Chatham-Kent

DETAILED ASSET MANAGEMENT PLAN 2024

Fire Department

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Chatham-Kent Fire Department Report Card

64 Apparatus Worth $61M

270 volunteers & 72 full-time firefighters

3,300 response calls in 2023

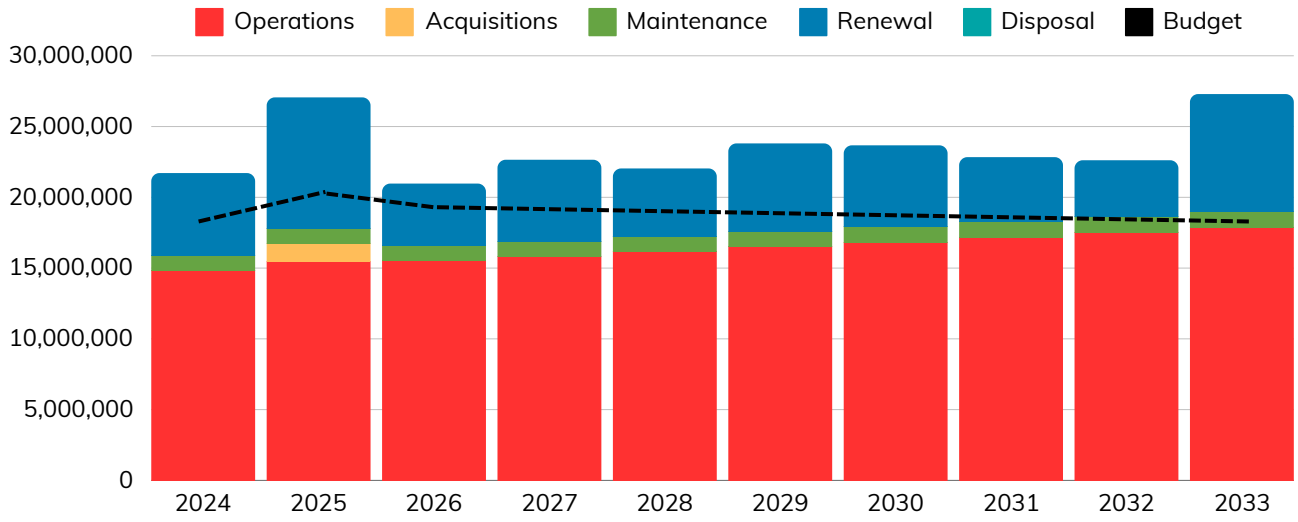
Annual Funding Gap	Asset Renewal Ratio	% of 10-Year Plan Funded
$4.7 Million	41%	80%

Asset Summary

Assets	Items	Replacement
	Emergency Response Vehicles	$61,639,000
	PPE & Tools	$7,976,000
	Facilities	$46,948,000
	Equipment	$1,675,000
	Software & Technology	$220,000

$118M Total Replacement Cost

10 Year Life Cycle Forecast



Data Confidence Low — Medium — High

2.0 INTRODUCTION

2.1 Background / Purpose of Service

Chatham-Kent's Fire Department is dedicated to preserving life, property, and the environment throughout the Municipality by providing an integrated service for Fire Protection, Rescue services and Emergency Management responsibilities and obligations.

The Chatham-Kent Fire Department (CKFD) has evolved over time and through amalgamations to provide services to over 112,000 Chatham-Kent residents and visitors to the Municipality. In 2023 CKFD had approximately **3,300** response calls that required trucks to be dispatched to respond to both Fire and medical emergencies. Chatham-Kent is a geographically large area covering 2,458 square kilometers, which creates unique challenges for the Fire Department and its ability to respond to emergency requests across the large service area.

CKFD requires significant assets and staff to provide an effective and efficient (Emergency Services Department) firefighting and emergency response service. To effectively respond to an emergency and to protect first responders, the service requires:

- Sufficient vehicles to respond to emergency incidents promptly;
- Reliable communications technology and software are crucial to keep communication lines open. This technology is essential to accepting emergency calls, recording information, dispatching vehicles, and supporting incident response communications;
- Adequate facilities, deemed to be in good condition and strategically situated throughout the Municipality, are available for storing vehicles, accommodating personnel, and storing protective equipment, thereby ensuring the service is ready to respond to emergencies and
- Specialized equipment for firefighters to mitigate risks and protect themselves and others while responding to emergencies.

The department comprises 72 full-time firefighters and around 270 volunteer firefighters. In addition, there are 8 staff members committed to leadership, management, administration, and supporting service delivery. The Chatham-Kent Fire Department operates 19 fire stations across the Municipality, encompassing roughly 500,000 square feet of fire stations and related sites due to the extensive geographic area CKFD serves.

The station types and locations include the following:

- **Full-Time Stations (2) - Chatham Station 1 and Station 2**
- **Composite Stations - Both full-time and volunteer staff (1) - Wallaceburg**
- **Volunteer Stations (16) -** Dover, Tupperville, Dresden, Chatham South, Thamesville, Bothwell, Orford, Ridgetown, Harwich North, Erieau, Raleigh North, Raleigh South, Merlin, Blenheim, Tilbury and Wheatley.

Differences in service levels among Full-time, Composite, and Volunteer firefighters stem from the response time and availability of responders. Each category of fire station offers distinct levels of service, as outlined below:

- **Full-Time:** Incident response is provided by full-time firefighters, operating on a scheduled 24-hour shift schedule;
- **Composite:** Incident response is provided by both full-time and volunteer firefighters and
- **Volunteer** (rural areas): Incident response is provided by volunteer firefighters who are on call and respond to emergency incidents as needed. These volunteers receive compensation for each call they attend (fixed fee); for any call that exceeds 4 hours, they receive an over-time (OT) payment amount for the time they dedicate to emergency responses, training sessions, and station duties.

The Fire Department offers a multitude of fire protection and community services, which include:

- Fire suppression and prevention
- Public education for and Community Fire Safety
- Mitigation and prevention of the risk created by the presence of unsafe levels of carbon monoxide
- Water rescue and emergency services/planning
- Burn Permits / Fireworks applications
- Property Inspections and incident reporting

With the establishment of its Fire department, Chatham-Kent became legally obligated to fulfill substantial duties and legislative responsibilities in providing Fire Fighting and Emergency Response Services. This Detailed Asset Management Plan (DAMP) will ensure that the Chatham-Kent Fire Department meets the Asset Management Planning requirements as specified in O. Reg 588/17 for current and future service levels by July 1st, 2025.

Additionally, the DAMP aims to ensure that the Fire Department possesses the necessary assets and funding to offer sustainable Fire Protection, Rescue Services, and Emergency Management throughout the 2023 - 2033 planning period, catering to the needs of Chatham-Kent's citizens in line with the Fire Protection and Prevention Act, 1997.

Chatham-Kent Fire station Locations

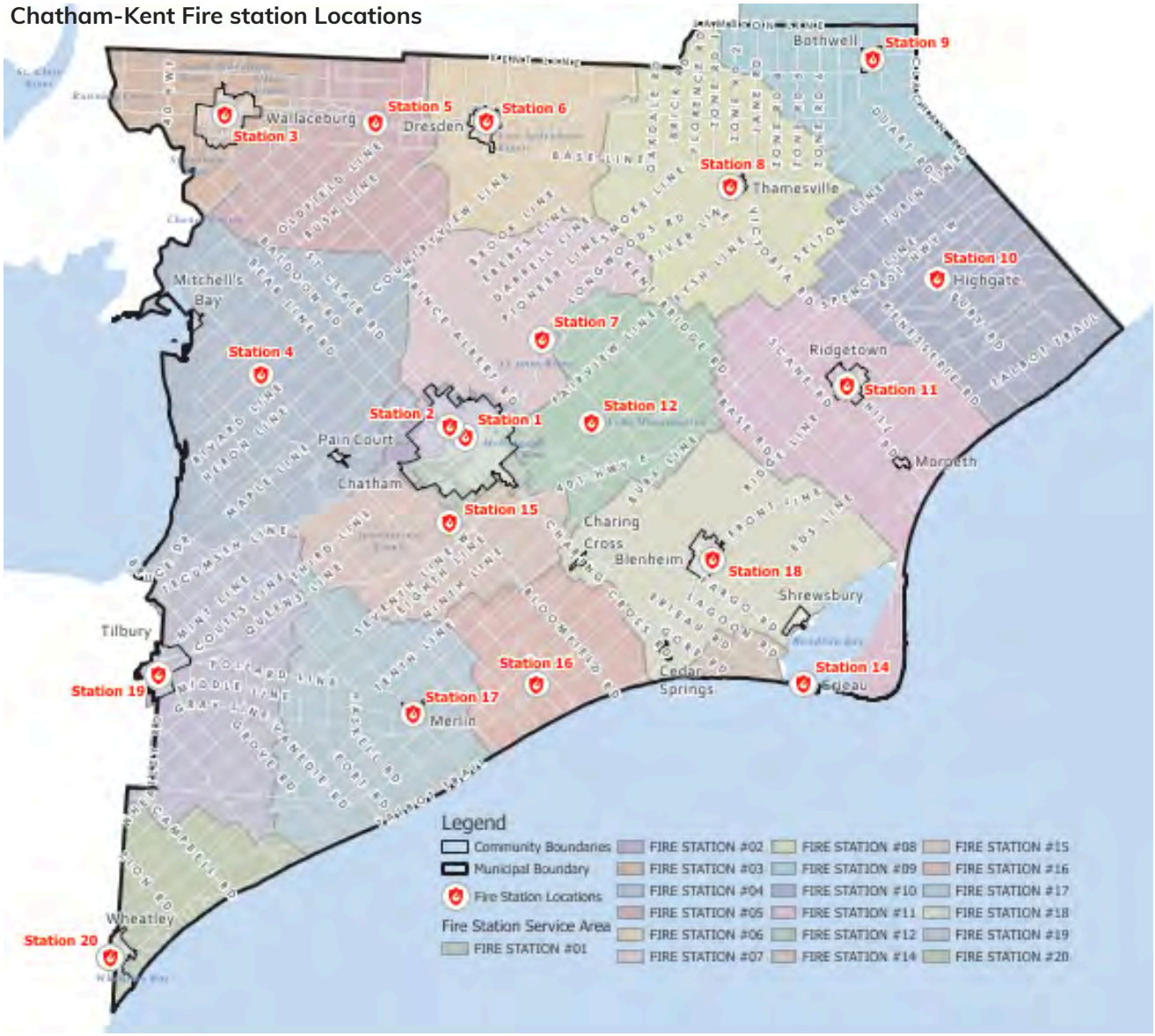


Table 2.2:Key Stakeholders in the DAMP

Key Stakeholder	Role in Asset Management Plan
Chatham-Kent Council	• Distribute resources to achieve planning objectives in service provision while effectively mitigating risks. • Back asset management initiatives to enhance understanding and guide decision-making. • Allocate funding to sustain the desired level of service throughout the entire life cycle.
Mayor/CAO	• Advocate for and champion the adoption of asset management principles within the organization. • Guarantee the availability of sufficient resources to foster the development of staff knowledge and skills, facilitating the implementation and ongoing enhancement of asset management practices.
Fire Chief	• Allocate resources to meet the organization's objectives in providing services while managing risks. • Overall responsibility for service delivery, provide leadership in influencing decision-making processes related to Asset Management.
Fire Responders	• Inform management to changes in asset conditions or known faults and risks • Proactively care for assets to ensure they can achieve their desired ESL
Community	• Engage in facilitated discussions to enable the municipality to comprehend the community's desired level of service.

Fire Organizational Chart

The organizational structure for service delivery from infrastructure assets for CKFD is detailed below in **figure 2.1.**

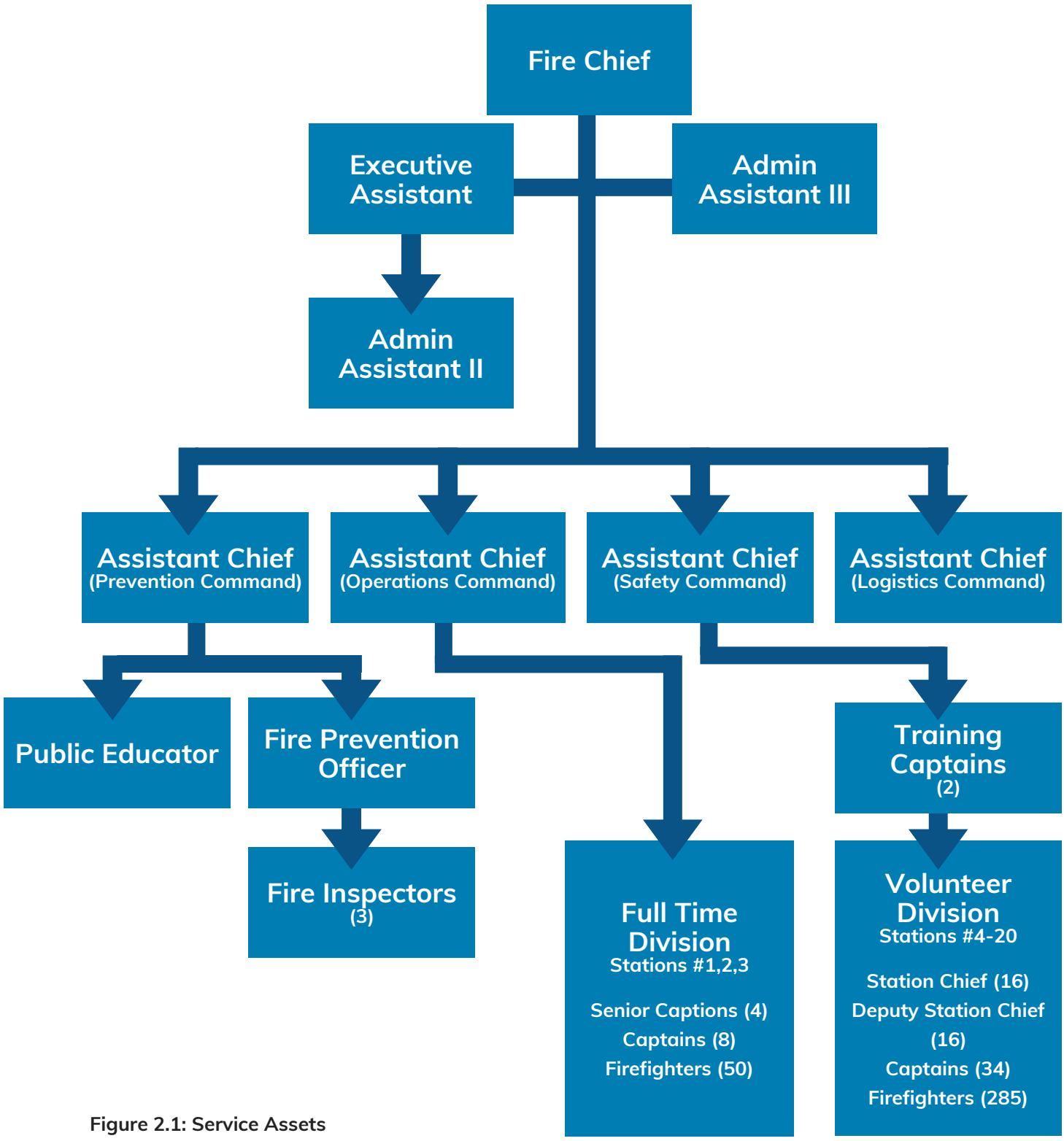


Figure 2.1: Service Assets

2.3 Asset Hierarchy, Registry & Age Profile

An asset hierarchy provides a framework for structuring data in an information system to assist in data collection, reporting, and decision-making. The hierarchy includes the asset class and components used for asset planning and financial reporting, as well as the service level hierarchy used for service planning and delivery.

An asset registry is a single data source containing an asset data inventory, including attribute information for each asset. This attribute information includes a record of each asset, including condition, age, replacement cost, and asset-specific information (e.g., length, diameter, material, etc.). The fire asset registry is currently structured as an asset hierarchy, explained below.

Chatham-Kent is working towards establishing a functional asset hierarchy, which means the hierarchy has been established based on what the asset owner needs or wants the asset or system to do. Generally, assets and systems are organized according to their primary function.

The service hierarchy is shown in **Table 2.3.1.**

Table 2.3.1: Asset Service Hierarchy

Service Hierarchy	Service Level Objectives
Apparatus (Fire Trucks)	Provide sufficient quantity of fire apparatus to ensure CKFD response obligations are met in the community
Facilities (Fire Stations)	Provide safe stations at optimal locations to ensure CKFD are able to meet level of service response times and assets are housed safely.
Technology (Communications Equipment)	Reliable communications equipment must be kept in good working order to ensure communication lines remain open for the community.
Personal Protective Equipment (PPE)	Safe and serviceable PPE to ensure that firefighters are provided optimal protection

Asset Registry

Table 2.3.2 shows the assets covered by this DAMP. These include all Fire Stations, Apparatus, Vehicles, Communications, Technology and Software, Medical Equipment, and supplies required for Chatham-Kent to deliver its service to the community.

Table 2.3.2: Service Assets

Asset Category	Description	Age or Average Age	Average Condition	Avg Estimate Service life Remaining	Current Replacement Value
Emergency Response Vehicles	7 Aerial Trucks, 21 Pumper Trucks, 18 Rescue Trucks, 18 Tanker Trucks, 7 Pick-up Trucks, Command Unit	10	Good	15	**$61,639,000**
PPE/Tools	Turnout Coats, Turnout Pants, Helmets, Boots, SCBA's, Radios	5	Good	5	**$7,976,000**
Facilities	19 Firehalls	43	Fair	25	**$46,948,000**
Equipment/ Specialty Vehicles	Extrication Equipment, Boats, Trailers, Utility Vehicles,	10	Good	16	**$1,675,000**
Software & Technology	Laptops, Desktops, Fire Specific Software	5	Good	10	**$220,000**
				Total Rep Value	**$118,458,000**

All values are shown in 2024 dollar values.

The initial plan attempts to include all assets required to deliver Fire service. It is acknowledged that as this is the 1st DAMP, additional assets will be included in the future. As assets are acquired, disposed of, discovered or are considered material, they will be included in future plans. Various asset parameters such as age, condition, estimated service life and replacement costs will be updated regularly to ensure the data confidence of the plan is sufficient to support evidence-based investment decisions.

Facilities - Currently, CKFD has 19 Fire Halls, of which 4 are shared locations. Three of the locations are shared space with EMS (paramedics). For this plan, the replacement costs for the three shared facilities will be considered part of the Fire Department's DAMP, and the costs to share the facilities will be considered an operational cost for CKFD. The shared locations are;

- **Blenheim Fire Station #18 -** Charles Street
- **Thamesville Fire Station #8 -** Industrial Road
- **Tilbury Fire Station # 19 -** Superior Street

The final shared space is **Station #1**, which currently shares its space with the Civic Centre.

Fire Station #1- Main Bays

Vehicles - The replacement costs for emergency service vehicles include the purchase cost and all the costs required to outfit them and ensure they are fit for use. Included in the outfitting costs are;

- Radio and communication devices
- GPS equipment
- Logos and Emergency vehicle identification
- Sirens and emergency lighting
- Vehicle identification numbering

CKFD is currently experiencing significant delivery delays for its fire apparatus. This poses a challenge in ensuring that CKFD will have the necessary assets renewed within their desired useful life. If vehicles surpass the estimated service life (ESL), it will lead to increased reactive and planned maintenance costs, as well as higher operational expenses. The recommended ESL for apparatus is 25 five years.

Current Fire Apparatus Inventory

Aerial Truck

Quantity - 7
Replacement Cost - $12.6 Million
Average Age - 12 Years

Pumper Truck

Quantity - 21
Replacement Cost - $27 Million
Average Age - 12 Years

Rescue Truck

Quantity - 18
Replacement Cost - $11.8 Million
Average Age - 13 Years

Tanker Truck

Quantity - 18
Replacement Cost - $9 Million
Average Age - 13 Years

CKFD maintains eight antique fire trucks in its inventory that are intended for something other than operational use. These trucks, dating from 1930 to 1959, are preserved to honour their historical significance. They are considered to have no replacement cost value since they will never be renewed. While these antiques incur operational costs, these expenses are significantly lower than those of a typical truck, as they are not deemed serviceable or suitable for use.

Personal Protective Equipment - A considerable array of PPE is essential for the safety of fire responders to ensure they are equipped to manage hazardous situations safely. This equipment includes bunker gear items such as turnout coats and pants, self-contained breathing apparatus (SCBA), boots, helmets, and more.

Turnout Coats and Pants - Each full-time firefighter is issued two sets of turnout gear, while volunteer firefighters receive one set. The gear is tailored to each firefighter to ensure optimal protection. These assets are inspected at least twice a year and after every use. If the gear remains in good condition, it must be replaced after ten years as per legislative requirements.

Self-Contained Breathing Apparatus (SCBA) - SCBAs are essential for providing airway protection against toxic gases and harmful particulates from fires. They operate under positive pressure and undergo hydrostatic testing annually. Inspection procedures are in place to verify that the equipment is safe and suitable for use.

Helmets & Boots - The boots and helmet are required safety gear. The helmet is made of thermoplastic to meet regulations and maximize safety for the wearer, and the boots are puncture-resistant and must meet standards for thermal protection. These components are renewed when;

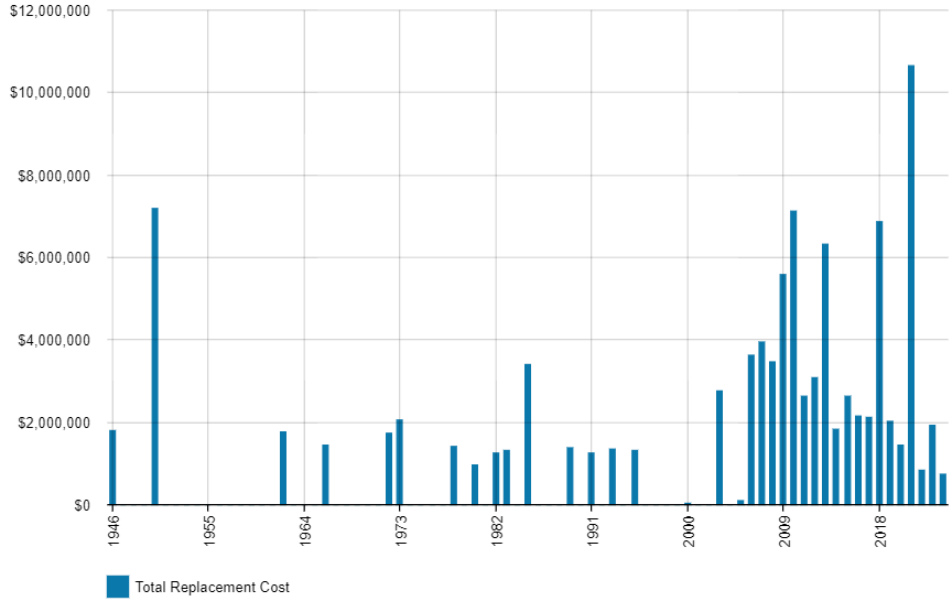
1. There is a defect that cannot be repaired and would compromise the wearer's safety
2. When they are legislatively required to be replaced

Boots and helmets are planned for renewal every 10 years.

Future iterations of this DAMP will expand on the asset registry information to include communications, life-saving equipment, and an in-depth analysis of facilities.

The age of an asset plays a crucial role in asset management, serving as a basis for planning. Assets typically have an estimated service life (ESL) that guides their replacement schedule. Assets with lower costs or criticality may be renewed based on age, serving as an interim measure for condition assessment until more robust methodologies are developed. However, it's essential to recognize that asset condition assessments based solely on age are generally regarded as low-confidence indicators. Age is a mandatory measurement required by O.Reg. 588/17. The age profile of the assets included in this DAMP is shown in **Figure 2.3.3.**

Figure 2.3.3 Assets Age Profile Graph



All values are shown in 2024 dollar values.

The age graph demonstrates the long-lived nature of CKFD's assets. Most of the assets that predate 2003 are the acquisitions of the Fire Halls across Chatham-Kent. The large spikes of investment dollars from 2003- 2024 represent the significant investment made in vehicles and equipment for CKFD. The large cluster of costs at the right side of the graph indicates that there will be significant challenges and financial demands over the next 20 years as the 2003 - 2024 cluster of assets has a much shorter service life, and most of those costs will need to be renewed in the next 20 years.

2.4. Asset Condition

The condition rating communicates the necessary maintenance for an asset to either return to an improved state, remain operational or achieve its expected lifespan. Condition is the leading indicator for maintenance activities.

The CKFD currently employs multiple methods to monitor the condition of Fire assets. Vehicles and equipment undergo mandatory annual inspections, along with ad hoc inspections. Specific PPE items, like Turnout Coats and Pants, are checked annually after each use to assess their condition. A standardized assessment of building conditions was carried out in 2024 to determine facility condition ratings. Going forward, the CKFD intends to create and implement a condition rating system for all critical assets to assist in future planning.

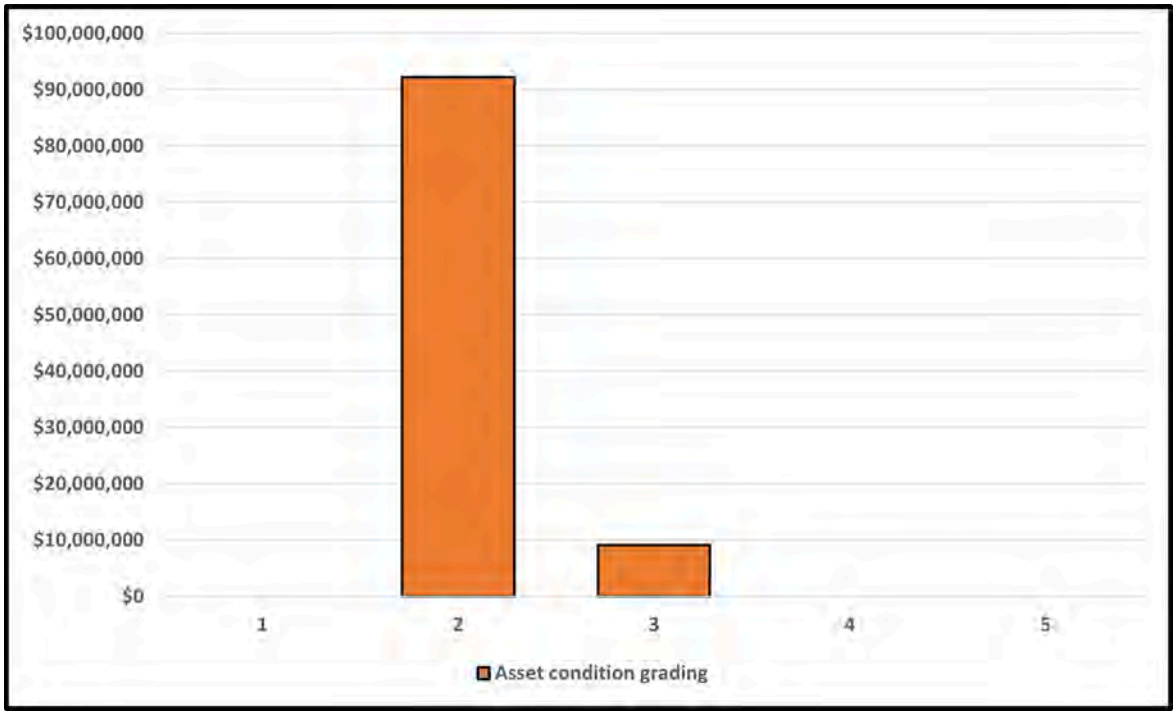
In future iterations of the plan, conditions will be measured using a 1 – 5 grading system, as detailed in **Table 2.4.1**. A consistent approach must be used in reporting asset performance, enabling adequate decision support. A finer grading system may be used at a more specific level, however, for reporting in the DAMP results are translated to a 1 – 5 grading scale for ease of communication.

Table 2.4.1: Condition Grading System

Condition Grading	Description of Condition
1	**Very Good**: free of defects, only planned and/or routine maintenance required
2	**Good**: minor defects, increasing maintenance required plus planned maintenance
3	**Fair**: defects requiring regular and/or significant maintenance to reinstate service
4	**Poor**: significant defects, higher order cost intervention likely
5	**Very Poor**: physically unsound and/or beyond rehabilitation, immediate action required

The condition profile of CKFD assets is shown in **Figure 2.4.2.**

Figure 2.4.2: Asset Condition Profile in Replacement Dollars



All figure values are shown in 2024 dollar values.

Currently, most Fire assets are in good condition, largely due to the critical nature of the service and the stringent regulatory service life guidance from provincial legislation and best practices. Although not all assets have formalized condition assessment processes, annual inspections often serve as de facto condition assessments. The CKFD will formalize its inspection results to correspond with a condition score in future iterations of the DAMP.

2.5. Asset capacity and performance

Assets are generally provided to meet design standards where available. However, there are insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in **Table 2.5.1**.

Table 2.5.1: Known Service Performance Deficiencies

Location	Service Deficiency
Fire Stations	Some fire stations have significant maintenance costs upcoming over the 10-year planning period (Station #2, #19)
Parking lots	Some parking lots are in need of renewal

The above service deficiencies were identified from the building condition assessment performed in 2024 and subject matter expert opinion.

3.0 LIFECYCLE MANAGEMENT

The lifecycle management plan will detail how CKFD plans to operate the assets at the agreed-upon levels of service by managing its lifecycle costs. These costs are categorized by lifecycle phases: **acquisition, operations, maintenance, renewal,** and **disposal**. It is budget-based but will evolve into a full lifecycle approach by 2027, where appropriate.

Once CKFD acquires an asset, the municipality must fund the remaining lifecycle costs, such as operations, maintenance and likely inevitable renewal. These other lifecycle costs are far more significant than the initial construction or purchase cost and are often multigenerational. Since lifecycle costs are spread across multiple decades, CKFD must approach its asset planning with a long-term view to ensure it effectively manages the assets and assists in making informed choices.

3.1 Acquisition Plan

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated to CKFD.

3.1.1 Selection criteria

Proposed acquisition of new assets and upgrade of existing assets are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrades and new works should be reviewed to verify that they are essential to the CKFD's needs. The proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled for future work programs. The priority ranking criteria are detailed in **Table 3.1.1.**

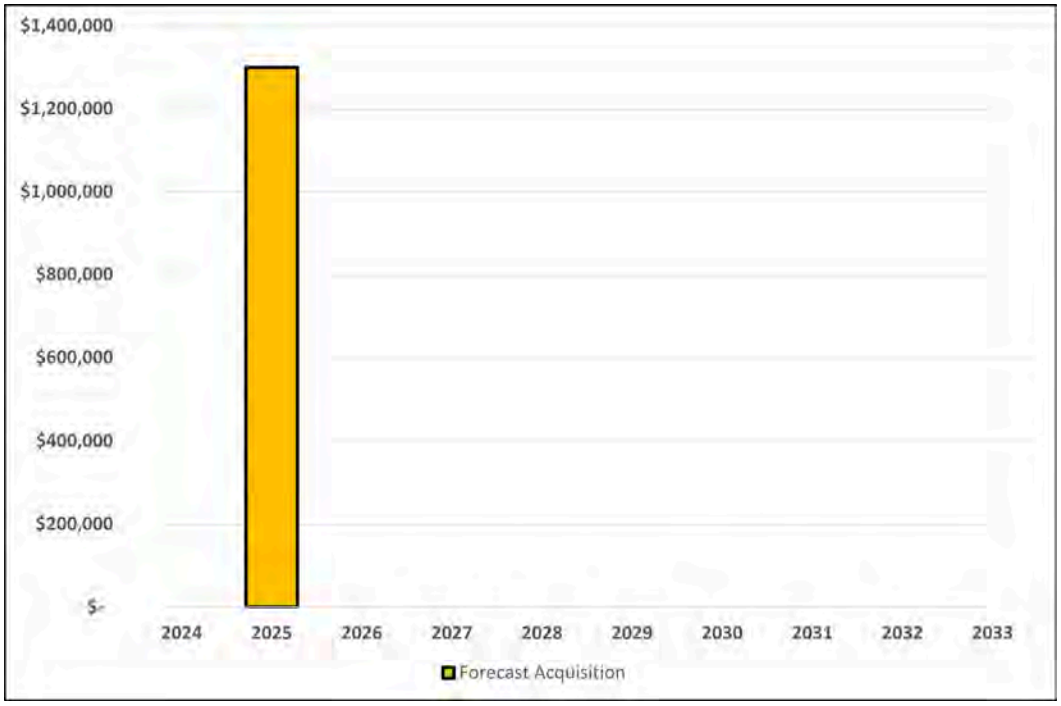
Criteria	Weighting
Increase to Level of Service	45%
Legislative Requirements or Obligations	45%
Emerging Technology	10%
Total	100%

Table 3.1.1: Acquired Assets Priority Ranking Criteria

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarized in **Figure 3.1.1** and shown relative to the proposed acquisition budget. At this time, the only Acquisition CKFD will undertake during the 10-year planning period is the purchase of a Heavy Rescue truck that will be available for use in the 2025 - 2026 timeline.

Figure 3.1.1: Acquisition Summary



All figure values are shown in 2024 dollar values.

Heavy Rescue Trucks generally carry specialized tools and equipment for automobile extrication, urban search and rescue, trenches and high-angle work. The expected cost for the Heavy Rescue with outfitting costs is approximately **$1.3 Million,** and the vehicle is expected to have a service life of 25 years.

CKFD Command Vehicles

When Chatham-Kent commits to new assets, it must be prepared to fund future operations, maintenance and renewal costs. Chatham-Kent must also account for future renewal planning when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by Chatham-Kent.

Expenditure on new assets and services will be accommodated in the long-term financial plan (LTFP), but only to the extent of available funding.
At this time, there are sufficient reserves to acquire the Heavy Rescue Truck, although there may be unforeseen costs as this is the first apparatus of this type that Fire has ever acquired.

3.2 Operations Plan

Operations encompass routine tasks to support CKFD delivery. Common operational activities include staff costs, volunteer call-out costs, licensing and insurance, fuel, facility utility expenses, annual software fees, obtaining licenses, conducting training sessions, and inspecting assets (Vehicles, SCBAs, Turnout Gear). These tasks are essential for the service's daily operations.

CKFD is a service driven by its personnel, and the costs associated with employees constitute a substantial part of the operational investment required to provide Fire & Rescue services. For CKFD to function efficiently and effectively, substantial staffing is necessary to attain the desired service level. Currently, CKFD employs;

- **72 Full-time Firefighters**
- **270 Volunteer Firefighters**
- **8 Leadership and Administrative staff**

The staff provides CKFD services throughout the municipality, responding to all emergency calls, conducting public education, performing fire safety building inspections, open water rescues and managing the Emergency Management Program as outlined in the Municipality of Chatham-Kent's Emergency Response Plan.

Over the 10-year planning period, CKFD forecasts it will invest;

- **$135,803,000 in staff cost**
- **$5,484,000 in dispatching costs**
- **$641,000 for uniform costs**
- **$746,000 for training and development**

Regular operational activities would be beneficial for reporting on the costs each year. At the time of writing this DAMP, it was not possible to adequately separate some of the costs to detail how much is invested each year for specific programs such as community education, firefighter annual training, vehicle inspections, inspections for PPE, insurance costs, etc. Over the next three years, CKFD will separate those costs to ensure that they can be included in the operational explanations and connect the costs to specific technical levels of service.

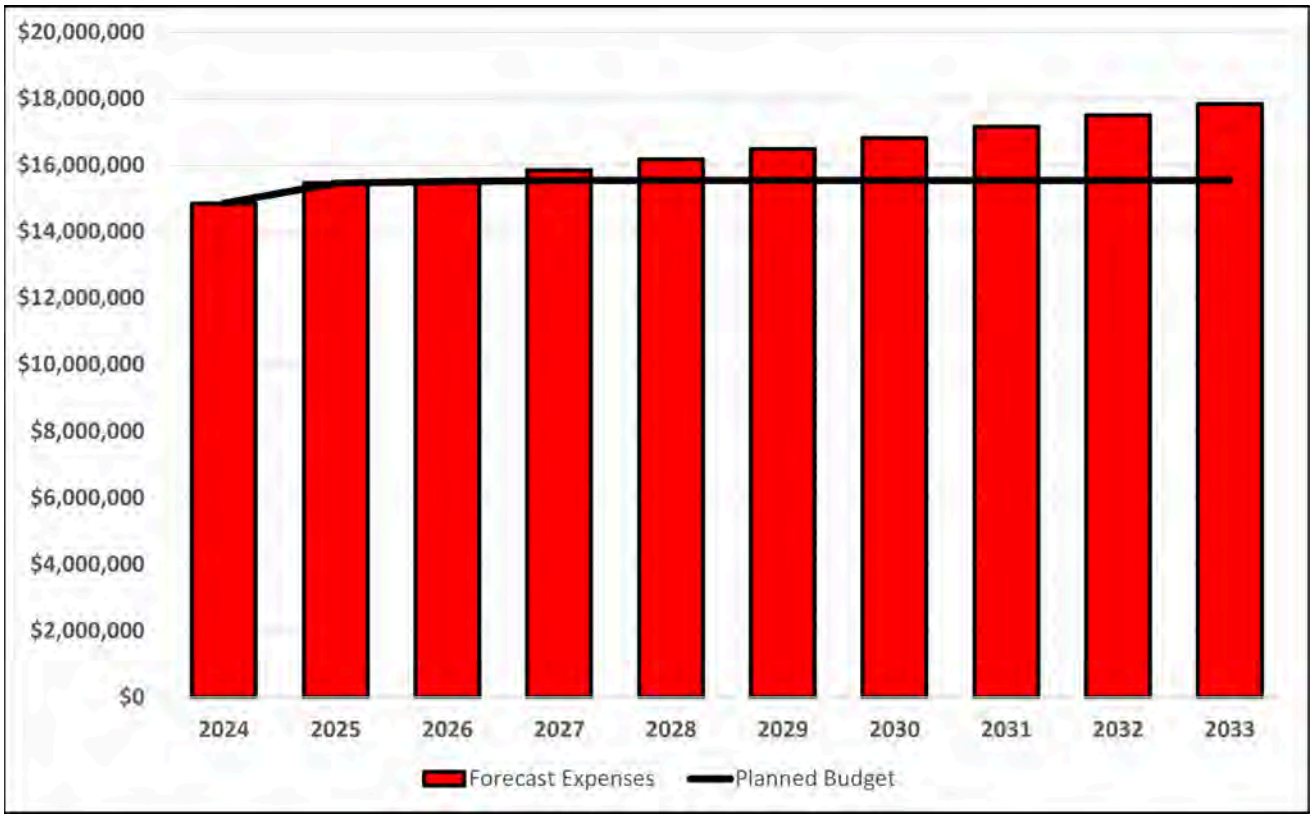
Other influences that will impact the operational budget include inflation, wage negotiations, and changes to levels of service. These impacts will be considered in greater detail in future DAMPs.

Summary of forecast operations costs

Forecast operations costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, future operations costs are forecast to increase. If assets are disposed of, forecast operations costs are expected to decrease. Changes in levels of service directed by the council will also affect the operational forecasts.

Figure 3.2.1. shows the forecast operations costs relative to the proposed operations Planned Budget.

Figure 3.2.1: Operations Summary



All figure values are shown in 2024 dollar values.

The operational budget levels are insufficient to meet the projected service levels throughout the ten-year planning horizon. This is partly due to inflationary projections of 2% each year past 2027. Wage negotiations every four years impact these costs and will need to be monitored for accuracy in the projections and the budget. Where operational budget allocations may lead to reduced service levels, the associated service consequences and risks, where possible, have been identified. They are emphasized in the DAMP, with service risks considered in the Infrastructure Risk Management Plan. Future iterations will more effectively communicate the consequences of an insufficient budget once the service levels are established in 2025.

Table 3.2.2: Operations Budget Trends

Year	Operations Budget
2024	$14,853,000
2025	$15,463,000
2026	$15,517,000
2027	$15,535,000

3.3 Maintenance Plan

Maintenance should be viewed as the ongoing management of deterioration. The goal of planned maintenance is to proactively apply the appropriate interventions to assets, ensuring they achieve their intended useful life. Maintenance doesn't substantially prolong the life of an asset; it is the actions necessary to enable assets to meet their expected lifespan by restoring them to a preferred 'improved' condition.

Proactive maintenance planning dramatically diminishes the need for reactive maintenance, which carries a greater risk to human safety and incurs higher financial costs. It is crucial for Chatham-Kent to strategically plan and adequately fund its maintenance activities to guarantee the reliability of CKFD assets and the achievement of the expected service level.

Examples of typical maintenance activities include apparatus repairs, pump replacements, component replacements, and a new roof on a fire station, along with the appropriate staffing and material resources required to perform these activities. CKFD will strategically plan and adequately finance its maintenance activities to maintain the desired service level.

Summary of forecast maintenance costs

Forecast maintenance costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, future maintenance costs are forecast to increase. If assets are disposed of, forecast maintenance costs are expected to decrease. Some of the major maintenance items that have been approved in the multi-year budget include;

2024

- Boiler replacement Fire Hall #1
- Roof Replacement at Thamesville Station
- Parking Lot repairs/surfacing at Highgate and Maynard Stations

2025

- HVAC Replacements at Stations #4, #12, #15, #16, #17

2026

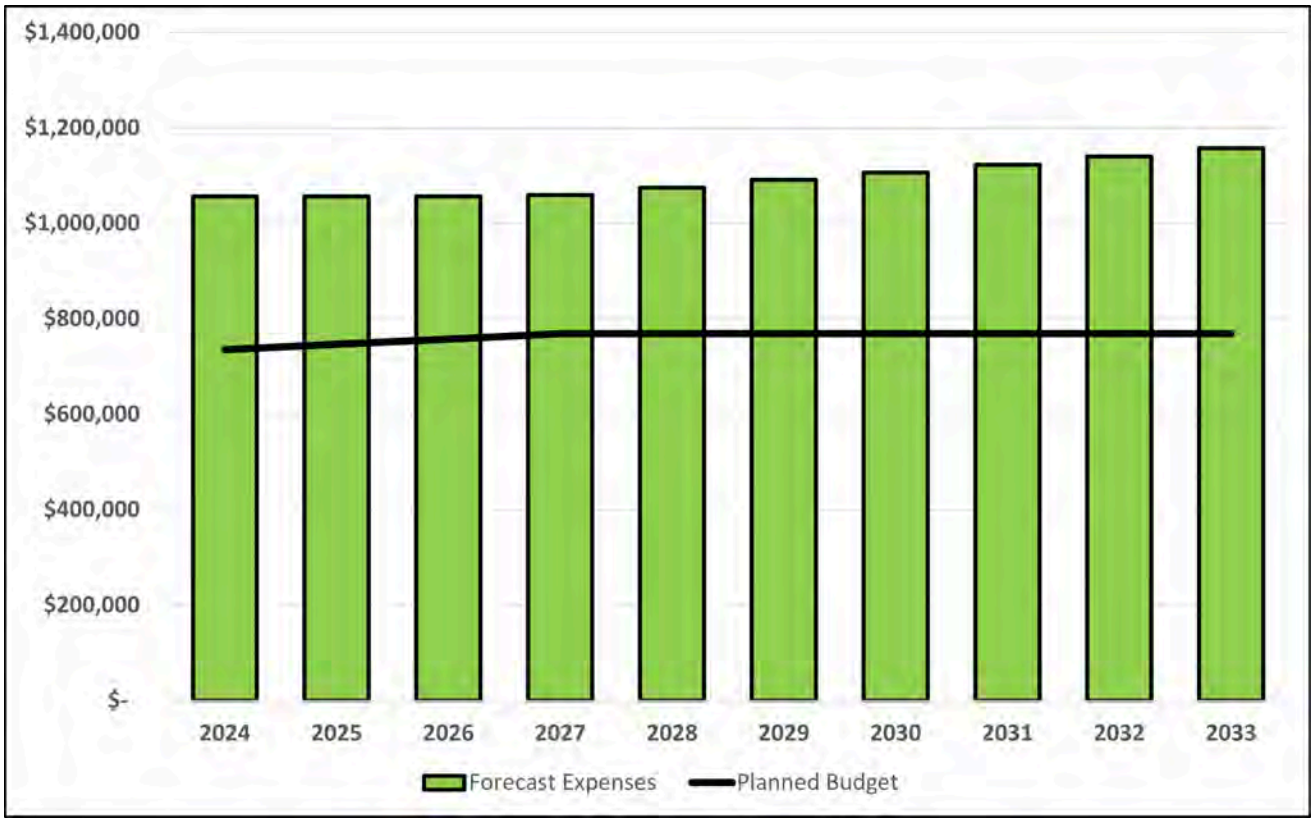
- Window/Door Replacements at Bothwell, Wallaceburg, Tilbury & Station #2
- Roof Replacement at Bothwell,
- Flooring Replacement at Dresden, Harwich, and Ridgetown stations

The budget costs also include planned and reactive maintenance costs required for:

- **Repairs to Firefighter PPE** - Turnout Coat and Pants/SCBAs require minor maintenance due to wear and tear or age
- **Radio Repairs -** Communication devices often require minor maintenance activities such as component replacement to ensure they are in optimal condition
- **Facility Repairs** - Every building will require maintenance and the fire halls require sufficient funding to address reactive and planned maintenance activities
- **Vehicles -** All vehicles will require maintenance at some point. These typically are planned activities however, the significant costs are typically reactive such as when a pump fails on a truck
- **Equipment -** With the extensive equipment required to support a Fire Service, there are significant annual costs and activities required to keep it functional and in good working order

Figure 3.3.1 shows the forecast maintenance costs relative to the proposed maintenance Planned Budget. The large difference between the planned and forecasted budgets is due to the recent Building Condition Assessments performed in 2024 that identified previously unidentified maintenance work.

Figure 3.3.1: Maintenance Summary



All figure values are shown in 2024 dollars values.

In future iterations of DAMP (2025—Ongoing), Fire will implement lifecycle models to guide maintenance activities and report on the associated costs for those assets. This will offer enhanced clarity on expenditures, informing future acquisitions, budgeting, reserve allocations, and reporting obligations. The trend in maintenance budgets is shown in **Table 3.3.2.**

Year	Maintenance Budget
2024	$735,000
2025	$746,000
2026	$757,000
2027	$769,000

Table 3.3.2: Maintenance Budget Trends

Maintenance budget levels are considered to be inadequate to meet projected service levels. Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified. The DAMP highlights service risks, and the Infrastructure Risk Management Plan considers service risks. Staff assess and prioritize reactive maintenance using experience and judgment.

The total costs of vehicular maintenance and facilities maintenance will be known once further work can be done with internal staff and the information provided in the building condition assessments. Any maintenance that cannot be funded will be deferred. Deferred maintenance (i.e., works identified for maintenance activities that need to be completed due to available resources).

Fire Apparatus Monitoring Panel

3.4 Renewal Plan

Renewal is major capital work that does not significantly alter the original service provided by the asset but restores, rehabilitates, replaces, or renews an existing asset to its original service potential. Work beyond restoring an asset to its original service potential is considered an acquisition, resulting in additional future maintenance costs.

Assets requiring renewal are identified from the asset register data to project the renewal costs (replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year). **Table 3.4.1.** shows the typical useful lives of assets used to develop projected asset renewal forecasts**.** Asset useful lives related to CKFD were last reviewed on **May 1st, 2024.**

Table 3.4.1: Useful Lives of Assets

Asset (Sub) Category	Useful Life
Apparatus (Various Fire Trucks)	25 Years
Fire Halls	75 Years
Turnout Coats & Pants	10 Years
Self Contained Breathing Apparatus (SCBA's)	10 Years
Other Vehicles	7 -8 Years
Computer Hardware	4 -5 Years
Radios	10 Years

The estimates for renewals in this DAMP are based on the asset register method.

3.4.2. Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a Fire Hall with one of similar size and capacity) or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. purchasing a Heavy Duty Truck or Extrication equipment).

CKFD will prioritize renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Having high use and the subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs and
- It can potentially reduce lifecycle costs by being replaced with a modern equivalent asset that provides the equivalent service.

The ranking criteria used to determine the priority of identified renewal proposals is detailed in **Table 3.4.3.**

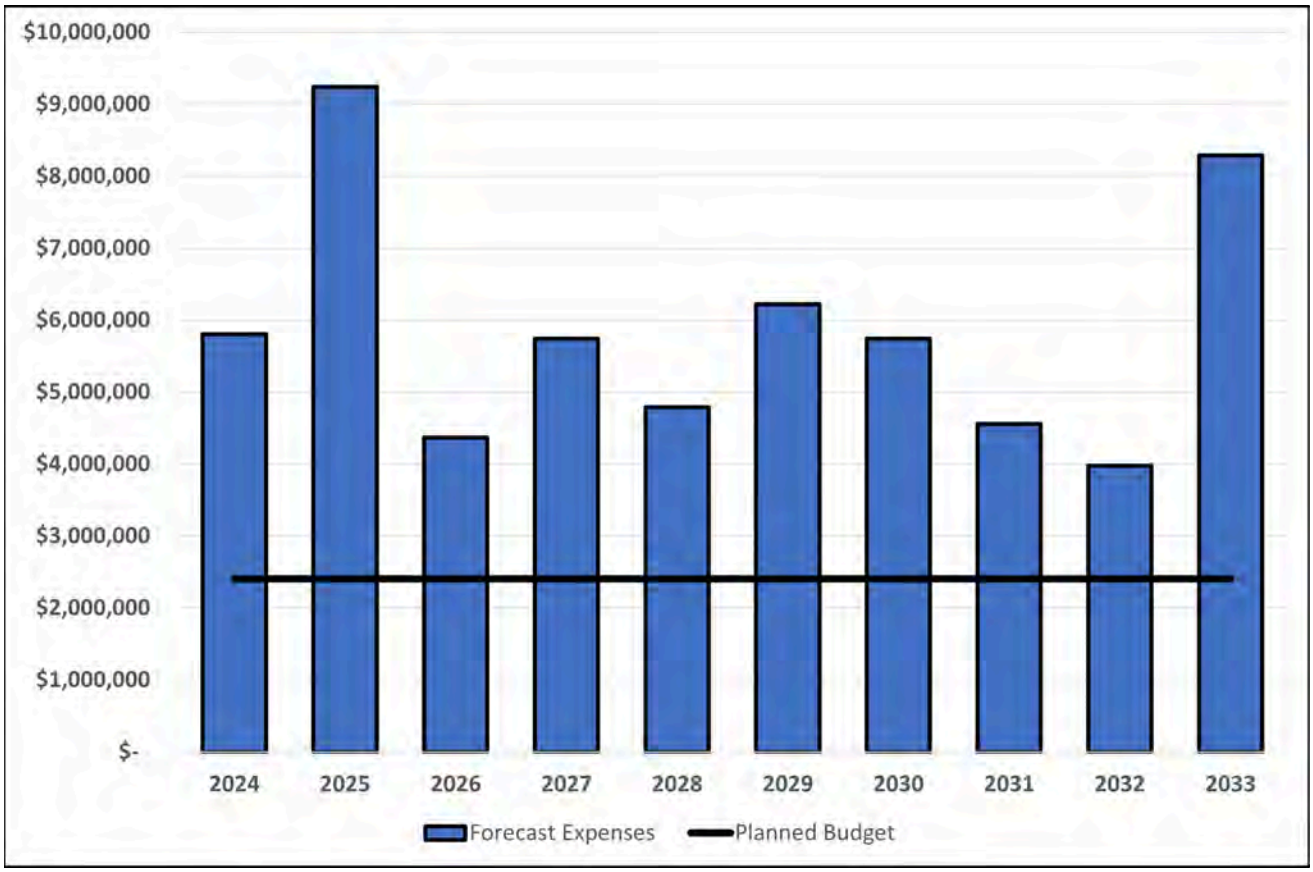
Table 3.4.3: Renewal Priority Ranking Criteria

Criteria	Weighting
Critical Asset Condition	30%
Legislative Requirements	30%
Lifecycle Cost Savings	20%
Council Strategic Priorities	20%
Total	100%

3.5 Summary of future renewal costs

Forecast renewal costs are projected to increase if the asset stock increases. In **Figure 3.5.1**, the forecast costs associated with renewals are shown relative to the proposed renewal budget**.**

Figure 3.5.1: Forecast Renewal Costs



All figure values are shown in 2024 dollar values.

The graph shown in **Figure 3.5.1** shows the intended renewals. At this time, there are insufficient funds allocated over the entire 10-year planning horizon to complete all planned renewals at this time. There are sufficient funds and reserves over the near term of the plan (1 - 3 years); however, with projected rising costs, it is reasonable to forecast there to be insufficient funding over the entire planning period.

At the time of writing this plan, investigations are still required to update available reserves for Fire. Fire contributes nearly **$2 Million** annually to the reserve for vehicle renewals, and the plan suggests it would reduce any reserves available by **$3.9 Million** annually on average during the 10-year planning period. Clarifying these asset balances and annual contributions has been identified as a continuous improvement item within this DAMP.

Over the next 10-year planning window, the Fire Department must invest approximately **$57,742,000.** This will include;

- **$3,000,000 to renew 500 Turnout Coat and Pants for Firefighters**
- **$36,654,000 to renew 39 Fire Apparatus**
  - **8 Tanker Trucks**
  - **15 Rescue Trucks**
  - **12 Pumper Trucks**
  - **4 Aerial Trucks**
- **$3,300,000 to renew 220 SCBAs**

Assets maintained beyond their expected useful life are marked as backlog items on the graph, which may increase operational and maintenance costs if their service is extended. This ESL plan is based on legislative requirements or industry best practices. Lifecycle models will be developed to confirm these assets' optimal ESL and evaluate their current lifespans.

Possible strategies to mitigate costs over the planning period will be explored during continuous improvement exercises and will include;

- Determining if ESLs can be extended on vehicles to reduce renewal needs.
- Complete Lifecycle models for each type of Apparatus to Forecast funding requirements over the entire ESL and optimize the timing of renewal
- Coordinate the timing of renewals to reduce large spikes in renewal needs.

Smoothing out the funding envelope for renewals throughout the planning process will ensure that budgeting needs can be forecasted accurately and minimize the administrative burdens on the procurement process.

Deferring renewals could seriously impact service delivery, as reliability factors directly into the Fire Department’s ability to respond to emergencies. Changes to the ESL of certain equipment should still be considered; however, the criticality of the service will be considered in that analysis.

3.6 Disposal Plan

Disposal includes any activity associated with disposing of a decommissioned asset, including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in **Table 3.6.1**. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

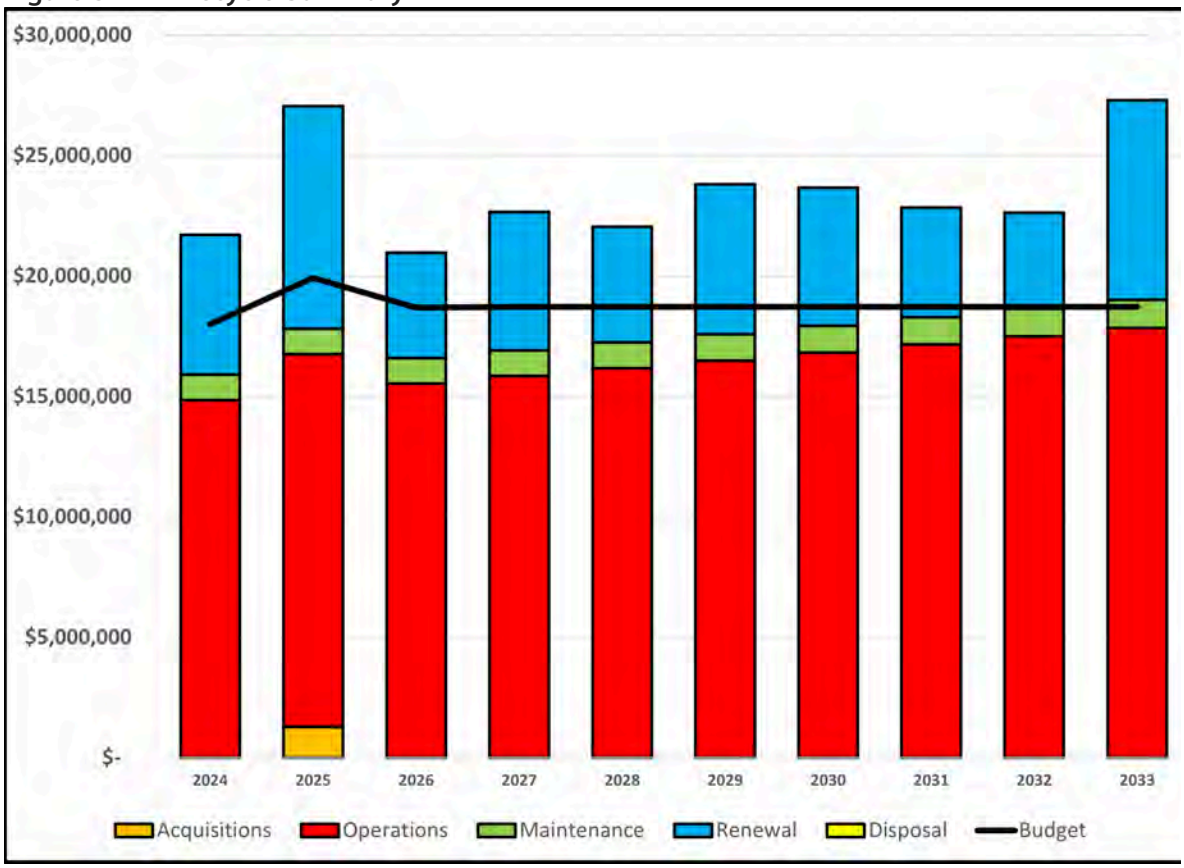
Table 3.6.1: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operation & Maintenance Annual Saving
Pumper Truck	Heavy Rescue will be purchased to meet changing service needs	**2025-2026**	Possible minor gain on disposal.	Negligible with Heavy Rescue absorbing any savings that would be realized.

3.7 Summary of asset forecast costs

The financial projections from this asset plan are shown in **Figure 3.7.1.** These projections include forecast acquisition, operation, maintenance, renewal, and disposal costs.

Figure 3.7.1: Lifecycle Summary



All figure values are shown in 2024 dollar values.

The forecast costs are shown relative to the proposed budget. The bars in the graphs represent the forecast costs needed to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimated amount of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving the balance between costs, levels of service and risk to achieve the best value outcome.

During the majority of the planning period, there were sufficient funds to operate normally with little to no impact on the levels of service provided. There are sufficient funds in reserves to complete most of the initial renewals; however, over the life of the plan, insufficient funds were transferred to the Fire reserve to ensure all assets could be renewed in accordance with the stated ESL.

The projections recognize that maintenance impacts may become apparent starting in 2032 and throughout 2033. Deferring renewal costs may even further exacerbate the operational shortfalls, as deferrals often lead to higher planned and reactive maintenance costs and even operational cost increases. Lifecycle models will help to inform the lifecycle projections and will be completed between 2024 and 2027. Eventually, these tradeoffs will impact Fire levels of service, such as response time.

4.0 LEVELS OF SERVICE

Levels of service describe the value that the Fire Department provides to the community and are typically spoken about in ‘measures.’ Utilizing service measures allows decision-makers to understand the outcome of investments, allowing those making choices to clearly understand how a dollar more or less will impact Chatham Kent’s ability to deliver its services. These measures also enable Chatham Kent to communicate with the public about the cost of the services they receive today and will be able to afford in the future.

Service levels are defined in four ways, legislative compliance, customer values, customer levels of service and technical levels of service.

4.1 Legislative Requirements

Meeting legislative requirements should be the minimum level of service Chatham Kent provides. These requirements often drive many lifecycle costs and staff tasks to ensure that Chatham Kent complies with all legislations ranging from Federal to Provincial or Chatham Kent's bylaws. There are many legislative requirements relating to the management of assets. Legislative requirements that impact the delivery of the Fire Department's service are outlined in **Table 4.1.1**.

Table 4.1.1: Legislative Requirements

Legislation or Regulation	Requirement
Fire Protection and Prevention Act, 1997	Sets out the legislative and regulatory framework for the establishment of fire protection in Ontario, which is a mandated municipal responsibility
Ontario Regulation (O. Reg) 343/22: Firefighter Certification NFPA Codes & Standards	Firefighters must meet competency standards through training and certification to enhance fire protection, prevention methods, and electrical safety.
O. Reg. 332/12: Building Code	Any facilities considered “Post-disaster”, like Chatham-Kent Fire Department facilities, must include additional provisions for seismic loading.
O.Reg.378/18: Community Risk Assessments	Every fire department must complete a community risk assessment every 5 years
O. Reg 380/04: Emergency Management and Civil Protection Act	In emergency management program development, Chatham-Kent must identify hazards, assess risks to public safety, and determine vulnerable facilities and infrastructure.
Occupational Health and Safety Act	This act guides operational activities, processes, inspections and improvements across the lifecycle of CKFD assets including items such as upgrades to facilities

Fire Protection and Prevention Act, 1997

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

- Establish a program in the municipality which must include public education for fire safety and specific components of fire prevention; and,
- Provide other fire protection services necessary to the municipality's needs and circumstances.

When Chatham-Kent establishes its Fire Department, the Council is obligated to appoint a Fire Chief responsible for delivering fire protection and rescue services. Fire protection services include:

- Fire suppression, fire prevention and fire safety education
- Mitigation and prevention of the risk created by the presence of unsafe levels of carbon monoxide and safety education related to the presence of those levels;
- Rescue and emergency services.
- Communication in respect of anything described above
- Training of persons involved in providing anything described above

O. Reg 343/22 Firefighter Certification NFPA Codes & Standards
Firefighters are required to meet minimum competency standards to carry out their duties effectively. This competency is attained through training and certification, which enhances fire protection and prevention methods, electrical safety, and other related safety objectives. It involves acquiring and applying information, fostering education and research in these areas, and ensuring the collaboration of its members and the public to establish adequate measures against the loss of life and property.

O.Reg.378/18: Community Risk Assessments
Every municipality and fire department must complete and review a community risk assessment no later than five years from the day the previous assessment was completed. The municipality and fire department must use the community risk assessment to inform decisions about the provision of fire services.

O. Reg 380/04: Emergency Management and Civil Protection Act
As part of developing an emergency management program, Chatham-Kent must identify and evaluate the hazards and risks to public safety that could lead to emergencies and pinpoint the facilities and infrastructure components that are vulnerable to these emergencies.

4.2 Customer Research and Expectations

This DAMP is prepared to facilitate consultation before the Fire Department adopts levels of service. Future revisions of the DAMP will incorporate customer consultation on service levels and costs required to provide the fire service. This will assist the Council and stakeholders in matching the level of service required, service risks and consequences with the customer's ability and willingness to pay for the service.

4.3 Customer Value

Service levels are defined in 4 ways: legislative compliance, customer values, customer levels of service and technical levels of service. **Customer Values indicate:**

- what aspects of the service are important to the customer,
- whether they see value in what is currently provided and
- the likely trend over time based on the current budget provision

Table 4.3.1: Customer Values

Customer Values	Customer Satisfaction Measure	Current Feedback	Expected Trend Based on Planned Budget
Excellent response times to emergency calls	To be determined (TBD) in 2025	TBD in 2025	TBD in 2025
Experienced and knowledgeable Firefighters	TBD in 2025	TBD in 2025	TBD in 2025
Appropriate Level of Service for the community	TBD in 2025	TBD in 2025	TBD in 2025

4.4 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

Condition How good is the service … what is the condition or quality of the service?
Function Is it suitable for its intended purpose …. Is it the right service?
Capacity/Use: Is the service over or underused… does CKFD need more or less of these assets?

In **Table 4.4.1.** under each of the service measure types (Condition, Function, Capacity/Use)**,** there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

These are measures are subjective in nature however they are important inputs for the DAMP as they inform what the desired level of service.

Table 4.4.1: Customer Level of Service Measure

Type of Measure	Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	CKFD meets the needs of the community	% of survey respondents opinions on the overall service	TBD in CK resident survey 2025	TBD once 2025 Survey Complete
Function	Achieve reasonable response times that align with legislative requirements and the needs of the Municipality	Desired Response time' as per CK Resident survey 2025	TBD in CK resident survey 2025	TBD once 2025 Survey Complete
Capacity	Ensure that CKFD has adequate resource capacity to respond reliably to emergencies and meet the planned level of service	CK resident 'desired response time' as per survey 2025	TBD in CK resident survey 2025	TBD once 2025 Survey Complete

Further investigation is necessary to ensure that customer service levels are regularly measured, allowing CKFD to consider various options to meet the community's evolving needs and expectations. The goal is to consistently engage in developing baseline community measurements and to continue the process of creating trend analysis data that will guide future decisions.

4.5 Technical Levels of Service

Technical Levels of Service – These represent lifecycle performance measures that gauge how CKFD intends to attain desired customer outcomes, showcasing effective performance, compliance, and management. These metrics will illustrate the alignment of CKFD service delivery with customer values and act as potential levers to affect and influence Customer Levels of Service. CKFD will track specific lifecycle activities to evidence service performance in meeting the desired service level and to shape customer perceptions of the services received from the assets.

These are measures of fact related to the service delivery outcome (e.g., the number of occasions when service is unavailable or the proportion of replacement value by condition %'s) to provide a balance compared to the customer perception, which may be more subjective.

Delivering customer values and impacting the achieved Customer Levels of Service are operational or technical measures of performance. These technical measures relate to the activities and allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance. Technical service measures are linked to the activities and annual budgets covering:

Acquisition – the activities to provide a higher level of service (e.g. increasing station quantities) or a new service that did not exist previously (e.g. new community safety or inspection program).

Operation – the regular activities to provide services (e.g. responding to emergency calls, PPE inspections, training, service programs, total staff hours, Bunker Gear cleansing, energy costs, etc.

Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. fixing radios, Fire Engine repairs, building and structure repairs),

Renewal – the activities that return an asset's service capability up to what it had originally provided (e.g., replacing firetrucks, Fire station replacement, extrication equipment replacement).

Service and asset managers plan, implement, and control technical service levels to influence service outcomes. **Table 4.5.1.** shows the activities expected to be provided under the current 10-year Planned Budget allocation and the Forecast activity requirements being recommended in this DAMP.

Table 4.5.1: Technical Levels of Service

Lifecycle Activity	Level of Service Statement	Activity Measure	Current Performance	Recommended Performance
Acquisitions	Ensure all new acquisitions follow purchasing policy and procedures	Review acquisitions RFP/Tender process to ensure policies followed	TBD after Heavy Rescue Purchase (2025 - 2026)	100% meets policy and procedures
Operations	Ensure personnel are trained and certified in accordance with CKFD standards and meet legislative compliance.	% of Active Firefighters completed annual certification	TBD 2025	100 %
Operations	Ensure compliance with legislative requirements and meet CKFD standards.	% of Turnout Gear that completed annual inspection	TBD 2025	100% Compliant
Operations	Ensure compliance with legislative requirements and meet CKFD standards.	Community Risk assessment Plan meets legislative requirement and is valid	100% Compliant	100% Compliant
Operations	CKFD has sufficient staff and assets to respond to emergency call outs	# of Truck Response's in pervious year (2024)	TBD 2025	TBD 2025
Disposal	Ensure CKFD data is current and of good quality	Ensure disposed assets are removed from all data bases	TBD 2025	TBD 2025

5.0 FUTURE DEMAND

5.1 Demand Drivers

Drivers affecting demand include population change, customer health emergencies, regulations, demographic changes, seasonal factors, vehicle ownership rates, consumer expectations, technological changes, economic factors, environmental awareness, etc.

5.2 Demand Forecasts

The present position and projections for demand drivers that may impact future service delivery and asset use have been identified and documented. **Table 5.4.1.** shows the impact of demand drivers that may affect future service delivery and asset use**.**

Demand for new services will be managed by managing and upgrading existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks, and managing failures. **Table 5.4.1.** shows opportunities identified for demand management to date. Future revisions of this DAMP will develop further opportunities.

5.3 Council Strategic Priorities for CKFD

Future iterations of the DAMP will detail the Council's strategic priorities and how they will impact service levels. The priorities will be operationalized through the DAMP and its continuous improvement initiatives.

5.4 Demand Impact and Demand Management Plan

Demand for new services will be managed by managing existing assets, upgrading existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks and managing failures. **Table 5.4.1.** shows the impact of demand drivers that may affect future service delivery and asset use.

Currently, CKFD is developing its Master Plan, which will address such implications as the projected 4.1% population increase over the planning horizon and its effect on projected service levels. With the population expected to grow over the next decade, additional pressures may exist to acquire new services to meet that demand. Future iterations of this plan will utilize the data within the Fire Master Plan to inform planning, budgeting and lifecycle decisions.

Demands will continue to change and influence Chatham-Kent, and the objective of the DAMP is to progressively measure, report, and elaborate on the impact of demand on the Fire service. Opportunities for demand management identified thus far are presented in **Table 5.4.1.**

Demand Driver	Current Position	10 Year Projection	Impact on services	Demand Management Plan
Population Growth	112,000	116,848	4.1% increase in population will see a corresponding increase in call volumes, increased vehicle costs, increased staffing costs, increased inspections and cleaning of vehicles	Incorporate increased costs with budgeting requests. Consider internal options for cost savings during service reviews
Legislative	Some of the facilities were constructed prior to the Ontario Building Code	Any new or newly occupied CKFD facility would be required to fulfill Ontario Building Code	All new constructions or leases must meet the seismic requirements, which are expensive and could restrict CKFD's capacity to readily obtain extra space.	Incorporate additional seismic requirement costs when completing lifecycle models to inform lease or purchase decisions

Table 5.4.1: Demand Management Plan

5.5 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Acquiring new assets, such as a new Fire Hall, would commit CKFD to ongoing operations, maintenance, and renewal costs for the period for which the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the LTFP in the finance section of the report.

CKFD is finalizing its Master Plan for the upcoming decade, which, upon adoption, will guide future DAMPs. The Master Plan will outline service demands, considering population growth and opportunities for asset acquisition and disposal. These opportunities will necessitate a funding analysis, which will be detailed in the 2025 DAMP.

6.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in **ISO 31000:2018** as: **'Coordinated activities to direct and control with regard to risk'.**

Chatham Kent is developing and implementing a formalized risk assessment process to identify service delivery risks and mitigate risks to tolerable levels. The assessment will identify risks that will result in:

- loss or reduction of the level of service,
- personal injury,
- environmental impacts,
- a 'financial shock',
- reputational impacts or
- other consequences.

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. It will also include developing a risk rating, evaluating the risks, and developing a risk treatment plan for those risks deemed unacceptable.

6.1 Critical Assets

Critical assets are defined as those with a high consequence of failure, causing significant loss or service reduction. Critical assets have been identified, and their typical failure mode and the impact on service delivery are summarized in **Table 6.1.1.** Failure modes may include physical failure, collapse, or essential service interruption.

Table 6.1.1. Critical Assets

Critical Asset(s)	Failure Mode	Impact
Vehicles (Apparatus)	Mechanical issues, vehicle shortage due to supply chains	Reduction in response times, unable to meet current and future call volumes at response time
PPE	Wear and tear, manufacturing defect, age	Increased reactive maintenance, reduced staff available for calls, acquire additional spares, increased lifecycle costs, may impact service delivery
Facilites	Major maintenance unable to be done due to funding shortfalls	Impact response times, increased reactive maintenance costs
911 Dispatch/ Communcations / Public Safety Communications & P25 Radio Infrastructure	Phone system failure, ITT equipment failure, essential service interruption	Unable to receive calls and updates from dispatch. Unable to receive call details (address, incident information, current status etc.)

By identifying critical assets and failure modes, CKFD can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at essential assets.

6.2 Risk Assessment

The risk management process used by Chatham Kent is an analysis and problem-solving technique designed to provide a logical process for selecting treatment plans and management actions to protect the community against unacceptable risks.
The process is based on the fundamentals of **International Standard ISO 31000:2018.**
The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, the development of a risk rating, the evaluation of the risk and the development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock,' reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the infrastructure risk management plan. **Table 6.2.1.** shows the residual risk and treatment costs of implementing the selected treatment plan. These critical risks and expenses must be reported to management and the council. This list is neither exhaustive nor comprehensive of all risks associated with CKFD. Subsequent versions of this DAMP will elaborate on risks and associated treatment costs.

Table 6.2.1: Risks and Treatment Plans

Asset Providing the Service	What can Happen	Risk Rating	Existing controls	Treatment Cost
Fire Trucks	Shortage/Long wait times for delivery when renewing Apparatus / Fire Trucks	High	Complete Major Maintenance on Ambulance to extend Useful Life Acquire Spare	**TBD in 2025** Cost varies greatly on type of spare to be acquired

Asset Providing the Service	What can Happen	Risk Rating	Existing controls	Treatment Cost
Facilities	Power Outage at facilities can impact service delivery	Medium	Backup Power / Generator for each facility, Regular inspection and testing.	**TBD in 2025**
PPE	Turnout Coat and Pants can be damaged beyond repair during fire response or training	High	Replace Immediately, Utilize spares	**$6,500 Per Set**

This is not an exhaustive list for all risks associated with CKFD. As the DAMPs develop over time this area will be expanded and demonstrate how much the existing controls mitigate the risk and at what cost.

This will inform future budget and risk management choices.

6.3 Infrastructure Resilience Approach

The resilience of the CKFD critical infrastructure is vital to customer service. To adapt to changing conditions, Chatham-Kent needs to understand its capacity to 'withstand a given level of stress or demand' and respond to possible disruptions to ensure continuity of service: resilience recovery planning, financial capacity, climate change risk assessment, and crisis leadership. CKFD does not currently measure resilience in service delivery in alignment with the AM process. This will be included in future iterations of the DAMP as further investigations are completed.

6.4 Service and Risk Trade-Offs

The adoption of this DAMP is guided by the goal of maximizing benefits from existing resources. Given that resources are not unlimited, some risks will inevitably remain unmitigated. Chatham-Kent will continue to review its risk registry and recognize the necessary trade-offs to maintain an acceptable level of risk tolerance.

If forecast work (operations, maintenance, renewal, acquisition or disposal) cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- As the condition of vehicles and buildings continues to deteriorate, it will result in a lower level of service or increased response times
- Increased maintenance costs for aging CKFD fleet if timely renewals are not funded
- Unable to expand service in-line with population growth
- Improve service response time for emergency requests as the population grows

6.4.1 What cannot be done

Some activities and projects cannot be undertaken within the next ten years.
These include:

- Increase the levels of operation, maintenance and renewal activities.
- Ensure that all future renewals outside the planning period can be completed, as the plan's scope is limited to a 10-year planning horizon.
- Renewing equipment in alignment with the desired ESL
- Improve the current levels of service without increased funding
- Allocate total maintenance costs within the DAMP that are part of the operational contract

6.4.2 Service trade-off

If forecast work (operations, maintenance, renewal, acquisition or disposal) cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- The condition of infrastructure assets will continue to deteriorate, resulting in a lower level of service.
- Lack of maintenance and renewal may compromise intergenerational equity.

6.4.3 Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may sustain or create risk consequences. These risk consequences include:

- As the condition of assets deteriorates, they may become unsafe.
- If CKFD assets do not meet current standards, the Authority could be at risk of litigation should an incident occur.
- We must prioritize maintenance and renewal works on components with very high safety risks and defer work on low- to medium safety risks.

These actions and expenditures are considered and included in the forecast costs and, where developed, the Risk Management Plan.

7.0 Climate Change Adaptation

Climate change will significantly impact assets and the services they provide. In asset management planning, climate change can be considered both a future demand and a risk. How climate change impacts assets will vary depending on the location and the type of services provided, as will how CKFD responds to and manages those impacts.

At a minimum, CKFD will consider how to manage its existing assets, given the potential climate change impacts on the region. The effects of climate change may significantly impact the assets CK manages and the services it provides. This can include;

- Impacting Asset Lifecycle Costs
- Affect the level of service that can be provided
- Increase demand for services
- Impact Risks involved with delivering services

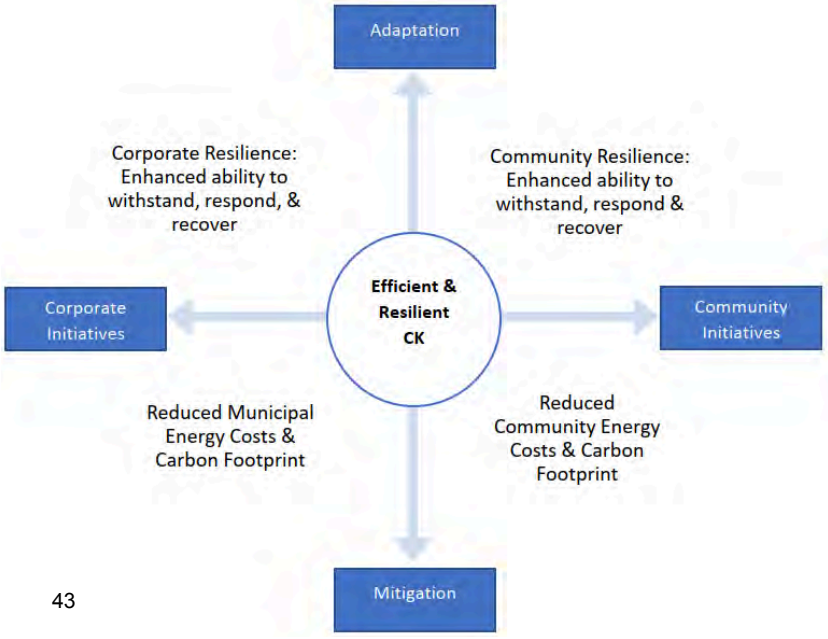
In the Asset Management Planning process, climate change can be considered a future demand and a risk.

The impacts of climate change on assets will vary depending on the location and the type of services provided, as will the way in which CK responds to and manages those impacts.
There have been many weather and climate-related impacts on the CK community, including the following:

- Extended summer heat waves in 2017 and 2018
- Severe rain storms of 2018 (and related flooding)
- Unseasonably wet spring and fall of 2019, which impacted crop production
- Record-breaking water levels within river systems and the Great Lakes in 2019 and early 2020 caused major erosion and flooding issues in the community

Recognizing these continuing climate change impacts, the Council declared a climate emergency in Chatham-Kent on July 15, 2019. It directed municipal staff to develop a climate change action plan (CCAP) to reduce CK's contribution to climate change (known as climate mitigation) and to enhance the community's resilience to climate change (known as climate adaptation).

The Municipality of Chatham-Kent is completing its CCAP, which will be presented to the Council and the public by the end of 2024. The CCAP actions presented in the CCAP report document will inform the Climate Section of the DAMPs in 2025. The CCAP actions will also be presented within the departments responsible for their completion.



Based on the Climate Atlas of Canada, historical climate patterns show that CCK's climate has become hotter, wetter, and wilder over the last six decades. This trend is expected to continue.

Hotter: Average annual temperatures have risen by 0.5°C and are expected to increase between 3.5°c and 5.8°c by the 2080s.

Wetter: Average annual precipitation has increased by 49.8mm (1.96in) and is expected to grow between 78mm and 127mm (5in) by the 2080s.

Wilder: Rainstorms have increased in frequency and severity, and seasonal precipitation patterns have changed, and this is expected to continue.

" From 1983 to 2008, insurers spent on average $400 million yearly on catastrophic claims; since 2009, the yearly average has risen to almost $2 billion. These" once in 100 years" events are happening more frequently and becoming more severe and costly" Statistics Canada, 2024)

Risks and opportunities identified to date are shown in **Table 7.0.1**

Climate Impact (Assets level or Service level)	Projected Position (in 10 years)	Potential Impact on Assets & Services	Climate Management Plan
Annual Precipitation (mm) increase	+45mm annually	Possible road washouts impacting levels of service such as response time	Regularly monitor weather conditions to ensure impacts can be mitigated as much as possible
Annual Very Hot Days, (+30 degrees Celsius), increase	+20 days, annually	Specific age demographics struggle with hotter temperatures. CKFD will see a higher call volume during peak temperatures in summer months.	Consider climate solutions for most vulnerable populations during Very Hot Days, Staff Training, Additional levels of service will be considered

Table 7.0.1 Managing the Impact of Climate Change on Assets and Services

Additionally, how Chatham-Kent constructs new assets should recognize that there is an opportunity to build resilience to climate change impacts. Building resilience can have the following benefits:

- Assets will withstand the impacts of climate change.
- Services can be sustained, and
- Assets that can endure may lower the lifecycle cost and reduce their carbon footprint.

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

8.0 FINANCIAL SUMMARY

8.1 Financial Sustainability and Projections

This section outlines the financial requirements derived from the data in the preceding sections of this DAMP. The financial forecasts will be refined through ongoing discussions about the desired service levels and as Asset Management expertise within Chatham-Kent matures. It is crucial to align the budgeting process, the LTFP, and the DAMPs to ensure that all the Fire department's needs are addressed while the municipality establishes a definitive financial strategy with measurable goals and targets.

Effective asset and financial management will enable the Fire department to ensure its services provide the appropriate level of service for the community to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the Municipality is transparently fulfilling its stewardship accountabilities. The LTFP is critical for the Fire department to ensure the network lifecycle activities, such as renewals, operations, maintenance, and acquisitions, can happen at the optimal time.

Reporting on service and financial performance to stakeholders guarantees that the Municipality is transparently fulfilling its stewardship responsibilities.

8.2. Financial Stewardship & Sustainability Measures

Two key indicators of sustainable service delivery are considered in the DAMP for this service area. The two indicators are the following:

- **Asset Renewal Funding Ratio** (proposed renewal budget for the next ten years / proposed renewal outlays for the next ten years shown in the DAMP) and
- **Lifecycle Funding Ratio** (proposed lifecycle budget for the following ten years / proposed lifecycle outlays for the next ten years shown in the DAMP).

Asset Renewal Funding Ratio - (ARFR)

Asset Renewal Funding Ratio **41%**

The Asset Renewal Funding Ratio (ARFR) is an important indicator that illustrates that over the next ten years, Chatham-Kent expects to have **41%** of the funds required for optimal asset renewal.

Lower **ARFR** typically occurs due to;

- Chronic underinvestment,
- A lack of permanent infrastructure funding from senior levels of government,
- A freeze on funding allocations from senior levels of government,
- Large spikes of growth throughout the years or amalgamations.

The ARFR is considered a stewardship measure that indicates whether Chatham-Kent is achieving intergenerational equity. Correcting this funding ratio so that it can meet its financial target over time is essential to ensuring the Fire department is considered sustainable.

If assets are not renewed at the appropriate timing, it will inevitably require difficult trade-off choices that could include:

- A reduction of the level of service and availability of assets;
- Increased complaints and reduced customer satisfaction;
- Increased reactive maintenance and renewal costs; and,
- Damage to Fire department's reputation and risk of fines or legal costs

The shortage of renewal resources will be tackled in upcoming DAMPs to ensure alignment with the LTFP. This approach will enable staff to devise options and strategies for addressing the long-term renewal rates challenges. Chatham-Kent plans to reassess its renewal allocations after the full inventory is verified and consolidated.

Lifecycle Funding Ratio – 10-year financial planning period -(LFR)

The current **10-year Lifecycle Financial Ratio is 80%**

This DAMP identifies the forecast operations, maintenance, and renewal costs required to provide an agreed-upon and affordable level of service to the community over a 10-year period. This provides input into 10-year financial and funding plans aimed at providing the required services in a sustainable manner. This forecast work can be compared to the proposed budget over the first 10 years of the planning period to identify any funding shortfall.

The forecast operations, maintenance, and renewal costs over the 10-year planning period are **$23,467,260** on average per year. The proposed (budget) operations, maintenance, and renewal funding is **$18,759,250** on average per year, giving a 10-year funding shortfall or **'Gap'** of **$4,708,000** per year.

This indicates that **80%** of the forecast costs needed to provide the services documented in this DAMP are accommodated in the proposed budget.

Funding an annual funding shortfall or funding 'gap' cannot be addressed immediately. The overall gap in funding for each of Chatham-Kents' services will require vetting, planning, and resources to begin incorporating gap management into future budgets. This gap will need to be managed over time to reduce it in a sustainable manner and limit financial shock to customers.

Options for managing the gap include;

- **Financing strategies** – increased funding, grant opportunities, envelope funding for specific lifecycle activities, long-term debt utilization;
- **Adjustments to lifecycle activities** – increase/decrease maintenance or operations, increase/decrease frequency of renewals, extend estimated service life, limit acquisitions or dispose of underutilized assets; and,
- **Influence level of service** - managing expectations or influencing demand drivers.

These options and others will allow the Fire department to manage the gap appropriately and ensure the level of service outcomes the customers desire. Providing sustainable services from infrastructure requires managing service levels, risks, forecast outlays, and financing to eventually achieve a financial indicator of **90-110%** for the first years of the DAMP and ideally over the 10-year life of the LTFP.

8.3 Forecast Costs (outlays) for the long-term financial plan

A gap between the forecast outlays and the amounts allocated in the financial plan indicates that further work is required to review service levels in the DAMP and/or financial projections in the LTFP. The initial DAMP only attempts to quantify the financial gap for the service. Future plans will focus on the methods and strategies to manage that gap over time to achieve sustainable services and intergenerational equity.

Chatham-Kent will manage any 'gap' by developing this DAMP, which will provide guidance on future service levels and resources required to provide these services in consultation with the community. **Table 8.2.1** shows the forecast costs (outlays) required for consideration in the 10-year LTFP. Providing services in a financially sustainable manner requires balancing the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the LTFP.

Table 8.3.1: Forecast Costs (outlays) for the Long-Term Financial Plan

Year	Acquisition	Operation	Maintenance	Renewal	Disposal
2024	-	$14,853,000	$1,056,383	$5,804,000	-
2025	$1,300,000	$15,463,000	$1,056,383	$9,240,000	-
2026	-	$15,543,000	$1,056,383	$4.372.000	-
2027	-	$15,853,000	$1,059,735	$5,741,000	-
2028	-	$16,170,000	$1,075,192	$4,794,000	-
2029	-	$16,493,000	$1,090,957	$6,225,000	-
2030	-	$16,822,000	$1,107,038	$5,744,000	-
2031	-	$17,158,000	$1,123,441	$4,557,000	-
2032	-	$17,501,000	$1,140,171	$3,978,000	-
2033	-	$17,850,000	$1,157,236	$8,288,000	-
Total	**$1,300,000**	**$163,706,000**	**$10,923,000**	**$58,863,000**	**-**

All figure values are shown in 2024 dollar values.

8.4 Funding Strategy

The proposed asset funding is detailed in Chatham-Kent's multiyear budget and LTFP. These operational and capital budgets outline the provision of funds, which are incorporated into the DAMP. The DAMP details the expenditure timeline and associated service and risk implications. Subsequent versions of the DAMP will offer service delivery choices and alternatives to optimize the use of limited financial resources.

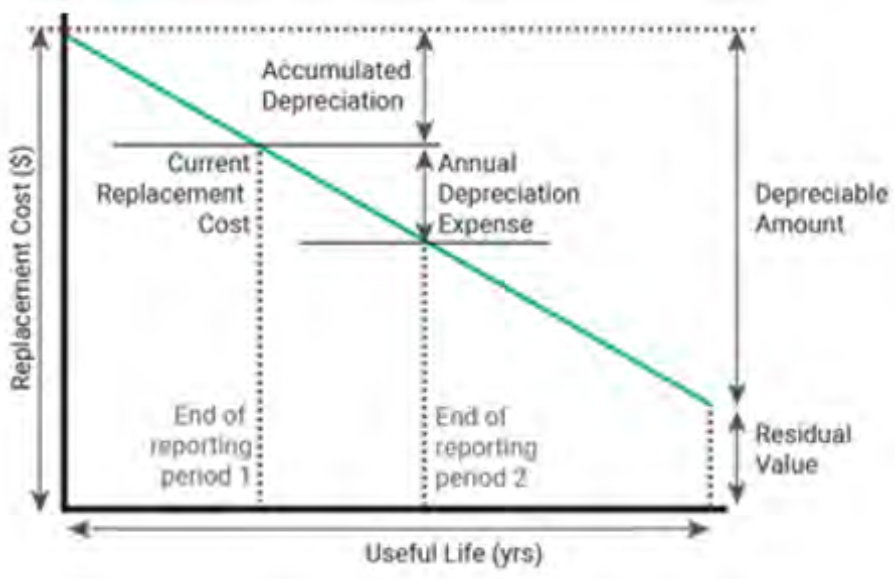
Fire does contribute annually to reserves for assisting in long term costs for the renewal of apparatus, vehicles, stations, equipment (SCBA’s, Radios etc.) however there is insufficient funds in the reserves to accommodate all forecast costs detailed within this plan. Future iterations will focus on the sustainability of the Fire service and determine how much is required to be contributed to the reserve and be available for future needs.

8.5 Valuation Forecasts

Asset valuations

Asset values are forecast to increase as additional assets are added to the service. As projections improve and are validated with market pricing, net valuations will likely increase significantly over the 10-year planning horizon. Additional assets will increase operations and maintenance costs in the longer term and future renewal costs.

Any asset disposals would decrease operations and maintenance needs in the longer term and remove the high-cost renewal obligations. At this time, it is not possible to separate the disposal costs from the renewal or maintenance costs; however, this will be improved for the next iteration of the plan. The best available estimate of the value of assets included in this DAMP is shown below.



The assets are valued utilizing Current Replacement Cost (Market Prices Index)

Table 8.5.1 Asset valuation table

Assets Valuation	Financial Value
Replacement Cost (Gross)	**$118,458,000**
Depreciable Amount	**$118,458,000**
Current Replacement Cost	**$ 42,941,000**
Annual Depreciation Expense	**$ 4,903,000**

8.6 Key Assumptions Made in Financial Forecasts

Some assumptions were necessary to compile this DAMP. This section details the key assumptions made in its development and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts. Key assumptions made in this DAMP are:

- Assumptions were made regarding the existing and planned budget for maintenance and renewal, using professional judgement.
- Omission of select disposal assets during this budget period; small projects will have a minor impact on disposal projections
- Budgets have been allocated based on the best available data on assets
- A 2% annual inflationary amount has been applied to the operational and maintenance forecast to reflect the projections that costs will increase over time
- Replacement costs are based on current market pricing and are determined to be a like-for-like replacement
- Maintenance forecasts are based on the current budget allocated and require further refinement to align the costs with technical levels of service
- Operational forecasts are based on current budget allocations and encompass anticipated needs that are known

8.7 Forecast Reliability and Confidence

This DAMP's forecast costs, proposed budgets, and valuation projections are based on the best available data. Current and accurate information is critical for effective asset and financial management. Data confidence is classified on an A-E scale by **Table 8.6.1.**

Table 8.6.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%
B. High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%
C. Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%
D. Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy ± 40%
E. Very Low	None or very little data held.

The estimated confidence level for and reliability of data used in this DAMP is shown in **Table 8.7.1.**

Table 8.7.1: Data Confidence Assessment for Data used in this DAMP

Data	Confidence Assessment	Comment
Demand drivers	Low	Future plans require further development to ensure drivers are known and measured appropriately
Growth projections	Medium	Standardized growth projections
Acquisition forecast	Medium	Possible growth in the future creates uncertainty and will be reviewed annually to improve quality
Operation forecast	Medium	Will improve once growth is established and continuous improvement items are completed
Maintenance forecast	Low	Requires further analysis and improvement
Renewal forecast - Asset value	Medium	Requires alignment with reserve contributions and ESL
Asset useful lives	Medium	Most align TCA practices. This will be improved and vetted annually
Condition modeling	Low	This requires improvement
Disposal forecast	Low	This requires improvement to process and administration of Disposals

The estimated confidence level and reliability of data used in this DAMP are considered **low-medium** confidence.

9.0 PLAN IMPROVEMENT AND MONITORING

Status of Asset Management Practices
ISO 55000 Refers to this as the Asset Management System

9.1. Accounting and financial data source

This DAMP utilizes accounting and financial data. The source of the data is:

- Chatham-Kent 2024 - 2027 Multi-Year Budget (Capital & Operating)
- Internal Market Price Valuations
- AM Software Multi-Year Forecasting Models
- Council Reports
- Financial Exports from various systems
- Fleet procurement documents

9.2. Asset management data sources

This DAMP also utilizes asset management data. The sources of the data are;

- Asset Registers
- Insurance Data
- Tangible Capital Asset Data
- Building Condition Assessment Data
- Fleet Vehicle Data
- Inspection Logs
- Subject Matter Expert Knowledge and Anecdotal Information

9.3 Continuous Improvement Plan

It is important that Chatham-Kent recognizes areas within the DAMP and within its planning processes that require future improvements to ensure effective asset management and informed decision-making. The tasks listed below are essential to improving the DAMP and the municipality's ability to make evidence-based and informed decisions. These improvements span from improved lifecycle activities, financial planning, and plans to improve the assets physically.

The Improvement Plan, Table 9.3.1 .highlights proposed improvement items requiring further discussion and analysis to determine feasibility, resource requirements and alignment to current work plans. Future iterations of this DAMP will provide updates on these improvement plans. The costs and resources to complete each task have not been included in the lifecycle models to data, and resource requirements would need to be reviewed for internal resource-driven projects.

The improvement plan generated from this DAMP is shown in Table 9.3.1.

Table 9.3.1: Continuous Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline
1	**Perform age analysis for Fire Fighter PPE to identify peaks in investment timing**	Fire, AQ&M	15 FTE Hours (within existing capacity)	2024
2	**Formally track age and develop condition methodologies for major equipment using AM 5-point scale**	Fire, AQ&M	20 FTE Hours Resources)	2024 - 2026
3	**Complete lifecycle model for each type of Fire Truck/Apparatus**	Fire, AQ&M	50 FTE Hours	2024 - 2027
4	**Improve Process to collecting Asset Unit Costs**	Fire, Finance	35 FTE Hours (Within Existing Resources)	2025
5	**Identify gaps in data and prioritize what can be improved**	Fire, AQ&M	10 FTE Hours (within existing capacity)	2025
6	**Review Fire reserves to determine funding allocation required over 10-year planning horizon**	Fire, Finance, AQ&M	15 Hours FTE	2025
7	**Implement an asset registry for all Fire Department assets for Mandatory AM Information**	Fire, AQ&M	40 FTE Hours	2025 - 2027

8	**Implement Risk Treatment Plans for Risks identified within the plan**	Fire, (Various Other Departments	120 FTE Hours	2025 - 2027
9	**Annual update of response time performance for Technical LOS**	Fire, AQ&M	4 Hours FTE	Q1 2025
10	**Define Level of Service for 2025 DAMP**	Fire, AQ&M	15 Hours FTE	Q2 2025
11	**Complete Community Risk Assessment**	Fire	300 FTE Hours	2027

The detailed improvements are intended to ensure that CKFD can achieve sustainable service over time. Some initiatives are required to meet legislative requirements, and others improve service or data quality. While not legislative, some initiatives are intended to find financial efficiencies or are required for other operational improvements.

Upon council approval, certain improvements can be accomplished within staffing capacity and should be included as work plan items for the Fire department. Other initiatives necessitate resources beyond those allocated in the current budget. Should resources be inadequate for the identified items, the strategy is to postpone them. Annually, the DAMP will be revised to align Continuous Improvement items with the opportunities and constraints of the budgetary provisions.

9.4 Monitoring and Review Procedures

This DAMP will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs, and proposed budgets resulting from budget decisions.

The DAMP will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the LTFP or will be incorporated into the LTFP once completed.

The DAMP has a maximum life of one year and will be updated annually. This plan will be completely revised and updated in 2027 to prepare the Fire Department for the 2028 four-year budget process.

9.5 Performance Measures

The effectiveness of this DAMP can be measured in the following ways:

- The degree to which the required forecast costs identified in this DAMP are incorporated into the LTFP,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures consider the 'global' work program trends provided by the DAMP,
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans,
- The Asset Renewal Funding Ratio achieves the Organizational target (this target is often 90 – 100%).

Document Control

Rev No	Date	Revision Details	Author	Reviewer	Approver
1	August 2024	1st Detailed Asset Management Plan	Sean Hilderley	Fire Chief, Fire and Emergency Services	Council

For more information, email AQM@chatham-kent.ca
To view all the asset management plans, visit
www.chatham-kent.ca/assetplans