

# Emergency and Protective Services Asset Management Plan

May 2024



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# Introduction

## 1.1 Background

Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure requires all municipalities to prepare baseline asset management plans for all their assets. The purpose of this legislation is to have municipalities demonstrate they can maintain their assets, balancing affordability, risk, and service levels to sustain them in their present state, with no change to the service level for the next ten years.

To meet the provincial requirements, the City has created this first version of its Emergency and Protective Services Asset Management Plan. It reports the current state of the assets, levels of service provided, strategies and activities applied by the City, historical and forecasted financial details, and potential improvement actions. It is a strategic document that provides a snapshot of current conditions and establishes a basis for future asset management planning and decision making. The Asset Management Plan is based on asset data and financial information from 2023.





## 1.2 Asset Classes and Types

The Emergency and Protective Services Asset Management Plan includes assets that support the protection of lives, property, and environment for residents and visitors provided by By-law Services, Fire Services and the Paramedic Service.

### Emergency and Protective Services Asset Classes and Types

<b>By-law Services</b>		
• By-law Facilities		• By-law Fleet
<b>Fire Services</b>		
• Fire Equipment	• Fire Facilities	• Fire Fleet
<b>Paramedic Services</b>		
• Paramedic Equipment	• Paramedic Facilities	• Paramedic Fleet



# State of Local Infrastructure

## 2.1 Asset Inventory and Valuation

The total replacement cost of emergency and protective services assets is approximately \$620 million as summarized in the table below.

**Emergency and Protective Services Asset Inventory and Replacement Cost**

Asset Class	Inventory	Replacement Cost
By-Law Facilities	1	\$16M
By-Law Fleet	84	\$4M
Fire Equipment	362	\$26M
Fire Facilities <sup>1</sup>	46	\$323M
Fire Fleet	240	\$159M
Paramedic Equipment	417	\$10M
Paramedic Facilities <sup>2,3</sup>	6	\$52M
Paramedic Fleet	142	\$31M

<sup>1</sup> The fire facilities reported in this Asset Management Plan includes 45 Fire Stations. Two of these assets were constructed recently and their replacement cost, age and condition are not included in this report.

<sup>2</sup> There is one Paramedic Administration Building that is leased, and which is not included in this inventory. There are lifecycle cost implications for this building because the City will eventually assume ownership.

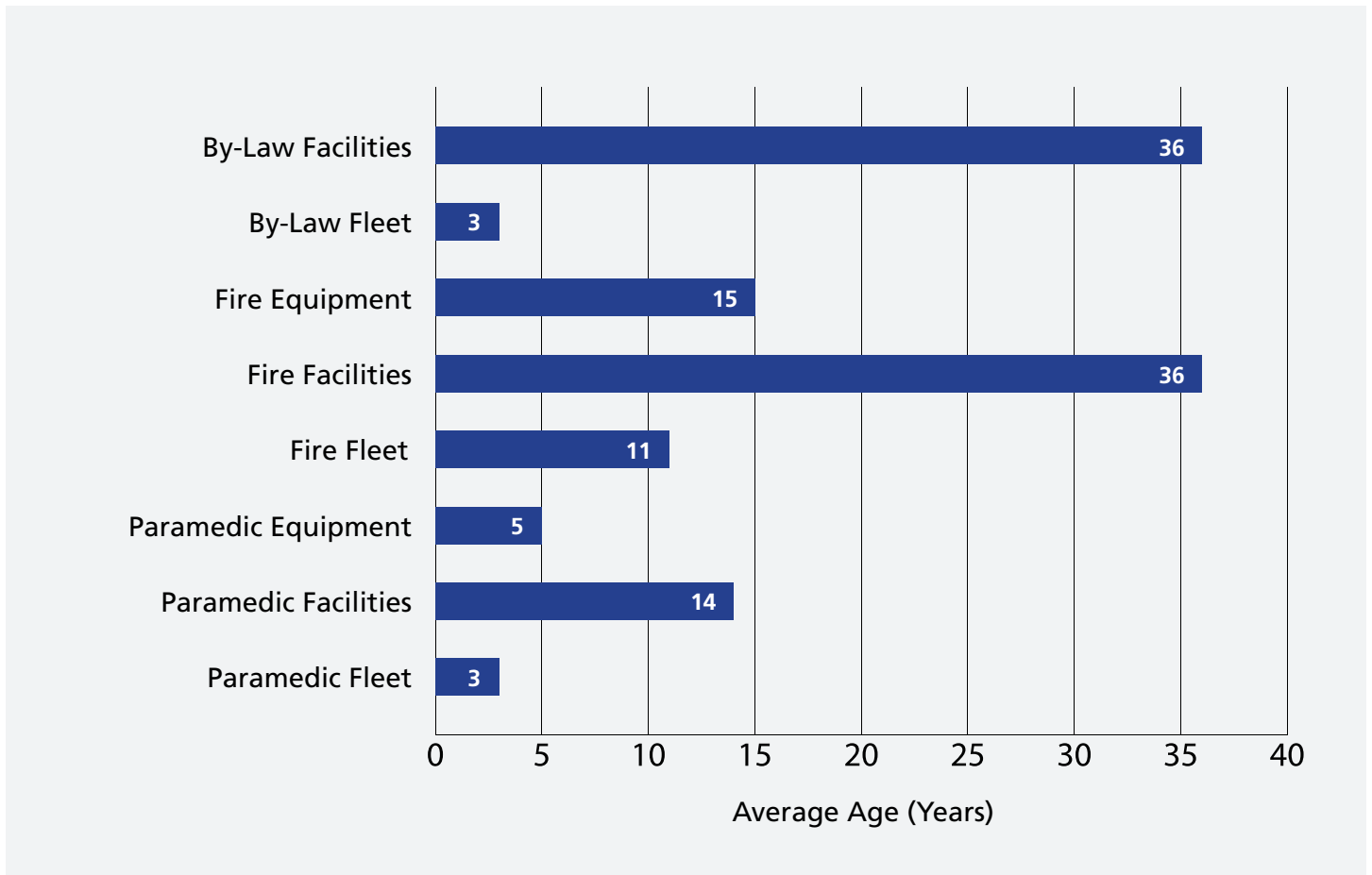
<sup>3</sup> There are six additional Paramedic Posts that are leased, and which are not included in this inventory.



## 2.2 Age and Condition

The age of an asset gives a sense of how close it is to the end of its service life and what renewal interventions may be appropriate. The average age of the City's emergency and protective services assets is shown in the figure below.

**Average Age of Emergency and Protective Services Assets**



The City uses a range of techniques and solutions to collect and assess condition data, and at various frequencies, which is summarized in the table below.

### Condition Data Collection Methods for Emergency and Protective Services Assets

Asset Class	Condition Data Collection Technique	Frequency
By-Law Facilities	Building Condition Audit	10 years
By-Law Fleet	Inspection and maintenance	6 months and original equipment manufacturer maintenance schedule
Fire Equipment	Calibration and regular preventative maintenance	As required
Fire Facilities	Building Condition Audit	10 years
Fire Services Fleet	Inspection and maintenance	6 months and original equipment manufacturer maintenance schedule
Paramedic Equipment	Calibration and regular preventative maintenance	As required
Paramedic Facilities	Building Condition Audit	10 years
Paramedic Fleet	Inspection and maintenance	6 months and original equipment manufacturer maintenance schedule



Based on condition data, supplemented by subject matter expert knowledge and professional judgment, the condition of assets is rated on a scale from “Very Good” to “Very Poor” as shown in the table below.

### Five-point Scale for Emergency and Protective Services Asset Condition

Rating	Rating Description	Facility Condition Index (FCI) <sup>(1)</sup>	Life Remaining	Life Consumed
		(By-Law Facilities, Fire Facilities, Paramedic Facilities)	(By-Law Fleet, Fire Fleet, Paramedic Fleet)	(Fire Equipment, Paramedic Equipment)
<b>Very Good</b>	<b>Sound Physical Condition</b> No short-term failure risk and no work required.	< 0.02	>75%	< 25%
<b>Good</b>	<b>Adequate for Now</b> Acceptable, generally in mid stage of expected service life	0.02 – 0.05	51% - 75%	26% – 50%
<b>Fair</b>	<b>Requires Attention</b> Signs of deterioration, requires attention, some elements exhibit deficiencies	0.05 – 0.15	26% - 50%	51% – 75%
<b>Poor</b>	<b>Increasing Potential of Affecting Service</b> Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration	0.15 – 0.30	1% - 25%	76% – 100%
<b>Very Poor</b>	<b>Unfit for Sustained Service (built infrastructure) / Nearing end of life (fleet)</b> Near or beyond expected service life, widespread signs of advanced deterioration, some built assets may be unusable.	> 0.30	<1% (outside of lifecycle)	> 100%

(1) Where FCI = 0, or no deferred maintenance is reported, or required maintenance is reported but has not yet been deferred, condition is reported based on typical useful life consumed as follows:

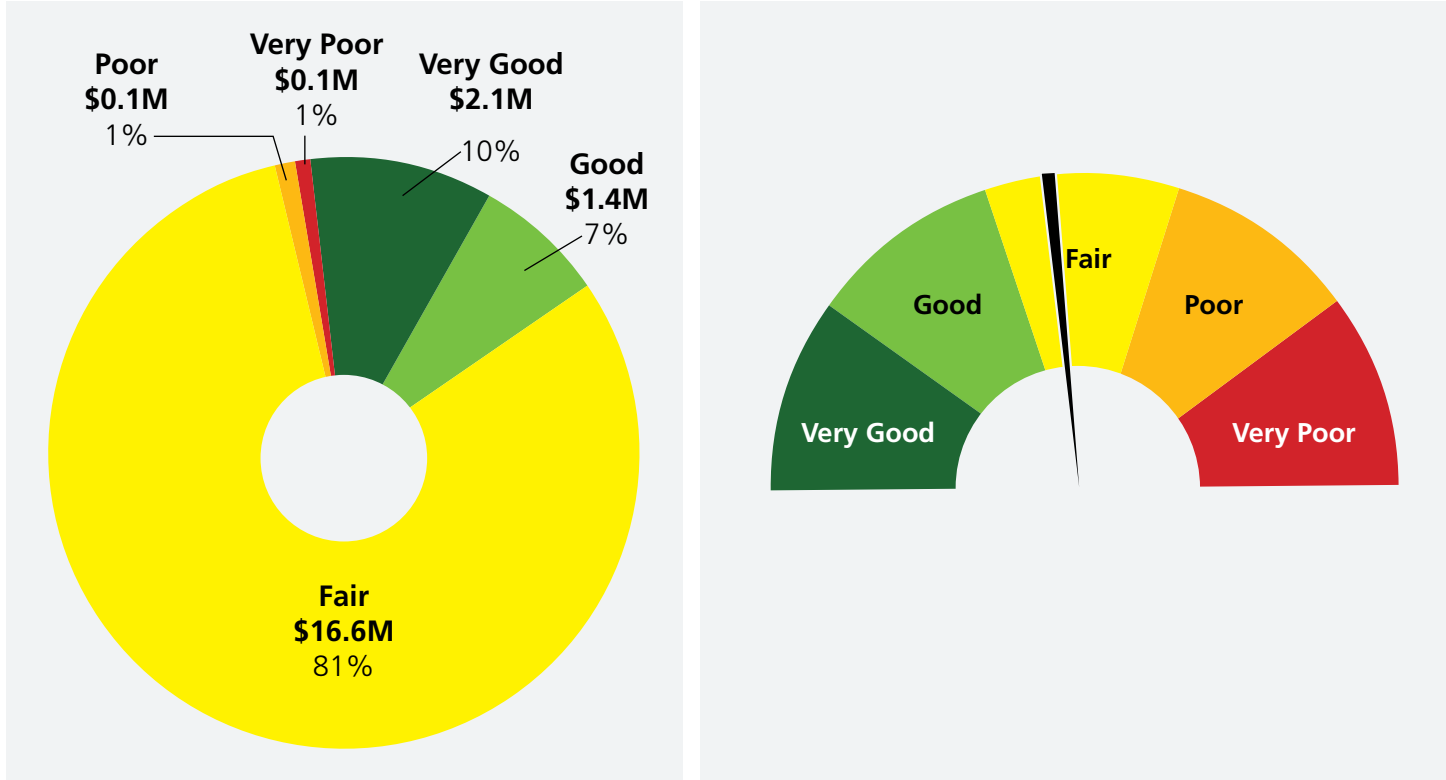
	Very Good	Good	Fair	Poor	Very Poor
Typical Useful Life Consumed	<40%	40% - 70%	70% - 90%	90% - 100%	≥100%



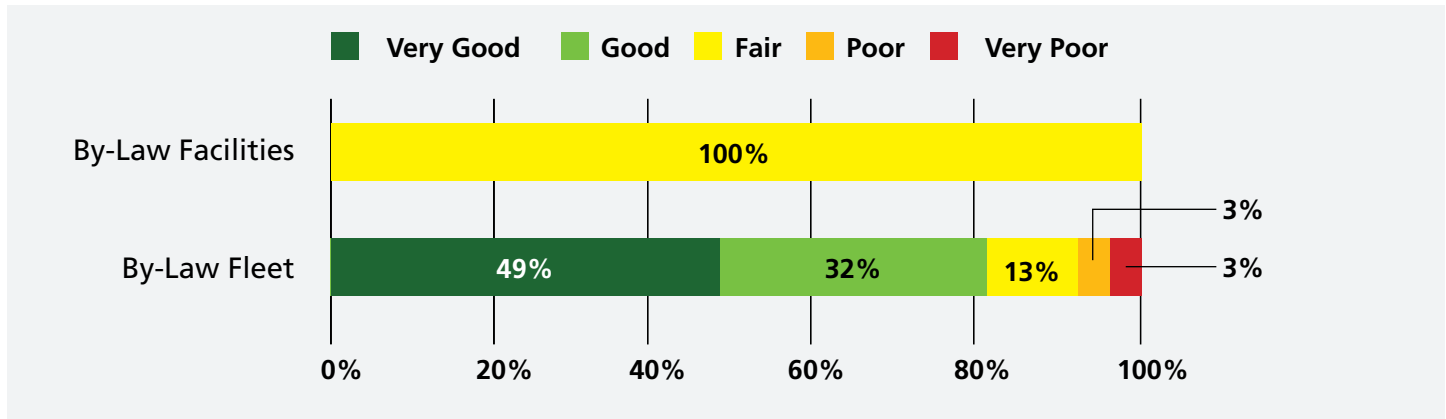


The overall condition of emergency and protective services assets is "Good to Fair" and a breakdown of the various asset classes are shown in the figures below.

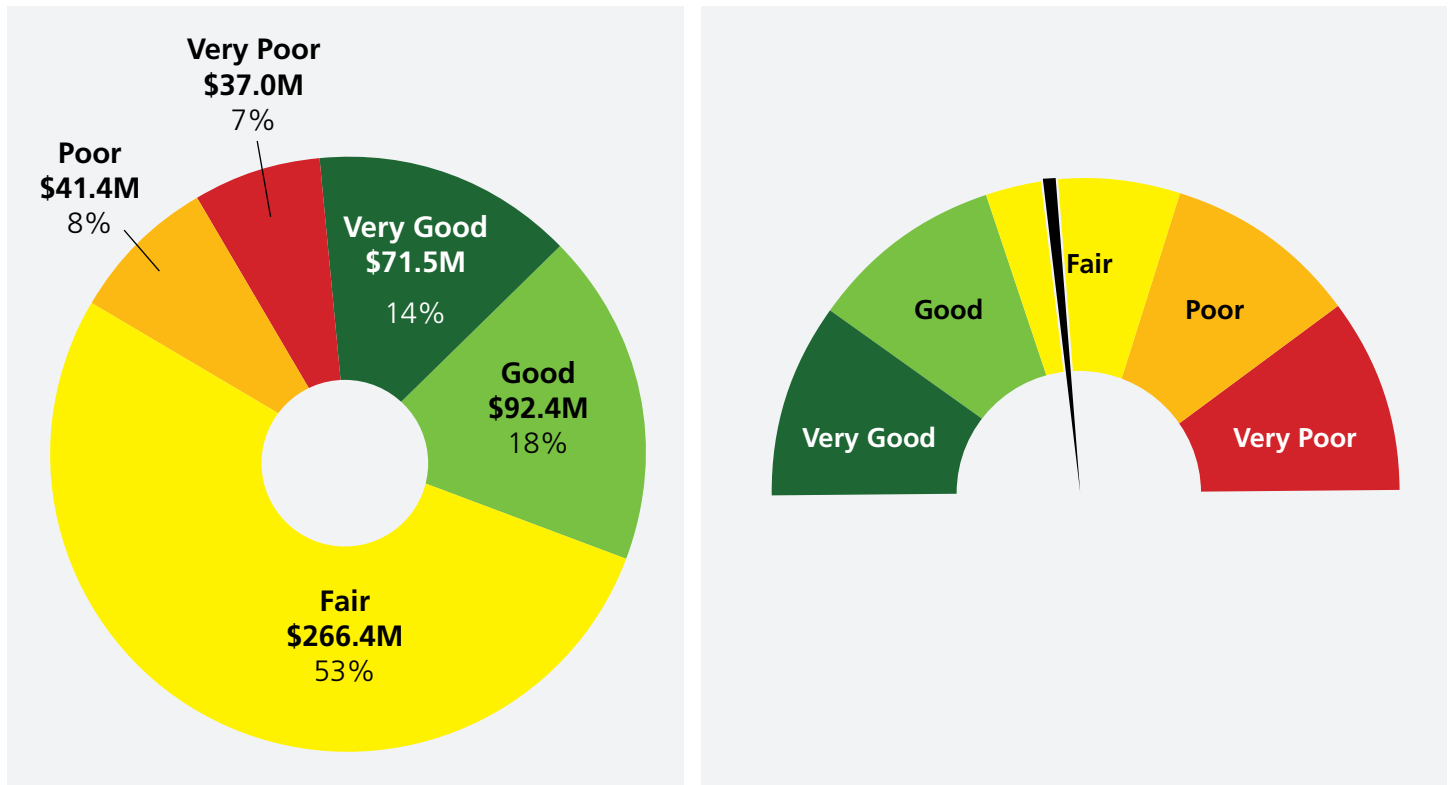
### Overall Condition Profile of By-Law Services Assets



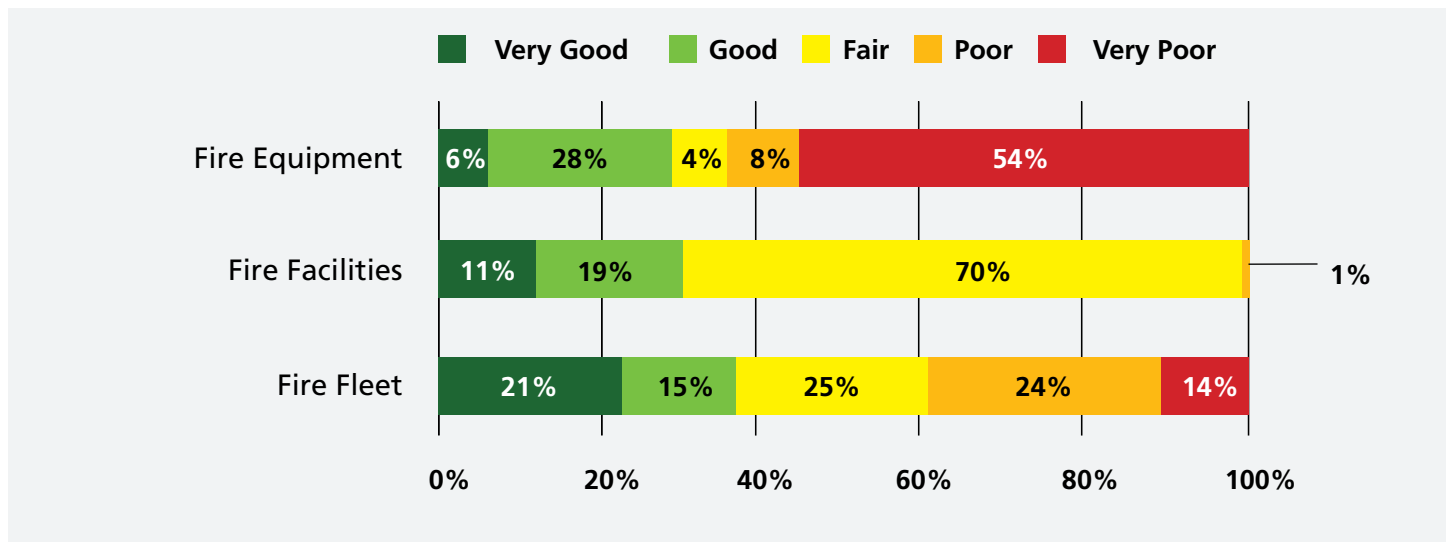
### Condition Profile of By-Law Services Assets



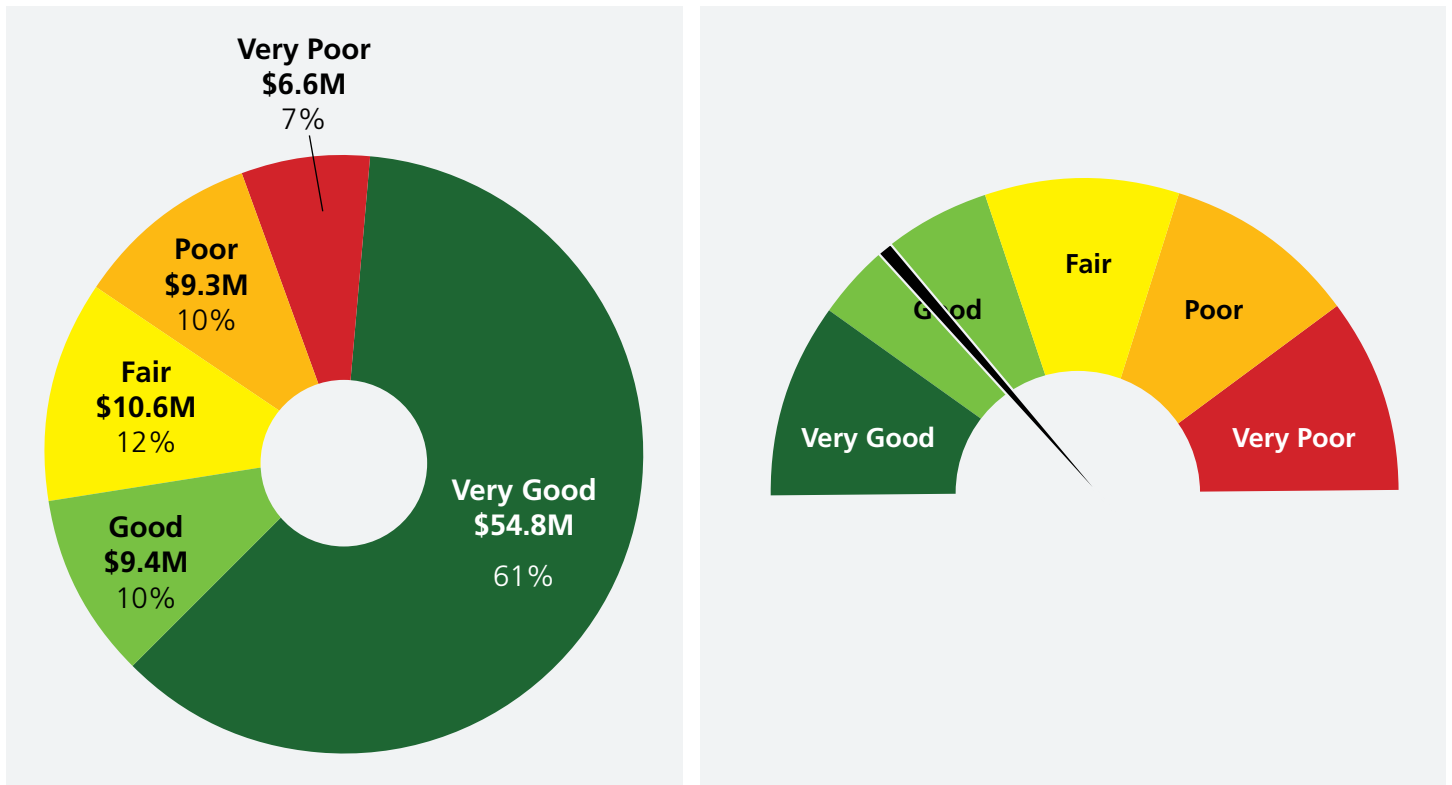
## Overall Condition Profile of Fire Services Assets



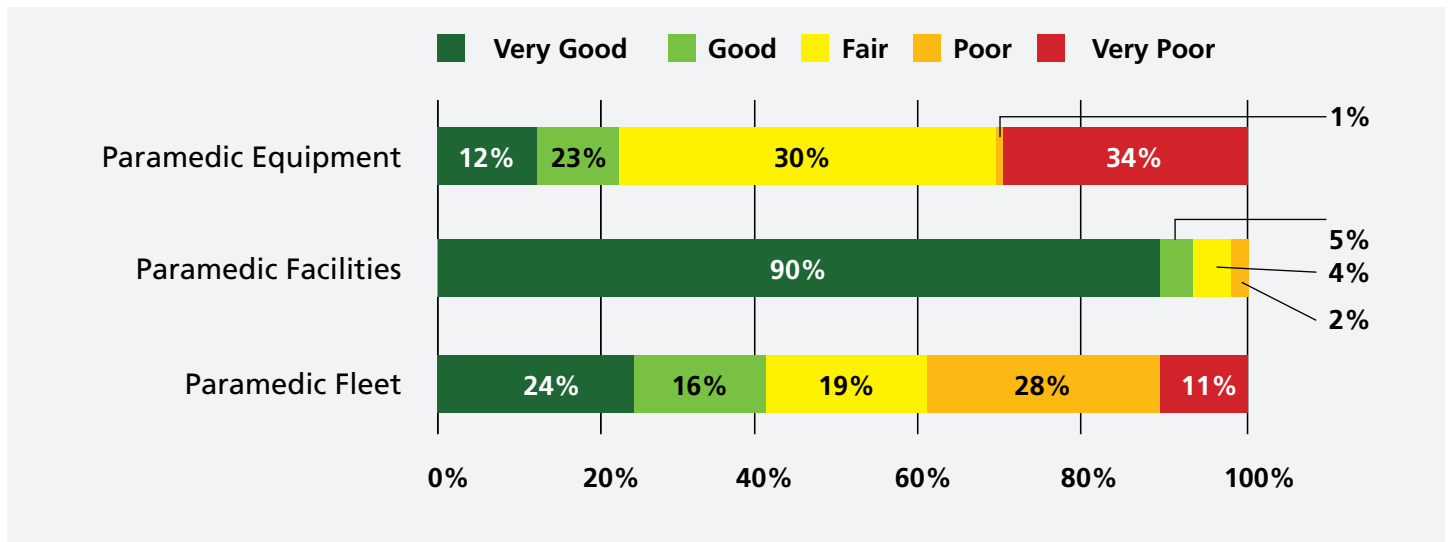
## Condition Profile of Fire Services Assets



## Overall Condition Profile of Paramedic Service Assets



## Condition Profile of Paramedic Service Assets



For fire and paramedic equipment assets, condition is approximated based on age and expected useful life, rather than directly observed condition assessment, so confidence in the findings is therefore low.



# Levels of Service

The City's assets exist to deliver service to customers. Levels of service measure the actual service delivered so that decisions can be made about the assets based on the service that they provide rather than simply on their condition.

The Emergency and Protective Services Asset Management Plan establishes level of service measures and reports the current levels of service being provided. The measures align with City goals and recognize that emergency and protective services assets should be managed in a way that:

- Provides adequate response times
- Reduces emissions associated with the City's operations and facilities
- Increases resiliency to extreme weather and changing climate conditions
- Provides accessible facilities
- Maintains assets in a state of good repair
- Provides sustainable and affordable services over the long-term





The level of service measures for emergency and protective services are shown in the table below.

### Level of Service Measures for Emergency and Protective Services

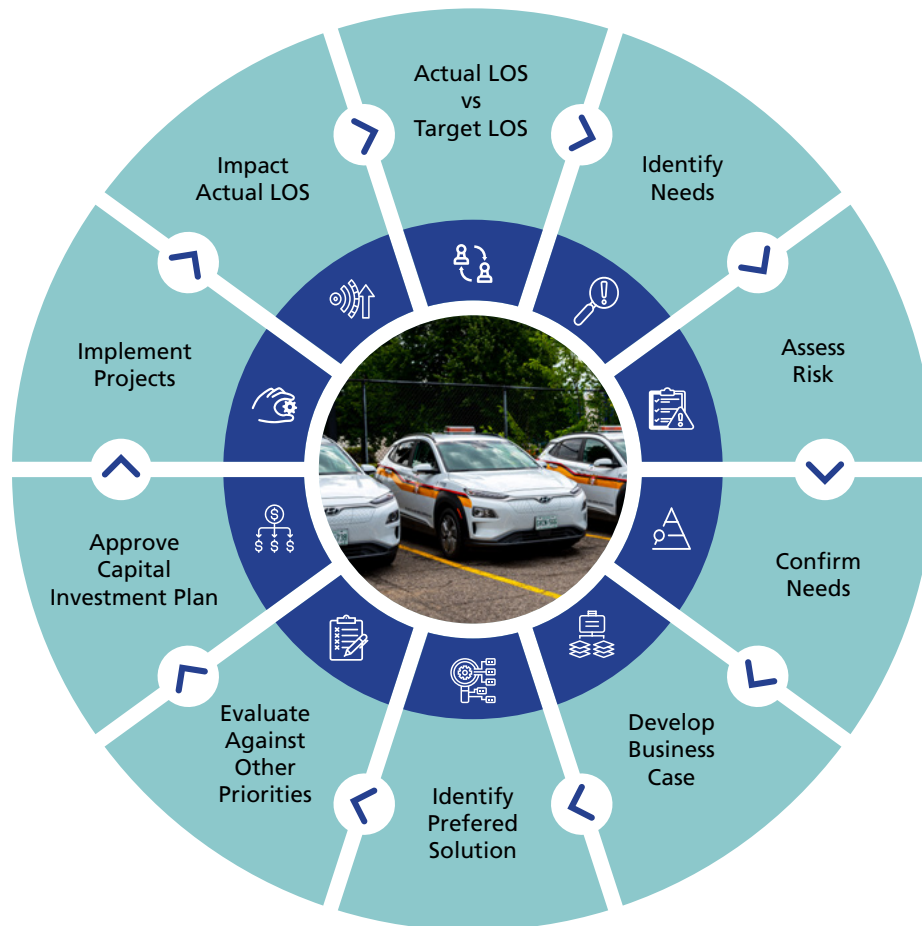
Service Attribute	Community Level of Service	Technical Level of Service	Current Performance (2022)
Capacity and use	Provide adequate response times	First on Scene total response time (urban, moderate risk) (fire)	06:41 minutes
		Effective Response Force total response time (urban, moderate risk) (fire)	11:46 minutes
		Sudden Cardiac Arrest response time (percent of responses within 6 minutes) (paramedic)	48.4%
		Hospital Offload Delay Time (minutes; average 90th percentile) (paramedic)	157.0 minutes
		Percent of service requests responded to within service standard (average or weighted average for Priority 1, 2 and 3 calls) (by-law)	81%
Function	Reduce emissions associated with the City's operations and facilities	GHG emissions per thousand square feet	3.3 tonnes CO2e
		GHG emissions per total fleet	6,358 tonnes CO2e
	Increase resiliency to extreme weather and changing climate conditions	Percent of facilities with backup power for critical building systems	76%
		Provide accessible facilities	Percent of facilities with accessibility audit completed
Reliability	Maintain assets in a state of good repair	Percent of assets in fair or better condition	85%
Affordability	Provide sustainable and affordable services over the long-term	Asset Renewal Funding Ratio	58%
		Average Annual Renewal Investment	\$17.9M



# Asset Management Strategy

## 4.1 Practices, Procedures and Tools

One of the key objectives of asset management is to recognize the objectives of the City and align them with the City's long term financial plans. This will allow Council to make informed decisions and provide clear direction on how the City will balance service levels, risks, and costs. The City has well-established practices to assess the risk of not meeting community and technical level of service standards and to determine the lowest lifecycle cost activities to reduce the risks to acceptable levels and the associated costs of undertaking them. The Asset Management Plan provides the needs forecast associated with maintaining current levels of service and compares it to the planned budget to determine funding gaps or surpluses.



## 4.2 Future Demand and Service Enhancement

In developing the Emergency and Protective Services Asset Management Plan, a preliminary estimate was prepared of the cost of maintaining all of the assets that support the City's by-law, fire and paramedic services at their current level of service over the next 10 years. The estimate includes forecasts of:

- Growth needs based on preliminary estimates compiled for the update of the City's Development Charges Study, required to serve the city's growing population.
- Enhancement needs based on accessibility audits and building condition assessments, and input from subject matter experts, required to improve services, meet new or updated standards, or address accessibility.
- Renewal needs identified for facilities based on building condition audits and forecasted lifecycle renewal needs for fleet and equipment, required to maintain assets in a state of good repair.

Ottawa's population is expected to increase to 1.4 million people by 2046, a significant increase of 40% since 2018, as summarized in the table below. This growth will put pressure on existing assets and services, and may require new or expanded assets to meet growing needs.

### City of Ottawa Population Projections for 2046

	2046 Projection	Growth Since 2018
Population	1,409,650	402,150
Private Households	590,600	194,800
Jobs	827,000	189,500

Source: *New Official Plan report to Council (ACS2021-PIE-EDP-0036), October 2021*



The table below summarizes the future growth, enhancement and renewal needs forecast for emergency and protective services assets.

### Future Demand and Service Enhancement Needs Forecast for Emergency and Protective Services

Asset Class	10-Year Growth Needs (\$ Millions)	10-Year Enhancement Needs (\$ Millions)	10-Year Renewal Needs (\$ Millions) <sup>4</sup>	10-Year Total Needs (\$ Millions)
By-Law Facilities	\$0	\$0.3	\$5.1	\$5.4
By-Law Fleet	\$0	Not applicable	\$4.9	\$4.9
Fire Equipment	\$1.5	\$5.5	\$219.3	\$366.0
Fire Facilities	\$123.5	\$8.2		
Fire Fleet	\$8.0	Not applicable		
Paramedic Equipment	\$0	Not applicable	\$17.0	\$17.0
Paramedic Facilities	\$9.0 <sup>5</sup>	\$1.0	\$4.1	\$14.1
Paramedic Fleet	\$5.0	Not applicable	\$59.4	\$64.4
<b>Total</b>	<b>\$147.0</b>	<b>\$15.0</b>	<b>\$309.8</b>	<b>\$471.8</b>

<sup>4</sup> The capital renewal needs identified for buildings are underestimated by approximately \$115M across all City services. The underestimation is due to: i) limitations with the asset management software utilized by Buildings & Parks Asset Management; ii) business process and timelines for acquiring projections and entering inventory data within the asset management software; and iii) data rationalization impacting accuracy at the point and time when the data was acquired from the asset management software.

<sup>5</sup> The Ottawa Paramedic Service is exploring possible growth projects/needs (i.e., West End Deployment Facility and additional fleet growth needs) that are not captured in the Asset Management Plan.





Asset management planning also needs to consider the City’s Climate Change Master Plan goals for both mitigation strategies to slow climate change impacts, such as reducing greenhouse gas emissions, and adaptation strategies to reduce negative impacts associated with existing and future climate change. The Asset Management Plan estimates the additional future costs due to climate change shown in the table below. These are preliminary estimates based on the latest information available, which will be refined over time.

### Estimated Additional Future Costs Due to Climate Change for Emergency and Protective Services

Additional Costs Due to Climate Change	Estimated 10-year Total Additional Cost (\$ Millions)
Increased operations and maintenance and capital renewal costs for buildings due to gradual, long-term impacts of climate change	\$3.9 (operating & maintenance) \$1.5 (capital renewal)
Increased operations and maintenance costs due to extreme weather events	\$5.8
Increased capital costs to implement climate change mitigation actions including municipal fleet electrification and building retrofits	\$29.5
<b>Total</b>	<b>\$40.7</b>



Some climate change costs have been or are expected in future to be at least partially recovered from upper levels of government; these recoveries are not factored into the estimates. Also, the estimates do not capture damage to capital infrastructure due to catastrophic/extreme weather events (e.g., tornadoes); increased capital renewal needs due to accelerated asset deterioration; increased capital renewal costs for assets other than buildings (such as fleet and equipment); and gradual, long-term impacts due to climate hazards other than extreme heat, extreme rainfall, and freeze-thaw cycles (such as drought, ice storms and wildfires).

### 4.3 Lifecycle Management and Risk

Lifecycle management activities refer to the set of planned activities and actions undertaken to maintain the current levels of service and achieve good economic life of the assets. The activities undertaken range from operations and maintenance activities, including planned and reactive maintenance, renewal activities (such as condition assessments and rehabilitations), disposal activities and non-infrastructure solutions (such as policies and processes that reduce costs, mitigate risks or maintain/enhance service delivery).

The City applies a risk-based approach to prioritizing asset renewals. The risk assessment frameworks and methods vary across the different types of assets, but are generally based on the importance of each asset in terms of service delivery/continuity and the number of users who could be impacted.



# Financing Strategy

The City continues to invest responsibly in maintaining infrastructure and has been increasing its capital investments to align with long-range financial plans. Funding targets recommended in the 2017 Comprehensive Asset Management Program were focused on maintaining critical infrastructure in a state of good repair. There will be a need to update the long range financial plans once new service levels are defined to ensure financial sustainability.

## 5.1 Expenditure History

For information on historical operating and capital expenditures, refer to the City’s historical annual budget documents.

## 5.2 Expenditure Forecast

Over the next 10 years, the City will continue investing in infrastructure to support operational expenses, respond to renewal needs, serve growth, and provide enhancements. The planned operating budget is based on Financial Planning’s operating budget forecast for By-law Services, Fire Services and Paramedic Service, and the planned capital budget is based on the City’s 2023 10-year capital budget forecast (for facilities and equipment, and for fleet growth) and Fleet Services’ 2024 forecast (for fleet renewal).

### Budget Forecast for By-Law Services

Component	Expenditure/Budget Forecast (\$ Millions)									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Operating Budget <sup>6</sup>	\$0.2	\$0.7	\$1.0	\$1.2	\$1.6	\$1.7	\$1.9	\$2.3	\$2.5	\$2.6
Capital Budget – Growth	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Capital Budget – Enhancement	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01	\$0.01
Capital Budget – Renewal	\$0.4	\$0.8	\$0.8	\$1.2	\$1.3	\$0.7	\$1.0	\$1.6	\$0.8	\$1.0

<sup>6</sup> Values shown are net operating budget requirement after expenditure recoveries and revenues.





## Budget Forecast for Fire Services

Component	Expenditure/Budget Forecast (\$ Millions)									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Operating Budget <sup>7</sup>	\$186.1	\$193.2	\$204.3	\$213.7	\$219.4	\$229.4	\$239.7	\$246.1	\$252.6	\$259.4
Capital Budget – Growth	\$4.0	\$6.7	\$11.0	\$31.0	\$35.5	\$24.0	\$1.0	\$1.3	\$0.5	\$0.5
Capital Budget – Enhancement	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8
Capital Budget – Renewal	\$11.6	\$10.0	\$12.4	\$10.9	\$9.5	\$16.5	\$7.7	\$7.3	\$8.3	\$10.3

## Budget Forecast for Paramedic Service

Component	Expenditure/Budget Forecast (\$ Millions)									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Operating Budget <sup>8</sup>	\$60.4	\$65.4	\$71.9	\$76.6	\$78.9	\$82.1	\$85.4	\$89.3	\$93.2	\$97.3
Capital Budget – Growth	\$0.6	\$2.9	\$2.2	\$0.6	\$3.9	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6
Capital Budget – Enhancement	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.03	\$0.04	\$0.04
Capital Budget – Renewal	\$10.2	\$4.21	\$3.31	\$6.01	\$4.51	\$6.11	\$6.71	\$7.21	\$8.61	\$6.91



<sup>78</sup> Values shown are net operating budget requirement after expenditure recoveries and revenues.





## 5.3 Funding Gap

The funding gap is the difference between the forecasted asset needs and the planned capital budget. Over the next 10 years, the total needs for emergency and protective services assets is \$471.8 million, while the planned budget is \$316 million, leading to a funding gap of \$155.8 million. The forecasted investment needs, planned budgets and funding gaps for emergency and protective services assets are summarized in the tables and figures below.

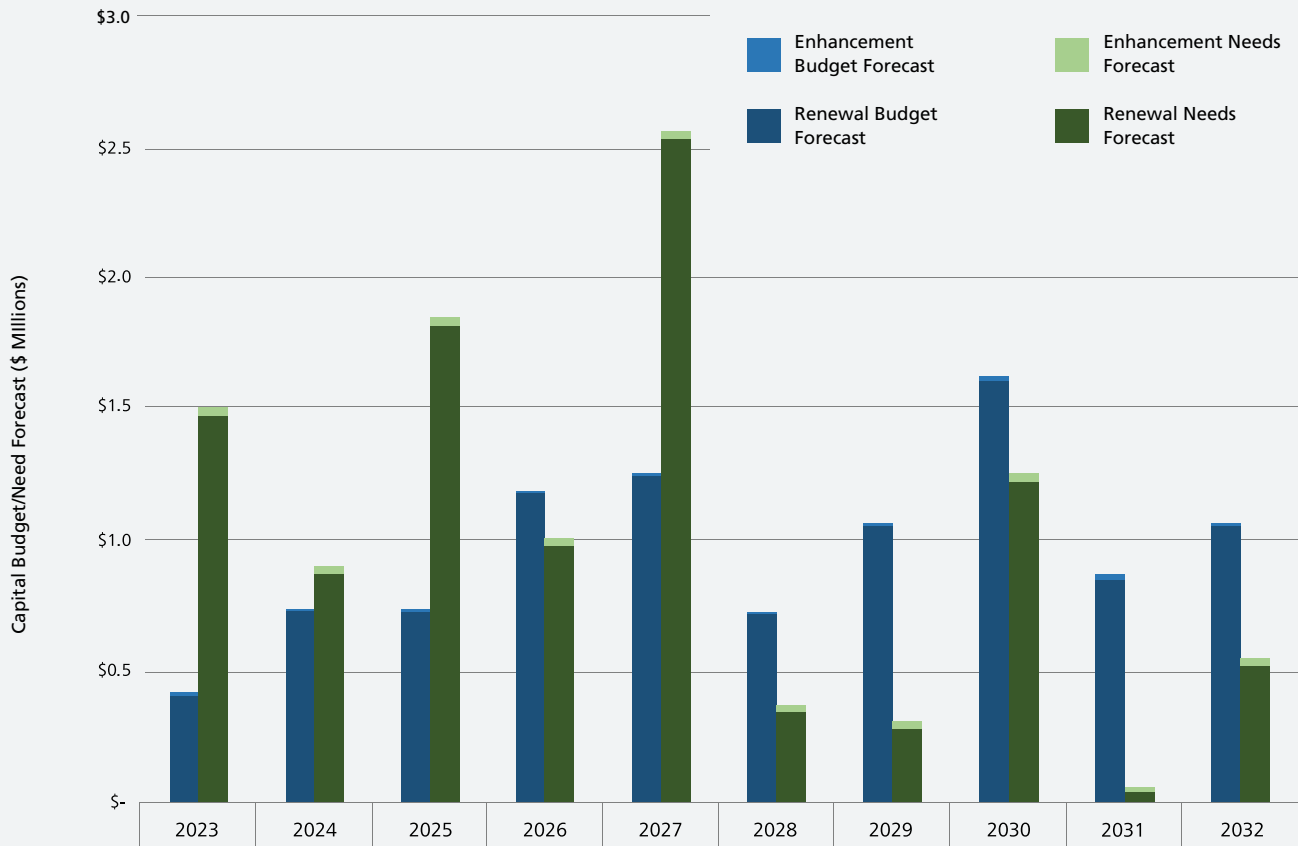
Note that growth needs and planned budgets will be finalized as part of the Development Charges By-law Update, which is intended to better align growth needs with planned budgets.

### Funding Gap for By-Law Services

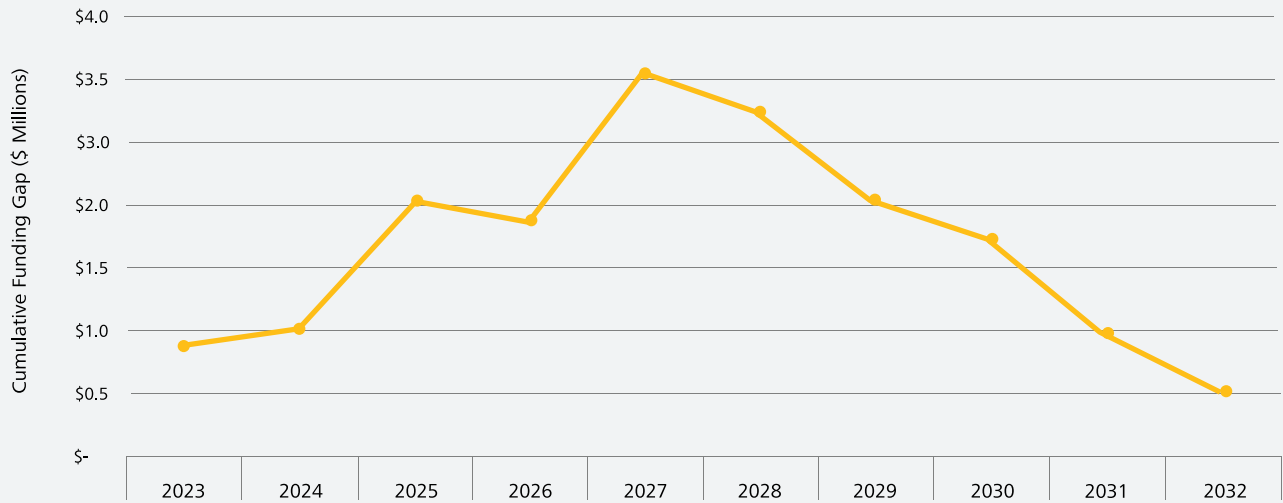
Asset Class	10-Year Need (\$ Millions)	10-Year Funding (\$ Millions)	10-Year Gap (\$ Millions)
<b>Growth</b>			
By-Law Facilities	\$0.0	\$0.0	\$0.0
By-Law Fleet	\$0.0	\$0.0	\$0.0
<b>Subtotal</b>	<b>\$0.0</b>	<b>\$0.0</b>	<b>\$0.0</b>
<b>Enhancement</b>			
By-Law Facilities	\$0.3	\$0.1	(\$0.2)
By-Law Fleet	\$0.0	\$0.0	\$0.0
<b>Subtotal</b>	<b>\$0.3</b>	<b>\$0.1</b>	<b>(\$0.2)</b>
<b>Renewal</b>			
By-Law Facilities	\$5.1	\$5.6	\$0.5
By-Law Fleet	\$4.9	\$4.0	(\$0.9)
<b>Subtotal</b>	<b>\$10.3</b>	<b>\$9.6</b>	<b>(\$0.4)</b>
<b>Total</b>	<b>\$10.3</b>	<b>\$9.7</b>	<b>(\$0.6)</b>



### Budget and Needs Forecast for By-Law Services



### Cumulative Funding Gap for for By-Law Services

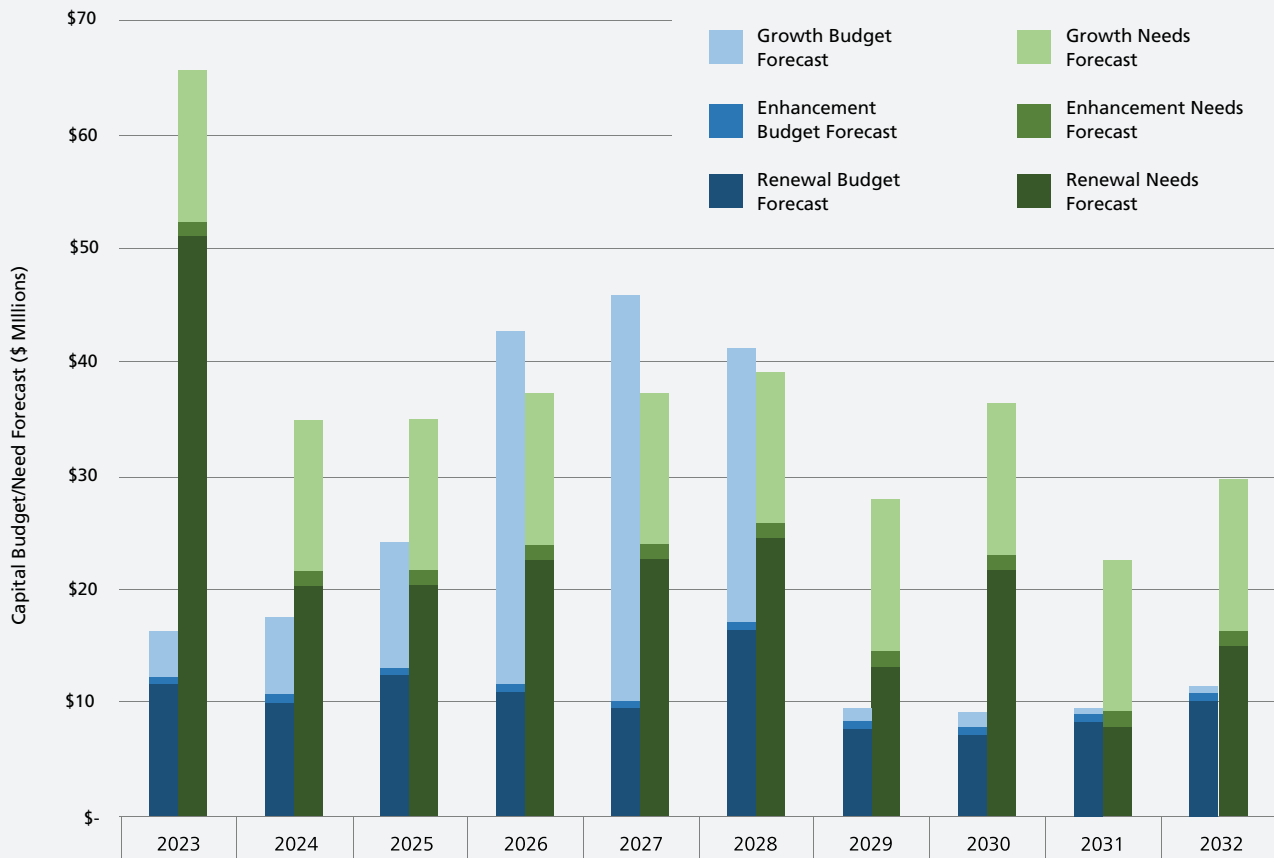


## Funding Gap for Fire Services

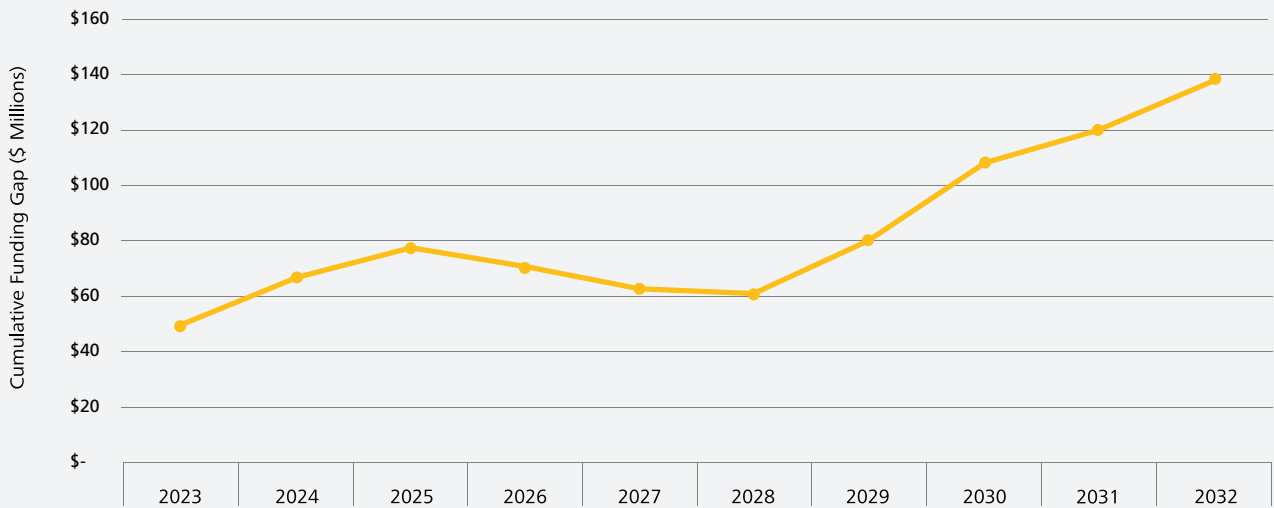
Asset Class	10-Year Need (\$ Millions)	10-Year Funding (\$ Millions)	10-Year Gap (\$ Millions)
<b>Growth</b>			
Fire Equipment	\$1.5	\$0.3	(\$1.2)
Fire Facilities	\$123.5	\$111.1	(\$12.4)
Fire Fleet	\$8.0	\$4.3	(\$3.7)
<b>Subtotal</b>	<b>\$133.0</b>	<b>\$115.7</b>	<b>(\$17.3)</b>
<b>Enhancement</b>			
Fire Equipment	\$5.5	\$5.5	\$0.0
Fire Facilities	\$8.2	\$2.1	(\$6.1)
Fire Fleet	\$0.0	\$0.0	\$0.0
<b>Subtotal</b>	<b>\$13.7</b>	<b>\$7.6</b>	<b>(\$6.1)</b>
<b>Renewal</b>			
Fire Facilities, Fire Fleet, Fire Equipment	\$219.3	\$104.5	(\$114.8)
<b>Subtotal</b>	<b>\$219.3</b>	<b>\$104.5</b>	<b>(\$114.8)</b>
<b>Total</b>	<b>\$365.9</b>	<b>\$227.8</b>	<b>(\$138.2)</b>



## Budget and Needs Forecast for Fire Services



## Cumulative Funding Gap for Fire Services



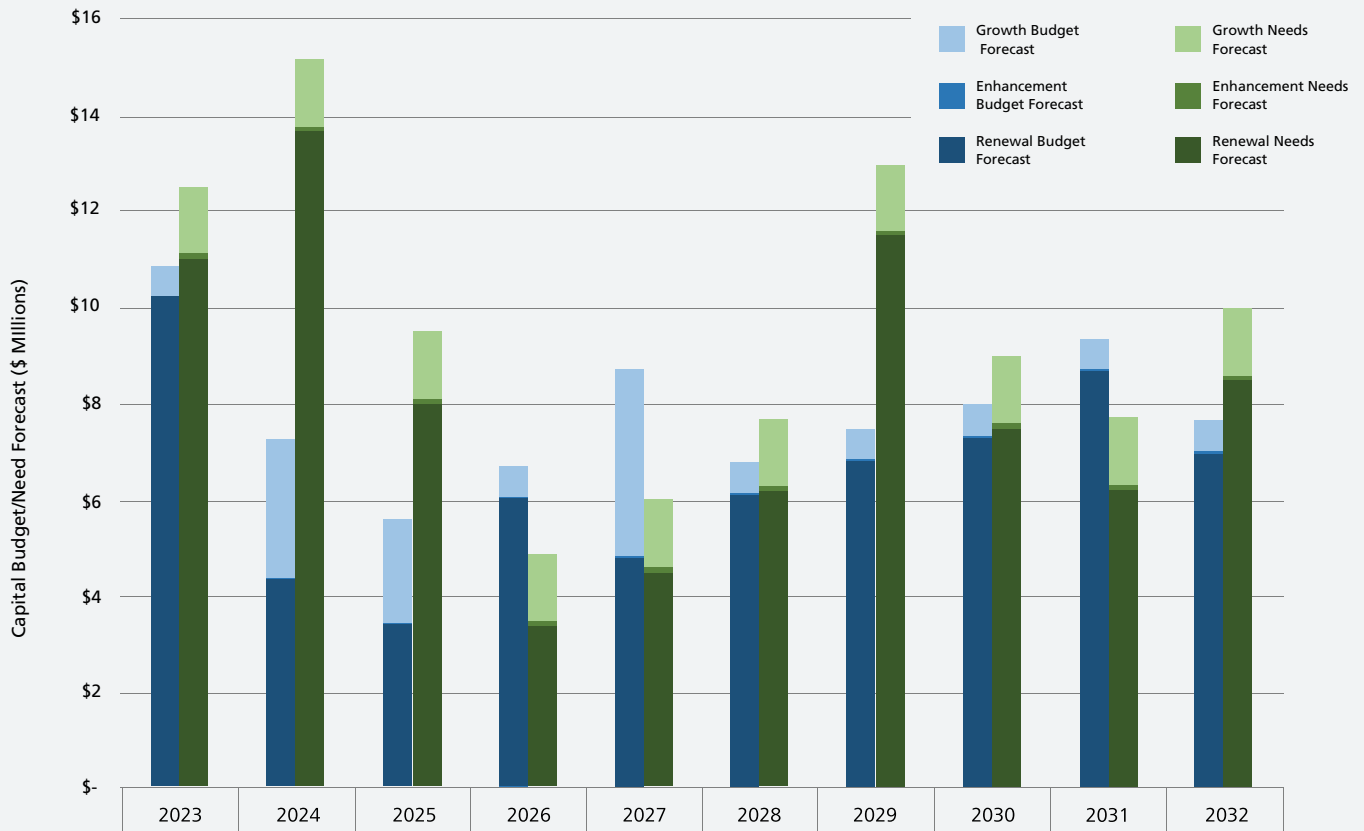
## Funding Gap for Paramedic Service

Asset Class	10-Year Need (\$ Millions)	10-Year Funding (\$ Millions)	10-Year Gap (\$ Millions)
<b>Growth</b>			
Paramedic Equipment	\$0.0	\$0.0	\$0.0
Paramedic Facilities <sup>6</sup>	\$9.0	\$7.9	(\$1.1)
Paramedic Fleet	\$5.0	\$5.6	\$0.6
<b>Subtotal</b>	<b>\$14.0</b>	<b>\$13.5</b>	<b>(\$0.5)</b>
<b>Enhancement</b>			
Paramedic Equipment	\$0.0	\$0.0	\$0.0
Paramedic Facilities	\$1.0	\$0.3	(\$0.7)
Paramedic Fleet	\$0.0	\$0.0	\$0.0
<b>Subtotal</b>	<b>\$1.0</b>	<b>\$0.3</b>	<b>(\$0.7)</b>
<b>Renewal</b>			
Paramedic Equipment	\$17.0	\$21.4	\$4.4
Paramedic Facilities	\$4.1	\$0.9	(\$3.2)
Paramedic Fleet	\$59.4	\$42.4	(\$17.0)
<b>Subtotal</b>	<b>\$80.5</b>	<b>\$64.7</b>	<b>(\$15.8)</b>
<b>Total</b>	<b>\$95.5</b>	<b>\$78.5</b>	<b>(\$17.0)</b>

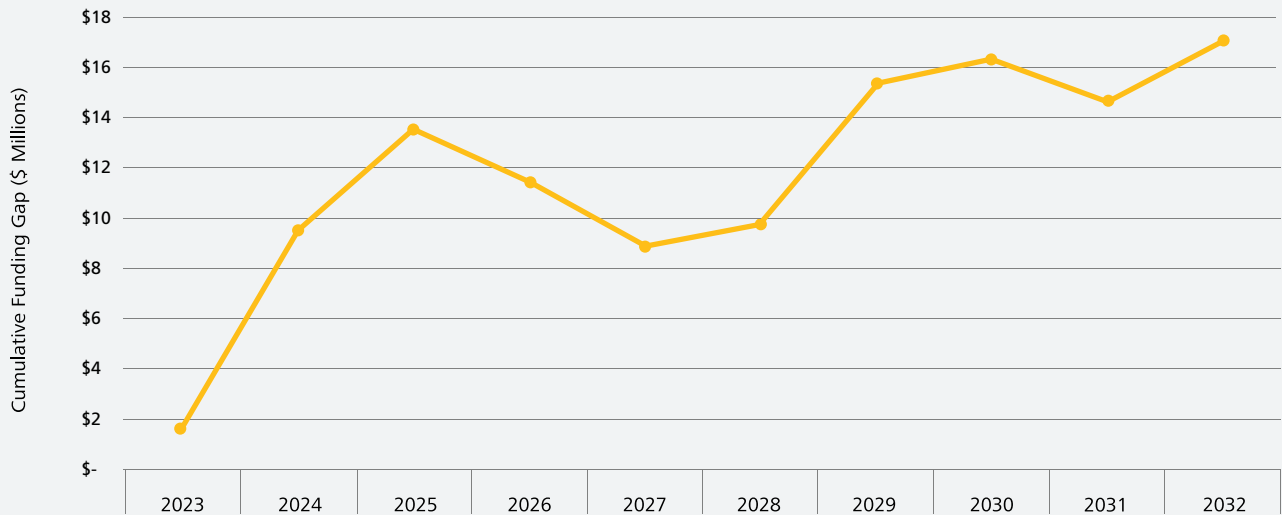
<sup>6</sup> The Ottawa Paramedic Service is exploring possible growth projects/needs (i.e., West End Deployment Facility and additional fleet growth needs) that are not captured in the Asset Management Plan.



## Budget and Needs Forecast for Paramedic Service



## Cumulative Funding Gap for Paramedic Service





The City has planned dedicated funding over the next 10 years to address climate change needs. The funding supports not only emergency and protective services, but various other services provided by the City. The climate change capital funding needs identified for the various City services and the total planned capital funding for climate change initiatives are summarized in the table below. These are preliminary estimates that are being refined through various initiatives, but they give a sense of the order-of-magnitude of future planned budget and potential needs.

**Estimated Future Climate Change Capital Budgets and Capital Needs for All City Services\***

Capital Program	10-year Total Capital Budget (\$ Millions)	Service/Asset Needs Supported	10-year Total Climate Change Capital Needs (\$ Millions)	10-year Total Capital Funding Gap/Surplus (\$ Millions)
Climate Change Master Plan	\$190.0	All	\$401.9	(\$179.1)
Emergency Reception Lodging Generators	\$4.1	Buildings		
Energy Management and Investment Strategy	\$28.7	Buildings		
<b>Total</b>	<b>\$222.8</b>		<b>\$401.9</b>	<b>(\$179.1)</b>

\*Excludes:

- (1) Core assets (refer to Drinking Water, Stormwater, Transportation and Wastewater Asset Management Plans).
- (2) Transit services (all needs and budgets for transit services are covered by the Transit Long Range Financial Plan).



# Improvement and Monitoring Plan

Based on the snapshot of current conditions and existing plans presented in the Emergency and Protective Services Asset Management Plan, areas of potential improvement include:

- Data gaps, data management, and record keeping
- Cost estimating
- Level of service measures and targets
- Inspection, condition assessment, corrective maintenance, and risk assessment
- Asset maintenance practices for facilities
- Climate change resiliency
- Applying an equity and inclusion lens

The Emergency and Protective Services Asset Management Plan will be reviewed and updated on a regular basis and over time these improvements will be reflected in future versions of the Asset Management Plan.



# More Information

For more information about comprehensive asset management, or to learn more about the City's Comprehensive Asset Management Program, please visit [Ottawa.ca](http://Ottawa.ca).

