CITY OF BRANTFORD

# 2024 Asset Management Plan

## Fire
## 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

| ROLE | NAME |
|---|---|
| **WRITERS:** | James Clarke, C.E.T., PMP<br>Senior Project Manager<br>Public Works – Engineering Services |
| **CONTRIBUTORS:** | **Infrastructure Planning**<br>Nora Fleming, Asset Management Specialist<br><br>**Fire**<br>Scott Pipe, Deputy Fire Chief<br>Dwayne Armstrong, Deputy Fire Chief |
| **REVIEWERS:** | Mike Abraham, C.E.T., Manager of Infrastructure Planning |
| **RECOMMENDED BY:** | Brian Hutchings, Chief Administrative Officer |
| **APPROVED BY:** | Brantford City Council |

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# ASSET MANAGEMENT PLAN
# FIRE SERVICES

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# FIRE SERVICES INTRODUCTION

Per O. Reg. 588/17 all municipal infrastructure assets which fall outside of the core asset categories (water, wastewater and stormwater) 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. 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.

**Table 1: Asset Type Breakdown**

| | **Asset Class** | | |
|---|---|---|---|
| | **Fire Facilities** | **Fire Fleet** | **Fire Machinery & Equipment** |
| **Asset Type:** | Fire Stations | Fire Fleet | Fire Machinery & Equipment |
| | Shelters & Storage | | |
| | Site Works | | |

# 1. FIRE FACILITIES

## 1.1. INTRODUCTION

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

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

## 1.2. FIRE FACILITIES 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 approaches the City currently uses to assess the condition of Fire Facilities assets are:

- Outsourced condition assessments to consultants; and
- Estimated condition based on asset specific information, such as age and estimated service life.

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

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

**Table 2: Fire Facilities 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** |
| **Fire Stations** | TCA List from City Finance Department | High | Formal inventory with few unknowns | TCA List from City Finance Department | Medium | Formal inventory with dated costing | Building Condition Assessments, and TCA List from City Finance Department | High | Formal condition assessment with few unknowns, and informal assessment based on age and estimated service life from TCA data |
| **Shelters & Storage** | TCA List from City Finance Department | High | Formal inventory with few unknowns | TCA List from City Finance Department | Medium | Formal inventory with dated costing | TCA List from City Finance Department | Medium | Informal assessment based on age and estimated service life from TCA data |
| **Site Works** | TCA List from City Finance Department | High | Formal inventory with few unknowns | TCA List from City Finance Department | Medium | Formal inventory with dated costing | TCA List from City Finance Department | Medium | Informal assessment based on age and estimated service life from TCA data and staff knowledge |

The Fire Facilities assets include the City's four (4) fire stations, as well as amenities/furniture, flag poles, parking lots, pylon signs, and sheds associated with these properties.

Per **Table 2** above, Fire Facilities assets' inventory and condition data are typically at a Medium to High confidence level, with an overall average confidence level of Medium.

Inventory data is at a High confidence level due to inventories maintained on the Tangible Capital Asset (TCA) registry by City staff. Replacement costs are at a Medium confidence level, as these values are estimated based on original asset costs, adjusted to current year prices.

Condition data is estimated at a Medium to High confidence level. Condition of Fire Stations assets is estimated at a High level, due to recent Building Condition Assessments completed for the majority of buildings. Condition for Shelters & Storage and Site Works assets are estimated at a Medium level, as these values are based on age and estimated service life assumptions in TCA data and staff knowledge.

## 1.2.1. SERVICE LIFE

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: Fire Facilities Assets' Estimated Service Life**

| Asset | Estimated Service Life |
|---|---|
| **Fire Stations** | 80 years for Fire Station buildings<br>10 to 15 years for Amenities & Furniture |
| **Shelters & Storage** | 30 years for Sheds |
| **Site Works** | 25 years for Flag Poles<br>30 years for Parking Lots<br>15 years for Pylon Signs |

## 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, some elements may have significant deficiencies, and asset will likely require repairs 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 or replacement 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 FIRE FACILITIES ASSETS

The summary of assets for the Fire Facilities 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 Fire Facilities assets is included in **Table 5** below, and 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 then if the average was calculated based on the number of assets.

The total replacement cost for all Fire Facilities assets is approximately $29.6M with an overall average estimated service life of 78 years. The average condition scores are shown to one decimal place to illustrate how close the scores are to being on a cusp of another rating and were used to calculate the weighted overall average condition score for the asset group, but are shown rounded to the nearest whole number in subsequent sections. Overall, Fire Facilities assets are in Good condition with a weighted average condition score of 1.3.

**Table 5: Total Summary of Fire Facilities Assets**

| Asset | Quantity | Unit | Replacement Cost | Weighted Average Age (years) | Weighted Average Estimated Service Life (years) | % of Estimated Service Life Expended | Weighted Average Condition Score | Weighted Average Condition Description |
|---|---|---|---|---|---|---|---|---|
| **Fire Facilities Total** | | | **$29.6M** | **19** | **78** | **24%** | **1.3** | **GOOD** |
| **Fire Stations** | 7 | ea | $28.8M | 19 | 79 | 24% | 1.2 | GOOD |
| **Shelters & Storage** | 4 | ea | $50.0K | 20 | 30 | 67% | 2.1 | FAIR |
| **Site Works** | 8 | ea | $725.4K | 21 | 29 | 73% | 2.2 | FAIR |

## 1.3.2. FIRE STATIONS

The Fire Stations asset group is comprised of the four (4) fire stations in service throughout the City, as well as three (3) groups of amenities and furniture assets included in these buildings. Asset age, cost and condition is estimated based on Condition Assessments completed in 2021. Where data from Condition Assessments is not available, information is estimated from staff knowledge or TCA data maintained by City staff.

As seen in **Figure 1** below, the Fire Stations assets have a total replacement cost of $28.8M, and the assets are typically in Good condition, with an average condition score of 1.

| NO OF ASSETS | REPLACEMENT COST | AVERAGE AGE | AVERAGE ESTIMATED SERVICE LIFE | AVERAGE CONDITION SCORE | AVERAGE CONDITION DESCRIPTION |
|---|---|---|---|---|---|
| 7 | 28.8M | 19 | 79 | 1 | Good |

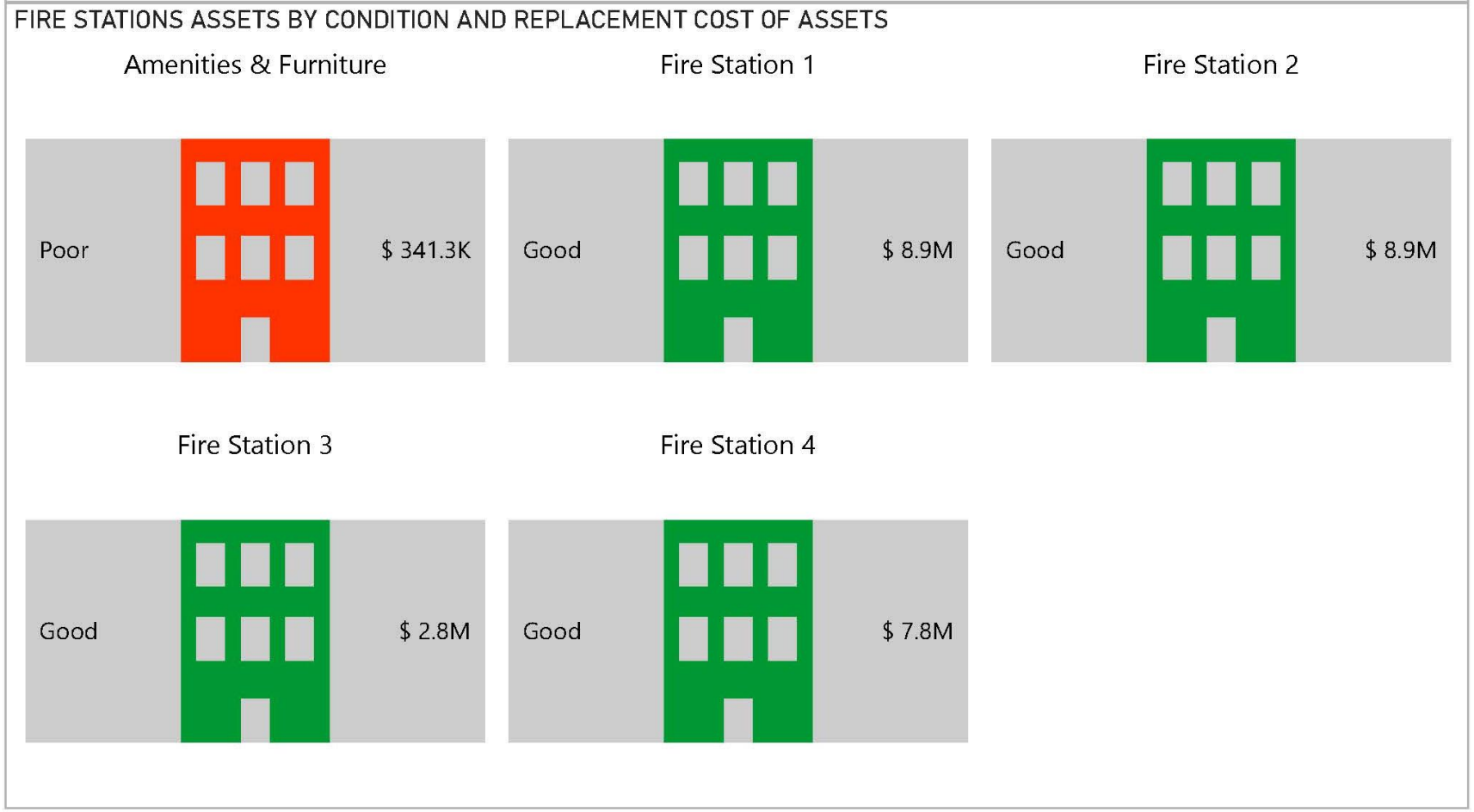


**Figure 1: Fire Stations Asset Summary**

## 1.3.3. SHELTERS & STORAGE

The Shelters & Storage asset group is comprised of four (4) sheds located on various fire station properties. Asset age, cost and condition information for this asset group is estimated based on staff knowledge or TCA data maintained by City staff. As seen in Error! No bookmark name given.

| NO OF ASSETS | REPLACEMENT COST | AVERAGE AGE | AVERAGE ESTIMATED SERVICE LIFE | AVERAGE CONDITION SCORE | AVERAGE CONDITION DESCRIPTION |
|---|---|---|---|---|---|
| 4 | 50.0K | 20 | 30 | 2 | Fair |


Figure 2 below, Shelters & Storage assets have a total replacement cost of $50.0K, and the assets are typically in Fair condition, with an average condition score of 2.

| NO OF ASSETS | REPLACEMENT COST | AVERAGE AGE | AVERAGE ESTIMATED SERVICE LIFE | AVERAGE CONDITION SCORE | AVERAGE CONDITION DESCRIPTION |
|---|---|---|---|---|---|
| 4 | 50.0K | 20 | 30 | 2 | Fair |


**Figure 2: Shelters & Storage Asset Summary**

## 1.3.4. SITE WORKS

The Site Works asset group is comprised of the flag poles, pylon signs and parking lot assets constructed at the Fire Station properties. Asset age, cost and condition information for this asset group is estimated based on TCA data maintained by City staff, and staff knowledge.

As seen in Error! No bookmark name given.**Figure 3** below, Site Works assets have a total replacement cost of $725.4K, and the assets are typically in Fair condition, with an average condition score of 2.

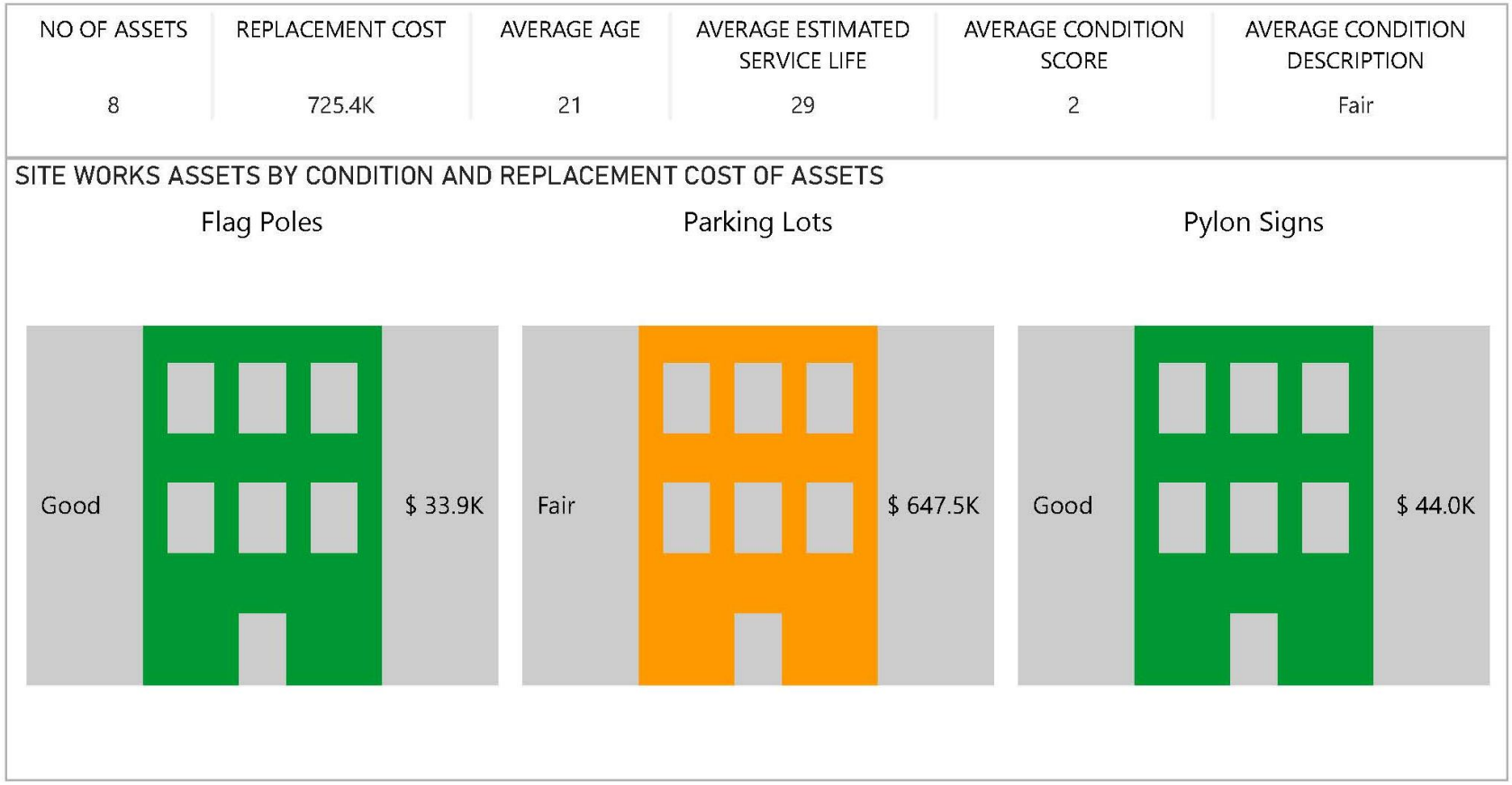


**Figure 3: Site Works Asset Summary**

# 1.4. LIFECYCLE OF FIRE FACILITIES ASSETS

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

- Key Lifecycle Stages of Fire Facilities Assets;
- Lifecycle Activities;
- Risks of Lifecycle Activities; and
- 10 Year Lifecycle Costs of Fire Facilities Assets.

## 1.4.1. KEY LIFECYCLE STAGES OF FIRE FACILITIES 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 Fire Facilities assets specifically, our general process is as follows:

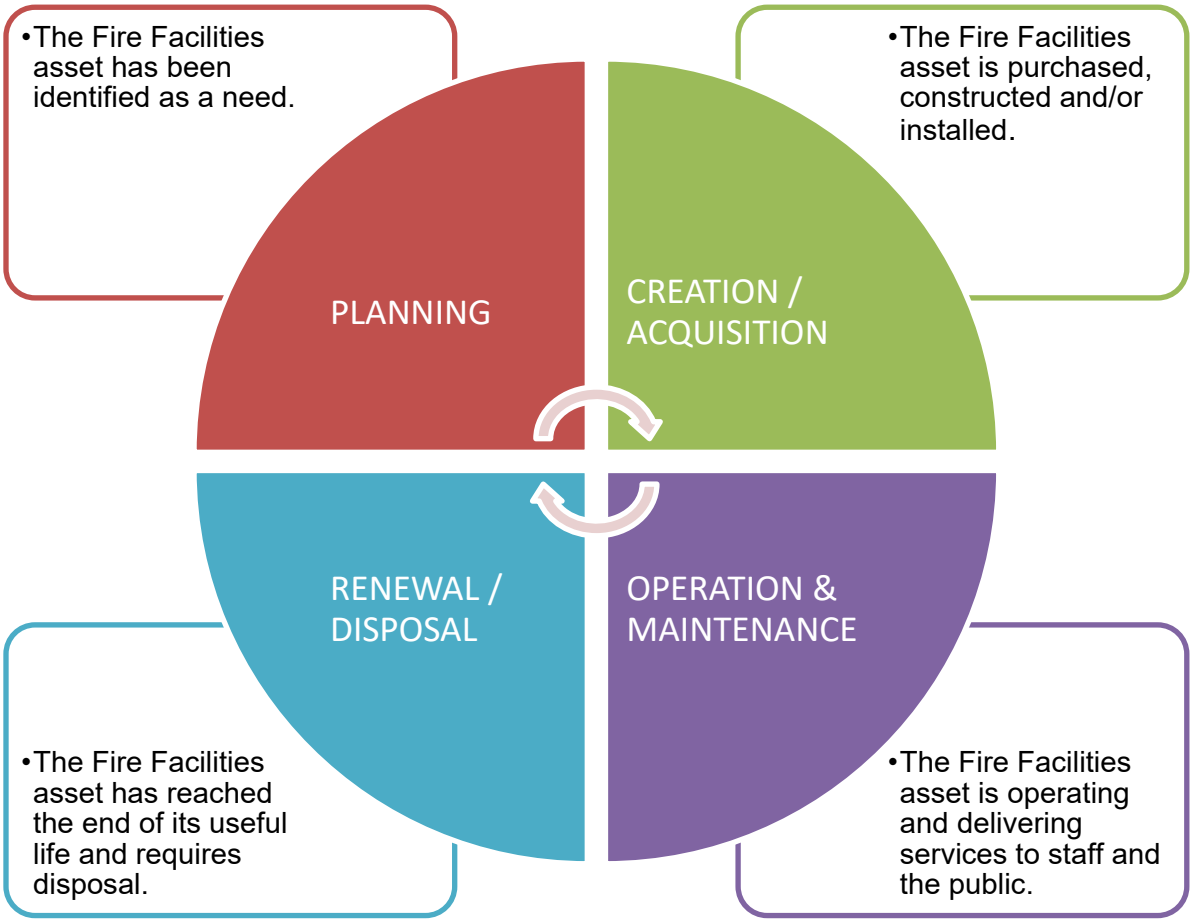


**Figure 4: Lifecycle Stages of Fire Facilities Assets**

1. **Planning** – The need to acquire the asset has been identified per the City's regular business activities, as required.
2. **Creation / Acquisition / Replacement** – The asset is purchased, constructed and/or installed as per any applicable standards and guidelines.
3. **Operation and Maintenance** – The asset is in use and assists in delivering a service to internal and external customers.
4. **Renewal / Disposal** – The asset has reached the end of its useful life, is in poor condition, and/or is underperforming, and requires disposal. The disposal considers the effect on customers such as level of service disruptions.

## 1.4.2. LIFECYCLE ACTIVITIES

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

**Table 6: Lifecycle Activities for Fire Facilities Assets**

| Asset Type | Lifecycle Activity | 2024 Annual Cost* | Frequency | Completed by |
|---|---|---|---|---|
| **Fire Stations** | Building Cleaning, Repairs and Maintenance | $39.1K | Ad hoc | City/Contracted Services |
| | General Supplies | $32.6K | Ad hoc | City staff |
| | Furniture | $2,400 | Ad hoc | City staff |
| | Building Operations | $98.5K | Daily | Utilities |
| **Site Works** | Snow Removal | $6,000 | Ad hoc | Contracted Services |
| | Waste Removal | $880 | Every two (2) weeks | Contracted Services |

*2024 Annual Cost is typically based on estimates presented in the 2024 Operating Budget.

## 1.4.3. RISKS OF LIFECYCLE ACTIVITIES

The identified lifecycle activities in **Table 6** above are historical activities taken on by Fire. Some risks associated with these activities include:

- **Traffic Accidents** - when performing maintenance in the vicinity of traffic vehicles, there is a risk of a traffic accident. This is mitigated by implementing a traffic control plan and wearing high visibility clothing during maintenance activities in the right of way or parking lots;
- **Operator Error** – When operators are operating equipment, there is a risk of an operator related accident. This risk is mitigated by ensuring all operators are trained on equipment.
- **Equipment Failure -** Equipment failure can occur during maintenance activities and this is mitigated by ensuring preventative maintenance is completed at regular intervals to prevent this from occurring.

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

- **Service Disruptions** as failure of assets could disrupt regular business activities, which could have been mitigated with preventative maintenance of assets;
- **Health and Safety Issues** due to unexpected failure of assets, such as potholes or tripping hazards in parking lots;
- **Increased Cost** due to reactive repairs which could have been prevented with preventative maintenance.

### 1.4.4. 10 YEAR LIFECYCLE COSTS OF FIRE FACILITIES ASSETS

**Figure 5** below outlines the 10 year lifecycle costs of Fire Facilities assets. Typically when the condition of an asset is estimated based on service life there are spikes in the first year to account for the backlog.

The capital investments for Fire Stations and Site Works assets are based on the projected replacement schedule and associated costing from the 2021 Building Condition Assessments. The capital costs associated with Shelters & Storage assets are based on replacement cost of assets as they reach the end of their estimated service life.

Based on the information presented in the figure below, the average annual capital cost for the next 10 years to maintain the state of good repair for Fire Facilities assets is $311.9K, and it is estimated that $202.5K should be spent annually on O&M. Therefore, it is recommended that the City invest $514.4K annually in Fire Facilities assets to maintain the state of good repair.

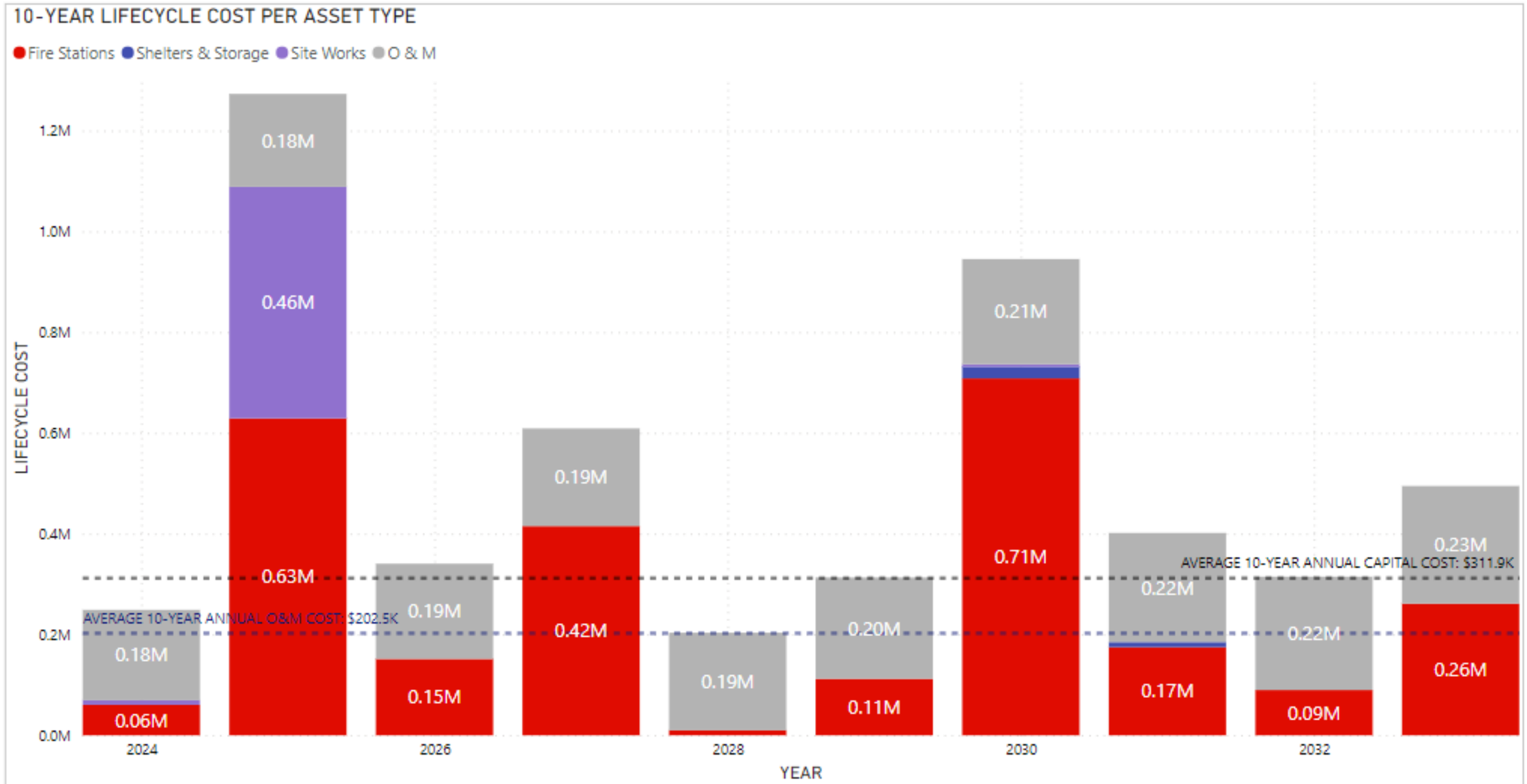


**Figure 5: 10-Year Lifecycle Cost Per Fire Facilities Asset Type**

Notes:

1. O&M costs are estimated based on the 2024-2027 Operating Budget. O&M costs beyond 2027 are estimated by 3.8% inflation each year.
2. Capital costs and lifecycle are estimated based on values and methodology identified in **Section 1.3**
3. Reimbursements and revenues are ignored in order to capture total cost/expenses.

Per **Figure 6** 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 $315.2K on Fire Facilities assets annually. As noted above, the required 10-year average annual amount is $311.9K; therefore, the City is currently meeting their required funding targets, with a 10-year average annual funding surplus of $3,300.

The City of Brantford has moved 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.

It is important to note that currently the City does not have access to detailed data on Operation and Maintenance costs, but it is anticipated this information will improve in future iterations of the AMP.

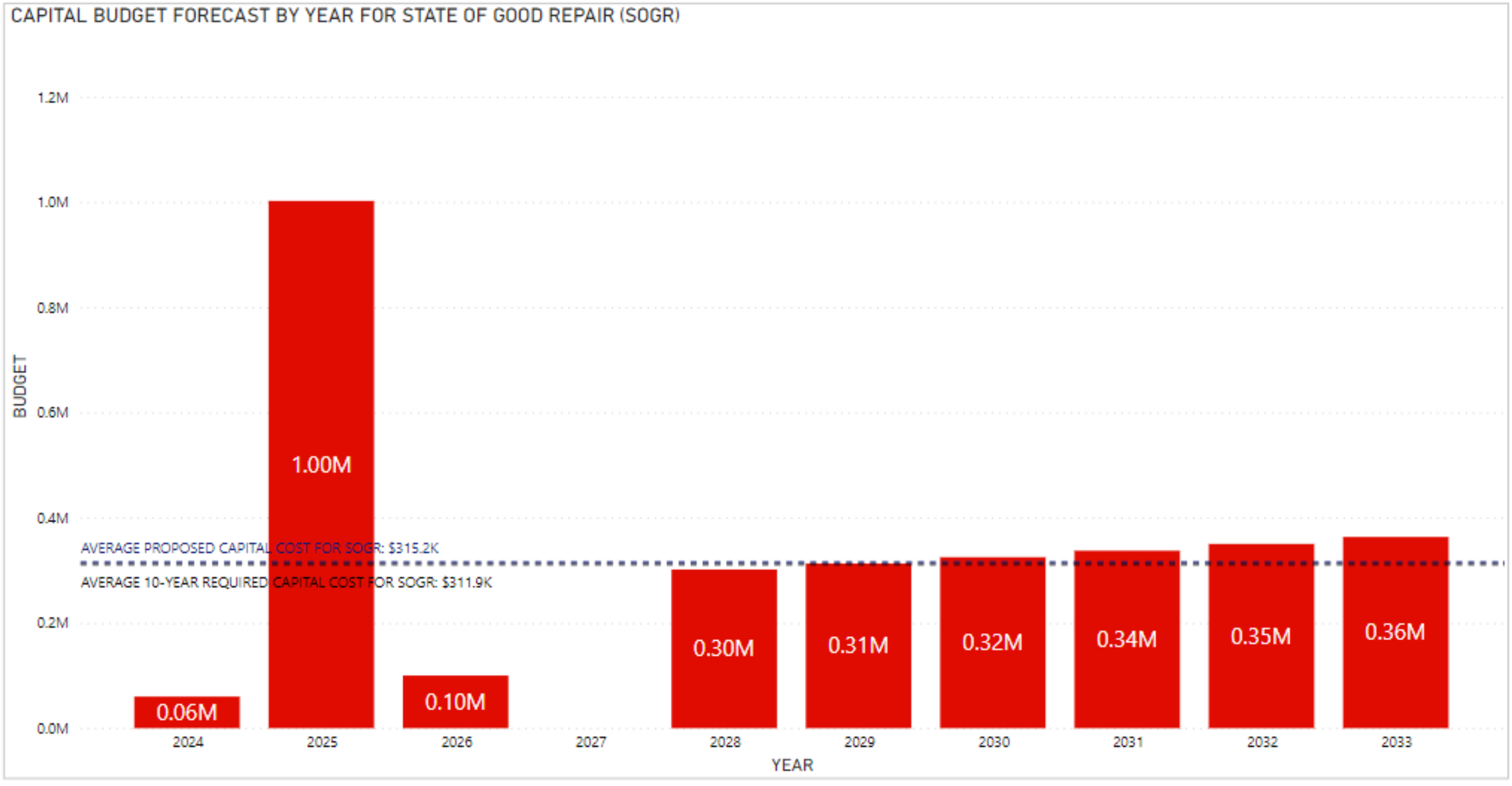


**Figure 6: Existing Capital Budget Forecast from 2024–2033 for Fire Facilities Assets**

Notes:

1. Capital budget forecast is estimated based on the 2024-2027 Capital Budget. Capital budget beyond 2027 is estimated by 3.8% inflation each year.

# 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 in this plan. This section will be kept for future iterations in case O. Reg. 588/17 requires 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 in this plan. This section will be kept for future iterations in case O. Reg. 588/17 requires 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 Fire Facilities 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** | Fire Facilities assets should be accessible to staff and the public without barriers in place. |
| **Quality** | Fire Facilities assets should deliver their intended purpose at a certain quality. |
| **Cost Efficiency** | Fire Facilities assets should be operated efficiently with extra care to minimize costs. |
| **Safety** | Fire Facilities assets should be safe to access, and staff should feel safe within these facilities. |
| **Environmental Sustainability** | Fire Facilities assets should be operating as environmentally as possible. |
| **Reliability** | Fire Facilities assets should be sufficient to provide service to the public and avoid closures or service disruptions. |
| **Responsiveness** | Fire Facilities assets should be maintained and repaired promptly to minimize closures or service disruptions. 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 Fire Facilities assets have been adopted 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 KPI metrics are defined in **Table 8**.

Due to a low response rate on customer surveys conducted in 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 future iterations of this AMP will look for opportunities to gather and include this information.

**Table 8: Levels of Service KPIs**

| Customer Level of Service | Technical LOS | 2024 KPI | Units |
|---|---|---|---|
| **Accessibility*** | Percentage of Customers who agree Fire Facilities should be accessible and meet provincial standards. | 86% | % of Customers |
| **Quality** | Not Available | Not Available | Not Available |
| **Cost Efficiency** | Not Available | Not Available | Not Available |
| **Safety** | Not Available | Not Available | Not Available |
| **Environmental Sustainability** | Not Available | Not Available | Not Available |
| **Reliability** | Not Available | Not Available | Not Available |
| **Responsiveness*** | Percentage of Customers who agree Fire Facilities should be clean and in good repair. | 100% | % of Customers |

*Note: Information obtained from customer surveys conducted in 2024, more details available in Overview Document. Due to a low response rate, the confidence level in the applicability of the information to the wider population is Low.

# 1.6. CURRENT ASSET PERFORMANCE

The current asset performance for Fire Facilities assets has been separated into two (2) categories for this section of the report:

- Energy Performance; and
- Operating Performance

## 1.6.1. FIRE FACILITIES CURRENT ENERGY PERFORMANCE

The City of Brantford has a Corporate Energy Management Plan (CEMP) which emphasizes energy efficiency within the City. The CEMP includes goals to reduce energy use, energy intensity, and greenhouse gas (GHG) emissions in City 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 will be working to improve energy efficiency and reduce the associated carbon footprint.

The City of Brantford also conducted a Corporate and Community Greenhouse Gas Emissions Inventory, which allows the City to track its progress towards meeting its GHG emissions reduction targets. Emissions are tracked annually and consolidated into a report every second year. Current energy performance for Emergency Services Buildings (incl. Fire, Police, and EMS facilities) was obtained from the Greenhouse Gas Emissions Inventory, summarized in **Table 9** below. The weighted average energy intensity by area for all City buildings is 41.25 ekWh/sq ft.

**Table 9: Current Energy Performance for Emergency Services Buildings assets**

| **Service Type** | **2018 Emissions (T $CO_2$ e)*** | **2021 Emissions (T $CO_2$ e)*** | **2022 Emissions (T $CO_2$ e)*** |
|---|---|---|---|
| Emergency Services | 417 | 368 | 410 |
| **Total** | **417** | **368** | **410** |
| **Change from 2018 Baseline** | | **- 12%** | **- 2%** |

* Based on information provided in the 2021/2022 Corporate and Community Greenhouse Gas Emissions Inventory.

## 1.6.2. FIRE FACILITIES CURRENT OPERATING PERFORMANCE

Currently, the City does not have a method to track Operating Performance for the Fire Facilities asset class. This section will be kept for future iterations as ways to track Operating Performance for this asset class are explored.

# 1.7. DISCUSSION & CONCLUSIONS

In conclusion, the City of Brantford operates and maintains Fire Facilities assets. These assets are in Good condition with a total estimated replacement cost of approximately $29.6M.

Inventory and condition data for Fire Facilities are typically at a Medium to High confidence level, with an overall average confidence level of Medium.

Inventory data is at a High confidence level due to inventories maintained on the TCA list by City staff. Replacement costs are at a Medium confidence level, as these values are estimated based on original asset costs, adjusted to current year prices.

Condition data is estimated at a Medium to High confidence level. Condition of Fire Stations assets is estimated at a High level, due to recent Building Condition Assessments completed for the majority of buildings. Condition for Shelters & Storage and Site Works assets are estimated at a Medium level, as these values are based on age and estimated service life assumptions in TCA data and staff knowledge.

The lifecycle stages for Fire Facilities assets include: Planning, Creation, O&M, and Disposal. During the Planning stage, the City identifies the need to obtain a Fire Facilities asset; during the Creation stage, the Fire Facilities asset is purchased, constructed, and/or installed; during the O&M stage, the Fire Facilities asset is in operation and delivering service to staff and the public; and in the Disposal stage, the Fire Facilities asset has reached the end of its useful life and requires disposal.

Lifecycle activities are currently completed by City staff and contractors/suppliers to maintain state of good repair. At this time, detailed tracking and costs associated with these activities are not available and are estimated based on the 2024 Operating Budget.

It is estimated based on the average annual cost in the 10 Year Lifecycle Costing that the City should be spending an average $311.9K in capital investment annually for replacement of Fire Facilities assets, and be spending an average of $202.5K on O&M for Fire Facilities assets. City is currently planning to spend an average of $315.2K on Fire Facilities capital annually; therefore, the City is currently meeting their required funding targets, with a 10-year average annual funding surplus of $3,300.

Current Levels of Service have been identified for Fire Facilities assets. Currently, these levels of service and associated KPIs are based on a survey conducted in 2023/2024 with external customers who utilize Fire Facilities assets. Due to a low response rate on customer surveys, the confidence level in the applicability of the KPIs derived from the survey data to the wider population is Low at this time. Brantford is working to continue

to develop a process to track these metrics which will assist in tracking these and any further identified KPIs for future iterations.

Finally, asset performance is separated into energy and operating performance in the City's AMPs. For current energy performance, data from the 2021-2022 Corporate and Community Greenhouse Gas Emissions Inventory concluded that Emergency Services Buildings emissions were approximately 368 T $CO_2e$ in 2021 and 410 T $CO_2e$ in 2022. This equated to a 12% reduction in greenhouse gas emissions in 2021 and a 2% reduction in greenhouse gas emissions in 2022 in comparison to 2018 benchmark levels.

Due to limited tracking for assets, the City is not able to provide operating performance information for Fire Facilities assets in this iteration of the AMP. Opportunities to track operating performance may be considered to provide updated information in future iterations of this plan.

# 2. FIRE FLEET

## 2.1. INTRODUCTION

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

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

## 2.2. FIRE FLEET 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 approaches the City currently uses to assess the condition of Fire Fleet assets are:

- Estimated condition based on asset specific information, such as age and estimated service life.

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

The origin of the Fire Fleet asset data for inventory, replacement cost, and condition, as well as data confidence in each are provided in **Table 10** below.

**Table 10: Fire Fleet Assets' Data Origin and Confidence Level**

| | Inventory | | | Replacement Cost | | | Condition | | |
|---|---|---|---|---|---|---|---|---|---|
| **Asset Type** | **Inventory (incl. Quantity and Age)** | **Data Confidence Level** | **Data Confidence Description** | **Replacement Cost From** | **Data Confidence Level** | **Data Confidence Description** | **Condition From** | **Data Confidence Level** | **Data Confidence Description** |
| **Fire Fleet** | TCA List from City Finance Department | High | Formal inventory with few unknowns | TCA List from City Finance Department | Medium | Formal inventory with dated costing | TCA List from City Finance Department | Medium | Informal assessment based on age and estimated service life from TCA data and staff knowledge |

Per **Table 10** above, Fire Fleet assets' inventory and condition data are typically at a Medium to High confidence level, with an overall average confidence level of Medium.

Inventory data is at a High confidence level due to inventories maintained on TCA list by City staff. Replacement costs are at a Medium confidence level, as these values are estimated based on original asset costs, adjusted to current year prices.

Condition data is estimated at a Medium confidence level. Condition of assets is estimated based on age and estimated service life assumptions in TCA data and staff knowledge.

## 2.2.1. SERVICE LIFE

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 11**. The average overall estimated service life for assets can be found in **Table 13**.

**Table 11: Fire Fleet Assets' Estimated Service Life**

| Asset | Estimated Service Life |
|---|---|
| **Fire Trucks** | 18 years |
| **Support Vehicles** | 10 years |
| **Boats, Trailers, Utility Vehicles** | 20 years |

## 2.2.2. 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 12: 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, some elements may have significant deficiencies, and asset will likely require repairs 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 or replacement within the next year. Where condition data is not available, this category applies to assets which have exceeded 80% of their estimated service life. |

# 2.3. SUMMARY OF FIRE FLEET ASSETS

The summary of assets for the Fire Fleet 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.

## 2.3.1. TOTAL SUMMARY OF ASSETS

A table summarizing all Fire Fleet assets is included in **Table 13** below, and 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 then if the average was calculated based on the number of assets. The total replacement cost for all Fire Fleet assets is approximately $17.9M with an overall average estimated service life of 18 years. The average condition scores are shown to one decimal place to illustrate how close the scores are to being on a cusp of another rating and were used to calculate the weighted overall average condition score for the asset group, but are shown rounded to the nearest whole number in subsequent sections. Overall, Fire Fleet assets are in Fair condition with a weighted average condition score of 1.9.

**Table 13: Total Summary of Fire Fleet Assets**

| Asset | Quantity | Unit | Replacement Cost | Weighted Average Age (years) | Weighted Average Estimated Service Life (years) | % of Estimated Service Life Expended | Weighted Average Condition Score | Weighted Average Condition Description |
|---|---|---|---|---|---|---|---|---|
| **Fire Fleet Total** | | | **$17.9M** | **11** | **18** | **61%** | **1.9** | **FAIR** |
| **Fire Trucks** | 11 | ea | $16.9M | 11 | 18 | 61% | 1.9 | FAIR |
| **Support Vehicles** | 13 | ea | $866.7K | 8 | 10 | 80% | 2.4 | FAIR |
| **Boats** | 2 | ea | $33.3K | 10 | 20 | 50% | 1.7 | FAIR |
| **Trailers** | 5 | ea | $43.0K | 7 | 20 | 35% | 1.4 | GOOD |
| **Utility Vehicles** | 1 | ea | $37.7K | 9 | 20 | 45% | 1.5 | FAIR |

## 2.3.2. FIRE FLEET

The Fire Fleet assets includes all fleet vehicles owned and operated by Fire and is comprised five (5) smaller subsets of assets: Fire Trucks, Support Vehicles, Boats, Trailers, and Utility Vehicles. Asset age, cost and condition is estimated based on information from TCA data maintained by City staff, and staff knowledge.

As seen in **Figure 7** below, the Fire Fleet assets have a total replacement cost of $17.9M, and the assets are typically in Fair condition, with an average condition score of 2.

| NO OF ASSETS | REPLACEMENT COST | AVERAGE AGE | AVERAGE ESTIMATED SERVICE LIFE | AVERAGE CONDITION SCORE | AVERAGE CONDITION DESCRIPTION |
|---|---|---|---|---|---|
| 32 | 17.9M | 11 | 18 | 2 | Fair |

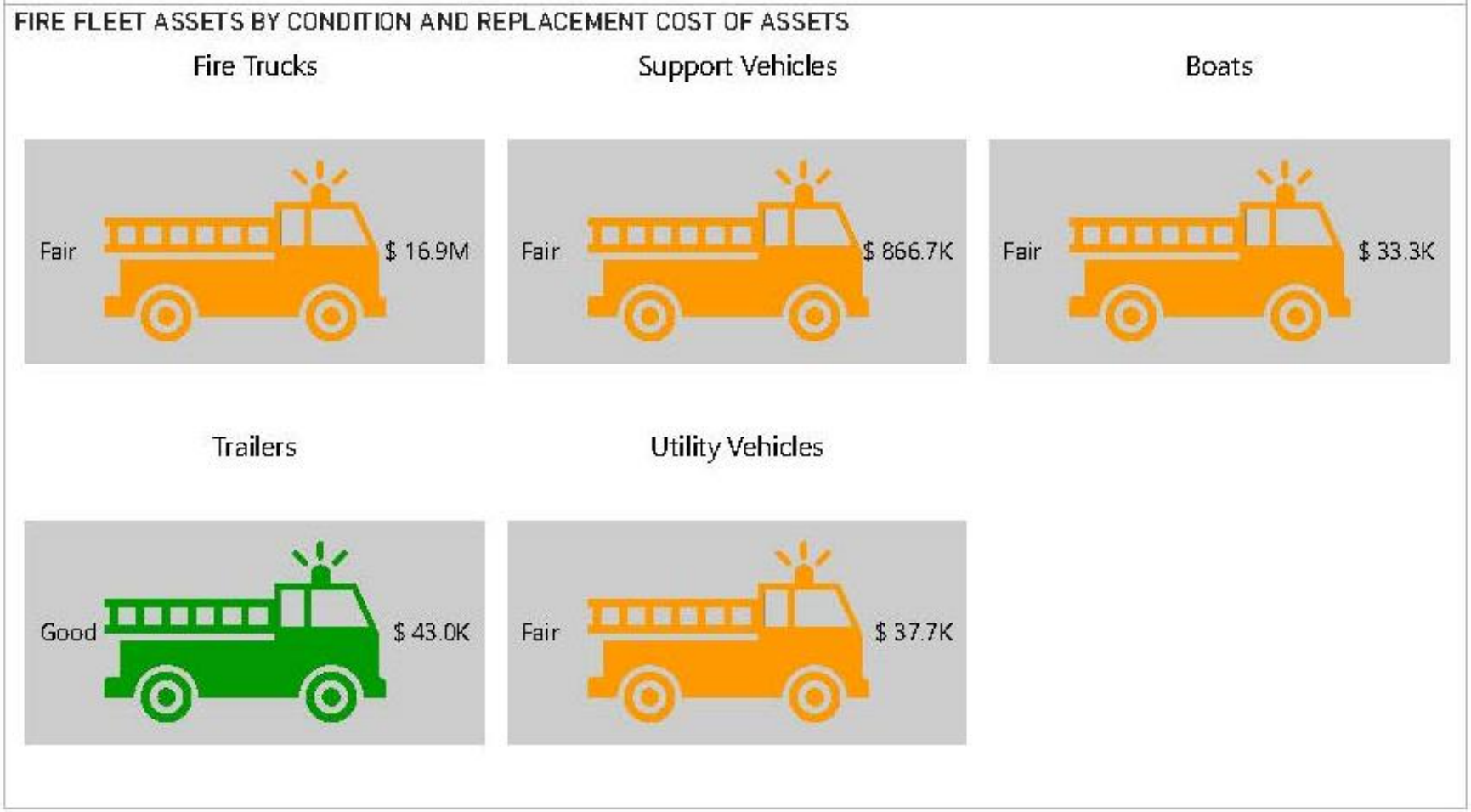


**Figure 7: Fire Fleet Asset Summary**

# 2.4. LIFECYCLE OF FIRE FLEET ASSETS

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

- Key Lifecycle Stages of Fire Fleet Assets;
- Lifecycle Activities;
- Risks of Lifecycle Activities; and
- 10 Year Lifecycle Costs of Fire Fleet Assets.

## 2.4.1. KEY LIFECYCLE STAGES OF FIRE FLEET 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 Fire Fleet assets specifically, our general process is as follows:

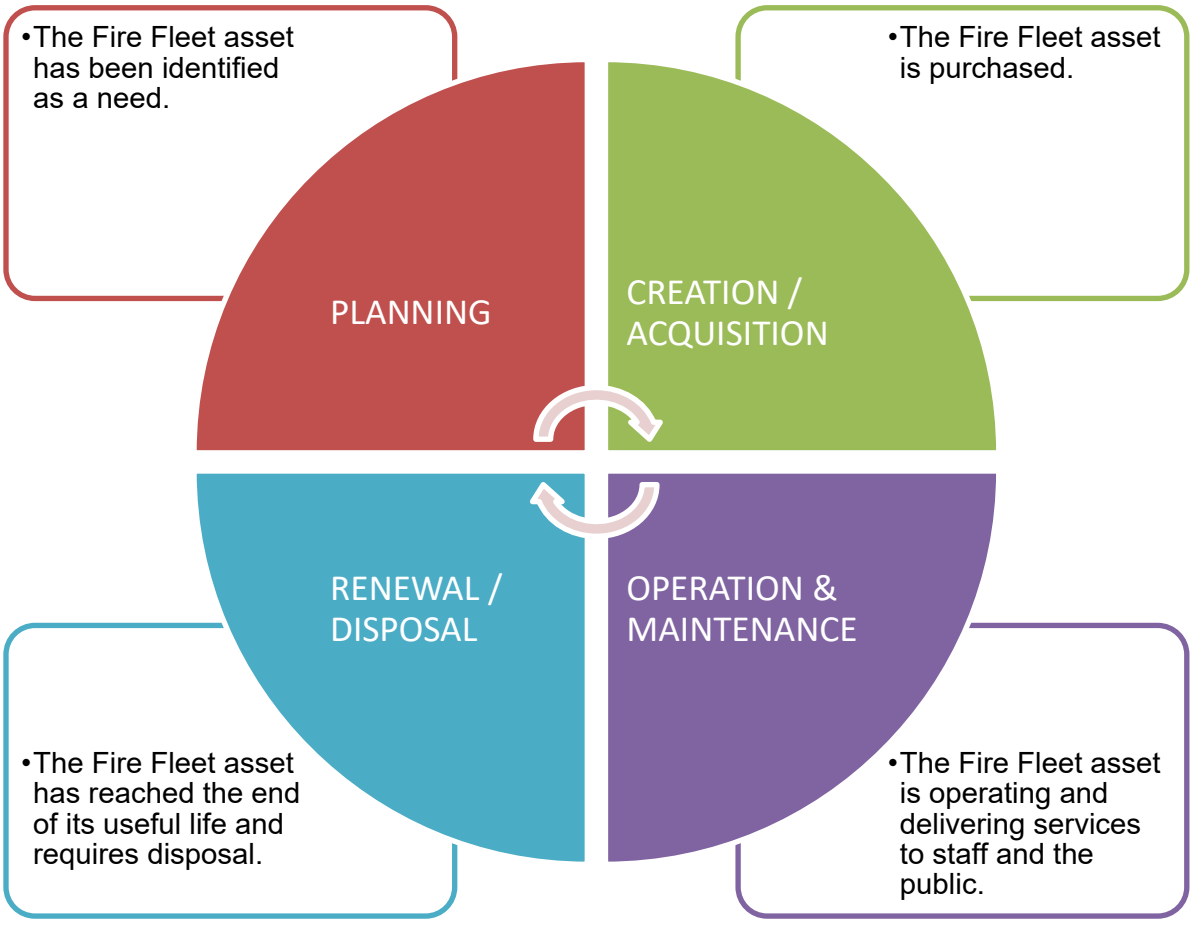


**Figure 8: Lifecycle Stages of Fire Fleet Assets**

5. **Planning** – The need to acquire the asset has been identified per the City's regular business activities, as required.
6. **Creation / Acquisition / Replacement** – The asset is purchased as per any applicable standards and guidelines.
7. **Operation and Maintenance** – The asset is in use and assists in delivering a service to internal and external customers.
8. **Renewal / Disposal** – The asset has reached the end of its useful life, is in poor condition, and/or is underperforming, and requires disposal. The disposal considers the effect on customers such as level of service disruptions.

## 2.4.2. LIFECYCLE ACTIVITIES

A list of the planned Lifecycle Activities, annual cost, and frequency for Fire Fleet assets can be found in **Table 14** below. These activities are currently being undertaken to maintain Fire Fleet assets and therefore maintain the current levels of service.

**Table 14: Lifecycle Activities for Fire Fleet Assets**

| Asset Type | Lifecycle Activity | 2024 Annual Cost* | Frequency | Completed by |
|---|---|---|---|---|
| **Fire Fleet** | Fleet Repairs and Maintenance | $13.0K | Ad hoc | City/Contracted Services |
| | Fleet Fuel, Parts and Equipment | $265.1K | Ad hoc | City/Contracted Services |

*2024 Annual Cost is typically based on estimates presented in the 2024 Operating Budget.

## 2.4.3. RISKS OF LIFECYCLE ACTIVITIES

The identified lifecycle activities in **Table 14** above are historical activities taken on by Fire. Some risks associated with these activities include:

- **Operator Error** – When operators are operating equipment, there is a risk of an operator related accident. This risk is mitigated by ensuring all operators are trained on equipment.
- **Equipment Failure -** Equipment failure can occur during maintenance activities and this is mitigated by ensuring preventative maintenance is completed at regular intervals to prevent this from occurring.

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

- **Service Disruptions** as failure of assets could disrupt regular business activities, which could have been mitigated with preventative maintenance of assets;
- **Fines** due to being non-compliant with regulations and requirements under the Ministry of Transportation and Highway Traffic Act.
- **Increased Cost** due to reactive repairs which could have been prevented with preventative maintenance.

## 2.4.4. 10 YEAR LIFECYCLE COSTS OF FIRE FLEET ASSETS

**Figure 9** below outlines the 10 year lifecycle costs of Fire Fleet assets. Typically when the condition of an asset is estimated based on service life there are spikes in the first year to account for the backlog.

The capital investments for Fleet assets are based on replacement cost of assets as they reach the end of their estimated service life.

Based on the information presented in the figure below, the average annual capital cost for the next 10 years to maintain the state of good repair for Fire Fleet assets is $1.1M, and it is estimated that $311.0K should be spent annually on O&M. Therefore, it is recommended that the City invest $1.4M annually in Fire Fleet assets to maintain the state of good repair.

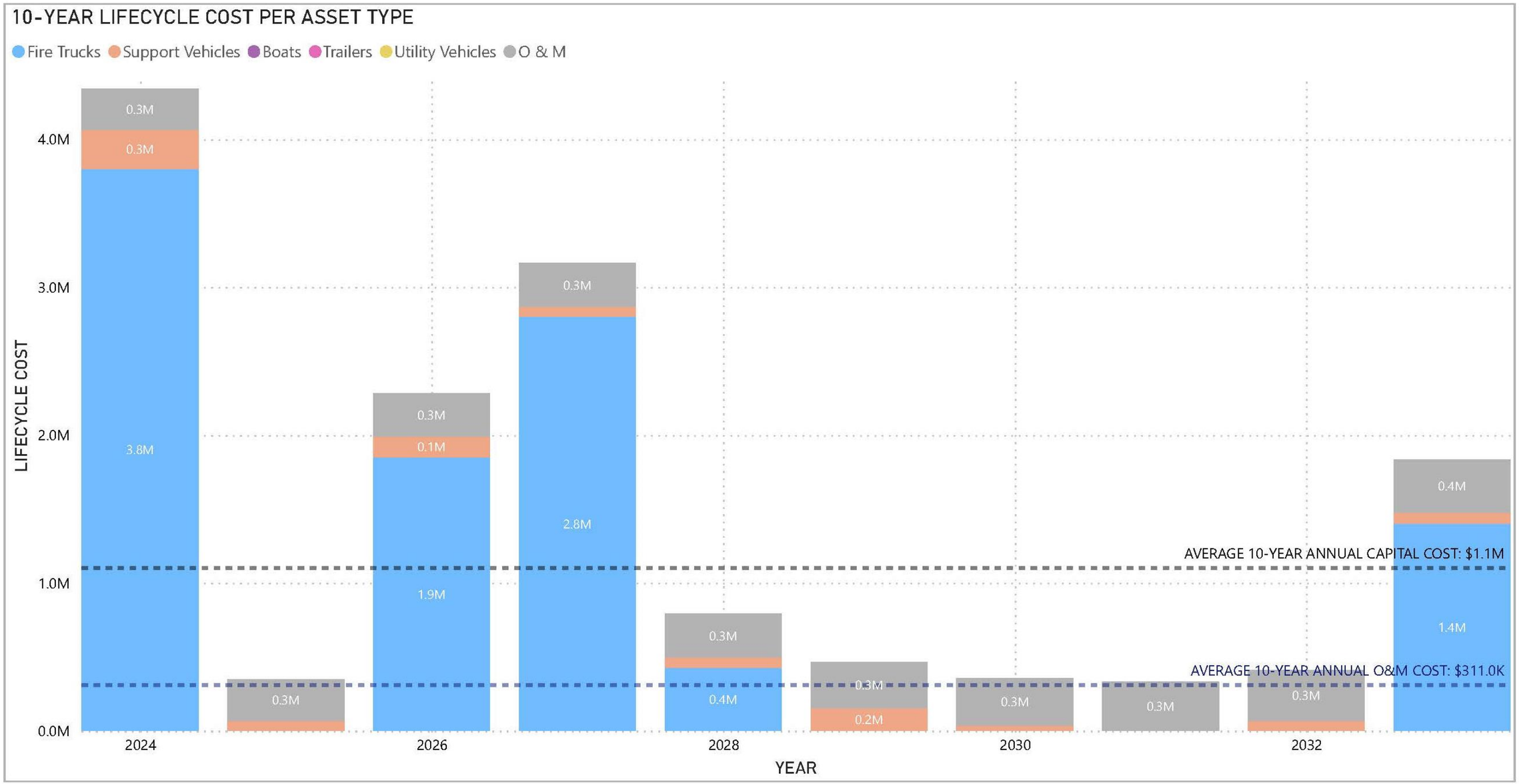


**Figure 9: 10-Year Lifecycle Cost Per Fire Fleet Asset Type**

Notes:

1. O&M costs are estimated based on the 2024-2027 Operating Budget. O&M costs beyond 2027 are estimated by 3.8% inflation each year.
2. Capital costs and lifecycle are estimated based on values and methodology identified in **Section 2.3**
3. Reimbursements and revenues are ignored in order to capture total cost/expenses.

Per **Figure 10** below, the existing 10-year forecast from 2024–2033, further explained in **Section 8.2.2** of the **Asset Management Plan Overview Document**, indicates that the City is currently planning to spend an average of $843.5K on Fire Fleet assets annually. As noted above, the required 10-year average annual amount is $1.1M; therefore, the City currently has a 10-year average annual funding gap of $278.6K.

The City of Brantford has moved 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.

It is important to note that currently the City does not have access to detailed data on Operation and Maintenance costs, but it is anticipated this information will improve in future iterations of the AMP.

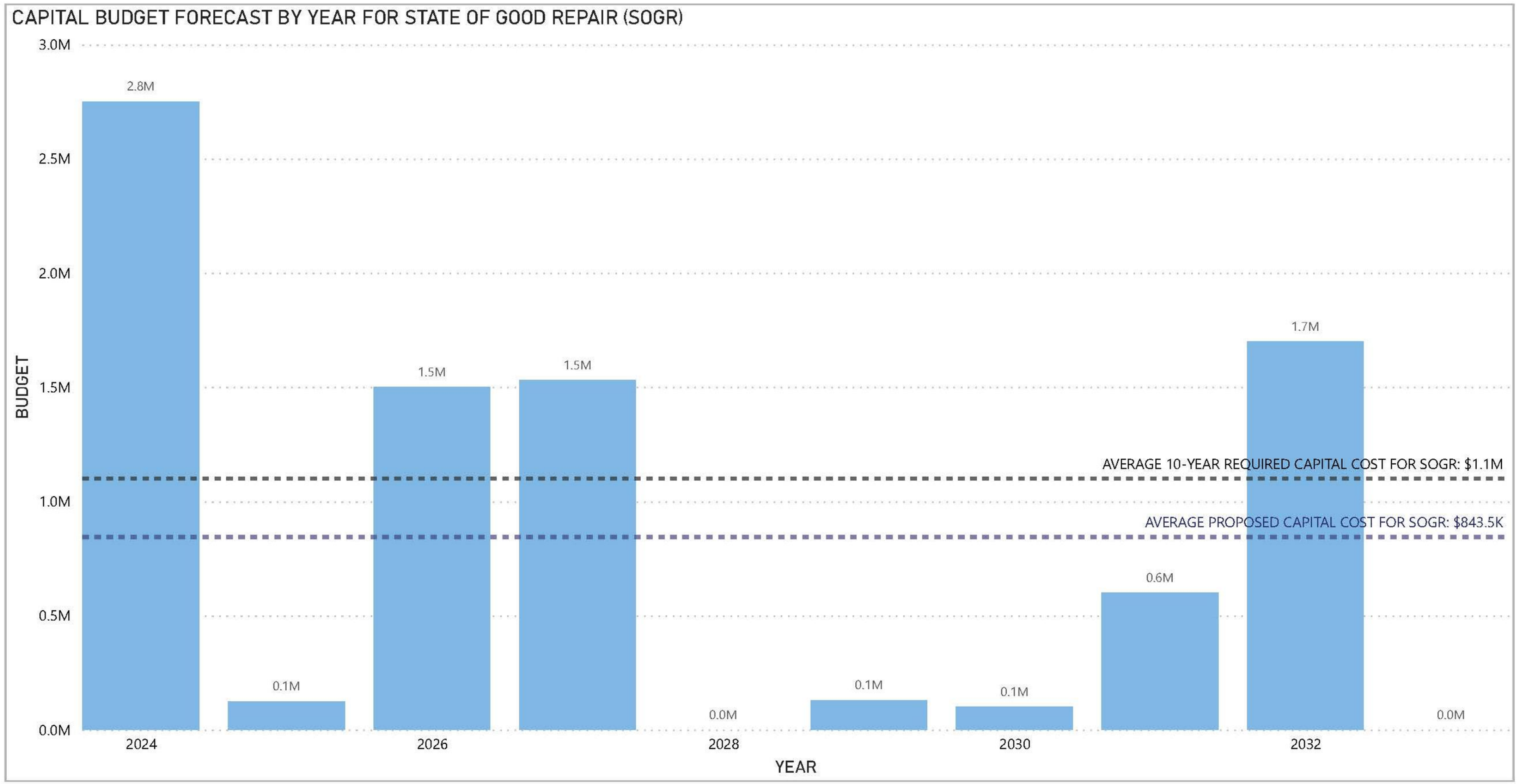


**Figure 10: Existing Capital Budget Forecast from 2024–2033 for Fire Fleet Assets**

Notes:

1. Capital budget forecast is estimated based on the 2024-2027 Capital Budget. Capital budget beyond 2027 is based on estimated 10-year forecast.

# 2.5. CURRENT LEVELS OF SERVICE

## 2.5.1. 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 in this plan. This section will be kept for future iterations in case O. Reg. 588/17 requires defined customer levels of service be reported.

## 2.5.2. 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 in this plan. This section will be kept for future iterations in case O. Reg. 588/17 requires defined technical levels of service be reported.

## 2.5.3. MUNICIPALLY DEFINED CUSTOMER LEVELS OF SERVICE

The customer levels of service are defined in **Section 6.2** of the **Asset Management Plan Overview**. For Fire Fleet assets, the asset specific interpretation of these levels of service is defined below in **Table 15**.

**Table 15: Municipally Defined Customer Levels of Service**

| Customer Level of Service | Definition |
|---|---|
| **Accessibility** | Fire Fleet assets should be accessible to staff without barriers in place. |
| **Quality** | Fire Fleet assets should deliver their intended purpose at a certain quality. |
| **Cost Efficiency** | Fire Fleet assets should be operated efficiently with extra care to minimize costs. |
| **Safety** | Fire Fleet assets should be safe to use and promote community safety. Staff should feel safe using these assets. |
| **Environmental Sustainability** | Fire Fleet assets should be operating as environmentally as possible. |
| **Reliability** | Fire Fleet assets should function and be available to staff when required to avoid service disruptions. |
| **Responsiveness** | Fire Fleet assets should be maintained and repaired promptly to minimize service disruptions. Responsiveness should account for the relative risk to the public, the surrounding property, the asset itself and to the staff completing the response. |

## 2.5.4. MUNICIPALLY DEFINED TECHNICAL LEVELS OF SERVICE

The technical levels of service for Fire Fleet assets have been adopted based on the customer levels of service defined in **Table 15**. The currently available customer levels of service with the corresponding technical levels of service and KPI metrics are defined in **Table 16**.

Due to a low response rate on customer surveys conducted in 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 future iterations of this AMP will look for opportunities to gather and include this information.

**Table 16: Levels of Service KPIs**

| Customer Level of Service | Technical LOS | 2024 KPI | Units |
|---|---|---|---|
| **Accessibility** | Not Available | Not Available | Not Available |
| **Quality*** | Percentage of Customers who feel overall performance of Emergency Response has been Good or Very Good. | 83% | % of Customers |
| **Cost Efficiency** | Not Available | Not Available | Not Available |
| **Safety** | Not Available | Not Available | Not Available |
| **Environmental Sustainability** | Not Available | Not Available | Not Available |
| **Reliability** | Not Available | Not Available | Not Available |
| **Responsiveness** | Not Available | Not Available | Not Available |

*Note: Information obtained from customer surveys conducted in 2024, more details available in Overview Document. Due to a low response rate, the confidence level in the applicability of the information to the wider population is Low.

# 2.6. CURRENT ASSET PERFORMANCE

The current asset performance for Fire Fleet assets has been separated into two (2) categories for this section of the report:

- Energy Performance; and
- Operating Performance

## 2.6.1. FIRE FLEET CURRENT ENERGY PERFORMANCE

The City of Brantford has a Corporate Energy Management Plan (CEMP) which emphasizes energy efficiency within the City. The CEMP includes goals to reduce energy use, energy intensity, and greenhouse gas (GHG) emissions in the City's transportation fleets. 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 will be working to improve energy efficiency and reduce the associated carbon footprint.

The City of Brantford also conducted a Corporate and Community Greenhouse Gas Emissions Inventory, which allows the City to track its progress towards meeting its GHG emissions reduction targets. Emissions are tracked annually and consolidated into a report every second year. Current energy performance for Fire Services Fleet assets was obtained from the Greenhouse Gas Emissions Inventory, summarized in **Table 17** below. The weighted average energy intensity by area for all City buildings is 41.25 ekWh/sq ft.

**Table 17: Current Energy Performance for Fire Services Fleet assets**

| Service Type | 2018 Emissions (T $CO_2$ e)* | 2021 Emissions (T $CO_2$ e)* | 2022 Emissions (T $CO_2$ e)* |
|---|---|---|---|
| Fire Services | 207 | 169 | 198 |
| **Total** | **207** | **169** | **198** |
| **Change from 2018 Baseline** | | **- 18%** | **- 4%** |

* Based on information provided in the 2021/2022 Corporate and Community Greenhouse Gas Emissions Inventory.

## 2.6.2. FIRE FLEET CURRENT OPERATING PERFORMANCE

Currently, the City does not have a method to track Operating Performance for the Fire Fleet asset class. This section will be kept for future iterations as ways to track Operating Performance for this asset class are explored.

# 2.7. DISCUSSION & CONCLUSIONS

In conclusion, the City of Brantford operates and maintains Fire Fleet assets. These assets are in Fair condition with a total estimated replacement cost of approximately $17.9M.

Inventory and condition data for Fire Fleet assets are typically at a Medium to High confidence level, with an overall average confidence level of Medium.

Inventory data is at a High confidence level due to inventories maintained on TCA list by City staff. Replacement costs are at a Medium confidence level, as these values are estimated based on original asset costs, adjusted to current year prices. Condition data is estimated at a Medium confidence level, as condition of assets is estimated based on age and estimated service life assumptions from TCA data and staff knowledge.

The lifecycle stages for Fire Fleet assets include: Planning, Creation, O&M, and Disposal. During the Planning stage, the City identifies the need to obtain a Fire Fleet asset; during the Creation stage, the Fire Fleet asset is purchased; during the O&M stage, the Fire Fleet asset is in operation and delivering service to staff and the public; and in the Disposal stage, the Fire Fleet asset has reached the end of its useful life and requires disposal.

Lifecycle activities are currently completed by City staff and contractors/suppliers to maintain state of good repair. At this time, detailed tracking and costs associated with these activities are not available and are estimated based on the 2024 Operating Budget.

It is estimated based on the average annual cost in the 10 Year Lifecycle Costing that the City should be spending an average $1.1M in capital investment annually for replacement of Fire Fleet assets, and be spending an average of $311.0K on O&M for Fire Fleet assets. The City is currently planning to spend an average of $843.5K on Fire Fleet capital annually; therefore, the City currently has a 10-year average annual funding gap of $278.6K.

Current Levels of Service have been identified for Fire Fleet assets. Currently, these levels of service and associated KPIs are based on a survey conducted in 2023/2024 with external customers who have recent experience with Fire Services. Due to a low response rate on customer surveys, the confidence level in the applicability of the KPIs derived from the survey data to the wider population is Low at this time. Brantford is working to continue to develop a process to track these metrics which will assist in tracking these and any further identified KPIs for future iterations.

Finally, asset performance is separated into energy and operating performance in the City's AMPs. For current energy performance, data from the 2021-2022 Corporate and Community Greenhouse Gas Emissions Inventory concluded that Fire Services Fleet emissions were approximately 169 T $CO_2e$ in 2021 and 198 T $CO_2e$ in 2022. This equated to an 18% reduction in greenhouse gas emissions in 2021 and a 4% reduction in greenhouse gas emissions in 2022 in comparison to 2018 benchmark levels.

Due to limited tracking for assets, the City is not able to provide operating performance information for Fire Fleet assets in this iteration of the AMP. Opportunities to track operating performance may be considered to provide updated information in future iterations of this plan.

# 3. FIRE MACHINERY & EQUIPMENT

## 3.1. INTRODUCTION

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

- Fire Machinery & Equipment Assets' Data Inventory and Condition Approach;
- Summary of Fire Machinery & Equipment Assets;
- Lifecycle Activities and Cost of Fire Machinery & Equipment Assets;
- Current Fire Machinery & Equipment Assets' Levels of Service;
- Current Fire Machinery & Equipment Assets' Performance; and
- Conclusion.

## 3.2. FIRE MACHINERY & EQUIPMENT 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 approaches the City currently uses to assess the condition of Fire Machinery & Equipment assets are:

- Estimated condition based on asset specific information, such as age and estimated service life.

A list of all condition assessments for all core assets can be found in **Table 6** in the **Asset Management Plan Overview Document**.

The origin of the Fire Machinery & Equipment asset data for inventory, replacement cost, and condition, as well as data confidence in each are provided in **Table 18** below.

**Table 18: Fire Machinery & Equipment 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** |
| **Fire Machinery & Equipment** | TCA List from City Finance Department | Low | TCA inventory often based on groups of assets, quantity of assets unclear | TCA List from City Finance Department | Medium | Formal inventory with dated costing | TCA List from City Finance Department | Medium | Informal assessment based on age and estimated service life from TCA data and staff knowledge |

Per **Table 18** above, Fire Machinery & Equipment assets' inventory and condition data are typically at a Low to Medium confidence level, with an overall average confidence level of Medium.

Inventory data is at a Low confidence level for this asset class as it relies heavily on pooled inventories within the TCA registry based on year purchased. As assets are retired it is not always clear which pool they were originally drawn from resulting in uncertainty in the total quantity on hand. For this reason, assets in this class have been quantified by asset group rather than number of assets at this time. The inventory for this asset class is expected to improve in future iterations of the AMP.

Replacement costs are at a Medium confidence level, as these values are estimated based on original asset costs, adjusted to current year prices. Condition data is estimated at a Medium confidence level. Condition of assets is estimated based on age and estimated service life assumptions in TCA data and staff knowledge.

## 3.2.1. SERVICE LIFE

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 19**. The average overall estimated service life for assets can be found in **Table 21**.

**Table 19: Fire Machinery & Equipment Assets' Estimated Service Life**

| Asset | Estimated Service Life |
|---|---|
| **Bunker Gear** | 8 years |
| **Communication Systems** | 10 to 25 years |
| **Computer Hardware** | 5 to 10 years |
| **Computer Software** | 10 years |
| **Fire Tools** | 10 years |
| **Hoses & Nozzles** | 18 years |
| **Various Machinery & Equipment** | 10 to 25 years |

## 3.2.2. 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 20: 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, some elements may have significant deficiencies, and asset will likely require repairs 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 or replacement within the next year. Where condition data is not available, this category applies to assets which have exceeded 80% of their estimated service life. |

# 3.3. SUMMARY OF FIRE MACHINERY & EQUIPMENT ASSETS

The summary of assets for the Fire Machinery & Equipment 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.

## 3.3.1. TOTAL SUMMARY OF ASSETS

A table summarizing all Fire Machinery & Equipment assets is included in **Table 21** below, and 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 then if the average was calculated based on the number of assets. The total replacement cost for all Fire Machinery & Equipment assets is approximately $5.6M with an overall average estimated service life of 14 years. The average condition scores are shown to one decimal place to illustrate how close the scores are to being on a cusp of another rating and were used to calculate the weighted overall average condition score for the asset group, but are shown rounded to the nearest whole number in subsequent sections. Overall, Fire Machinery & Equipment assets are in Fair condition with a weighted average condition score of 2.1.

**Table 21: Total Summary of Fire Machinery & Equipment Assets**

| Asset | Quantity | Unit | Replacement Cost | Weighted Average Age (years) | Weighted Average Estimated Service Life (years) | % of Estimated Service Life Expended | Weighted Average Condition Score | Weighted Average Condition Description |
|---|---|---|---|---|---|---|---|---|
| **Fire Machinery & Equipment Total** | | | **$5.6M** | **9** | **14** | **67%** | **2.1** | **FAIR** |
| **Bunker Gear** | 1 | Group | $896.4K | 9 | 8 | 100% | 3 | POOR |
| **Communication Systems** | 3 | Group | $2.3M | 7 | 15 | 47% | 1.6 | FAIR |
| **Computer Hardware** | 3 | Group | $98.8K | 6 | 7 | 86% | 2.6 | POOR |
| **Computer Software** | 1 | Group | $216.9K | 4 | 10 | 40% | 1.4 | GOOD |
| **Fire Tools** | 9 | Group | $305.1K | 9 | 10 | 90% | 2.7 | POOR |
| **Hoses & Nozzles** | 1 | Group | $235.6K | 15 | 18 | 83% | 2.5 | POOR |
| **Various Machinery & Equipment** | 19 | Group | $1.6M | 12 | 16 | 75% | 2.3 | FAIR |

### 3.3.2. FIRE MACHINERY & EQUIPMENT

The Fire Machinery & Equipment assets includes all supplementary machinery and equipment owned and operated by Fire that was not categorized under the Facilities and Fleet asset classes. These assets are comprised seven (7) smaller subsets of assets: Bunker Gear, Communication Systems, Computer Hardware, Computer Software, Fire Tools, Hoses & Nozzles, and Various Machinery & Equipment. Asset age, cost and condition is estimated based on information from TCA data maintained by City staff, and staff knowledge.

It should be noted that machinery and equipment assets are categorized in Poor condition when their average age exceeds 80% or more of their estimated service life; therefore, condition rating is an approximation and does not mean that the assets are broken or unsafe to operate.

As seen in **Figure 11** below, the Fire Machinery & Equipment assets have a total replacement cost of $5.6M, and the assets are typically in Fair condition, with an average condition score of 2.

| NO OF ASSET GROUPS | REPLACEMENT COST | AVERAGE AGE | AVERAGE ESTIMATED SERVICE LIFE | AVERAGE CONDITION SCORE | AVERAGE CONDITION DESCRIPTION |
|---|---|---|---|---|---|
| 37 | 5.6M | 9 | 14 | 2 | Fair |

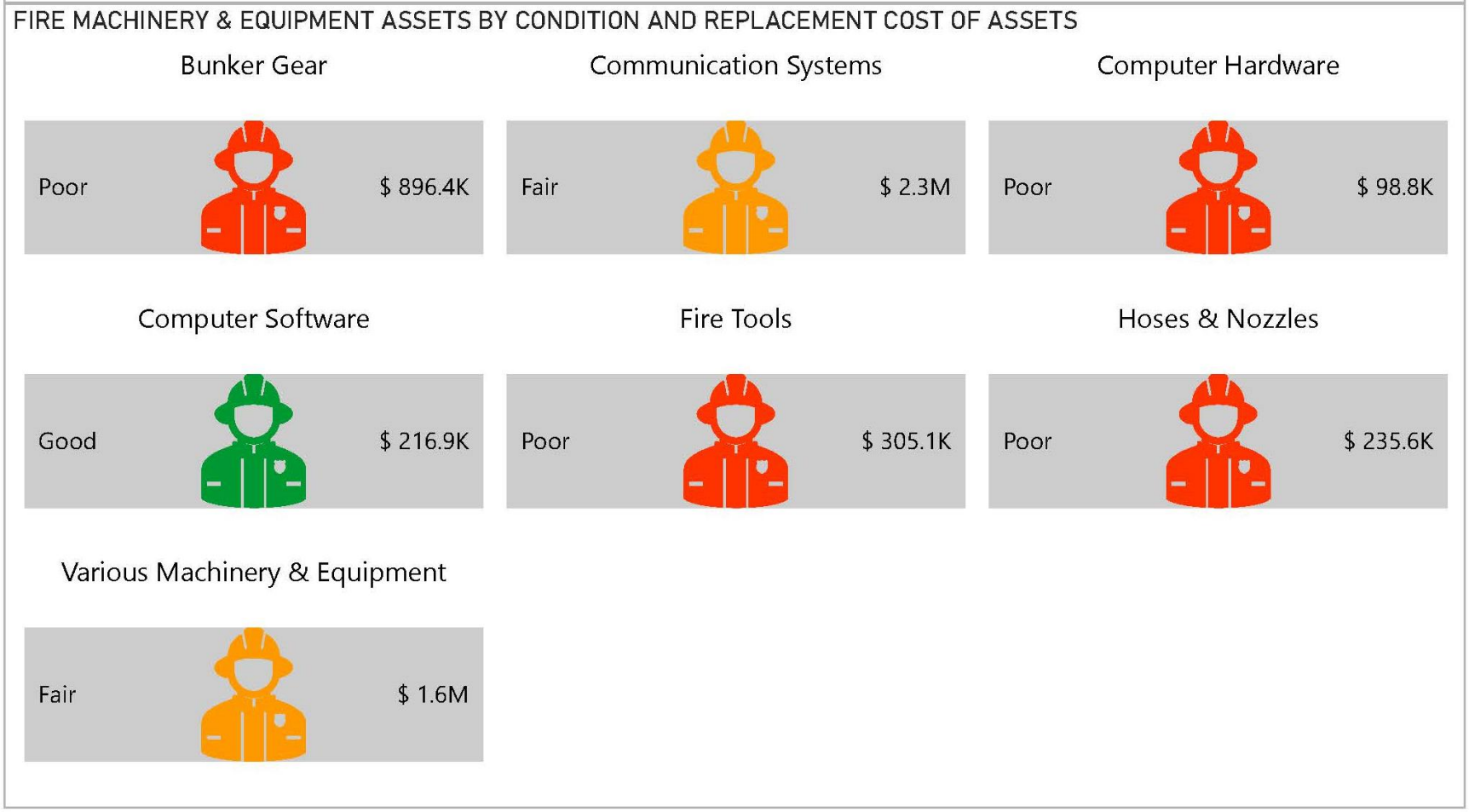


**Figure 11: Fire Machinery & Equipment Asset Summary**

# 3.4. LIFECYCLE OF FIRE MACHINERY & EQUIPMENT ASSETS

The lifecycle of Fire Machinery & Equipment assets is described under four (4) categories which are described in this section:

- Key Lifecycle Stages of Fire Machinery & Equipment Assets;
- Lifecycle Activities;
- Risks of Lifecycle Activities; and
- 10 Year Lifecycle Costs of Fire Machinery & Equipment Assets.

## 3.4.1. KEY LIFECYCLE STAGES OF FIRE MACHINERY & EQUIPMENT 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 Fire Machinery & Equipment assets specifically, our general process is as follows:

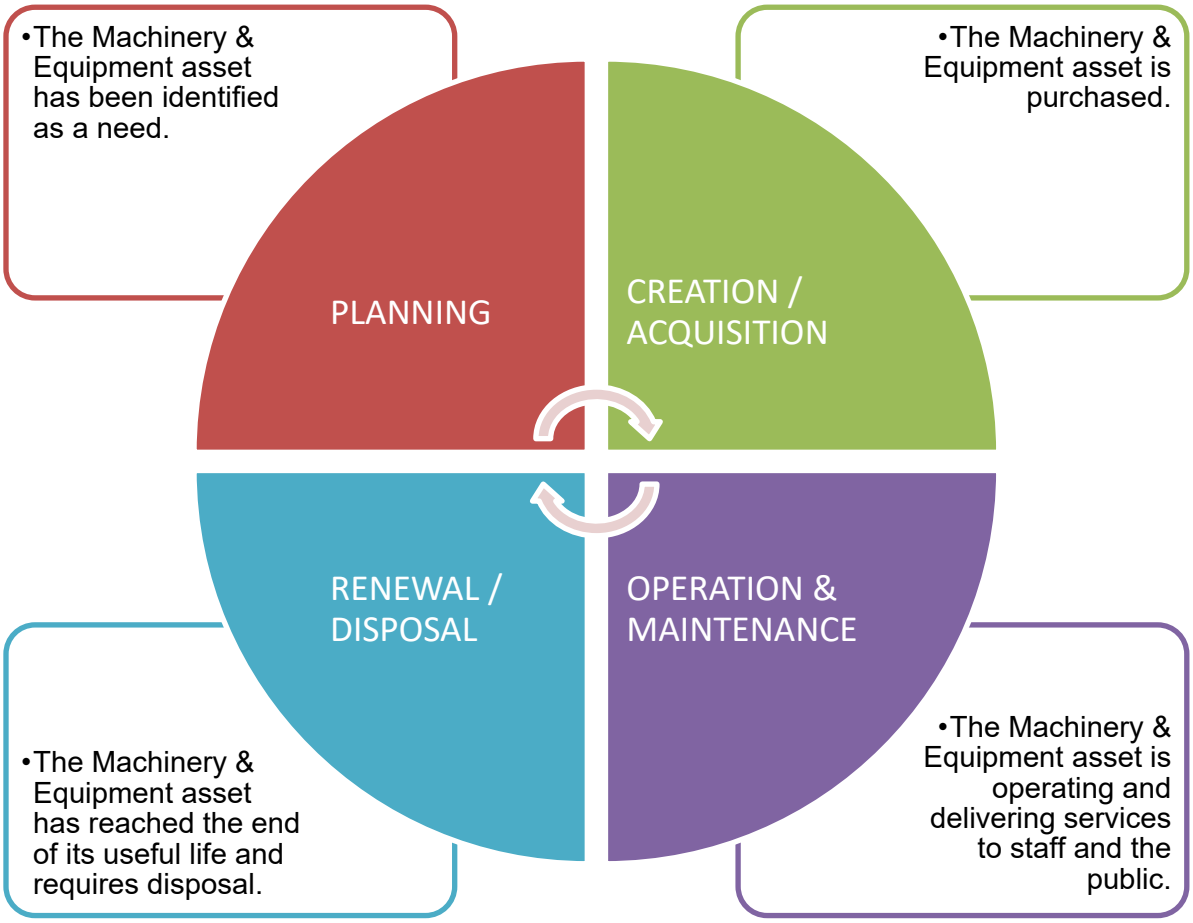


**Figure 12: Lifecycle Stages of Fire Machinery & Equipment Assets**

9. **Planning** – The need to acquire the asset has been identified per the City's regular business activities, as required.
10. **Creation / Acquisition / Replacement** – The asset is purchased as per any applicable standards and guidelines.
11. **Operation and Maintenance** – The asset is in use and assists in delivering a service to internal and external customers.
12. **Renewal / Disposal** – The asset has reached the end of its useful life, is in poor condition, and/or is underperforming, and requires disposal. The disposal considers the effect on customers such as level of service disruptions.

## 3.4.2. LIFECYCLE ACTIVITIES

A list of the planned Lifecycle Activities, annual cost, and frequency for Fire Machinery & Equipment assets can be found in **Table 22** below. These activities are currently being undertaken to maintain Fire Machinery & Equipment assets and therefore maintain the current levels of service.

**Table 22: Lifecycle Activities for Fire Machinery & Equipment Assets**

| Asset Type | Lifecycle Activity | 2024 Annual Cost* | Frequency | Completed by |
|---|---|---|---|---|
| **Fire Machinery & Equipment** | Equipment Repair and Maintenance | $29.8K | Ad hoc | City/Contracted Services |
| | Software Repair and Maintenance | $73.6K | Ad hoc | Contracted Services |
| | Hardware Repair and Maintenance | $74.7K | Ad hoc | Contracted Services |

*2024 Annual Cost is typically based on estimates presented in the 2024 Operating Budget.

## 3.4.3. RISKS OF LIFECYCLE ACTIVITIES

The identified lifecycle activities in **Table 22** above are historical activities taken on by Fire. Some risks associated with these activities include:

- **Operator Error** – When operators are operating equipment, there is a risk of an operator related accident. This risk is mitigated by ensuring all operators are trained on equipment.
- **Equipment Failure -** Equipment failure can occur during maintenance activities and this is mitigated by ensuring preventative maintenance is completed at regular intervals to prevent this from occurring.

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

- **Service Disruptions** as failure of assets could disrupt regular business activities, which could have been mitigated with preventative maintenance of assets;
- **Health and Safety Issues** due to lack of functioning machinery and equipment in the event of an emergency;
- **Increased Cost** due to reactive repairs which could have been prevented with preventative maintenance.

## 3.4.4. 10 YEAR LIFECYCLE COSTS OF FIRE MACHINERY & EQUIPMENT ASSETS

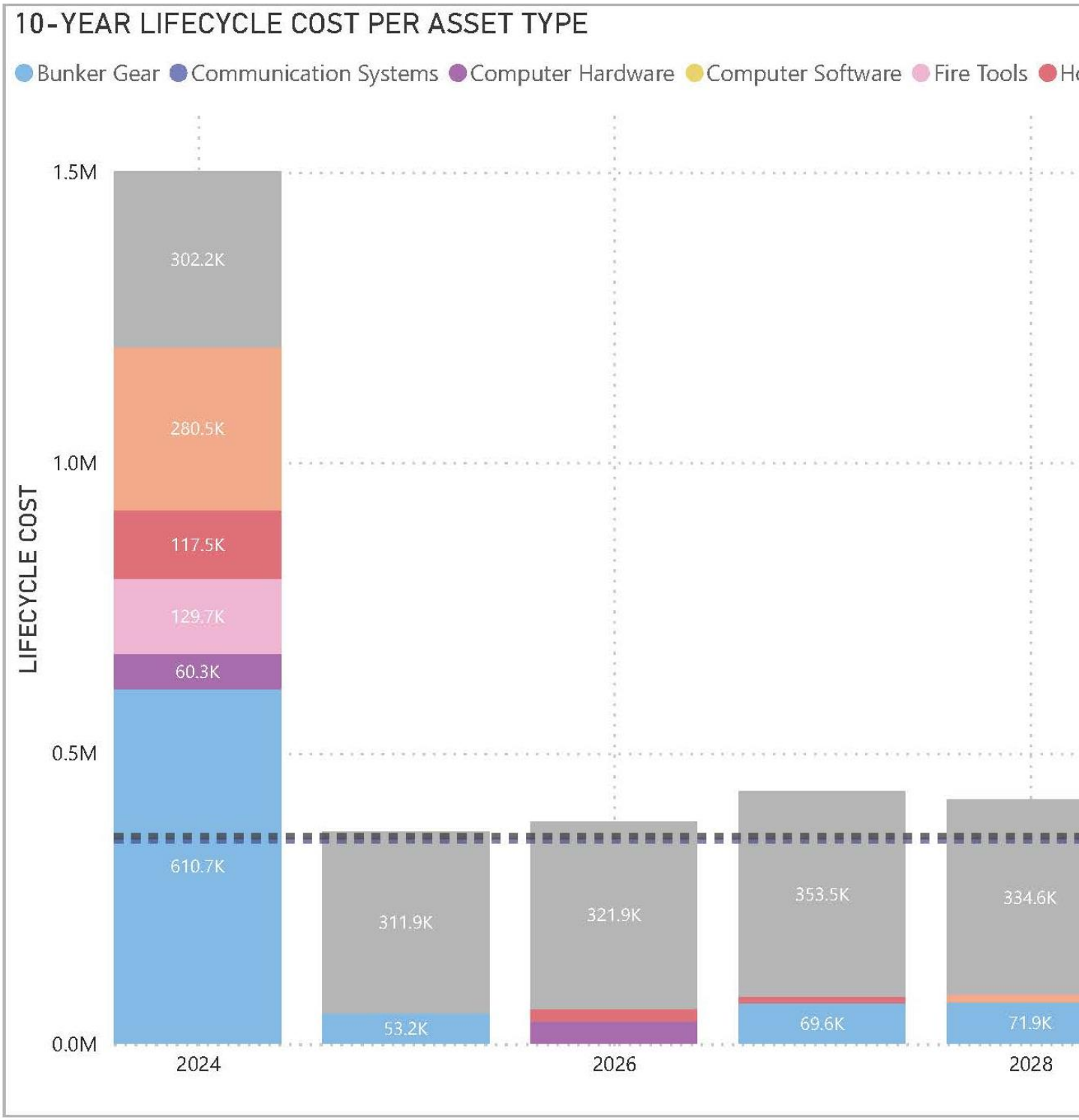

**Figure** 13 below outlines the 10 year lifecycle costs of Fire Machinery & Equipment assets. Typically when the condition of an asset is estimated based on service life there are spikes in the first year to account for the backlog.

The capital investments for Fleet assets are based on replacement cost of assets as they reach the end of their estimated service life.

Based on the information presented in the figure below, the average annual capital cost for the next 10 years to maintain the state of good repair for Fire Machinery & Equipment assets is $357.1K, and it is estimated that $349.8K should be spent annually on O&M. Therefore, it is recommended that the City invest $706.9K annually in Fire Machinery & Equipment assets to maintain the state of good repair.

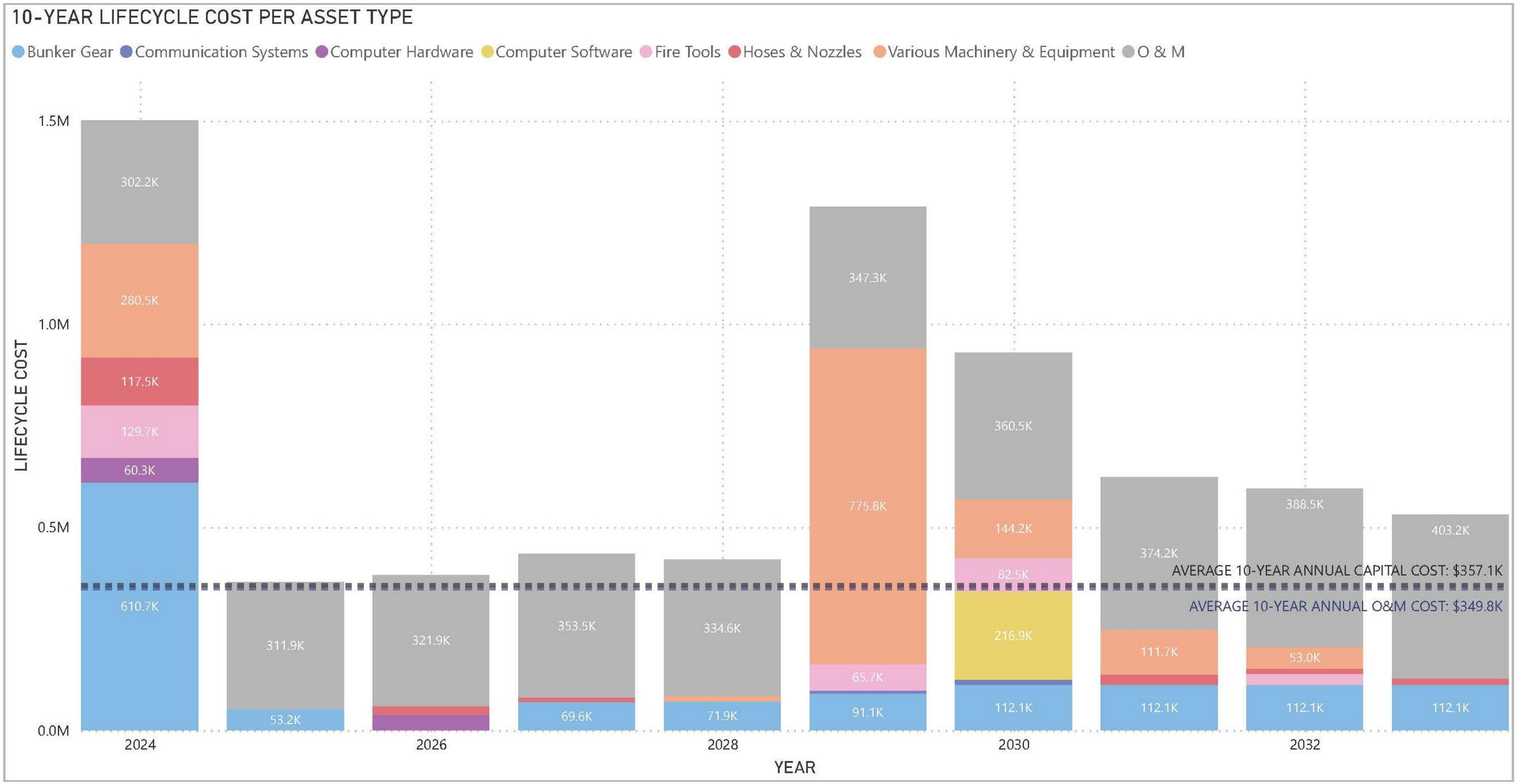


**Figure 13: 10-Year Lifecycle Cost Per Fire Machinery & Equipment Asset Type**

Notes:

1. O&M costs are estimated based on the 2024-2027 Operating Budget. O&M costs beyond 2027 are estimated by 3.8% inflation each year.
2. Capital costs and lifecycle are estimated based on values and methodology identified in **Section 3.3**
3. Reimbursements and revenues are ignored in order to capture total cost/expenses.

Per **Figure 14** below, the existing 10-year forecast from 2024–2033, further explained in **Section 8.2.2** of the **Asset Management Plan Overview Document**, indicates that the City is currently planning to spend an average of $376.5K on Fire Machinery & Equipment assets annually. As noted above, the required 10-year average annual amount is $357.1K; therefore, the City is currently meeting their required funding targets, with a 10-year average annual funding surplus of $19.4K.

The City of Brantford has moved 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.

It is important to note that currently the City does not have access to detailed data on Operation and Maintenance costs, but it is anticipated this information will improve in future iterations of the AMP.

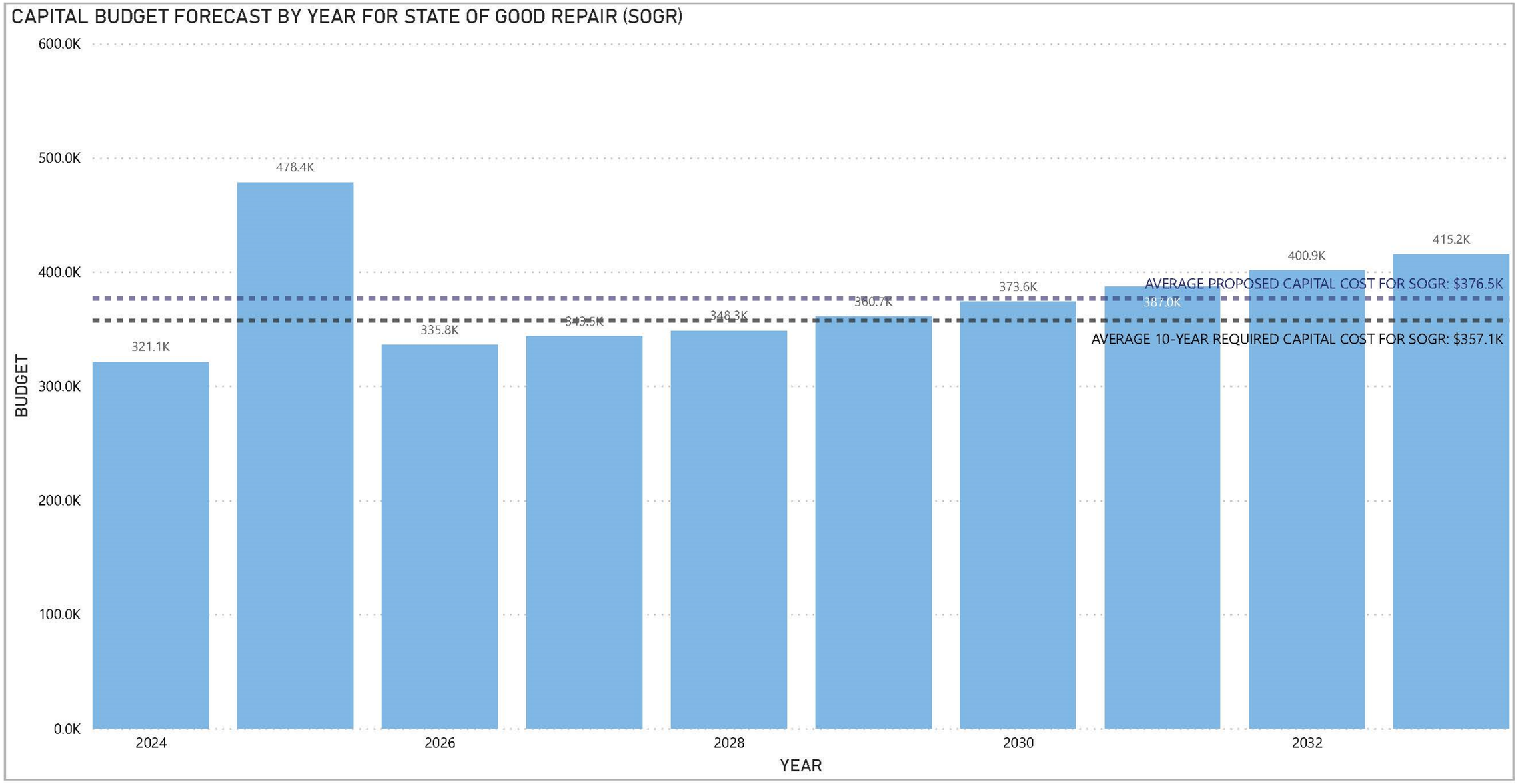


**Figure 14: Existing Capital Budget Forecast from 2024–2033 for Fire Machinery & Equipment Assets**

Notes:

1. Capital budget forecast is estimated based on the 2024-2027 Capital Budget and Operating Budget. Capital budget beyond 2027 is based on estimated 10-year forecast.

# 3.5. CURRENT LEVELS OF SERVICE

## 3.5.1. 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 in this plan. This section will be kept for future iterations in case O. Reg. 588/17 requires defined customer levels of service be reported.

## 3.5.2. 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 in this plan. This section will be kept for future iterations in case O. Reg. 588/17 requires defined technical levels of service be reported.

## 3.5.3. MUNICIPALLY DEFINED CUSTOMER LEVELS OF SERVICE

The customer levels of service are defined in **Section 6.2** of the **Asset Management Plan Overview**. For Fire Machinery & Equipment assets, the asset specific interpretation of these levels of service is defined below in **Table 23**.

**Table 23: Municipally Defined Customer Levels of Service**

| Customer Level of Service | Definition |
|---|---|
| **Accessibility** | Fire Machinery & Equipment assets should be accessible to staff without barriers in place. |
| **Quality** | Fire Machinery & Equipment assets should deliver their intended purpose at a certain quality. |
| **Cost Efficiency** | Fire Machinery & Equipment assets should be operated efficiently with extra care to minimize costs. |
| **Safety** | Fire Machinery & Equipment assets should be safe to use and promote community safety. Staff should feel safe using these assets. |
| **Environmental Sustainability** | Fire Machinery & Equipment assets should be operating as environmentally as possible. |
| **Reliability** | Fire Machinery & Equipment assets should function and be available to staff when required to avoid service disruptions. |
| **Responsiveness** | Fire Machinery & Equipment assets should be maintained and repaired promptly to minimize service disruptions. Responsiveness should account for the relative risk to the public, the surrounding property, the asset itself and to the staff completing the response. |

## 3.5.4. MUNICIPALLY DEFINED TECHNICAL LEVELS OF SERVICE

The technical levels of service for Fire Machinery & Equipment assets have been adopted based on the customer levels of service defined in **Table 23**. The currently available customer levels of service with the corresponding technical levels of service and KPI metrics are defined in **Table 24**.

Due to a low response rate on customer surveys conducted in 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 future iterations of this AMP will look for opportunities to gather and include this information.

**Table 24: Levels of Service KPIs**

| Customer Level of Service | Technical LOS | 2024 KPI | Units |
|---|---|---|---|
| **Accessibility** | Not Available | Not Available | Not Available |
| **Quality*** | Percentage of Customers who feel overall performance of Emergency Response has been Good or Very Good. | 83% | % of Customers |
| **Cost Efficiency** | Not Available | Not Available | Not Available |
| **Safety** | Not Available | Not Available | Not Available |
| **Environmental Sustainability** | Not Available | Not Available | Not Available |
| **Reliability** | Not Available | Not Available | Not Available |
| **Responsiveness** | Not Available | Not Available | Not Available |

*Note: Information obtained from customer surveys conducted in 2024, more details available in Overview Document. Due to a low response rate, the confidence level in the applicability of the information to the wider population is Low.

# 3.6. CURRENT ASSET PERFORMANCE

The current asset performance for Fire Machinery & Equipment assets has been separated into two (2) categories for this section of the report:

- Energy Performance; and
- Operating Performance

## 3.6.1. FIRE MACHINERY & EQUIPMENT CURRENT ENERGY PERFORMANCE

The City of Brantford has a Corporate Energy Management Plan (CEMP) which emphasizes energy efficiency within the City. The CEMP includes goals to reduce energy use, energy intensity, and greenhouse gas (GHG) emissions in the City's 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 will be working to improve energy efficiency and reduce the associated carbon footprint.

Currently, the City does not have a method to track Energy Performance for the Fire Machinery & Equipment asset class. This section will be kept for future iterations as ways to track Energy Performance for this asset class are explored.

## 3.6.2. FIRE MACHINERY & EQUIPMENT CURRENT OPERATING PERFORMANCE

Currently, the City does not have a method to track Operating Performance for the Fire Machinery & Equipment asset class. This section will be kept for future iterations as ways to track Operating Performance for this asset class are explored.

# 3.7. DISCUSSION & CONCLUSIONS

In conclusion, the City of Brantford operates and maintains Fire Machinery & Equipment assets. These assets are in Fair condition with a total estimated replacement cost of approximately $5.6M.

Inventory and condition data for Fire Machinery & Equipment assets are typically at a Low to Medium confidence level, with an overall average confidence level of Medium.

Inventory data is at a Low confidence level for this asset class as it relies heavily on pooled inventories within the TCA registry based on year purchased. As assets are retired it is not always clear which pool they were originally drawn from resulting in uncertainty in the total quantity on hand. For this reason, assets in this class have been quantified by asset group rather than number of assets at this time. The inventory for this asset class is expected to improve in future iterations of the AMP.

Replacement costs are at a Medium confidence level, as these values are estimated based on original asset costs, adjusted to current year prices. Condition data is estimated at a Medium confidence level. Condition of assets is estimated based on age and estimated service life assumptions in TCA data and staff knowledge.

The lifecycle stages for Fire Machinery & Equipment assets include: Planning, Creation, O&M, and Disposal. During the Planning stage, the City identifies the need to obtain a Fire Machinery & Equipment asset; during the Creation stage, the Fire Machinery & Equipment asset is purchased; during the O&M stage, the Fire Machinery & Equipment asset is in operation and delivering service to staff and the public; and in the Disposal stage, the Fire Machinery & Equipment asset has reached the end of its useful life and requires disposal.

Lifecycle activities are currently completed by City staff and contractors/suppliers to maintain state of good repair. At this time, detailed tracking and costs associated with these activities are not available and are estimated based on the 2024 Operating Budget.

It is estimated based on the average annual cost in the 10 Year Lifecycle Costing that the City should be spending an average $357.1K in capital investment annually for replacement of Fire Machinery & Equipment assets, and be spending an average of $349.8K on O&M for Fire Machinery & Equipment assets. The City is currently planning to spend an average of $376.5K on Fire Machinery & Equipment capital annually; therefore, the City is currently meeting their required funding targets, with a 10-year average annual funding surplus of $19.4K.

Current Levels of Service have been identified for Fire Machinery & Equipment assets. Currently, these levels of service and associated KPIs are based on a survey conducted

in 2023/2024 with external customers who have recent experience with Fire Services. Due to a low response rate on customer surveys, the confidence level in the applicability of the KPIs derived from the survey data to the wider population is Low at this time. Brantford is working to continue to develop a process to track these metrics which will assist in tracking these and any further identified KPIs for future iterations.

Finally, asset performance is separated into energy and operating performance in the City's AMPs. However, due to limited tracking for assets, the City is not able to provide information for Fire Machinery & Equipment asset performance in this iteration of the AMP. Opportunities to track energy performance may be considered to provide updated information in future iterations of this plan.