



2024 Asset Management Plan

Solid Waste
Non-Core Assets
City of Brantford, Ontario



Prepared by: Infrastructure Planning Asset Management, Public Works
Corporation of the City of Brantford, June 2024

RECORD SHEET

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RECORD SHEET

Asset Management Document Set	Asset Group	First Issuance
Strategic Asset Management Policy	All	May 2019
Asset Management Plan Core Assets Overview	Core Assets Replaced by Core & Non-Core Assets Overview	September 2021
Asset Management Plan, Core Assets	Environmental Services Transportation	September 2021
Asset Management Plan Core & Non-Core Assets Overview	Core & Non-Core Assets	June 2024
Asset Management Plan, Non-Core Assets	Solid Waste	This Document
Asset Management Plan, Non-Core Assets	Airport Cemetery Clerks Services Economic Development & Tourism Facilities Fire Fleet & Transit Forestry & Horticulture Golf Human Resources IT Services Library Parking Parks & Recreation Police	June 2024
Asset Management Plan, Non-Core Assets	Housing JNH	TBD

ASSET MANAGEMENT PLAN

SOLID WASTE

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SOLID WASTE OPERATIONS INTRODUCTION

Per O.Reg 588/17 all municipal infrastructure assets which fall outside of the core asset categories (water, wastewater, stormwater and roads) and their respective subcategories, shall be non-core or “other” infrastructure assets. These assets shall have qualitative descriptions and technical metrics established by the municipality.

Table 1 below outlines which Asset Types are included under each Asset Class and will be reported on in this AMP document. In addition, it is important to note that the AMP only includes assets owned by the City or Local Boards and does not include assets that are owned privately or by other organizations.

Solid Waste assets are managed by a combination of City staff from the Solid Waste department, the 3rd party who maintains daily operations of the landfill, the 3rd party who completes curbside waste collection and the 3rd party who operates the landfill gas facility.

Table 1: Asset Type Breakdown

	Asset Class
	Solid Waste
Asset Type:	Buildings
	Collection
	Processing
	Site Works

1. SOLID WASTE ASSETS

1.1. INTRODUCTION

The City of Brantford owns and maintains assets under the Solid Waste asset class. The purpose of this section is to present specific information about the Solid Waste asset class to answer the questions posed in **Section 2** of the **Asset Management Plan (AMP) Overview Document**, and includes the following:

- Solid Waste Assets' Data Inventory and Condition Approach;
- Summary of Solid Waste Assets;
- Lifecycle Activities and Cost of Solid Waste Assets;
- Current Solid Waste Assets' Levels of Service;
- Current Solid Waste Assets' Performance; and
- Conclusion.

1.2. SOLID WASTE ASSETS' DATA INVENTORY AND CONDITION APPROACH

Information related to the City's data collection methodologies as well as data confidence level definitions are defined in the **Asset Management Plan Overview Document**.

The City of Brantford currently has three (3) approaches to establishing the inventory and condition of Solid Waste assets due to available resources, technologies, and budget restrictions:

- Condition assessments outsourced to consultants;
- Periodic inspection programs conducted by City staff; and
- Estimated condition based on asset specific information.

A list of all condition assessments for all non-core assets can be found in **Table 7** in the **Asset Management Plan Overview Document**.

The origin of the Solid Waste asset data for inventory, replacement cost, and condition, as well as data confidence in each are provided in **Table 2** below.

Table 2: Solid Waste Assets' Data Origin and Confidence Level

	Inventory			Replacement Cost			Condition		
Asset Type	Inventory (incl. Quantity and Age) From	Data Confidence Level	Data Confidence Description	Replacement Cost From	Data Confidence Level	Data Confidence Description	Condition From	Data Confidence Level	Data Confidence Description
Buildings	Inventory from GIS Condition Assessments Staff Knowledge	High	Inventory field verified	.Tangible Capital Asset Registry .Industry Reference .Staff Knowledge	Medium	Estimated costs based on known units	Age Condition Assessments	Medium	Condition Assessments from 2015 and 2017
Collection	Staff Knowledge Condition Assessments	High	Inventory field verified	.Tangible Capital Asset Registry .Staff Knowledge	Medium	TCA cost over 10 years old in some cases	Age Based Staff Knowledge	Medium	Informal condition from staff knowledge, supplemented by asset age
Processing	Inventory from GIS Staff Knowledge Work Tracking Software	Medium	Underground Infrastructure requires updated field verification	.Tangible Capital Asset Registry .Staff Knowledge	Medium	TCA cost over 10 years old in some cases	Age Based	Low	Age and Condition unknown for some assets; some assets are underground
Site Works	Inventory from GIS Condition Assessments Staff Knowledge	Medium	GIS requires updated field verification	.Tangible Capital Asset Registry .Industry Reference .Staff Knowledge	Medium	Estimated costs	Age Condition Assessments	Medium	Condition Assessments from 2022 not completed on all assets

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Per **Table 2** above, Solid Waste assets' data are typically at a Medium or High confidence level with an overall average confidence level of Medium for all three asset categories. The lowest confidence is the condition of Processing assets as most of these assets are buried underground so condition needs to rely on age.

Replacement costing for Buildings, Processing and Site Works is based on an industry standard cost guide published by a third party or Tangible Capital Asset costs brought forward to 2024 \$ from their original purchase/install dates.

1.2.1 SERVICE LIFE

Formal condition assessments are periodically completed on Solid Waste assets. Where condition assessments have not been completed, the condition has been estimated based on the estimated service life of the asset shown below in **Table 3**. The average overall estimated service life for assets can be found in **Table 5**. Provided that assets are maintained they are expected to remain structurally sound and functional under normal conditions for the Estimated Service Lives outlined below before replacement or significant rehabilitation is required. Environmental conditions and operating practices may result in a shorter or longer useful lifetime.

Table 3: Solid Waste Assets' Estimated Service Life

Asset Class	Estimated Service Life
Buildings	Buildings are composed of various sub-systems including structure, mechanical and electrical with different service lives. The different sub-system Estimated Service Lives are as follows: Structure & Substructure: 80 years Mechanical: 30 years Electrical: 25 years Interior: 15 years
Collection	Collection Trucks: Contractor Asset Inspection Vehicles: included in Fleet AMP
Processing	Chambers/Maintenance Holes: 50 years Monitoring Wells: 20 years Process Pipes: 30 years Equipment: 30 years Software & Control Systems: 10 years Roll-off Containers: 20 years
Site Works	Parking Lots & Site Roads: 30 years Pathways: 30 years Lighting: 25 years Light Supports: 40 years Fencing: 20 years Signs: 10 years Retaining Walls: 25 years Landfill: 80 years Storage Tanks: 25 years Stormwater Management: 50 years

1.2.2 CONDITION SCORING

For the purpose of this report and standardizing condition scores across all assets in the Asset Management Plan, the Condition Rating is defined by three (3) Condition Scores as defined in the table below. For assets with formal consultant condition assessments, the conditions have been modified to fit into this model.

Table 4: Condition Score Description

Condition Score	Condition Rating	Description
1 – 1.4	Good	Assets are in working order, have no or minor deficiencies. Where condition data is not available, this category applies to assets which are within the first 40% of their estimated service life.
1.5 – 2.4	Fair	Assets show general signs of deterioration/age, some elements may have significant deficiencies, and asset will likely require repairs/removal in the next 10 years. Where condition data is not available, this category applies to assets which are within 41% - 80% of their estimated service life.
2.5 - 3	Poor	Asset is below standard showing signs of significant deterioration, is in danger of imminent failure, and will require repair, replacement or removal within the next year. Where condition data is not available, this category applies to assets which have exceeded 80% of their estimated service life.

1.3. SUMMARY OF SOLID WASTE ASSETS

The summary of assets for the Solid Waste Asset Class can be found below. The summary of assets includes: Quantity, Replacement Cost, Average Age, and Average Condition Score for each asset type in accordance with O. Reg 588/17.

1.3.1 TOTAL SUMMARY OF ASSETS

A table summarizing all Solid Waste assets is included in **Table 5** below. Detailed information about each asset is included in individual sections. Calculations of averages have been weighted by the overall replacement value of assets. This means that assets of higher estimated replacement value will have a stronger influence on the average than if the average was calculated based on the number of assets.

The total replacement cost for all Solid Waste assets is approximately \$71.8M and they are an average of 18 years old which is 36% of the overall average estimated service life of 50 years. Overall Solid Waste assets are in Good condition with a weighted average condition score of 1.2.

Table 5: Total Summary of Solid Waste Assets

Asset	Quantity	Unit	Replacement Cost	Average Age (years)	Average Estimated Service Life (years)	% of Estimated Service Life Expended	Average Condition Score	Average Condition Description
Solid Waste Assets Total			\$71.8M	18	50	36%	1.2	GOOD
Buildings	10	Ea	\$31.2M	18	36	50%	1.30	GOOD
Collection	0	Ea	\$0M	N/A	N/A	N/A	N/A	N/A
Processing	Varies	Varies	\$30.4M	17	66	26%	1.00	GOOD
Site Works	Varies	Varies	\$10.2M	22	44	50%	1.41	FAIR

1.3.2 BUILDINGS

Assets within the Buildings group consists of six (6) buildings which support the processing of solid waste, one (1) supporting landfill gas production, and three (3) pump stations supporting leachate collection. The six buildings grouped in the processing category include the scalehouse, transfer station, hazardous household waste pavilion, staff lunchroom, attendant building and equipment garage.

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It can be seen in

AREA OF BUILDINGS (sq m)	REPLACEMENT COST (\$)	WEIGHTED AVG AGE (YEARS)	WEIGHTED AVG ESTIMATED SERVICE LIFE (YEARS)	WEIGHTED AVG CONDITION SCORE	WEIGHTED AVG CONDITION DESCRIPTION
3.5K	31.2M	18	36	1.3	Good

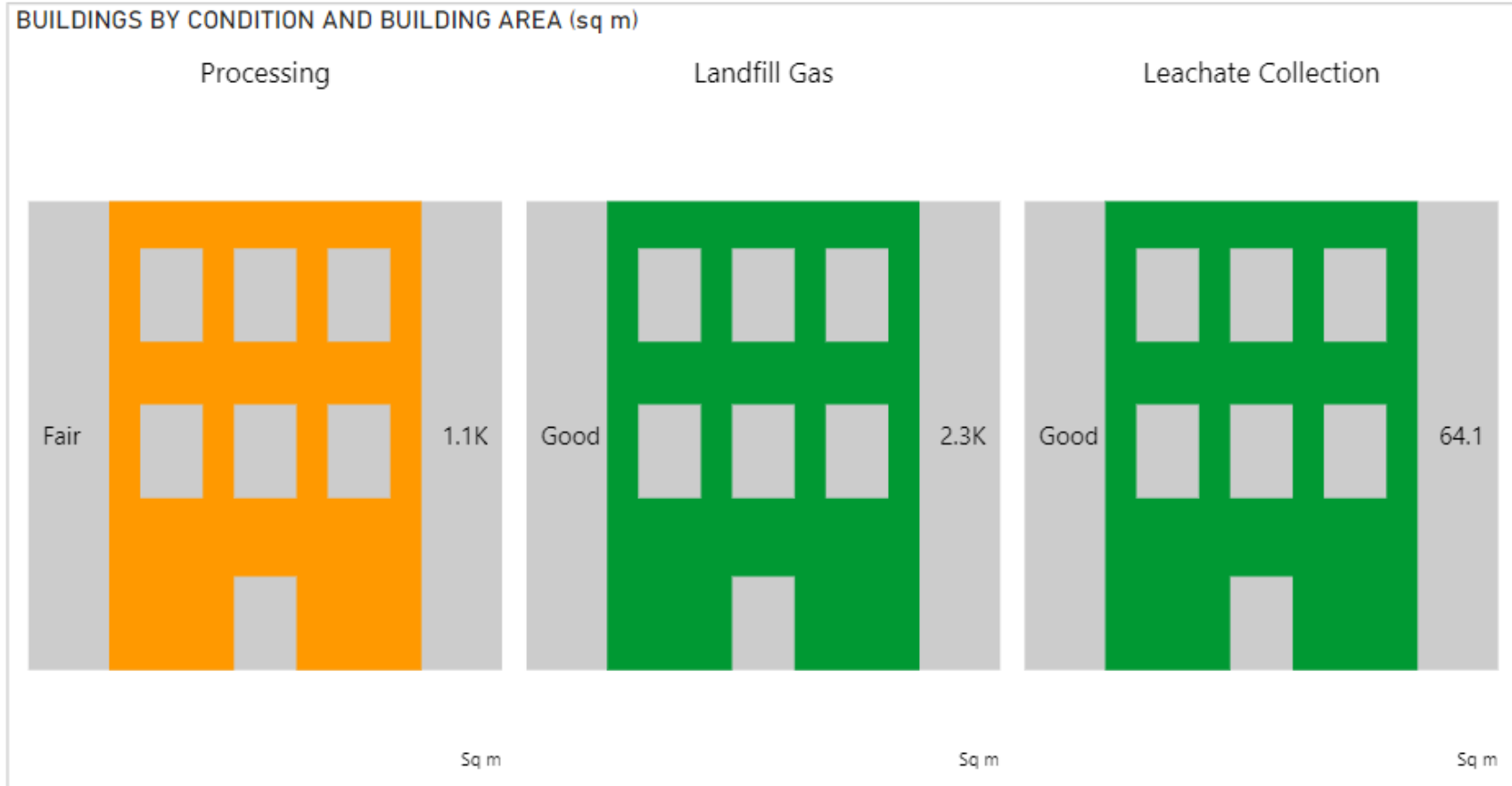


Figure 1 that there is estimated to be over 3,500 sq. m. of area with a total replacement cost of \$31.2M in buildings for Solid Waste assets. Assets are typically in Good condition with a weighted average condition score of 1.2. Nine (9) of the

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ten (10) Solid Waste buildings have had condition assessments completed within the last 10 years. The values are weighted based on estimated replacement value.

The average age for the City's Solid Waste Buildings is 18 years which is 50% of the average estimated service life of 36 years for all buildings. However, as the condition rating for the ten buildings formally assessed ranged from Fair to Good, the overall weighted average condition of this asset type is Good rather than Fair.

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AREA OF BUILDINGS (sq m)	REPLACEMENT COST (\$)	WEIGHTED AVG AGE (YEARS)	WEIGHTED AVG ESTIMATED SERVICE LIFE (YEARS)	WEIGHTED AVG CONDITION SCORE	WEIGHTED AVG CONDITION DESCRIPTION
3.5K	31.2M	18	36	1.3	Good

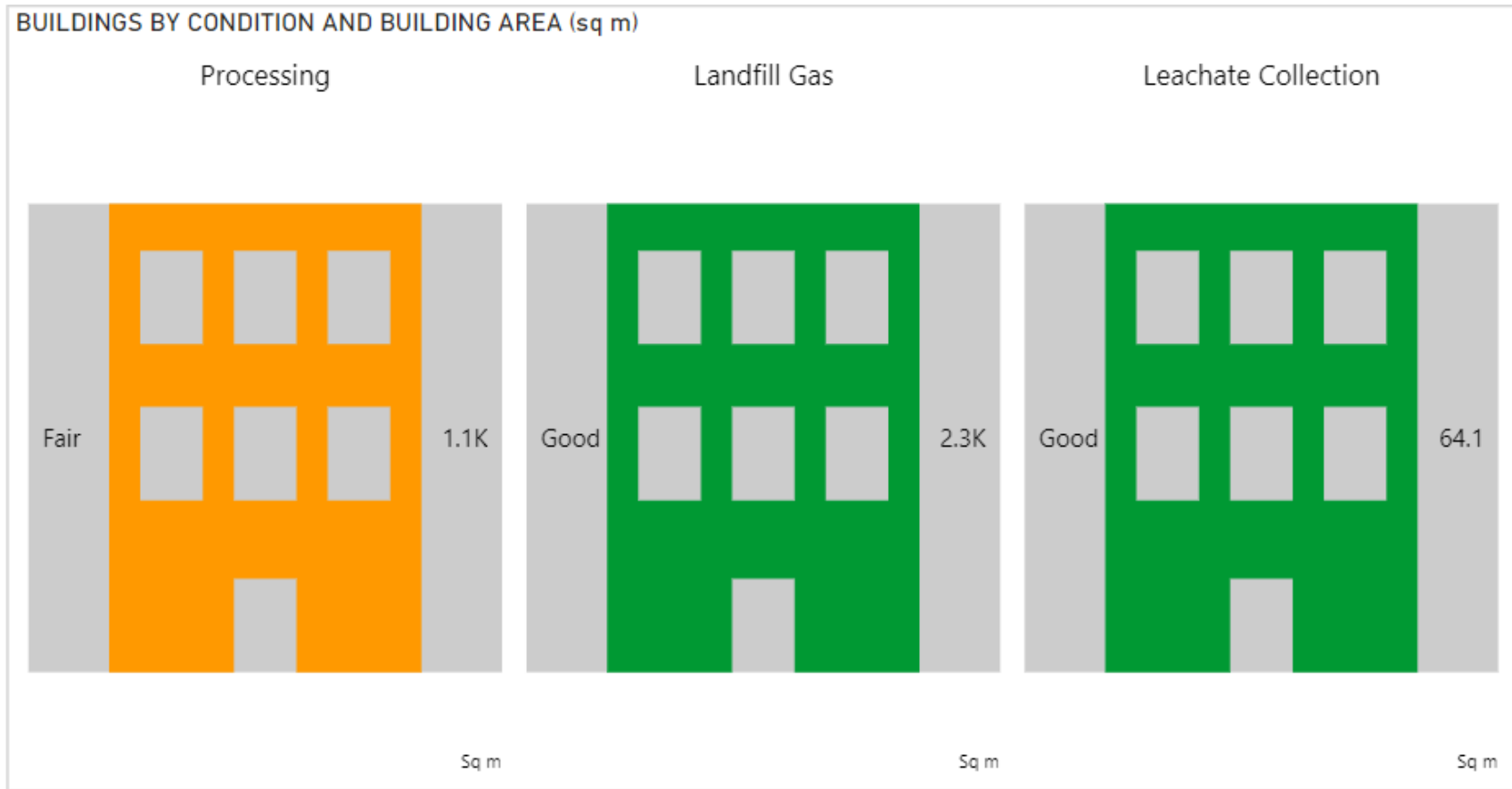


Figure 1: Buildings Asset Summary by Condition and Building Area

1.3.3 COLLECTION ASSETS

At this time all vehicles used during regular curbside collection activities are owned and maintained by a 3rd party contractor as part of their collections contract. As these collection assets are privately held, they are not included in this Asset Management Plan. The fleet assets which are used to complete field inspections verifying the quality of the collection activities are included in the Fleet & Transit AMP.

While a **Figure 2** caption has been included below, no Figure 2 exists at this time due to their being no current inventory of collection assets owned by the City. The caption has been retained for future iterations of the plan should the City obtain assets in the collections category.

Figure 2: HOLD for Future AMP

1.3.5 PROCESSING

Processing assets refers to assets which assist with the sorting and placement or transfer of solid waste once it arrives at the landfill. Solid waste at the City's landfill can be sorted into five (5) main categories: waste/garbage, recyclable materials, green bin organic materials, yard waste/compost and hazardous household waste. Four of these categories are collected at the curbside, the exception is hazardous household waste which must be dropped off at the landfill separately for appropriate sorting and disposal.

The processing assets include: 1.1kms of electrical wiring, 1.9kms of bentonite liner, 5.4 kms of leachate collection pipes, 49 monitoring wells, 76 gas collection wells, 6 kms of gas collection piping and 2 software and control systems with a total replacement cost of \$30.4M. Assets are in overall good condition with a weighted average condition score of 1.0, the breakdown of condition by asset subtype is shown in **Figure 3**. The values are weighted based on estimated replacement value.

The average age for the City's Processing assets is 17 years which is 26% of their weighted average estimated service life of 66 years.

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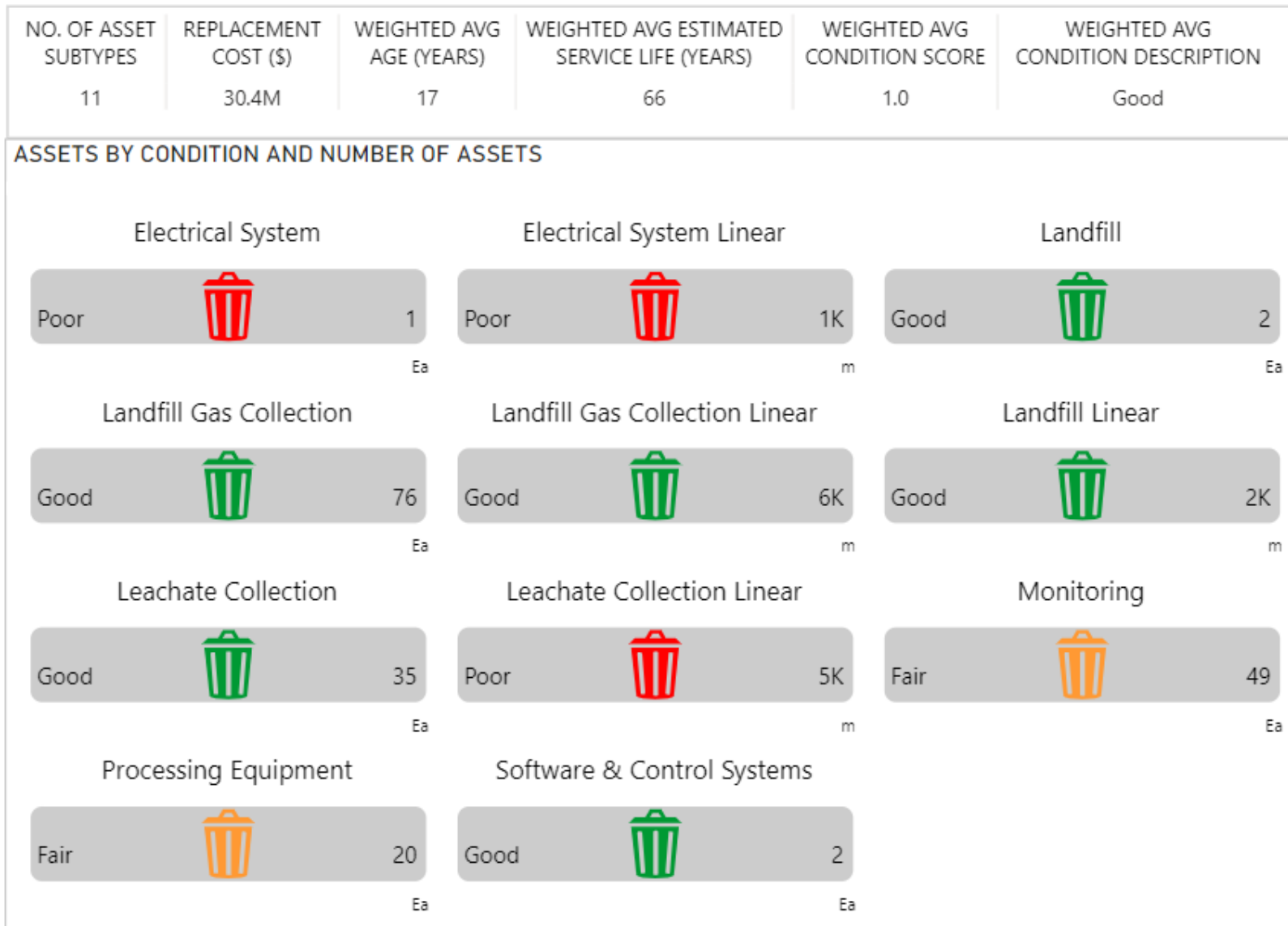


Figure 3 Processing Assets Summary by Condition and Number of Assets

1.3.6 SITE WORKS

Site works refers to assets which are present on the landfill site and support landfill operations. Assets within the Site Works group include: weigh scales, retaining walls, parking lots, access roadways, fencing, gates, signage and parking lot lighting.

The Site Works assets include: 3.7 kms of fencing and gates, 4 scalehouse gates, 53.5K sq m of access road, 16.2K sq m of parking lots, 176 m of retaining walls, 2 weigh scales, 1 oil tank, 1 storm pond and 1 LED sign with a total replacement cost of \$10.2M. Assets are in overall fair condition on the verge of being in overall good condition with a weighted average condition score of 1.41, the breakdown of condition by asset subtype is shown in **Figure 3**. The values are weighted based on estimated replacement value.

The average age for the City's Site Works assets is 44 years which is 50% of the weighted average estimated service life of 44 years.

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Figure 4 Processing Assets Summary by Condition and Number of Assets

1.4. LIFECYCLE OF SOLID WASTE ASSETS

The lifecycle of Solid Waste assets is described under four (4) categories which are described in this section:

- Key Lifecycle Stages of Solid Waste Assets;
- Lifecycle Activities;
- Risks of Lifecycle Activities; and
- 10 Year Lifecycle Costs of Solid Waste Assets.

1.4.1 KEY LIFECYCLE STAGES OF SOLID WASTE ASSETS

The lifecycle of an asset refers to the following stages: Planning, Creation/Acquisition, Operations and Maintenance, Renewal/Disposal which are defined in the Main Body of the report. For Solid Waste assets specifically our general process is as follows:

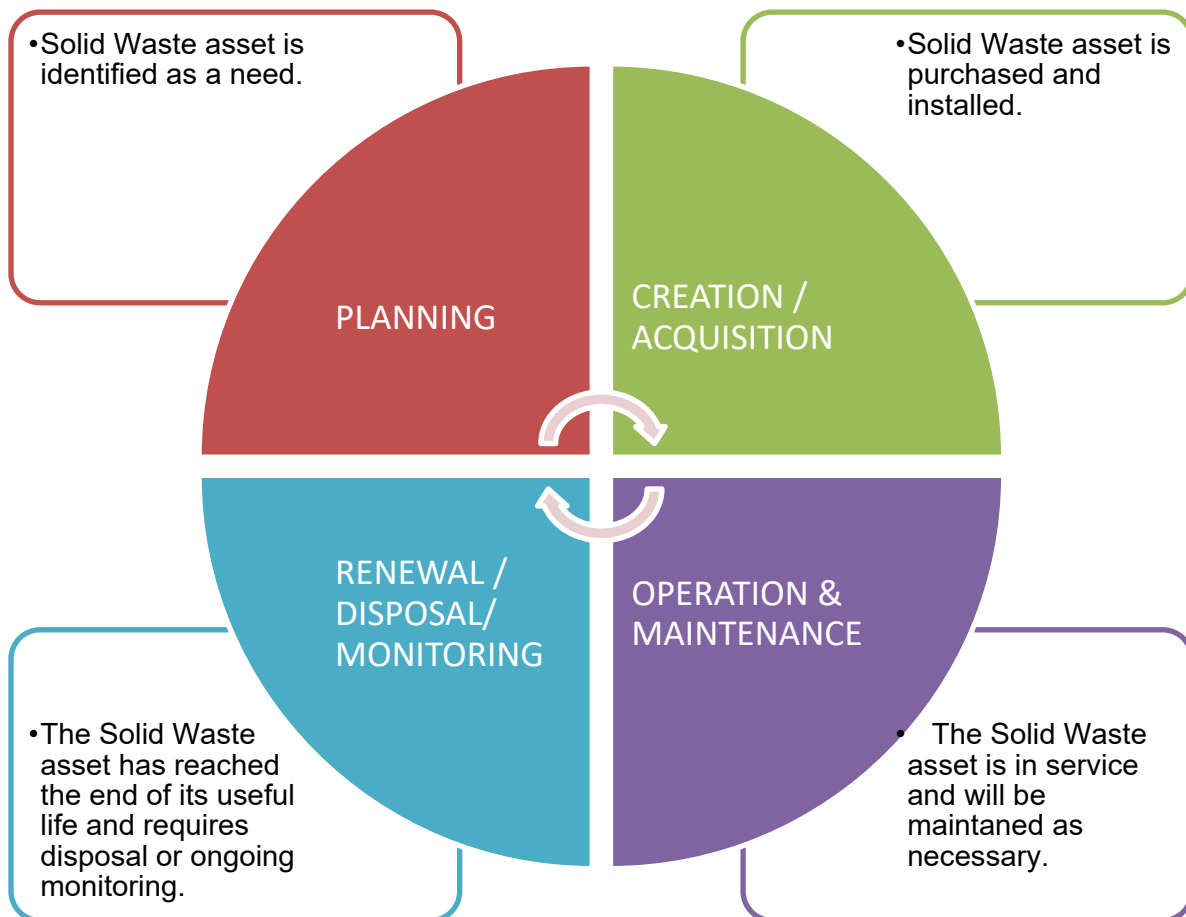


Figure 5: Lifecycle Stages of Solid Waste Assets

1. **Planning** –The Solid Waste asset has been identified as a need. The asset is purchased considering all needs, City policies and Master Plans.

2. **Creation / Acquisition / Replacement** – The cost and requirements for the new asset are defined considering all City needs and policies. The asset is purchased and installed/planted.
3. **Operation and Maintenance** – The Solid Waste asset has been installed/planted and is providing benefits to the community. Maintenance (Lifecycle) Activities are completed on the asset at specific time intervals as shown in **Table 6** to prevent premature failures of the asset. Additional monitoring and potential improvements are evaluated during this process.
4. **Renewal / Disposal / Monitoring** – The Solid Waste asset has reached the end of its useful life or has been replaced and requires disposal. The disposal considers the effect on customers such as required detouring or service disruptions which are taken into account in the Planning stage thereby restarting the cycle. The City follows industry standards when disposing of these assets. The landfill asset is unusual as upon reaching the end of its useful life, while some assets will be able to be disposed of, others such as the leachate monitoring system and landfill cells will need ongoing monitoring for a period of years, as determined by the appropriate provincial ministry. This will result in an ongoing annual cost beyond when the landfill ceases to provide landfill services to the public.

1.4.2 LIFECYCLE ACTIVITIES

A list of the planned Lifecycle Activities, annual cost, and frequency for each Solid Waste Asset Type can be found in **Table 6** below. These activities are currently being undertaken to maintain these Solid Waste assets and therefore maintain the current levels of service.

Table 6: Lifecycle Activities for Solid Waste Assets

Asset Type	Lifecycle Activity	2024 Annual Cost*	Frequency	Completed by
Buildings	Building Operations Utilities	\$165,000	Daily	Solid Waste
	Cleaning	\$13,600	Twice per week	Contractor
	Repairs	\$64,000	Based on removal activity	Solid Waste or Contractor
	Garbage Removal	\$250	As Required	Contractor
Collection	Inspections	\$210,000	Daily	Solid Waste
	Cleaning	\$300	Daily	Solid Waste or Contractor
Processing	Cleaning	\$3,100	As Required	Contractor
	Repair	\$368,000	As Required	Contractor
	Maintenance	\$116,000	Varies with Process/Equipment	Solid Waste
	Inspections	\$10,100	Weekly	Solid Waste or Contractor
	Monitoring & Sampling	\$44,000	Varies with Process/Equipment	Solid Waste or Contractor
Site Works	Inspections	\$1,500	Monthly/As Required	Solid Waste or Contractor
	Repair	Not Available	As needed	Contractor
	Landscaping	\$33,000	Seasonal - As Required	Contractor
	Winter Control	\$55,000	Seasonal - As Required	Contractor

*2024 Annual Cost is typically based on an average of the 4 year cost estimates presented in the 2024 Operating Budget.

Lifecycle activities occur on each of our Solid Waste assets classes. Solid Waste assets are maintained by Solid Waste staff or contractors and activities are currently tracked through a combination of email, excel, the City's customer relationship management system and Maintenance Connection work management software.

1.4.3 RISKS OF LIFECYCLE ACTIVITIES

The identified lifecycle activities in **Table 6** above are historical activities taken on by Solid Waste Operations staff or hired contractors. Some risks associated with these activities include:

- **Short Term Operational Disruption** – Depending on the scope of maintenance or repair activities they could result in normal operations being unable to continue while the work is in progress. This can be mitigated by completing maintenance and repairs at the correct time of year, and by appropriately coordinating with the 3rd party running the landfill operations.
- **Safety Hazards** – Even with proper safety protocols in place, a different approach is required for repairs on an active landfill site. Improperly conductive activities could pose risks to workers, the environment and the public.

However, if these activities were not completed, the risks would include:

- **Long Term Operational Disruption** due to maintenance or repair activities being delayed until the scope has increased beyond the initial issue resulting in a more time consuming or costly repair;
- **Safety Hazards to Environment and People** due to undetected issues posing safety risks if inspections were not completed in a timely fashion or safety risks which were not remedied promptly;
- **Regulatory Non-Compliance** due to failure to maintain key systems resulting in regulatory standards which are not met;
- **Lower Landfill Gas Production** due to decreasing operating efficiency of equipment over time if maintenance and required repairs are not completed in a timely fashion; and
- **Increased Cost** due to reactive actions which could have been prevented with preventative maintenance.

1.4.4 10 YEAR LIFECYCLE COSTS OF SOLID WASTE ASSETS

Figure 6 below outlines the 10 year lifecycle costs of Solid Waste assets.

Although there are a number of assets needing to be replaced over the 10 years, the average annual cost for Operation and Maintenance of Solid Waste Assets outweighs the capital cost for this infrastructure. The Operations & Maintenance (O&M) costs for the collections assets, mostly in the form of contractual payments to the 3rd party, have been included as a separate category to allow for a visible distinction between these costs and the O&M costs for the other asset categories.

Based on the information presented in the figure below, the total annual average capital cost for the next 10 years needed to maintain the state of good repair of these Solid Waste assets is \$1.4M, and the average annual Operation and Maintenance cost to maintain the current state of good repair and level of service is \$8.1M for collection assets and \$6.6M for other solid waste assets. Therefore, it is recommended that the City invest \$16.1M in Solid Waste assets annually to maintain the state of good repair and current level of service.

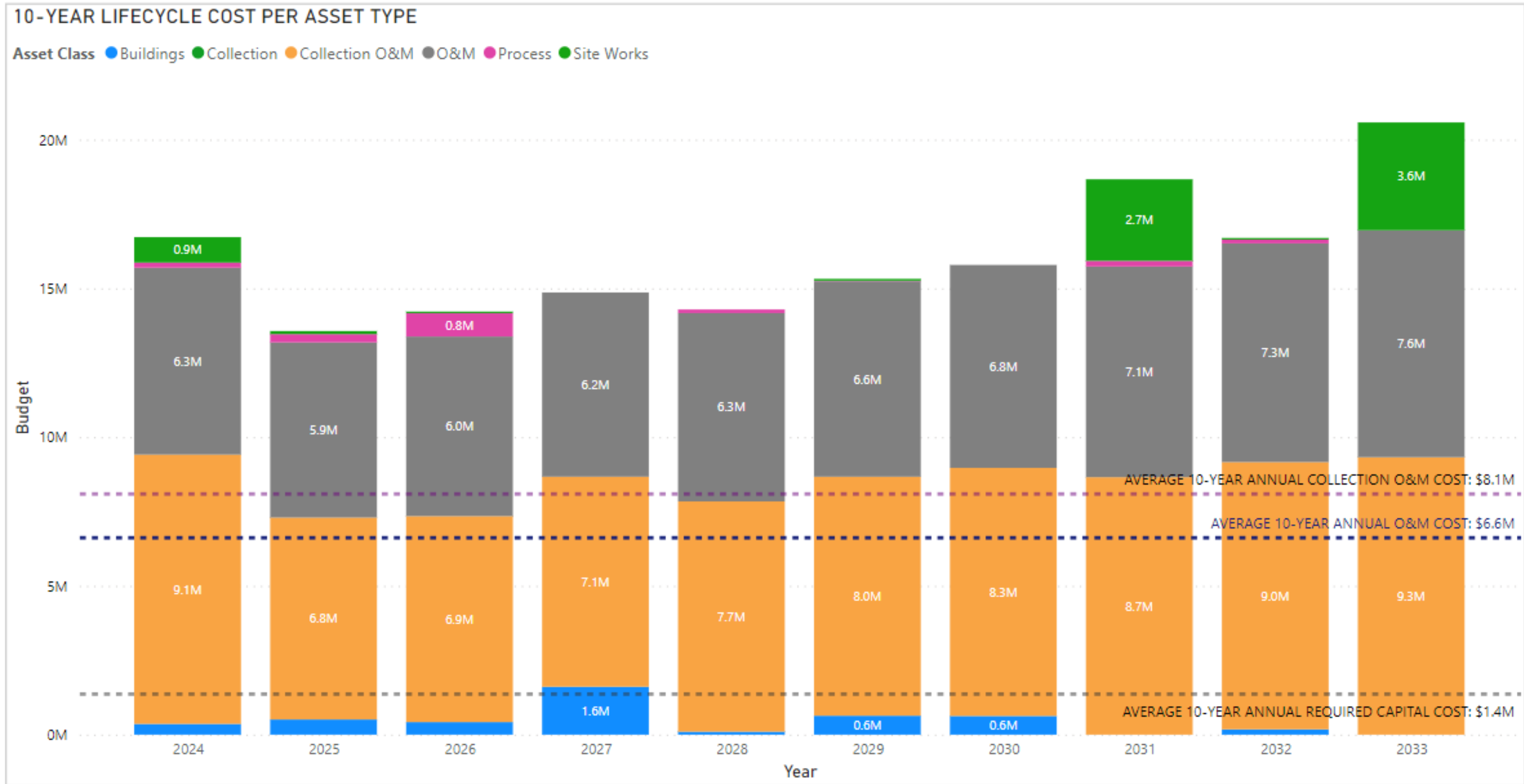


Figure 6: 10-Year Lifecycle Cost Per Solid Waste Asset Type

Notes:

1. Operation and Maintenance Costs are estimated based on the 2024 Operating Budget and are inflated by 3.8% each year.
2. For assets where no formal capital forecast was available, the replacement year is based on the estimated remaining service life of each asset or the condition assessment of each asset, as applicable.
3. Reimbursements and revenues are ignored in order to capture total cost/expenses.

Per **Figure 7** below, the existing 10-year forecast from 2024 – 2033, further explained in **Section 8.3 of the Asset Management Plan Overview Document**, indicates that the City is currently planning to spend an average of \$1.3M on Solid Waste assets capital work annually, and as noted above, the required 10-year average amount is \$1.4M to maintain the state of good repair for these assets, which indicates there is an annual 10-year funding gap of \$0.1M for Solid Waste assets. The impacts resulting from these funding gaps will be monitored and reported as appropriate.

The City of Brantford is currently moving to a four (4) year budget cycle and departments will complete long term planning as opposed to annual planning for projects within this time period. The Prioritization Matrix explained in **Section 9** of the **Asset Management Plan Overview Document** has also been implemented which will help departments confirm priority projects. It is anticipated that the new process for the City's 2024 budget cycle will help departments prepare and request funding in advance of significant replacement costs for assets reaching the end of their useful life.

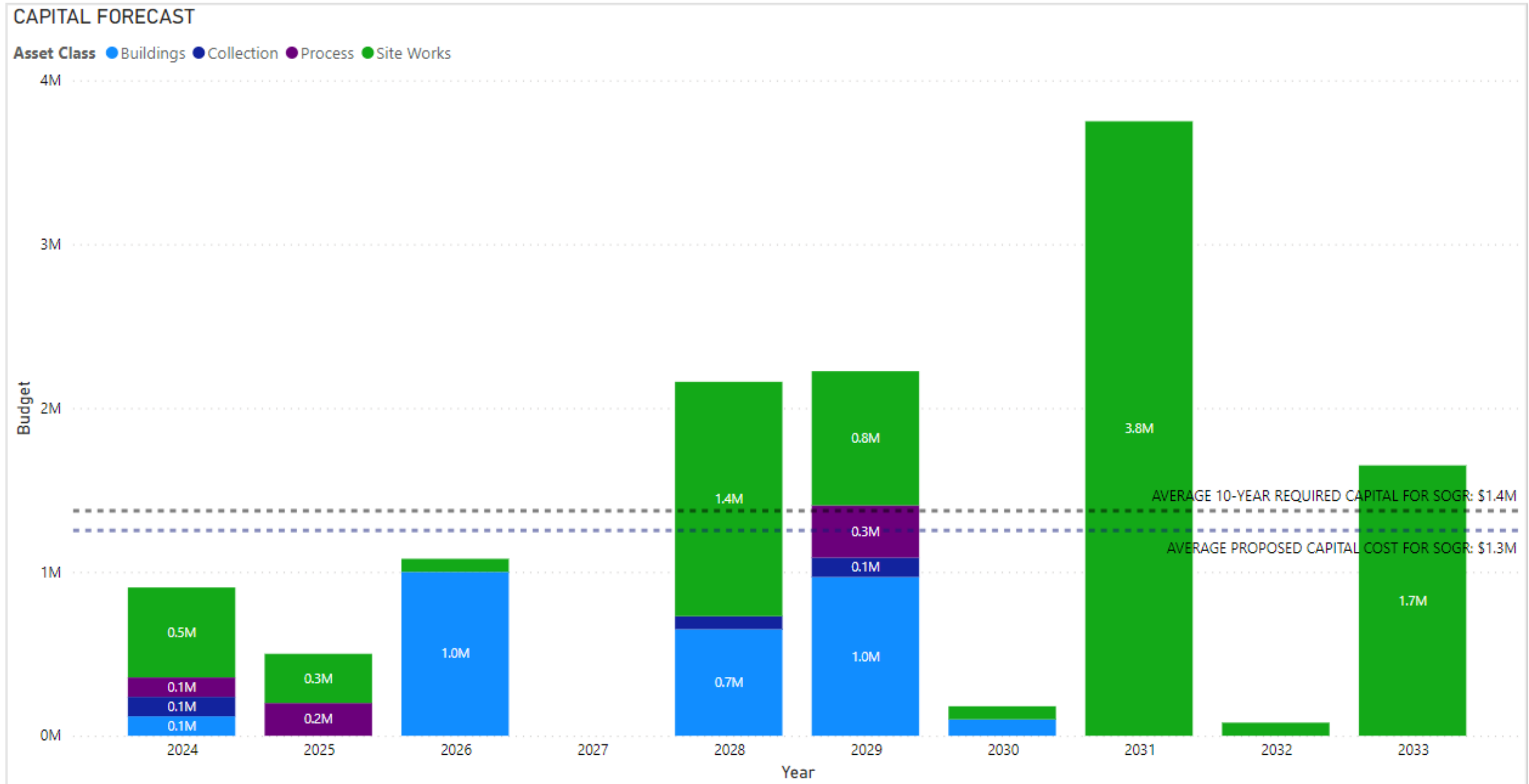


Figure 7: Existing Capital Budget Forecast from 2024 – 2033 for Solid Waste Assets

1.5. CURRENT LEVELS OF SERVICE

1.5.1 O. REG 588/17 CUSTOMER LEVELS OF SERVICE

O. Reg 588/17 does not currently have defined customer levels of service for this asset class that must be reported within this plan. This section will be kept for future plan iterations should O. Reg 588/17 be updated and require defined customer levels of service be reported.

1.5.2 O. REG 588/17 TECHNICAL LEVELS OF SERVICE

O. Reg 588/17 does not currently have defined technical levels of service for this asset class that must be reported within this plan. This section will be kept for future plan iterations should O. Reg 588/17 be updated and require defined technical levels of service be reported.

1.5.3 MUNICIPALLY DEFINED CUSTOMER LEVELS OF SERVICE

The customer levels of service are defined in **Section 6.2** of the **Asset Management Plan Overview**. For Solid Waste assets, the asset specific interpretation of these levels of service is defined below in **Table 7**.

Table 7: Municipally Defined Customer Levels of Service

Customer Level of Service	Definition
Accessibility	Solid Waste assets should be available to and easily accessed by the local population.
Quality	Solid Waste assets should deliver their intended services at a certain quality.
Cost Efficiency	Solid Waste assets should meet the needs of the user at an affordable cost to the City.
Safety	Solid Waste assets should not endanger people or property.
Environmental Sustainability	Solid Waste assets shall consider measures to improve energy and environmental performance.
Reliability	Solid Waste assets should be available as needed.
Responsiveness	Requests for repair or access to Solid Waste assets should be completed as quickly as safely practical. Responsiveness should account for the relative risk to the public, the surrounding property, the asset itself and to the staff completing the response.

1.5.4. MUNICIPALLY DEFINED TECHNICAL LEVELS OF SERVICE

The technical levels of service for Solid Waste assets have been developed based on the customer levels of service defined in **Table 7**. The currently available customer levels of service with the corresponding technical levels of service and Key

Performance Indicators (KPI) metrics are defined in **Table 8**. N/A indicates information, which is Not Available for this AMP, and will be reviewed for future iterations. Due to a low response rate on customer surveys conducted from 2023/2024, the confidence level in the applicability of the KPIs derived from the survey data to the wider population, is Low.

The need for additional KPIs and KPI targets has been identified and the City will look for opportunities to gather and include this information for future iterations of this AMP.

Table 8 Technical Levels of Service KPIs

Customer Level of Service	Technical LOS	2024 KPI	Units
Accessibility	Not Available (N/A)	N/A	N/A
Quality*	Citizen Assessment of Value for Money	83%	% of survey responses on value for money indicating an assessment of average or higher
Cost Efficiency	Annual cost per tonne of material landfilled	176.65	\$ per tonne
Safety*	Citizen Assessment of Collection Vehicle Operation	90%	% of survey responses who agree that waste collection vehicles were operated safely in the community
Environmental Sustainability	N/A	N/A	N/A
Reliability*	Citizen Assessment of Frequency of Missed Waste Pickups	84%	% of survey response who indicate they rarely (2 times per year) or never experience a missed waste pickup
Responsiveness	N/A	N/A	N/A

*Information obtained from external surveys conducted in 2023/2024, more details available in Overview Document. Note due to the low response rate the confidence level in the applicability of survey results to the wider City population is Low

1.6. CURRENT ASSET PERFORMANCE

The current asset performance for Solid Waste assets have been separated into two (2) categories for this section of the report:

- Energy Performance; and
- Operating Performance

1.6.1 SOLID WASTE ASSETS CURRENT ENERGY PERFORMANCE

The City of Brantford has a Corporate Energy Management Plan (CEMP) which emphasizes energy efficiency within the City. The goals of the CEMP are to reduce energy use, energy intensity, and greenhouse gas (GHG) emissions in our Facilities. In addition, through the City’s Climate Change Action Plan and Climate Lens Tool explained in **Section 10** of the **Asset Management Plan Overview Document**, the City has been working to improve our facilities’ energy efficiency and reduce the associated carbon footprint.

Under the CEMP, annual energy management data is reported, but has a reporting delay of two (2) years. **Table 9** contains data from the 2020 Corporate Energy Management Report which is available on the City’s website. The weighted average energy intensity by area for all City buildings is 41.25 ekWh/sq ft.

Table 9: Current Energy Performance of Solid Waste Facilities*

Building	Address	Avg Hours Per Week	Electricity (kWh)	Natural Gas (m3)	GHG Emissions (kg)	Energy Intensity (ekWh/sq ft)
Landfill Scale House	20 Morrison Rd	40	12,595.87	N/A	320.54	31.49

*Based on information provided in the 2022 Corporate Energy Management Report

1.6.2 SOLID WASTE ASSETS CURRENT OPERATING PERFORMANCE

Table 10 contains criteria by which the City’s Solid Waste operating performance can be assessed. In January 2022, the City of Brantford released its’ Zero Waste Brantford (ZWB) vision for Solid Waste. The ZWB outlines short, medium and long term actions to reduce waste overall and reduce GHG emissions by diverting and reducing organic waste sent to the City’s landfill. The diversion rate from this plan is the first performance measure listed in **Table 10**. The second performance measure is related to landfill gas (LFG) recovery rates from the 2017 LFG Collection System Master Plan.

Table 10: Solid Waste Operating Performance

Criteria	Current Performance (Year of Data)	Possible Improvement
Percent of materials reduced, recycled or composted diverted from landfill disposal from residential waste	34% Diverted (2022) 37% Diverted (2023)	Diversion is expected to increase with the introduction of a Green Bin program in November 2023 Goal is 70% diverted by 2050
LFG Recovery Rate	458 standard cubic feet per minute at 47% methane (2016)	Work to increase LFG Recovery Rate until it matches LFG recovery potential

1.7. DISCUSSION AND CONCLUSIONS

In conclusion, the City of Brantford operates and maintains many Solid Waste assets. These assets are in overall Good condition with a total estimated replacement cost of approximately \$71.8M. The asset inventory and condition data confidence for Solid Waste is typically at a Medium to High level which will improve with the Solid Waste Master Plan updated proposed for 2024/2025.

The lifecycle stages for Solid Waste assets includes: Planning, Creation, Operation and Maintenance, and Renewal/Disposal/Monitoring. During the Planning stage, the City identifies the need for the asset; during the Creation stage, the asset is purchased and installed/planted or deployed; during the Operation and Maintenance stage, the asset is operating and lifecycle activities (i.e. maintenance) occur on each of our assets to maintain the state of good repair; and the Renewal/Disposal/Monitoring stage is when the asset has reached the end of its useful life, or has reached capacity and requires disposal. The while some solid waste assets can be disposed of at the end of their useful lives, others such as the landfill liner and caps, leachate collection system and monitoring wells will need ongoing monitoring and corrective actions, as required, for a period of years, as determined by the appropriate provincial ministry.

Lifecycle activities are currently typically tracked through a combination of email, excel, the City's customer relationship management system and work management software owned by 3rd party contractors. For more information on key database applications and work order management, please refer to **Section 4.2**, in the **AMP Overview** document. As staff continue to track data and review opportunities to improve tracking, the frequency and costs associated with specific activities will be better represented.

It is estimated based on the average annual cost in the 10 Year Life Cycle Costing that the City should be spending an average \$1.4M annually for capital Solid Waste asset costs and will be spending an average of \$8.1M on Operating and Maintenance associated to collection activities and \$6.6M on the other Solid Waste assets. The City is currently proposing to spend an average of \$1.3M annually on capital for Solid Waste assets' state of good repair, resulting in a deficit of \$0.1M per year from the forecasted capital need.

While some Current Levels of Service have been identified, additional metrics have been identified as a need for Solid Waste assets. Brantford is working to continue to develop the process to track these metrics which will assist in tracking these and any further identified KPIs for future iterations.

Asset performance is separated into operating and energy performance in the City's AMPs. Currently only one of the Solid Waste buildings is tracked as part of the Corporate Energy Management report. In 2020 the landfill scalehouse had an energy

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intensity of 31.49 ekWh/sq ft. This energy performance is better than the weighted average energy intensity by area for all City buildings is 41.25 ekWh/sq ft. For operating performance, the City has a Zero Waste Brantford vision document with a target of 70% of residential waste diverted from the landfill by 2050. The diversion rate achieved in 2023 was 37% a 3% increase from 2022. Additional performance measures are expected to be added in future iterations of the AMP.