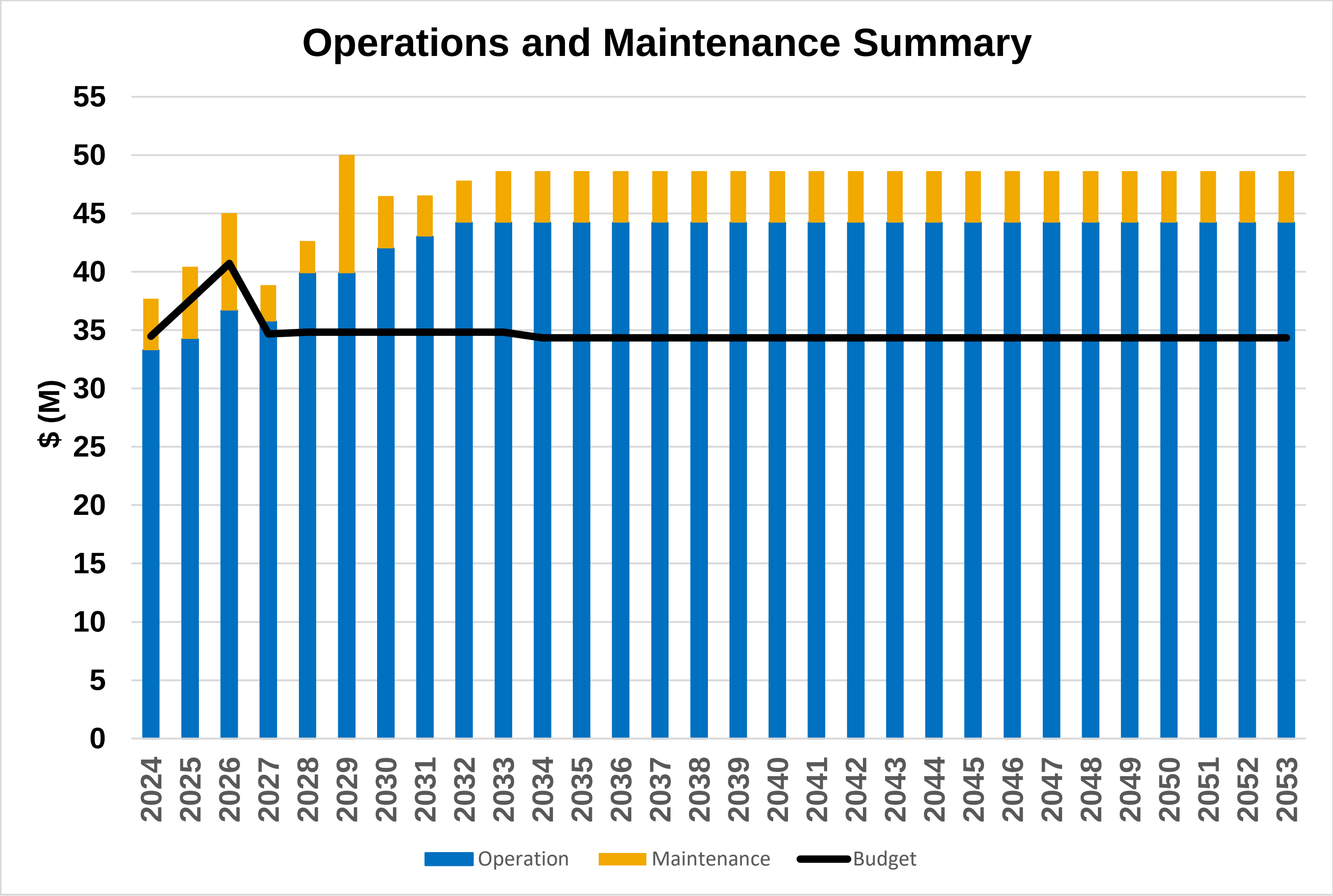
- **$5.0 Million** for Local History and Archives Renovation in 2026. This project entails updating the Central Library third floor to make the Local History and Archives collection more user friendly and accessible to the public. Note that this date for renovation is likely to be pushed back despite being listed as 2026 in HPL's capital budget projections.
- **$2.9 Million** for Mount Hope Library renovation in 2025

The two projects mentioned above are part of HPL’s 10-year capital plan and explain the spike in the budget in years 2025 -2026 in ***Figure 13*** on the following page.

In terms of needs, Building Condition Assessment reports have identified $33.1 Million worth of maintenance work required for HPL facilities over the next 10 years. Most of the needs to relate to Central, Turner Park and Terryberry branches. The most significant needs include replacement of roof, floor and wall finishes, exterior windows, air distribution systems and electric service and distribution.

Forecast operations and maintenance costs vary in relation to the total value of the asset registry. When additional assets are acquired, the future operations and maintenance costs are forecast to increase. When assets are disposed of the forecast operation and maintenance costs are reduced. For this plan operation and maintenance costs are added at 10% and 1% of acquisition cost respectively based on subject matter expert's opinion. Figure 12 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget. It is evident that over the next 10 years, as HPL acquires more branches, its forecasted operations and maintenance needs continue to increase as well.

Figure 13 : Operations and Maintenance Summary
***** All Figure Values Are Shown In 2023 Dollars.***



As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated these operation and maintenance forecasts will change. Future iterations of this plan will provide a more thorough analysis of operations and maintenance costs including types of expenditures for training, mandatory certifications, insurance, staffing costs and requirements, equipment, and maintenance activities.

8.3 RENEWAL PLAN

Renewal is major work which does not increase the assets design capacity but restores, rehabilitates, replaces, or renews an existing asset to its original service potential. Works over and above restoring an asset to 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 those that have the highest consequence of failure, have high usage, have high 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 28*** and are based on estimated design life for this iteration of the AM Plan. 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 28: Estimated Service Lives for Assets

ASSET (SUB)CATEGORY	ESTIMATED SERVICE LIFE (YEARS)
Heritage Facilities (Dundas, Kenilworth, Locke, Mount Hope)	150
All other Facilities	75
Bookmobiles	10
Vans and Trucks	7
Boom Lifts	10
Collection Materials (excl. devices and eBooks)	8
Data Center Assets	12
Networking Equipment	12
Staff Computers	5
Staff Laptops	4
Mobile Devices	4
Printers	9

ASSET (SUB)CATEGORY	ESTIMATED SERVICE LIFE (YEARS)
Public Computers	8
PACS - ELO	12
Sorters	12
Self-Check Equipment	12
Security Cameras	8
Makerspace Equipment	6

The estimates for renewals in this AM Plan were based on the register method which utilizes the data from HPL's asset registry to analyse all available lifecycle information and then determine the optimal timing for renewals based on the ESL.

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., library branches remain open for service hours); or,
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. IT equipment is in acceptable condition)[5]

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

- Have a high consequence of failure;
- Have high use and subsequent impact on users would be significant;
- Have higher than expected operational or maintenance costs; and,
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[6]

SUMMARY OF FUTURE RENEWAL COSTS

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 14.***

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.

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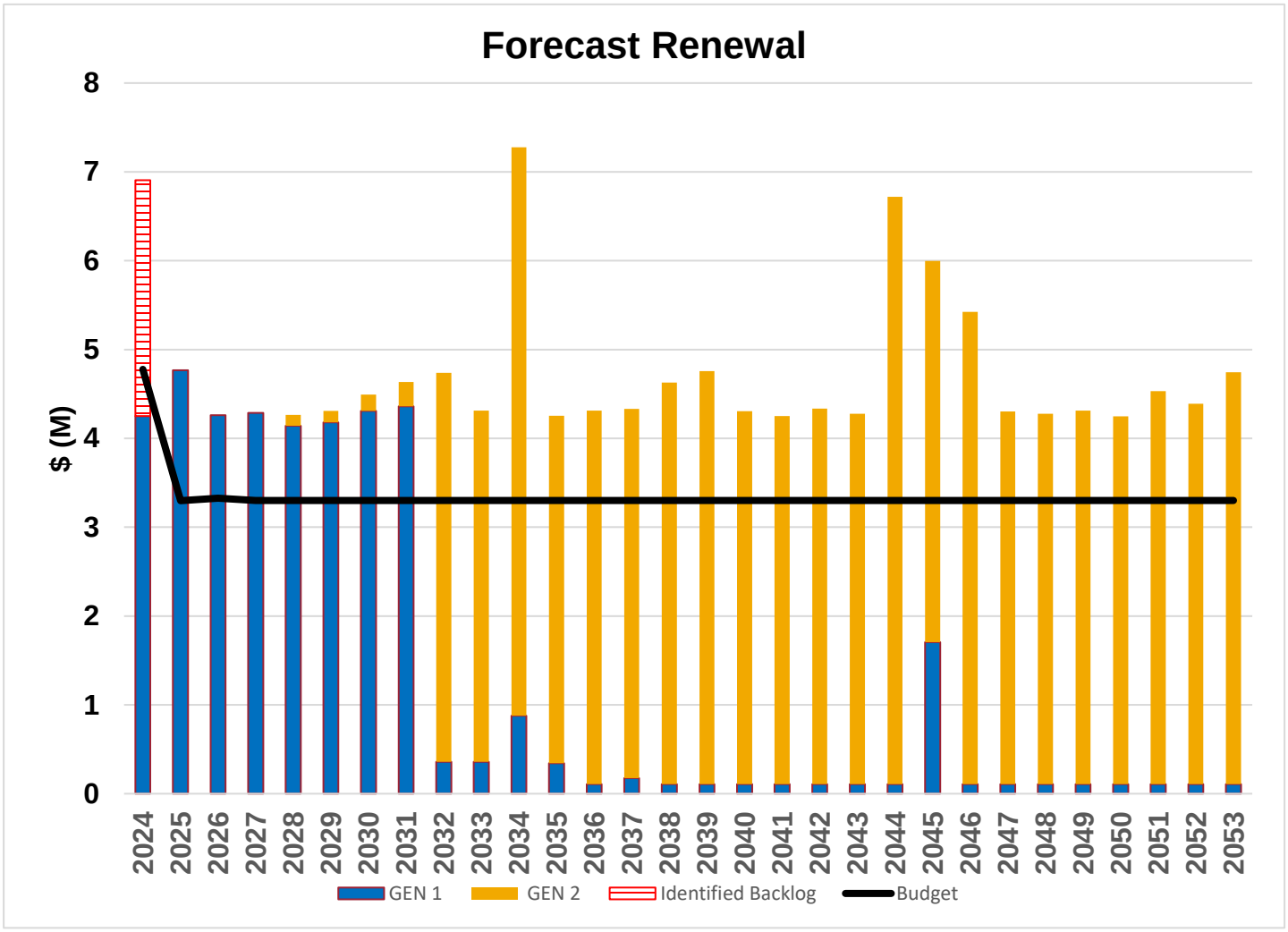
[5] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[6] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

Figure 14: Forecast Renewal Costs
***** All Figure Values Are Shown In 2023 Dollars.***



Currently, HPL has a backlog amount of approximately $2.7M. The major backlog items include:

- $2.4 Million for Bookmobiles which are expected to be replaced in 2026
- $300K in for various assets including utility vehicles, technology assets and digitization equipment.

The planned renewal works over the 10-year planning horizon include:

- Replacement of vehicles as they reach the end of useful life;
- Replacement of technology assets as they reach the end of useful life; and,
- Replacement of collection materials as they reach the end of useful life.

Every year the biggest contributors to renewal needs are collection materials ($3.7 Million need compared $2.4 Million budget) and technology assets ($100K need compared to $24K budget). For this plan, only complete replacement of building is considered renewal. Any replacement of a component is taken to be maintenance cost. As a result, facilities do not contribute to renewal needs.

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 structure has fallen.

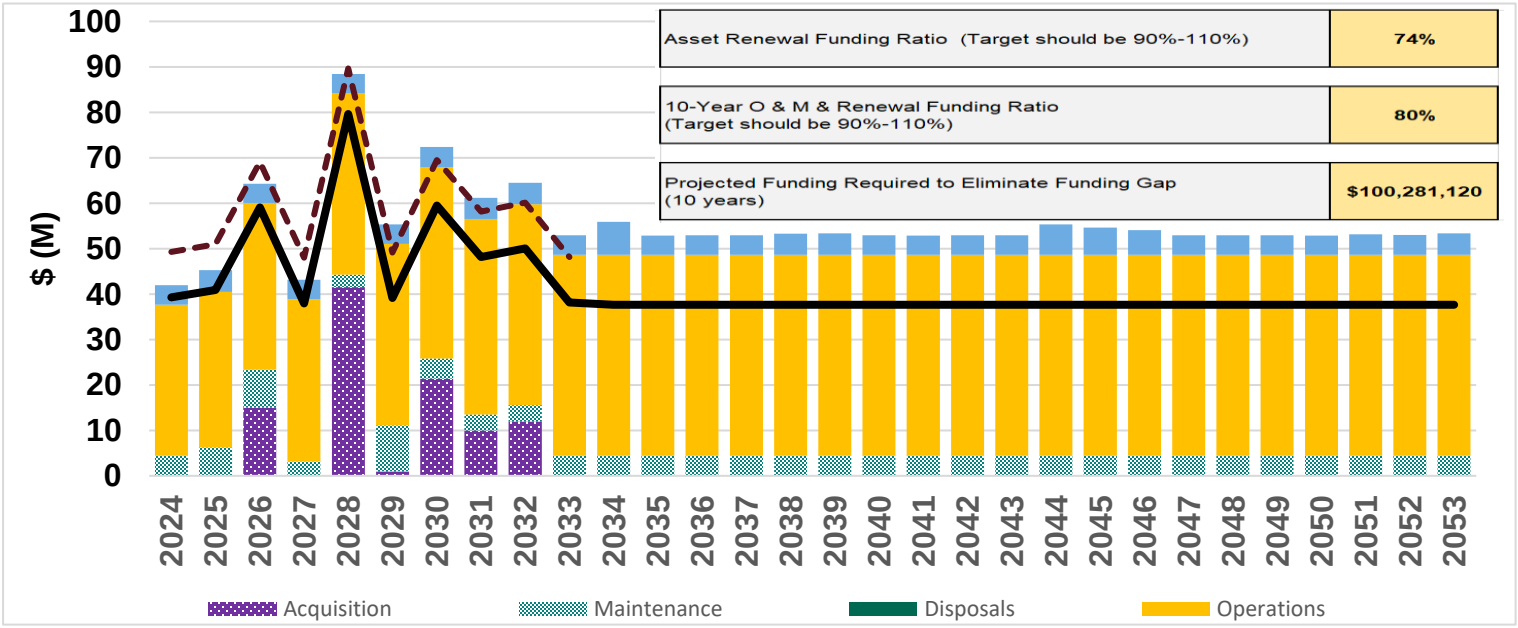
Currently, no assets have been identified for disposal by HPL.

8.5 LIFECYCLE COST SUMMARY

The financial projections from this asset plan are shown in ***Figure 15.*** 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 balance between costs, levels of service and risk to achieve the best value outcome.

Figure 15: Lifecycle Summary
All Figure Values Are Shown In 2023 Dollars



There is typically insufficient budget to address the planned lifecycle activities for the 2024-2033 planning period which may result in an eventual reduction in levels of service if not addressed. HPL will also need to increase their operating budget beyond the status quo to support the acquisitions described in ***Section 8.1.***

The current gap comes from these main sources: insufficient budget to meet current facility maintenance needs, additional (as yet unbudgeted) operations and maintenance expenditure for new facility acquisitions, unfunded Bookmobile renewals in backlog, as well as underfunded collection materials and technology assets renewals.

The City will continue to improve its lifecycle data, and this will allow for informed choices as how best to mitigate impacts and how to address the funding gap itself. This gap in funding for future plans will be refined over the next three years to improve the confidence and accuracy of the forecasts.

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 HPL 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 customers while keeping costs at an affordable level and maintaining its financial sustainability.

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

Aligning the LTFP with the AM Plan is critical to ensure all of the network's 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[7] **73.5%**

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 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.

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

Over the next 10 years the City expects to have **73.5%** of the funds required for the optimal renewal of assets. This is clearly not enough to reliably renew HPL's assets. Major contributors to unfunded renewals include collection materials and technology 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 O&M and Renewal Ratio 80%

Although this AM Plan includes forecast projections to 30-years, the higher confidence numbers are typically within the first 10-years of the lifecycle forecast. The 10-year Lifecycle Financial Ratio compares the Planned Budget with the Lifecycle 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 AARF, 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 **$49 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 **$39 Million** on average per year giving a 10-year funding shortfall **of $10 Million** per year or **$100 Million** over the 10 year planning period. This indicates that **80%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget, which is within the 90-110% range. Therefore, it can be concluded that HPL is funding their assets at an acceptable rate. Note, that these calculations exclude acquired assets.

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 29 shows the forecast costs (outlays) required for consideration in the 10-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.

These options will be explored in the next AM Plan and the City will provide analysis and options for Council to consider going forward.

**** Forecast Costs Are Shown In 2023 Dollar Values**

Table 29: Forecast Costs (Outlays) For the Long-Term Financial Plan

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2024	$0	$33,275,856	$0	$6,906,080	$0
2025	$48,900	$34,244,644	$6,196,783	$4,766,440	$0
2026	$15,000,000	$36,679,516	$8,348,957	$4,260,543	$0
2027	$0	$35,733,340	$3,118,806	$4,287,218	$0
2028	$41,500,000	$39,883,340	$2,765,212	$4,262,840	$0
2029	$1,000,000	$39,883,340	$10,137,254	$4,310,035	$0
2030	$21,360,000	$42,019,340	$4,487,391	$4,492,733	$0
2031	$10,000,000	$43,019,340	$3,538,139	$4,634,881	$0

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2032	$11,940,000	$44,213,340	$3,594,650	$4,737,040	$0
2033	$0	$44,213,340	$4,419,128	$4,313,038	$0
2034	$0	$44,213,340	$4,419,127	$7,276,100	$0
2035	$0	$44,213,340	$4,419,127	$4,255,240	$0
2036	$0	$44,213,340	$4,419,127	$4,311,306	$0
2037	$0	$44,213,340	$4,419,127	$4,332,040	$0
2038	$0	$44,213,340	$4,419,127	$4,627,888	$0
2039	$0	$44,213,340	$4,419,127	$4,756,833	$0
2040	$0	$44,213,340	$4,419,127	$4,304,640	$0
2041	$0	$44,213,340	$4,419,127	$4,250,881	$0
2042	$0	$44,213,340	$4,419,127	$4,333,947	$0
2043	$0	$44,213,340	$4,419,127	$4,276,440	$0
2044	$0	$44,213,340	$4,419,127	$6,718,235	$0
2045	$0	$44,213,340	$4,419,127	$5,997,800	$0
2046	$0	$44,213,340	$4,419,127	$5,424,209	$0
2047	$0	$44,213,340	$4,419,127	$4,302,240	$0
2048	$0	$44,213,340	$4,419,127	$4,278,485	$0
2049	$0	$44,213,340	$4,419,127	$4,312,435	$0
2050	$0	$44,213,340	$4,419,127	$4,248,502	$0
2051	$0	$44,213,340	$4,419,127	$4,531,879	$0
2052	$0	$44,213,340	$4,419,127	$4,388,640	$0
2053	$0	$44,213,340	$4,419,127	$4,745,240	$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 more detailed service delivery options and alternatives to optimize limited financial resources.

9.4 VALUATION FORECASTS

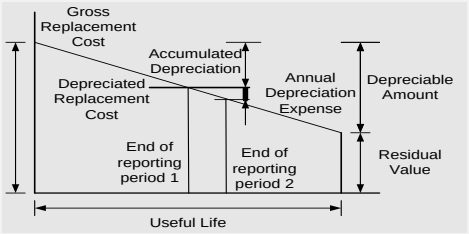
Asset values are forecast to increase as additional assets are added into service. As projections improve and can be validated with market pricing, the net valuations will increase significantly.

Additional assets will add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs for 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 would remove the high costs 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 VALUATIONS

The best available estimate of the value of assets included in this AM Plan are shown below. The assets are valued at estimated replacement costs:

Replacement Cost (Current/Gross)	**$424,880,813**
Depreciable Amount	**$424,880,813**
Depreciated Replacement Cost[8]	**$250,161,696**
Depreciation	**$ 8,726,381**



The current replacement cost is the most common valuation approach for specialized infrastructure assets. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets) and useful lives, determining the appropriate depreciation method, testing for impairments, and determining remaining useful life.

As the City matures its asset data, it is highly likely that these valuations will fluctuate significantly over the next three years, and they should increase over time based on improved market

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

equivalent costs as well as anticipated cost changes due to climate change mitigation and adaptation strategies.

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 encompass additional operational need estimates where already quantified;
- Maintenance forecasts are based on current budget allocations and encompass anticipated needs where known;
- Replacement costs were based on current pricing. They were also made without determining what the asset would be replaced with in the future (e.g. hydrogen vehicles were not encompassed in replacement costs).

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 on ***Page 31*** in the AM Plan Overview.

Table 30: Data Confidence Assessment for Data Used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand Drivers	Medium	The impacts from the identified demand drivers were not added to lifecycle model for this iteration of the AM plan.
Acquisition Forecast	Medium	Used HPL's 10-Year Capital Plan for anticipated acquisitions which are subject to change.
Operation Forecast	Low	Operation needs for new acquisitions are added as 10% of acquisition cost for each subsequent year.
Maintenance Forecast	Low	Maintenance needs encompass current forecast needs per the Building Condition Assessment as well maintenance needs for new facilities that are planned to be acquired over the next 10 years. Maintenance needs for new acquisitions are added as 1% of acquisition cost for each subsequent year.
Renewal Forecast - Asset Values	Medium	A combination of market and historical costs was used for renewal costs of technology assets,

DATA	CONFIDENCE ASSESSMENT	COMMENT
		vehicles, and collection materials with medium confidence. No local history assets and facilities assets are due for renewal in the planned period.
Renewal Forecast - Asset Useful Lives	Medium	Estimated service lives are based on subject matter expert's opinion for all asset classes.
Renewal Forecast- Condition Modelling	Medium	Condition was known for facilities based on Building Condition Assessment Reports. For vehicles and technology assets, it was based on subject matter expert's opinion and no condition information was available for collection material and local history assets.
Disposal Forecast	Not Applicable	No disposals were integrated into the forecast.

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

10. PLAN IMPROVEMENT AND MONITORING

10.1 STATUS OF ASSET MANAGEMENT PRACTICES[9]

ACCOUNTING AND FINANCIAL DATA SOURCES

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

- 2023 HPL 10-Year Capital Plan:
- 2023 HPL Operating Budget;
- 2024-2026 HPL Multi-Year Operating Forecast;
- 2024 Corporate Facilities and Energy Management Capital Budget;
- Building Condition Assessment reports;
- Various internal 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 databases;
- Asset Management Data Collection Templates;
- Development Charges Collection Template;
- Condition assessments; and,
- Subject matter Expert Opinion and Anecdotal Information.

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 and improved financial planning to plans to physically improve the assets.

The Improvement plan ***Table 31*** below highlights proposed improvement items that will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. Future iterations of this AM Plan will provide updates on these improvement plans. The costs and resources to complete each of these tasks has not been included in the lifecycle models to data, and resource requirements would need to be reviewed for internal resource driven projects.

[9] ISO 55000 Refers to this as the Asset Management System

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

Table 31: Improvement Plan
****p.a. – per annum***

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1.	Update HPL Branch Building Condition Assessments	CFEM	Internal Resources and External Consultant	2026
2.	Complete Exterior Site Management Plans for all branches (climate change management)	HPL Facilities	Internal Resources	2025
3.	Compile fixture and furniture inventory for all HPL branches	HPL Facilities	Internal Resources	2025
4.	Update HPL's Facilities Master Plan	HPL Facilities	Internal Resources	2025
5.	Develop an average annual sustainable funding amount to budget for major digital technology equipment replacement purchases.	HPL	Internal Resources	2024
6.	Develop an average annual sustainable funding amount to budget for bookmobile replacements.	HPL	Internal Resources	2026
7.	Establishing consistency in asset purchases across all Makerspaces	HPL - Digital Technology Services	Internal Resources	2024
8.	Establish a tracking system of expiry dates for subscriptions and licenses. Integrate with existing asset management inventory sheet.	HPL - Digital Technology Services	Internal Resources	2024
9.	Appraisal of all corporate art and archival accessions to improve data confidence of collection value.	HPL - Local History and Archives	Dedicated annual budget line ($15,000)	Ongoing; 10-15 years for initial appraisals depending on budget; ongoing reappraisal for more valuable pieces (every 15 to 20 years)
10.	Investigate developing condition scoring methodology for collection material assets.	HPL - Collections	Internal Resources	2024

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
11.	Document IT Procurement process and communicate to staff to ensure asset information is tracked for all new assets.	HPL - DT	Internal Resources	2025
12.	Investigate developing condition assessment methodology for significant technology assets and review estimated service lives.	HPL - DT	Internal Resources	Ongoing
13.	Investigate developing condition and collection assessment methodologies for Local History and Archive collections.	HPL - Local History and Archives	Internal Resources	2029
14.	Calculate average transit travel time to HPL facilities as a measure of technical level of service.	HPL/CAM/IT	Within existing capacity	2024

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 10-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 achieving the Organizational target (this target is 90-100%).

HAMILTON PUBLIC LIBRARY ASSET MANAGEMENT PLAN

Appendix A – Survey Analysis

Hamilton
Corporate Asset Management

Hamilton Public Library

Survey Period: September 5th - October 10, 2023

November 2023

Hamilton Public

Survey Response Demographics

09/05/2023 to 10/10/2023

84	74	6	5170	503
Respondents	Survey Questions	Demographic Questions	Survey Responses	Demographic Responses

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Age	% Pop. by Age	% of Respondents	Respondents
18 to 34	22.1%	19.0%	16
35 to 64	41.7%	58.3%	49
65+	19.5%	20.2%	17

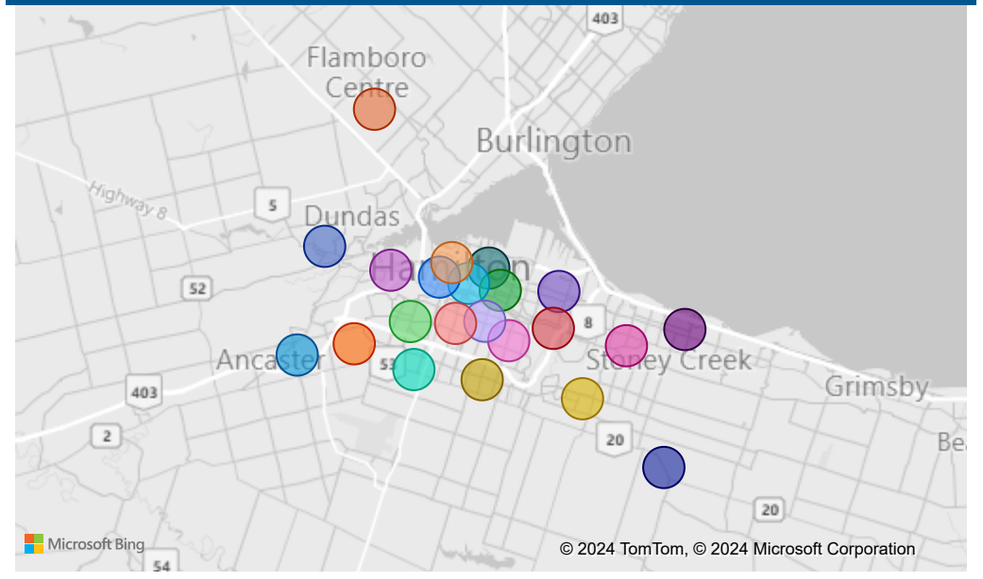
Gender	% of Respondents	Respondents
Female	70.2%	59
Male	23.8%	20
Other	6.0%	5

Residency	% of Respondents	Respondents
I live in Hamilton	92.9%	78
I work in Hamilton	44.0%	37
I'm retired	21.4%	18
Other	10.7%	10

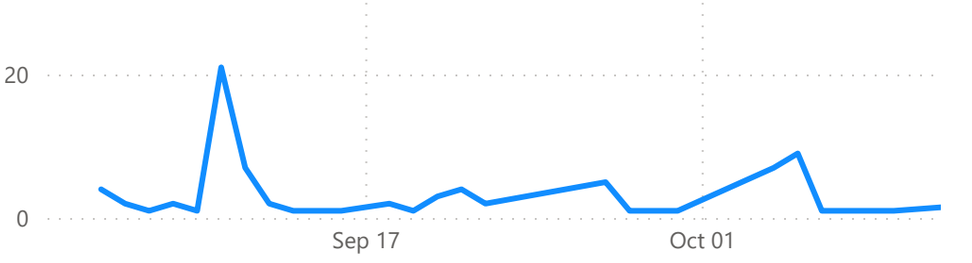
Identity	% of Respondents	Respondents
I do not identify with any of the other groups	57.1%	48
Marginalized group	40.5%	42

Region	% Pop. by Region	Population	% of Respondents	Respondents
Lower	45.6%	432,375	61.9%	52
Upper	37.3%	353,485	23.8%	20
Rural	17.1%	161,840	8.3%	7

Respondent Density Map



Respondents by Day



Responses	Respondents
3785	84

Summary of Survey Results

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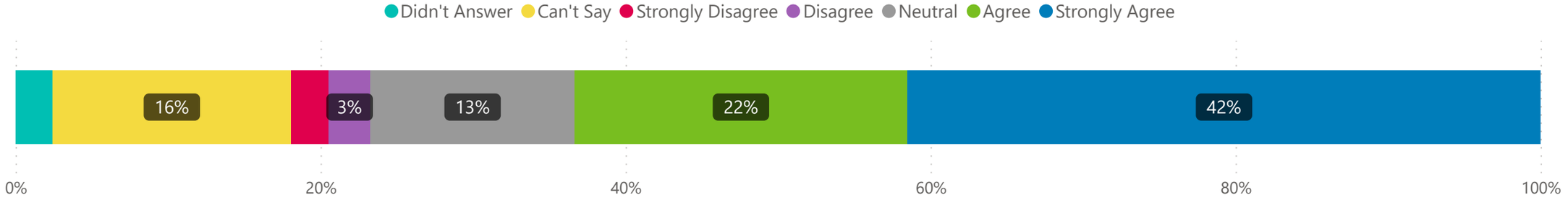
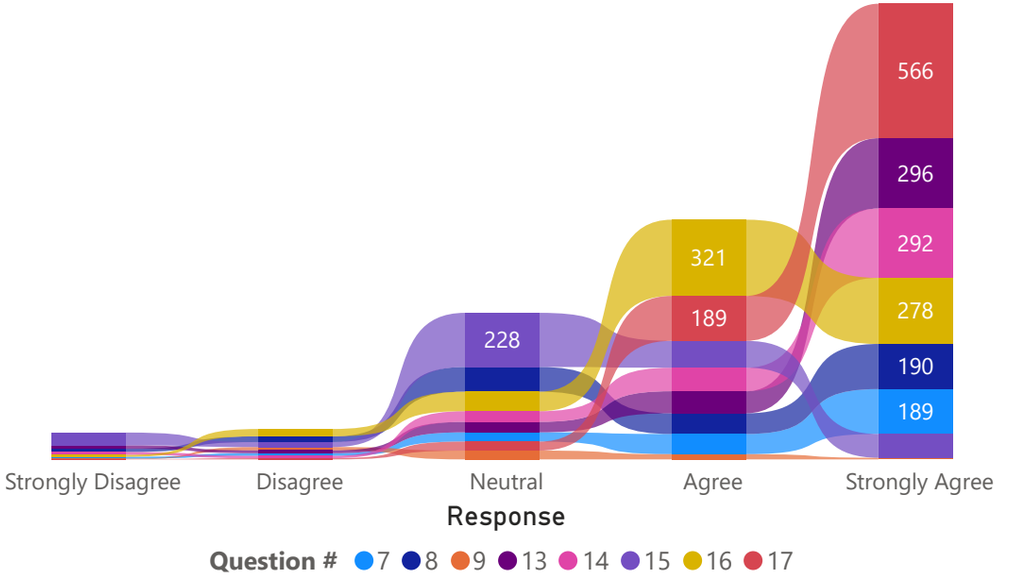
Hamilton



Questions	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.02**	**4.19**	**83.7%**	**835**	**18.07%**
Q17 Importance of Services	0.61	4.64	92.9%	41	4.88%
Q14 Value for Money	0.94	4.42	88.3%	130	22.11%
Q13 Recommend to Others	0.98	4.41	88.1%	129	21.94%
Q7 Satisfaction with Services	0.97	4.31	86.3%	172	34.13%
Q16 Performance of Services	0.87	4.15	83.1%	120	14.29%
Q8 Services Meeting Needs	1.11	3.99	79.8%	169	28.74%
Q15 Tax Rates	1.15	3.36	67.1%	72	12.24%
Q9 Library Placement	0.91	3.22	64.4%	2	2.38%



Responses	Respondents
4317	84

Survey Question Summary

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Question #	Survey Question	n (Sample Size)	σ (Consistency)	Margin of Error (Confidence Level ±)
7	In the last 24 months if you have used Hamilton Public Library services, how satisfied are you with your ability to access services?	47	0.97	14%
8	Do the following Hamilton Public Library services meet your needs?	60	1.11	13%
9	Based on the map above and your experience accessing libraries in Hamilton, does the placement of Hamilton Public Library branches meet your needs?	82	0.91	11%
10	One of Hamilton Public Library Design Principles is that libraries should be spaced throughout the city so that no resident (or as few as possible) need to travel more than 15 minutes to reach a library. Travel time is defined as transit use where transit is available and car use where no transit is available. Does the HPL's target of having a library location within a 15-minute travel time from each Hamilton resident meet your needs?	81	0.99	11%
11	Did you feel comfortable accessing the following Hamilton Public Library services?	64	0.93	12%
13	How likely would you be to recommend the following Hamilton Public Library service to others?	66	0.98	12%
14	Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?	65	0.94	12%
15	If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?	74	1.15	11%
16	Thinking about how you use libraries, do you agree with the following statements?	72	0.87	12%
17	Thinking about how you want to use the library, do you agree with the following statements?	80	0.61	11%

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Question
7

Responses
332

Respondents
83

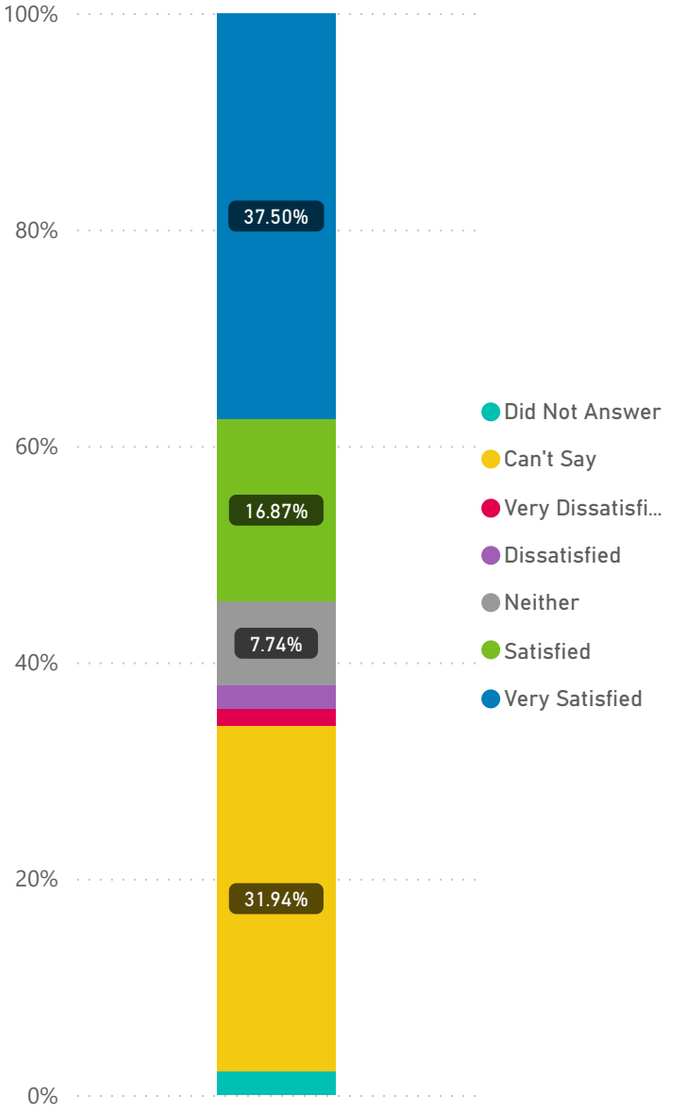
Question

Satisfaction with Services

In the last 24 months if you have used Hamilton Public Library services, how satisfied are you with your ability to access services?

Service Area	Very Dissatisfied	Dissatisfied	Neither	Satisfied	Very Satisfied
Total	**8**	**11**	**39**	**85**	**189**
Public Computers	1		8	10	24
Programs and Classes	2	5	9	10	13
Library Locations and Spaces	2	3	7	24	41
Free Wi-Fi	1	1	5	11	32
Connecting Customers to Information and Community Resources	1	2	6	17	21
Checkout and Renewal Process	1		4	13	58

Service Area	σ	Avg.	Opt Out	Opt Out %
Total	**0.97**	**4.31**	**172**	**34.1%**
Checkout and Renewal Process	0.70	4.67	8	9.5%
Free Wi-Fi	0.90	4.44	34	40.5%
Public Computers	0.93	4.30	41	48.8%
Library Locations and Spaces	0.97	4.29	7	8.3%
Connecting Customers to Information and Community Resources	0.95	4.17	37	44.0%
Programs and Classes	1.20	3.69	45	53.6%



Respondents who did not answer or selected 'Can't Say' are included in opt out.

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Question
8

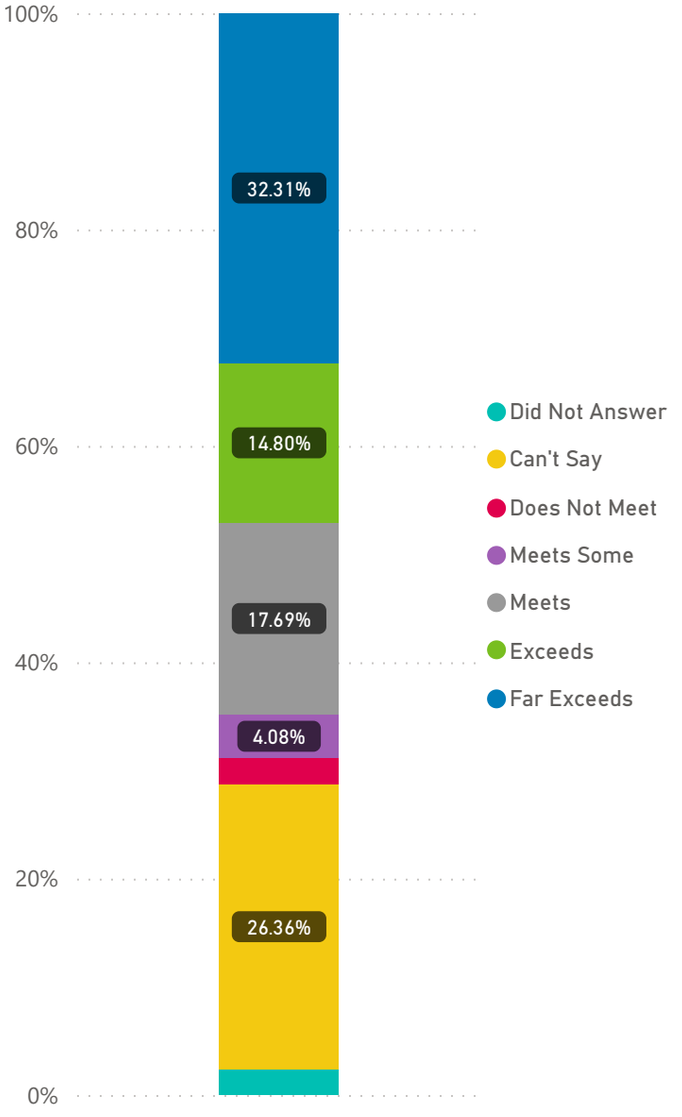
Responses
419

Respondents
81

Services Meeting Needs

Do the following Hamilton Public Library services meet your needs?

Service Area	Does Not Meet	Meets Some	Meets	Exceeds	Far Exceeds
Total	**14**	**24**	**104**	**87**	**190**
Public Computers	1	1	18	9	17
Programs and Classes	5	9	11	5	13
Library Locations and Spaces	3	8	15	16	36
Free Wi-Fi	1	1	12	11	26
Connecting Customers to Information and Community Resources	2	1	10	15	21
Collection Materials	1	4	22	18	28
Checkout and Renewal Process	1		16	13	49



Service Area	σ	Avg.	Opt Out	Opt Out %
Total	**1.11**	**3.99**	**169**	**28.7%**
Checkout and Renewal Process	0.89	4.38	5	6.0%
Free Wi-Fi	0.98	4.18	33	39.3%
Connecting Customers to Information and Community Resources	1.04	4.06	35	41.7%
Library Locations and Spaces	1.19	3.95	6	7.1%
Collection Materials	1.01	3.93	11	13.1%
Public Computers	1.01	3.87	38	45.2%
Programs and Classes	1.39	3.28	41	48.8%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

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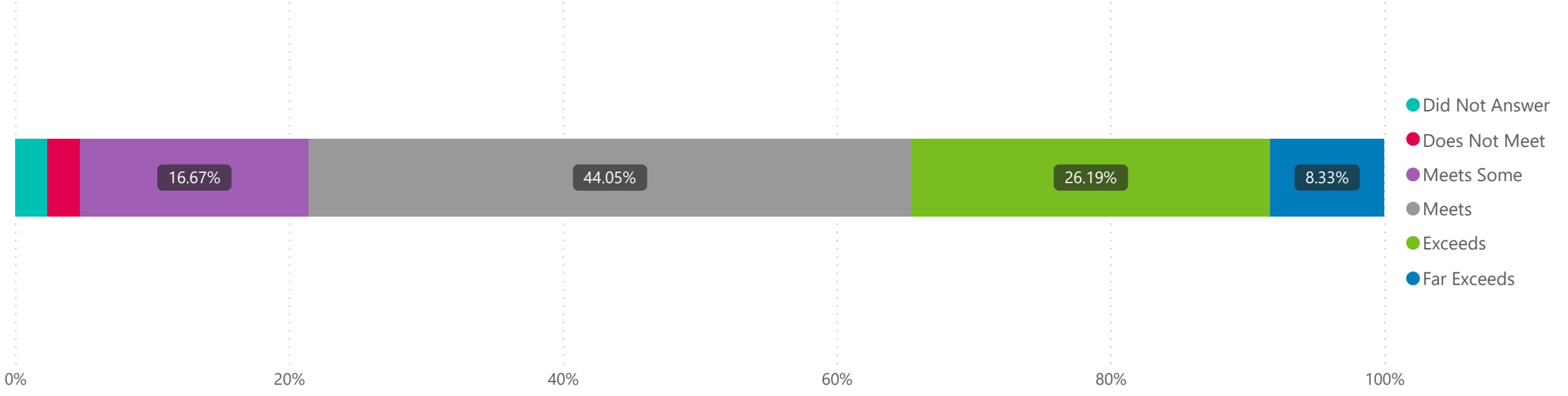
Question
9

Responses
82

Respondents
82

Library Placement

Based on the map above and your experience accessing libraries in Hamilton, does the placement of Hamilton Public Library branches meet your needs?



Service Area	Does Not Meet	Meets Some	Meets	Exceeds	Far Exceeds	σ	Avg.	Avg. %	Opt Out	Opt Out %
Based on the map above and your experience accessing libraries in Hamilton, does the placement of Hamilton Public Library branches meet your needs?	2	14	37	22	7	0.91	3.12	64.4%	2	2.38%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

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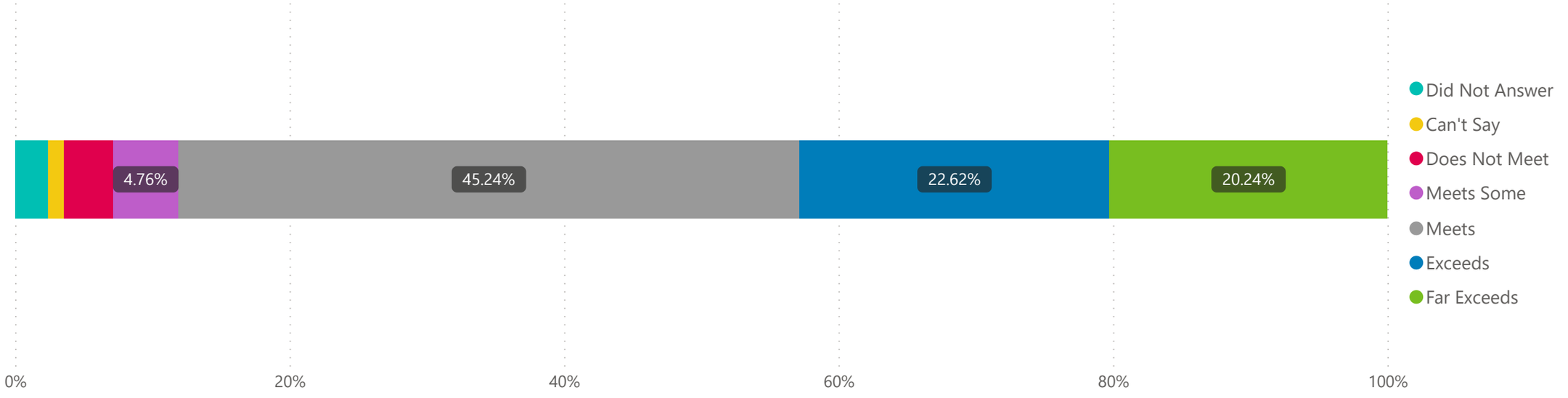
Question
10

15-Minute Travel Time

Does the HPL's target of having a library location within a 15-minute travel time from each Hamilton resident meet your needs?

Responses
82

Respondents
82



Service Area	Does Not Meet	Meets Some	Meets	Exceeds	Far Exceeds	Avg.	Avg. %	σ	Opt Out	Opt Out %
One of Hamilton Public Library Design Principles is that libraries should be spaced throughout the city so that no resident (or as few as possible) need to travel more than 15 minutes to reach a library	3	4	38	19	17	3.38	70.6%	0.99	3	3.57%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

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Question
11

Safe and Comfortable Access

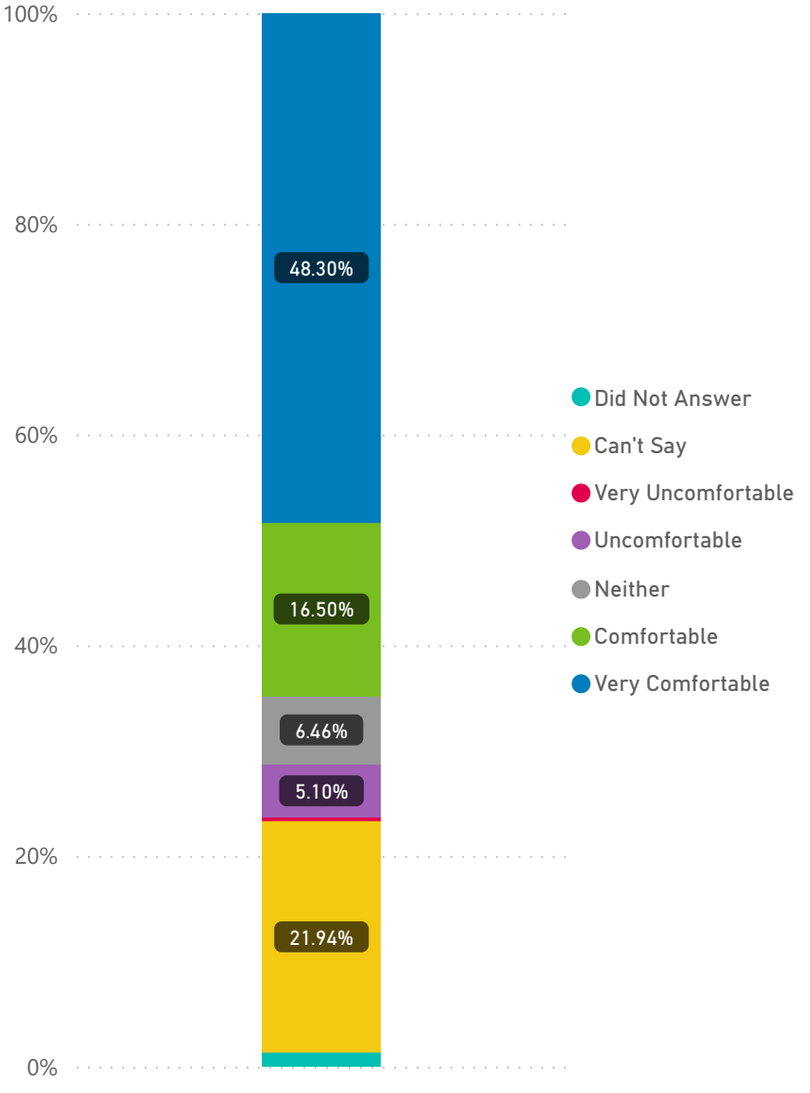
Did you feel comfortable accessing the following Hamilton Public Library services?

Responses
451

Respondents
82

Service Area	Very Uncomfortable	Uncomfortable	Neither	Comfortable	Very Comfortable
Total	**2**	**30**	**38**	**97**	**284**
Public Computers		4	7	11	33
Programs and Classes		9	3	11	27
Library Locations and Spaces	1	5	9	17	44
Free Wi-Fi		4	4	11	39
Connecting Customers to Information and Community Resources	1	3	7	17	30
Collection Materials		3	5	18	50
Checkout and Renewal Process		2	3	12	61

Service Area	σ	Avg.	Opt Out	Opt Out %
Total	**0.93**	**4.40**	**137**	**23.3%**
Checkout and Renewal Process	0.67	4.69	6	7.1%
Collection Materials	0.79	4.51	8	9.5%
Free Wi-Fi	0.89	4.47	26	31.0%
Public Computers	0.95	4.33	29	34.5%
Library Locations and Spaces	1.00	4.29	8	9.5%
Connecting Customers to Information and Community Resources	0.97	4.24	26	31.0%
Programs and Classes	1.14	4.12	34	40.5%



Respondents who did not answer or selected 'Can't Say' are included in opt out.

Corporate Asset Management
City Services & Asset Review
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Hamilton

Question
12

Models of Service Delivery

How can we improve our services or spaces to increase how comfortable you felt?

Responses
48

Respondents
48

Open Text Responses

Corporate Asset Management
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Hamilton

Question
13

Responses
459

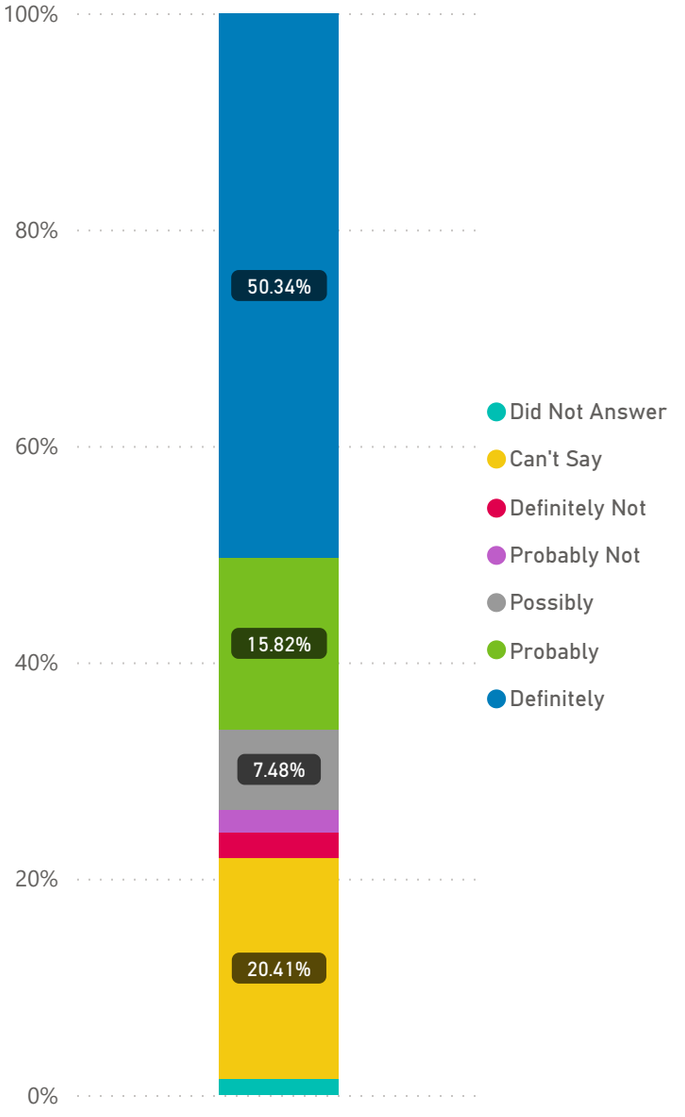
Respondents
83

Recommend to Others

How likely would you be to recommend the following Hamilton Public Library service to others?

Service Area	Definitely Not	Probably Not	Possibly	Probably	Definitely
Total	**14**	**12**	**44**	**93**	**296**
Public Computers	2	2	9	12	34
Programs and Classes	3	2	6	10	31
Library Locations and Spaces	2	3	5	20	47
Free Wi-Fi	3	1	5	9	44
Connecting Customers to Information and Community Resources	1	2	5	15	33
Collection Materials	1	1	8	16	49
Checkout and Renewal Process	2	1	6	11	58

Service Area	σ	Avg.	Opt Out	Opt Out %
Total	**0.98**	**4.41**	**129**	**21.9%**
Checkout and Renewal Process	0.89	4.56	6	7.1%
Collection Materials	0.84	4.48	9	10.7%
Free Wi-Fi	1.04	4.45	22	26.2%
Library Locations and Spaces	0.96	4.39	7	8.3%
Connecting Customers to Information and Community Resources	0.92	4.38	28	33.3%
Public Computers	1.05	4.25	25	29.8%
Programs and Classes	1.15	4.23	32	38.1%



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Question
13

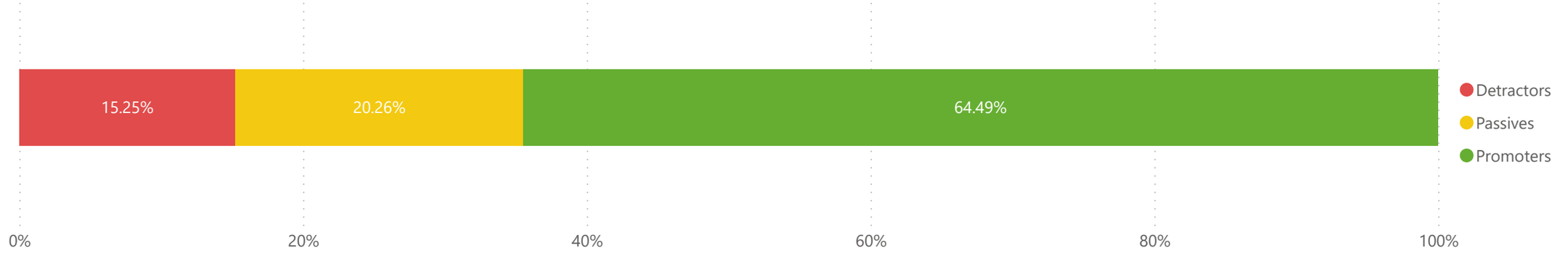
Net Promoter Score

Typically the Net Promoter Score is used to measure customer loyalty.

How likely would you be to recommend the following Hamilton Public Library service to others?

Responses
459

Respondents
83



Service Area	σ	NPS	Detractors	Passives	Promoter
All Service Areas	**19.6%**	**49.24**	**70**	**93**	**296**
Checkout and Renewal Process	17.7%	62.82	9	11	58
Free Wi-Fi	20.8%	56.45	9	9	44
Collection Materials	16.8%	52.00	10	16	49
Library Locations and Spaces	19.1%	48.05	10	20	47
Connecting Customers to Information and Community Resources	18.3%	44.64	8	15	33
Programs and Classes	23.1%	38.46	11	10	31
Public Computers	21.0%	35.59	13	12	34

Likert choices less than 4 are considered 'Detractors' while 5s are considered 'Promoters' and 4s are 'Passive'. Respondents who opted out by not answering or selecting 'Can't Say' were removed from the sample. Net Promoter score is calculated by subtracting (% Detractors) from (% Promoters). σ (Standard Deviation) is calculated in percent, the same units as the Net Promoter Score.

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Question
14

Responses
458

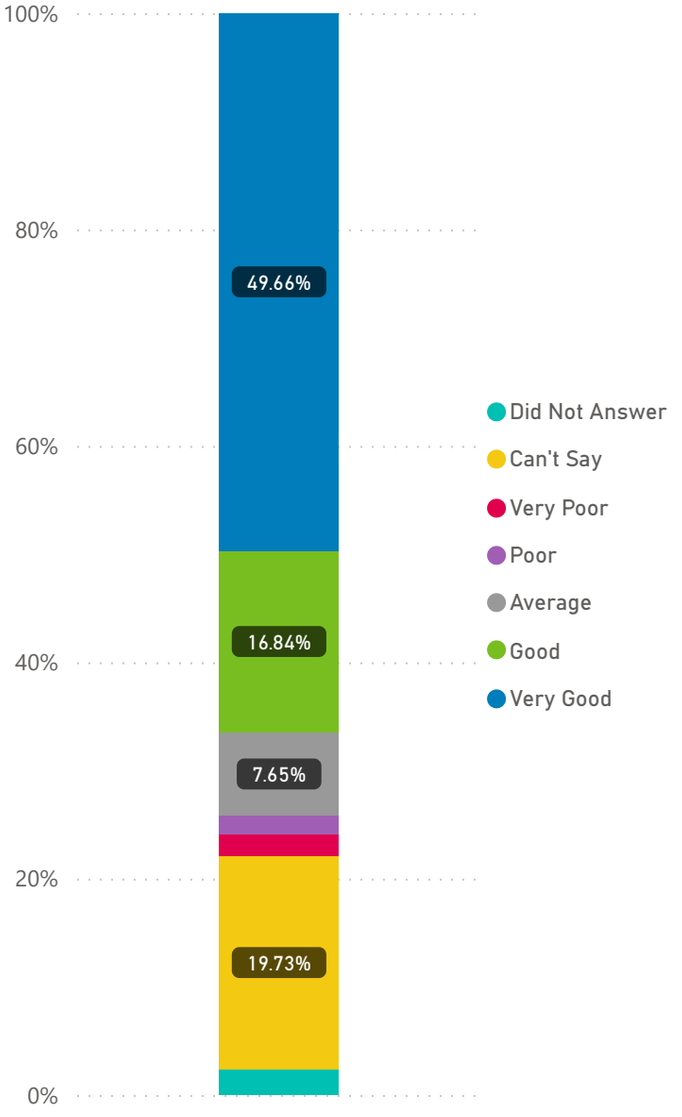
Respondents
83

Value for Money

Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?

Service Area	Very Poor	Poor	Average	Good	Very Good
Total	**12**	**10**	**45**	**99**	**292**
Public Computers	1	1	6	12	39
Programs and Classes	2	3	7	16	28
Library Locations and Spaces	3	3	4	18	47
Free Wi-Fi	2		4	12	41
Connecting Customers to Information and Community Resources	2	1	9	8	37
Collection Materials	1	2	9	19	45
Checkout and Renewal Process	1		6	14	55

Service Area	σ	Avg.	Opt Out	Opt Out %
Total	**0.94**	**4.42**	**130**	**22.1%**
Checkout and Renewal Process	0.74	4.61	8	9.5%
Free Wi-Fi	0.89	4.53	25	29.8%
Public Computers	0.87	4.47	25	29.8%
Collection Materials	0.89	4.38	8	9.5%
Library Locations and Spaces	1.03	4.37	9	10.7%
Connecting Customers to Information and Community Resources	1.03	4.35	27	32.1%
Programs and Classes	1.07	4.16	28	33.3%



Respondents who opted out by not answering or selecting 'Can't Say' are included in opt out.

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Hamilton Public Library
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Hamilton

Question
15

Responses
516

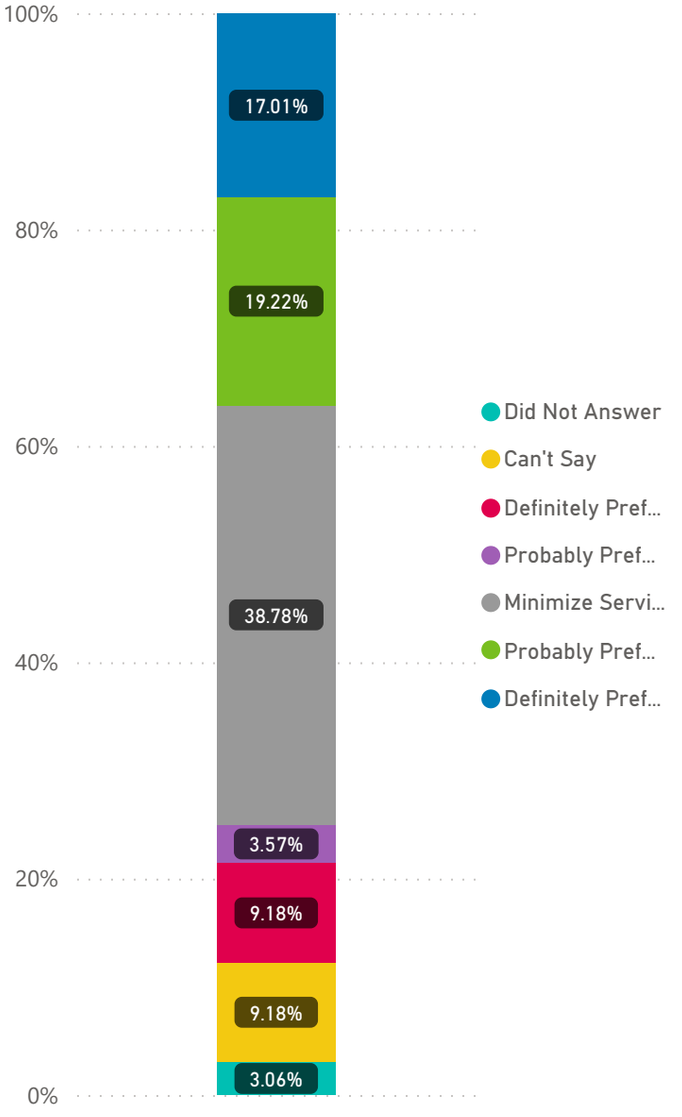
Respondents
80

Tax Rates

If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?

Service Area	Definitely Prefer Service Cuts	Probably Prefer Service Cuts	Minimize Service Cuts, Maintain Rates	Probably Prefer Rate Rise	Definitely Prefer Rate Rise
Total	**54**	**21**	**228**	**113**	**100**
Public Computers	9	4	31	17	14
Programs and Classes	8	5	28	15	14
Library Locations and Spaces	10	2	25	22	18
Free Wi-Fi	7	2	37	13	14
Connecting Customers to Information and Community Resources	9	4	36	11	12
Collection Materials	6	3	31	20	15
Checkout and Renewal Process	5	1	40	15	13

Service Area	σ	Avg.	Opt Out	Opt Out %
Total	**1.15**	**3.36**	**72**	**12.2%**
Library Locations and Spaces	1.24	3.47	7	8.3%
Collection Materials	1.10	3.47	9	10.7%
Checkout and Renewal Process	1.01	3.41	10	11.9%
Free Wi-Fi	1.11	3.34	11	13.1%
Programs and Classes	1.20	3.31	14	16.7%
Public Computers	1.19	3.31	9	10.7%
Connecting Customers to Information and Community Resources	1.16	3.18	12	14.3%



Respondents who opted out by not answering or selecting 'Can't Say' are included in opt out.

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Question
16

Responses
720

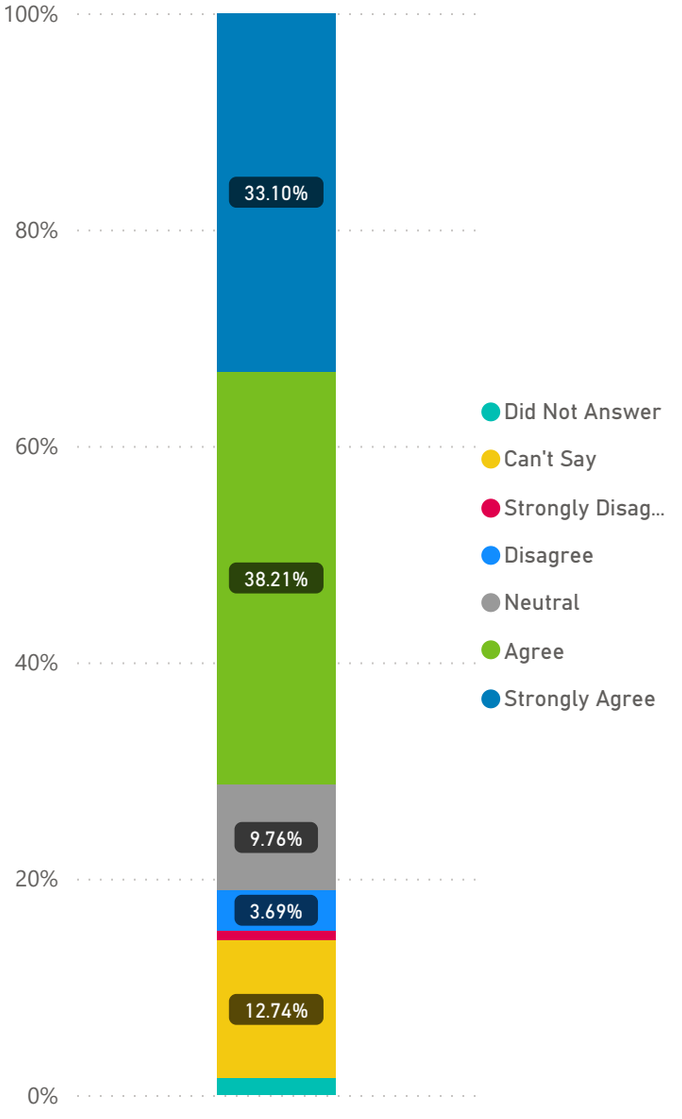
Respondents
83

Performance of Services

Thinking about how you use libraries, do you agree with the following statements?

Service Area	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Total	**8**	**31**	**82**	**321**	**278**
Safe, equitable and inclusive spaces for all.	2	4	8	32	34
Inviting, appealing and attractive	1	5	9	38	30
Energy efficient, helping the city meet energy targets and reduce utility usage.	1	2	5	17	14
Easy to enter, with clearly marked public entrances.		2	8	37	34
Comfortable with appropriate levels of lighting and noise.		5	9	39	30
Clean and in good repair.		5	8	42	28
Accessible, meeting provincial minimum standards per AODA, 2005.	1	2	4	35	30
Accessible by public transportation.	1	2	10	38	27
The public computers are fast, reliable and secure.	1	1	14	15	15
Connecting members to information and services should be an important service for Hamilton Public Library to provide.	1	3	7	28	36

Service Area	σ	Avg.	Opt Out	Opt Out %
Total	**0.87**	**4.15**	**120**	**14.3%**
Easy to enter, with clearly marked public entrances.	0.74	4.27	3	3.6%
Connecting members to information and services should be an important service for Hamilton Public Library to provide.	0.88	4.27	9	10.7%
Accessible, meeting provincial minimum standards per AODA, 2005.	0.80	4.26	12	14.3%
Safe, equitable and inclusive spaces for all.	0.96	4.15	4	4.8%
Comfortable with appropriate levels of lighting and noise.	0.83	4.13	1	1.2%
Accessible by public transportation.	0.82	4.13	6	7.1%
Clean and in good repair.	0.81	4.12	1	1.2%
Inviting, appealing and attractive	0.90	4.10	1	1.2%
Energy efficient, helping the city meet energy targets and reduce utility usage.	0.96	4.05	45	53.6%
The public computers are fast, reliable and secure.	0.95	3.91	38	45.2%



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Differential of Importance and Performance

Service areas where importance exceeds performance by 20 points is indicative of a mismatch between expectations and service levels, equal to one point on the Likert scale used.

Responses
1519

Respondents
58

Service Area	Performance (index score)	Importance (index score)	Net Differential	Opt Out %
Total	**83**	**93**	**-10**	**10%**
Clean and in good repair.	82	95	-12	2%
The public computers are fast, reliable and secure.	78	90	-12	26%
Safe, equitable and inclusive spaces for all.	83	95	-12	5%
Accessible by public transportation.	83	94	-11	5%
Comfortable with appropriate levels of lighting and noise.	83	94	-11	3%
Energy efficient, helping the city meet energy targets and reduce utility usage.	81	92	-11	29%
Inviting, appealing and attractive	82	93	-11	3%
Accessible, meeting provincial minimum standards per AODA, 2005.	85	94	-9	10%
Easy to enter, with clearly marked public entrances.	85	93	-8	4%
Connecting members to information and services should be an important service for Hamilton Public Library to provide.	85	89	-4	8%

Performance — *Q16 Thinking about how you use libraries, do you agree with the following statements?*

Importance — *Q17 Thinking about how you want to use the library, do you agree with the following statements?*

HPL Survey

Service Area	Performance	Importance	Net Differential	Count
Checkout and Renewal process	81.39	95.11	-13.71	4,654
Free Wi-Fi	78.24	80.54	-2.29	4,672
Programs and Classes	70.31	70.06	0.25	4,640
Collection Material	73.90	70.06	3.84	4,595

These are the results for the survey run internally by HPL which examine alternative service areas that were not covered in our survey.

The Net Differential is calculated here by taking the average Likert score for each service area and multiplied by 20, the difference between performance and importance is then calculated as our final product. Negative differential indicates a higher perceived level of importance vs performance and positive is the opposite.

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Question
17

Responses
799

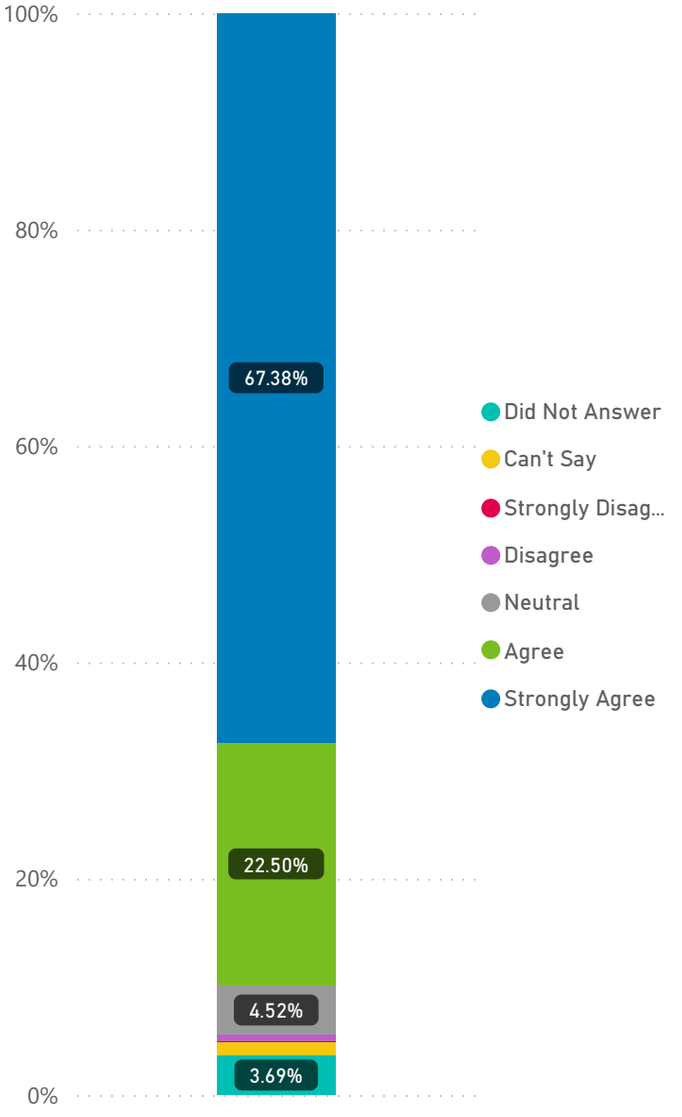
Respondents
82

Importance of Services

Thinking about how you want to use the library, do you agree with the following statements?

Service Area	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Total	**1**	**5**	**38**	**189**	**566**
Safe, equitable and inclusive spaces for all.		1	2	15	62
Inviting, appealing and attractive			4	21	55
Energy efficient, helping the city meet energy targets and reduce utility usage.		2	4	18	56
Easy to enter, with clearly marked public entrances.			5	17	59
Comfortable with appropriate levels of lighting and noise.			3	19	58
Clean and in good repair.			2	17	62
Accessible, meeting provincial minimum standards per AODA, 2005.			2	19	58
Accessible by public transportation.			4	17	60
The public computers are fast, reliable and secure.		1	6	23	48
Connecting members to information and services should be an important service for Hamilton Public Library to provide.	1	1	6	23	48

Service Area	σ	Avg.	Opt Out	Opt Out %
Total	**0.61**	**4.64**	**41**	**4.9%**
Clean and in good repair.	0.49	4.74	3	3.6%
Safe, equitable and inclusive spaces for all.	0.57	4.73	4	4.8%
Accessible, meeting provincial minimum standards per AODA, 2005.	0.51	4.71	5	6.0%
Accessible by public transportation.	0.56	4.69	3	3.6%
Comfortable with appropriate levels of lighting and noise.	0.54	4.69	4	4.8%
Easy to enter, with clearly marked public entrances.	0.59	4.67	3	3.6%
Inviting, appealing and attractive	0.58	4.64	4	4.8%
Energy efficient, helping the city meet energy targets and reduce utility usage.	0.70	4.60	4	4.8%
The public computers are fast, reliable and secure.	0.69	4.51	6	7.1%
Connecting members to information and services should be an important service for Hamilton Public Library to provide.	0.79	4.47	5	6.0%



Respondents who opted out by not answering or selecting 'Can't Say' are included in opt out.

Responses
28,413

HPL Survey - Importance of Services

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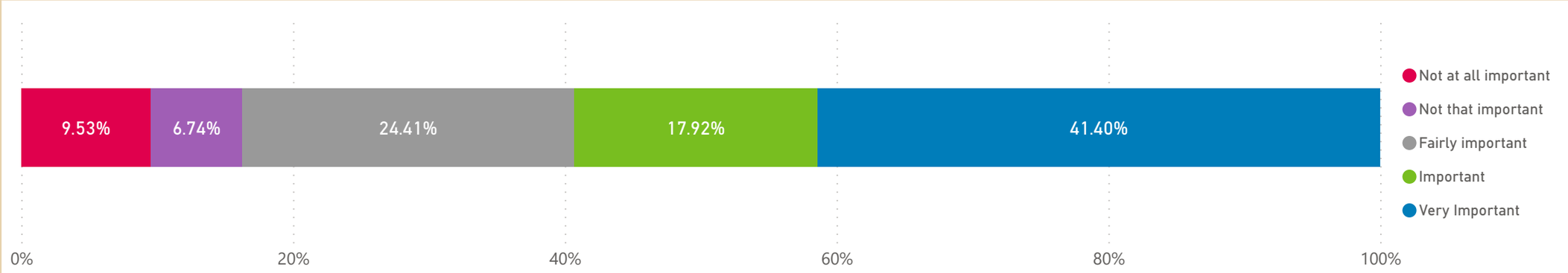

Service Area	Not at all important	Not that important	Fairly important	Important	Very Important
Total	**2,709**	**1,914**	**6,937**	**5,091**	**11,762**
Checkout and Renewal process	69	37	218	316	4,014
Collection Material	69	356	2,082	1,370	718
Free Wi-Fi	516	228	642	514	2,772
Locations	526	345	1,521	1,038	1,490
Programs and Classes	472	435	1,347	1,059	1,327
Public Computers	1,057	513	1,127	794	1,441

Service Area	Average	Avg. %	σ	Count
Checkout and Renewal process	4.76	95.11	0.71	4,654
Free Wi-Fi	4.03	80.54	1.39	4,672
Locations	3.53	70.65	1.28	4,920
Collection Material	3.50	70.06	0.90	4,595
Programs and Classes	3.50	70.06	1.27	4,640
Public Computers	3.21	64.25	1.50	4,932

These are the results for the survey run internally by HPL

Responses
27,962

HPL Survey - Performance of Services

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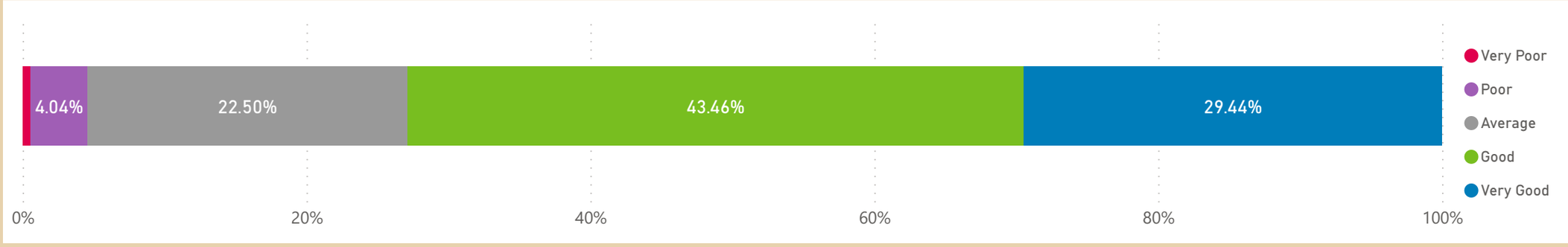

Service Area	Very Poor	Poor	Average	Good	Very Good
Total	**156**	**1,130**	**6,292**	**12,151**	**8,233**
Checkout and Renewal process	9	113	532	2,891	1,109
Collection Material	11	222	1,218	2,850	294
Connections	25	52	322	1,540	2,762
Free Wi-Fi	33	56	1,771	1,240	1,572
Hours	29	305	422	2,139	1,805
Programs and Classes	49	382	2,027	1,491	691

Service Area	Average	Avg. %	σ	Count
Connections	4.48	89.62	0.72	4,701
Hours	4.15	82.92	0.88	4,700
Checkout and Renewal process	4.07	81.39	0.68	4,654
Free Wi-Fi	3.91	78.24	0.91	4,672
Collection Material	3.70	73.90	0.67	4,595
Programs and Classes	3.52	70.31	0.88	4,640

These are the results for the survey run internally by HPL

Responses
13,907

HPL Survey - Impact of Services

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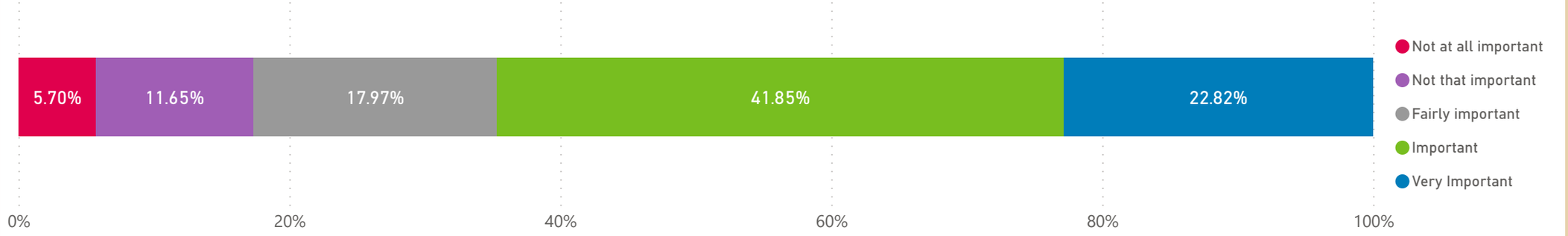


Service Area	Not at all important	Not that important	Fairly important	Important	Very Important
Total	**1,128**	**2,305**	**3,555**	**8,278**	**4,513**
Collection Material	81	443	921	2,569	929
Free Wi-Fi	472	506	1,053	1,574	1,340
Locations	489	1,115	1,173	1,735	426
Programs and Classes	86	241	408	2,400	1,818

Service Area	Average	Avg. %	σ	Count
Free Wi-Fi	3.80	76	1.25	4,672
Locations	3.52	70	1.14	4,920
Programs and Classes	3.28	66	0.88	4,640
Collection Material	3.26	65	0.91	4,595

These are the results for the survey run internally by HPL

Responses
3588

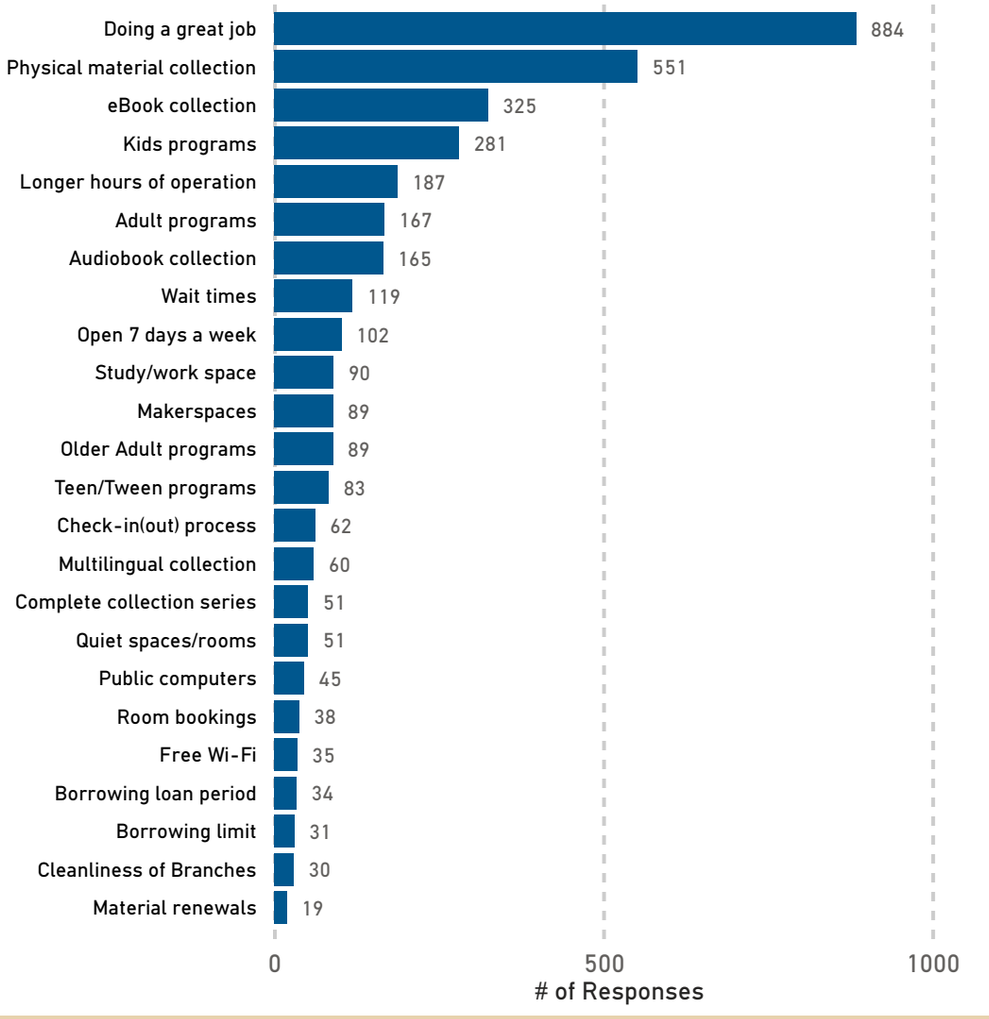
HPL Survey - How Can We Do Better?

Do you have any comments or questions regarding the Hamilton Public Library services that you want to share?

Hamilton

Open Text Responses

Open Text Response Category



These are the results for the survey run internally by HPL

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Question
18

Additional Comments and Questions

Do you have any comments or questions regarding the Hamilton Public Library services that you want to share?

Responses
42

Respondents
42

Open Text Responses

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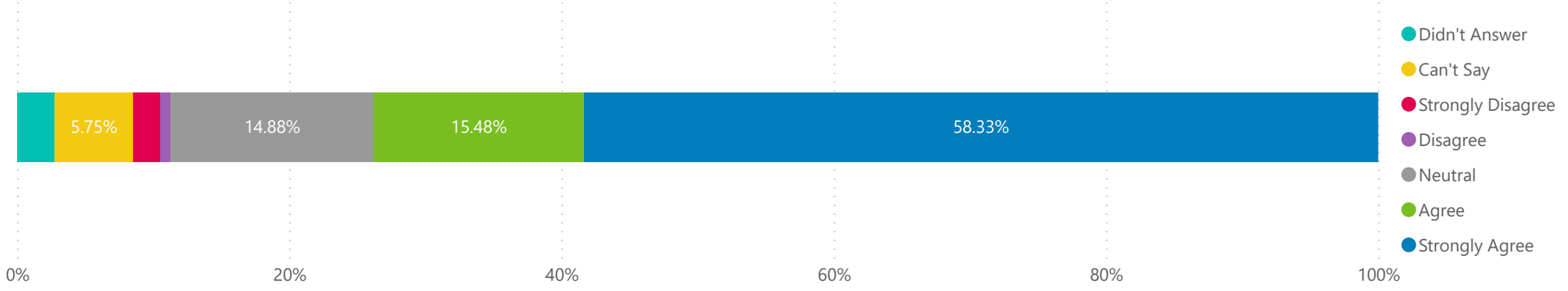
Hamilton

Summary of Specific Service Areas over Several Questions

Checkout and Renewal Process

Responses
451

Respondents
81



Question	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**0.94**	**4.39**	**87.85**	**43**	**8.53%**
Q11 Did you feel comfortable accessing the following Hamilton Public Library services?	0.67	4.69	93.85	6	7.14%
Q7 In the last 24 months if you have used Hamilton Public Library services, how satisfied are you with your ability to access services?	0.70	4.67	93.42	8	9.52%
Q14 Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?	0.74	4.61	92.11	8	9.52%
Q13 How likely would you be to recommend the following Hamilton Public Library service to others?	0.89	4.56	91.28	6	7.14%
Q8 Do the following Hamilton Public Library services meet your needs?	0.89	4.38	87.59	5	5.95%
Q15 If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?	1.01	3.41	68.11	10	11.90%

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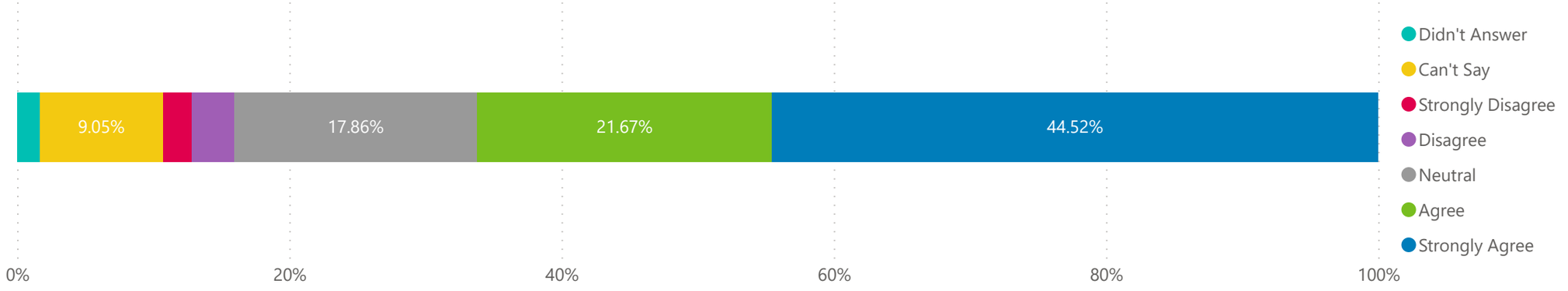
Summary of Specific Service Areas over Several Questions

Collection Materials

Responses
366

Respondents
82



	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.01**	**4.16**	**83.15**	**45**	**10.71%**
Q11 Did you feel comfortable accessing the following Hamilton Public Library services?	0.79	4.51	90.26	8	9.52%
Q13 How likely would you be to recommend the following Hamilton Public Library service to others?	0.84	4.48	89.60	9	10.71%
Q14 Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?	0.89	4.38	87.63	8	9.52%
Q8 Do the following Hamilton Public Library services meet your needs?	1.01	3.93	78.63	11	13.10%
Q15 If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?	1.10	3.47	69.33	9	10.71%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

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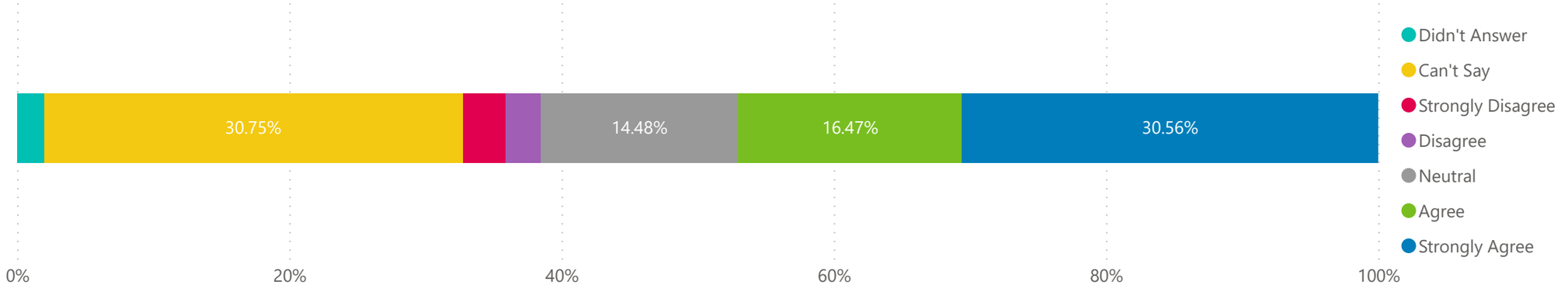
Summary of Specific Service Areas over Several Questions

Connecting Customers to Information and Community Resources

Responses
323
Respondents
79



	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.12**	**4.02**	**80.41**	**165**	**32.74%**
Q13 How likely would you be to recommend the following Hamilton Public Library service to others?	0.92	4.38	87.50	28	33.33%
Q14 Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?	1.03	4.35	87.02	27	32.14%
Q11 Did you feel comfortable accessing the following Hamilton Public Library services?	0.97	4.24	84.83	26	30.95%
Q7 In the last 24 months if you have used Hamilton Public Library services, how satisfied are you with your ability to access services?	0.95	4.17	83.40	37	44.05%
Q8 Do the following Hamilton Public Library services meet your needs?	1.04	4.06	81.22	35	41.67%
Q15 If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?	1.16	3.18	63.61	12	14.29%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

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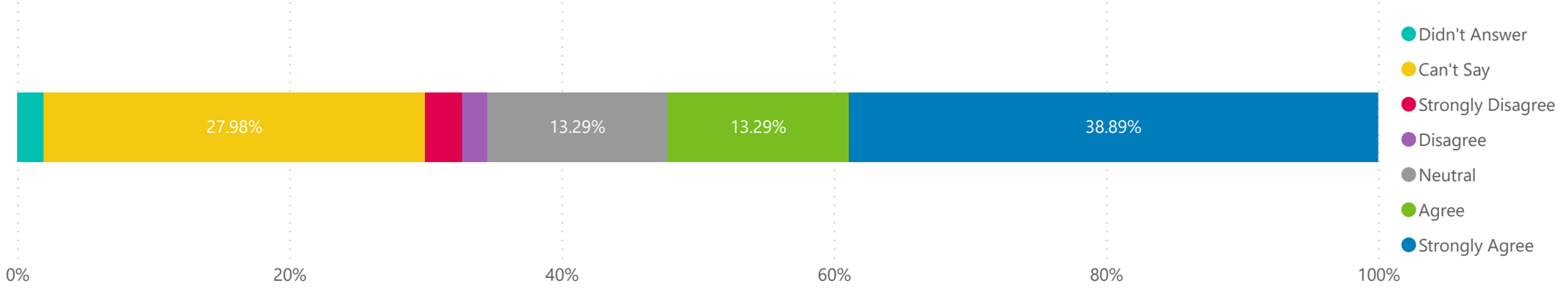
Summary of Specific Service Areas over Several Questions

Free Wi-Fi

Responses
339

Respondents
80



	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.08**	**4.20**	**83.91**	**151**	**29.96%**
Q14 Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?	0.89	4.53	90.51	25	29.76%
Q11 Did you feel comfortable accessing the following Hamilton Public Library services?	0.89	4.47	89.31	26	30.95%
Q13 How likely would you be to recommend the following Hamilton Public Library service to others?	1.04	4.45	89.03	22	26.19%
Q7 In the last 24 months if you have used Hamilton Public Library services, how satisfied are you with your ability to access services?	0.90	4.44	88.80	34	40.48%
Q8 Do the following Hamilton Public Library services meet your needs?	0.98	4.18	83.53	33	39.29%
Q15 If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?	1.11	3.34	66.85	11	13.10%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

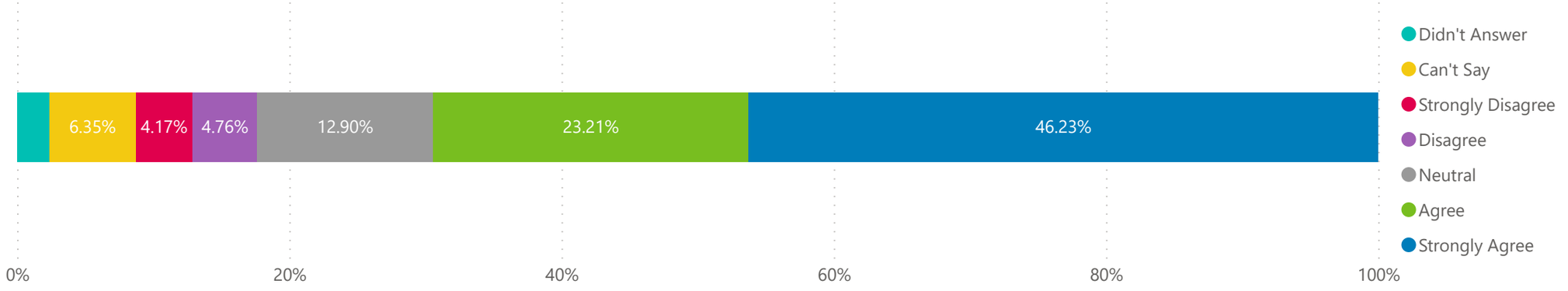
Corporate Asset Management
City Services & Asset Review
Hamilton Public Library
November 2023

Hamilton

Summary of Specific Service Areas over Several Questions

Library Locations and Spaces

Responses
439
Respondents
83



	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.12**	**4.12**	**82.48**	**44**	**8.73%**
Q13 How likely would you be to recommend the following Hamilton Public Library service to others?	0.96	4.39	87.79	7	8.33%
Q14 Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?	1.03	4.37	87.47	9	10.71%
Q11 Did you feel comfortable accessing the following Hamilton Public Library services?	1.00	4.29	85.79	8	9.52%
Q7 In the last 24 months if you have used Hamilton Public Library services, how satisfied are you with your ability to access services?	0.97	4.29	85.71	7	8.33%
Q8 Do the following Hamilton Public Library services meet your needs?	1.19	3.95	78.97	6	7.14%
Q15 If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?	1.24	3.47	69.35	7	8.33%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Corporate Asset Management
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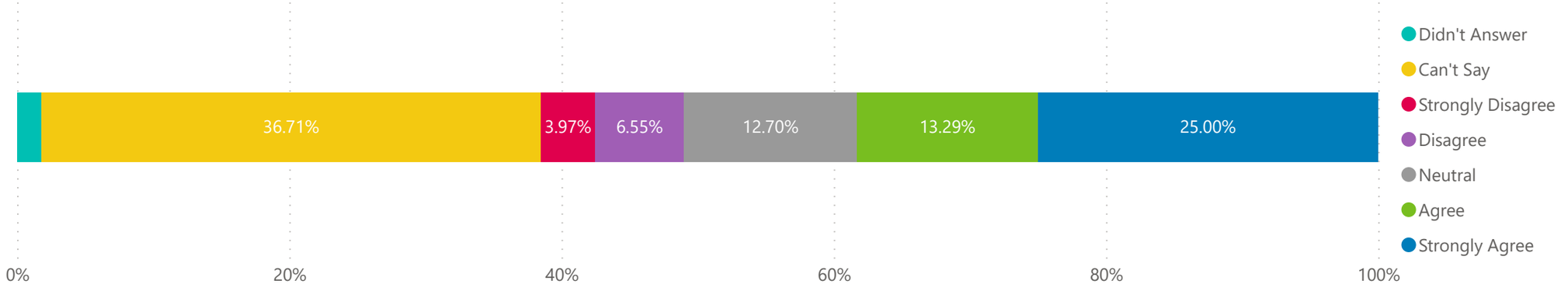
Hamilton

Summary of Specific Service Areas over Several Questions

Programs and Classes

Responses
290
Respondents
78



	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.26**	**3.79**	**75.87**	**194**	**38.49%**
Q13 How likely would you be to recommend the following Hamilton Public Library service to others?	1.15	4.23	84.62	32	38.10%
Q14 Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?	1.07	4.16	83.21	28	33.33%
Q11 Did you feel comfortable accessing the following Hamilton Public Library services?	1.14	4.12	82.40	34	40.48%
Q7 In the last 24 months if you have used Hamilton Public Library services, how satisfied are you with your ability to access services?	1.20	3.69	73.85	45	53.57%
Q15 If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?	1.20	3.31	66.29	14	16.67%
Q8 Do the following Hamilton Public Library services meet your needs?	1.39	3.28	65.58	41	48.81%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

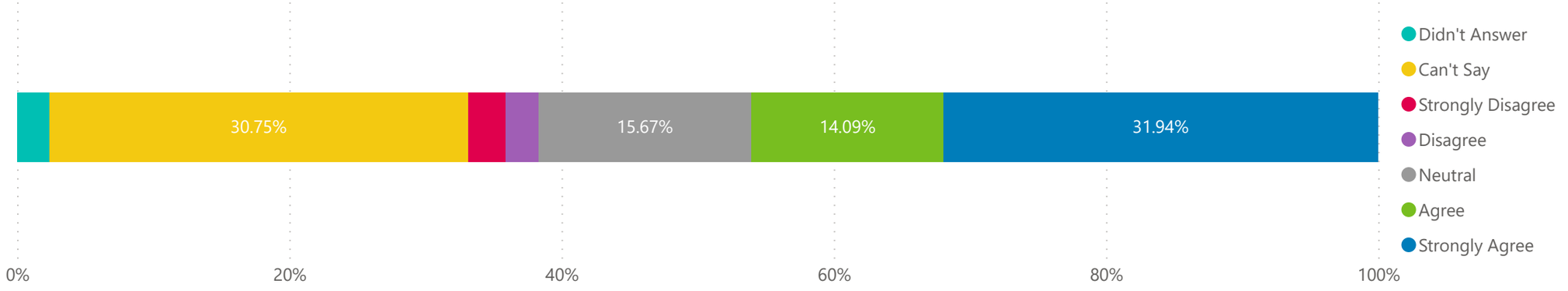
Summary of Specific Service Areas over Several Questions

Public Computers

Corporate Asset Management
City Services & Asset Review
Hamilton Public Library
November 2023

Hamilton

Responses
323
Respondents
80



	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.11**	**4.05**	**80.95**	**167**	**33.13%**
Q14 Based on the figure above, how would you rate Hamilton Public Library for providing good value for money in the infrastructure and services provided to your community?	0.87	4.47	89.49	25	29.76%
Q11 Did you feel comfortable accessing the following Hamilton Public Library services?	0.95	4.33	86.55	29	34.52%
Q7 In the last 24 months if you have used Hamilton Public Library services, how satisfied are you with your ability to access services?	0.93	4.30	86.05	41	48.81%
Q13 How likely would you be to recommend the following Hamilton Public Library service to others?	1.05	4.25	85.08	25	29.76%
Q8 Do the following Hamilton Public Library services meet your needs?	1.01	3.87	77.39	38	45.24%
Q15 If you had to choose, would you prefer to see tax rates increase to improve local services OR would you prefer to see service level cuts to minimize tax rate increases?	1.19	3.31	66.13	9	10.71%

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Definition and Ranking of Consistency and Confidence

Data Grading Scales

Grade	Data Consistency Standard Deviation (σ, Consistency of Responses)	Confidence Level Margin of Error (at 95% Confidence in Sample Size)
A Very High	0 to 0.5 - results are tightly grouped with little to no variance in response	0% to 5% - Minimal to no error in results, can generally be interpreted as is
B High	0.5 to 1.0 - results are fairly tightly grouped but with slightly more variance in response	5% to 10% - Error has become noticeable, but results are still trustworthy
C Medium	1.0 to 1.5 - results are moderately grouped together, but most respondents are generally in agreeance	10% to 20% - Error is a significant amount and will cause uncertainty in final results
D Low	1.5 to 2.0 - results show a high variance with a fair amount of disparity in responses	20% to 30% - Error has reached a detrimental level and results are difficult to trust
E Very Low	2.0+ - results are highly variant with little to no grouping	30%+ - Significant error in results, hard to interpret data in much of a meaningful way

$$Margin\ of\ Error = \frac{0.98}{\sqrt{n}}$$

Here we attribute a lower value of consistency of response (Standard Deviation) to a higher confidence grade, but it does not necessarily mean that the data is "better". In reality we receive more insight in the data regardless. With a high consistency we can tell that respondents more often come to the same conclusion on a response for a question, whereas with low consistency we would see a split in people's opinion, some with a very high rating and others with a very low rating. Knowing this and then understanding why is the most important aspect.

The margin of error is calculated using the factor n (sample size). The margin of error mainly tells us whether the sample size of the survey is appropriate. This is because in the calculation above, sample size is the only factor and thus has the biggest impact. The margin of error is represented as a percentage and indicates the range above and below the calculated average the true value is likely to fall. A smaller margin of error indicates a more precise estimate and vice versa.

Hamilton

Accessibility Committee for Persons with Disabilities (ACPD)

As per the Accessibility for Ontarians with Disabilities Act, 2005, the council of every municipality having a population of not less than 10,000 shall establish an accessibility advisory committee or continue any such committee that was established before the day this section comes into force (Sub-Section 29. (1))

Mission Statement

The Accessibility Committee for Persons with Disabilities (ACPD) in the City of Hamilton assists the work of City Council by identifying accessibility barriers and making recommendations with regard to barrier removal and prevention in compliance with the *Accessibility for Ontarians with Disabilities Act*, 2005 and the Ontario Human Rights Code.

The work of the Sub-Committee encompasses the broadest possible scope of services, facilities, policies and practices affecting the lives of all persons with disabilities in the City.

Vision Statement

Hamilton is an inclusive community where ALL people can live, work, play and participate fully, free from barriers or discrimination.

Values

Accessibility
Accountability
Cooperation
Dignity
Diversity
Equity
Excellence
Honesty
Inclusiveness
Innovation
Leadership
Respect
Teamwork
Tolerance

As approved by Council on _____, as part of GIC Report 23-____, (date)
As approved by Council on October 11, 2023 as part of GIC Report 23-026, October 4, 2023
As approved by Council on January 25, 2023 as part of GIC Report 23-004, January 18, 2023
As approved by Council on November 23, 2016 as part of GIC Report 16-029, November 16, 2016
As amended by Council on September 25, 2019 as part of GIC Report 19-017, September 18, 2019
As Amended by Council on February 26, 2020 as part of GIC Report 20-007, February 19, 2019

Mandate

As per the *Accessibility for Ontarians with Disabilities Act,* 2005**,** the committee shall, (a) advise the council about the requirements and implementation of accessibility standards and the preparation of accessibility reports and such other matters for which the council may seek its advice under subsection (5); (b) review in a timely manner the site plans and drawings described in section 41 of the Planning Act that the committee selects; and (c) perform all other functions that are specified in the regulations. (Sub-Section 29. (4))

As per the *Accessibility for Ontarians with Disabilities Act, 2005***,** the council shall seek advice from the committee on the accessibility for persons with disabilities to a building, structure or premises, or part of a building, structure or premises,
(a) that the council purchases, constructs or significantly renovates; (b) for which the council enters into a new lease; or (c) that a person provides as municipal capital facilities under an agreement entered into with the council in accordance with section 110 of the *Municipal Act*, 2001. (Sub-Section 29. (5)) Supplying site plans when the committee selects site plans and drawings described in section 41 of the *Planning Act* to review, the council shall supply them to the committee in a timely manner for the purpose of the review. (Sub-Section 29. (6))

The Accessibility Committee for Persons with Disabilities (ACPD) advises Council on providing full accessibility and inclusion of persons with disabilities in the City related to City goods and services and City-owned facilities and spaces and recommends to the City of Hamilton policies, procedures, standards and guidelines.

Composition

The Accessibility Committee for Persons with Disabilities (ACPD) shall be comprised of up to 18 citizen members in accordance with *Accessibility for Ontarians with Disabilities Act,* 2005, a majority of the members of the committee shall be persons with disabilities (Sub-Section 29. (3)) and two Members of Council.

The membership should also reflect a wide range of disabilities and represent the interests of all persons with disabilities.

Membership should fully represent the community arising from an Inclusion, Diversity, Equity and Access (IDEA) lens.

The Accessibility Committee for Persons with Disabilities (ACPD) shall also have access to key staff from Transit, Housing, Planning, Building, Recreation, Public Health, etc. as a resource, in order to fulfill their mandate.

Terms of Reference

1. In accordance with the *Accessibility for Ontarians with Disabilities Act,* 2005 (AODA), Ontario Human Rights Code (OHRC), and all applicable legislation, regulations, standards, policies and guidelines:

    (i) Advise Council and staff on barriers affecting full participation of persons with disabilities in the City.

    (ii) Advise Council and staff, annually about the preparation, implementation, and effectiveness of its accessibility plan required pursuant to the AODA.

    (iv) Ensure that the right of access for persons with disabilities to programs and services provided by the City is sustained, maintained, and/or improved.

    (v) Review and comment to Council and other levels of government on pertinent reports, proposed legislation and studies which affect all persons with disabilities, where appropriate.

    (vi) Provide a forum where persons with disabilities and service representatives can express their concerns, identify barriers, share information and recommend improvements to the existing level of City services, goods, facilities and spaces, for persons with disabilities, while taking into consideration a wide spectrum of disabilities in discussions and decision making.

    (vii) Educate and increase awareness to City Council and staff on issues which affect people with disabilities.

    (viii) Regularly review the progress and measure the success of the committee and its activities.

2. Members are to adhere to the Procedural Handbook for Citizen Appointees to City of Hamilton Local Boards, which includes the Code of Conduct for Local Boards.

Working Groups:

The Accessibility Committee for Persons with Disabilities (ACPD) shall consider establishing, at the outset of each four-year term, Working Groups tasked with performing much of the work of the Accessibility Committee for Persons with Disabilities (ACPD).

The Accessibility Committee for Persons with Disabilities (ACPD) may establish, from time to time any Working Group tasked to complete specific tasks on behalf of the Accessibility Committee for Persons with Disabilities (ACPD) and may be established for a time limited period.

Every member of the Accessibility Committee for Persons with Disabilities (ACPD) is expected to be a member of no less than one (1) Working Group and encouraged to limit membership to no more than three (3) Working Groups.

Members are strongly encouraged to fully participate and contribute to discussion and debate at the full Accessibility Committee for Persons with Disabilities (ACPD) and its Working Groups.

Annual Events:

"Ability First" Accessibility Fair

Members of the Accessibility Committee for Persons with Disabilities (ACPD) shall be strongly encouraged to participate in the organization and planning of the Annual "Ability First" Accessibility Fair, which would include their attendance and participation on the day of the event.