Forestry & Horticulture Asset Management Plan 2024

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FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

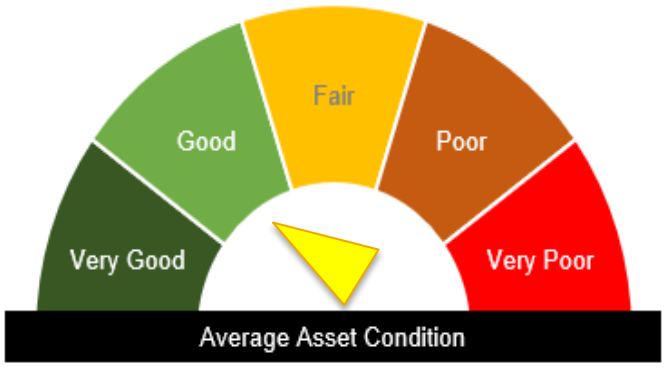
SUMMARY AND QUICK FACTS

SERVICE PROFILE

The City of Hamilton's Forestry & Horticulture section aims to both promote and preserve sustainable urban forests and green infrastructure through best management practices while ensuring biodiversity, risk management, climate resiliency, professionalism, community engagement and awareness.

ASSET SUMMARY

Replacement Value
$390M
GOOD CONDITION
Average Age of **26** years
or **48%** of the average
remaining service life



LEVEL OF SERVICE SUMMARY

Customer

- Customers feel Forestry & Horticulture has **GOOD** performance overall in the last 24 months in all service areas.
- Customers feel the Forestry & Horticulture **MEETS NEEDS** overall.
- Customers are **SATISFIED** with their ability to access Forestry & Horticulture sites and services.

Technical

- Forestry planted over 15,000 trees in 2023.
- Forestry responds to storm related tree damage within 24 hours.

ASSET HIGHLIGHTS

ASSETS	QUANTITY	REPLACEMENT COST	AVERAGE CONDITION	STEWARDSHIP MEASURES
Public Trees	273,618	$351.5M	Good	Street trees are trimmed every 7 years.
Forestry & Horticulture Facilities	8	$27.7M	Fair	Building Condition Assessments are completed every 5 years.

DATA CONFIDENCE

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

DEMAND DRIVERS

Customer Preferences – Green Street Design and increased tree canopy targets will increase the need for tree planting programs and the overall number of assets Forestry & Horticulture will care for.

Environmental Benefit – An increase in invasive species and conversion from annual beds to perennial beds will result in Forestry & Horticulture's need to pivot and potentially acquire different assets.

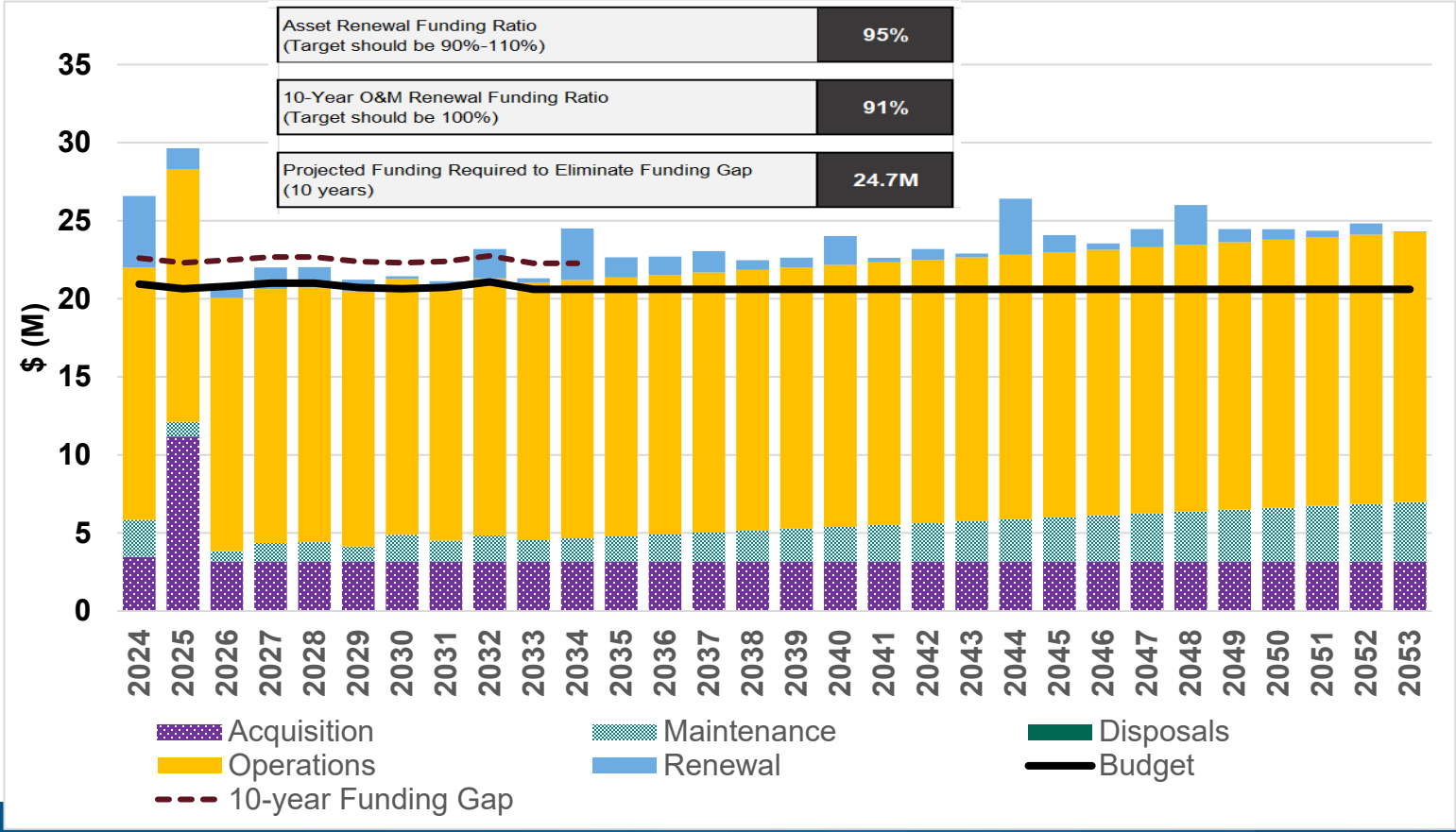
RISK

- Critical Assets are identified as trees, the Forestry Operations Centre, the Production and Tropical Greenhouses, and GIS asset inventories.

CLIMATE CHANGE MITIGATION

- The City has committed to planting 20,000/year of the 50,000/year Growing Green Mitigation Transformation target through capital and operating budgets and programs.

LIFECYCLE SUMMARY



1. INTRODUCTION

The City of Hamilton's Forestry & Horticulture section aims to both, promote and preserve sustainable urban forests and green infrastructure through best management practices while ensuring biodiversity, risk management, climate resiliency, professionalism, community engagement and awareness. The Purpose of this Asset Management Plan (AM Plan) is to ensure that Forestry & Horticulture has the required assets to deliver beautiful and sustainable Forestry & Horticulture 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 (i.e. O.Reg 588/17[1]), and required funding to provide the appropriate levels of service over the 2023-2052 planning period.

[1] Government of Ontario, 2017

2. BACKGROUND

The information in this section is intended to provide background on the Forestry & Horticulture service by providing a service profile, outlining legislative requirements, and defining the asset hierarchy used throughout the report. This section will provide the necessary background for the remainder of the AM Plan.

2.1 SERVICE PROFILE

Forestry & Horticulture (F&H) provides the following services within the City of Hamilton.

- Tree planting and tree maintenance programs;
- Public tree permits and development reviews;
- Forest health programs;
- Emergency and storm response related to public trees;
- Production Greenhouse;
- Tropical Greenhouse;
- Floral Shows;
- Horticultural maintenance of high-profile public parks, civic properties, and right-of-way; and,
- Public outreach and education.

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

- Asset Management Plan Overview Document;
- Hamilton's Urban Forest Strategy; and,
- Hamilton's Climate Action Strategy.

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

2.1.1 SERVICE HISTORY

The forest ecosystem in Hamilton and the surrounding Southwestern Ontario area is known as the Carolinian forest. This ecozone is rare in Canada, representing only 1% of the country's forests but containing a greater variety of plants and animals than any other ecosystem in the country including one-third of Canada's rare and endangered species. Over the past 250 years, the zone has been reduced in size by over 90% as settlers cleared land for agriculture and cities grew and developed. The area is also home to the Niagara Escarpment, winding through the urban area and providing natural connecting corridors and greenspaces. The escarpment is home to some of the oldest cliff-dwelling trees in the world, including the oldest living eastern white cedar at 1,050 years old.

Urban neighborhoods have grown around original trees making original trees some of the oldest features in our streets. Development history and land use have shaped the way the urban forest is distributed across the City. Historical industrial and commercial areas of the city have generally fewer trees and less canopy cover while areas of the City with large parks or mature residential neighbourhoods benefit from increased canopy cover. Protecting and caring for our urban forest is critical to the city's sustainability, green infrastructure and resident's health and well-being.

Gage Park was established in 1918 when the City purchased the land from Robert Russel Gage to beautify the eastern entrance. The park was designed to include various landscaped gardens and indoor horticultural displays in the greenhouses originally built in 1921 and continues in the tradition to the present day with the Memorial Rose Gardens, reflective and perennial gardens and the tropical greenhouse. The iconic Chrysanthemum Show (Fall Mum Show) has been hosted at the greenhouses every fall for over a century, with the first show in 1921. The show has continually expanded and in 1976 began incorporating themes which are creative and change every year. The show now incorporates over 200 varieties of chrysanthemums, 100,000 blooms grown at the Gage Park Greenhouse and over 20,000 square feet of displays.

2.1.2 SERVICE FUNCTION

Forestry & Horticulture is separated into two sections: Forestry and Horticulture.

The Forestry section is mandated by the City of Hamilton Public Tree Preservation and Sustainability Policy and the City of Hamilton By-Law 15-125 to regulate trees on or affecting public property. This policy and bylaw also influence Forestry and Arboriculture best management practices, which provide the following directives:

- The Urban Forest benefits the city by, amongst other things, providing natural habitat, better air quality, shade, stormwater control, and an improved pedestrian experience through enhanced landscapes and aesthetic beauty.
- The City promotes and preserves a sustainable Urban Forest through the diversity of tree species, health management, and community awareness to increase the tree canopy coverage in the city to over 35%.
- The maintenance of trees on or affecting the highways to protect the city's highways and those using the highways.

In addition to these services, Forestry also offers education programs, free tree giveaways and a street tree planting program.

The Horticulture section intends to elevate civic pride across the City by transforming Hamilton's urban landscapes through horticultural excellence and innovative floral displays.

2.1.3 USERS OF THE SERVICE

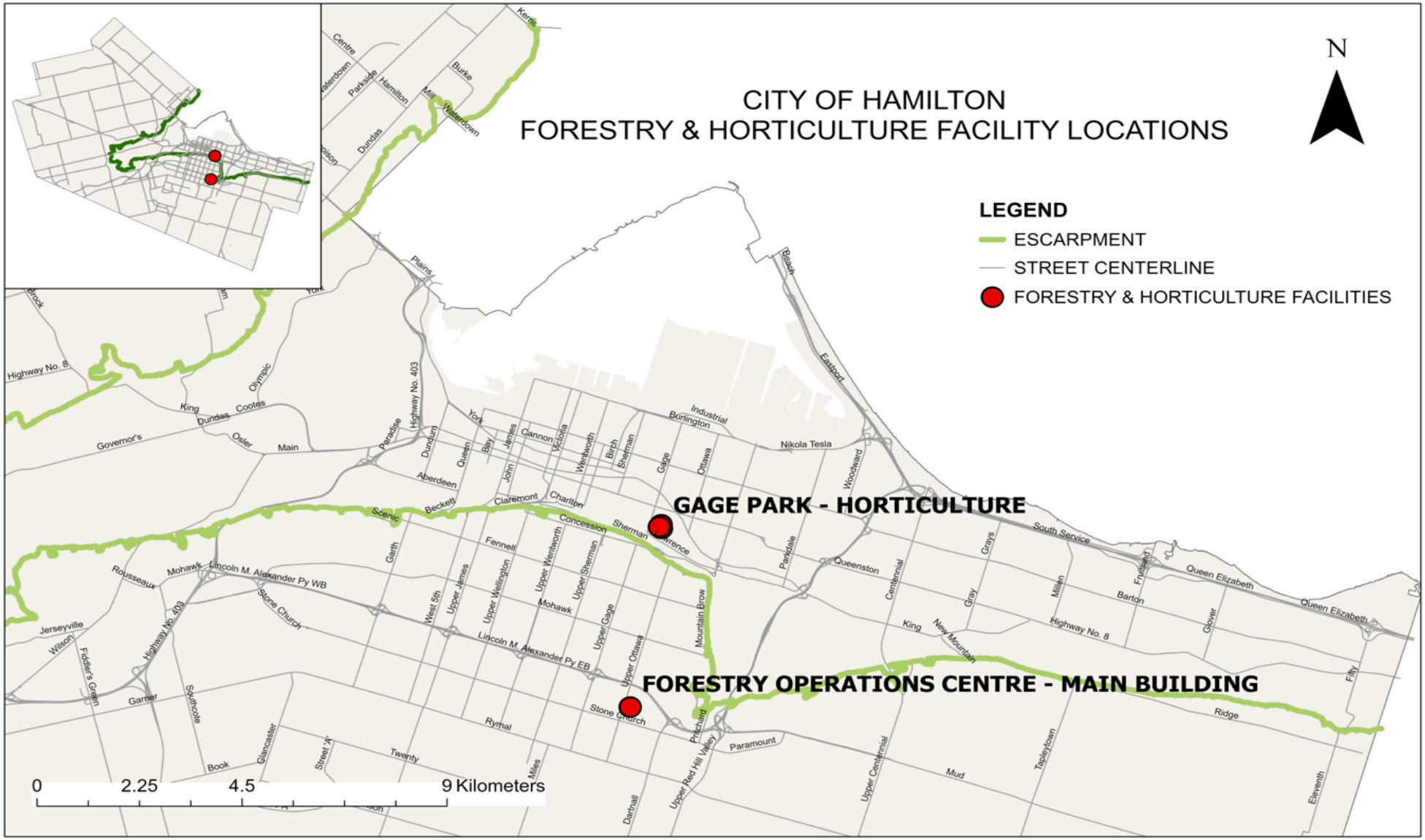
Forestry & Horticulture customers include all Hamilton residents & visitors to the City who enjoy the benefits of the existing urban forest canopy and the garden beds, planters and baskets throughout the City. Based on the 2021 (2016) Census results, Hamilton's population is 569,353 (536,917), and the average household size is 2.5 (2.5) people. [2]

Other user groups include those who are interested in participating in community planting initiatives, homeowners who are interested in enhancing the urban forest canopy through street tree planting, and visitors to the Gage Park Greenhouses. ***Figure 1*** below shows the facility locations for Forestry & Horticulture.

[2]Census Profile, 2021 Census of Population, 2021

FORESTRY & HORTICULTURE
2024 ASSET MANAGEMENT PLAN

Figure 1: Forestry & Horticulture Operations Map:



2.1.4 UNIQUE SERVICE CHALLENGES

Since urban trees and plants are considered enhanced natural assets[3], these assets do not follow traditional asset management practices for traditional assets. Some differences between enhanced natural assets and traditional assets include:

- Enhanced natural assets do not have an end-of-life or replacement schedule and are typically maintained in perpetuity unless the asset dies or is irreparably damaged;
- Desired service capacity can take decades to achieve, and assets increase in value over time. Therefore, replacement costs are not calculated simply based on acquiring a new sapling;
- Enhanced natural assets also provide other ecosystem services that benefit the City but may not be able to be quantified monetarily at this time (e.g. carbon sequestration benefits, wildlife habitat etc.). These services should eventually be incorporated into a replacement costing methodology;
- These assets are typically not included in Generally Accepted Accounting Principles (GAAP) or the Tangible Capital Assets (TCA) reports which means they are treated differently in the City's financial reporting.
- Currently, there are few available best practices for green infrastructure asset management which could be used to develop this plan.

Due to these variances, Corporate Asset Management (CAM) has finalized this Asset Management (AM) Plan to align it with the current asset management program. A continuous improvement item identified in ***Table 31*** will address this once additional best practice documents have been developed for green infrastructure asset management.

In addition, the Forestry & Horticulture section has some unique service challenges which will be discussed throughout this report:

- The City has committed to facilitating the planting of 50,000 trees per year to 2050 and Forestry is committing to adding 20,000 trees to the urban canopy annually. This will commit the Forestry section to ongoing operations and maintenance.
- Forestry is currently only responsible for public trees (i.e. street trees and parks trees), but it is anticipated that their responsibility may grow to be responsible for all city-owned trees.
- Forestry encountered an unprecedented number of new invasive species in 2022 and 2023 (i.e. hemlock woolly adelgid, spotted lantern fly and oak wilt) which has led to an increase in tree treatment and monitoring in order to support the canopy.
- Most Horticulture staff are seasonal. This results in significant staff time annually for training and recruitment, and half of these staff do not return.

[3] Enhanced natural assets are natural assets which were not naturally formed or inherited, but were strategically placed or constructed.

- As the City continues to prioritize biodiversity, there is a desire to convert annual garden beds to perennial, pollinator garden beds, which is a change in operations and may require additional assets, training, resources and operational requirements to deliver.
- Horticulture arrangements bring beautification value to the City, but some practices are costly (i.e. hanging baskets require frequent watering, and horticulture installments require significant staff time and budget). There may be opportunities for savings if certain activities are modified, but there is a cost-benefit analysis required for this change.

2.2 LEGISLATIVE REQUIREMENTS

The most significant legislative requirements that impact the delivery of Forestry & Horticulture 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
Migratory Birds Convention Act	States harming or killing bird populations through forestry operations is illegal, therefore all forestry activities should be planned outside of normal nesting periods.
Pest Control Products Act	To protect people living in Canada and the environment and ensure that all pest control products in the marketplace can be used safely and effectively, therefore staff plan and use products as per regulations.
Public and Private Tree/Woodland Bylaws: • 15 –125 To Regulate Trees on or Affecting Public Property • 2000-118 Town of Ancaster • 4513-99 Town of Dundas • 4401-96 Stoney Creek • 14-212 Urban Woodland Conservation By-law • R00-054 Woodland Conservation	Regulate the preservation and destruction of public trees and woodlands as well as private trees in Ancaster, Dundas, Stoney Creek and woodlands.

LEGISLATION OR REGULATION	REQUIREMENT
Canadian Landscape Standard	Provides guidelines and recommendations for major aspects of the Forestry and Horticulture nursery and landscape industry and sets standards for landscape construction projects.
Arborist Safe Work Practices	Provides arboricultural safety requirements for planting, pruning, repairing, maintaining, and removing woody plants (trees) including the use of equipment and techniques. Referenced by the Ministry of Labour for safe work practices within the Urban Forestry industry.

2.3 ASSET HIERARCHY

In order to deliver sustainable levels of service, Forestry & Horticulture requires assets. The Forestry & Horticulture Service Area has been broken down into **six** asset classes for the purpose of this AM Plan:

- **Public Trees:** refers to all trees in municipal parks and cemeteries & within the public Right of Way (ROW). Exclusions include City trees at City-owned facilities (e.g., libraries, recreation centres, etc.) and on all other City-owned land.
- **Facilities:** refers to any City-owned facilities necessary to deliver Forestry & Horticulture services.
- **Vehicles:** describes different types of vehicles (i.e., motor vehicles, trailers, aerial devices, and chippers) which are used for delivering services provided by Forestry & Horticulture.
- **Small Equipment:** refers to small equipment/tools used for delivering services provided by Forestry & Horticulture.
- **Technology:** describes the different types of technology required to deliver services including computers, and mobile equipment.
- **Horticulture Equipment:** refers to city-owned gardens, planters, hanging baskets, tropical greenhouse plants, and irrigation systems.

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

FORESTRY & HORTICULTURE
2024 ASSET MANAGEMENT PLAN

Table 2: Asset Class Hierarchy

SERVICE AREA	FORESTRY & HORTICULTURE					
ASSET CLASS	**PUBLIC TREES**	**FACILITIES**	**VEHICLES**	**SMALL EQUIPMENT**	**TECHNOLOGY**	**HORTICULTURE EQUIPMENT**
Asset	Street Trees	Horticulture Facilities including: • Horticulture Operations • Gage Park 1919 Building • Tropical Greenhouse • Production Greenhouse	Heavy Duty (Greater than 10,000 lbs)	Includes: • Auger post-hole • Batteries and battery chargers • Blower • Concrete saws, handheld • Generators • Landscaping trim tools • Rototiller/rotovator • Saws chain-generic • Washer/pumps • Weedeater/ attachments	Computer	Beautification Assets
	Park Trees (including cemetery trees)	Forestry Facility (i.e., Forestry Operations Centre)	Medium Duty (less than 10,000 lbs, greater than 4,000 lbs)		Mobile	Irrigation Equipment
	Rural Trees	Poly Houses	Light Duty (less than 4,000 lbs)			Tropical Greenhouse (TGH) Plants
	Other City Trees on City-owned Properties					

3. SUMMARY OF ASSETS

This section provides a detailed summary and analysis of the existing inventory information as of November 2023 including age profile, condition methodology, condition profile, and asset usage and performance for each of the asset classes. ***Table 3*** displays the summary of assets for the **Forestry & Horticulture** service area. The information used for this report was sourced from various City databases discussed in Section 10.1. It is important to note that inventory information changes often, and that this is a snapshot in time of information.

The City owns approximately **$390M** in **Forestry & Horticulture** assets. A weighted average calculation has been completed based on replacement cost and excludes assets where information is currently unavailable.

Assets are a weighted average of **26 years** which is **48%** of the average remaining service life and excludes Public Trees because the age of trees is not a factor for determining tree replacement. Therefore, the majority of the weighting for this average comes from the **Facilities** asset class.

The assets in this category are on average in **Good** condition which is mostly weighted toward the Public Trees assets. 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 ***AMP Overview Document***. For this asset management plan, the Public Trees asset class has the highest replacement value at **$351M**.

It is important to note that Public Trees are considered enhanced natural assets and increase in value over time (e.g., tree canopy increases with age) instead of depreciating in value like traditional assets (e.g., asset conditions worsen with age). Therefore, the Public Trees in this report were not calculated by assuming a mature tree would be replaced with a sapling because a mature tree would deliver a higher service level than a sapling. Instead, Public Tree replacement costs were calculated using an industry-standard tree appraisal methodology which values trees based on several factors including trunk diameter, overall condition, species, growing space, site suitability and competing infrastructure. For this analysis, an average unit cost was calculated for both Street Trees and Park's Trees based on an average tree in Fair[4] condition. Although this is a robust methodology, the data confidence in this replacement value is Low due to the assumptions embedded in the unit cost; since this is the highest-value asset, the overall data confidence for replacement cost is Low. A continuous improvement item identified in ***Table 31*** is to investigate also valuing trees from an ecological service perspective

[4] Fair condition was used because Good condition trees would escalate the replacement cost calculation significantly which did not appear to be correct based on subject matter expert opinion.

as well since trees provide ecological services (e.g., carbon sequestration, wildlife habitat) that are difficult to quantify at this time.

For facilities, replacement costs are calculated using an internal tool which encompasses current market rates, building type and size and is considered to be Medium data confidence. Replacement costs for the vehicles, equipment and technology asset classes were gathered from the most recent purchase price for similar assets and are considered to be High data confidence.

Additionally, replacement costs and other inventory information for Horticulture Equipment is not currently available which includes the perennial plants in the Production Greenhouse. In addition, Rural Trees and other City-owned trees were not included in this report due to a lack of inventory information. These items have been identified as continuous improvement items in ***Table 31.***

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 of this AM plan. In addition, the assets included below are assets that are assumed and in service at the time of writing.

Table 3: Detailed Summary of Assets
****Weighted Average Based on Replacement Cost***

PUBLIC TREES				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Street Trees	201,877	$297M	N/A	2-GOOD
Data Confidence	**LOW**	**LOW**		**LOW**
Parks Trees[5]	71,741	$54.3M		2-GOOD
Data Confidence	**LOW**	**LOW**		**LOW**
Rural Trees	No Data	No Data		No Data
Data Confidence	**VERY LOW**	**VERY LOW**		**VERY LOW**
Other City Trees on City-owned Properties	No Data	No Data		No Data
Data Confidence	**VERY LOW**	**VERY LOW**		**VERY LOW**
SUBTOTAL	**$351.5M**		**N/A**	**2-GOOD**
DATA CONFIDENCE	**LOW**			**LOW**

[5] Also includes trees in cemeteries.

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FACILITIES				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Forestry Facility	1	$ 8.8M	29 years (61%)	4 - POOR
Data Confidence	**HIGH**	**MEDIUM**	**HIGH**	**HIGH**
Horticulture Facilities	4	$18.9M	37 years (62%)	4 - POOR
Data Confidence	**HIGH**	**MEDIUM**	**HIGH**	**HIGH**
Poly Houses	3	$2.7M	6 years (70%)	3 - FAIR
Data Confidence	**HIGH**	**MEDIUM**	**HIGH**	**MEDIUM**
SUBTOTAL	**$27.7M**		**21 years (73%)***	**3 – FAIR***
DATA CONFIDENCE	**HIGH**	**MEDIUM**	**HIGH**	**HIGH**

VEHICLES				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Vehicles	101	$ 10.4M	9 years (10%)	4 - POOR
Data Confidence	**HIGH**	**MEDIUM**	**HIGH**	**LOW**
SUBTOTAL	**$ 10.4M**		**9 years (10%)**	**4 - POOR**
DATA CONFIDENCE	**MEDIUM**		**HIGH**	**LOW**

SMALL EQUIPMENT				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Small Equipment	237	$0.2M	9 years (10%)	4 - POOR
Data Confidence	**MEDIUM**	**MEDIUM**	**MEDIUM**	**LOW**
SUBTOTAL	**$0.2M**		**9 years (10%)**	**4-POOR**
DATA CONFIDENCE	**MEDIUM**		**MEDIUM**	**LOW**

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TECHNOLOGY				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
IT Equipment	107	$0.1M	3 years (25%)	4 - POOR
Data Confidence	**HIGH**	**HIGH**	**HIGH**	**LOW**
SUBTOTAL	**$0.1M**		**3 years (25%)**	**4-POOR**
DATA CONFIDENCE	**HIGH**		**HIGH**	**LOW**

HORTICULTURE EQUIPMENT				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Horticulture Beautification (e.g. baskets, planters)	2519	No Data	No Data	No Data
Data Confidence	**HIGH**			
Irrigation equipment	188	No Data	No Data	No Data
Data Confidence	**HIGH**			
TGH Plants	449	$0.1M	N/A	No Data
Data Confidence	**HIGH**	**LOW**		
SUBTOTAL	**NO DATA**		**NO DATA**	**NO DATA**
DATA CONFIDENCE				
TOTAL	**$390.0M**		**26 years (48%)*[6]**	**2-GOOD***
DATA CONFIDENCE	**LOW**		**HIGH**	**LOW**

[6] This weighted average calculation excludes Public Tree assets.

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

3.1 ASSET CONDITION GRADING

Condition refers to the physical state of 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 4*** below shows how each rating was converted to a standardized 5-point condition category so that the condition could be reported consistently across the AM Plan.

Table 4: Equivalent Condition Conversion Table

EQUIVALENT CONDITION GRADING CATEGORY	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE	PUBLIC TREES	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	N/A
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	< 5%
3 Fair	The asset is sound but has minor defects. Deterioration has some impact on asset usage. Minor to significant maintenance is required.	39.5% - 69.4%	Fair	>= 5% to < 10%
4 Poor	The asset has significant defects and deterioration. Deterioration has an impact on asset usage. Rehabilitation or major maintenance is required in the next year.	19.5% -39.4%	Poor	>= 10% to <30%
5 Very Poor	The asset has serious defects and deterioration. The asset is not fit for use. Urgent rehabilitation or closure is required.	<19.4%	Dead	>= 30%

The following conversion assumptions were made:

- Average condition of public trees was estimated based on a four-point scale used by Forestry as shown above (i.e. Good, Fair, Poor, Dead).
- For assets where a condition assessment was not completed, but age information was known (small equipment, vehicles, technology assets) 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) or subject matter expert opinion if this information is not available.

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 or assessed at different frequencies and using different methodologies to determine their condition which are noted in this section.

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

3.2.1 PUBLIC TREES PROFILE

3.2.1.1 AGE PROFILE

As previously mentioned, since the age of trees is not a factor for determining tree replacement, an age profile has not been created for this asset class.

3.2.1.2 CONDITION METHODOLOGY & PROFILE

The condition of Public Trees is assessed by Forestry staff using industry standards per the inspection frequency shown in ***Table 5*** below. The methodology includes a visual inspection completed from the ground including but not limited to the presence of deadwood, leaf size, leaf colour, growth rate, and the presence of insect or disease, which are all used to determine a specific condition score from good, fair, poor or dead.

Table 5: Inspection and Condition Information

ASSET	INSPECTION FREQUENCY	DESCRIPTION	LAST INSPECTION	CONDITION SCORE OUTPUT
Street Trees	7 years	Grid Program – Trees are Inspected and Trimmed	Varies	4-Point Scale
Parks Trees	7 years	Trees are Inspected and Trimmed as needed		

For this iteration of the plan, Public Trees were given an overall condition of Good, but a condition profile was not able to be completed at this time.

3.2.1.3 ASSET USAGE AND PERFORMANCE

Service deficiencies with public trees include trees being affected by invasive species and rural trees being reactively managed.

Table 6: Known Service Performance Deficiencies

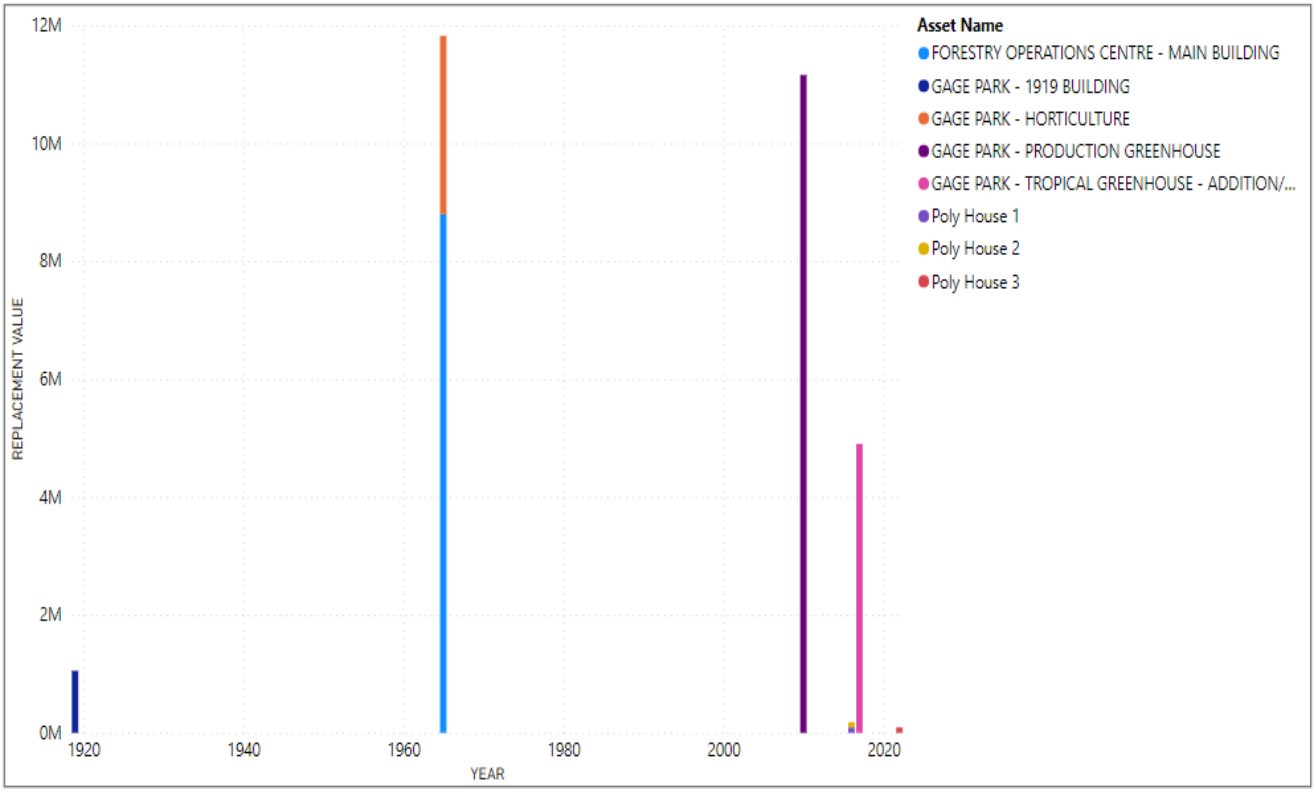
ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
PUBLIC TREES	**Various**	Invasive Species	Invasive species may result in the trees approaching the end of life and may cause a reduction in the tree canopy.
RURAL TREES	**Rural Areas of the City**	Reactive management	There is currently no maintenance program available for these trees, and these trees are maintained on a reactive basis.
OTHER CITY TREES ON CITY-OWNED PROPERTIES	**City Facilities**		

3.2.2 FACILITIES PROFILE

3.2.2.1 AGE PROFILE

The age profile for Forestry & Horticulture Facilities is shown below in ***Figure 2***. For these assets, the age data confidence is Medium because there were discrepancies encountered during the development of this AM Plan between staff knowledge of the building age versus what was in the Corporate Facilities and Energy Management (CFEM) database. For the purposes of this plan, the facility ages were estimated by Forestry staff, but a continuous improvement item identified in ***Table 31*** is to confirm the facility ages with available documentation and ensure they are accurately recorded in the CFEM database.

Figure 2: Forestry & Horticulture Facilities Age Profile



Most Forestry & Horticulture facilities have an Estimated Service Life (ESL) of 75 years except for heritage facilities which have an assumed ESL of 150 years, and the three Poly Houses have been assumed to have a useful life of 20 years. The oldest facility in this asset plan is the 1919 Gage Park building which was constructed in 1919 and is considered to be a heritage facility and is therefore not being considered for replacement.

3.2.2.2 CONDITION METHODOLOGY & PROFILE

The condition for Forestry & Horticulture facilities is typically determined based on the results of a Building Condition Assessment (BCA) with the exception of the Poly Houses which were assumed based on subject matter expert opinion.

BCAs are completed on these facilities every five years by the Corporate Facilities and Energy Management (CFEM) division 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 4.*** A continuous improvement item identified in ***Table 31*** is to ensure Poly Houses are inspected by CFEM staff and given condition ratings.

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Table 7: Inspection and Condition Information

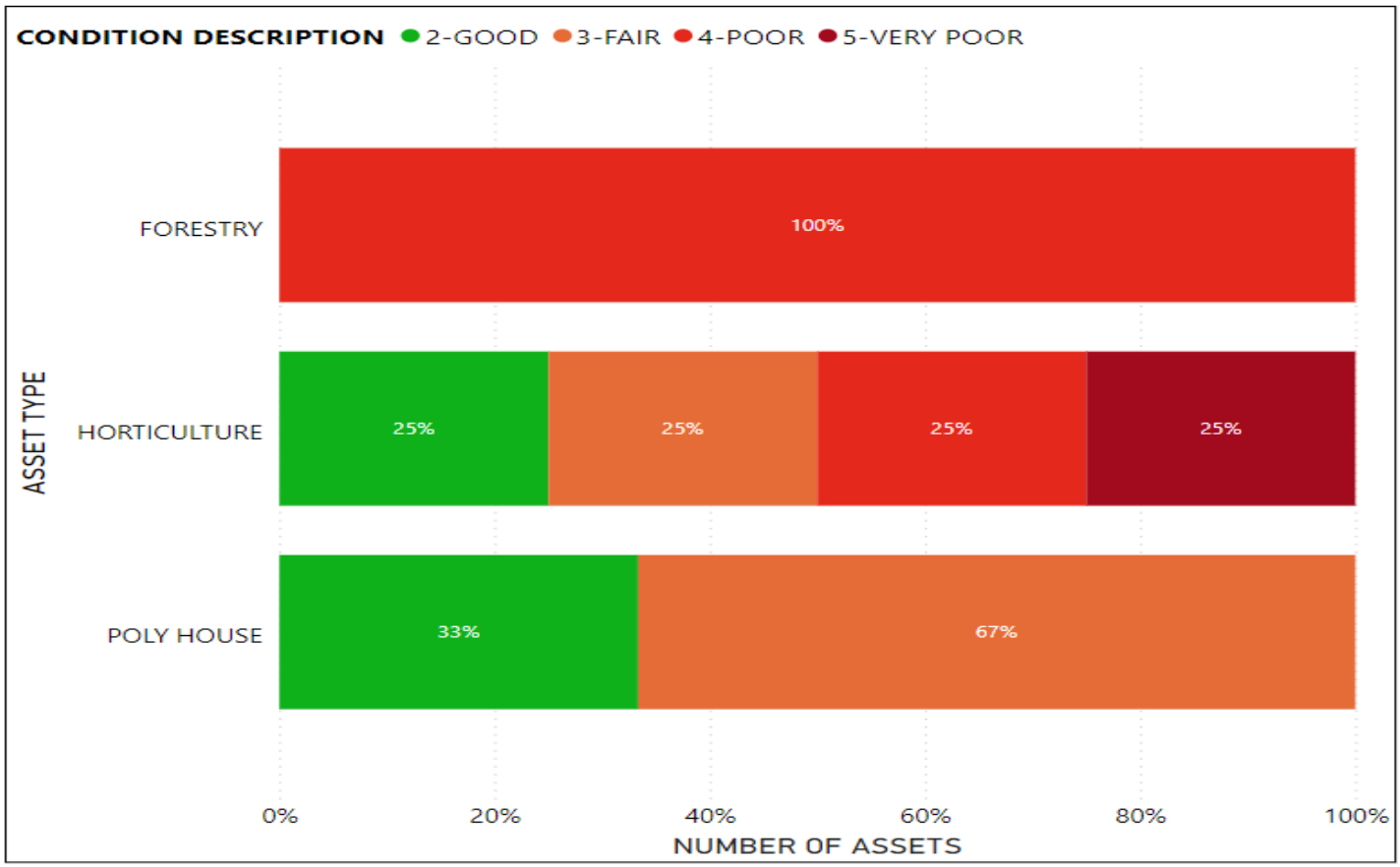
ASSET	INSPECTION FREQUENCY	LAST INSPECTION	CONDITION SCORE OUTPUT
Forestry Facility	5 years	2020	Facilities Condition Index
Horticulture Facilities	5 years		
Poly Houses	None	None	None

The condition profile for Forestry & Horticulture facilities can be found in ***Figure 3.*** The weighted average by replacement cost for all facilities is Fair condition. It is evident that 100% of Forestry Facilities are in Poor condition which represents the Forestry Operations Centre. It is important to note that the Forestry Operations Centre was renovated in 2012, but there are costly site maintenance items discussed in ***Table 7*** which have resulted in the facility showing a Poor condition FCI.

In addition, 50% of Horticulture Facilities (representing Gage Park – 1919 Building and the Tropical Green House) are in Poor condition or worse meaning there is significant rehabilitation work required on these facilities. Although the Tropical Greenhouse is a fairly new building, there was an incident in December 2022 where wind damaged the roof during a significant weather event, and a roof panel replacement is required.

The maintenance work required to restore these buildings to Good condition has been included in the maintenance forecast in **Section 8.2**. Currently, Forestry & Horticulture intends to replace the Horticulture Operations building with an expanded acquisition discussed in **Section 8.1**, but no other buildings are being planned for replacement and so these buildings are not represented in the backlog in **Section 8.3**.

Figure 3: F & H Facilities Condition Distribution



3.2.2.3 ASSET USAGE AND PERFORMANCE

Assets are generally provided to meet design standards where available. Known service performance issues are included in ***Table 8*** below.

Table 8: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
FACILITIES	**Forestry Operations Centre – Main Building**	Roadway Asphalt Replacement	Repair or replacement work is required on these building components.
		Vehicle Fuelling Station Replacement	
	Gage Park – Horticulture	Built-Up Roof	

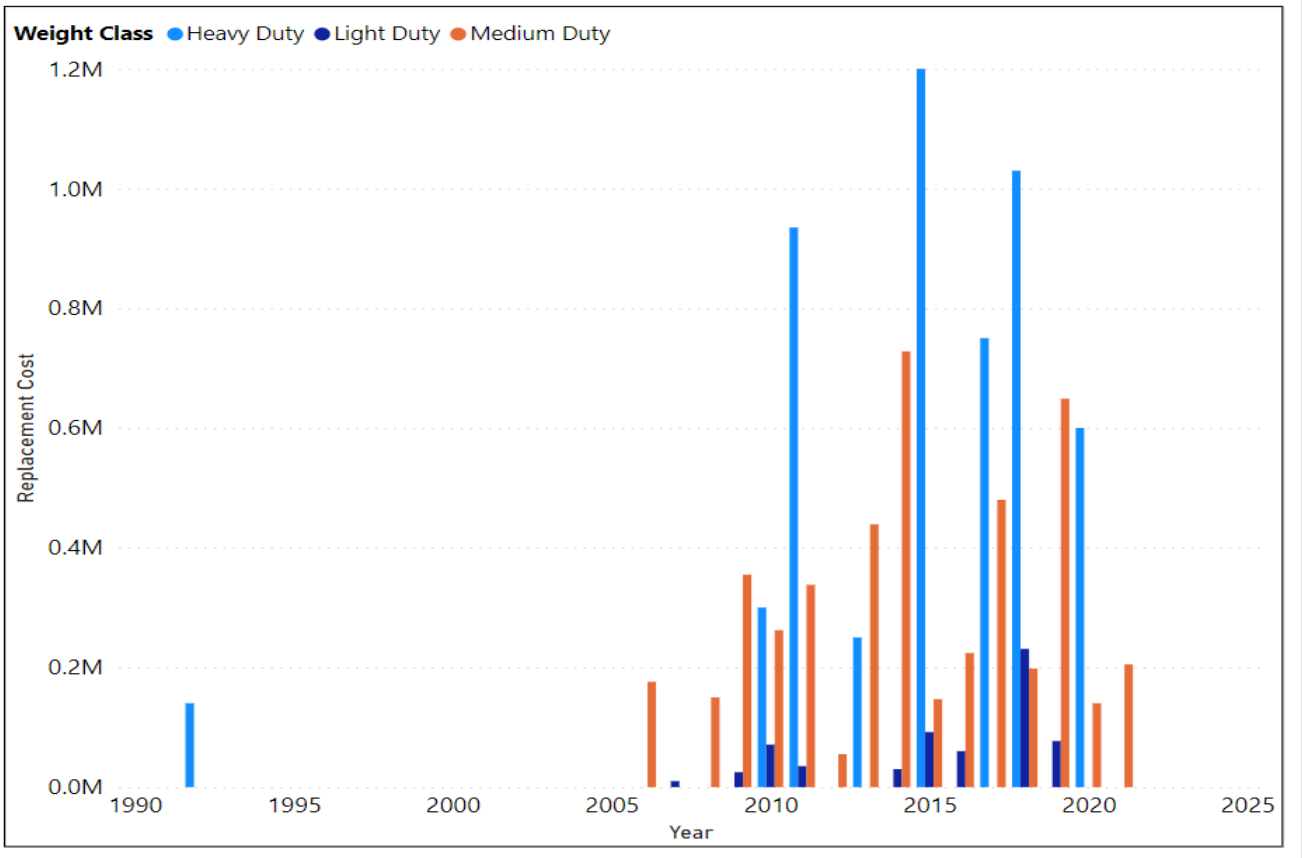
ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
	Gage Park - Tropical Greenhouse	Roof Repair	
	Gage Park – 1919 Building	Built-Up Roof	
		Structural Repairs	

3.2.3 VEHICLES PROFILE

3.2.3.1 AGE PROFILE

The age profile of the Forestry & Horticulture vehicles assets is shown in ***Figure 4.*** The age of these assets is considered to be high data confidence because they are recorded at the time of purchase. An analysis of the age profile is provided below.

Figure 4: Vehicles Age Profile



Most of the Forestry & Horticulture vehicles were acquired from 2005 to 2022. Since the Estimated Service Life (ESL) for vehicles is an average of 10 years, any vehicles purchased before 2014 are beyond their service life and will appear in the Renewal backlog in ***Section 8.3***. The oldest vehicle Forestry & Horticulture owns is a water tank truck which was purchased in 1992 and is 21 years past its Replacement date. This vehicle has been difficult to procure and is currently on the replacement list.

3.2.3.2 CONDITION METHODOLOGY & PROFILE

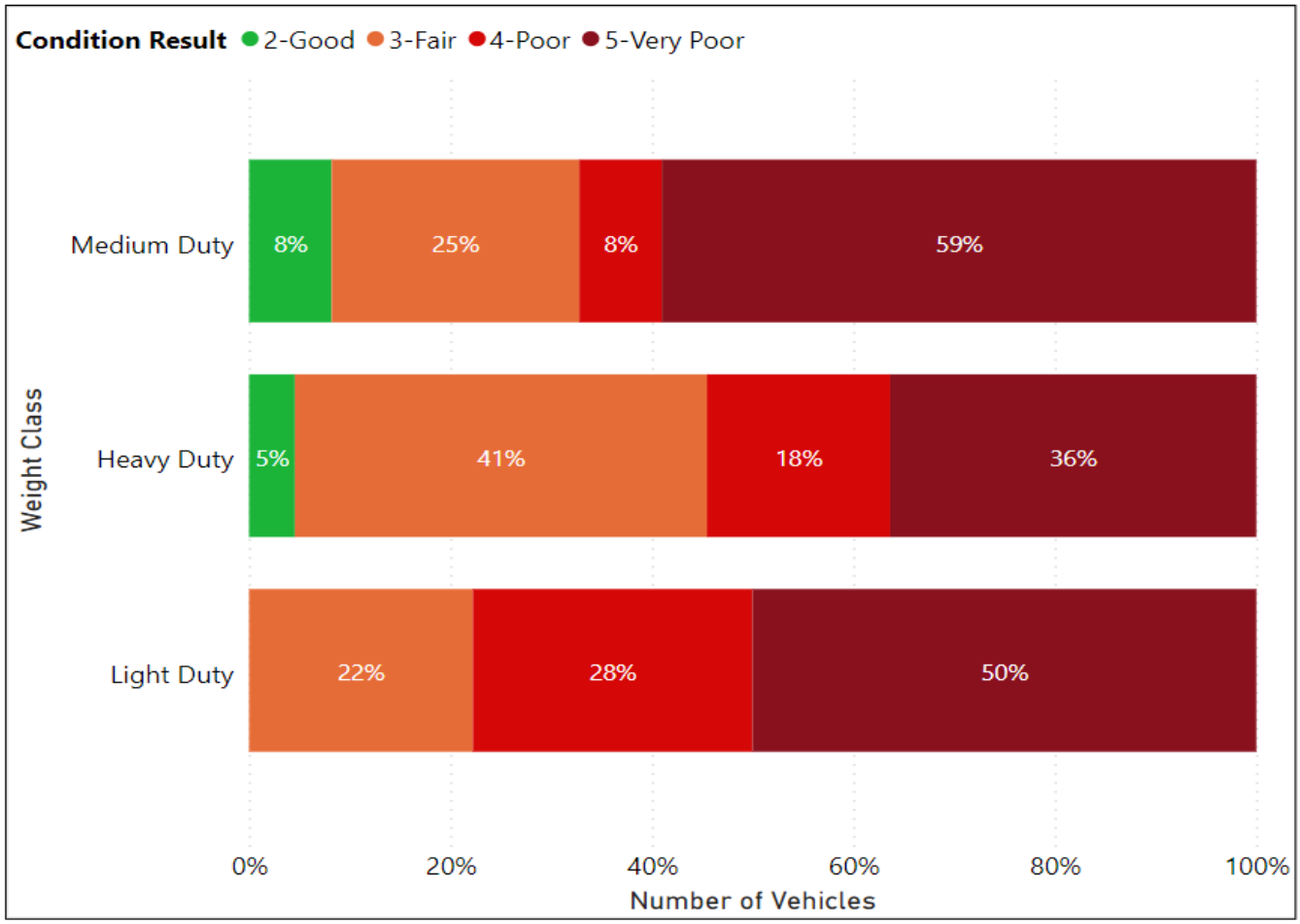
Vehicles are inspected and maintenance activities are conducted at specific intervals throughout the asset's lifecycle however no formal condition rating is assigned to each vehicle as shown in ***Table 9***. Forestry & Horticulture relies on the Fleet Section in the Corporate Asset Management (CAM) division to assist with the inspection, maintenance and procurement of vehicles on their behalf. Age has been used to estimate the condition of these assets where age is known which is considered to be low data confidence. This has been identified as a continuous improvement item in ***Table 31.***

Table 9: Inspection and Condition Information

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

Per the condition profile in ***Figure 5*** on the following page, Forestry & Horticulture has 59% of Medium duty vehicles, 36% of Heavy-Duty Vehicles and 50% of Light Duty vehicles in Very Poor condition. The replacement of Vehicles occurs per processes outlined by the Fleet Section. The condition of vehicles is based only on age and estimated service life and is consistent with many vehicles being beyond their ESLs as explained in the age profile section above.

Figure 5: Vehicles Condition Profile



3.2.3.3 ASSET USAGE AND PERFORMANCE

Assets are generally provided to meet design standards where available. Known service performance issues for vehicle assets involve assets being beyond their Estimated Service Life as shown in ***Table 10***.

Table 10: Known Service Performance Deficiencies - Vehicles

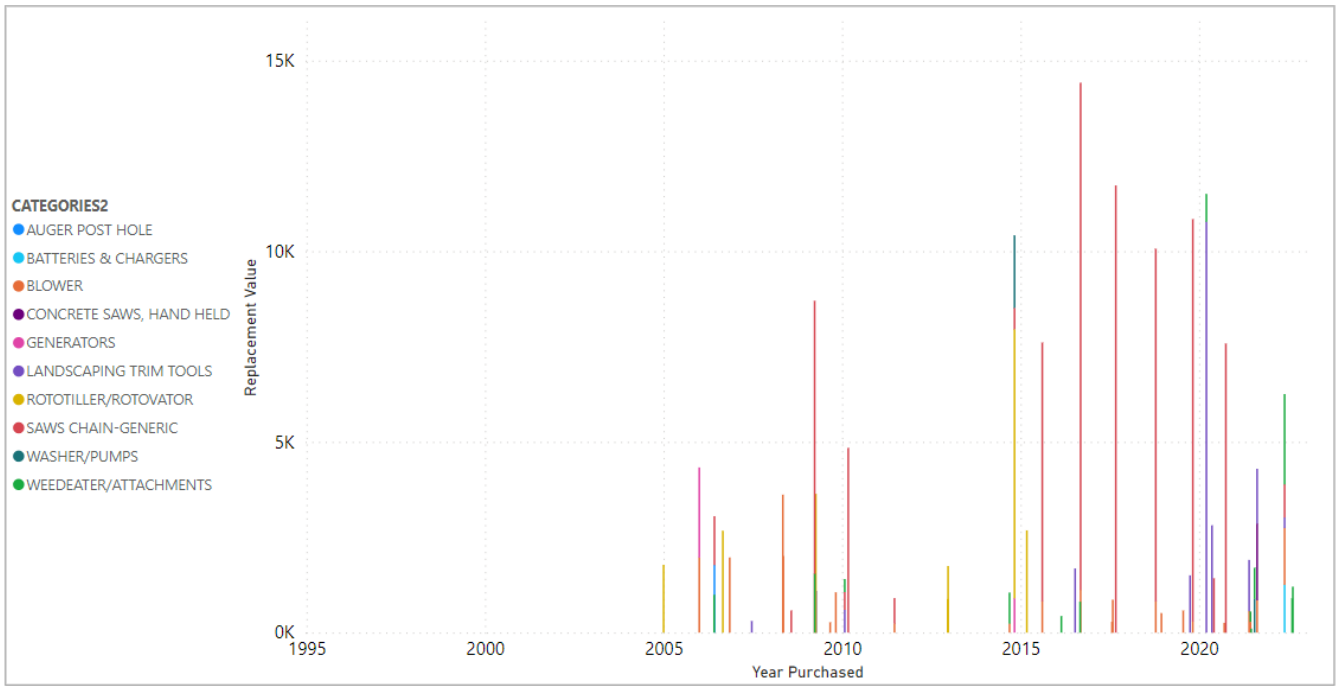
ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Vehicles	**Various**	Vehicles past estimated service life recommendations	Results in increases in maintenance costs, potential safety concerns, and potentially interrupted service with more staff downtime

3.2.4 SMALL EQUIPMENT PROFILE

3.2.4.1 AGE PROFILE

The age profile of the Forestry & Horticulture Small equipment assets is shown in ***Figure 6.*** The age of these assets is considered to be medium data confidence because there were some gaps in the data. Estimated Service Life (ESL) was recorded as 10 years.

Figure 6: Small Equipment Age Profile



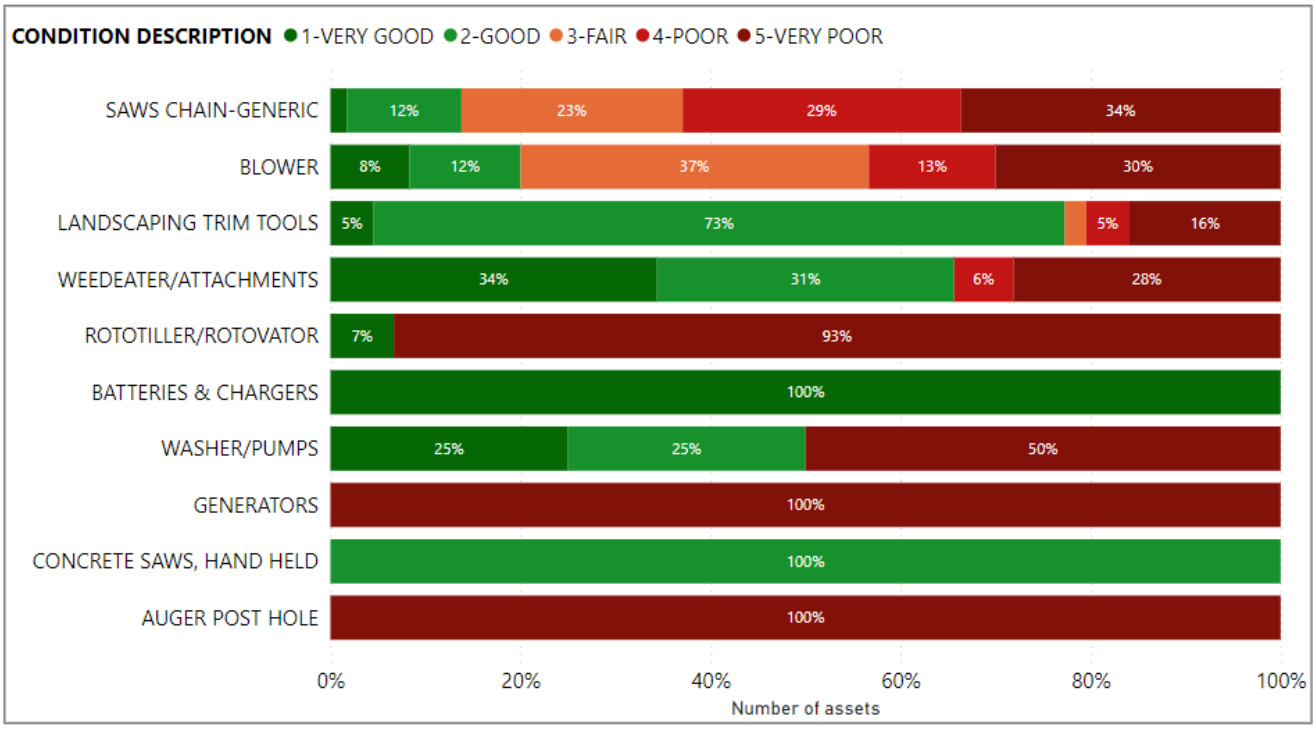
The above figure shows Replacement Value by Year Purchased for the Small Equipment asset class and indicates that **$47K or 28%** of the small equipment assets are beyond their Estimated Service Life.

3.2.4.2 CONDITION METHODOLOGY & PROFILE

There is currently no formal inspection process in place for the Small Equipment asset class. There are plans in place to perform inspections of small equipment on an annual basis in 2024. This has been identified as a continuous improvement item in ***Table 31.***

The condition of small equipment is based only on age and estimated service life and is considered to be low data confidence. Based on the information in the Condition profile in Figure 7, Auger Post Hole, Generators and rototiller/rotavator equipment are in Very Poor condition. The rest of the equipment in this category is in Fair to Good condition.

Figure 7: Small Equipment Condition Profile



3.2.4.3 ASSET USAGE AND PERFORMANCE

Assets are generally provided to meet design standards where available. Known service performance issues for small equipment assets involve assets being beyond their Estimated Service Life as shown in ***Table 11***.

Table 11: Known Service Performance Deficiencies – Small Equipment

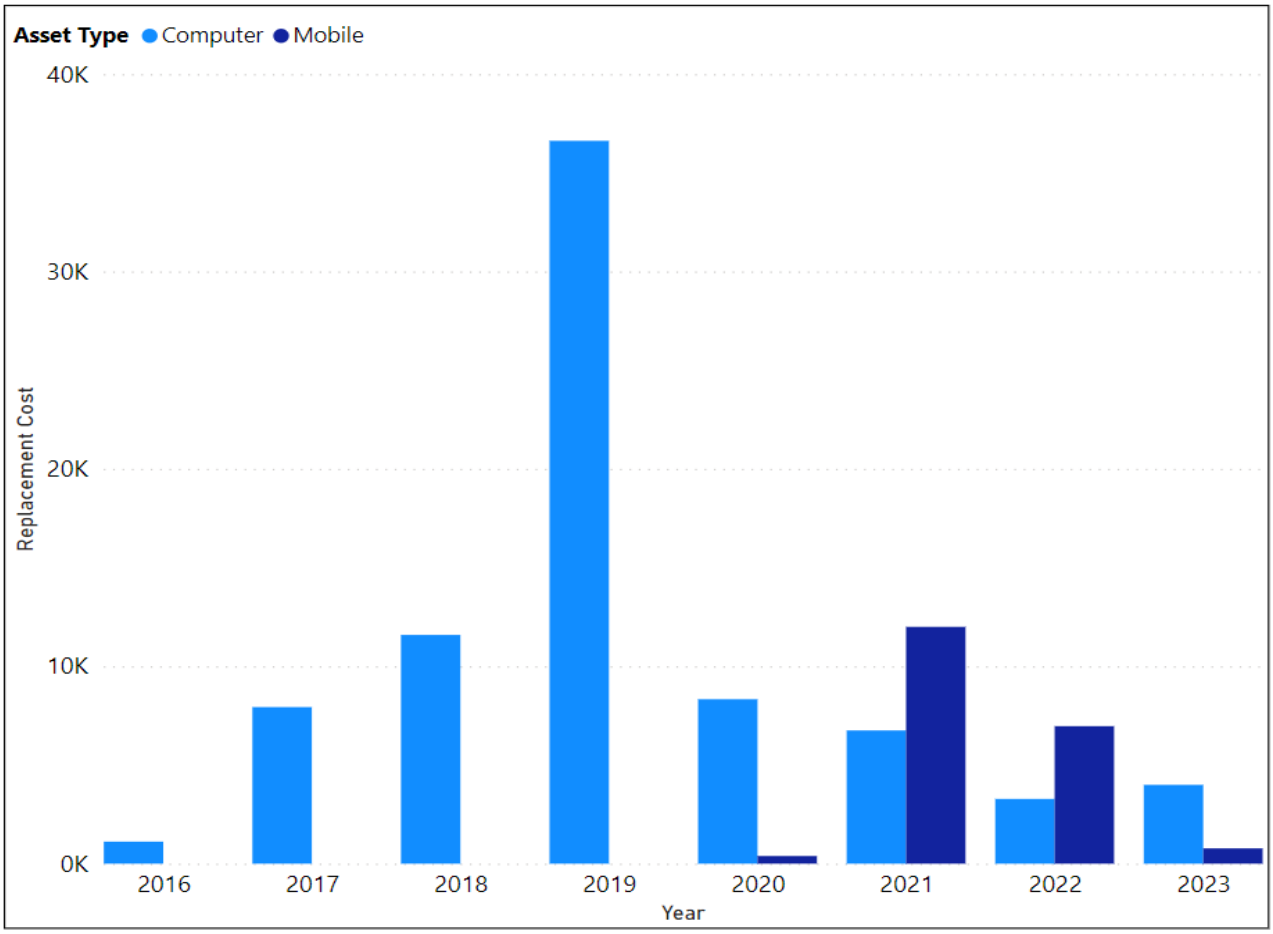
ASSET	LOCATION	SERVICE DEFICIENCY
Technology	Equipment purchased before 2014	Beyond estimated service life

3.2.5 TECHNOLOGY PROFILE

3.2.5.1 AGE PROFILE

The age profile of the Forestry & Horticulture technology assets is shown in ***Figure 8.*** The age of these assets is considered to be high data confidence because they are recorded at the time of purchase. An analysis of the age profile is provided below. In the Technology age profile figure below, the computer (desktop & laptop) assets have a useful life of five years while the remaining assets have a useful life of four years. As can be seen from the figure, most of the assets are at or close to the end of their ESLs.

Figure 8: Technology Age Profile

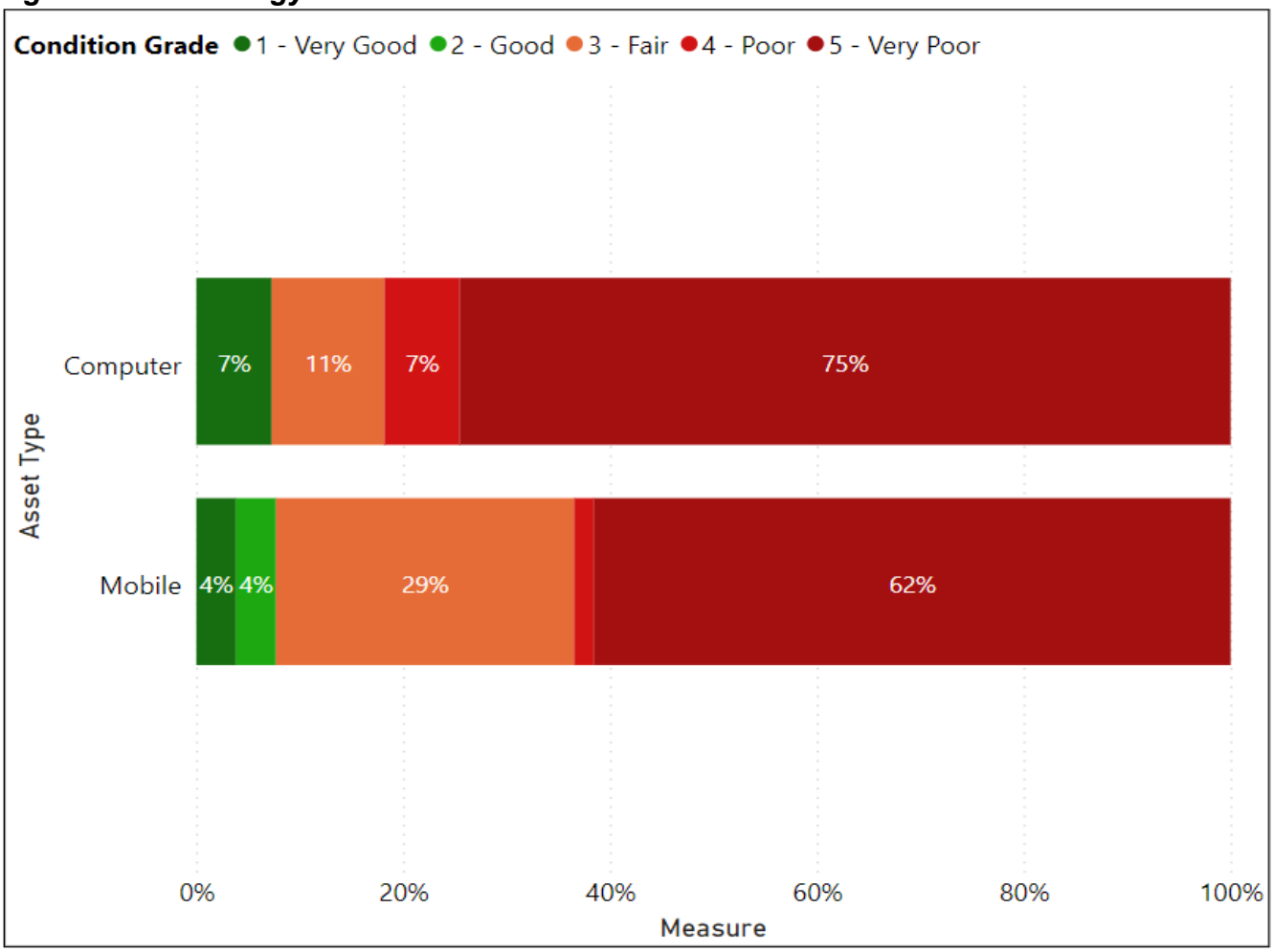


3.2.5.2 CONDITION METHODOLOGY & PROFILE

Currently 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 which is considered to be low data confidence. This has been identified as a continuous improvement item in ***Table 31.***

Figure 9 indicates that 62% of mobile assets and 75% of computer assets are in **Very Poor**. These assets will appear in the Renewal backlog in ***Section 8.3.***

Figure 9: Technology Condition Distribution



3.2.5.3 ASSET USAGE AND PERFORMANCE

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

Table 12: Known Service Performance Deficiencies - Technology

ASSET	LOCATION	SERVICE DEFICIENCY
Technology	Technology purchased before 2019	Beyond estimated service life

3.2.6 HORTICULTURE EQUIPMENT PROFILE

Since there is currently no age or condition data available for horticulture equipment, age and condition profiles were not created. A continuous improvement item indicated in ***Table 31*** is to develop an asset registry for these items as well as a condition methodology to assess the condition of these assets.

3.2.6.1 ASSET USAGE AND PERFORMANCE

Assets are generally provided to meet design standards where available. Known service performance issues are included in ***Table 13*** below.

Table 13: Known Service Performance Deficiencies – Horticulture Equipment

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Irrigation Systems	**Various**	Non-compliance with City By-laws	Some irrigation systems are not currently compliant with City Backflow By-law 10-103. Backflow preventers must be installed.

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 Forestry & Horticulture assets and therefore the City has developed municipally defined levels of service. Levels of service are defined in three ways, customer values, customer levels of service and technical levels of service which are outlined in this section. An explanation for how these were developed is provided in ***Section 7.5*** of the AMP Overview Document.

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:* ***Forestry & Horticulture*** was released on **November 7, 2023**, on the Engage Hamilton platform and closed on **December 13, 2023.** The survey results can be found in Appendix "A."

The survey received submissions from **69** respondents and contained **17** questions related to the Forestry & Horticulture service delivery. 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 become noticeable, but results are still trustworthy
Medium	1.0 to 1.5 – results are moderately grouped together, but most respondents are generally in agreement	10% to 20% - error is a significant amount and will cause uncertainty in the 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 the number of responses, a sample size of **69** correlates to a **MEDIUM** confidence level with a **12%** margin of error based on an approximate population size of **580,000**. This was determined to be an acceptable confidence level to use to develop the customer values and customer performance measures for this AM Plan. It is important to note that survey respondents were allowed to opt out of questions, and so, different questions may have varying confidence levels depending on the opt-out rate for that question.

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 respondent's opinions are split. A low consistency of data does not mean the data is wrong, but it does mean that it is difficult to make decisions using that information. Overall, Forestry & Horticulture's survey 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 further 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. This has been identified as a continuous improvement item identified in ***Table 31***.

Although there are limitations to the survey methodology and the number of responses was not at a high confidence level, these results can be used to provide some context about the feelings customers have about the services that the Forestry & Horticulture sections provide. However, decisions should not be made based on this survey alone and further investigation is required prior to proposing new levels of service.

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.

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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.

As previously mentioned, the customer values below were determined using the results from the *Let's Connect, Hamilton – City Services & Assets Review: Forestry &* Horticulture and are shown in ***Table 15*** below.

Table 15: Customer Values

CUSTOMER VALUES	CURRENT FEEDBACK	DATA CONSISTENCY	EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)
Street & Park Trees are Forestry & Horticulture's most important service area and increasing tree planting on City properties and trees is desired.	The average survey respondent rated Street & Park Trees as a very important service area and increased tree planting as a very important potential service.	Medium-High	Maintain
Customers are willing to increase tax rates to improve local services related to the Street and Park Tree service area.	The average survey respondent would prefer to minimize tax rate increases for Forestry & Horticulture services, except for Street and Park trees where they would probably prefer to see tax rates increase to improve services.	Medium	Maintain
The following existing services are important to the community: Tree Health & Education, Gage Park Tropical Greenhouse, and Garden Beds and Hanging Baskets.	The average survey respondent rated these service areas as important.	Medium	Maintain
Providing Floral Shows and Special Installations Across the City are not as important as other services that Forestry & Horticulture delivers.	The average survey respondent rated this service area as fairly important.	Medium	Maintain

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CUSTOMER VALUES	CURRENT FEEDBACK	DATA CONSISTENCY	EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)
The following potential services are important to the community: increase rain gardens, pollinator plants in City gardens, and greening school programs.	All these services were listed as important.	Medium	Increase
Customers are divided on decommissioning diesel vehicles as part of the Green Fleet Strategy and providing nature-based programs for children at the Gage Park Tropical Greenhouse.	The average survey respondent considered these important, but the data consistency was approaching low.	Medium-Low	Medium
Forestry & Horticulture sites should meet the Accessibility for Ontarians with Disabilities Act (AODA)[7]	The average survey respondent strongly agreed that services should meet this requirement.	High	Maintain
Most customers agree that Forestry & Horticulture services should be comfortable; inviting, appealing and attractive; safe, equitable and inclusive; clean and in good repair; and accessible by public transit. However, many customers couldn't say whether they agreed.	Many survey respondents (35-48%) opted out of these questions, but those who responded, on average, agreed with these service expectations.	Medium	Maintain
The majority of customers can't say if they agree that Forestry & Horticulture services should be energy efficient and reduce greenhouse gas emissions.	The majority of customers (61%) opted out of this question.	Medium	Maintain

[7] This question will be revised in future surveys since all City facilities are compliant with the Accessibility for Ontarians with Disabilities Act.

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 City's Forestry & Horticulture services in terms of their quality, reliability, accessibility, responsiveness, sustainability and, over the course, their cost. The City will continue to measure these customer levels of service to ensure a clear understanding of how the customers feel about the services and the value of their tax dollars.

The Customer Levels of Service are considered in terms of:

Condition	How good is the service? What is the condition or quality of the service?
Function	Is it suitable for its intended purpose? Is it the right service?
Capacity/Use	Is the service over or underused? Do we need more or less of these assets?

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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 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 beautiful and sustainable Forestry & Horticulture services.	2023 Forestry & Horticulture Services & Assets Review Survey	Average survey respondent opinion on how Forestry & Horticulture have performed overall in all aspects of the service.	Good Performance	Maintain
			Confidence Level	***Medium***	
			Data Consistency	***Medium***	
	Ensure that Forestry & Horticulture services & assets are maintained in good condition.	2023 Forestry & Horticulture Services & Assets Review Survey	Average survey respondent opinion on if Forestry & Horticulture facilities and services are clean & in good repair.	Agree	Maintain
			Confidence Level	***Medium***	
			Data Consistency	***Medium***	
	Ensure that Forestry & Horticulture sites & services are accessible to the public.	2023 Forestry & Horticulture Services & Assets Review Survey	Average survey respondent opinion on if customers were comfortable accessing Forestry & Horticulture sites & services.	Comfortable	Maintain
			Confidence Level	**Medium**	
			Data Consistency	**Medium**	
	Be fiscally responsible when delivering Forestry & Horticulture services.	2023 Forestry & Horticulture Services & Assets Review Survey	Average survey respondent opinion on whether Forestry & Horticulture is providing good value for money for sites and services.	Good Performance	Maintain
			Confidence Level	**Medium**	
			Data Consistency	**Medium**	
Function	Provide beautiful and sustainable Forestry & Horticulture services.	2023 Forestry & Horticulture Services & Assets Review Survey	Average survey respondent opinion on whether Forestry & Horticulture is meeting service needs overall for all services.	Meets Needs	Maintain
			Confidence Level	**Medium**	
			Data Consistency	**High**	
	Ensure Forestry can reliably respond to calls within an acceptable timeframe.	2023 Forestry & Horticulture Services & Assets Review Survey	Average survey respondent opinion on whether a response time of 24 hours meets the needs for storm-related tree damage.	Meets Needs	Maintain
			Confidence Level	**Medium**	
			Data Consistency	**Medium**	
Capacity	Ensure that Forestry & Horticulture sites & services are accessible to the public.	2023 Forestry & Horticulture Services & Assets Review SurveyL	Average survey respondent opinion on whether they are satisfied with their ability to access Forestry & Horticulture sites and services.	Satisfied	Maintain
			Confidence Level		
			Data Consistency		
			Average survey respondent opinion on whether Forestry & Horticulture sites & services are accessible per the Accessibility for Ontarians with Disabilities Act (AODA)	Agree	Maintain
			Confidence Level	Low	
			Data Consistency	Medium	
			Average survey respondent opinion on whether Forestry & Horticulture sites & services are accessible by public transportation.	Agree	Maintain
			Confidence Level		
			Data Consistency	Medium	

4.3.1 CUSTOMER INDICES

The three indices calculated to assess how customer expectations for a service align with the perceived performance for a service are listed below in ***Table 17.*** Based on the results of the table, since the net differential indices do not exceed 20 points overall for the Forestry & Horticulture service, there is generally a match between customer expectations and perceptions. In addition, since the Net Promoter Score is positive, it indicates customers would be willing to recommend the service to others. These indices are explained and analyzed in more detail in the sections below with areas to investigate further.

Table 17: Customer Indices

CUSTOMER INDICES	AVERAGE RESULT
Service Importance Versus Performance Net Differential[8]	-5
Net Promoter Score (%)[9]	23.24%
Service Rates Versus Value for Money Net Differential[5]	9

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%. The information below is intended to provide context around the survey results to assist **Forestry & Horticulture** with areas to further investigate before proposing any new levels of service.

SERVICE IMPORTANCE VERSUS PERFORMANCE INDICES

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 are indicative of a mismatch between expectations and service levels, equal to one point on the Likert[10] scale.

As previously mentioned, since the net differential indices do not exceed 20 points overall for the Forestry & Horticulture service, there is generally a match between customer expectations (performance) and perceptions (importance). However, ***Figure 10*** below indicates the net differential exceeds or is approaching -20 points for the Street & Park Trees and the Tree Health & Education Programs service areas, respectively. This indicates that the perceived importance

[8] For these indices, a value close to 0 is considered a match, and a value exceeding 20 points indicates a mismatch between customer expectations, and perception or service levels.
[9] A positive net promoter score indicates customers would recommend the service to others, a negative score indicates they would not, and a value close to 0 indicates a neutral feeling about the service.
[10] A Likert scale is a rating scale used to measure opinions, attitudes, or behaviours. It consists of a series of five answer statements which are consistently written the same way (e.g., Very Good to Very Poor, Very Satisfied to Very Unsatisfied).

of these services exceeds the performance expectations meaning that customers feel that these service areas are Very Important and Important respectively, but that the overall performance from the City in providing these assets or services is only Good. To reduce the net differential, Forestry & Horticulture 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.*** As a result, these service areas are potential areas where Forestry could further investigate proposing different service levels.

In addition, it is important to note that the Gage Park Tropical Greenhouse and Floral Shows & Special Installations Across the City are two service areas where the performance expectations exceeded the perceived importance of the service by over 10 points. Although this net differential mismatch is not as significant as the ones listed above, it is still worth mentioning that these results suggest that customers feel we are currently overperforming in these service areas. These are additional service areas where Horticulture could further investigate proposing different service levels.

Proposed levels of service are discussed further in ***Section 4.5***.

Figure 10: Importance versus Performance Index Score

ServiceArea	Performance	Importance	Net Differential ▲
Total	75.64	81	-5
Street and Park Trees	69.12	96	-27
Tree Health and Education Programs	64.24	83	-19
Garden Beds and Hanging Baskets (Along the street and on City property)	73.03	77	-3
Gage Park Tropical Greenhouse	90.00	80	10
Floral Shows and Special Installations Across the City	80.85	68	13

NET PROMOTER SCORE INDICE

The Net Promoter Score indices outline how likely an individual is to recommend a service to another person and measure customer loyalty. For municipal services, this score is difficult to interpret because oftentimes, individuals do not have many alternatives for utilizing different services and also there may be internal biases for certain service areas, however, this score does provide valuable information on whether customers would recommend using the service or whether they may seek alternatives or avoid using the service altogether.

Likert[11] choices less than a score of 4 are considered '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. Respondents who opted out by not answering or selecting 'Can't Say' were removed from the sample. Net Promoter score is calculated by subtracting (% Promoters) and (% Detractors). The Standard Deviation (σ) is calculated in percent and has the same units as the Net Promoter Score.

As previously mentioned, and based on the results below in ***Figure 11,*** Forestry & Horticulture has a positive Net Promoter Score indicating that on average customers would recommend Forestry & Horticulture services to others. The highest scoring service area is Street and Park Trees which also has a high data consistency, and the lowest scoring service area is the Floral Shows and Special Installations Across the City which customers do not recommend, but it is evident that the data consistency is medium indicating respondents were more divided on this service area.

Figure 11: Net Promoter Score

ServiceArea	σ	NPS
All Service Areas	**1.21**	**23.24**
Street and Park Trees	0.57	85.29
Tree Health and Education Programs	1.08	25.40
Gage Park Tropical Greenhouse	1.17	17.19
Garden Beds and Hanging Baskets (Along the street and on City property)	1.32	10.14
Floral Shows and Special Installations Across the City	1.29	-25.40

SERVICE RATES VERSUS VALUE FOR MONEY INDICE

The Service Rates versus Value for Money indices are 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 are indicative of a mismatch between expectations and service levels, equal to one point on the Likert scale. A 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.

[11] A Likert scale is a rating scale used to measure opinions, attitudes, or behaviours. It consists of a series of five answer statements which are consistently written the same way (e.g. Very Good to Very Poor, Very Satisfied to Very Unsatisfied).

As previously mentioned, since the net differential indices do not exceed 20 points overall for the Forestry & Horticulture service, there is generally a match between customer expectations (value for money) and service levels (tax rates). However, per ***Figure 12*** below, survey respondents generally perceived they were getting Good value for money across all services except for the Tree Health and Education Programs which were rated as Average. The two service areas where there is a mismatch between Value for Money and Tax Rates are Gage Park Tropical Greenhouse, and Floral Shows and Special Installations Across the City. This mismatch indicates that although customers believe they are receiving good value for money for these service areas, they would prefer to minimize service cuts and maintain rates. Therefore, if Horticulture is proposing to increase levels of service for these service areas, they would want to ensure they are educating and seeking agreement from the public.

In addition, it is important to note that the Street and Park Trees is a service area where increasing the tax rate measure exceeded the value of money by almost 10 points. Although this net differential mismatch is not as significant as the ones listed above, it is still worth mentioning that these results suggest that customers feel the City could investigate increasing levels of service for this service area.

Figure 12: Rates versus Value for Money Index Score

ServiceArea	Value for Money	Tax Rates	Net Differential ▲
Total	73%	64%	9
Street and Park Trees	72%	80%	-9
Tree Health and Education Programs	67%	66%	1
Garden Beds and Hanging Baskets (Along the street and on City property)	72%	61%	12
Floral Shows and Special Installations Across the City	72%	52%	20
Gage Park Tropical Greenhouse	83%	62%	21

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 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 the service outcomes.[12]

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. A continuous improvement item in ***Table 31*** is to create an application to collect and share key technical measures and make the data publicly accessible i.e., Tracking Grid, Statistics, and Service Requests.

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

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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 that Forestry & Horticulture sites & services are accessible to the public.	Total number of trees planted through Forestry-led programs.	15,256	12,000	120,000 (12,000/year)
		Tree canopy Coverage	20%	20%	29%
		Budget	$ 3.2M	$4.1M	$ 53.0M
Operation	Ensure Forestry can reliably respond to calls within an acceptable timeframe.	Response Time for storm-related tree damage	>24 hours	24 hours	24 hours
		Budget	Not able to be quantified		
	Provide beautiful and sustainable Forestry & Horticulture services.	Frequency of hanging basket watering	Daily	Daily	Daily
		Budget	Not able to be quantified		
	Ensure Forestry & Horticulture are fiscally responsible when delivering services.	Actual Operating Expenditures vs Planned Budget	90-100%	90-100%	90-100%
Maintenance	Provide beautiful and sustainable Forestry & Horticulture services.	Centimetres of tree trimming per crew per day.	373 cm/day	400cms/day	400 cm/day
		Budget	$866K	$807K	$8.66M
		The average cm of stump removal completed per day	338 cm/day	200 cm/day	200 cm/day
		Budget	$97.7K	$165K	$1.0M
Renewal	Ensure that Forestry & Horticulture services & assets are maintained in good condition.	Average Facility Condition Index Forestry & Horticulture Facilities	13%	<5%	<5%
		Budget	$0.13M	$2.4M	$3.7M

4.5 PROPOSED LEVELS OF SERVICE DISCUSSION

Per the Technical Levels of Service **Table 18** described above, it can be concluded that Forestry & Horticulture is often meeting technical standards with some exceptions. However, customer preferences and expectations do not always align with internal technical targets. This section links the customer and technical levels of service to determine areas where different levels of service could be proposed. As previously mentioned, since the 2023 survey results have only a medium level of data confidence, it is difficult to make any conclusive decisions based on this initial survey. The discussion below is intended to provide context to direct Forestry & Horticulture to areas for further investigation based on these initial results before proposing any new levels of service.

In addition, the activity measures listed in the Technical Levels of Service table are not exhaustive and do not currently contain many Horticulture-specific measurements. Additional technical measurements will be created in future to better compare customer and technical levels of service which has been identified as a continuous improvement item in ***Table 31.***

CONDITION / QUALITY

Based on the Customer Levels of Service ***Table 16,*** it is evident that customers think that Forestry & Horticulture has Good Performance overall in all aspects of the service. As indicated in ***Section 4.3.1***, the most important service area for Forestry & Horticulture is Street and Public Trees. This Customer Level of Service quality measurement can be linked to the Technical Levels of Service Table Y through the stump removal and tree trimming measurements which are major activities Forestry completes to maintain the condition of Street and Parks Trees. At the time of writing, Forestry is not achieving the daily target for daily tree trimming but is exceeding its target for stump removal. Since tree performance was an area where there was a mismatch in customer performance expectations and perceived importance, Forestry may want to consider increasing levels of service for Public Trees. An increase in service levels may include Forestry investigating expanding the urban tree maintenance grid program to rural areas as well as to trees on City-owned properties. As previously mentioned, there is no inventory for these trees at this time so the cost to expand the service is currently unknown, but these City-owned assets are not being pro-actively managed and can result in unknown costs for the City in reactive maintenance.

In addition, in Customer Levels of Service ***Table 16*** survey respondents agreed that Forestry & Horticulture facilities and services were clean and in good repair and said they felt comfortable accessing the sites and services. Since the only facilities the public would typically access are the Gage Park Tropical Greenhouse and the Production Greenhouse, and both facilities were determined to be in Good condition based on the Building Condition Assessments discussed in ***Section 3.2.2.1***, there is a match between customer and technical levels of service. However, the City is not currently meeting the Facility Condition Index target overall and this should be investigated further.

Per Customer Levels of Service ***Table 16,*** survey respondents indicated that Forestry & Horticulture had Good Performance when providing good value for money, but as explained in ***Section 4.3.1***, they also opted to minimize service cuts and maintain tax rates overall for most service areas most notably with Gage Park Tropical Greenhouse, and Floral Shows and Special Installations Across the City service areas. The exception to this is Street and Park Trees where respondents felt the City could increase tax rates to increase levels of service. Therefore, if Forestry & Horticulture were to propose a different level of service, Street and Park Trees is an area where the focus should be. However, as previously mentioned, it is difficult to make this decision with the limited customer data available in this Asset Management Plan. When comparing the customer to technical levels of service, Forestry & Horticulture were in range in 2023 showing that Forestry & Horticulture are fiscally responsible with their current budget.

FUNCTION

Per Customer Levels of Service ***Table 16,*** Forestry & Horticulture are meeting customer needs overall in most service areas except for exceeding needs at the Gage Park Tropical Greenhouse. When comparing these results to the Technical Levels of Service ***Table 18***, the frequency of hanging basket watering target is being met. In addition, survey respondents also indicated that a 24-hour response time to clear or remove tree damage after a storm event also met needs, and ***Table 18*** shows Forestry is currently meeting the 24-hour response time target. Since customer needs and technical targets are both being met, this indicates there is a match between customer and technical levels of service. Currently, there are currently no areas to further investigate in this section to propose different levels of service.

As previously mentioned, additional technical measurements should be formulated in future to better compare the technical performance to the customer expectations. Additional response time measurements could be included, as well as the frequency of other key activities for critical assets.

CAPACITY

Results from the survey indicated customers were satisfied with their ability to access sites and services. In addition, survey respondents agreed that sites and services were compliant with the Accessibility for Ontarians with Disabilities Act (AODA) and were accessible by public transportation. All City facilities are AODA compliant, and the Horticulture facilities at Gage Park are on a bus route, and so it can be concluded that the City is meeting technical performance measures even though there are no direct measurements in ***Table 18*** indicating a match between customer expectations and technical performance.

The only technical levels of service measure related to capacity in ***Table 18*** is the total number of trees planted through Forestry-led programs where the City is exceeding its target in 2023, the survey did indicate that survey respondents wanted increased tree planting on City properties and streets as part of potential services that the City could offer. Therefore, with the information available, there is a match between customer expectations and technical performance.

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Other potential services survey respondents thought were important include the implementation of rain gardens for City sites and increased pollinator plants in City gardens, which should also be investigated if Forestry & Horticulture are proposing to change levels of service.

Additional technical measurements should be formulated in future to better compare the technical performance to the customer expectations. Measurements related to proposed acquisitions such as garden beds, hanging baskets, pollinator beds, and rain gardens should be included in future drafts.

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 being responsive to inevitable changes in demand. Demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services and types of services required.

5.1 DEMAND DRIVERS

For the Forestry & Horticulture service area, the key drivers are related to population growth, customer preferences, and environmental benefits as discussed in ***Table 19.***

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 19.*** Growth projections have been shown on ***Page 45*** of the AMP Overview Document.

Where costs are known, these additional demands as well as anticipated operations and maintenance costs have been encompassed in the Lifecycle Management Plan in ***Section 8.***

5.3 DEMAND IMPACT AND DEMAND MANAGEMENT PLAN

The impact of demand drivers that may affect future service delivery and use of assets are shown in ***Table 19***. 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.

Climate change mitigation and adaptation demands are included in ***Section 7.*** A continuous improvement item identified in ***Table 31*** is to investigate enhancing the demand management plans identified in this AM Plan.

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Table 19: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Customer Preference & Expectation	Current Canopy= 20%	2033 Canopy = 29% 2050 Canopy = 40%	Increase to current tree planting programs and need for additional programs.	Submit requests through the budget process, and where required, create Council Reports and Business Cases based on data-driven strategic planting plans, to increase planting numbers and types of trees/plants and identify required resources to support the lifecycle requirements for these assets.
Growth (Population Change)	580,000	633,000	Increased population leads to densification as well as expansion of the urban boundary requiring an increased number of assets and resources.	Submit requests through the budget process, and where required, create Council Reports and Business Cases to support the lifecycle requirements for these proposed assets.
Customer Preference & Expectation	Status quo	Additional assets required related to Green Street Design	Increased assets and required resources to ensure assets are maintained.	
Environmental Benefit	Status Quo	Annual Garden Beds Converted to Perennial Pollinator Beds	Increased Horticultural assets and required resources to ensure assets are maintained.	
Environmental Benefit	Unprecedented two new invasives in one year (i.e., spotted lantern fly, and oak wilt)	Continued increase in new invasive species	Additional treatments on trees and monitoring will be required. Potential impact on canopy if trees are dying.	

5.4 ASSET PROGRAMS TO MEET DEMAND

The new assets required to meet demand may be acquired, donated or constructed. For Forestry & Horticulture, typically assets are acquired or constructed. Occasionally assets are donated (e.g. commemorative trees, other donations), but this is minimal.

At this time there are approximately **$40M** in assets anticipated to be acquired over the **next 10 years**, and an anticipated **$104M** over the 30-year planning period as discussed in ***Section 8.1***. Acquiring new assets will commit Forestry & Horticulture 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 Plan 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[13].

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 assets 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 20.*** Failure modes may include physical failure, collapse or essential service interruption.

Table 20: Critical Assets

CRITICAL ASSET	FAILURE MODE	IMPACT
Trees	Weather event or pest/disease infestation	Severe Environmental Impacts (i.e., air quality, stormwater mitigation etc.)
Forestry Operations Centre	Weather event or lifecycle failure	Service disruption

[13] ISO 31000:2009, p 2

CRITICAL ASSET	FAILURE MODE	IMPACT
Tree & Other GIS Inventory	IT Failure/ Cyberattack	Service disruption/inability to provide storm response/loss of valuable information resulting in a major investment required to rebuild databases
Production & Tropical Greenhouses - loss of mechanical controls (irrigation, temperature/climate control, fertilization etc)	Mechanical Failure	Loss of valuable plant assets/service disruption

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 21***. It is essential that these critical risks and costs are reported to management. Risk treatment costs will be quantified and included in future iterations of the plan and are identified in ***Table 31*** in ***Section 10.2*** of the plan.

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Table 21: Risks and Treatment Plans

SERVICE OR ASSET AT RISK	WHAT COULD HAPPEN	RISK RATING	RISK TREATMENT PLAN	RESIDUAL RISK	TREATMENT COSTS
Public Trees in Rural Areas	Without proactive management of public trees in rural areas tree health could decline, risk claims could be incurred, and property damage or injury to the public could occur.	High	Implement tree inspections in rural areas and complete risk mitigation work as required. The industry standard is a 10-year cycle for inspections, so should be a minimum of every 10 years.	Low	Unknown currently. Identified as a Continuous Improvement item.
Public Trees on other City Properties	Currently, these trees are being managed on an ad hoc basis by asset owners who do not have the expertise to manage these assets. Similarly, to above, without proactive management, tree health could decline, risk claims could be incurred, and property damage or injury to the public could occur.	High	To manage the Urban Forest, Forestry & Horticulture responsibilities may need to expand to include management of all public trees, not just those in parks and the right of way.	Low	Unknown currently. Identified as a Continuous Improvement item.
Horticulture Assets	Horticulture staff are hired seasonally, and many do not return, requiring significant recruitment and training time every season.	High	Investigate increasing dual staff whose positions transfer between work locations seasonally and would be permanent staff.	Low	Unknown currently. Identified as a Continuous Improvement item.
Irrigation System	Some systems not compliant with City Backflow By-law 10-103, water contamination could occur.	High	Utilize approved contractors to assess all irrigation systems to quantify compliance levels. Potentially request additional budget to resolve the issue.	Low	Unknown currently. Identified as a Continuous Improvement item.

6.3 INFRASTRUCTURE RESILIENCE APPROACH

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

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

6.4 SERVICE AND RISK TRADE-OFFS

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

Table 22 outlines what activities Forestry & Horticulture cannot afford to do over the next 10 years with their existing budget and provides the associated service and risk tradeoffs. Other than the proposed Horticulture Facility, due to unknown costs, these projects have not been included in the Lifecycle Management Plan in **Section 8** and should be investigated in future AM Plans.

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?)
Ensure irrigation system compliance with City Backflow By-law 10-103.	Status quo. Service will continue to be delivered, but some systems are non-compliant with city bylaws.	Health & Safety risk of water contamination. Financial penalties may occur. The reputational risk of noncompliance with own bylaws
Rural Trees Service Level Increase	Status quo. Delays to clean up rural trees. Delays to Urban Grid Maintenance program.	Work on rural trees is more reactive and more expensive than the Urban Grid Maintenance Program Potential Health & Safety risks due to falling branches and potential utility outages.

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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?)
		The reputational risk with rural customers having lower service levels than urban customers.
Replace existing Horticulture Facility with Expanded Facility Acquisition	Space constraints for expansion required for growth. May be unable to meet service delivery requirements in future. May be unable to accommodate maintenance of new assets.	Financial risk due to delays to repairs. Health and Safety concerns for staff operating out of that facility.
Roof Panel Replacement on Tropical Greenhouse	Definite facility closure. Inability to maintain tropical plants which can be expensive. Loss of affordable rentable space for events.	Reputational risk due to closure and inability to rent. Health and Safety concerns for staff operating out of that facility. Financial risk for replacement of expensive plants.
Upgrades to Production Green House	The quality of plants may decline and may be difficult to pivot to perennial growth demand. Services like the Mum show may not be able to run.	Financial risk with plant cost increases due to purchasing plants versus in-house growing.
Irrigation Systems Repair	The system may fail, and hand watering would be required for garden beds throughout the City. This would lead to inconsistent watering, and plants potentially not surviving/ growing.	Financial risks due to increased water consumption/contracted-out watering and/or reactive maintenance. Reputational risks due to blocked traffic lanes to facilitate hand watering.

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 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. 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[14] (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.

[14] Newbold, Skidmore, Chessman , Imhoff, & McDowell, 2022

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Mitigation Demand Analysis

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

- Identifying the City's modelled targets for the low carbon transformations that applied to the service/asset.
- Discussing the impact, the targets would have on the service/asset; and,
- Proposing a preliminary demand management plan for how this modelled target will be achieved by 2050 as shown in ***Table 23*** 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 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 31.***

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

Table 23: Climate Change Mitigation Transformation

CLIMATE CHANGE MITIGATION TRANSFORMATION	MODELLED TARGET	IMPACT TO SERVICE OR ASSET	DEMAND MANAGEMENT PLAN
Growing Green	Planting 50,000 trees a year through to 2050	More Forestry staff would be required to maintain new trees on City properties. This target will also require participation from all sectors within Hamilton because most of the viable planting space within the city is privately owned.	The City has committed to planting 20,000 of this 50,000 tree target through capital and operating budgets and programs.
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.	Electric Vehicle Chargers will need to be installed at all Yards. Compensation for staff who charge City vehicles at home will need to be considered. Initial upfront capital costs for electric vehicles.	The vehicle conversion schedule for the existing fleet will be developed in partnership with Fleet to convert where feasible and as the market allows. Limitations may exist for heavy-duty vehicles due to availability within the market. Capital budgets will reflect increased costs related to conversions and additions to the existing fleet. Capital budgets will also be developed and submitted for charging stations on facilities.
Transforming Our Buildings	Post-retrofits, switch buildings to heat pumps for space and water heating by 2050.	The conversion may not be straightforward and may require the facility to be out of service for a period.	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 the new system.
	By 2050, all new municipal buildings achieve net-zero emissions.		
Revolutionizing Renewables	By 2050, 50% of municipal buildings will add rooftop solar PV, covering 30% of the building's electrical load.		

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

CURRENT MITIGATION PROJECTS

Mitigation projects Forestry & Horticulture 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
Urban Tree Canopy Equity Analysis	Growing Green	Analysis of equity in relation to the tree canopy to assist in strategic tree planting initiatives and reduce equity gaps identified.	An increase in the urban tree canopy is related to air quality, reduced heat island effect, improved stormwater management, and carbon sequestration
Annual Tree Planting Programs		Addition of 20,000 trees to the urban forest each year through forestry-led programs (i.e., Community Tree Planting, Street Tree Planting, Free Tree Giveaways)	
Mulching Program		Installation of mulched tree rings for public trees.	Reduced need for watering during drought and improvement of tree health which relates to the ecological benefits trees provide.
Electric Equipment Pilot		Currently piloting electric small equipment.	Reduced emissions associated with the use of small equipment used to maintain public trees.

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 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.[15]

In 2021, the City of Hamilton completed a Vulnerability and Risk Assessment Report[16] guided by ICLEI's Building Adaptive and Resilient Communities (BARC) Framework as part of the Climate Change Impact Adaptation Plan (CCIAP). The BARC Framework identified thirteen high-impact areas.

Adaptation Demand Analysis

Climate adaptation demands for Forestry & Horticulture are shown on the following page in ***Table 25***.

[15] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure
[16] City of Hamilton & Local Governments for Sustainability Canada, 2021

FORESTRY & HORTICULTURE
2024 ASSET MANAGEMENT PLAN

Table 25: Managing the Demand of Climate Change on Assets and Services

ADAPTATION IMPACT STATEMENT	BASELINE (1976 - 2005)[17]	AVERAGE PROJECTED CHANGE 2021-2050[17] (ASSUMING RCP4.5[18] 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 the Temperature is 30 Degrees Celsius or More	34.4 Average Days Where the Temperature is 30 Degrees Celsius or More	Increased days of Heat warnings may reduce employee productivity and daily accomplishments.	Explore options to shift change or manage expectations for daily workloads for frontline staff.
			Possible decline in tree health and extension of the growing season leading to weaker wood.	Request budget to increase services that regulate impacts of heat (i.e., Tree watering and mulching). Request budget to increase the use of technologies such as watering bags and storm retention systems
			Possible decline in plant health and ability to maintain planters and hanging baskets due to significant need for water during high heat periods.	Review approved plant lists to increase the use of drought-tolerant plants. Review current planting practices to implement mulching where possible to reduce soil moisture loss. Explore the reduction of hanging baskets and planter assets. Investigate creating requirements for designs to include stormwater retention to reduce manual watering needs.
Increased intensity and frequency of ice storms leading to increased hazardous roads, pathways and sidewalk conditions.	187mm Average Total Winter Precipitation	204mm Average Total Winter Precipitation	Increased loss of canopy from trees damaged. Periods of reduced proactive maintenance on Trees because of the increase in storm maintenance and its impact on staffing and contractual resources. Increase in Insurance claims related to tree-related property damages.	Proactively complete tree risk assessments. Request increase for Planting and Maintenance budgets to replace and maintain trees to ensure a 7-year cycle is maintained.
Changes in precipitation resulting in erosion of natural systems (i.e. water banks, escarpment erosion) leading to washouts of bridges and roadways.	844mm Average Annual Total Precipitation	886mm Average Annual Total Precipitation	Increased loss of canopy from trees damaged or trees that require removal due to root instability	
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 (20mm)	7.7 Heavy Precipitation Days (20mm)	Increased Fungal Diseases, and root rot.	Provide Public Education on Diseases, Property maintenance and good gardening practices to reduce flood effects on soil and plant roots.
More intense summer precipitation combined with increasing temperatures lowering the water supply as well as increasing water demand for drinking, landscaping, and irrigation. (Rural)	217mm Average Total Summer Precipitation	221mm Average Total Summer Precipitation	Increased loss of canopy from trees damaged. Periods of reduced proactive maintenance on Trees because of the increase in storm maintenance and its impact on staffing and contractual resources. Increase in Insurance claims related to tree-related property damages.	Proactively complete tree risk assessments. Request increase for Planting and Maintenance budgets to replace and maintain trees to ensure a 7-year cycle is maintained. Provide Public Education on the importance of planting appropriate species, watering correctly and utilizing mulch to reduce water loss.
Increase in average annual temperatures (especially in the summer) leading to increased food insecurity in the region (i.e. decrease in local crop yields, food cost fluctuations, etc.)	13.1 Degrees Celsius Average Annual Temperature	15.1 Degrees Celsius Average Annual Temperature	Longer Growing Seasons will create the formation of weak wood in trees making them more susceptible to storm damage.	Request increase to storm damage and Maintenance budgets.

[17] ICLEI Canada, 2022

[18] 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 CO_2 and would more than likely lead to 3°C of warming by the end of the 21st century.

ADAPTATION RISK ANALYSIS

Additionally, the City should consider the risks for the asset or service because 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 26.***

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 AMP, and new projects should consider these risks during the planning and design processes. Future changes will be incorporated into future iterations of the AMP. 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 COULD 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.	**Public Trees**	Deterioration of tree health.	Medium	Implementation of rain gardens for City sites to improve stormwater management and climate resilience.

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

CURRENT ADAPTATION PROJECTS

Forestry & Horticulture are currently working on climate adaptation projects as outlined in ***Table 27***.

Table 27: Current Adaptation Projects

PROJECT	ADAPTATION IMPACT STATEMENT	PROJECT DESCRIPTION
Changes to fertilizer and irrigation practices	Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.	Changed from the scheduled application of fertilizer and use of irrigation systems to informed decision-making. Irrigation is based on the real moisture condition of gardens/planters. Fertilizer is only used when needed based on soil testing.
LID Features		Installation of rain gardens

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 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, currently, the plan is limited to those aspects. Expenditure on new assets and services will be accommodated in the long-term financial plan but only to the extent that there is available funding.

8.1 ACQUISITION PLAN

The 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 agreements with the City, through land acquisitions, or through the construction or purchase of new assets.

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 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. These drivers will be developed as part of a future iteration of this plan.

DONATED ACQUISITIONS

Occasionally assets are donated (e.g. commemorative trees, other donations), but this is minimal. For the Forestry & Horticulture group, there were no donated assets reported as part of the analysis.

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

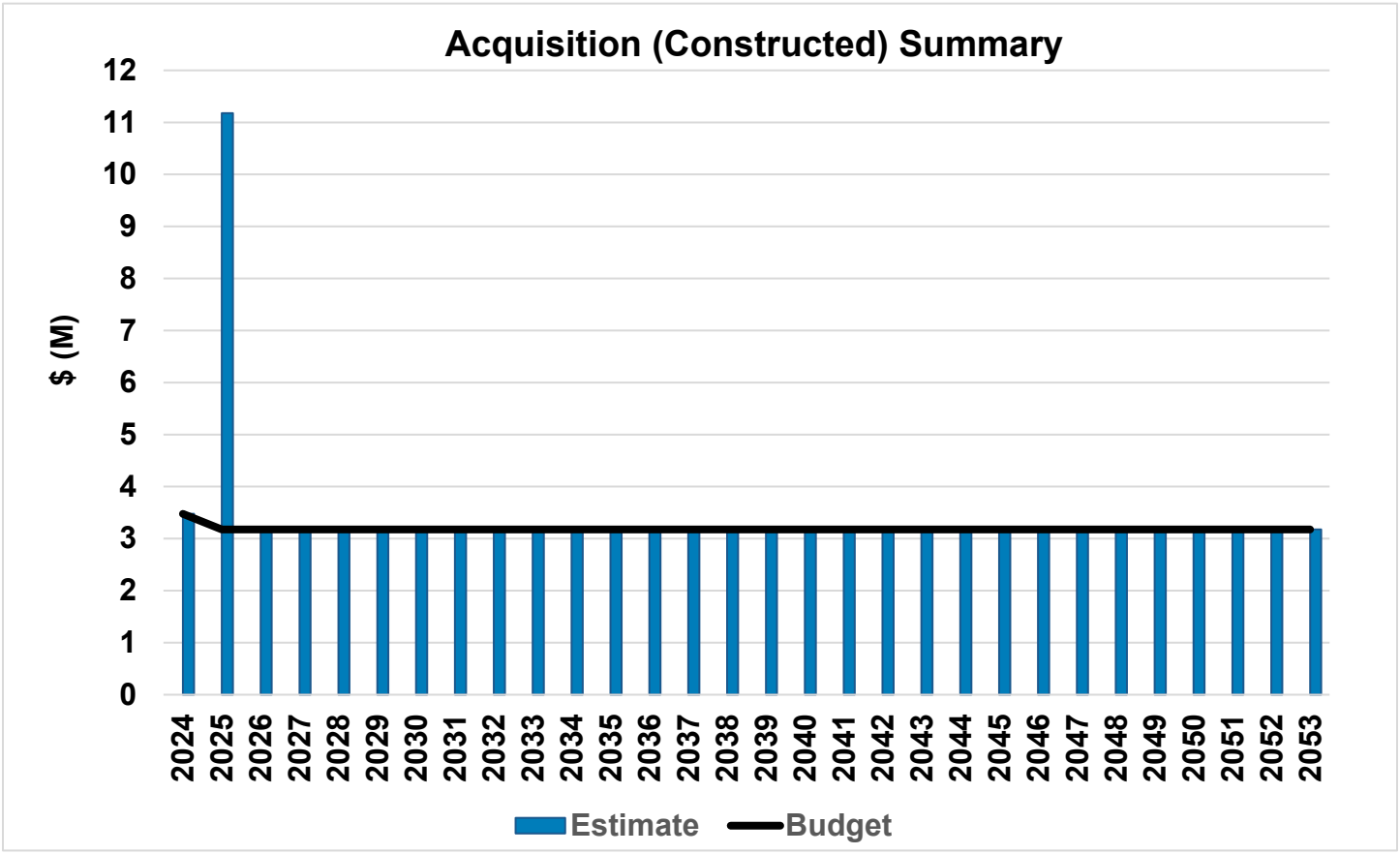
CONSTRUCTED OR PURCHASED ACQUISITIONS

Over the next **10**-year planning period **2024 to 2033,** the City will acquire approximately **$32M** of new trees which relates to 20,000 trees (6,000 street trees, 9,000 parks trees and 5,000 giveaway trees) or $3.2M per year in ***Figure 13*** below which have been assumed to be funded over the next 30 years.

The City currently has a sufficient budget for these planned tree acquisitions. However, this budget does not address future asset needs that may need to be constructed to ensure service levels are maintained over the long term for these assets. There is an **$8M unfunded acquisition** for a Horticulture building in 2025 which is required to support increased accommodations for front-line and administrative staff due to past and anticipated growth of Horticulture managed assets citywide.

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 and/or purchased assets annually and update the AM Plan when new information becomes available.

Figure 13: Acquisition (Constructed) Summary

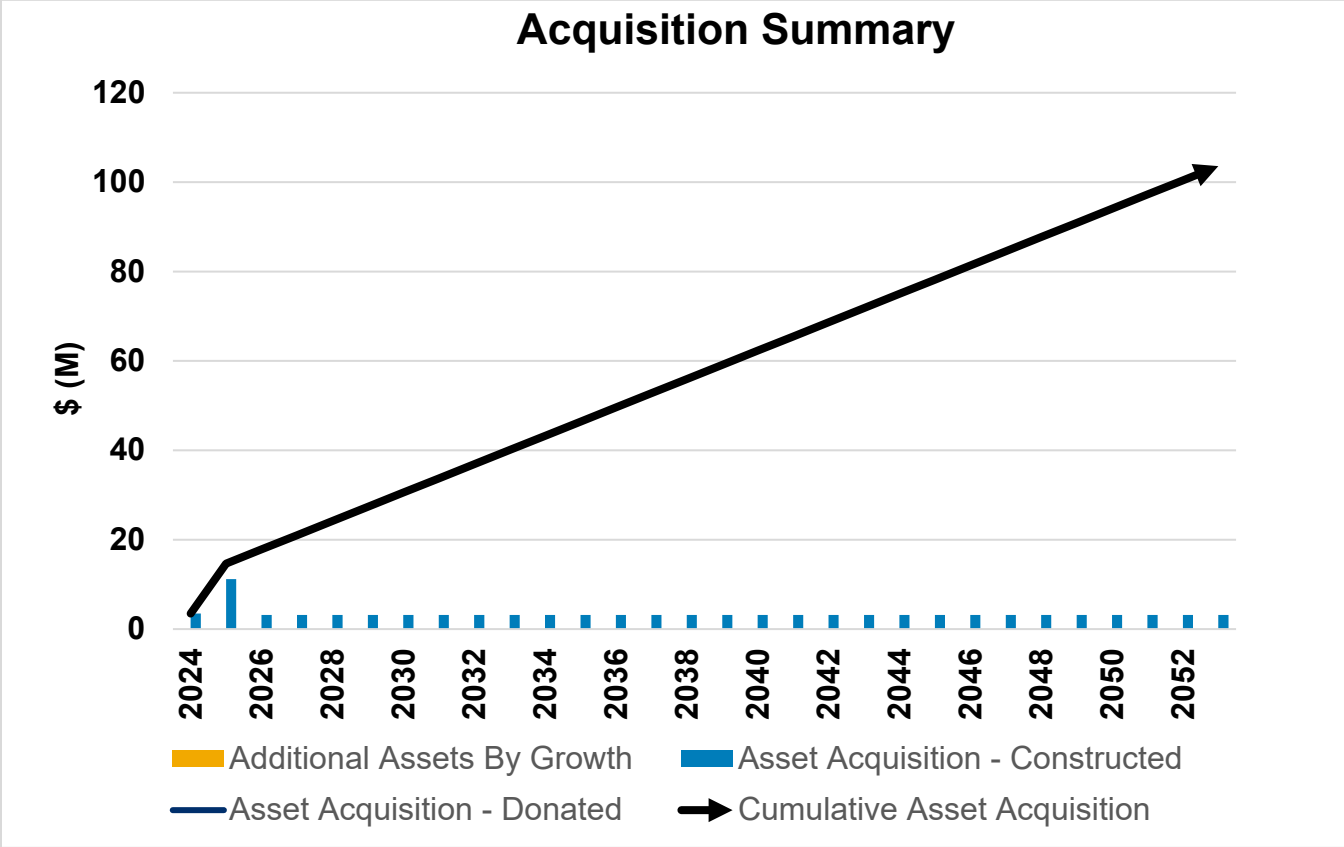


FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

ACQUISITIONS SUMMARY

Forecast acquisition asset costs are summarized in ***Figure 14*** and show the cumulative effect of asset assumptions over the next 10-year planning period.

Figure 14: Acquisition Summary



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. Of the $96M of trees anticipated over the 30-year forecast, approximately 25% (5,000 trees) will consist of trees included in Free Tree Giveaways to the public and will therefore not commit the City to additional operations and maintenance activities.

Hamilton must also account for future depreciation when reviewing long-term sustainability, but this does not apply to natural-enhanced assets like public trees. 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 is shown in ***Figure 14***. The 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.

Some of the major operational investments over the next 10 years include:

- **$10.4 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 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 tree maintenance, equipment repairs, and component replacements along with 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 Forestry & Horticulture assets are reliable and can achieve the desired level of service.

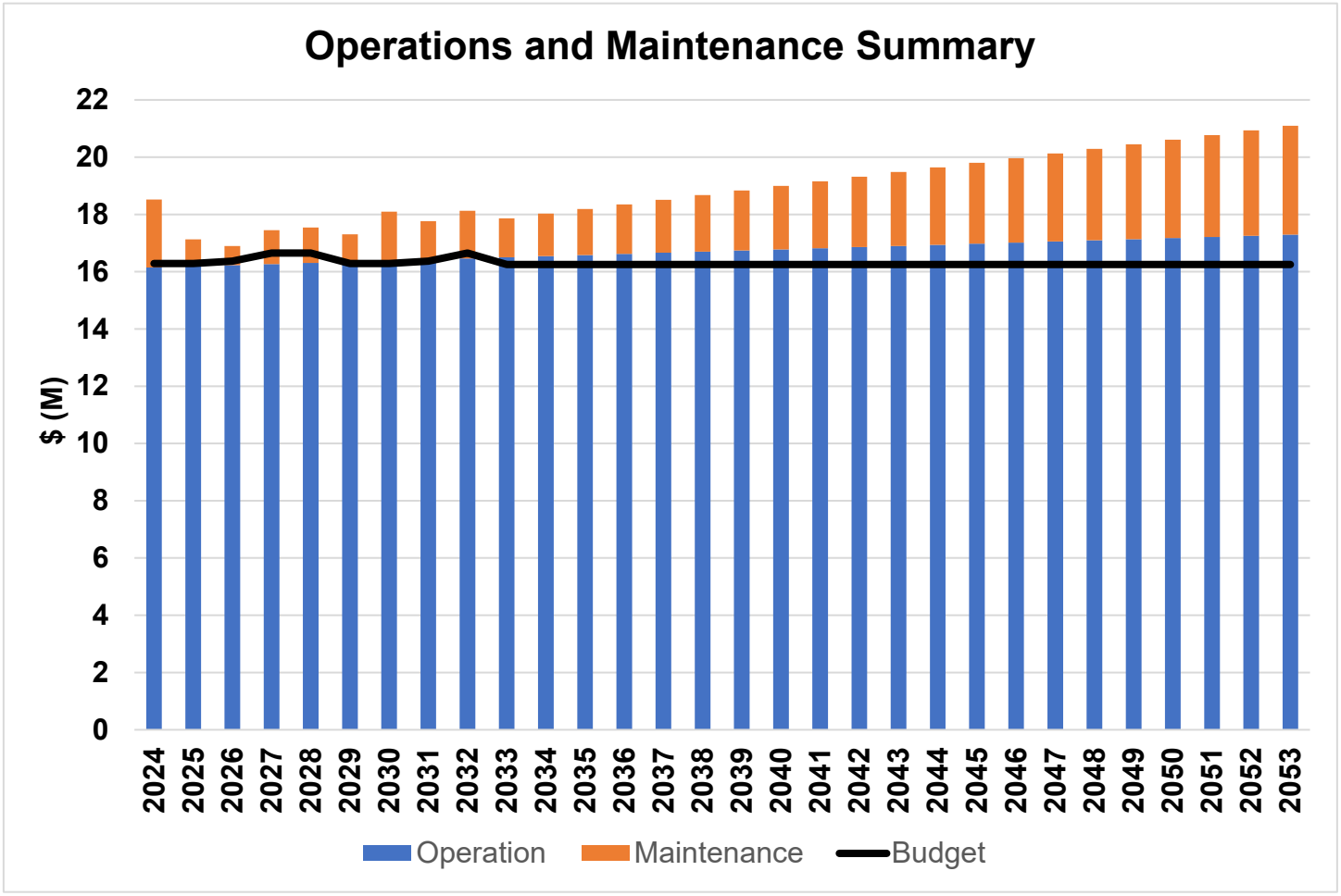
Major maintenance projects the City plans to complete over the next 10 years include:

- **$1.6** Million allocated across 2024 to 2032 for Spongy Moth Program; and,
- **$0.13** Million allocated in 2024 for facilities 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 forecasted to increase. When assets are disposed of the forecast operation and maintenance costs are reduced.

It is important to note that Street Trees are considerably more expensive in maintenance costs than Parks Trees since Street Trees require more proactive management to ensure they are not affecting surrounding infrastructure. Of the 20,000 trees acquired per year approximately 30% (6,000) are Street Trees and approximately 45% (9,000) are Parks trees. As previously mentioned, approximately 25% (5,000) of trees acquired by the City are donated to the public through Free Tree Giveaways and do not cost the City additional operations and maintenance costs over time. Additional O&M costs for the acquisitions of these trees are included in ***Figure 15*** which also shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 15: Forestry & Horticulture Operations & Maintenance Summary



Per ***Figure 15*** above, it is evident that operations and maintenance needs are growing for the Forestry & Horticulture section over the next 30 years due to increased tree planting throughout the City. O&M costs to support these future acquisitions were based on the anticipated needs for Street and Parks Trees. At this time these additional O&M requirements have been assumed to be unfunded and will need to be presented in future budgets. If the City endorses the requested Forestry & Horticulture budget on an annual basis and Forestry & Horticulture quantifies the lifecycle costing associated with the addition of these trees, it is predicted that there will be sufficient operating budget to deliver the service at the current service level. It is important to note that this forecast only includes the additional O&M required to support the proposed 15,000 trees Hamilton is acquiring per year and does not include additional anticipated O&M requirements for other demands, risks, climate change demands/risks, or proposed levels of services identified in **Sections 4 through 7** which will be quantified in future AM Plans.

Facilities maintenance amounts beyond the existing budget are assumed to be unfunded. The maintenance spike in 2024 is considered a maintenance backlog because it includes deferred maintenance due to budget constraints within the Corporate Facilities and Energy Management division over time. A key unfunded project included in this maintenance backlog is the roof panel

replacement of the Tropical Greenhouse roof which was damaged in 2022 and is estimated to cost $1M. 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 Forestry & Horticulture budget forecasts.

As the City continues to develop condition methodologies 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 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 28*** 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 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 28: Useful Lives of Assets

ASSET SUBCATEGORY	ESTIMATED SERVICE LIFE (YEARS)
Computers	5
Laptops	4
Mobile Devices	4
Vehicles	10
Facilities	20 - 75
Small Equipment	10
Irrigation system	20 – 25

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).[19]

Future methodologies may be developed to optimize and prioritize renewals by identifying assets of Forestry & Horticulture 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.[20]

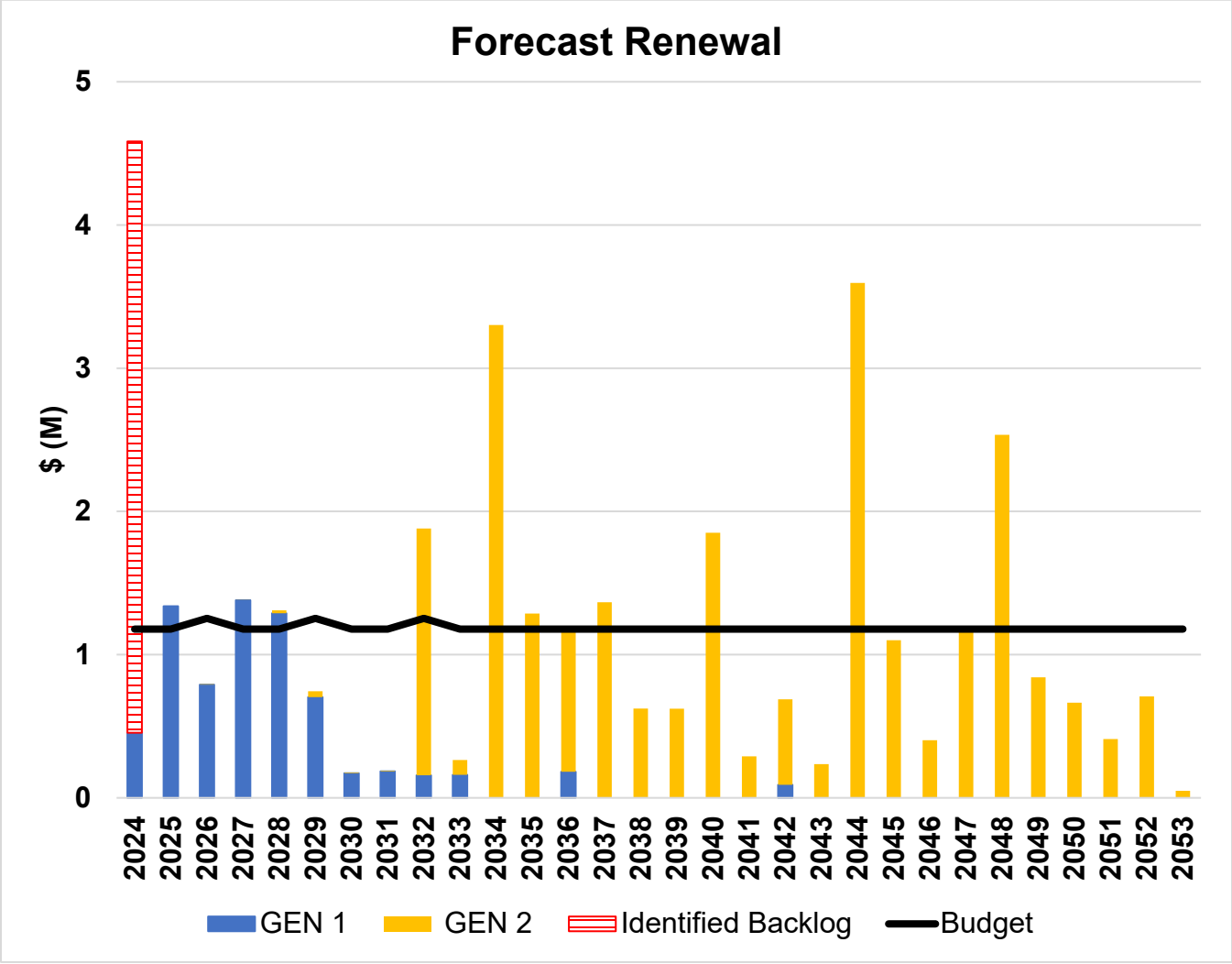
SUMMARY OF FUTURE RENEWAL COST

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 the figure below.

In ***Figure 16*** 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.

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

Figure 16: Forecast Renewal
All figure values are shown in 2023 dollars.



Currently, there is mostly sufficient funding to accomplish all the renewals that are planned over the next 10 years with a few exceptions as noted below:

- There is a $4.1M backlog amount in 2024 consisting of Vehicle assets that have exceeded their estimated service life. Since most vehicles are replaced on a 10-year lifecycle, this amount occurs again in 2034. Forestry & Horticulture should continue to work with Fleet Services to ensure these vehicles are renewed on a regular cycle.

It is important to note that the Public Trees asset class has not been included in the Renewals model because trees are maintained in perpetuity unless the asset dies or is irreparably damaged, and the condition for trees is not yet known on an individual basis and so no estimate could be created.

Properly funded and timely renewals ensure the assets perform as expected. Deferring renewals creates 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 in future AM Plans.

8.4 DISPOSAL PLAN

Disposal includes any activity associated with the disposal of a decommissioned asset including the 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.

No assets were identified for disposal in this plan. However, if the Horticulture Building becomes funded, the existing Horticulture Operations building will be disposed of. In addition, the Forestry and Horticulture section creates Wood Chips as part of the Tree disposal process. The costs and revenue associated with this process will be included as part of future iterations of this plan.

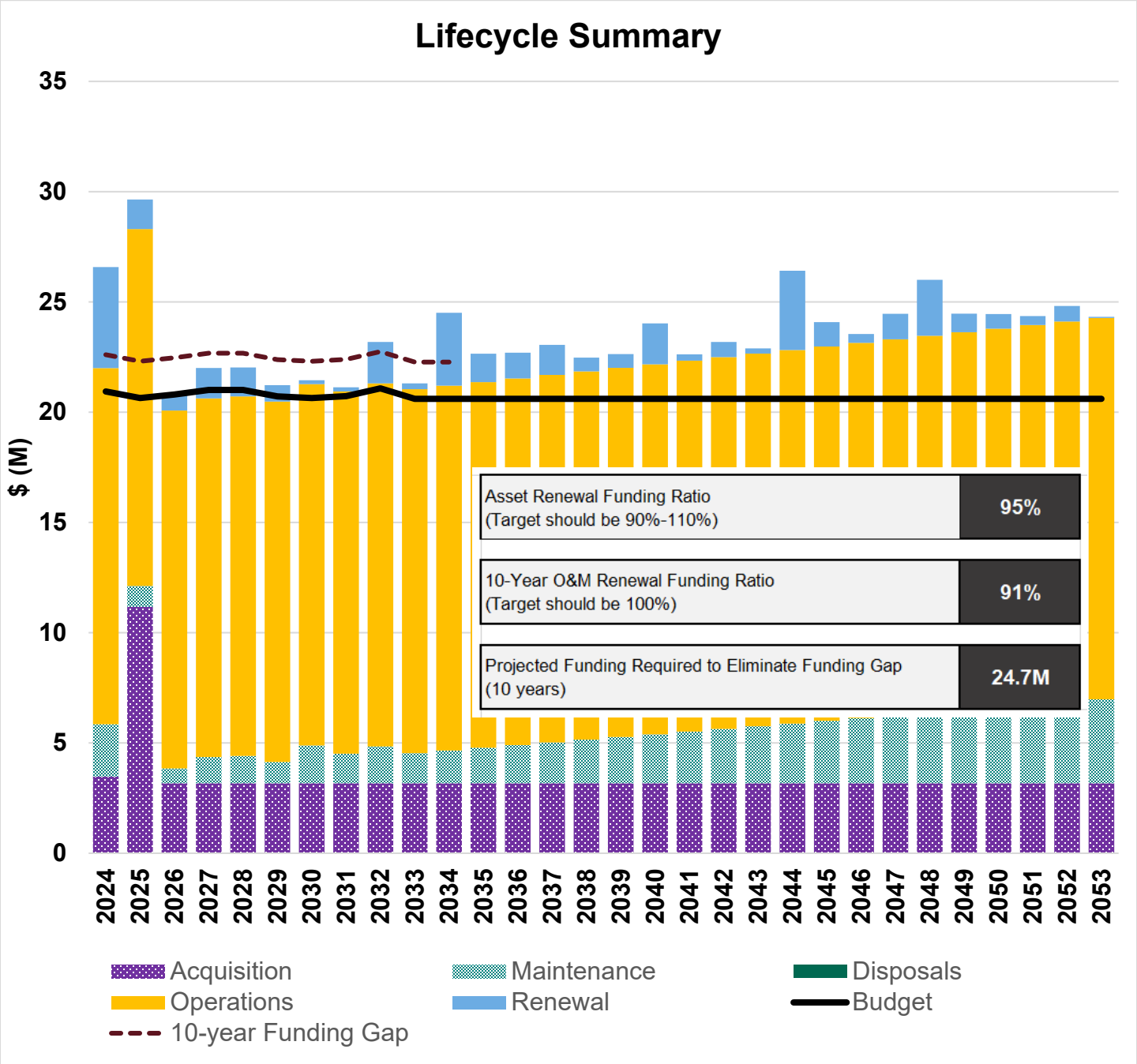
8.5 LIFECYCLE COST SUMMARY

The financial projections from this asset plan are shown in ***Figure 17***. 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.

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

Figure 17: Forestry and Horticulture Lifecycle Cost Summary



The figure above indicates that there is mostly sufficient budget over the 10-year planning period to address lifecycle needs except for 2024 and 2025. As previously mentioned, the unfunded needs in 2024 are mostly related to the vehicle-renewal and facility maintenance backlogs, and the unfunded need in 2025 is related to the proposed Horticulture Facility acquisition required to support increased accommodations for front-line and administrative staff due to past growth of Horticulture managed assets citywide.

Though operations and maintenance budgets are currently sufficient, the annual acquisitions of trees through the tree planting program will commit the City to additional operations and maintenance costs across the lifecycle of the tree. If the City continues to acquire 15,000 City-owned trees per year, the City will also need to increase the operating budget to support these assets. It was estimated in this forecast that this would be an additional $40 Thousand in operations costs and $122 Thousand in maintenance costs with each year's tree planting program. By 2053 this will result in a required increase of $1.2 Million and $3.7 Million to the operations and maintenance budgets respectively. If the City endorses the requested Forestry & Horticulture budget on an annual basis and Forestry & Horticulture quantifies the lifecycle costing associated with these trees, it is predicted that there will be sufficient operating budget to deliver the service at the current service level.

It is important to note that this forecast does not include additional anticipated lifecycle activities for other demands or risks discussed in ***Section 5*** or ***Section 6*** which will be quantified in future AM Plans.

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 Forestry & Horticulture provide the appropriate level of service for the City to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the City is transparently fulfilling its stewardship accountabilities.

Long-Term Financial Planning (LTFP) is critical for the City to ensure the service's 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 Forestry & Horticulture assets; 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 the service'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[21] **95%**

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 indicates that service levels are achievable, however, the expenditures are below this level in some service areas 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.

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

If assets are not renewed at 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 **91%**

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 O&M and Renewal 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 **$19.3M** 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 $**17.6M** on average per year giving a 10-year funding shortfall of **$167K** per year or **$1.67M** over the 10-year planning period. This indicates that **91%** 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 Forestry & Horticulture is funding their assets at an acceptable rate. Note, that these calculations exclude acquired assets, but include the O&M costs associated with anticipated acquisitions.

If the City continues to acquire 15,000 City-owned trees per year, the City will also need to increase the operating budget to maintain an acceptable financial ratio. If the City endorses the requested Forestry & Horticulture budget on an annual basis and Forestry & Horticulture quantifies the lifecycle costing associated with these trees, it is predicted that there will likely be sufficient operating budget to deliver the service at the current service level. However, as discussed throughout the report, there are opportunities for proposing new levels of service (e.g., expanding the maintenance program for Rural Trees and Other City-Owned trees, ensuring compliance with City Backflow By-law 10-103, and investigating dual staff) which should be investigated further when reporting on proposed levels of service by 2025 and have not yet been encompassed in this value.

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 sustainably 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 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 guide 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.

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

Table 29: Forestry & Horticulture Lifecycle Costs

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2024	$3,476,000	$16,147,945	$2,374,185	$4,583,894	$-
2025	$11,176,000	$16,187,445	$942,290	$1,337,828	$-
2026	$3,176,000	$16,226,945	$671,430	$793,071	$-
2027	$3,176,000	$16,266,445	$1,184,294	$1,380,219	$-
2028	$3,176,000	$16,305,945	$1,234,634	$1,309,505	$-
2029	$3,176,000	$16,345,445	$960,811	$744,716	$-
2030	$3,176,000	$16,384,945	$1,711,862	$176,523	$-
2031	$3,176,000	$16,424,445	$1,339,292	$189,315	$-
2032	$3,176,000	$16,463,945	$1,665,706	$1,880,602	$-
2033	$3,176,000	$16,503,445	$1,362,699	$264,403	$-
2034	$3,176,000	$16,542,945	$1,484,699	$3,301,222	$-
2035	$3,176,000	$16,582,445	$1,606,699	$1,286,828	$-
2036	$3,176,000	$16,621,945	$1,728,699	$1,172,743	$-
2037	$3,176,000	$16,661,445	$1,850,699	$1,366,219	$-
2038	$3,176,000	$16,700,945	$1,972,699	$623,833	$-
2039	$3,176,000	$16,740,445	$2,094,699	$622,716	$-
2040	$3,176,000	$16,779,944	$2,216,699	$1,851,195	$-
2041	$3,176,000	$16,819,444	$2,338,699	$289,315	$-
2042	$3,176,000	$16,858,944	$2,460,699	$687,930	$-
2043	$3,176,000	$16,898,444	$2,582,699	$235,403	$-
2044	$3,176,000	$16,937,944	$2,704,699	$3,595,894	$-
2045	$3,176,000	$16,977,444	$2,826,699	$1,100,828	$-
2046	$3,176,000	$17,016,944	$2,948,699	$402,071	$-
2047	$3,176,000	$17,056,444	$3,070,699	$1,159,219	$-
2048	$3,176,000	$17,095,944	$3,192,699	$2,534,505	$-

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2049	$3,176,000	$17,135,444	$3,314,699	$841,716	$-
2050	$3,176,000	$17,174,944	$3,436,699	$664,523	$-
2051	$3,176,000	$17,214,444	$3,558,699	$410,315	$-
2052	$3,176,000	$17,253,944	$3,680,699	$708,602	$-
2053	$3,176,000	$17,293,444	$3,802,699	$49,403	$-

9.3 FUNDING STRATEGY

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

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

9.4 VALUATION FORECASTS

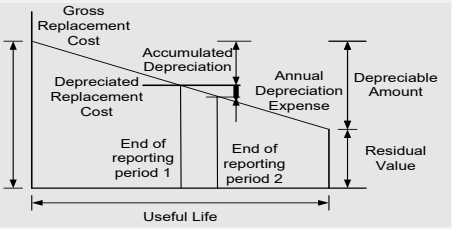
Asset values are forecast to increase as additional assets are added into service. As projections improve and can be validated with market pricing, the net valuations will likely increase significantly despite some assets being programmed for disposal that will be removed from the register over the 30-year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

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

9.5 ASSET VALUATION

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

Replacement Cost (Current/Gross)	**39,982,593**
Depreciable Amount	**38,463,133**
Depreciated Replacement Cost[22]	**24,254,940**
Depreciation	**1,547,600**



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 previously mentioned, Public Trees were not included in the depreciation as enhanced natural assets do not depreciate.

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:

- 30-year operational and maintenance forecasts are based on current budget allocations as well as subject matter expert estimates on O&M activities for additional Public Tree acquisitions. O&M forecasts were not estimated for the proposed Horticulture Facility;
- Public Trees asset class was not included in the Renewals model because trees are maintained in perpetuity unless the asset dies or is irreparably damaged, and the condition for trees is not yet known on an individual basis; and,
- Replacement costs in the renewal forecast were based on market value pricing where known and historical costs where market value prices were not available.

[22] 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 in the AMP Overview Document.

The estimated confidence level for and reliability of data used in this AM Plan is a **Low** confidence level as estimated using the information in ***Table 30*** below.

Table 30: Data Confidence Assessment for Data Used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand Drivers	Low	Demand drivers were determined using subject matter expert opinion.
Acquisition Forecast	Medium	Anticipated acquisitions required to support service were included in the Capital Budget.
Operation Forecast	Medium	Operations costs for new tree acquisitions were estimated as described in ***Section 8.2*** using subject matter expert opinion.
Maintenance Forecast	Medium	Maintenance costs for new tree acquisitions were estimated as described in ***Section 8.2*** using subject matter expert opinion.
Renewal Forecast - Asset Value	Low	Market pricing was used for renewal replacement costs for facilities, vehicles, small equipment and IT equipment which have generally medium confidence. There was no data available for horticulture beautification assets and tree renewals were not included in the model due to data and methodology limitations resulting in an overall confidence of low.
Renewal Forecast - Asset Useful Lives	Low	There is a high confidence in age data for fleet and IT assets. Age and service lives for facilities assets had to be estimated by staff based on discrepancies in the corporate facilities data. There was no data available for horticulture beautification assets and tree renewals were not included in the model due to data and methodology limitations resulting in an overall confidence of low.

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

DATA	CONFIDENCE ASSESSMENT	COMMENT
Renewal Forecast - Condition Modelling	Low	Condition data was only known for facilities. The condition of vehicles, small equipment, and IT assets was based on age and estimated service life. There was no data available for horticulture beautification assets and tree renewals were not included in the model due to data and methodology limitations resulting in an overall confidence of low.
Disposal forecast	Very Low	No disposals were integrated into the forecast

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:

- 2024 Approved Operating Budget;
- 2024-2025 Multi-Year Operating Forecast;
- 2024 Approved Capital Budget;
- 2024-2032 Multi-Year Capital Forecast;
- 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;
- Projected growth forecasts as well as internal reports;
- Condition assessments;
- Subject matter Expert Opinion and Anecdotal Information; and,
- Reports from the mandatory inspections and operations & maintenance 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 ***Table 31*** 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.

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

Table 31: Improvement Plan

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1	Review and revise this AM Plan once additional best practice documents have been developed for green infrastructure asset management.	CAM	Internal Resources	Q2-2025
2	Investigate valuing trees from an ecological service perspective in alignment with natural asset management best practices.	CAM	Internal Resources	Q2-2025
3	Complete inventory for Horticulture Equipment including age, condition, and replacement cost.	Horticulture Operations	Internal Resources	Q4-2026
4	Create a process to inventory all perennial plants in the Production Greenhouse including condition and replacement cost.	Horticulture Operations	Internal Resources	Q3 2024
5	Complete inventory for Public Rural Trees within the ROW including age, condition, and replacement cost.	Forestry Operations	Unknown	Q4-2026
6	Complete inventory for Other City Trees on City-owned Properties (e.g., Facilities, EMS, Libraries etc.) including age, condition and replacement cost.	Forestry Operations	Unknown	Q4-2026
7	Confirm Forestry & Horticulture facility ages with available documentation and ensure they are accurately recorded in the CFEM database	CFEM and Forestry & Horticulture Operations	Internal Resources	Q3-2024
8	Ensure Poly Houses are inspected by CFEM staff on a 5-year basis and given a condition score.	CFEM	Internal Resources	Q2 - 2025
9	Complete condition assessments on small equipment as part of regular operations.	Forestry & Horticulture Business Programs	Internal Resources	Q1 - 2025
10	Complete condition assessments on fleet assets as part of the regular inspection cycle.	Fleet Services	Internal Resources	Q2 – 2025

FORESTRY & HORTICULTURE 2024 ASSET MANAGEMENT PLAN

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
11	Create a process to better estimate the condition of technology assets.	Information Technology	Internal Resources	Q2 - 2025
12	Create online/ public facing dashboards to share asset info i.e., Grid Maintenance Program, Proposed Tree Planting, Tree Permits, Upcoming Tree Removals, Statistics	Forestry Operations/IT	Internal Resources	2025
13	Improve the survey process to increase responses and data confidence levels by incorporating other methodologies (e.g. telephone surveys, IP address control).	CAM	Internal Resources / Consultant	Ongoing
14	Create additional technical measurements to better compare customer and technical levels of service	CAM and Forestry & Horticulture Operations	Internal Resources	Q2 - 2025
15	Review and investigate implementing Demand Management Plans.	CAM and Forestry & Horticulture Operations	Internal Resources	Ongoing
16	Quantify Risk Treatment costs. Review and investigate implementing Risk Treatment Plans.	CAM and Forestry & Horticulture Operations	Unknown	Ongoing
17	Quantify the effects of climate change mitigation and adaptation projects in the next iterations of the AM Plan.	CAM and Forestry & Horticulture Operations	Internal Resources	Q2 - 2025
18	Incorporate metrics around the completion of Continuous Improvement items.	CAM	Internal Resources	Q2-2025

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 regularly 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' 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; and,
- The Asset Renewal Funding Ratio achieving the Organizational target (this target is often 90 – 110%).

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FORESTRY & HORTICULTURE
2024 ASSET MANAGEMENT PLAN

12. APPENDIX A – SURVEY ANALYSIS

Hamilton
Corporate Asset Management

Forestry & Horticulture

Survey Period: November 7th - January 2nd, 2024

January 2024

Forestry and Horticulture

Survey Response Demographics

11/7/2023 to 01/02/2024

69	75	5	4346	271
Respondents	Survey Questions	Demographic Questions	Survey Responses	Demographic Response

Age	% Pop. by Age	% of Respondents	Respondents
18 to 34	22.1%	20.29%	14
35 to 64	41.7%	57.97%	40
65+	19.5%	14.49%	10

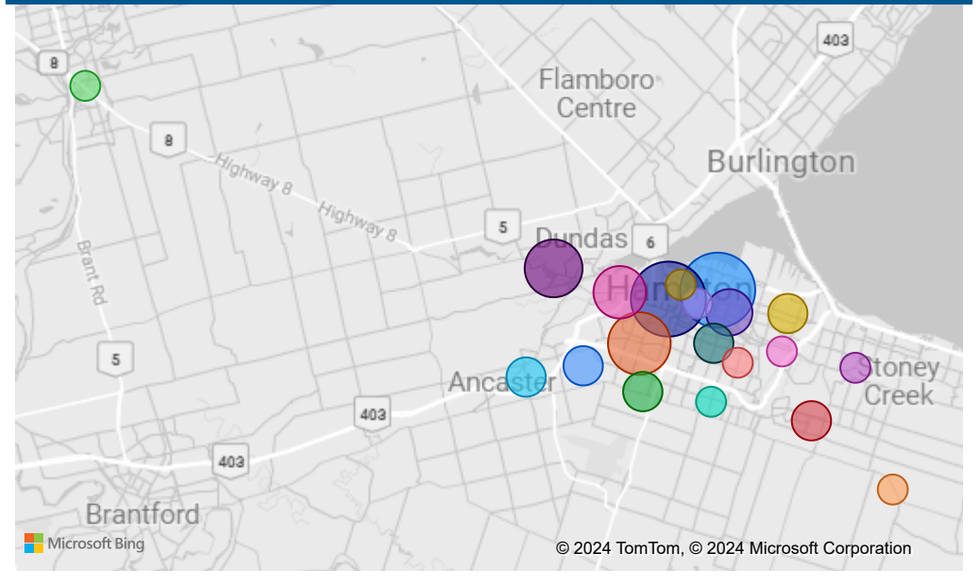
Identity	% of Respondents	Respondents
No	57.97%	40
Yes	20.29%	17
I would prefer not to answer	14.49%	10
Other	2.90%	2

Region	% Pop. by Region	Population	% of Respondents	Respondents
Lower	45.6%	432,375	52.17%	36
Upper	37.3%	353,485	26.09%	18
Rural	17.1%	161,840	1.45%	1

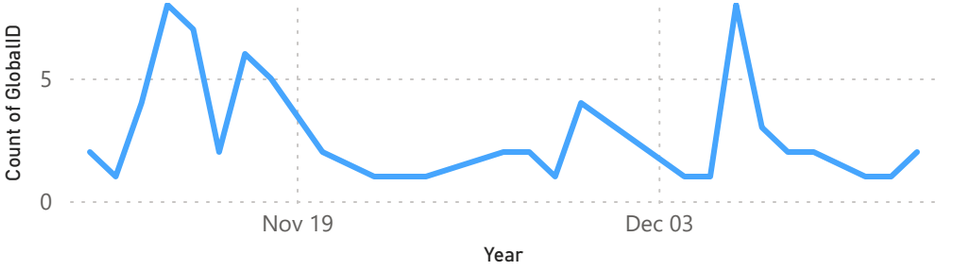
Residency	% of Respondents	Respondents
I live in Hamilton	91.30%	63
I work in Hamilton	44.93%	31
I am retired in Hamilton	15.94%	11
I run a Hamilton-based business	8.70%	6
I run a business outside of Hamilton	1.45%	1

These stats will add to over 100% because the survey allowed responders to choose multiple options for each of the questions

Respondent Density Map



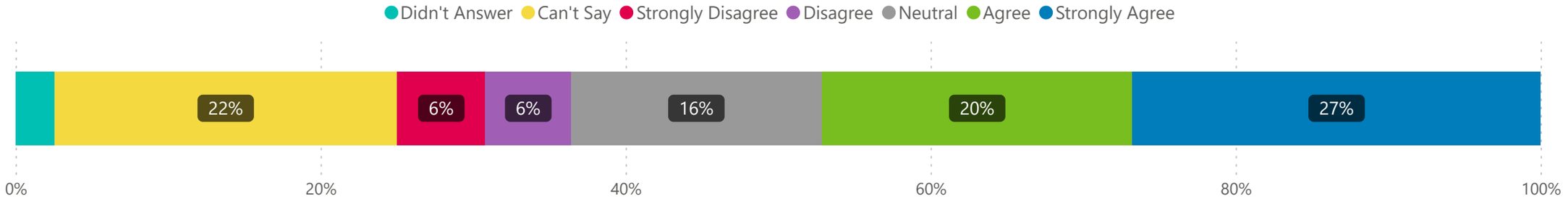
Respondents By Day



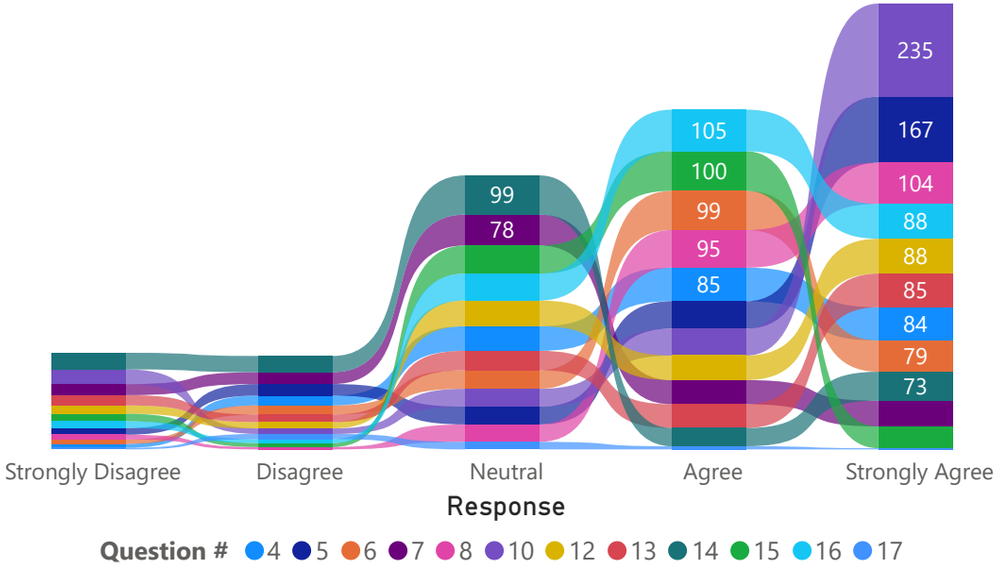
Hamilton

Responses	Respondents
3156	69

Summary of Survey Results



Questions	σ	Avg.	Opt Out	Opt Out %
All Questions	**1.23**	**3.76**	**1053**	**25.02%**
Q10 Potential Services	1.29	4.13	15	3.62%
Q8 Comfortability Accessing Services	1.03	4.05	84	24.35%
Q5 Importance of Services	1.21	4.04	18	5.22%
Q16 Service Level Expectation	1.09	3.82	195	40.37%
Q6 Satisfication with Services	1.09	3.82	86	24.93%
Q4 Performance of Services	1.10	3.78	79	22.90%
Q12 Recommendation of Services	1.24	3.71	93	26.96%
Q13 Value for Services	1.32	3.67	106	30.72%
Q15 Service Level Rating	1.09	3.64	228	47.20%
Q7 Needs are Being Met	1.27	3.40	83	24.06%
Q14 Tax Rates	1.33	3.22	44	12.75%
Q17 Response Time	1.01	2.85	22	31.88%



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Respondents who did not answer or selected 'Can't Say' are included in opt out.

Responses	Respondents
3358	69

Survey Question Summary

Question #	Survey Question	n (Sample Size)	σ (Consistency)	Margin of Error (Confidence Level ±)
4	How do you feel Forestry & Horticulture have preformed overall in the following services?	53	1.10	13%
5	How important to you are the Forestry & Horticulture services listed below?	65	1.21	12%
6	How satisfied are you with your ability to access Forestry & Horticulture's sites and services?	52	1.09	14%
7	Do the following Forestry & Horticulture sites and services meet your needs?	52	1.27	14%
8	Do you feel comfortable accessing these sites and services provided by Forestry and Horticulture?	52	1.03	14%
10	Please rate the following potential Forestry & Horticulture services based on their importance to you.	67	1.29	12%
12	How likely would you be to recommend the following Forestry & Horticulture sites and services to others?	50	1.24	14%
13	How would you rate Forestry & Horticulture in providing good value for money for the following sites and services?	48	1.32	14%
14	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 rates.	60	1.33	13%
15	Forestry & Horticulture's buildings and services rating	36	1.09	16%
16	Forestry & Horticulture's buildings and services expectations	41	1.09	15%
17	Does the following response time meet your needs and expectations for an effective response?	47	1.01	14%

Hamilton

Question

2

Who did you visit with?

In the last 24 months, which of the Forestry & Horticulture sites and services have you visisted or used, and who did you go with?

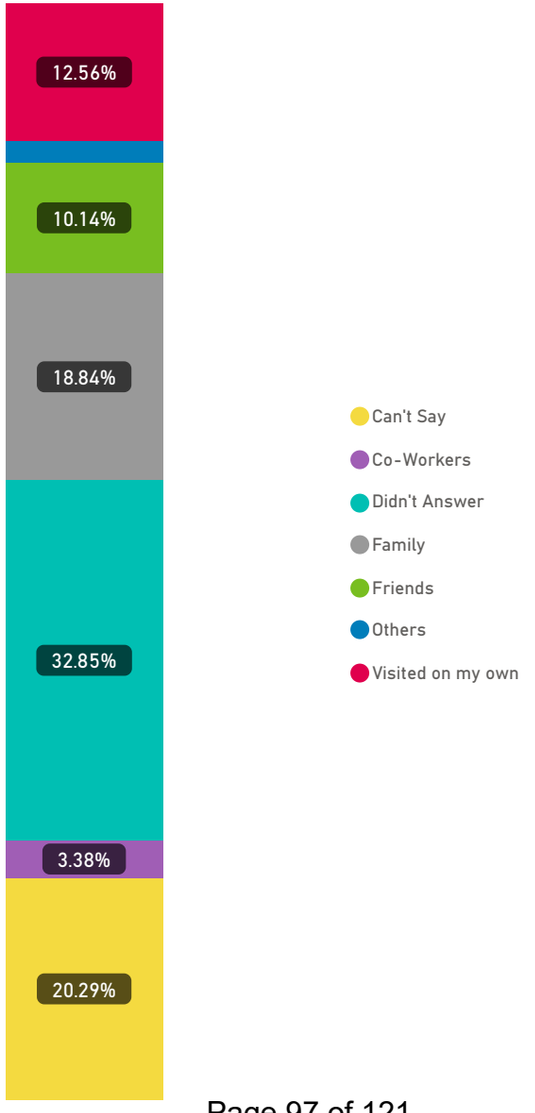
Responses

97

Respondents

55

ServiceArea	Co-Workers	Family	Friends	Others	Visited on my own
Total	**7**	**39**	**21**	**4**	**26**
Floral Show ad Special Installations Across the City	2	11	9	1	12
Gage Park Tropical Greenhouse	1	26	10	2	9
Tree Health and Education Programs	4	2	2	1	5



Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Question

3

Age of visitors

If you have visited or used any of the Forestry & Horticuture sites or services below, what are the ages of the people who visited with you?

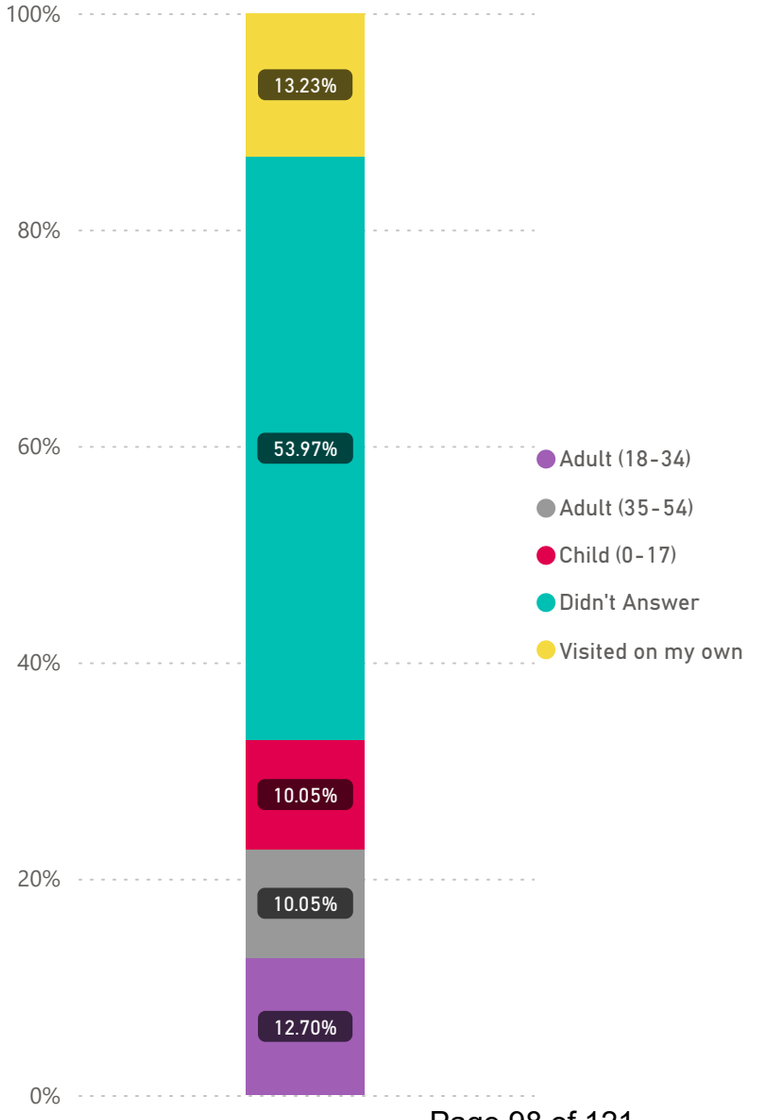
Responses

105

Respondents

54

ServiceArea	Adult (18-34)	Adult (35-54)	Adult (55 plus)	Child (0-17)	Visited on my own
Total	**24**	**19**	**18**	**19**	**25**
Floral Show ad Special Installations Across the City	9	5	8	5	12
Gage Park Tropical Greenhouse	12	10	9	12	6
Tree Health and Education Programs	3	4	1	2	7



Hamilton

Respondents who opted out by not answering or selecting 'Can't Say' are included in opt out.

Question
4

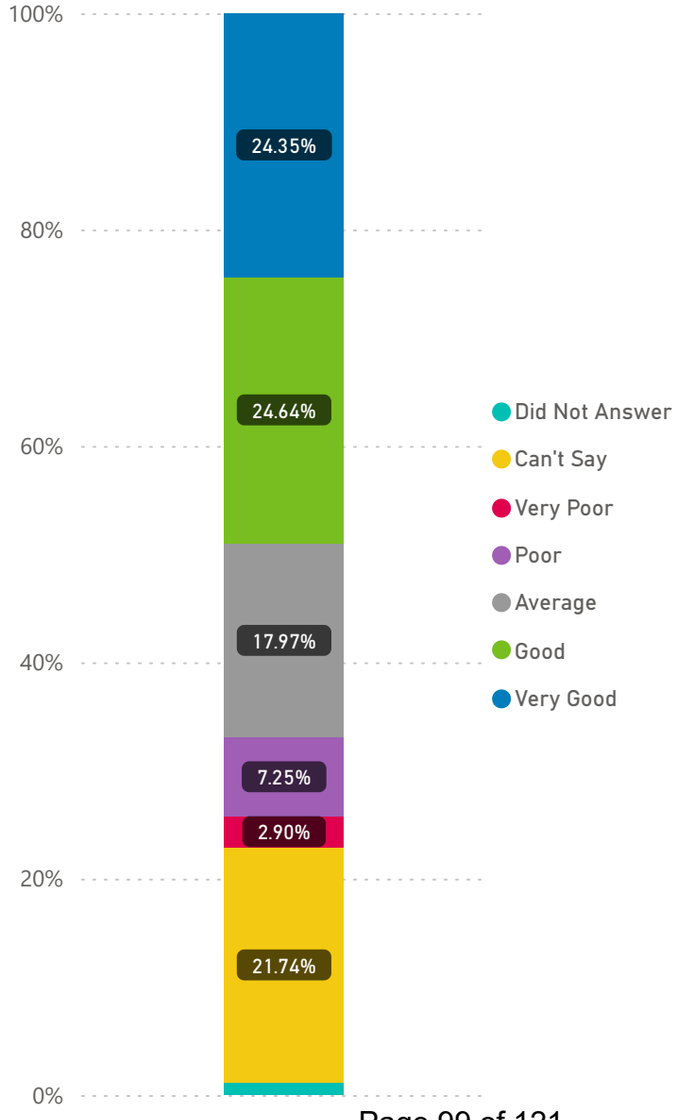
Responses
266

Respondents
69

Performance of Services

How do you feel Forestry & Horticulture have preformed overall in the following services?

ServiceArea	Very Poor	Poor	Average	Good	Very Good
Total	**10**	**25**	**62**	**85**	**84**
Floral Shows and Special Installations Across the City		3	9	18	17
Gage Park Tropical Greenhouse			4	18	30
Garden Beds and Hanging Baskets (Along the street and on City property)	1	8	19	23	15
Street and Park Trees	6	8	20	17	17
Tree Health and Education Programs	3	6	10	9	5



ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.10**	**3.78**	**79**	**22.9%**
Gage Park Tropical Greenhouse	0.64	4.50	17	24.6%
Floral Shows and Special Installations Across the City	0.90	4.04	22	31.9%
Garden Beds and Hanging Baskets (Along the street and on City property)	1.01	3.65	3	4.3%
Street and Park Trees	1.23	3.46	1	1.4%
Tree Health and Education Programs	1.17	3.21	36	52.2%

Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

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

593

Respondents

69

ServiceArea	Performance (index score)	Importance (index score)	Net Differential	Opt Out %
Street and Park Trees	69	96	-27	1%
Tree Health and Education Programs	64	83	-19	30%
Gage Park Tropical Greenhouse	90	80	10	16%
Garden Beds and Hanging Baskets (Along the street and on City property)	73	77	-3	2%
Floral Shows and Special Installations Across the City	81	68	13	20%

Performance *Q4 How do you feel Forestry & Horticulture have preformed overall in the following services?*

Importance *Q5 How important to you are the Forestry & Horticulture services listed below?*

Hamilton

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.

Question
5

Responses
327

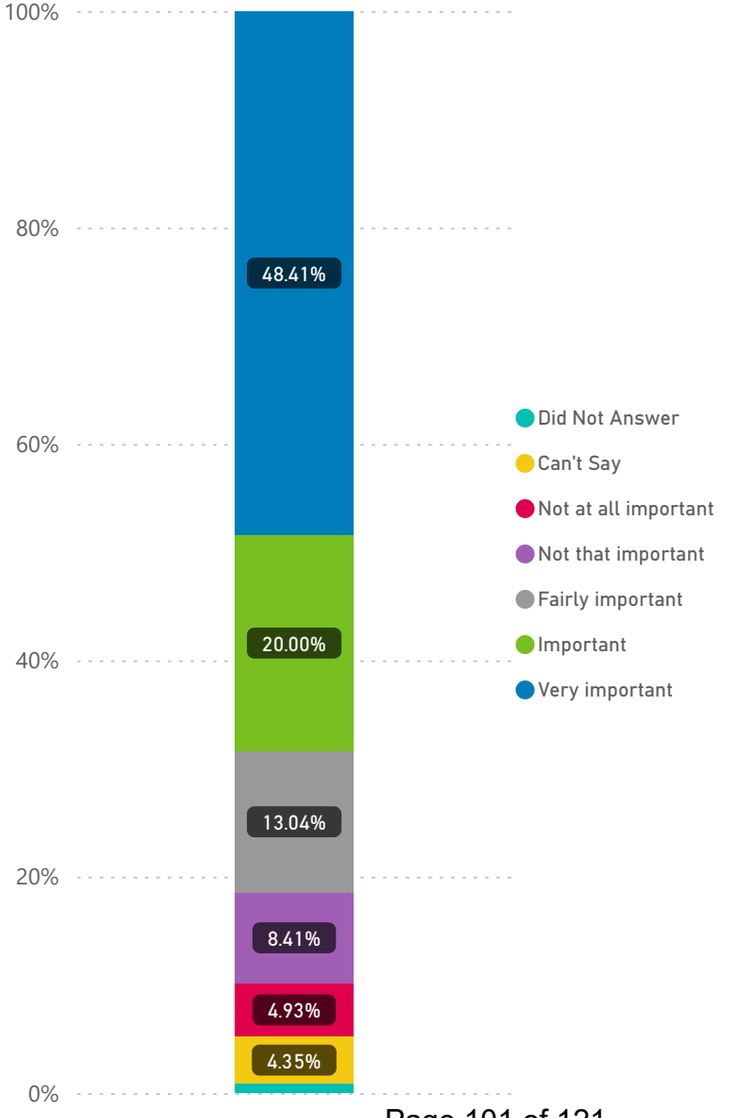
Respondents
69

Importance of Services

How important to you are the Forestry & Horticulture services listed below?

ServiceArea	Not at all important	Not that important	Fairly important	Important	Very important
Total	**17**	**29**	**45**	**69**	**167**
Floral Shows and Special Installations Across the City	6	11	15	15	16
Gage Park Tropical Greenhouse	2	8	8	17	29
Garden Beds and Hanging Baskets (Along the street and on City property)	6	7	10	16	30
Street and Park Trees	1			8	59
Tree Health and Education Programs	2	3	12	13	33

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.21**	**4.04**	**18**	**5.2%**
Street and Park Trees	0.57	4.82	1	1.4%
Tree Health and Education Programs	1.08	4.14	6	8.7%
Gage Park Tropical Greenhouse	1.17	3.98	5	7.2%
Garden Beds and Hanging Baskets (Along the street and on City property)	1.32	3.83		
Floral Shows and Special Installations Across the City	1.29	3.38	6	8.7%



Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Question

5

Net Promoter Score

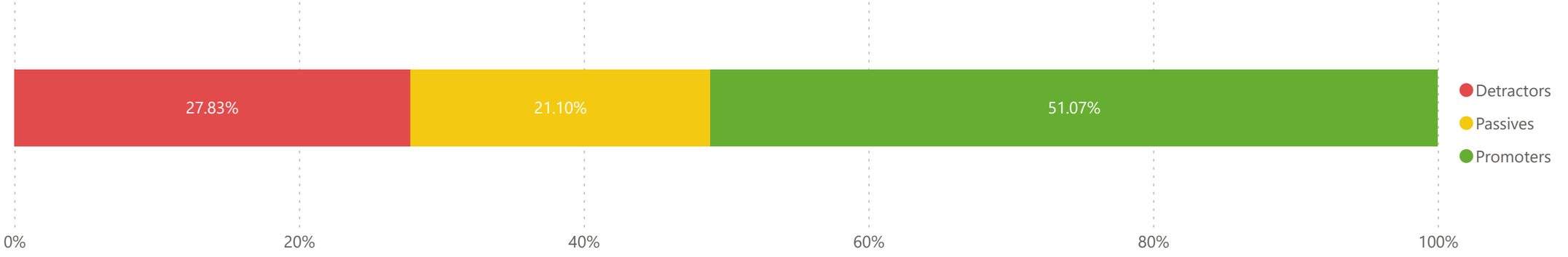
How important to you are the Forestry & Horticulture services listed below?

Responses

327

Respondents

69



ServiceArea	σ	NPS	Detractors	Passives	Promoter
All Service Areas	**1.21**	**23**	**91**	**69**	**167**
Street and Park Trees	0.57	85	1	8	59
Tree Health and Education Programs	1.08	25	17	13	33
Gage Park Tropical Greenhouse	1.17	17	18	17	29
Garden Beds and Hanging Baskets (Along the street and on City property)	1.32	10	23	16	30
Floral Shows and Special Installations Across the City	1.29	-25	32	15	16

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

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.

Question
6

Responses
259

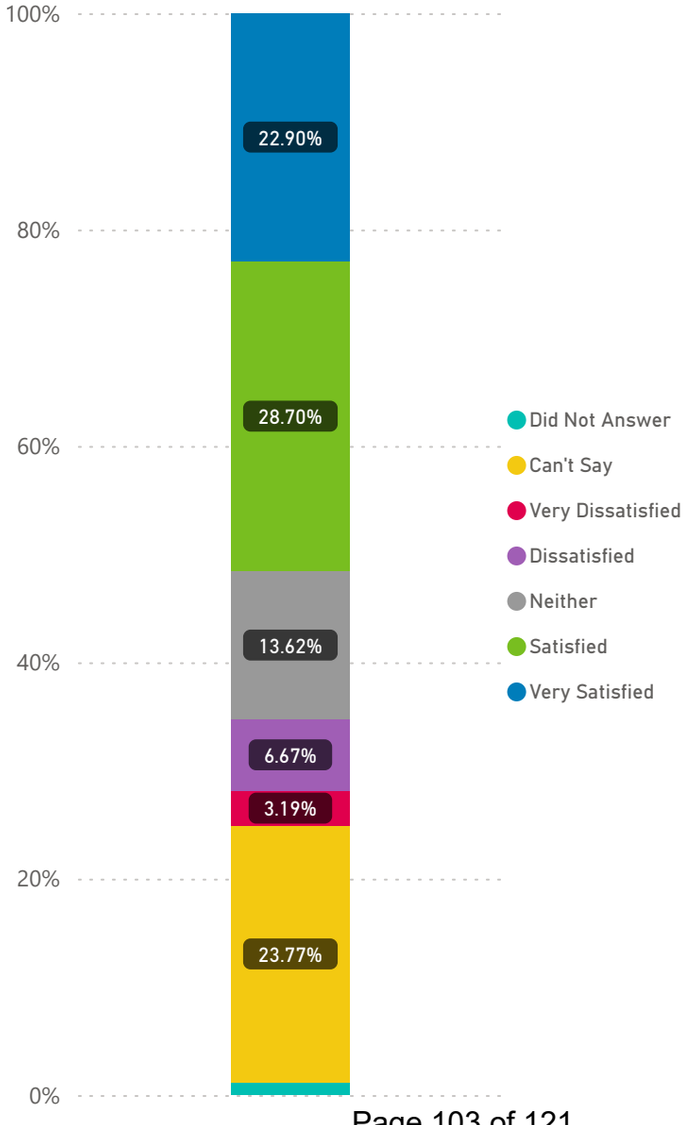
Respondents
66

Satisfication with Services

How satisfied are you with your ability to access Forestry & Horticulture's sites and services?

ServiceArea	Very Dissatisfied	Dissatisfied	Neither	Satisfied	Very Satisfied
Total	**11**	**23**	**47**	**99**	**79**
Floral Shows and Special Installations Across the City	1	2	9	22	15
Gage Park Tropical Greenhouse	1	2	7	22	23
Garden Beds and Hanging Baskets (Along the street and on City property)	2	3	12	23	16
Street and Park Trees	4	9	10	21	19
Tree Health and Education Programs	3	7	9	11	6

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.09**	**3.82**	**86**	**24.9%**
Gage Park Tropical Greenhouse	0.91	4.16	14	20.3%
Floral Shows and Special Installations Across the City	0.91	3.98	20	29.0%
Garden Beds and Hanging Baskets (Along the street and on City property)	1.01	3.86	13	18.8%
Street and Park Trees	1.22	3.67	6	8.7%
Tree Health and Education Programs	1.19	3.28	33	47.8%



Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Question
7

Responses
262

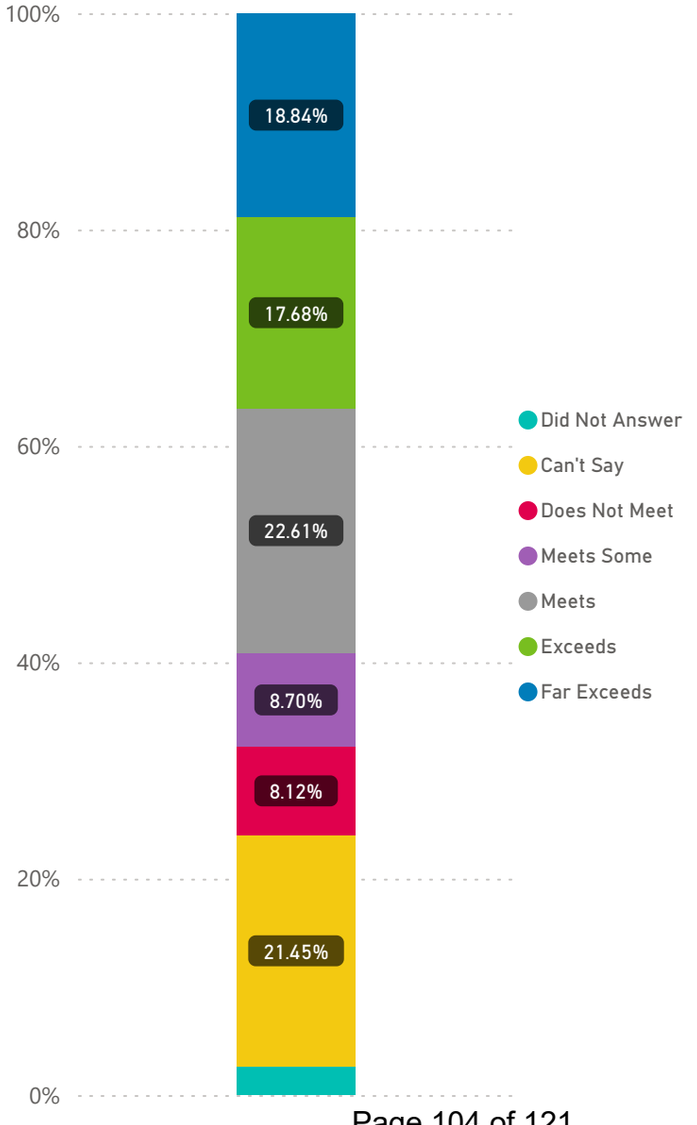
Respondents
68

Needs are Being Met

Do the following Forestry & Horticulture sites and services meet your needs?

ServiceArea	Does Not Meet	Meets Some	Meets	Exceeds	Far Exceeds
Total	**28**	**30**	**78**	**61**	**65**
Floral Shows and Special Installations Across the City	5		16	10	17
Gage Park Tropical Greenhouse	2	3	11	17	21
Garden Beds and Hanging Baskets (Along the street and on City property)	6	4	23	16	11
Street and Park Trees	12	16	18	11	11
Tree Health and Education Programs	3	7	10	7	5

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.27**	**3.40**	**83**	**24.1%**
Gage Park Tropical Greenhouse	1.07	3.96	15	21.7%
Floral Shows and Special Installations Across the City	1.24	3.71	21	30.4%
Garden Beds and Hanging Baskets (Along the street and on City property)	1.15	3.37	9	13.0%
Tree Health and Education Programs	1.19	3.13	37	53.6%
Street and Park Trees	1.32	2.90	1	1.4%



Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Question
8

Responses
261

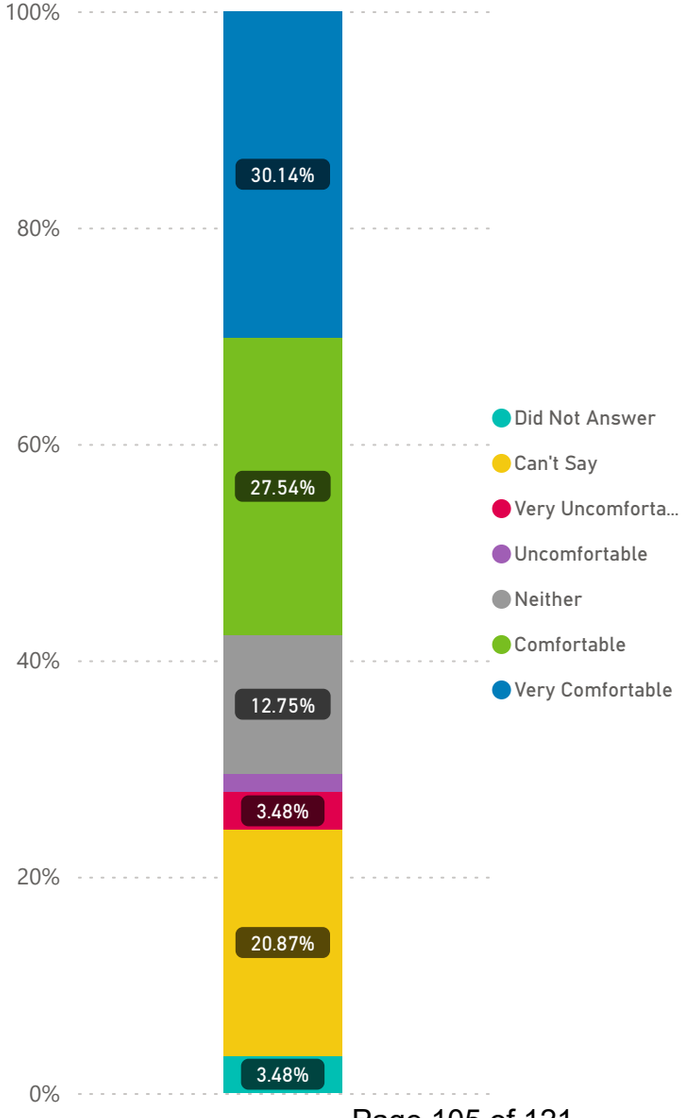
Respondents
64

Comfortability Accessing Services

Do you feel comfortable accessing these sites and services provided by Forestry and Horticulture?

ServiceArea	Very Uncomfortable	Uncomfortable	Neither	Comfortable	Very Comfortable
Total	**12**	**6**	**44**	**95**	**104**
Floral Shows and Special Installations Across the City	2	2	7	17	22
Gage Park Tropical Greenhouse	1	1	6	16	29
Garden Beds and Hanging Baskets (Along the street and on City property)	3	2	10	23	21
Street and Park Trees	3	1	10	28	20
Tree Health and Education Programs	3		11	11	12

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.03**	**4.05**	**84**	**24.3%**
Gage Park Tropical Greenhouse	0.89	4.34	16	23.2%
Floral Shows and Special Installations Across the City	1.04	4.10	19	27.5%
Street and Park Trees	0.99	3.98	7	10.1%
Garden Beds and Hanging Baskets (Along the street and on City property)	1.06	3.97	10	14.5%
Tree Health and Education Programs	1.14	3.78	32	46.4%



Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Question

9

Responses

31

Respondents

31

Models of Service Delivery

How can Forestry & Horticulture change the sites or services to improve how comfortable you feel?

Open Text Responses

Question
10

Responses
399

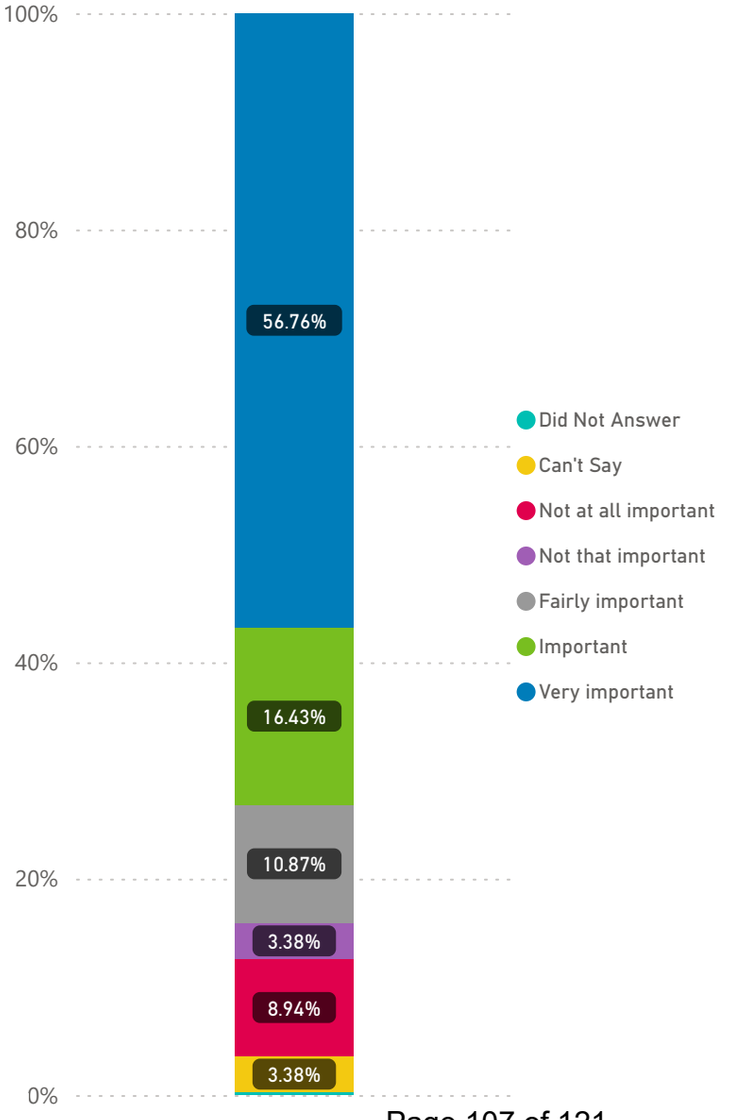
Respondents
69

Potential Services

Please rate the following potential Forestry & Horticulture services based on their importance to you.

ServiceArea	Not at all important	Not that important	Fairly important	Important	Very important
Total	**37**	**14**	**45**	**68**	**235**
De-commissioning of diesel forestry vehicles (Green Fleet Strategy)	12	3	9	16	23
Increased implementation of rain gardens for City sites (to improve stormwater management and climate resiliance)	1	3	7	13	43
Increased planting of pollinator plants in City gardens	6		5	7	50
Increased tree-planting on City properties and streets	5	1	4	3	55
Schoolyard greening program (tree planting, garden installations)	5	3	6	16	38
Tropical green house nature-based programs for elementary school children	8	4	14	13	26

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.29**	**4.13**	**15**	**3.6%**
Increased tree-planting on City properties and streets	1.16	4.50	1	1.4%
Increased implementation of rain gardens for City sites (to improve stormwater management and climate resiliance)	0.95	4.40	2	2.9%
Increased planting of pollinator plants in City gardens	1.20	4.40	1	1.4%
Schoolyard greening program (tree planting, garden installations)	1.21	4.16	1	1.4%
Tropical green house nature-based programs for elementary school children	1.37	3.69	4	5.8%
De-commissioning of diesel forestry vehicles (Green Fleet Strategy)	1.49	3.56	6	8.7%



Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Question
11

Models of Service Delivery

What are the biggest changes Forestry & Horticulture could implement to meet your future needs?

Responses
41

Respondents
41

Open Text Responses

Question
12

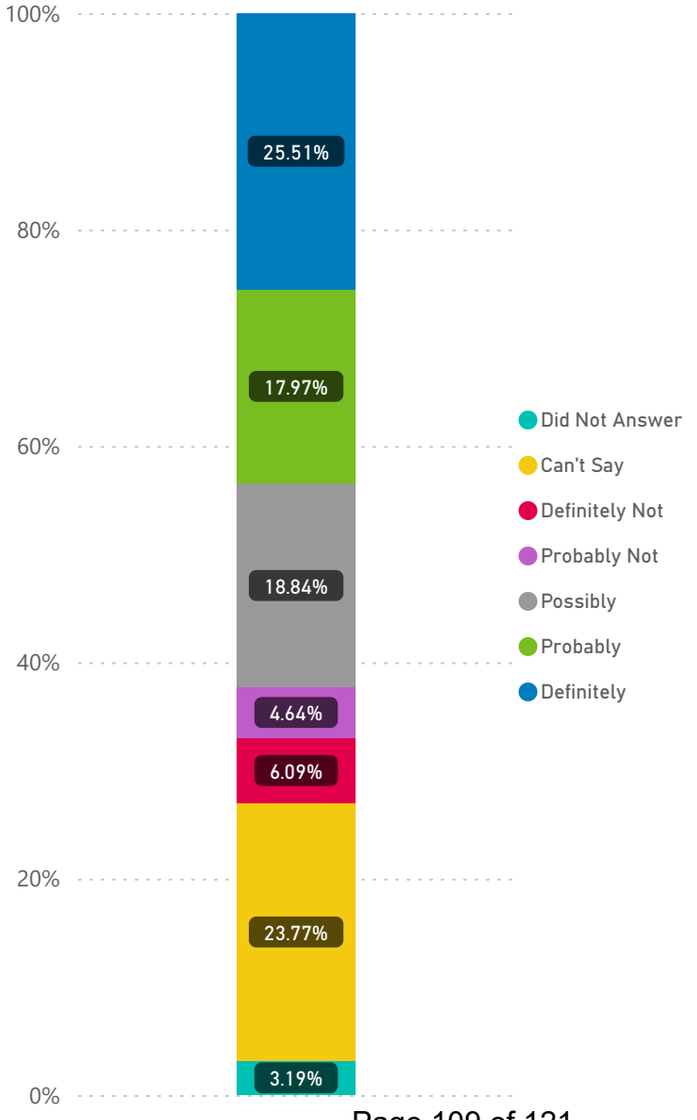
Recommendation of Services

How likely would you be to recommend the following Forestry & Horticulture sites and services to others?

Responses
252

Respondents
63

ServiceArea	Definitely Not	Probably Not	Possibly	Probably	Definitely
Total	**21**	**16**	**65**	**62**	**88**
Floral Shows and Special Installations Across the City	3	2	18	10	19
Gage Park Tropical Greenhouse	2	1	6	15	31
Garden Beds and Hanging Baskets (Along the street and on City property)	7	4	15	20	12
Street and Park Trees	7	3	17	12	16
Tree Health and Education Programs	2	6	9	5	10



ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.24**	**3.71**	**93**	**27.0%**
Gage Park Tropical Greenhouse	0.99	4.31	14	20.3%
Floral Shows and Special Installations Across the City	1.15	3.77	17	24.6%
Street and Park Trees	1.31	3.49	14	20.3%
Tree Health and Education Programs	1.27	3.47	37	53.6%
Garden Beds and Hanging Baskets (Along the street and on City property)	1.23	3.45	11	15.9%

Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Question
13

Responses
239

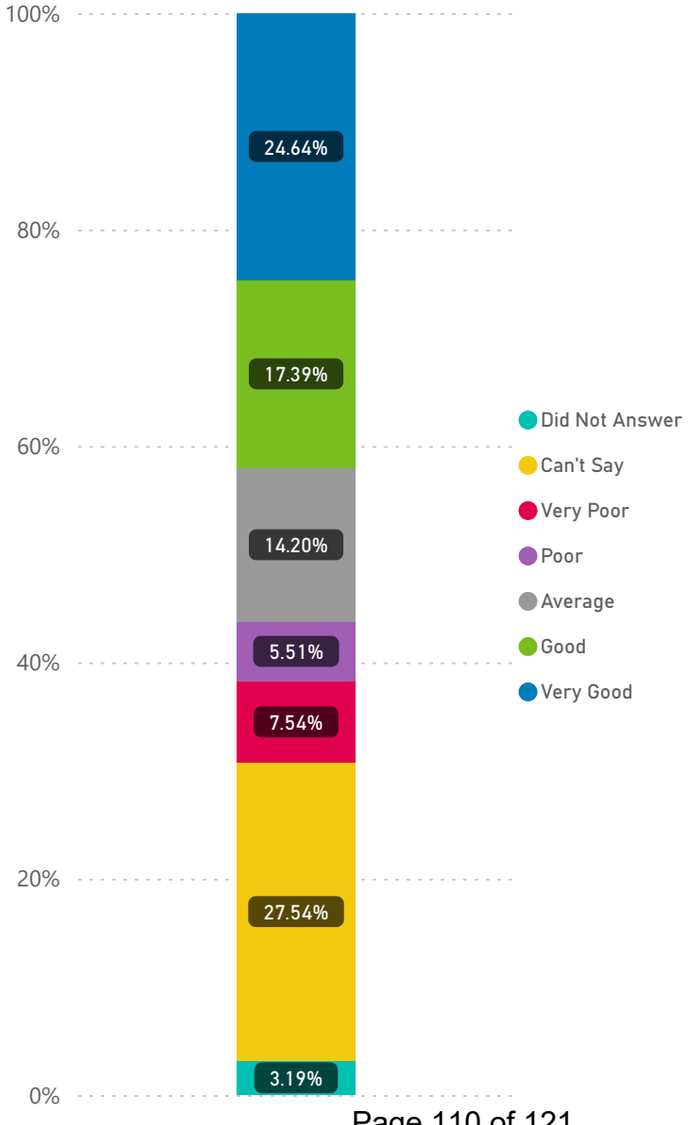
Respondents
60

Value for Services

How would you rate Forestry & Horticulture in providing good value for money for the following sites and services?

ServiceArea	Very Poor	Poor	Average	Good	Very Good
Total	**26**	**19**	**49**	**60**	**85**
Floral Shows and Special Installations Across the City	6	4	9	9	17
Gage Park Tropical Greenhouse	3	2	6	9	26
Garden Beds and Hanging Baskets (Along the street and on City property)	7	3	13	15	18
Street and Park Trees	7	5	11	19	17
Tree Health and Education Programs	3	5	10	8	7

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.32**	**3.67**	**106**	**30.7%**
Gage Park Tropical Greenhouse	1.20	4.15	23	33.3%
Garden Beds and Hanging Baskets (Along the street and on City property)	1.32	3.61	13	18.8%
Floral Shows and Special Installations Across the City	1.40	3.60	24	34.8%
Street and Park Trees	1.30	3.58	10	14.5%
Tree Health and Education Programs	1.22	3.33	36	52.2%



Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Differential of Value for Money and Tax Rates

Service areas where importance exceeds performance by 20 points is indicative of a mismatch between value for money and tax rates, equal to one point on the Likert scale used.

Responses

540

Respondents

69

ServiceArea	Value for Money	ServiceLevel	ValueDiff	Opt Out %
Street and Park Trees	72	80	-9	10%
Tree Health and Education Programs	67	66	1	37%
Gage Park Tropical Greenhouse	83	62	21	23%
Garden Beds and Hanging Baskets (Along the street and on City property)	72	61	12	14%
Floral Shows and Special Installations Across the City	72	52	20	25%

Value for Money *Q13 How would you rate Forestry & Horticulture in providing good value for money for the following sites and services?*

Tax Rate *Q14 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 rates.*

Hamilton

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.

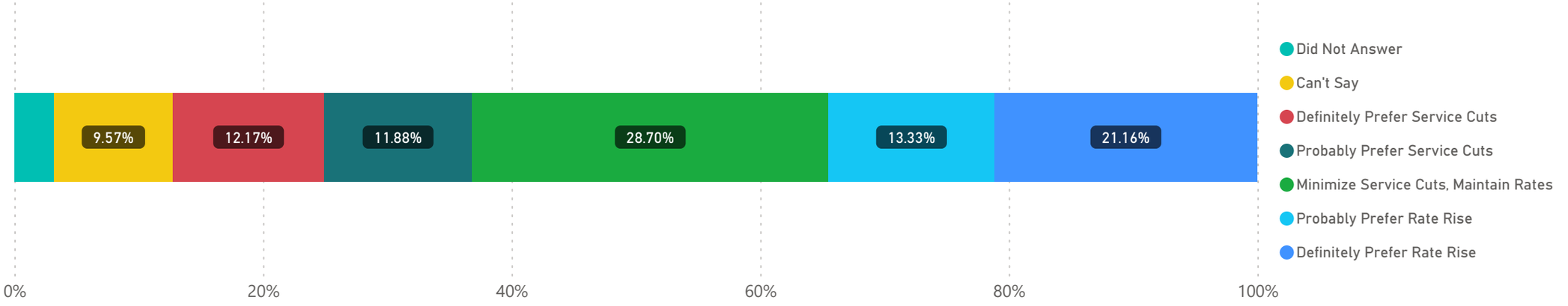
Question
14

Responses
301

Respondents
65

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 rates.



ServiceArea	Definitely Prefer Service Cuts	Probably Prefer Service Cuts	Minimize Service Cuts, Maintain Rates	Probably Prefer Rate Rise	Definitely Prefer Rate Rise
Total	**42**	**41**	**99**	**46**	**73**
Floral Shows and Special Installations Across the City	15	14	18	4	8
Gage Park Tropical Greenhouse	7	6	29	9	9
Garden Beds and Hanging Baskets (Along the street and on City property)	10	13	17	11	12
Street and Park Trees	3	2	18	10	32
Tree Health and Education Programs	7	6	17	12	12

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.33**	**3.22**	**44**	**12.8%**
Street and Park Trees	1.14	4.02	4	5.8%
Tree Health and Education Programs	1.29	3.30	15	21.7%
Gage Park Tropical Greenhouse	1.14	3.12	9	13.0%
Garden Beds and Hanging Baskets (Along the street and on City property)	1.33	3.03	6	8.7%
Floral Shows and Special Installations Across the City	1.30	2.59	10	14.5%

Hamilton

Respondents who opted out by not answering or selecting 'Can't Say' are included in opt out.

Question
15

Responses
255

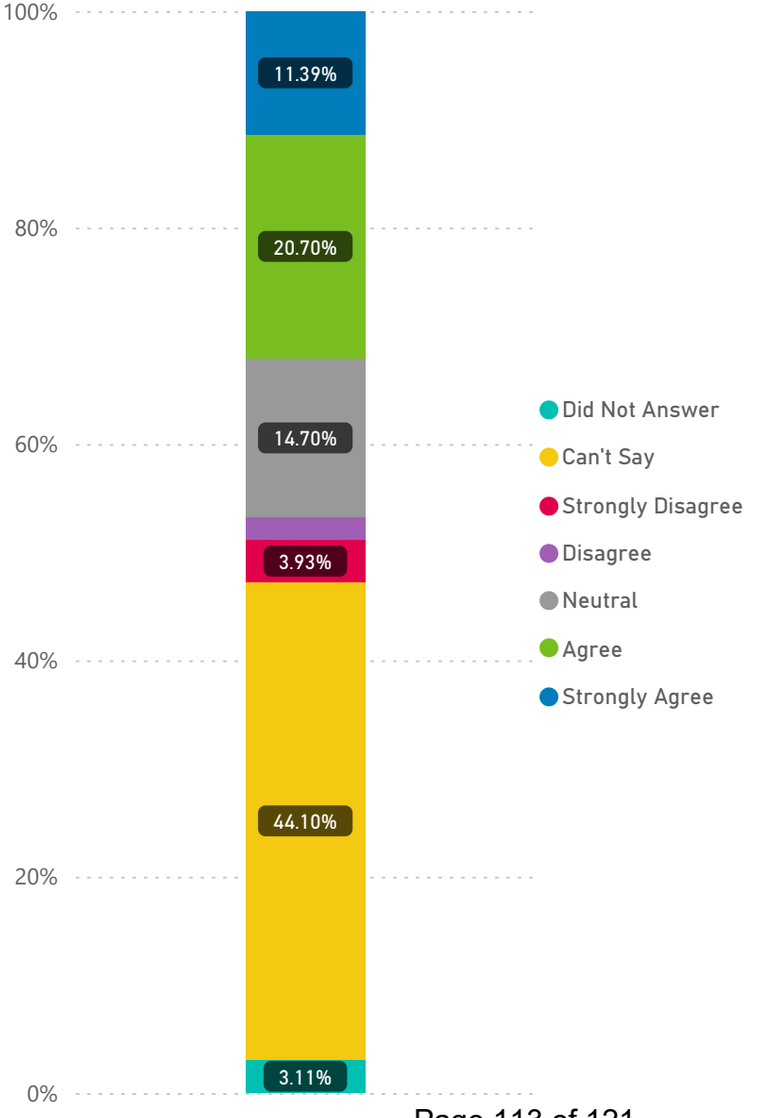
Respondents
49

Service Level Rating

Forestry & Horticulture's buildings and services rating

ServiceArea	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Total	**19**	**10**	**71**	**100**	**55**
Accessible by public transportation	3	2	7	17	7
Accessible; meets the Accessibility for Ontarians with Disabilities Act (AODA), 2005 standards	3		8	10	7
Clean and in good repair	3	1	12	20	8
Comfortable with appropriate levels of lighting and noise	2	2	9	15	11
Energy efficient, reduce greenhouse gas emissions (Example: Reducing greenhouse gases by decreasing utility use)	3	2	12	7	3
Inviting, appealing and attractive	1	3	13	19	9
Safe, equitable and inclusive spaces for all	4		10	12	10

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.09**	**3.64**	**228**	**47.2%**
Comfortable with appropriate levels of lighting and noise	1.07	3.79	30	43.5%
Inviting, appealing and attractive	0.93	3.71	24	34.8%
Safe, equitable and inclusive spaces for all	1.20	3.67	33	47.8%
Clean and in good repair	1.02	3.66	25	36.2%
Accessible; meets the Accessibility for Ontarians with Disabilities Act (AODA), 2005 standards	1.17	3.64	41	59.4%
Accessible by public transportation	1.11	3.64	33	47.8%
Energy efficient, reduce greenhouse gas emissions (Example: Reducing greenhouse gases by decreasing utility use)	1.09	3.19	42	60.9%



Hamilton

Respondents who opted out by not answering or selecting 'Can't Say' are included in opt out.

Question
16

Responses
288

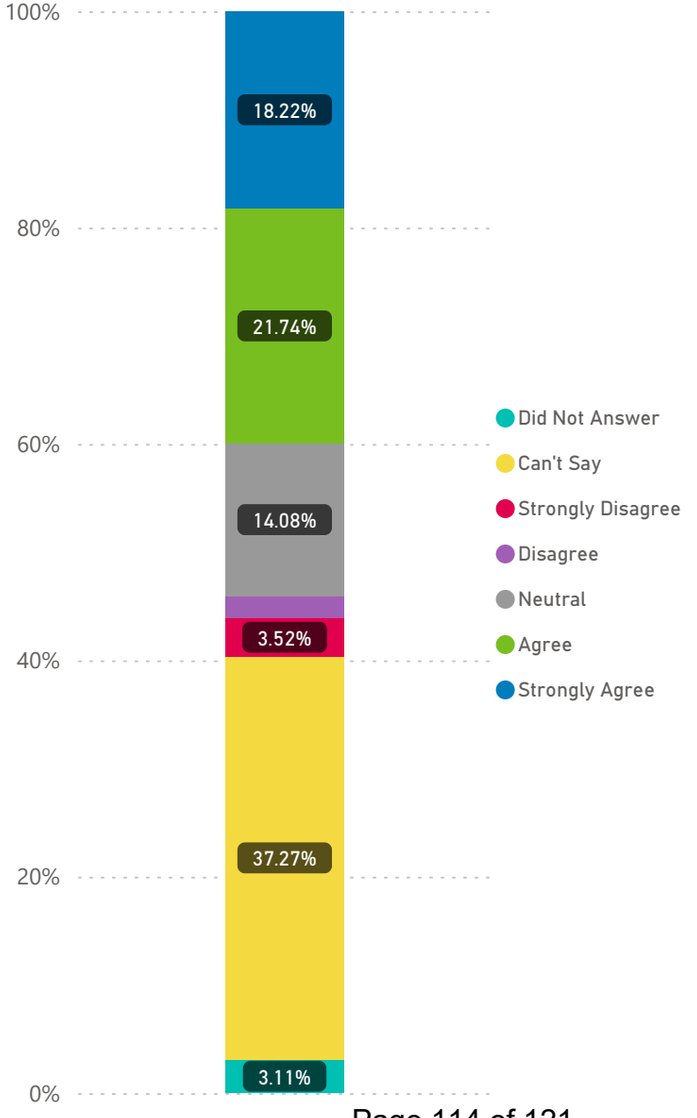
Respondents
64

Service Level Expectation

Forestry & Horticulture's buildings and services expectations

ServiceArea	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Total	**17**	**10**	**68**	**105**	**88**
Accessible by public transportation	3	2	7	17	7
Accessible; meets the Accessibility for Ontarians with Disabilities Act (AODA), 2005 standards	1		5	15	40
Clean and in good repair	3	1	12	20	8
Comfortable with appropriate levels of lighting and noise	2	2	9	15	11
Energy efficient, reduce greenhouse gas emissions (Example: Reducing greenhouse gases by decreasing utility use)	3	2	12	7	3
Inviting, appealing and attractive	1	3	13	19	9
Safe, equitable and inclusive spaces for all	4		10	12	10

ServiceArea	σ	Avg.	Opt Out	Opt Out %
Total	**1.09**	**3.82**	**195**	**40.4%**
Accessible; meets the Accessibility for Ontarians with Disabilities Act (AODA), 2005 standards	0.78	4.52	8	11.6%
Comfortable with appropriate levels of lighting and noise	1.07	3.79	30	43.5%
Inviting, appealing and attractive	0.93	3.71	24	34.8%
Safe, equitable and inclusive spaces for all	1.20	3.67	33	47.8%
Clean and in good repair	1.02	3.66	25	36.2%
Accessible by public transportation	1.11	3.64	33	47.8%
Energy efficient, reduce greenhouse gas emissions (Example: Reducing greenhouse gases by decreasing utility use)	1.09	3.19	42	60.9%



Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Question
17

Response Time

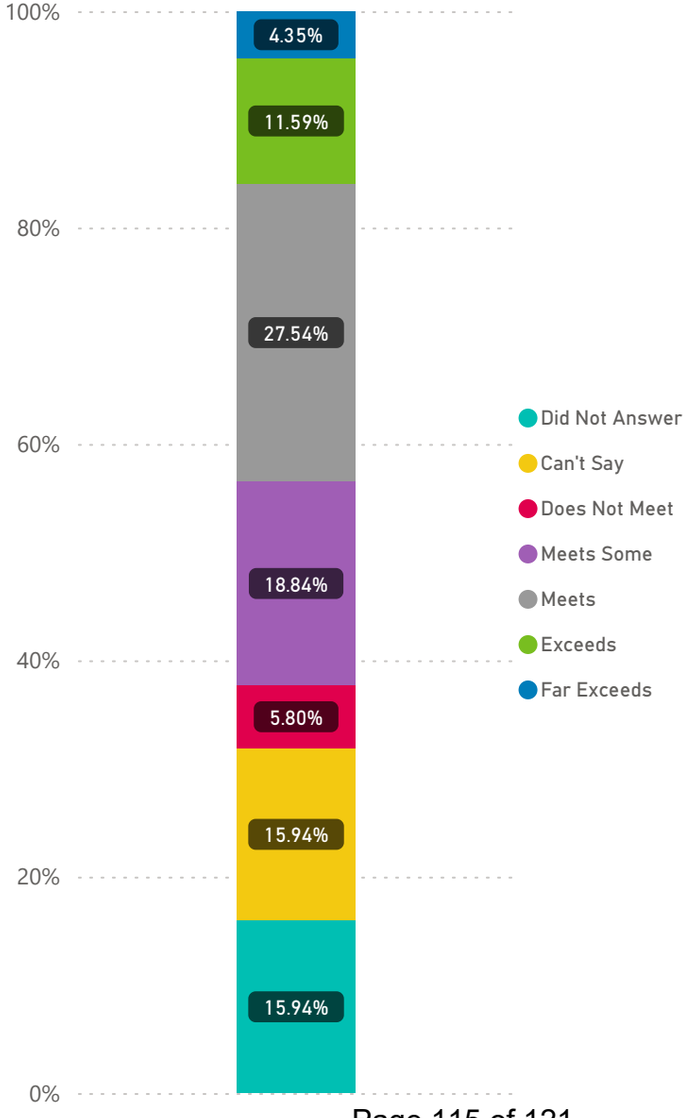
Does the following response time meet your needs and expectations for an effective response?

Responses
47

Respondents
47

Question	Does Not Meet	Meets Some	Meets	Exceeds	Far Exceeds
Total	**4**	**13**	**19**	**8**	**3**
Does the following response time meet your needs and expectations for an effective response?	4	13	19	8	3

QText	σ	Avg.	Opt Out	Opt Out %
Total	**1.01**	**2.85**	**22**	**31.9%**
Does the following response time meet your needs and expectations for an effective response?	1.01	2.85	22	31.9%



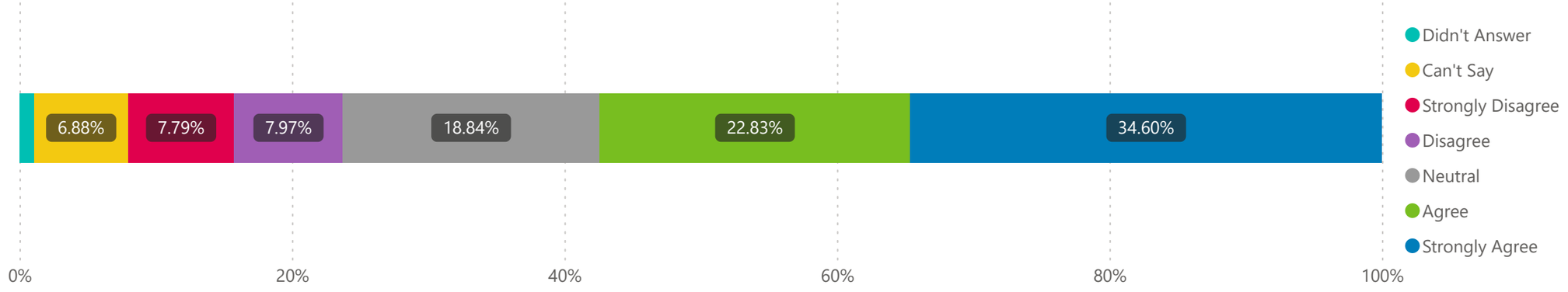
Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Summary of Specific Service Areas over Several Questions

Street and Park Trees

Responses
465
Respondents
69



Question	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.27**	**3.74**	**74.88**	**44**	**7.97%**
Q5 How important to you are the Forestry & Horticulture services listed below?	0.57	4.82	96.47	1	1.45%
Q14 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 rates.	1.14	4.02	80.31	4	5.80%
Q8 Do you feel comfortable accessing these sites and services provided by Forestry and Horticulture?	0.99	3.98	79.68	7	10.14%
Q6 How satisfied are you with your ability to access Forestry & Horticulture's sites and services?	1.22	3.67	73.33	6	8.70%
Q13 How would you rate Forestry & Horticulture in providing good value for money for the following sites and services?	1.30	3.58	71.53	10	14.49%
Q12 How likely would you be to recommend the following Forestry & Horticulture sites and services to others?	1.31	3.49	69.82	14	20.29%
Q4 How do you feel Forestry & Horticulture have preformed overall in the following services?	1.23	3.46	69.12	1	1.45%
Q7 Do the following Forestry & Horticulture sites and services meet your needs?	1.32	2.90	57.94	1	1.45%

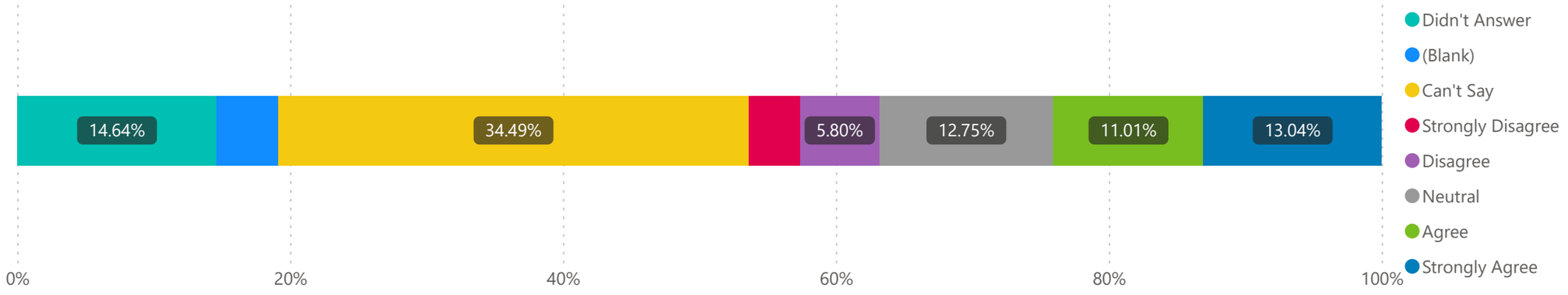
Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Summary of Specific Service Areas over Several Questions

Tree Health and Education Programs

Responses
325
Respondents
66



Question	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.24**	**3.51**	**70.25**	**232**	**42.03%**
Q5 How important to you are the Forestry & Horticulture services listed below?	1.08	4.14	82.86	6	8.70%
Q8 Do you feel comfortable accessing these sites and services provided by Forestry and Horticulture?	1.14	3.78	75.68	32	46.38%
Q12 How likely would you be to recommend the following Forestry & Horticulture sites and services to others?	1.27	3.47	69.38	37	53.62%
Q13 How would you rate Forestry & Horticulture in providing good value for money for the following sites and services?	1.22	3.33	66.67	36	52.17%
Q14 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 rates.	1.29	3.30	65.93	15	21.74%
Q6 How satisfied are you with your ability to access Forestry & Horticulture's sites and services?	1.19	3.28	65.56	33	47.83%
Q4 How do you feel Forestry & Horticulture have preformed overall in the following services?	1.17	3.21	64.24	36	52.17%
Q7 Do the following Forestry & Horticulture sites and services meet your needs?	1.19	3.13	62.50	37	53.62%

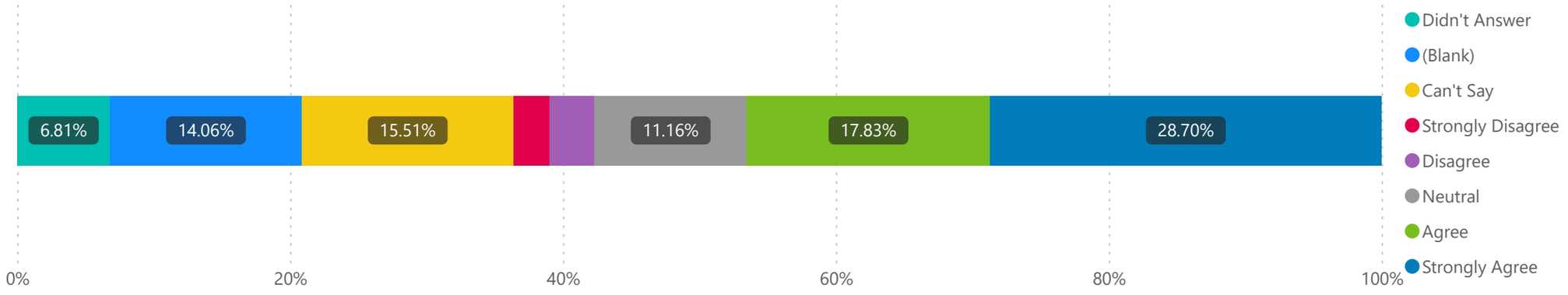
Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Summary of Specific Service Areas over Several Questions

Gage Park Tropical Greenhouse

Responses
518
Respondents
65



Question	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.10**	**4.05**	**80.96**	**113**	**20.47%**
Q4 How do you feel Forestry & Horticulture have preformed overall in the following services?	0.64	4.50	90.00	17	24.64%
Q8 Do you feel comfortable accessing these sites and services provided by Forestry and Horticulture?	0.89	4.34	86.79	16	23.19%
Q12 How likely would you be to recommend the following Forestry & Horticulture sites and services to others?	0.99	4.31	86.18	14	20.29%
Q6 How satisfied are you with your ability to access Forestry & Horticulture's sites and services?	0.91	4.16	83.27	14	20.29%
Q13 How would you rate Forestry & Horticulture in providing good value for money for the following sites and services?	1.20	4.15	83.04	23	33.33%
Q5 How important to you are the Forestry & Horticulture services listed below?	1.17	3.98	79.69	5	7.25%
Q7 Do the following Forestry & Horticulture sites and services meet your needs?	1.07	3.96	79.26	15	21.74%
Q14 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 rates.	1.14	3.12	62.33	9	13.04%

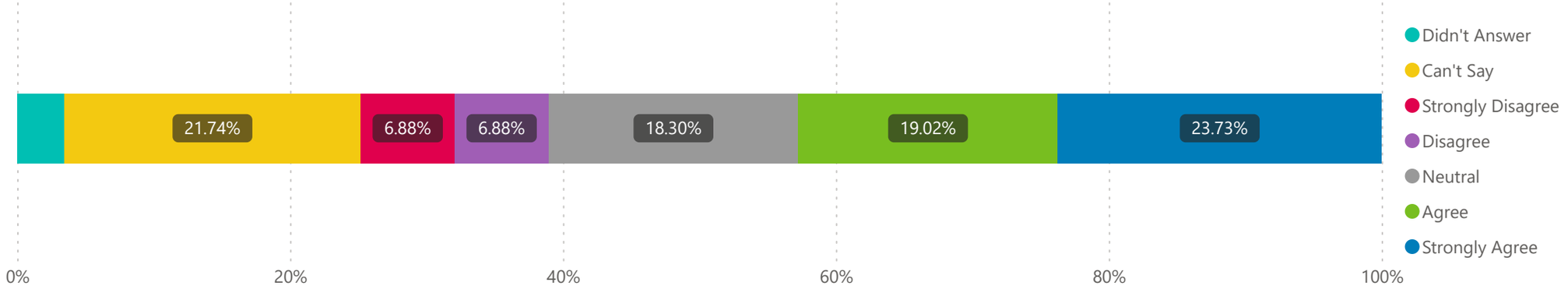
Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Summary of Specific Service Areas over Several Questions

Floral Shows and Special Installations Across the City

Responses
375
Respondents
67



Question	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.27**	**3.61**	**72.25**	**139**	**25.18%**
Q8 Do you feel comfortable accessing these sites and services provided by Forestry and Horticulture?	1.04	4.10	82.00	19	27.54%
Q4 How do you feel Forestry & Horticulture have preformed overall in the following services?	0.90	4.04	80.85	22	31.88%
Q6 How satisfied are you with your ability to access Forestry & Horticulture's sites and services?	0.91	3.98	79.59	20	28.99%
Q12 How likely would you be to recommend the following Forestry & Horticulture sites and services to others?	1.15	3.77	75.38	17	24.64%
Q7 Do the following Forestry & Horticulture sites and services meet your needs?	1.24	3.71	74.17	21	30.43%
Q13 How would you rate Forestry & Horticulture in providing good value for money for the following sites and services?	1.40	3.60	72.00	24	34.78%
Q5 How important to you are the Forestry & Horticulture services listed below?	1.29	3.38	67.62	6	8.70%
Q14 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 rates.	1.30	2.59	51.86	10	14.49%

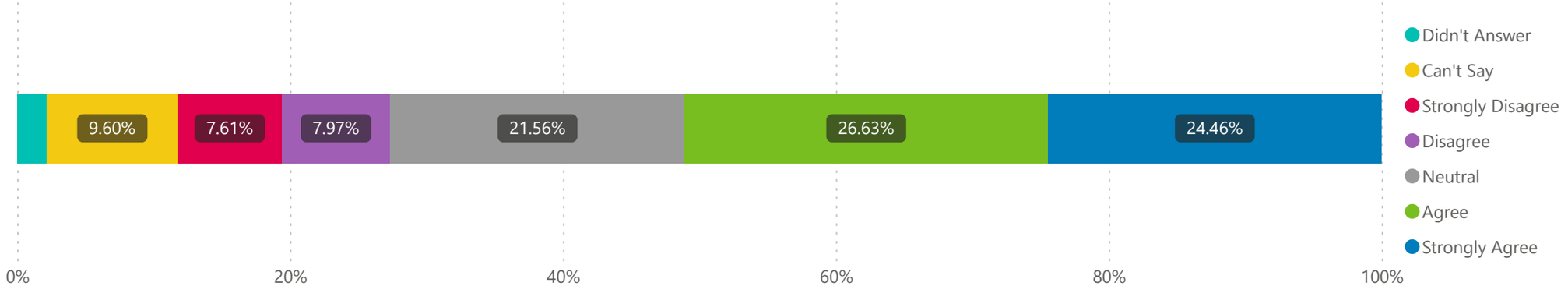
Hamilton

Respondents who did not answer or selected 'Can't Say' are included in opt out.

Summary of Specific Service Areas over Several Questions

Garden Beds and Hanging Baskets (Along the street and on City property)

Responses
445
Respondents
69



Question	σ	Avg.	Avg. %	Opt Out	Opt Out %
All Questions	**1.22**	**3.59**	**71.87**	**65**	**11.78%**
Q8 Do you feel comfortable accessing these sites and services provided by Forestry and Horticulture?	1.06	3.97	79.32	10	14.49%
Q6 How satisfied are you with your ability to access Forestry & Horticulture's sites and services?	1.01	3.86	77.14	13	18.84%
Q5 How important to you are the Forestry & Horticulture services listed below?	1.32	3.83	76.52		
Q4 How do you feel Forestry & Horticulture have preformed overall in the following services?	1.01	3.65	73.03	3	4.35%
Q13 How would you rate Forestry & Horticulture in providing good value for money for the following sites and services?	1.32	3.61	72.14	13	18.84%
Q12 How likely would you be to recommend the following Forestry & Horticulture sites and services to others?	1.23	3.45	68.97	11	15.94%
Q7 Do the following Forestry & Horticulture sites and services meet your needs?	1.15	3.37	67.33	9	13.04%
Q14 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 rates.	1.33	3.03	60.63	6	8.70%

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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.

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