Attachment #1: Roads & Related Assets Service Area

Infrastructure Value	$1,447M	
Overall Condition	3.0	Fair
High Risk Asset Value	$470M	32%
Trend		

1.0 Summary of Roads & Related Assets

Asset classes that fall under the roads & related assets service area include road right of ways, municipal structures, active transportation network (sidewalks, trails), facilities, equipment and traffic management (traffic lights, streetlights, poles, etc. Condition rating trends are neutral from the previous reported Plan.

Table 1 details the City's inventory for the roads & related asset service area.

1.1 Inventory Details

Table 1: Roads and Related Assets Service Area Inventory

Asset Class & Sub-class	Asset	2023 Quantity	Unit of Measure
Right of Way - Roads			
Arterial	Rural & Urban	100	km
Collector	Rural & Urban	76	km
Local	Rural & Urban	225	km
Lane	Rural	0.2	km
Unclassified	-	1	km
Municipal Structures			
Road Bridges	-	26	Each
Pedestrian Bridges	-	21	Each
Culvert Bridges	-	16	Each

Asset Class & Sub-class	Asset	2023 Quantity	Unit of Measure
Culvert	-	3	Each
Active Transportation			
Sidewalks	Sidewalks & Sidewalk Walkways	404	km
Trails	Trails, Bicycle and Footpaths, Trail Roadside	35	km
Equipment			
Parking Equipment	Meters	Pooled	
	Parking Equipment		
Fleet			
Light Duty Vehicles	-	5	Each
Traffic Management			
Guardrails	-	5.4	km
Street Signs	Signs	18,196	Each
	Supports	8,836	Each
Traffic Signals	Intersections	142	Each
Controllers/Detectors	Controllers/Detectors	953	Each
Street Lights	Lamps	7,574	Each
	Poles	2,030	Each
Facilities			
Parking Garage – King St. Parkade		1	Each
Parking Lots		7	Each

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the roads & related assets service area totalled $1.4 billion. Replacement costs were determined using different valuation methods, such as unit cost multipliers based on recent construction projects or replacements, condition assessments or historical costs inflated to 2023 where recent assessments or costing information was not available.

Figure 1: Roads & Related Assets Service Area –Replacement Cost by Asset Class

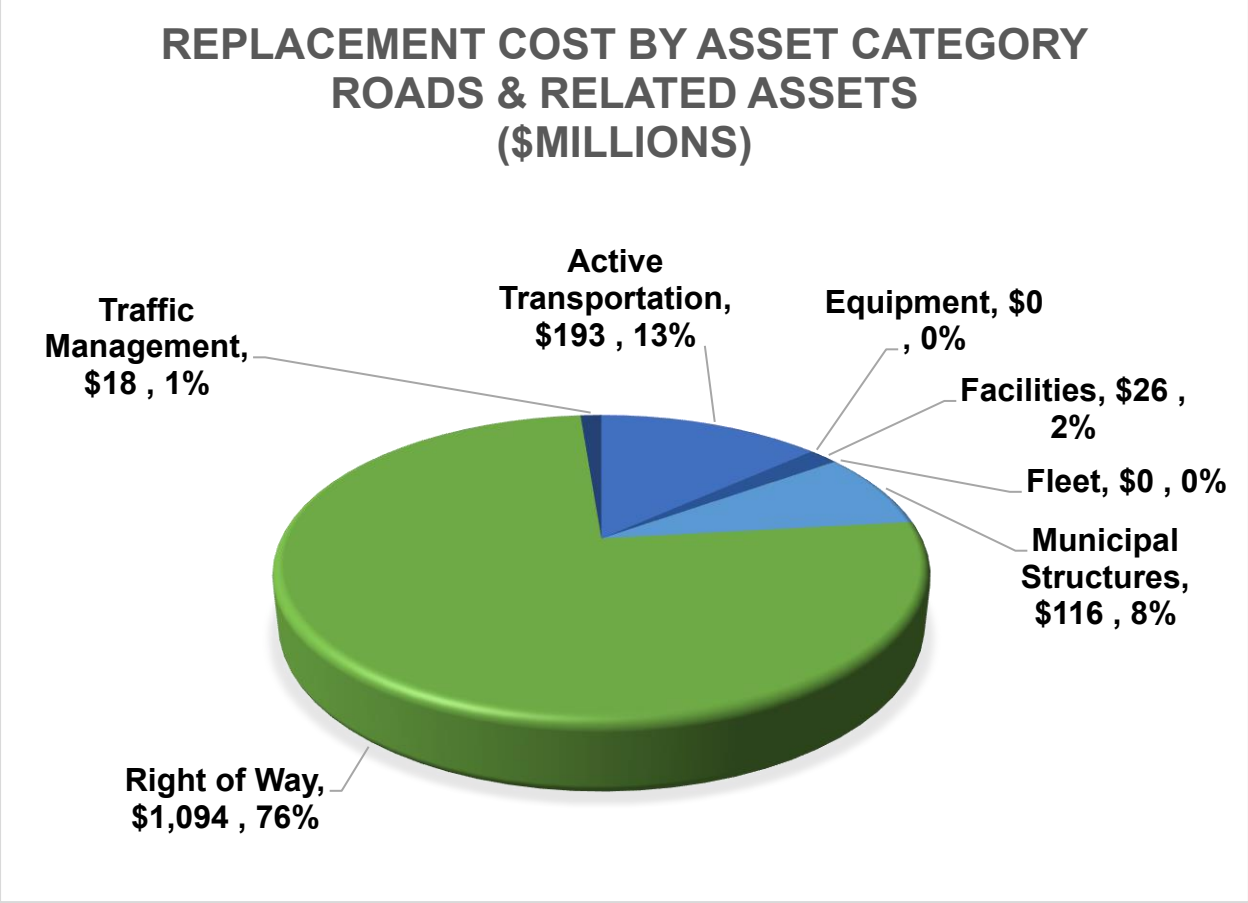

Table 2: Roads & Related Assets - Replacement Costs by Asset Class

Asset Category & Class	Asset Type	2023 Replacement Cost
Roads - Right of Way		**$1,094,189,539**
Arterial	Rural & Urban	$274,249,440
Collector	Rural & Urban	$207,191,853
Local	Rural & Urban	$609,972,577
Lane	Rural	$531,340
Unclassified	-	$2,244,337
Municipal Structures		**$115,801,869**
Road Bridges	-	$66,574,782
Pedestrian Bridges	-	$14,313,859
Culvert Bridges	-	$30,365,096
Culvert	-	$4,548,132
Active Transportation		**$193,192,356**
Sidewalks	Sidewalks Sidewalk Walkways	$172,057,406

Asset Category & Class	Asset Type	2023 Replacement Cost
	Trail Neighbourhood	
Trails	Bicycle and Footpaths Trails Trail Roadside	$21,134,942
Equipment		**$41,761,151**
Parking Equipment	Metres and Parking Equipment	$37,423
Fleet		**$132,684**
Light Duty Vehicles		$132,684
Facilities		**$25,665,607**
Parking Garage – King St. Parkade	-	$23,505,351
Parking Lots	-	$2,160,256
Traffic Management		**$17,860,467**
Guardrails	-	$123,014
Street Signs	Signs Supports	$1,838,995
Traffic Signals	-	$8,503,248
Street Lights	Lamps	$5,821,599
	Poles	$1,572,578
Roads & Related Assets Total		**$1,446,878,910**

1.3 Asset Condition and Remaining Useful Life

The City's roads & related service area is currently rated in overall fair condition. Condition assessments have been completed for road right of way, municipal structures, sidewalks, signs, facilities and most traffic management assets except for guardrails and traffic assets. Where condition inspections have not been completed, age-based ratings were used. Based on replacement cost, 26% or $373 million are rated very good, 17% or $252 million rated good, 29% or $422 million rated fair and 28% or $399 million rated poor and very poor. Figure 2 and Table 3 provide condition details of the roads & related assets service area.

Figure 2: Roads & Related Assets - Distributed Condition and Replacement Cost

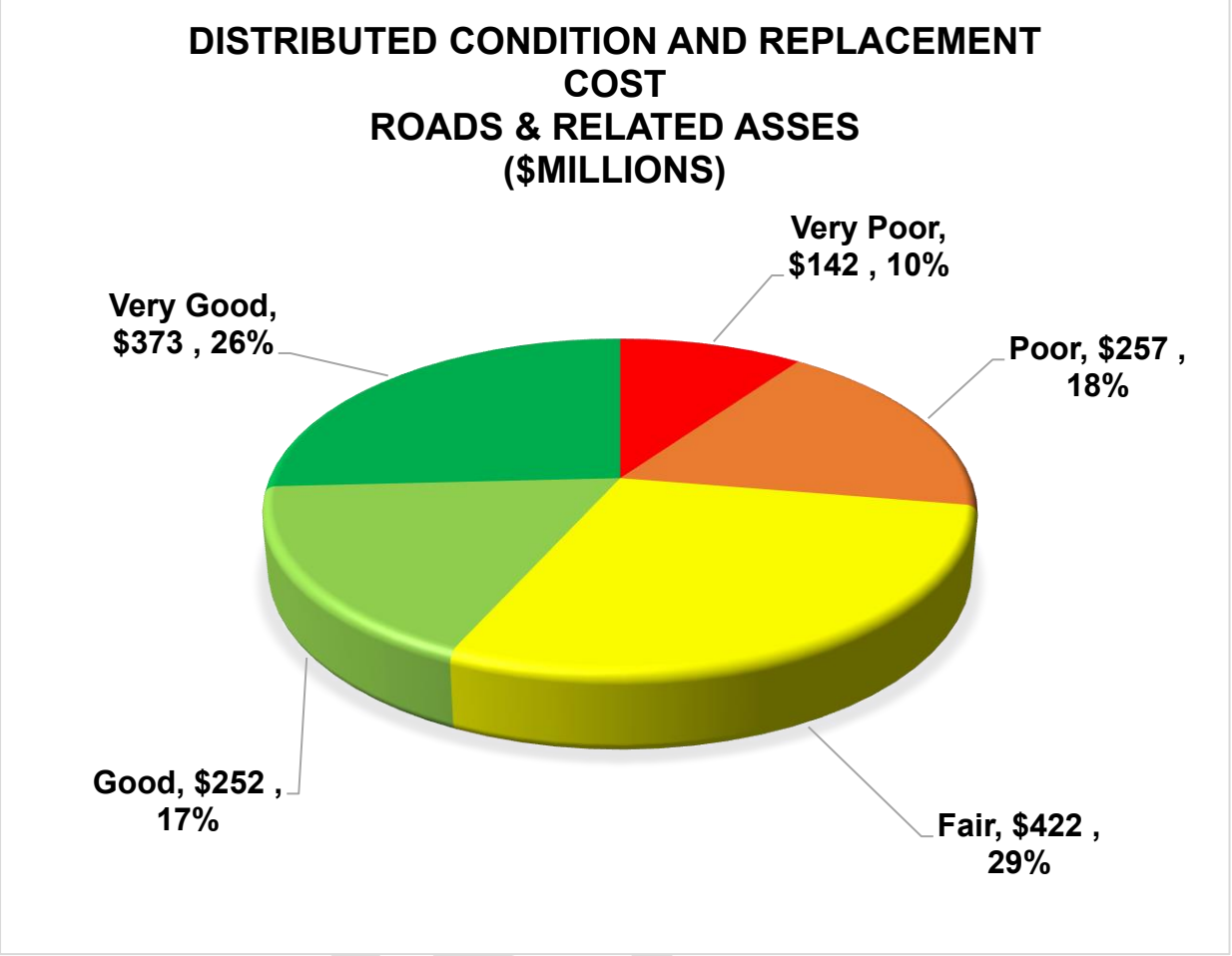

Table 3: Roads & Related Assets - Asset Condition Ratings

Asset Category & Class	Asset Type	2023 Condition Rating
Roads - Right of Way		
Arterial	Rural & Urban	Fair
Collector	Rural & Urban	Fair
Local	Rural & Urban	Fair
Lane	Rural	Very Good
Unclassified	-	Poor
Municipal Structures		
Road Bridges	-	Good
Pedestrian Bridges	-	Fair
Culvert Bridges	-	Fair
Culvert	-	Fair
Active Transportation		
Sidewalks	Sidewalks	Very Good

Asset Category & Class	Asset Type	2023 Condition Rating
	Sidewalk Walkways	
	Trail Neighbourhood	
	Bicycle and Footpaths	
	Trails	Very Good
Trails	Trail Roadside	
Equipment		
Parking Equipment	Metres and Parking Equipment	Poor
Fleet		
Light Duty Vehicles		Poor
Facilities		
Parking Garage – King St. Parkade	-	Good
Parking Lots	-	Poor
Traffic Management		
Guardrails	-	Good
	Signs	
Street Signs	Supports	Very Good
Intersections	-	Fair[1]
	Lamps	Very Good
Street Lights	Poles	Fair
Roads & Related Overall Condition		**Fair**

Roads

The City conducts road right-of-way pavement condition assessments based on frequency cycles recommended in the 2014 Road Needs Study[2]. The frequency for each asset class is as follows:

- Arterial roads - every two years
- Collector roads – every three years
- Local roads – every four years

The City's Public Works department also operates a weekly pavement inspection program which focuses on routine maintenance repairs (i.e. pothole filling, small patching, etc.).

The City is currently using Paver to perform road analysis. Paver calculates a PCI for each individual road section based on the data collected. Values range from zero

[1] Revised to 'fair' from 'very poor'. Alternate rating is based on professional judgement/expertise by subject matter experts.

[2] City of Peterborough & DM Wills Associates Limited, Road Needs Study Report, (2014)

(Failed) to 100 (Perfect) and relies on three data types; distress type, distress severity and distress quantity. Using this data, a PCI is assigned using the scale shown in Table 4 Standard PCI Rating Scale. The City of Peterborough currently aims for a target condition rating of Fair or minimum PCI of 55.

Table 4: Standard PCI Rating Scale

Standard PCI Rating Scale (Paver)		
PCI Scale		**Pavement Management Strategy**
Good	85-100	Preventative Maintenance – crack route & seal, micro-surfacing, inspection program
Satisfactory	70-85	
Fair	56-70	Micro-surfacing and/or road resurfacing
Poor	41-55	Road Resurfacing
Very Poor	26-40	Road surface repairs only – 'Do nothing strategy'
Serious	11-25	Full Reconstruction
Failed	0-10	

Municipal Structures

Municipal structures (bridges and culverts) that are 3 metres or greater are inspected every two years and must follow specific inspection procedures as provided in the Ontario Structure Inspection Manual[3]. Each structure is assigned a Bridge Condition Index (BCI) which is used to determine an overall condition rating. The City currently aims to maintain municipal structures in fair or better range (minimum BCI of 60). The overall 2022 BCI rating for all structures is 71.56[4] or good. Figure 3 in Section 2 Levels of Service shows the BCI rating scale along with recommended capital works timelines.

Active Transportation

The active transportation network's overall condition is rated very good. Except for sidewalks, condition ratings for trails are age based and do not reflect actual conditions. Future plans will be to include trails and hardscaping in an on-going inspection program which will provide for more accurate and up-to-date condition ratings. Currently, sidewalks are inspected annually[5] in the spring with remediation work commencing in the fall of the same year.

Fleet, Equipment, Traffic Management & Facilities

The overall condition rating for fleet is poor, fair for parking equipment, fair for traffic management and good for facility assets.

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[3] Ontario, Ministry of Transportation, Ontario Structure Inspection Manual (OSIM) 2008, (St. Catherines, ON: Ministry of Transportation, 2008)

[4] Non weighted average.

[5] Ontario, Municipal Act 2001, O. Reg 239/02, Minimum Maintenance Standards for Municipal Highways, (Consolidated 2018)

Traffic controllers and detectors are currently inspected and tested twice a year as per the Minimum Maintenance Standards for Municipal Highways, O. Reg 239/02. Replacement activities for traffic signal controllers are currently underway with a total estimated project cost of $2.7 million and is anticipated to be completed in the spring of 2024. The traffic signal controller upgrades are required to implement Smart Signal systems across the city. Traffic signal asset condition ratings are primarily based on high level recommendations provided by expert City staff until refinements to the asset hierarchy can be completed which better reflects actual condition and ages.

Guardrail condition ratings are currently age based. Future plans include adding guardrails in an annual inspection program which will provide more accurate and up-to date condition ratings.

Street signs overall condition rating is very good. Condition ratings are based on a combination of visual condition assessments which include annual retro reflectivity testing for regulatory and warning signs and age-based ratings. Regulatory and warning signs are required to meet minimum retro reflectivity standards set forth in the Manual of Uniform Traffic Control Devices for Canada [MUTCD(C)] and are replaced as required.

Parking equipment assets overall condition rating is poor. Assets include parking equipment and parking meters.

Facilities overall condition rating is good. Facilities include parking lots and parking garages. The King St. Parking Garage (rated good) reflect actual conditions as per the most recent building condition assessment completed in 2020/2021.

Based on previously completed condition assessments, streetlights are in overall very good condition. Streetlight condition assessments are planned to be completed every five years, pending budget approvals.

Remaining Useful Life

The following summarizes the roads & related assets service area remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the calculated age or observed age (where condition assessments have been completed) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the ‘observed’ age will be used in calculating remaining useful life. The ages of the assets are variable and with efforts to extend the life by application of lifecycle treatments, there isn’t necessarily a linear relationship between age and condition.

Table 5 shows the roads & related assets remaining useful life details.

Table 5: Roads & Related Assets Remaining Useful Life[6]

Asset Category & Class	Average Expected Useful Life (Yrs)	Average Remaining Useful Life (Yrs)	Percent Useful Life Remaining
Roads - Right of Way	21	0	0%
Municipal Structures	69	7	10%
Active Transportation	30	0	0%
Equipment	5	0	0%
Fleet	6	0	0%
Facilities	64	36	56%
Traffic Management	26	0	0%
Roads & Related Assets Total	**27**	**0**	**0%**

1.4 Asset Risk Assessment

Currently, the consequences of failure for road & related assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The risk evaluation considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence. Service area specific factors include the road classification, the land use and the zoning surrounding the asset, where possible.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

[6] ESL, RUL, and percent of useful life remaining are based on calculated weighted average of asset classes

The estimated replacement value of Roads & Related Assets high risk assets is $338 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will discuss LOS as they are currently being provided. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 6 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the 2023 Transportation Master Plan and the Official Plan.

Stakeholder and technical levels of service, performance measures and targets for the roads & related assets service area are outlined in Table 6 below.

Table 6: Levels of Service – Roads & Related Assets

Asset Class: Roads - ROW								
Service Objective Statement: The City strives to provide a safe mode of transportation maintained to an acceptable quality that allows for drainage and movement of goods								
Stakeholder Value/ Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope/ Availability	The road network is safe, efficient, and accessible for all residents, businesses and visitors.	Level of connectivity of road network throughout the city	Peterborough's road network consists of Arterial, Collector, Local and Lane roads, connecting people, goods and places. See Figure 4: City of Peterborough Road System	Peterborough's road network consists of Arterial, Collector, Local and Lane roads, connecting people, goods and places. See Figure 4: City of Peterborough Road System	Number of lane-kilometres of each arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality	Maintain or increase for accessibility	**City Area:** 67.35 km2	**City Area:** 67.35 km2
							Arterial: 265 km/ 67.35 sq.km	**Arterial:** 261.69 km/67.35 sq. km
							Collector: 152 km/67.35 sq.km	**Collector:** 154.11 km/67.35 sq.km
							Local: 450 km/67.35 sq.km	**Local:** 451.72 km/67.35 sq. km
							Lane road: 0.39 km/67.35 sq.km	**Lane road:** 0.44 km/67.35 sq.km
Reliability/ Quality	Providing reliable mode of transportation at an acceptable quality that	Road pavement is maintained in a state of good repair	See Figure 3: Road Class Pavement Conditions	See Figure 3: Road Class Pavement Conditions	Average PCI for Paved Roads	Greater than 55	Average PCI for Paved Roads = 63	Average PCI for Paved Roads = 63
					Percentage of arterial roads in poor or better condition	100%	100%	100%

Asset Class: Roads - ROW								
Service Objective Statement: The City strives to provide a safe mode of transportation maintained to an acceptable quality that allows for drainage and movement of goods								
Stakeholder Value/ Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
	meets the needs of the community.				Percentage of collector roads in poor or better condition	Min. 75%	91% of total surface area	91% of total surface area
					Percentage of local roads in poor or better condition	Min. 50%	21% of total surface area	21% of total surface area
					Average Surface Condition for unpaved roads (e.g. Good, fair, poor)	Fair	Fair	Fair
Climate Leadership	Providing streetlights that are energy efficient	Streetlights are meet our environmental objectives	Streetlights are replaced with energy efficient or LED fixtures where possible	Streetlights are replaced with energy efficient or LED fixtures where possible	Percentage of streetlights that are LED or low energy fixtures	100%	84% of streetlight inventory is LED	84% of streetlight inventory is LED

Asset Class: Municipal Structures								
Service Objective Statement: The City strives to provide safe structures efficiently and connecting roads, sidewalks and trails								
Stakeholder Value/ Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2021**	**2023**	**Technical PM**	**Target**	**2023**	**2024**
Scope/ Availability	The road and crossings network is adequate for all modes of transportation .	Types of traffic that are supported by municipal bridges	Bridges and crossings within the City support the movement of motor vehicles, heavy transport vehicles, emergency vehicles, pedestrians and cyclists	Bridges and crossings within the City support the movement of motor vehicles, heavy transport vehicles, emergency vehicles, pedestrians and cyclists	% of bridges with loading/dimensional restrictions	Maintain or decrease restrictions	No City owned bridges have loading/dimensional restrictions however 2 bridges within City limits have loading restrictions but owned by Parks Canada.	No City owned bridges have loading/dimensional restrictions however 2 bridges within City limits have loading restrictions but owned by Parks Canada.
Reliability/ Quality	Providing reliable and high-quality bridges that meet the needs of the community and stakeholders	Bridges and culverts are maintained in a state of good repair.	See Figure 5: Bridges and Culverts Condition Rating Descriptors	See Figure 5: Bridges and Culverts Condition Rating Descriptors	Average Bridge Condition Index	BCI = >60 (Fair or better)	Average BCI: 71.93 (Good)	Average BCI: 71.93 (Good)
					Percentage of bridges in fair or better condition	Maintain current LoS as minimum	87%	87%
					For Structural Culverts: Average Bridge Condition Index	BCI = >60 (Fair or better)	Average BCI of structural culverts: 68.86 (Fair)	Average BCI of structural culverts: 68.86 (Fair)

Asset Class: Municipal Structures								
Service Objective Statement: The City strives to provide safe structures efficiently and connecting roads, sidewalks and trails								
Stakeholder Value/ Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2021**	**2023**	**Technical PM**	**Target**	**2023**	**2024**
					Percentage of structural culverts in fair or better condition	Maintain current LoS as minimum	88%	88%

Asset Class: Active Transportation Network - Sidewalks								
Service Objective Statement: The City strives to provide a safe and connected health promoting network of alternate transportation								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope/Availability	A connected network that is safe, efficient and accessible with sidewalks installed on both sides of the road, as per the Provision of Sidewalk Policy	Description, which may include maps, of the sidewalk network in the municipality and its level of connectivity.	The City is working to advance sidewalk installation, as per the Sidewalk Strategic Plan. See Figure 6: City of Peterborough Pedestrian Network.	The City is working to advance sidewalk installation, as per the Sidewalk Strategic Plan. See Figure 6: City of Peterborough Pedestrian Network.	Km and % of missing sidewalk installed	Maintain or increase for accessibility	1km, 0.003% of missing sidewalk installed	4.07 km, 0.011% of missing sidewalk installed
Reliability/Quality	Providing reliable sidewalks that meet the needs of the community	Sidewalks are maintained in a state of good repair	Sidewalks are proactively maintained and reliable for intended use	Sidewalks are proactively maintained and reliable for intended use	Percentage of sidewalks in poor or better condition (using condition parameters to meet minimum maintenance standards)	Maintain current LoS as minimum	99%	99%

Asset Class: Active Transportation Network - Sidewalks								
Service Objective Statement: The City strives to provide a safe and connected health promoting network of alternate transportation								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Safety	New subdivisions are built with sidewalks on both sides of the road.	Kilometers of sidewalks built compared to new subdivision streets	No new streets built in 2019	Subdivisions are planned to have sidewalks on both sides except on back lanes. New subdivisions that are not assumed by the City may not have all sidewalks installed yet.	All trip hazards greater than 2 cm are marked	100% of trip hazards greater than 2 cm are marked	100% of trip hazards greater than 2 cm were marked. 146 defects marked and 2 repairs completed in 2022.	100% of trip hazards greater than 2cm were marked. 203 defects marked, 46 repairs completed in 2024
					Sidewalks inspected annually as per Minimum Maintenance Standards from Ministry of Transportation	Annually	Completed June 2023	Completed June 2024

Asset Class: Active Transportation Network - Trails								
Service Objective Statement: The City strives to provide a network of trails for recreation and transportation connecting people to places.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope/Availability	The pedestrian network is well connected and accessible for users	90% of population is within 400m of a trail	84 % of pop. is within 400m of a trail. - note that this is all trails This also included non-city owned trails such as portions of the Trans Canada trail owned by ORCA)	84 % of pop. is within 400m of a trail. - note that this is all trails This also included non-city owned trails such as portions of the Trans Canada trail owned by ORCA)	Trails are maintained in the winter	Greater than 75% of trails are maintained	78.6% of trails maintained in the winter	77% of trails maintained in the winter
					Availability of bike only lanes	Increase to 83km by year 2031	35 km of bike specific lanes	38 km of bike specific lanes
Reliability/Quality	Providing reliable trails that meet the needs of the community	Trails are maintained in a state of good repair	Trails are proactively maintained and reliable for intended use	Trails are proactively maintained and reliable for intended use	Percentage of trails in poor or better condition	Maintain current LoS as minimum	96%	96%

Figure 3: Road Class Pavement Conditions

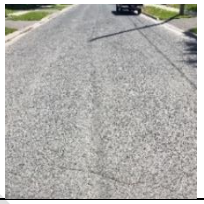
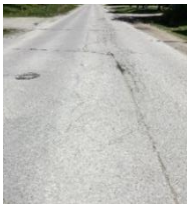
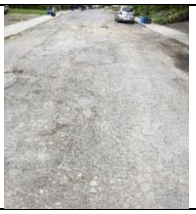
Condition	PCI Score	Description	Sample
Good	86 – 100	Functional, new or like new, little deterioration; preventative maintenance work required (crack route and seal), renewal work is not usually required within short term planning.	
Satisfactory	71 – 85		
Fair	56 – 70	Functional, little deterioration; preventative maintenacne ongoing, renewal work usually required (micro-surfacing) reconstruction not usually required within short term planning.	
Poor	41 – 55	Functional,some deterioration; preventative maintenacne ongoing, still required, renewal work usually required (road resurfacing) reconstruction not usually required within short term planning.	
Very Poor	26 – 40	Not functioning as intended. Significant to major deterioriation, surface repairs on an as needed basis, replacement considered within short term planning.	
Serious	11 – 25		
Failed	1 – 10	Not functional Major deterioriation, major rehabilitation/replacement considered within one (1) year.	

Figure 4: City of Peterborough Road System

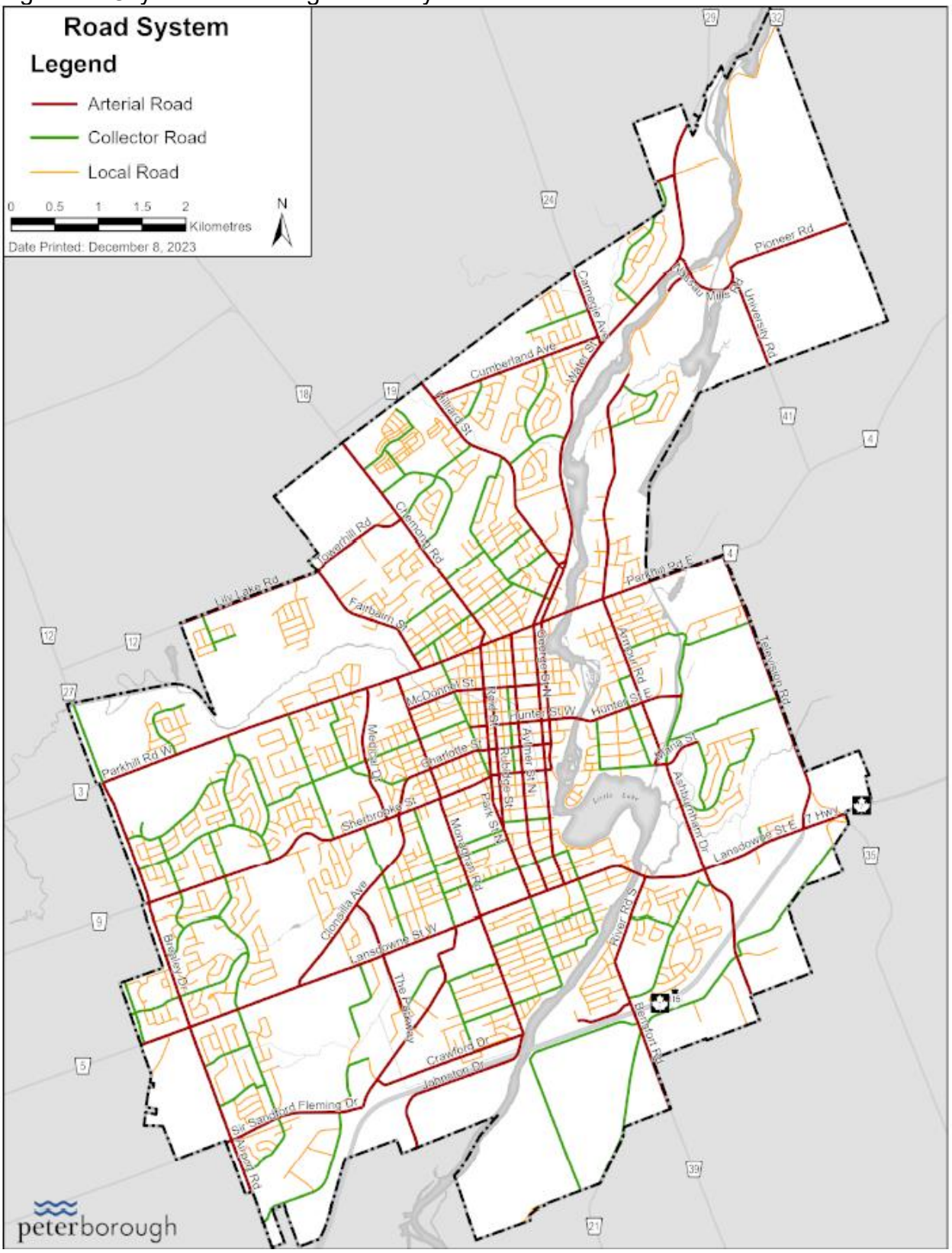
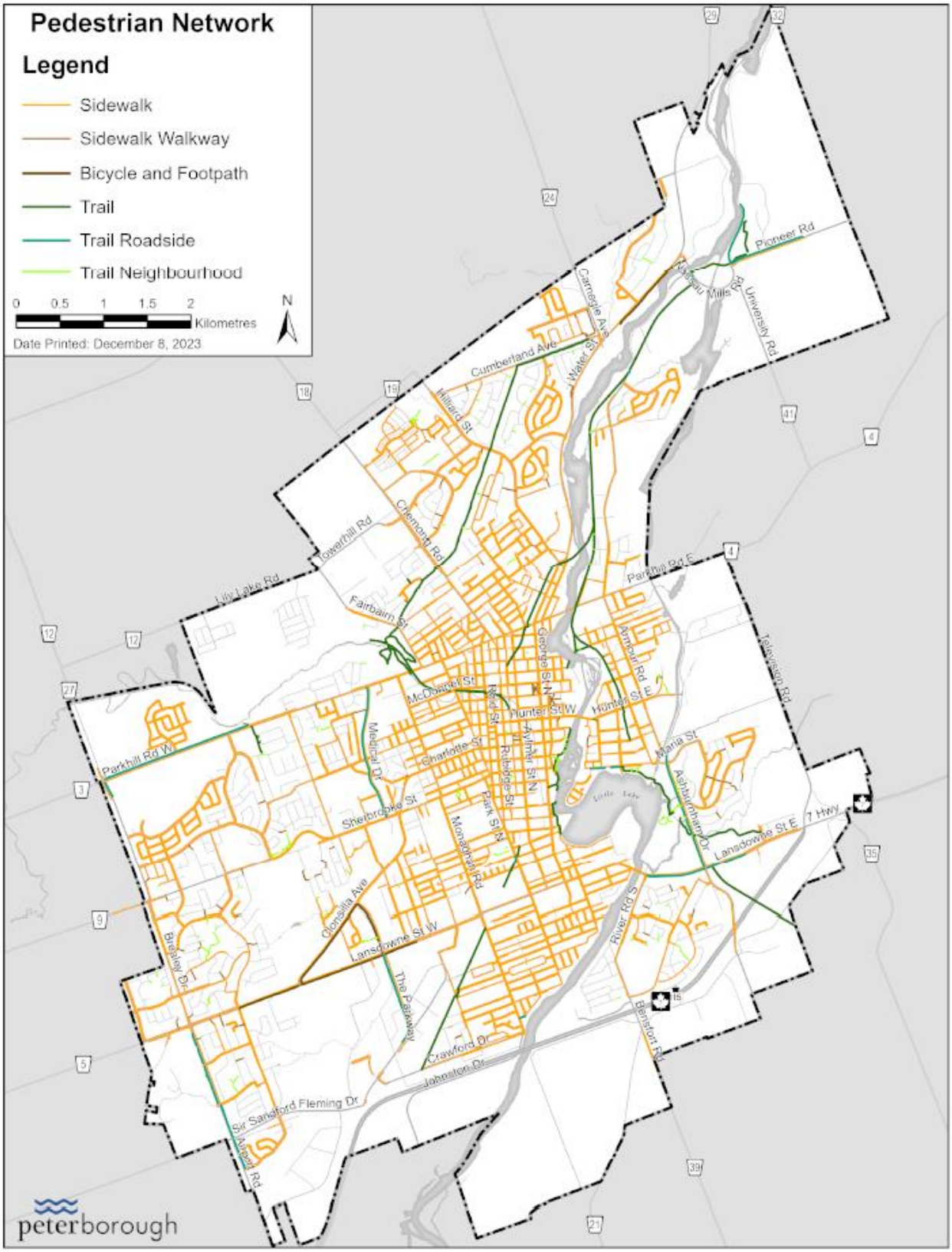


Figure 5: Bridges & Culverts Condition Rating Descriptors

Condition Rating	Condition	Description
Good BCI Score: 70-100		Refers to an element or part of an element which is new or like new, minor defects are visible, remedial action not usually required, performing as intended.
Fair BCI Score: 60-70		Refers to an element or part of an element where medium defects are visible, preventative maintenance work usually required, performing as intended.
Poor BCI Score: <60		Refers to an element or part of an element where severe defects are visible, rehabilitation or replacement is usually required, performance of element is affected and/or not performing as intended.

Figure 6: City of Peterborough Pedestrian Network



2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Roads & Related Assets Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees.
- LOS are achievable for some lifecycle activities over the short term however service levels related to renewal and growth activities are expected to decline beyond the 10-year outlook without intervention.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service - Projected Performance and Lifecycle Costs

Table 7 and Table 8 below outline Stakeholder and Technical LOS, current/proposed performance and proposed performance anticipated over the 10-year forecast based on current levels of capital investment.

Assuming no significant impacts to road and related asset funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 7: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Road ROW				
Scope/ Availability	The road network is safe, efficient, and accessible for all residents, businesses and visitors	Level of connectivity of road network throughout the city	Peterborough's road network consists of Arterial, Collector, Local and Lane roads, connecting	Road network and level of connectivity expected to increase due to projected growth

			people, goods and places. See Figure 4: City of Peterborough Road System	and increasing traffic demand.
Reliability/ Quality	Providing reliable mode of transportation at an acceptable quality that meets the needs of the community	Road pavement is maintained in a state of good repair	See Figure 3: Road Class Pavement Conditions in Section 2.0	Same level of service expected
Climate Leadership	Providing streetlights that are energy efficient	Streetlights meet our environmental objectives	Streetlights are replaced with energy efficient or LED fixtures where possible	Streetlight replacement activities will remain the same
Stakeholder LOS – Municipal Structures				
Scope/Availability	The road crossing network is adequate for all modes of transportation	Types of traffic that are supported by municipal structures	Structures and crossings within the City support the movement of motor, heavy transport and emergency vehicles, pedestrians and cyclists	Same level of service expected
Reliability/ Quality	Providing reliable and high-quality structures that meet the needs of the community and stakeholders	Municipal structures are maintained in a state of good repair	See Figure 5: Bridges and Culvers Condition Rating Descriptors in Section 2.0	Same level of service expected
Stakeholder LOS – Active Transportation Network – Sidewalks and Trails				
Scope/Availability	A connected network that is safe, efficient and accessible with sidewalks installed on both sides of the road, as per the Provision of Sidewalk Policy	Description, which may include maps, of the sidewalk network in the municipality and its level of connectivity.	See Figure 6: City of Peterborough Pedestrian Network in Section 2.0	The City is working to advance sidewalk installation, as per the Sidewalk Strategic Plan
Reliability/Quality	Providing reliable sidewalks that meet the needs of the community	Sidewalks are maintained in a state of good repair	Sidewalks are proactively maintained and reliable for intended use	Same level of service expected
Safety	New subdivisions are built with sidewalks on both sides of the road.	Kilometers of sidewalks built compared to new subdivision streets	Subdivisions are planned to have sidewalks on both sides except on back lanes. New subdivisions that are not assumed by the City may not have all	Same level of service expected

			sidewalks installed yet.	
Scope/Availability	The pedestrian network is well connected and accessible for users	Population is within 400m of a trail	84 % of pop. is within 400m of a trail. - note that this is all trails This also included non-city owned trails such as portions of the Trans Canada trail owned by ORCA)	Same level of service expected
Reliability/Quality	Providing reliable trails that meet the needs of the community	Trails are maintained in a state of good repair	Trails are proactively maintained and reliable for intended use	Same level of service expected

Table 8 below outlines the Road and Related Assets Service Area Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used. A 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 8: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Road ROW and Traffic Management				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Currently not measured in Technical LOS	Non-Infrastructure Solutions are carried out as required to support ongoing asset condition monitoring, service provision, regulatory requirements, etc.	LOS Likely to remain the same over the 10-year planning period
		Level of Funding:	Historical 3-yr Annual Average: $0.1M	Estimated Average Annual Cost: $0.1M
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Road ROW O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	LOS Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Average PCI for Paved Roads Currently no Technical LOS measured for traffic management assets for renewals	Average PCI for Paved Roads = 63 (Fair) Road surfaces are typically reconstructed when PCI is 25 or less (very poor to failed) Traffic signal controller replacement program carried out as equipment nears end of life.	Annual ROW capital budget expected to increase due to standard deterioration rate and existing condition of road surfaces. Conditions are expected to be maintained over the 10yr forecast but start to decline in long term (10-25 yr forecast) without increased funding. Traffic signal renewals expected to remain at the same level of service in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $19.1M (ROW) $2.2M (Traffic)	Annual Average: $21.6M (ROW) $1.8M (Traffic)

Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	Disposals are carried out as required or as identified in the Transportation Master Plan	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0.1M	Annual Average: $0.1M
Growth/ Service Improvements	Capacity/service improvements Support development and growth Support connectivity of road network and accessibility	Number of lane-kilometres of each arterial, collector and local roads as a proportion of square kilometres of land area of the municipality	**City Area:** 67.35 km2 **Arterial:** 265 km/ 67.35 sq.km **Collector:** 152 km/67.35 sq.km **Local:** 450 km/67.35 sq.km **Lane road:** 0.39 km/67.35 sq.km	Quantity of lane km's are expected to increase due to growth. Road acquisition costs are likely to increase to align with DC Study/TMP requirements Note: Initial costs for road acquisitions are mostly covered under DC's however BTE costs are the responsibility of the City
		Level of Funding:	Historical 3-yr Annual Average: $2.0M (ROW) $2.0 (Traffic)	Annual Average: $7.0M (ROW) $1.5M (Traffic)
Technical LOS – Municipal Structures				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Currently not measured in Technical LOS	Municipal structures 3m or greater are inspected every 2 years	Frequency of inspections will remain the same. Annual costs are likely to increase for inflation/cost of inspection services
		Level of Funding:	Historical 3-yr Annual Average: $52K	Annual Average: $68K
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Municipal structure O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.

		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Average Bridge Condition Index	Average BCI: 71.93 (Fair)	Average BCI likely to remain the same in the 10-yr planning period if funding levels are increased to meet lifecycle costing needs. Higher annual costs are accounting for increasing quantity of aging assets falling into unacceptable BCI range from age. Funding levels will need to increase to maintain LOS.
		Level of Funding:	Historical 3-yr Annual Average: $1.6M	Annual Average: $3.7M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	Disposals are carried out as required or as identified in the Transportation Master Plan	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/service improvements Support development and growth Support connectivity of road network and accessibility	% of bridges with loading/dimensional restrictions	No City owned bridges have loading/dimensional restrictions however 2 bridges within City limits have loading restrictions but owned by Parks Canada.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Technical LOS – Active Transportation Network				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Currently not measured in Technical LOS	Non-Infrastructure Solutions are carried out as required to support ongoing asset condition monitoring, service provision, regulatory requirements, etc.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0

Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Sidewalk and Trail O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments. The City ensures sidewalk inspections and markings take place as per minimum maintenance standards	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	% of active network in poor or better condition	Sidewalks: 99% Trails: 96%	Likely to remain the same in the 10-yr planning period. Annual costs are expected to increase due to standard deterioration rate of sidewalks and account for additional sidewalks/trails being constructed. Sufficient funding is required to avoid premature failure of sidewalk and trail assets.
		Level of Funding:	Historical 3-yr Annual Average: $1.7	Annual Average: $2.0
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	Disposals are carried out as required	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/service improvements Support development and growth Support connectivity of active transportation network and accessibility	a) Km and % of missing sidewalk installed b) Availability of bike only lanes	a) 1km, 0.003% of missing sidewalk installed b) 35 km of bike specific lanes	Quantity of sidewalks and bike lanes are likely to increase in the 10-yr planning period. Annual costs to construct sidewalks and bike lanes are expected to increase to meet growth demands.

		Level of Funding:	Historical 3-yr Annual Average: $1.0M	Annual Average: $2.3M

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Lifecycle Management Plan - Roads & Related Assets

Roads & related assets include all major infrastructure for the movement of people and goods excluding public transit. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not necessarily need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 9: Roads & Related Assets – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	Development of *Comprehensive Transportation Plan, 2012* to understand demand, needs and develop direction
	Ontario Structures Inspection Manual (OSIM) inspections for all bridges with maintenance management reports every 2 years.
	Linking the asset management plan to other studies, master plans and strategies
	Public consultation on levels of service
	Transportation Demand Management program which promotes encouraging alternate use of transportation assets to reduce strain on system
	Tool kits for external organizations to promote alternate transportation
	Promote carpooling, car sharing
	Inspection program for roads, and sidewalks to understand future needs and reduce ad hoc spending
	Trails are multi-purpose for access for City vehicles and bicycles, pedestrians and other recreational users
	Load restrictions on bridges posted
	Signaling program to effectively move all forms of traffic through the city
	Implementation of Road Needs Study to assist in priority decision making
Operating and Maintenance Activities These include regularly scheduled inspection and	Implementation of minimum maintenance standards legislated by

Strategy Type	Current Practice
maintenance, or more significant repair and activities associated with unexpected events.	the Province of Ontario for Roads and Sidewalks
	Winter maintenance program for sidewalks, paved trails and roads
	Ontario Structure Inspection Manual (OSIM) recommended maintenance program implementation for bridges with BCI rating of 70 or better
	Less severe trip hazards are grinded
	Crack route and seal for roads with PCI of 70 or better
	Severe trip hazards are asphalt repaired to eliminate safety hazards
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	Pavement Preservation Program (previously various road resurfacing project):
	Micro-surfacing only for arterial and collector roads with PCI between 56-70
	Resurfacing of roads with PCI between 40-55
	Bridges: Minor rehabilitation at BCI between 70 and 65, major rehabilitation at BCI between 60 and 50. Road Culverts (Corrugated Steel): No rehabilitation, only replacement at end of life. Road Culverts (Concrete, Steel/Conc, Other): Minor Rehabilitation at BCI between 67 and 62, major rehabilitation at BCI between 60 and 50.
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	Full replacement of roads with PCI less than 50
	Streetlight replacement program (current initiative is to convert to LED lights)
	Replacement of surface asphalt/cement mix with less recycled material to extend road surface life
	Bridges: Replace at a BCI of 60, but after a second rehabilitation occurs. Road Culverts (Corrugated Steel): Replace at BCI of 50. Road Culverts (Concrete, Steel/Conc, Other): Replace at BCI of 60, but after a second rehabilitation occurs.

Strategy Type	Current Practice
	Coordinate replacements of roads, sidewalks etc. with buried infrastructure needs
	Replacement of traffic controllers and detectors at end of useful life and coordinate implementation of improved/new technologies at time of replacement
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	Roads sold for private ownership (very rare)
	Decommissioning and repurposing of pedestrian bridges (rare)
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	Complete design standards to develop streets for all abilities and traffic types
	Cyclist designated lanes
	On road marked cycle routes
	Sidewalks provided
	Subdivision assumptions of roads, trails, sidewalks
	Purchasing of old rail lines for trail development
	Implementation of sidewalk policy and procedure to create sidewalks on priority 1 and 2 streets and new streets
Future Strategies	Road Degradation Program fees according to road cuts for restoration recuperation fund recommended in Failed Roads Report
	Materials investigations to extend the life of paved surfaces
	Investigations into different maintenance equipment to reduce damage to assets during regular maintenance

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models were developed in which asset intervention thresholds and associated costs (rehabilitation and replacement) are documented. These models are used to assess best options for what activities the City will undertake.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle renewal activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Roads & Related services subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 9: Roads & Related Assets – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspections and utility costs.

Maintenance includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, asphalt patching and equipment repairs.

Refer to Table 9: Roads & Related Assets – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are considered adequate to meet projected service levels. Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Forecasted renewal costs are projected to increase as the number of assets increase. The 3-year historical capital budget indicates that current funding levels for existing assets are insufficient to address short-term renewal needs (primarily local roads and some municipal structures not meeting condition-based LOS). Additional assets acquired due to growth/service improvements will also impact renewal funding needs in the long-term. This shortfall may result in road related re-construction projects being deferred. Where deferred renewal takes place, the City is committed to ensuring that risks are minimized where possible.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include new subdivision developments, new ROW roads or road widening, new sidewalks, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily growth related, new construction costs and other capacity improvement costs. The City of Peterborough's City-Wide Development Charges (DC) Background Study has identified anticipated residential and non-residential growth capital program requirements to meet growth demands. Even though DC charges are intended to pay for the initial round of capital costs needed to service new development over an identified planning period, the City will need to commit the funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond). The current levels of funding for ongoing lifecycle activities will likely need to increase to support the acquisition of road and related assets and to deliver proposed levels of service.

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 10 below for each asset category. Costs shown are the costs needed to minimize lifecycle costs associated with delivering proposed LOS. Shortfalls between lifecycle activity costing and investment levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 10: Roads & Related Total Lifecycle Activity Costs and Projected funding – Proposed Levels of Service

Roads & Related Assets	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Roads ROW & Traffic Management	$25.0	$25.7	$26.5	$27.3	$28.1	$28.9	$29.8	$30.7	$31.6	$32.6	$28.6
Municipal Structures	$1.6	$1.7	$1.7	$1.8	$1.9	$1.9	$2.0	$2.0	$2.1	$2.1	$1.9
Active Transportation Network	$2.7	$2.8	$2.9	$3.0	$3.0	$3.1	$3.2	$3.3	$3.4	$3.5	$3.1
Total Projected Funding	$29.3	$30.2	$31.1	$32.0	$33.0	$34.0	$35.0	$36.1	$37.1	$38.3	$33.6
Lifecycle Costs											
Roads ROW & Traffic Management	$33.7	$21.5	$35.9	$30.4	$31.0	$32.0	$32.9	$33.9	$34.9	$36.0	$32.2
Municipal Structures	$2.1	$8.4	$0.1	$3.5	$3.6	$3.7	$3.9	$4.0	$4.1	$4.2	$3.8
Active Transportation Network	$5.0	$3.7	$3.2	$4.0	$4.1	$4.2	$4.3	$4.4	$4.6	$4.7	$4.2
Total Lifecycle Costs	$40.7	$33.6	$39.2	$37.9	$38.7	$39.9	$41.1	$42.3	$43.6	$44.9	$40.2
Funding Shortfall	**-$11.4**	**-$3.4**	**-$8.1**	**-$5.8**	**-$5.7**	**-$5.9**	**-$6.1**	**-$6.3**	**-$6.5**	**-$6.7**	**-$6.6**

Based on the lifecycle assessment of Roads & Related Assets it is estimated that the City would need to spend an average of $40.2 million per year to deliver LOS. The average annual funding is an estimated $33.6 million, leaving an average shortfall of $6.6 million per year over the 10-year forecast. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital investment for similar lifecycle activities and used as a proxy for the forecast.

The overall forecasted lifecycle costs to deliver levels of service for the Roads & Related Assets service area exceeds the current levels of funding over the 10-year forecast. Risk management strategies related to managing the shortfall are discussed in Section 3.3 of this attachment.

Assuming current levels of funding remain consistent, without intervention, the City will likely experience gradually declining service levels and increased risk exposure over the long-term that will need to be managed. As roads are acquired and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures. Over time, insufficient funding to complete renewal activities will likely lead to accelerated deterioration of assets resulting in increasing treatment costs to ensure assets are maintained in a state of good repair. The City will need to consider opportunities to manage the shortfall and assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established services are**:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety – assets not adequate/available for emergency response
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs

- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)

Managing the Risks

The projected lifecycle costs for the Road and Related service area exceed the current levels of funding over the short term (10-yr forecast) and long-term (10-year to 25-year) forecast and service levels/performance will likely decrease. The number of ROW road assets (primarily local roads) in poor and very poor condition are expected to increase over the long-term and will likely require additional funding to keep assets in a state of good repair. It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing road and related asset projects together to minimize costs. E.g. replace storm/sanitary pipes when a road is scheduled for rehabilitation.

- Seek approvals to implement recommendations and strategies set forth in the City's Transportation Master Plan and Transportation Demand Management Plan

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of road and related assets.

Risks relating to road & related asset infrastructure failure are also mitigated though condition assessment programs and maintenance programs (legislated and best practices) which provide the data necessary to plan the actions at the right time to achieve the determined levels of services. Risks related to fleet asset failures are addressed through proactive fleet maintenance and adequate vehicle storage to ensure adequate service readiness.

All City services, including Roads & Related services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining roads & related assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Roads & related assets projects seek to work with external stakeholders to align projects to minimize disruption to the transportation network and reduce costs. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the proposed levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future iterations of the asset management plan when complete.

Attachment #2: Stormwater Service Area

Infrastructure Value	$1.8B	
Overall Condition	4.0	Good
High Risk Asset Value	$147M	8%
Trend		

1.0 Summary of Stormwater Assets

Asset classes that fall under the Stormwater service area include stormwater management ponds, conveyance assets and ancillary assets such as catch basins, headwalls, manholes, outfalls, etc. which capture storm water flows from roads. Condition rating trends remain neutral for with an overall service area rating of good.

1.1 Inventory Details

Table 1 details the City of Peterborough's inventory for the stormwater service area

Table 1: Stormwater Service Area Asset Inventory

Asset Category and Class	Asset	2023 Quantity	Unit of Measure
Stormwater Management			
Ponds	Wet Pond	19	Each
	Dry Pond	13	Each
Conveyance			
Pipes	Lead	48	km
	Main	168	km
	Trunk	119	km
	Unclassified	0.4	km
Ancillaries	Catch basin	4,883	Each
	Catch basin Manhole	4,991	Each
	Headwall	2	Each
	Storm Manhole	1,666	Each
	Oil/Grit	23	Each

Asset Category and Class	Asset	2023 Quantity	Unit of Measure
	Separator		
	Clean Out	6	Each
	Double Catch basin	554	Each
	Ditch Inlet Catch basin	146	Each
	Inlet Headwall	21	Each
	Double Ditch Catch basin	6	Each
	Double Catch basin Manhole	275	Each
	Ditch Catch basin Manhole	22	Each
	Rainwater Manhole	88	Each

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the Stormwater service area totalled $1.8 billion. Replacement costs were determined using unit cost multipliers based on recent construction projects[1], condition assessments or historical costs inflated to 2023 where recent assessments or costing information was not available.

[1] Stormwater pipes and ancillaries' replacement costs are based on recent construction projects which include hard costs, soft costs and the cost of replacing materials above the pipes at the time of install (i.e. granular fill, asphalt, sod, concrete, etc.).

Figure 1: Stormwater Service Area –Replacement Cost by Asset Sub-Class

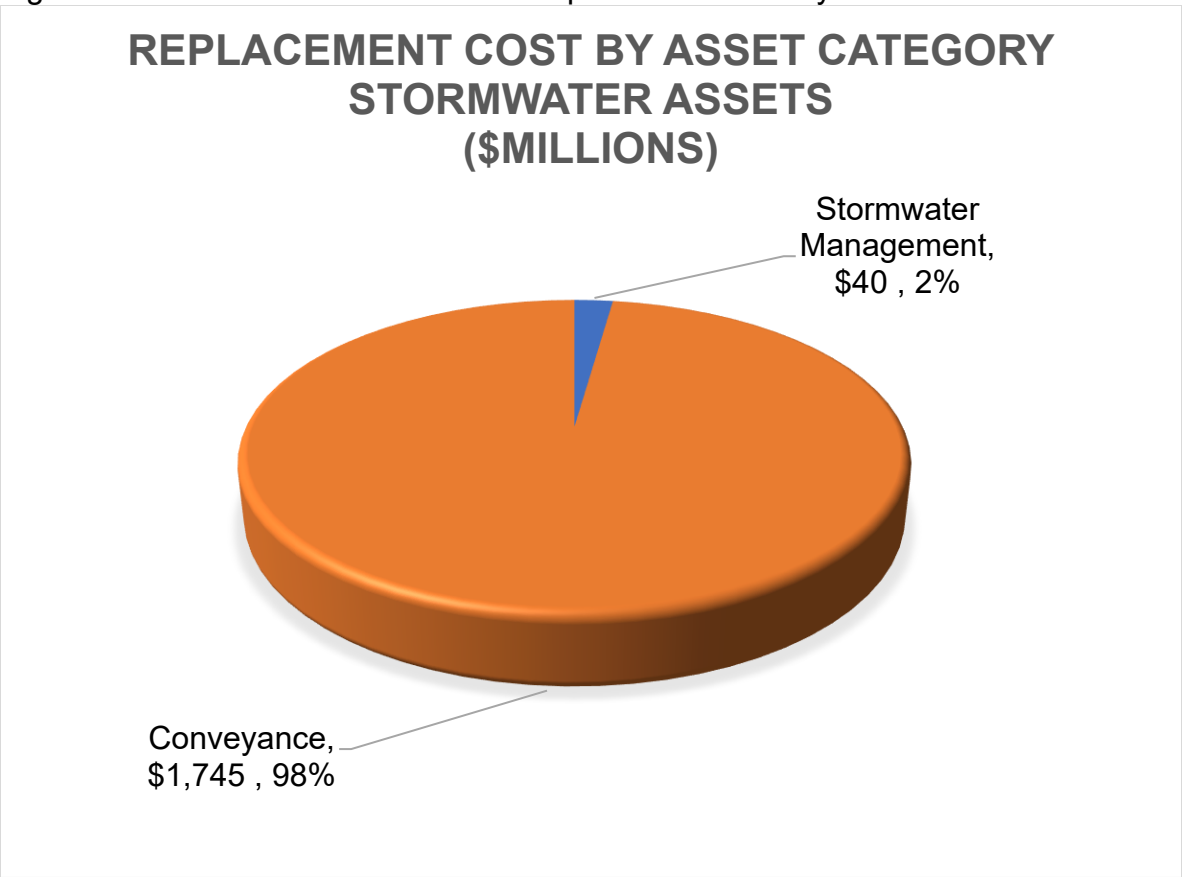


Table 2: Stormwater – Replacement Cost by Asset Class

Asset Class & Sub-Class	Asset	2023 Replacement Cost
Stormwater Management		**$40,177,271**
Ponds	Wet Pond	$20,035,082
	Dry Pond	$20,142,188
Conveyance		**$1,744,855,801**
Pipes	Lead	$152,906,354
	Main	$607,789,079
	Trunk	$586,695,881
	Sub-drain	$395,503
	Unclassified	$169,795
Ancillaries	Catchbasin	$150,087,387
	Catchbasin Manhole	$157,152,692
	Headwall	$61,524
	Storm Manhole	$53,795,946
	Oil/Grit Separator	$745,634

	Clean Out	$177,684
	Double Catchbasin	$17,181,937
	Ditch Inlet Catchbasin	$4,569,556
	Inlet Headwall	$719,593
	Double Ditch Catchbasin	$184,571
	Double Catchbasin Manhole	$8,711,088
	Ditch Catchbasin manhole	$781,903
	Rainwater Manhole	$2,730,275
Stormwater Total		**$1,744,855,801**

1.3 Asset Condition and Remaining Useful Life

The City's Stormwater service area is currently rated in overall good condition. Where condition assessments have not been completed, age-based ratings were used. Based on replacement cost, 32% or $566 million are rated very good, 34% or $600 million are rated good, 18% or $319 million are fair and 17% or $300 million are poor to very poor condition. Figure 2 and Table 3 provide condition details of the stormwater service area.

Figure 2: Stormwater - Distributed Condition and Replacement Cost

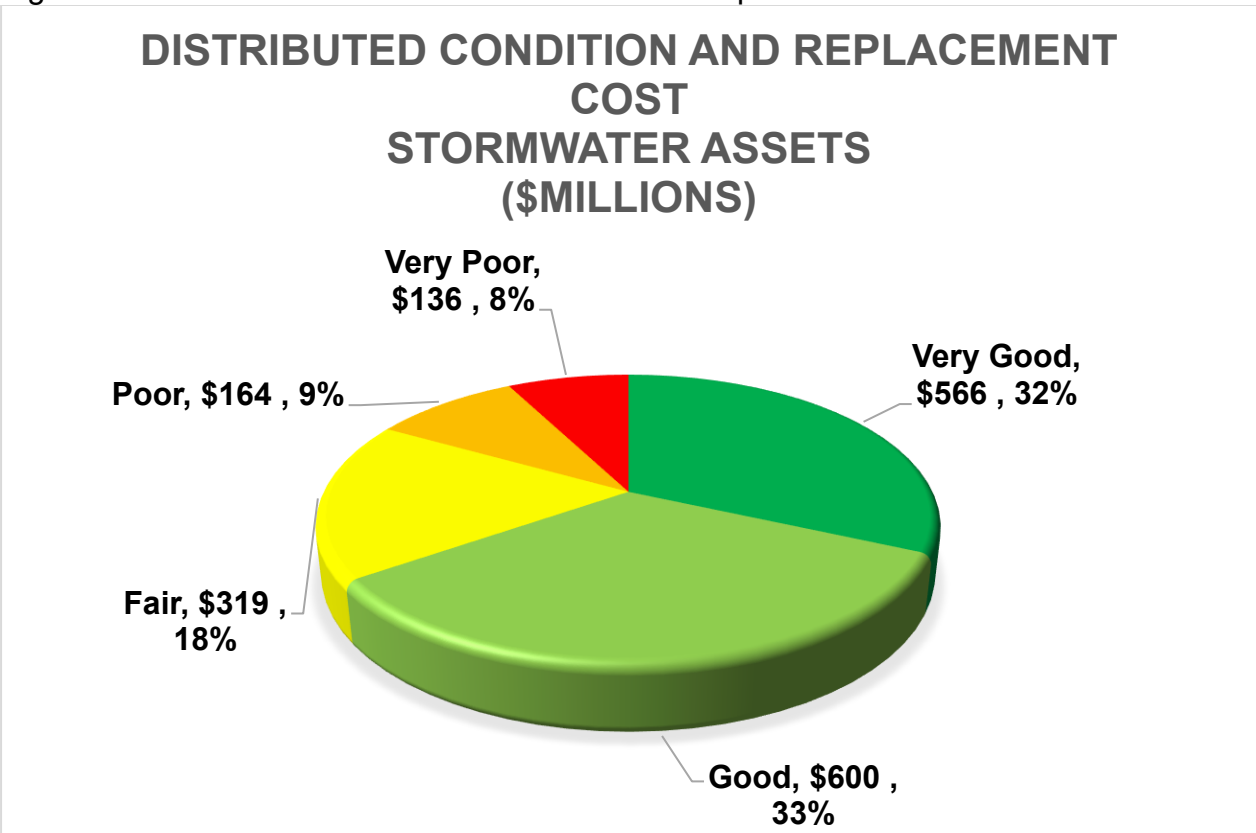


Table 3: Stormwater – Asset Condition Ratings

Asset Class & Sub-Class	Asset	2023 Condition Rating
Stormwater Management		
Ponds	Wet Pond	Good
	Dry Pond	Poor
Conveyance		
Pipes	Lead	Good
	Main	Good
	Trunk	Very Good
	Sub Drain	Very Good
	Unclassified	Very Good
Ancillaries	Catchbasin	Fair
	Catchbasin Manhole	Fair
	Headwall	Fair
	Storm Manhole	Fair
	Oil/Grit Separator	Very Good
	Clean Out	Good
	Double Catchbasin	Good
	Ditch Inlet Catchbasin	Good

	Inlet Headwall	Good
	Double Ditch Catchbasin	Very Good
	Double Catchbasin Manhole	Good
	Ditch Catchbasin manhole	Good
	Rainwater Manhole	Good
Overall Stormwater Condition		**Good**

Stormwater Management Ponds

City staff perform detailed surveys of storm ponds every three years to provide water quality and quantity performance monitoring of the stormwater management ponds (facilities) within the City of Peterborough. Stormwater management facilities work as temporary storage for runoff to avoid flooding in the city, as well as quality control to trap pollutant laden sediment before the stormwater is released to receiving water bodies. Surveys of these facilities are necessary to monitor asset functionality to maintain required standards. To determine total pond clean-out requirements, the Ministry of the Environment's (MOE) 2003 *Stormwater Management Planning and Design Manual* governs required capacity for desired pond efficiency. Also inspected is the forebay diminished capacity requirements as set-out in the subdivision agreement.

Conveyance Assets

The City currently conducts sanitary sewer condition inspections (CCTV) in conjunction with the storm sewers, on a six-year cycle as part of the Flood Reduction Master Plan project. CCTV inspections of storm and sanitary sewers are in accordance with NASSCO[2] inspection standards and use a PACP[3] defect rating approach. As a result, structural and service deficiencies are evaluated in which performance ratings for pipe segments are established. Based on the findings of the condition inspections, a remedial plan to address the deficiencies is developed and implemented.

Remaining Useful Life

The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the calculated age or observed age where available, and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age would be used in calculating remaining useful life. The age of the stormwater service area is variable and with efforts to extend the life by application of lifecycle treatments, there isn't necessarily a linear relationship between age and condition. Table 4 shows the stormwater remaining useful life details.

[2] National Association of Sewer Service Companies
[3] Pipeline Assessment Certification Program

Table 4: Stormwater Remaining Useful Life

Asset Class & Sub-Class	Expected Useful Life (Yrs)	Ave. Remaining Useful Life (Yrs)	Percent of Useful Life Remaining
Stormwater Management			
Ponds	30	9	35%
Conveyance			
Pipes	75	27	35%
Ancillaries	75	26	56%
Stormwater Remaining Useful Life[4]	**74**	**30**	**40%**

1.4 Asset Risk Assessment

Currently, the consequences of failure for Stormwater assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B) which also took into consideration the pipe size, land use and the zoning surrounding the asset, where possible. Where condition assessment data isn't available, likelihood of failure was calculated using age of the asset.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Stormwater high risk assets is $147 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

[4] Overall RUL and Percent Useful Life remaining are weighted by replacement cost

2.0 Levels of Service

This section will present levels of service as they are currently being provided. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service*.

Table 6 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2033). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the 2005 Flood Reduction Master Plan and the Official Plan.

Table 5: Levels of Service – Stormwater

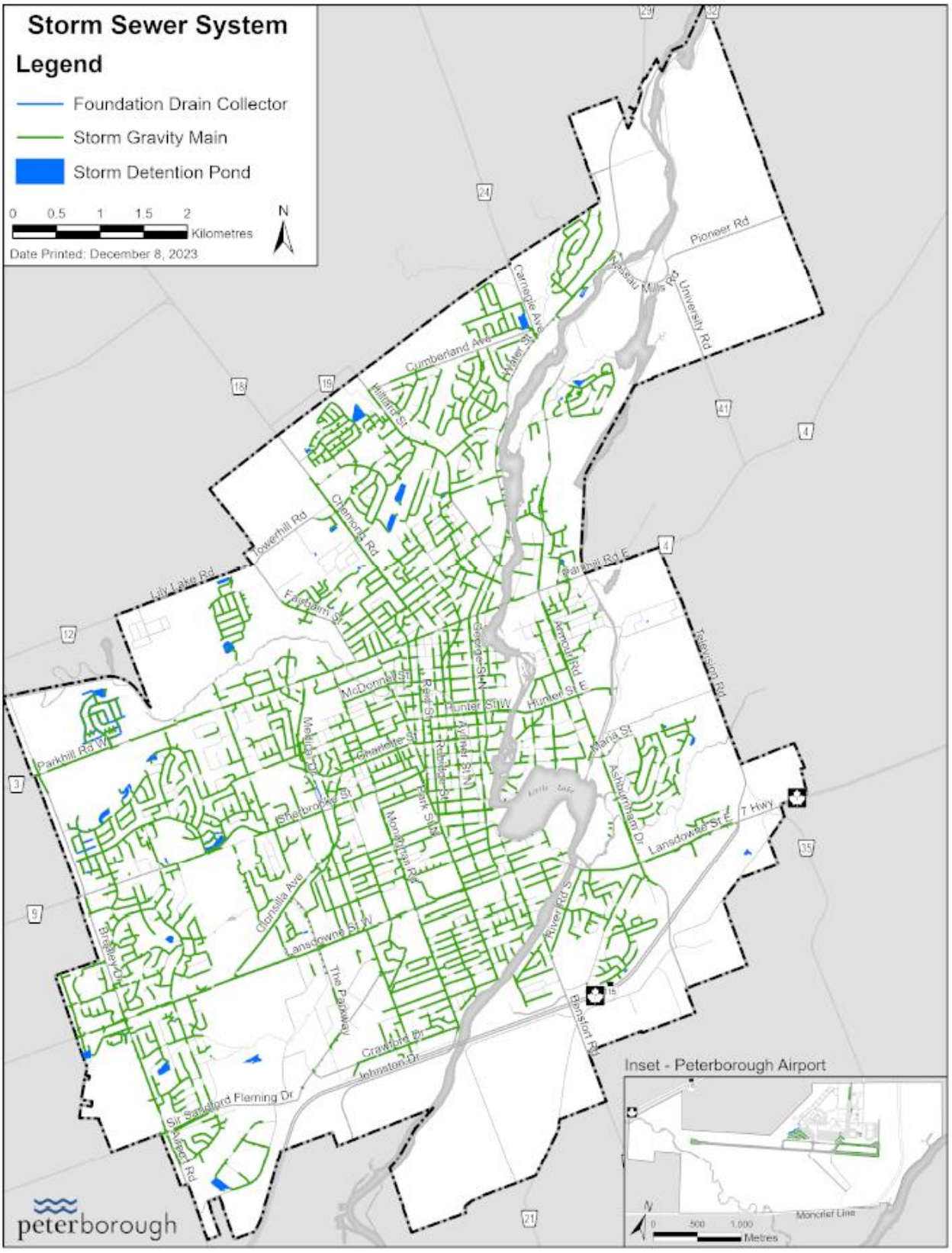
Asset Class: Stormwater								
Service Objective Statement: The City strives to protect property, infrastructure and the environment.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope	Protect property, infrastructure and environment	Area of the City that is protected from flooding, including the extent of the protection provided by the municipal stormwater management system	Peterborough's storm sewer and storm management system consists of foundation drain collectors, storm gravity main pipes and stormwater detention ponds. See Figure 3: Storm Sewer System	Peterborough's storm sewer and storm management system consists of foundation drain collectors, storm gravity main pipes and stormwater detention ponds. See Figure 3: Storm Sewer System	Percentage of properties in municipality that are resilient to a 100-year storm	21% of properties are resilient to 100-year storm	a) % of properties resilient to 100-yr storm (buildings not impacted by flooding = 17%) b) % of properties resilient to 100-yr storm (overland flooding only) - 89%	a) % of properties resilient to 100-yr storm (buildings not impacted by flooding = 17%) b) % of properties resilient to 100-yr storm (overland flooding only) - 89%

Asset Class: Stormwater								
Service Objective Statement: The City strives to protect property, infrastructure and the environment.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
					Percentage of municipal stormwater management system resilient to a 5-year storm	21% of municipal stormwater management system to be resilient to 5-yr storm	n/a - not reported	a) % of municipal SWM system (pipes) resilient to 5-year storm - 21% b) % of municipal SWM system (maintenance holes) resilient to 5-year storm = 66%
Reliability/Quality	Providing reliable stormwater assets that meet the needs of the community	Stormwater assets are maintained in a state of good repair	Stormwater assets are proactively maintained and reliable for intended use	Stormwater assets are proactively maintained and reliable for intended use	Percentage of Conveyance assets in poor or better condition	Maintain 100% of conveyance assets in poor or better.	94%	94%
					Percentage of Storm Management assets in fair or better condition	100% of SWM assets in fair or better condition	81%	81%

Asset Class: Stormwater								
Service Objective Statement: The City strives to protect property, infrastructure and the environment.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
					Length of pipe inspected and flushed per year	All pipes inspected on a 5-year cycle	Target achieved	Target achieved
					Maintain catch basin cleanout program	20% of existing inventory to be cleaned out annually	2022: 1412 cleaned or 26%	2024: 1080 cleaned or 20%

To provide updated level of service measures for properties resilient to a 100-yr storm and systems resilient to 5-yr storms, the City developed a comprehensive storm sewer model for the entire sewer network. The model assesses sewer conveyance capacity (minor system) using current conditions and future land-use and climate scenarios, as well as the risks associated with urban surface flooding (major system). The model will provide the City with a detailed assessment of our resilience now, and in the future, to a range of design storms, including a 5-year (or greater) return period event.

Figure 3: Storm Sewer System



2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Stormwater Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees.
- LOS are achievable over the short term for renewal activities, however some lifecycle activities, e.g. service improvements and growth-related activities, will need additional investment to achieve targets, accommodate growth, and adapt/mitigate against climate change impacts.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and expected performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Stormwater asset funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Stormwater				
Scope	Protect property, infrastructure and the environment	Area of the City that is protected from flooding, excluding the extent of the protection provided by the municipal storm water management system	Peterborough's storm sewer and management system consists of foundation drain collectors, storm gravity main pipes and stormwater detention ponds.	Stormwater system and detention ponds expected to increase due to projected growth
Reliability/Quality	Providing reliable storm water assets that meet the needs of the community	Stormwater assets are maintained in a state of good repair	Stormwater assets are proactively maintained and reliable for intended use	Same level of service expected

Table 7 below outlines the Stormwater Service Area Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The current performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used. A 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Stormwater Conveyance and Management				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Length of pipe inspected per year	All pipes are inspected per year	Inspection frequency likely to remain the same. Annual cost likely to increase to accommodate for additional assets being constructed. The City conducts inspection activities on both sanitary and storm pipes. Costs include storm and sanitary pipes at this time.
		Level of Funding:	Historical 3-yr Annual Average: $2.3M	Annual Average: $2.7M
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Stormwater O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset.	Percentage of Conveyance assets in poor or better condition	94% of conveyance assets are in poor or better condition	Percentage of conveyance network is expected to be maintained over 10-year forecast.

	Activities that are expected to occur once an asset has reached the end of its useful life.	Percentage of SWM system in fair or better condition	81% of SWM system assets are in fair or better condition	Condition of SWM assets are likely to remain the same
		Level of Funding:	Historical 3-yr Annual Average: $3.0M	Annual Average: $1.7M
Disposals	Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No Stormwater disposals planned for the 10-yr period	No Stormwater disposals planned for the 10-yr period
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Percentage of properties resilient to a 100-yr storm Percentage of SWM systems resilient to a 5-yr storm	a) % of properties resilient to 100-yr storm (buildings not impacted by flooding = 17%) b) % of properties resilient to 100-yr storm (overland flooding only) - 89% a) % of municipal SWM system (pipes) resilient to 5-year storm - 21% b) % of municipal SWM system (maintenance holes) resilient to 5-year storm = 66%	LOS likely to decrease over the planning period. Annual costs expected to increase to accommodate for planned watershed improvements and flood mitigation activities.
		Level of Funding:	Historical 3-yr Annual Average: $1.0M	Annual Average: $7.5M

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Lifecycle Management Plan – Stormwater

The stormwater management strategy incorporates all major stormwater management assets. Options for which lifecycle activities that could potentially be undertaken are explored and analyzed in various studies and reports such as the Flood Reduction Master Plan (2005), Stormwater Quality Management Master Plan (2015) and CCTV inspection reports. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not necessarily need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Stormwater - Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	Public notices to remind residents to clean catch basin covers during fall before large storms
	Storm water management design standards in place
	Official Plan provides high level guidance to development and the inclusion of storm water management in development
	Linking the asset management plan to other studies, master plans and strategies
	Public consultation on levels of service
	Inspection programs to understand the condition of pipes, manholes and catch basins
	Annual inspection program for SWM facilities.
	Standard operating procedures in place for the survey, inspection and monitoring of all stormwater management facilities to ensure storm water management wet and dry ponds operate properly and adhere to Environmental Compliance Approvals
	Assumption process for subdivisions to minimize City risks and ensure development to City design standards
	New Provincial guidelines and legislation that require Municipalities to ensure stormwater management practices minimize stormwater volume and contaminate loads and maintain or increase the extent of vegetative and pervious cover.
	Implementation of site alteration bylaw to help

Strategy Type	Current Practice
	enforce erosion and sediment control measures on developments during construction
	Creation of a subsidy for the implementation of rain gardens on private residential lots
	Include climate change adaptation and promote the use of LID on City projects (as per CLI-ECA standards)
	Implementation of Stormwater Management Fee as a dedicated funding stream allocated back to providing the service
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	Street Sweeping
	Catchbasin clean out program
	Pipe flushing and cleaning during condition inspection programs
	Roots and heavy debris removal
	Spot repairs and other trenchless maintenance based on inspection programs findings
	Vegetation management and removal, debris removal, and minor structural repairs at stormwater ponds
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	Relining program for pipes based on inspection programs findings and pipe rehabilitation matrix. After relining of pipes, replace at end of service life.
	Pond structures and grading renewals, including major sediment removals to maintain compliance with ECA. Ponds are dredged based on sediment accumulation, as determined by surveys
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	Replacement of collapsed pipes
	After a single reline, replace pipes in poor condition based on a matrix of inspection findings and risk.
	Structures replaced with pipe when warranted
	After a single reline, stormwater pipes are replaced at the end of service life. Replacement of stormwater pipes and ancillaries are combined with other projects or utilities to reduce the cost and impact on other infrastructure

Strategy Type	Current Practice
	Storm asset replacement is prioritized when in combination of road rehab/replacement activities
	Availability of grants for funding storm water management programs
	For every capital project with regards to road reconstruction the storm sewers are looked at in detail for possible replacement and in many cases upgrade in diameter to suit larger storms due to climate change
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	Project coordination in combination with the age and condition to remove old infrastructure
	Plug pipes on a case-by-case basis (rare)
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	System expanded when city grows through subdivision developments
	Legislative changes in minimum design standards
	Capacity of the system no longer meets needs
	Intensification programs
	Most replacement of pipes are an expansion of the system
	new design standards requiring design increase from 2–5-year storms to 5–100-year storms
	Climate change related improvement requirements
	Rural road upgrades to urban roads require ditch replacements with storm infrastructure
	Addition of storm separators for environmental protection
Future Strategies	A source control program to reward customers that reduce and disburse storm water on their property in the form of credits
	Update engineering standards to include climate change adaptation and promote the use of LID

Strategy Type	Current Practice
	Public education program
	Implement the vision, goals, objectives, targets, policies and guidelines from the Watershed Plan and use the watershed as the ecologically meaningful scale for integrated and long-term planning of stormwater infrastructure

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models were developed in which asset intervention thresholds and associated costs (rehabilitation and replacement) are documented. These models are used to assess best options for what activities the City will undertake.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle renewal activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with Stormwater subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 9: Stormwater – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include street sweeping, catch basin clean out, pipe flushing and vegetation management.

Refer to Table 9: Stormwater – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are considered adequate to meet projected service levels. Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Forecasted renewal costs are projected to increase as assets age and conditions decline. The 3-year historical capital budget indicates that current funding levels for existing assets are relatively sufficient to address short-term renewal needs. Additional assets acquired due to growth/service improvements will also impact renewal funding needs in the long-term. Any significant shortfall may result in capital renewal activities for conveyance and stormwater management assets being deferred and/or declining condition ratings without interventions.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include system expansions, capacity upgrades, addition of storm separators, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily due to new developments, watershed improvements and flood mitigation activities. The City of Peterborough's City-Wide Development Charges (DC) Background Study has identified anticipated residential and non-residential growth capital program requirements to meet growth demands. Even though DC charges are intended to pay for the initial round of capital costs needed to service new development over an identified planning period, the City will need to commit the funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond). The current levels of funding for ongoing lifecycle activities will likely need to increase to support the acquisition of Stormwater assets and to deliver proposed levels of service.

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Costs shown are the costs needed to minimize lifecycle costs associated with delivering proposed LOS. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Stormwater Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Stormwater Conveyance and Management	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Conveyance	$1.6	$1.6	$1.6	$1.7	$1.7	$1.8	$1.9	$1.9	$2.0	$2.0	$1.8
Stormwater Management	$0.4	$0.4	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.6	$0.5
General - Other	$4.4	$4.5	$4.6	$4.8	$4.9	$5.1	$5.2	$5.4	$5.5	$5.7	$5.0
Total Proposed Funding	$6.3	$6.5	$6.7	$6.9	$7.1	$7.4	$7.6	$7.8	$8.0	$8.3	$7.3
Lifecycle Costs											
Conveyance	$4.6	$3.1	$13.1	$6.9	$7.1	$7.4	$7.6	$7.8	$8.0	$8.3	$7.4
Stormwater Management	$1.3	$0.0	$2.4	$1.2	$1.3	$1.3	$1.3	$1.4	$1.4	$1.5	$1.3
General - Other	$4.1	$2.5	$2.5	$3.0	$3.1	$3.2	$3.3	$3.4	$3.5	$3.6	$3.2
Total Lifecycle Costs	$10.0	$5.6	$17.9	$11.2	$11.5	$11.8	$12.2	$12.6	$12.9	$13.3	$11.9
Funding Shortfall	**-$3.6**	**$1.0**	**-$11.2**	**-$4.2**	**-$4.4**	**-$4.5**	**-$4.6**	**-$4.8**	**-$4.9**	**-$5.0**	**-$4.6**

Based on the lifecycle assessment of the Stormwater service area, it is estimated that the City would need to spend an average of $11.9 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $7.3 million, leaving an average shortfall of $4.6 million per year over the 10-year forecast. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast.

The overall forecasted lifecycle costs to deliver levels of service for the Stormwater service area exceeds the current levels of funding over the 10-year forecast. Risk management strategies related to managing the shortfall are discussed in Section 3.1 of this attachment.

Assuming current levels of funding remain consistent, without intervention, the City will likely experience gradually declining service levels primarily related to service improvements and growth activities, resulting with increased risk exposure over the long-term that will need to be managed. Funding over the 10-year planning period for watershed improvements and flood risk mitigation projects are not sufficient relative to the historical levels and will likely result in deferral or reduced scope of identified projects for areas such as Byersville, Meade, Thompson, Brookdale, Riverview and North-West Jackson watersheds. As storm pipes and management facilities are acquired and renewed, the planned maintenance budget should also be increased from year to year to perform the pro-active preventative maintenance measures. Over time, insufficient funding to complete renewal activities will likely lead to accelerated deterioration of assets resulting in increasing treatment costs to ensure assets are maintained in a state of good repair. The City will need to consider opportunities to manage the shortfall and assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to **effectively deliver established Stormwater services** are:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth).

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety – assets not adequate/available for emergency response

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The projected lifecycle costs for the Stormwater service area exceeds the current levels of funding over the short term (10-yr forecast) and long-term (10-year to 25-year) forecast and service levels/performance will likely decrease. The number of stormwater collection assets in poor and very poor condition are expected to increase over the long-term and will likely require additional funding to keep assets in a state of good repair (relining and reconstruction activities). It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds, and user fees to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired. For example, the recent implementation of a Stormwater Management Fee approved by Council in January 2025 (Report FCSFS25-003) that will allow for a dedicated funding stream allocated back to providing the stormwater service. Implementation of this fee is set to begin on April 1, 2025.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiency in completing projects such as grouping stormwater road and related asset projects together to minimize costs. E.g. complete renewals of road segments when storm/sanitary pipes are scheduled for rehabilitation.

- Seek approvals to implement recommendations and strategies set forth in the Flood Reduction Master Plan and Stormwater Quality Master Plan

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of stormwater assets.

The City has recently invested a great deal of resources into improving the gaps in knowledge for the storm water system and developing programs to maintain and improve the system. The Storm Water Quality Master Plan[5] provides options for programs to reduce the City's risks. Additionally, the recent Water Resource Funding Study has developed creative financing options to implement the recommendations of the Storm Water Quality Master Plan. As the City moves towards implementing these programs the current risks surrounding our storm water management will be greatly reduced.

The City is also undertaking a Watershed Plan for our region's various sub-watersheds. The Watershed Plan will create a number of risk-based targets, policies and guidelines for the watershed in relation to surface water quality and quantity, groundwater, natural hazards, natural heritage and infrastructure.

All City services, including Stormwater services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining Stormwater assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

[5] Stormwater Quality Master Plan, October 2015

Attachment #3: Wastewater Service Area

Infrastructure Value	$1,863M	
Overall Condition	4.0	Good
High Risk Asset Value	$105M	6%
Trend		

1.0 Summary of Wastewater

Asset classes that fall under the Wastewater service area include treatment and conveyance assets. Treatment assets include wastewater treatment plants and pumping stations, fleet, equipment (process mechanical, electrical, safety, structural and the Centennial fountain). Conveyance assets include linear infrastructure such as gravity pipes (forcemains, trunk, main, siphon pipes) and ancillaries (manholes, flushing manholes, valve chambers and unclassified. Condition rating trends remain neutral with an overall rating of good.

1.1 Inventory Details

The following table details the City of Peterborough's inventory for the wastewater service area.

Table 1: Wastewater Service Area Asset Inventory

Asset Category & Class	Asset	2023 Quantity	Unit of Measure
Treatment			
Facilities	Treatment Plant	1 plant (20 structures)	Structures
	Pumping Stations	10	Buildings
	Bypass Station	1	Buildings
	Administration/Laboratory	1	Buildings

Asset Category & Class	Asset	2023 Quantity	Unit of Measure
Fleet	Light duty trucks/van, heavy duty trucks, trailers, boat/carts	7	each
Equipment	Various pumping station and treatment plant process equipment and Centennial fountain.	1,625	each
Conveyance			
Pressure Pipe	Forcemains	12	km
Gravity Pipe	Mains	284	km
	Trunk	78	km
	Siphon	0.4	km
Ancillaries	Flushing Manholes	5,130	each
	Sanitary Manhole		
	Valve Chamber		
	Unclassified		

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the wastewater service area totalled $1.9 billion. Replacement costs were determined using different valuation methods, such as unit cost multipliers based on recent construction projects[1], condition assessments or historical costs inflated to 2023 where recent assessments or costing information was not available.

[1] Wastewater gravity pipes and ancillaries' replacement costs are based on recent construction projects which include hard costs, soft costs and the cost of replacing materials above the pipes at the time of install (i.e. granular fill, asphalt, sod, concrete, etc.).

Figure 1: Wastewater Service Area –Replacement Cost by Category[2]

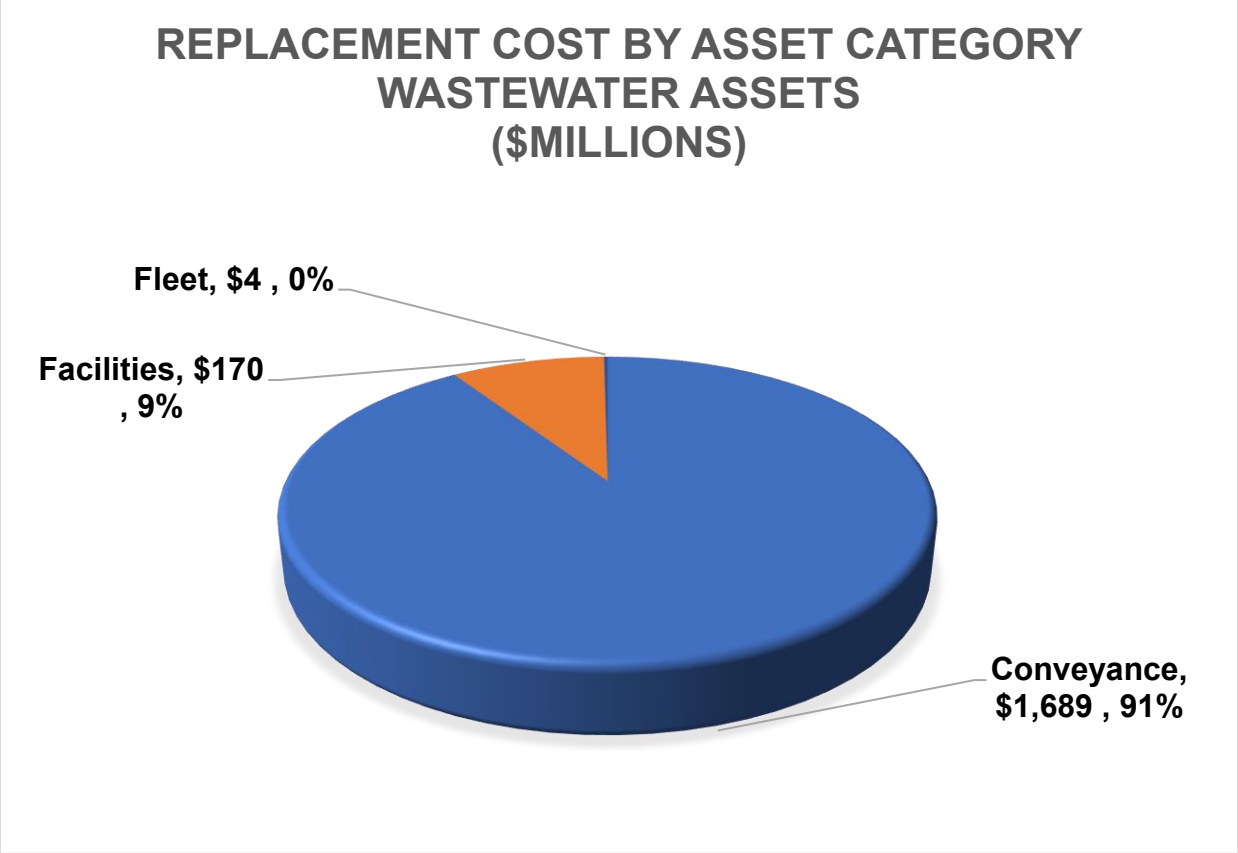


Table 2: Wastewater – Replacement Cost by Asset

Asset Category & Class	Asset	2023 Replacement Cost
Treatment		**$174,313,444**
Facilities	Treatment Plant	$143,366,677
	Pumping Stations	$26,878,544
Fleet	Light duty trucks/van, heavy duty trucks, trailers, boat/carts	$4,068,222
Conveyance		**$1,689,164,383**
Pressure Pipe	Forcemains	$32,759,068
Gravity Pipe	Mains	$1,497,386,758
	Trunk	
	Siphon	
Ancillaries	Flushing Manholes	$159,018,558
	Sanitary Manholes	

[2] Based on replacement cost of assets which have had condition assessments completed.

Asset Category & Class	Asset	2023 Replacement Cost
	Valve Chambers	
	Unclassified	
Wastewater Total		**$1,863,477,827**

1.3 Asset Condition and Remaining Useful Life

The City's wastewater service area is currently rated in overall good condition. Where condition inspections have not been completed, age-based ratings were used. Based on replacement cost, 74% or $1.4 billion are rated very good, 27% or $460.3 million are good, 12% or $205.8 million are fair and 6% or $108.1 million are rated poor to very poor. Figure 2 and Table 3 provide condition details of the wastewater service area.

Figure 2: Wastewater - Distributed Condition and Replacement Cost

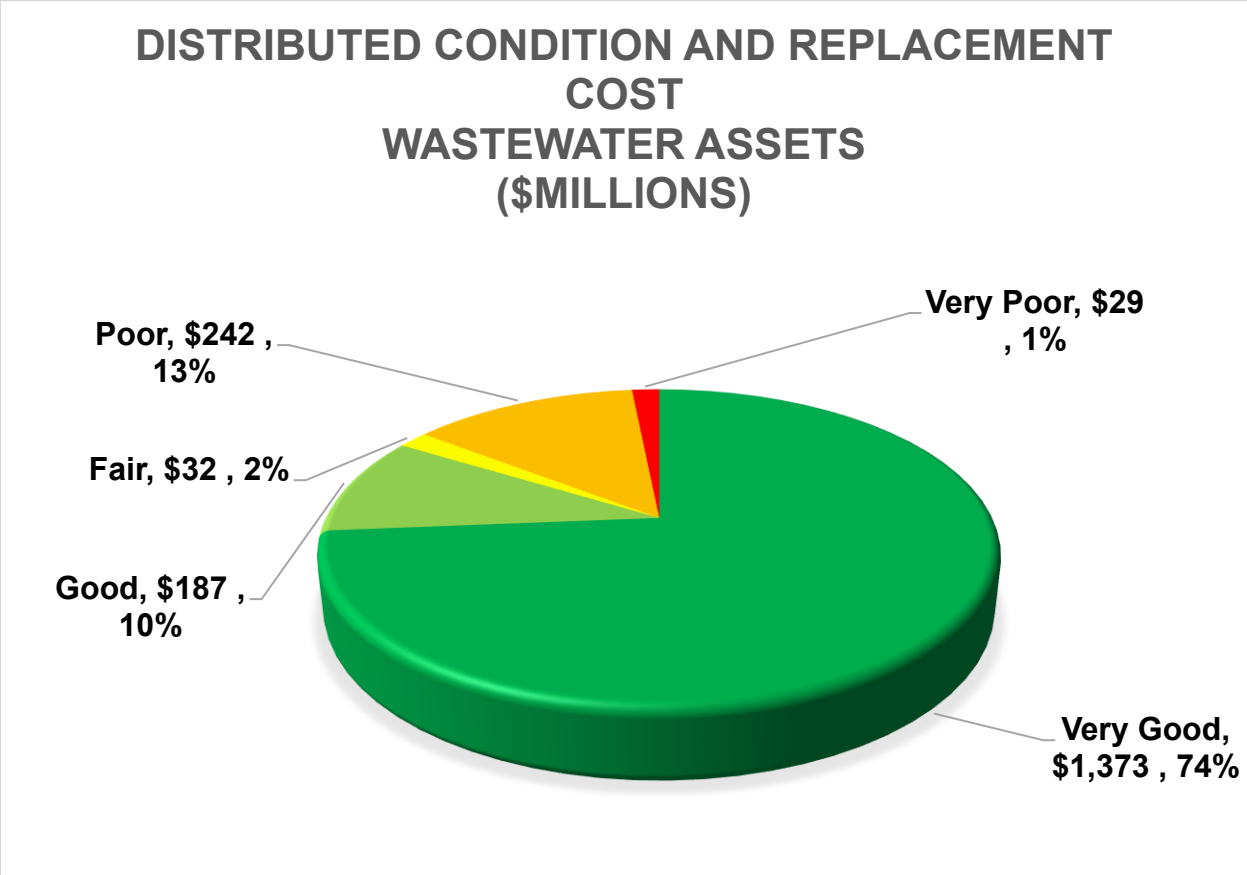


Table 3: Wastewater – Asset Condition Ratings

Asset Category & Class	Asset	2023 Condition Rating
Treatment		
Facilities	Treatment Plant	Good
	Pumping Stations	
Fleet	Light duty trucks/van, heavy duty trucks, trailers, boat/carts	Poor
Conveyance		
Pressure Pipe	Forcemains	Good
Gravity Pipe	Mains	Very Good
	Trunk	
	Siphon	
Ancillaries	Flushing Manholes	Poor
	Sanitary Manholes	
	Valve Chambers	
	Unclassified	
Wastewater Overall Condition[3]		**Good**

Treatment

Facilities
Condition ratings for the wastewater treatment facilities are based on the most recent building condition assessments completed in 2021-2022 and use observed age of facility elements at the time of assessment. Other assets use an age-based rating methodology and have been reviewed by staff to ensure that it reflects the current conditions until detailed assessments are completed. The City plans to complete BCA's on a seven year cycle with the next round of assessments anticipated to be completed in 2028

Fleet
Condition ratings for fleet are based on both inspected conditions and age-based ratings. The City's fleet maintenance plan incorporates ministry requirements and industry best practices which aims to maintain a high level of vehicle health. Predictive processes are utilized when scheduling major repairs such as engine, transmission and

[3] Weighted by replacement cost

axle repairs. This ensures that the right maintenance activities are being carried out at the correct time throughout the vehicle's life cycle.

Remaining Useful Life

The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the calculated age or observed age where available, and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age would be used in calculating remaining useful life. The age of the Wastewater Service Area is variable and with efforts to extend the life by application of lifecycle treatments. Table 4 shows the Wastewater remaining useful life details.

Table 4: Wastewater Remaining Useful Life

Asset Inventory	Expected Useful Life (Yrs)[4]	Ave. Remaining Useful Life (Yrs)	Percent of Useful Life Remaining
Conveyance	75	21	28%
Facilities	28	9	34%
Fleet	10	0	0%
Wastewater Remaining Useful Life[5]	**64**	**18**	**28%**

1.4 Asset Risk Assessment

Currently, the consequences of failure for wastewater assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B) which also took into consideration the pipe size, land use and the zoning surrounding the asset, where possible. Where condition assessment data isn't available, likelihood of failure was calculated using age of the asset.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Wastewater high risk assets is $105 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service*.

[4] Uses average of asset classes/assets
[5] Overall RUL and Percent Useful Life remaining are weighted by replacement cost

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2033). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the 2005 Flood Reduction Master Plan and the Official Plan.

Table 5: Levels of Service – Wastewater Assets

Asset Class: Wastewater - Conveyance, Treatment								
Service Objective Statement: The City will meet legislative requirements, while promoting safe and reliable infrastructure that protects the environment, public and property.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope	A wastewater collection and treatment system that will protect the environment, public and property	Description/maps of areas that are connected to the wastewater system	See Figure 3: Waste-water System	See Figure 3: Waste-water System	% of properties connected to the municipal wastewater system	100% of properties connected to wastewater system	All parcels in the City = 27,090 Serviced Parcels in the City = 25,481 % of parcels serviced = 94.1%	All parcels in the City = 27,645 Serviced Parcels in the City = 26,067 % of parcels serviced = 94.3%
Safety	Wastewater system does not pose a health and safety risk onto stakeholders	Number of sewer backups into private property	159 Services, 4 Main	187 Services 2 mains	Pipes are inspected and flushed per year	All pipes are flushed on a 5-yr cycle	Target achieved	Target achieved
Reliability/Quality	Reliable wastewater service is provided with	>2 odour complaints per year	2 complaints	1 complaint	Number of bypasses at the WWTP into the river	Zero by-passes	Zero by-passes	Zero by-passes

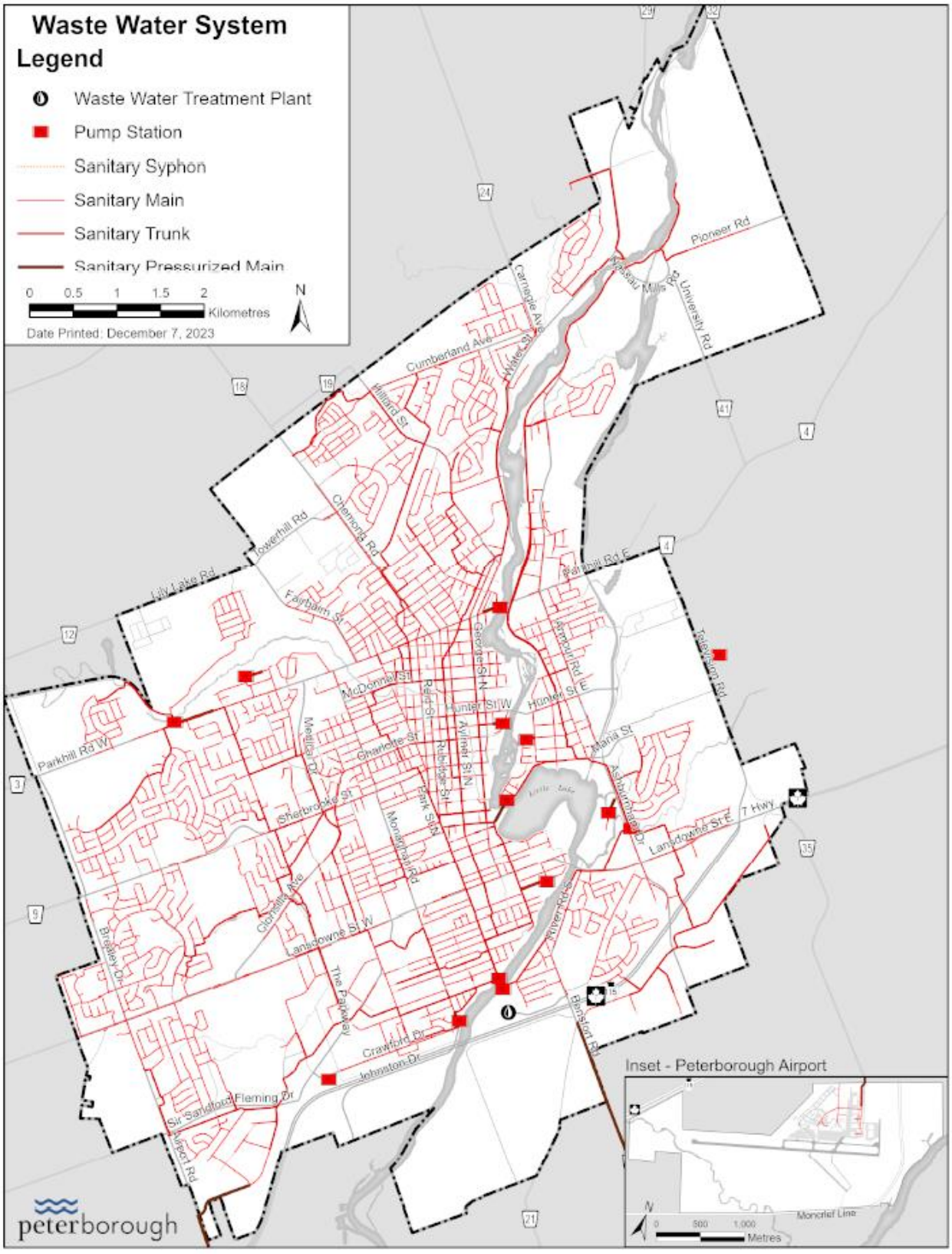
Asset Class: Wastewater - Conveyance, Treatment								
Service Objective Statement: The City will meet legislative requirements, while promoting safe and reliable infrastructure that protects the environment, public and property.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
	minimal public impact				Percentage of Conveyance assets in poor or better condition	100%	97% (average of conveyance asset sub-classes)	97% (average of conveyance asset sub-classes)
					Percentage of Treatment assets in fair or better condition	100%	86%	86%
Reliability/Quality	A wastewater collection and treatment system that will protect the environment, public and property	Description of how stormwater can get into sanitary sewers, causing sewage overflow into streets or back up into homes	See PM Statement 1) below	See PM Statement 1) below	# of effluent violations per year due to wastewater discharge compared to the total # of properties connected to the system	Zero effluent violations	Zero effluent violations	Zero effluent violations

Asset Class: Wastewater - Conveyance, Treatment								
Service Objective Statement: The City will meet legislative requirements, while promoting safe and reliable infrastructure that protects the environment, public and property.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
PM Statement 1)	Inflow and Infiltration refers to rainwater and groundwater that enters the sanitary sewer through a variety of defects. Inflow sources allow rainwater to enter the sanitary sewer directly from the surface through improper plumbing and cross connections. Some examples include downspouts and roof drain connections and catch basin cross connections as well as former construction practices. Infiltration sources allow the groundwater to seep into the sanitary sewer through cracks or bad joints in sewer pipes and manholes as well as through the foundation drains of older buildings. A certain amount of inflow and infiltration is unavoidable and is accounted for in routine sewer design. However, when inflow and infiltration exceed design allowances, sewer capacity is consumed and may result in overflows, risks to health, damage to the property and the environment, and increased treatment and disposal costs.							
Reliability/ Quality	A wastewater collection and treatment system that will protect the environment, public and property	Description of how sanitary sewers are designed to be resilient to avoid events described in 1) above	See PM Statement 2) below	See PM Statement 2) below	# of connection-days per year due to backups compared to total # of properties connected to the City	0 connection days per year: total number of properties	163:26,082 or 0.006	182:26,067 or 0.007
PM Statement 2)	Calculations demonstrate that there is sufficient capacity in the proposed new system and the existing system downstream of the development must be presented where new flows will be introduced to the sanitary sewer system. For small developments with known							

Asset Class: Wastewater - Conveyance, Treatment								
Service Objective Statement: The City will meet legislative requirements, while promoting safe and reliable infrastructure that protects the environment, public and property.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
	downstream capacity issues and medium sized developments, capacity assessment is to be extended to the first trunk sewer (375mm in diameter and greater). Larger developments typically must continue the capacity assessment downstream into the trunk sanitary sewer system to a location as determined by the City's Water Resource Systems Division, typically on a case-by-case basis upon review of the additional flows versus known existing capacity constraints of the trunk sanitary sewer system. Calculations must be provided on an appropriate design chart and should be accompanied by legible sanitary sewer area plan showing catchment areas and land uses. In addition to design land use sewage loading, extraneous flows (inflow and in infiltration) at the maximum MECP standard are also required to be included in the sanitary sewer capacity assessment. Calculated peak flows should not exceed 80% of the 'just full' pipe capacity of new sewers.							
Reliability/ Quality	A wastewater collection and treatment system that will protect the environment, public and property	Description of the effluent that is discharged from the sewage treatment plant	See PM Statement 3) below	See PM Statement 3) below				

Asset Class: Wastewater - Conveyance, Treatment								
Service Objective Statement: The City will meet legislative requirements, while promoting safe and reliable infrastructure that protects the environment, public and property.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
PM Statement 3)	Described in terms of average annual daily flow, average annual concentration and annual geometric mean for E. coli; 2022: Average Annual Daily Flow: 39,246 m3/d. Average Annual Concentration: cBOD 3.71mg/L, TSS 10.59mg/L Total Phosphorus 0.35mg/L Annual Geometric Mean for E. coli: 108cfu/100mL pH (Min/Max): 7.00/7.84 2024: Average Annual Daily Flow: 45,236 m3/d Average Annual Concentration: n/a Total Phosphorus 0.23mg/L Annual Geometric Mean for E. coli: 59 cfu/100mL pH (Min/Max): 6.60-7.64							

Figure 3: Wastewater System



2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Wastewater Service Area:

- Current LOS for both treatment assets and conveyance assets are appropriate and will establish the LOS the City proposes to provide over the next 10 years.

- Proposed LOS are aligned with service delivery objectives, council approved strategic plans, policies, and service area studies and budget constraints.

- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.

- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*

- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year and 25-year forecast to understand impacts to assets and services.

- Sanitary Sewer Relining, Renew & Repair Lifecycle activity historical costs are reported as a lump sum cost but is 50%-50% shared with Stormwater collection relining costs.

- The current funding levels are affordable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees.

- LOS are achievable over the short term with for most lifecycle activities, however renewal lifecycle activities will need additional investment to achieve targets, accommodate growth, and adapt/mitigate against climate change impacts in the long-term.

- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and expected performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to wastewater funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Wastewater Conveyance and Treatment				
Scope	A wastewater collection and treatment system that will protect the environment, public and property	Description/maps of areas that are connected to the wastewater system	Extent of the wastewater collection and treatment system is provided in the AMP	Wastewater collection and treatment systems are expected to increase due to projected growth
Safety	Wastewater system does not pose a health and safety risk onto stakeholders	Number of sewer backups into private property	187 Services, 2 Mains	Same level of service expected
Reliability/Quality	Reliable wastewater service is provided with minimal public impact	Number of Odour Complaints	One complaint per year	Same level of service expected
Reliability/Quality	A wastewater collection and treatment system that will protect the environment, public and property	Description of how stormwater can get into sanitary sewers, causing sewage overflow into streets or backup into homes	See below	Same level of service expected
Proposed Performance: Inflow and Infiltration refers to rainwater and groundwater that enters the sanitary sewer through a variety of defects. Inflow sources allow rainwater to enter the sanitary sewer directly from the surface through improper plumbing and cross connections. Some examples include downspouts and roof drain connections and catch basin cross connections as well as former construction practices. Infiltration sources allow the groundwater to seep into the sanitary sewer through cracks or bad joints in sewer pipes and manholes as well as through the foundation drains of older buildings. A certain amount of inflow and infiltration is unavoidable and is accounted for in routine sewer design. However, when inflow and infiltration exceed design allowances, sewer capacity is consumed and may result in overflows, risks to health, damage to the property and the environment, and increased treatment and disposal costs				
Reliability/Quality	A wastewater collection and treatment	Description of how sanitary sewers are designed to be	See below	Same level of service expected

	system that will protect the environment, public and property	resilient to avoid events described in LOS above		
Proposed Performance: Calculations demonstrating that there is sufficient capacity in the proposed new system and the existing system downstream of the development must be presented where new flows will be introduced to the sanitary sewer system. For small developments with known downstream capacity issues and medium sized developments, capacity assessment is to be extended to the first trunk sewer (375mm in diameter and greater). Larger developments typically must continue the capacity assessment downstream into the trunk sanitary sewer system to a location as determined by the City's Water Resource Systems Division, typically on a case-by-case basis upon review of the additional flows versus known existing capacity constraints of the trunk sanitary sewer system. Calculations must be provided on an appropriate design chart and should be accompanied by legible sanitary sewer area plan showing catchment areas and land uses. In addition to design land use sewage loading, extraneous flows (inflow and in infiltration) at the maximum MECP standard are also required to be included in the sanitary sewer capacity assessment. Calculated peak flows should not exceed 80% of the 'just full' pipe capacity of new sewers.				

Table 7 below outlines the Wastewater Area Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The proposed performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used. A 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Wastewater Collection and Treatment				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Investigation and identification of inflow and infiltration into sanitary sewer systems	Conduct sanitary sewer master plan and servicing studies	Likely to remain the same over the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Length of pipe inspected per year	All pipes are inspected per year	Likely to remain the same over the 10-year planning period. The City conducts inspection activities on both sanitary and storm pipes. Costs have been included in stormwater analysis.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected	Percentage of Conveyance and treatment assets in fair/poor or better condition	97% of conveyance assets are in poor or better condition 86% of treatment facility assets are in fair or better condition	Condition of conveyance assets expected to stay the same. Annual costs expected to increase due to quantity of ageing conveyance

	to occur once an asset has reached the end of its useful life.			assets due for relining. Treatment assets LOS is likely to remain the same. Proposed level of funding is more reflective of projected renewal needs. Historical $6.3M is attributed to significant treatment projects that are not typical levels of funding presented in the budget.
		Level of Funding:	Historical 3-yr Annual Average: $2.3M (Conveyance) $6.3M (Treatment)	Annual Average: $2.8M (Conveyance) $1.4M (Treatment)
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No wastewater disposals planned for the 10-yr period	No wastewater disposals planned for the 10-yr period
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Percentage of properties connected to the municipal wastewater system	94.4% of existing parcels serviced	Number of parcels to be connected to the wastewater system is likely to increase over the 10-yr planning period due to growth. Forecasted costs include new eastern trunk sewer, treatment plant revitalization, upgrades, and expansion

		Level of Funding:	Historical 3-yr Annual Average: $6.4M	Annual Average: $10.1M (Collection and Treatment)

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Lifecycle Management Plan – Wastewater Assets

The Wastewater services strategy incorporates all wastewater assets. Options for which lifecycle activities that could potentially be undertaken are explored and analyzed in various studies and reports such as the Flood Reduction Master Plan (2005) and CCTV inspection reports. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Wastewater – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	Updates of assumed data from CCTV program to improve data sets for management and modelling capacity
	Sanitary system design standards in place
	Linking the asset management plan to other studies, master plans and strategies
	Public consultation on levels of service
	Official Plan provides high level guidance to development and the inclusion of sanitary systems in development
	CCTV program to understand the condition of pipes and manholes
	Assumption process for subdivisions to minimize City risks and ensure development to City design standards
	Change the purpose of retired building structures to be used for new purposes
	Process changes to treatment to maximize equipment efficiency and performance

Strategy Type	Current Practice
	Inflow and Infiltration (I&I) program[1] to increase capacity in conveyance network and at plant.
	Flow monitoring and rain gauges
	Alarm system in place to notify of large storms
	Smoke testing to locate cross connections and downspout connections
	CCTV program to locate sites of I&I
	Manhole inspection started; to be finished in 2020
	Advanced operator program for treatment plant operators
	Support of PUC's wastewater conservation program
	Water meters for all users
	CCTV inspector training
	Flood reduction subsidy program[2] to remove cross connections
	To assist with downspout disconnection
	Addition of downspout splash pads to reduce impact of water
	Public education program on website and media releases
	Modelling of system to understand effects of storms and hydraulic capacity of network
	Calibrated with flow monitor data and rain gauges
	Dedicated funding from Sanitary Sewer Reserve Fund using rates collected from Sanitary Sewer Service[3] to improve and maintain sanitary system as a part of the Flood Reduction Program
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	Pipe flushing during CCTV condition inspection program on a 6-year cycle
	Pipe grouting and reaming to remove roots and fix small cracks and joints
	Spot repair, sleeves and other trenchless maintenance based on CCTV program findings
	Preventative maintenance program based on manufactures specification for plant equipment
	Redundancy of key plant equipment
	Emergency maintenance triggered by customer service line at public works primarily related to laterals
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of	Relining program for pipes based on CCTV program findings and pipe rehabilitation matrix
	Tank refurbishments at plant

Strategy Type	Current Practice
the asset (e.g. the lining of iron watermains can defer the need for replacement).	Reuse of retired building
	Pump rebuilds
	Motor rebuilds
	Purchase used equipment when possible
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	Replacement of Collapsed pipes
	After a reline, pipes are replaced at end of life based on a matrix of CCTV inspection findings and risk
	Manholes replaced with pipes when warranted
	Replacement of sanitary pipes and ancillaries combined with other projects or utilities to reduce the cost and impact to other infrastructure
	Replace equipment for more efficient equipment to give better power savings and process efficiency
	Replace similar assets at the same time to save on bulk equipment purchases
	Combine replacements to happen during “Shutdown” periods
	Most equipment is run until failure with redundancy on hand to handle failed assets
	If repair is greater than 50% of the replacement cost the equipment is replaced
	Customer complaints may drive replacement of laterals
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	Project coordination in combination with the age and condition to remove old infrastructure
	Forcemains abandoned in place
	Tanks are abandoned, filled and built over
	Equipment generally decommissioned at the end of their useful service life
	Process updates leads process equipment abandon strategy which is based on best practices
	Equipment decommissioned based on new legislation
	Some items sold for scrap
	Some older equipment is saved as backup for emergency use
	Dispose of equipment that no longer meets capacity
Expansion Programs Planned activities required to extend the services to previously un-serviced areas	System expanded when city grows through subdivision developments
	Legislative changes in minimum design standards
	Capacity of the system no longer meets needs

Strategy Type	Current Practice
– or expand services to meet growth demands.	System modelled in MikeUrban software to understand capacity
	Ministry requirements updated
	Response to climate change
	Adapting to changes in industry and their waste
	Increased process efficiency
	Intensification programs
	Addition of backup generators at pump stations
	Expansion of redundancy for emergency management
Future Strategies	Tertiary Treatment Program (Effluent polishing)
	Digester replacement
	Improved manhole covers to reduce infiltration
	Raise low lying manholes to grade
	Trenchless pipe bursting for replacements
	Transformer replacement program for increased efficiency
	Incorporating ground water levels and soil type information into pipe replacement matrix
	Predictive lateral and pipe maintenance
	Investigate forcemains for condition and capacity
	Provide redundancy for forcemains
	Manhole relining program
	Condition assessment of plant equipment
	Manhole grouting program
	Increase subsidy program to include backflow preventers, sump pit and pumps, and fixing clean-out covers to prevent basement flooding and reduce surcharges
	Locating pipes and manholes not inspected due to locate issues

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models were developed in which asset intervention thresholds and associated costs (rehabilitation and replacement) are documented. These models are used to assess best options for what activities the City will undertake.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle renewal activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with Wastewater subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 8: Wastewater – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include, pipe flushing, spot repair, implementing preventative maintenance programs based on manufactures specification for plant equipment, etc.

Refer to Table 8: Wastewater – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are considered adequate to meet projected service levels. Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Overall, the forecasted renewal costs are projected to increase as assets age and conditions decline to less than acceptable standards. The 3-year historical capital budget indicates that current funding levels for existing treatment assets are sufficient for treatment assets but insufficient to address conveyance renewal needs such as planned reconstruction and rehabilitation projects within arterial corridors. Additional assets due to growth/service improvements are planned which will impact renewal funding needs for both asset classes in the long-term.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include system expansions, capacity upgrades, response to climate change impacts, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily due to new developments, treatment facility expansions and upgrades, and capacity enhancements. The City of Peterborough's City-Wide Development Charges (DC) Background Study has identified anticipated residential and non-residential growth capital program requirements to meet growth demands. Even though DC charges are intended to pay for the initial round of capital costs needed to service new development over an identified planning period, the City will need to commit the funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond). The current levels of funding for ongoing lifecycle activities will likely need to increase to support the acquisition of Wastewater assets and to deliver proposed levels of service.

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Costs shown are the costs needed to minimize lifecycle costs associated with delivering proposed LOS. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Wastewater Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Wastewater Conveyance and Treatment	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Wastewater Other	$0.1	$0.1	$0.1	$0.1	$0.2	$0.2	$0.2	$0.2	$0.2	$0.2	$0.2
Wastewater Collection	$3.5	$3.6	$3.7	$3.8	$3.9	$4.0	$4.1	$4.3	$4.4	$4.5	$4.0
Wastewater Treatment	$11.4	$11.7	$12.1	$12.4	$12.8	$13.2	$13.6	$14.0	$14.4	$14.8	$13.0
Total Proposed Funding	$15.0	$15.4	$15.9	$16.4	$16.9	$17.4	$17.9	$18.4	$19.0	$19.5	$17.2
Lifecycle Costs											
Wastewater Other	$0.3	$0.8	$0.8	$0.6	$0.6	$0.6	$0.6	$0.7	$0.7	$0.7	$0.6
Wastewater Collection	$6.4	$5.8	$2.5	$4.9	$5.0	$5.2	$5.3	$5.5	$5.7	$5.8	$5.2
Wastewater Treatment	$6.2	$11.3	$6.5	$8.0	$8.2	$8.5	$8.7	$9.0	$9.3	$9.5	$8.5
Total Lifecycle Costs	$12.8	$17.8	$9.8	$13.5	$13.9	$14.3	$14.7	$15.1	$15.6	$16.1	$14.3
Funding Shortfall	**$2.2**	**-$2.4**	**$6.1**	**$2.9**	**$3.0**	**$3.1**	**$3.2**	**$3.3**	**$3.4**	**$3.5**	**$2.8**

Based on the lifecycle assessment of the Wastewater service area, the current average funding level is $17.2 million and estimated average lifecycle costs are $14.3 million per year. The average level of funding for the Wastewater service area is estimated to be sufficient however planned growth and service improvement activities will require additional funding to avoid risks such as the deferral of key growth projects. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast.

Assuming current levels of funding remain consistent, the City will likely maintain levels of service for most lifecycle activities except for growth and service improvement related activities. As sanitary pipes and treatment facility assets are expanded and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures. Over time, insufficient funding to complete renewal activities will likely lead to accelerated deterioration of assets resulting in increasing treatment costs to ensure assets are maintained in a state of good repair. The City will need to assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.1 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Wastewater services** are:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Deferral of projects that will impact key growth areas of the City
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The current funding level is sufficient to deliver proposed levels of service for the Wastewater service area over the short term (10-yr forecast). As assets are acquired, it is expected that operation and preventative maintenance investments will increase to accommodate both new assets and ageing assets falling into condition ranges that are below acceptable standards.

Where a shortfall in funding may be identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects such as grouping wastewater and road and related asset projects together to minimize costs. E.g. complete renewals of road segments when storm/sanitary pipes are scheduled for rehabilitation.

- Seek approvals to implement recommendations and strategies set forth in the Sanitary Master Plan

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of wastewater assets.

Due to the 2004 flood event a great deal of attention has been applied to minimizing service risks within the sanitary system. The ability to use dedicated funding has also allowed the City to apply funding continuously into the program and fully utilize best practises. Risks relating to asset failure are mitigated though condition assessment programs, maintenance programs (legislated and best practices) and scheduled renewal programs which ensure assets are in acceptable condition and are available to achieve the determined levels of services. Risks related to fleet asset failures are addressed through proactive fleet maintenance and adequate vehicle storage to ensure adequate service readiness.

All City services, including Wastewater services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining Wastewater assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

Attachment #4: Transit Service Area

Infrastructure Value	$115M	
Overall Condition	3.0	Fair
High Risk Asset Value	$23M	20%
Trend		

1.0 Summary of the Transit Service Area

Asset classes that fall under the transit service area include fleet, transit facilities, linear assets (access lanes and driveways) and miscellaneous assets which include bus stops and shelters (including pads), bus fareboxes and equipment and software. Condition rating trends are neutral from the previous year and remain Fair. The Simcoe St. parking garage/bus terminal facility is a shared facility between the transit and the roads & related assets service area (parking services). Details are reported in this section until further analysis is completed which will allocate the correct portion of assets into the respective service area.

Table 1 details the City of Peterborough's inventory for the transit service area.

1.1 Inventory Details

Table 1: Transit Service Area Asset Inventory

Asset Category & Class	2023 Quantity	Unit of Measure
Fleet		
Bus – Conventional	61	Each
Accessible Van	13	Each
Transit Facilities		
Transit Garage - 200 Townsend St.	4,045	Sq.m
Simcoe St. Parking Garage/Bus Terminal - 190 Simcoe St.	20,129	Sq.m
Bus Storage – 182 Townsend St.	33,100	Each
Transit Linear Assets		

Asset Category & Class	2023 Quantity	Unit of Measure
Access/Driveways	1	Each
Miscellaneous		
Bus Stops	637	Each
Fareboxes & Equipment	Pooled	Each
Pre-Board announcement	Pooled	Each
Stop announcement signs	Pooled	Each
Software	Pooled	Each

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the transit service area totalled $115 million. Replacement costs were determined using different valuation methods, such as unit cost multipliers based on recent construction projects or replacements, condition assessments or historical costs inflated to 2023 where recent assessments or costing information was not available.

Figure 1: Transit Service Area –Replacement Cost by Asset Class

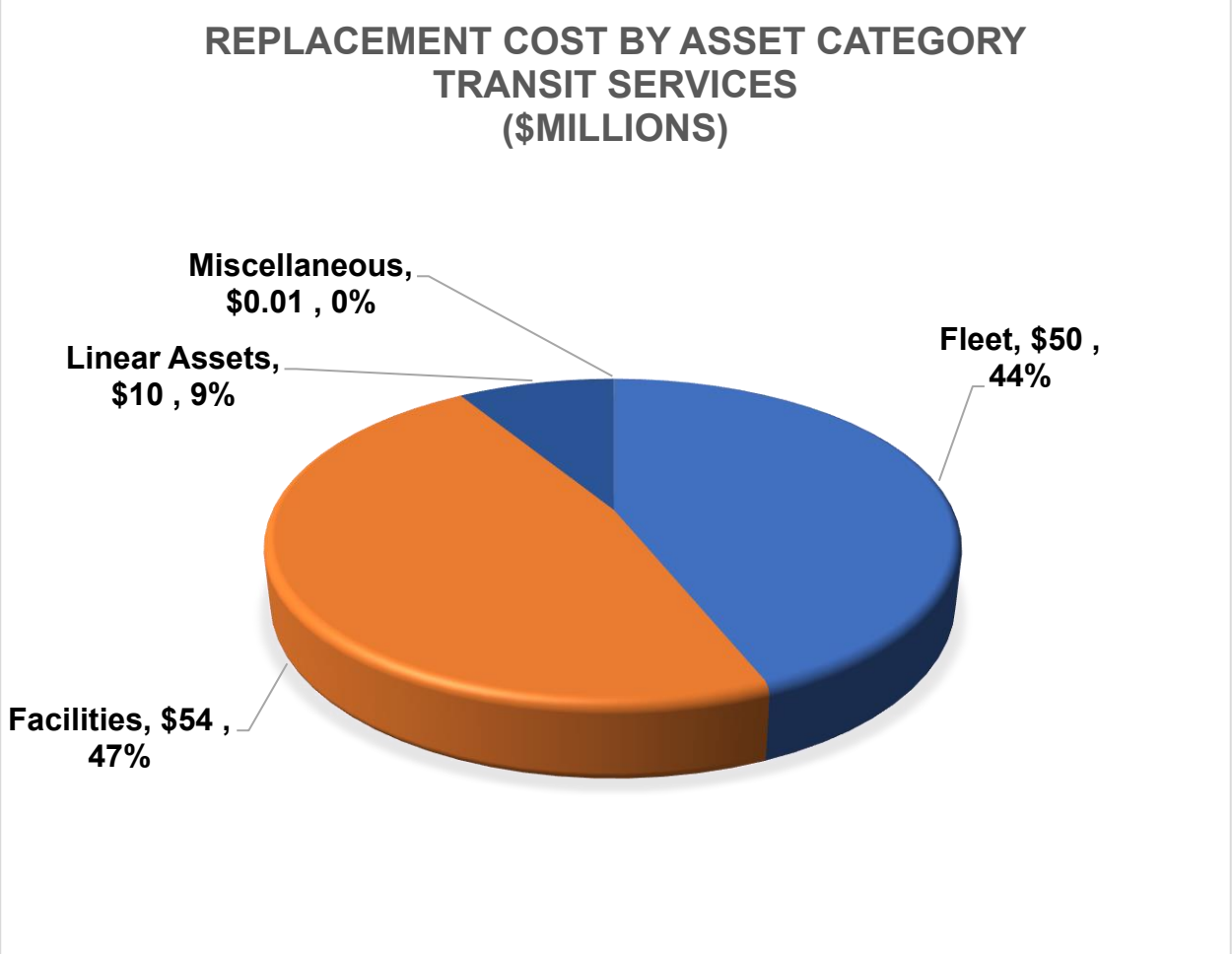


Table 2: Transit – Replacement Cost by Asset Sub-Class

Asset Class & Sub-Class	2023 Replacement Cost
Fleet	**$54,405,167**
Bus	$52,740,857
Accessible Van	$1,664,310
Transit Facilities	**$50,031,888**
Transit Garage - 200 Townsend St.	$13,560,610
Simcoe St. Parking Garage/Bus Terminal - 190 Simcoe St.	$31,051,728
Bus Storage – 182 Townsend St.	$5,419,549
Transit Linear Assets	**$114,711**
Access/Driveways	$114,711
Miscellaneous	**$10,066,687**
Bus Stops	$7,432,429
Fareboxes & Equipment	$2,327,272

Asset Class & Sub-Class	2023 Replacement Cost
Pre-board announcement	$129,150
Stop announcement sign	$77,000
Software	$100,836
Transit Total	**$114,618,453**

1.3 Asset Condition and Remaining Useful Life

The City's transit service area is currently rated in overall fair condition. Where condition inspections have not been completed, age-based ratings were used. Based on replacement cost, 11% or $12 million are in very good condition, 17% or $20 million are in good condition, 45% or $52 million are Fair and 27% or $21 million in poor to very poor condition. Figure 2 and Table 3 provide condition details of the transit service area.

Figure 2: Transit - Distributed Condition and Replacement Cost

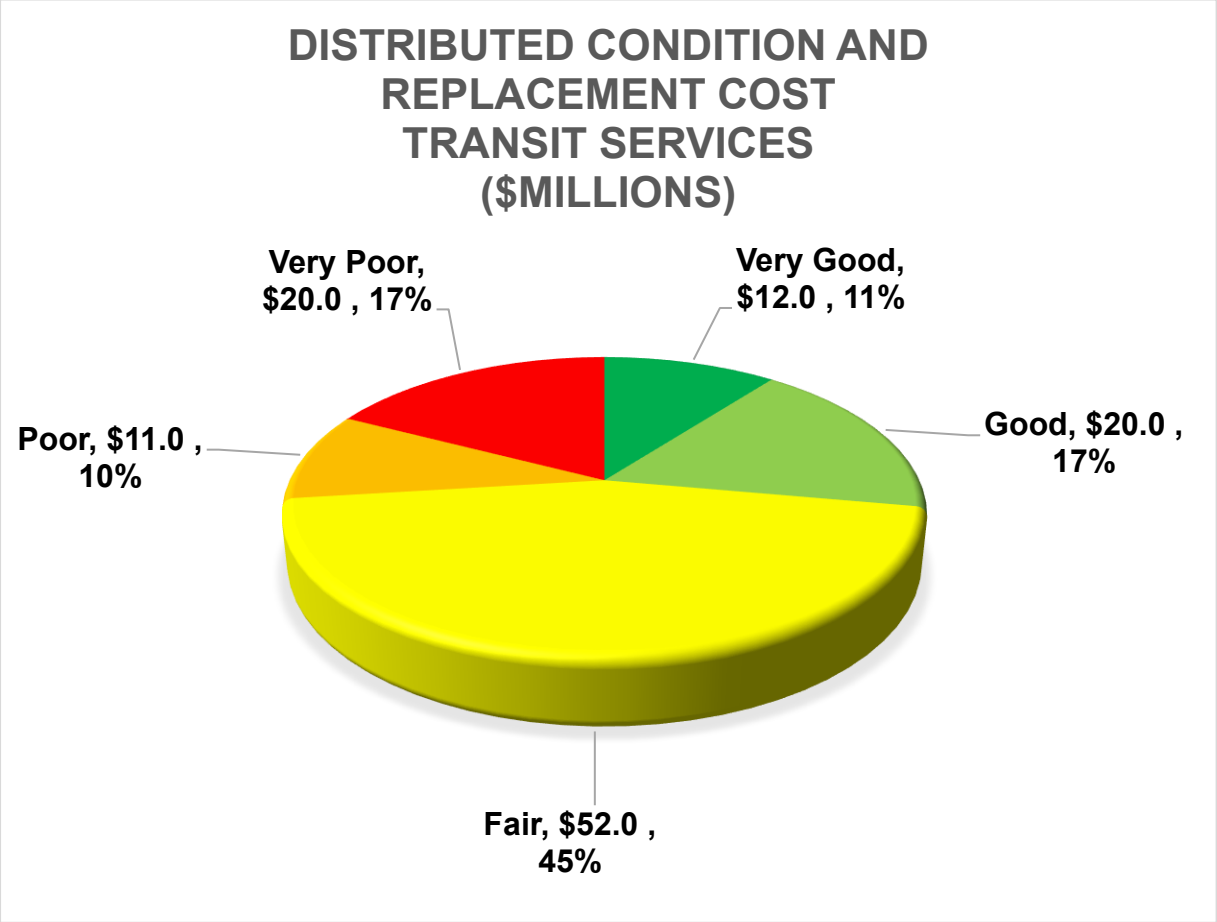


Table 3: Transit – Asset Class Condition Ratings

Asset Class & Sub-Cass	2023 Condition Rating
Fleet	
Conventional Bus	Fair
Accessible Van	Good
Transit Facilities	
Transit Garage - 200 Townsend St.	Very Good
Simcoe St. Parking Garage/Bus Terminal - 190 Simcoe St.	Fair

Asset Class & Sub-Cass	2023 Condition Rating
Bus Storage – 182 Townsend St.	Very Poor
Transit Linear Assets	
Access/Driveways	Fair
Miscellaneous	
Bus Stops	Fair
Fareboxes & Equipment	Very Good
Pre-board announcement	Very Good
Stop announcement signs	Very Good
Software	Very Good
Transit Overall Condition[1]	**Fair**

Fleet

Transit fleet condition ratings are based on both age and recommended ratings provided by staff. Estimated useful lives of transit fleet are 16 years for conventional buses and 18 years for accessible vans. The City currently has a target average age 18 years prior to replacing a bus without having to carry out traditional bus refurbishment. The City's fleet maintenance plan incorporates ministry requirements and industry best practices which maintains a high level of vehicle health. Predictive processes are utilized when scheduling major repairs such as engine, transmission and axle repairs. This ensures that the right maintenance activities are being carried out at the correct time throughout the vehicle's life cycle.

Climate Change Considerations

New fleet buses come equipped with Nova Bus' clean diesel propulsion system which includes a proprietary electric engine cooling system. Use of this system results in significant fuel savings, reduced greenhouse gas emissions and competitive life cycle costs when compared to conventional diesel-powered buses. Continuing to reduce the age of the fleet will contribute to meeting corporate greenhouse gas emission targets. As well, staff continue to review industry technology and opportunities for alternate fuel vehicles, which fit the Peterborough context.

Transit Facilities

Condition ratings for the Transit Garage and Simcoe St. Parking Garage/Bus Terminal are based on the available building condition assessments completed in 2021-2022 and use observed age of facility elements at the time of assessment. High level condition rating for the Bus Storage at 182 Townsend St. have been provided by internal staff. Individual facility BCA's will be updated on a 7-year cycle and are anticipated to be completed in 2028.

A facility that is rated poor or worse does not represent a hazard but rather represents that the facility is not performing as intended, at the end of its useful life or have

[1] Weighted by replacement cost

significant deferred maintenance/capital costs relative to the overall replacement cost of the facility.

Simcoe St. Parking Garage/Bus Terminal

The parking garage/bus terminal at 190 Simcoe St., currently rated in fair condition, underwent a structural review in 2013 which identified major structural and mechanical capital needs which were completed in 2016 at an estimated $790,000 (Phase 1 of second rehab program). Major works included replacing deteriorated concrete on structural beams, updating the drainage systems, localized repairs to the concrete deck surface, waterproofing systems and expansion joint repairs. An updated structural review in 2017 identified a further $2.3 million in work to upgrade and replace the waterproofing system and repair deteriorated concrete in the structure.

The facility was constructed in 1974 as a parking garage and was initially designed for smaller buses serving fewer transit trips than the service provides today. Currently the transit terminal configuration and size are not suited to meet the current operating needs. The Downtown Transit Hub Plan is currently underway and will review and evaluate candidate sites for the new transit garage site along with concept plans and identify the most suitable location and design for a downtown terminal.

Transit Garage

The transit garage facility located at 200 Townsend St. is currently rated very good. Funds requested in 2020 at an estimated $1.0 million will be used for minor upgrades to the garage to extend its service life until a new garage can be constructed.

The transit garage is only capable of storing 42 buses indoors which does not allow for enough storage of 55 buses. In 2018, Public Works operations, including major bus maintenance activities, moved from the 182 Townsend Street location to the new location at 791 Webber Avenue. With the Webber Ave. yard not being large enough to incorporate a new bus storage facility onsite, buses will continue to be stored at the 200 Townsend St. and 182 Townsend St. location and at the new PW Yard on Webber Ave, albeit outdoors, until further plans are developed regarding a new Transit garage location.

Outdoor bus storage does not allow the vehicles to be properly washed and cleaned at the end of the day to ensure that interior surfaces and the advanced accessibility features (kneeling buses, accessible ramps) do not freeze up during the winter. The inability to properly service and maintain the buses reduces the life expectancy and increases longer term maintenance costs. Currently, staff are required to shuttle the buses from the storage facility to the Webber Ave. Public Works yard for maintenance work. Funds in 2017 were used to undertake a transit garage relocation study, complete design work for the selected location and secure necessary approvals allowing for construction to proceed once funding is available.

Miscellaneous Assets
Assets within the miscellaneous asset class are primarily rated in fair to very good condition. The proposed capital budget includes the Transit Stop Shelter project with an estimated total project cost of $0.1 million over the 2020-2023 capital forecast. This project was initiated in 2017 as part of the Public Transit Infrastructure Funding (PTIF) received from the federal government. The program will allow existing transit stops to be upgraded and the install of new transit shelters to accommodate various levels of passenger demand. The shelter upgrades enhance accessibility by being designed barrier free and to accommodate passengers with mobility devices.

Remaining Useful Life
The following summarizes the Transit service area remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the calculated age (not observed age) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age would be used in calculating remaining useful life. The ages of the transit service area assets are variable and with efforts to extend the life by application of lifecycle treatments. Table 4 shows the transit remaining useful life details.

Table 4: Transit Remaining Useful Life

Asset Inventory	Expected Useful Life (Yrs)[2]	Ave. Remaining Useful Life (Yrs)	Percent of Useful Life Remaining
Transit Facilities	45	0	0%
Fleet	11	0	0%
Miscellaneous	13	0	0%
Transit Remaining Useful Life[3]	**33**	**0**	**0%**

1.4 Asset Risk Assessment

The consequences of failure for Transit assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

[2] Uses average of asset classes/assets
[3] Overall RUL and Percent Useful Life remaining are weighted by replacement cost

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Transit services high risk assets is $22.7 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the 2023 Transportation Master Plan and the Official Plan.

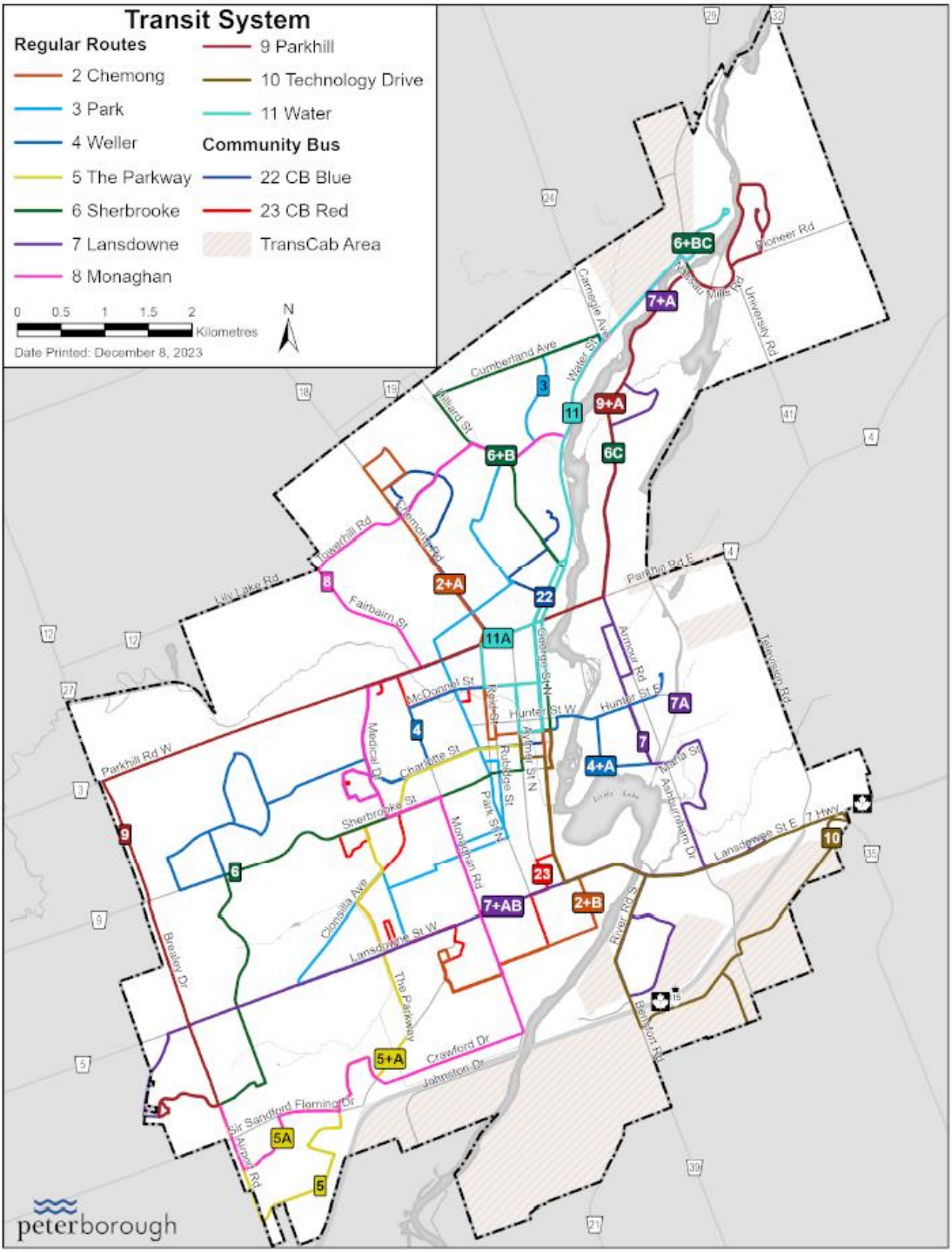
Stakeholder and technical levels of service, performance measures and targets for the Transit service area are outlined in Table 5 below

Table 5: Levels of Service – Transit Service Area

Asset Class: Transit								
Service Objective Statement: The City strives to provide a high quality, accessible and affordable service that provides access to the city.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope/Availability	A transit system with access to all areas of the City.	Map showing the extent of the transit route system throughout the City	See Figure 3: Peterborough Transit Routes	See Figure 3: Peterborough Transit Routes	Access to a service is provided to customers by providing bus stops within distance of addresses	90% percent of the population is within 450m of a bus stop	97% of the population is within 450m of bus stop	97% of the population is within 450m of bus stop
					Provide various routes and services to suit ridership needs	Maintain current available routes and services	4 Services - 10 Regular Routes, Community Bus Service, Trans-Cab Service, Snow Routes	4 Services - 10 Regular Routes, Community Bus Service, Trans-Cab Service, Snow Routes
					Conventional Bus Vehicle hours per person	1.4 vehicle hours	1.70 vehicle hours	1.84 vehicle hours
Reliability/Quality	Providing reliable Transit that meets the	Transit facilities and assets are	Transit facilities and assets are	Transit facilities and assets are	Number of facilities with overall condition	3 Facilities	2 Facilities	2 Facilities

Asset Class: Transit								
Service Objective Statement: The City strives to provide a high quality, accessible and affordable service that provides access to the city.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
	needs of the community	maintained in a state of good repair	proactively maintained and reliable for intended use	proactively maintained and reliable for intended use	rating of 'Fair' or better			
					Percentage of vehicles that are past their useful life	Max 10%	14%	14%
					Unassigned ratio of vehicles	Max 15%	Conventional Bus: 10% Wheelchair Access: 10%	Conventional Bus: 10% Wheelchair Access: 10%
					Average Fleet Vehicle Age (Conventional Buses)	Average of 10 years	Average of 12 years	Average of 12 years
Accessibility (Specialized accessible buses)	Door to door service is available to registered users	Availability of accessible transit service throughout the City	Door to door service is available	Door to door service is available	Specialized Bus Vehicle hours per person	0.2 vehicle hours	0.33 vehicle hours	0.20 vehicle hours

Figure 3: City of Peterborough Transit Routes



2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Transit Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees. However, the current funding levels are not sufficient to achieve LOS over the short- and long-term planning period.
- LOS are not achievable over the short term for renewal activities and some lifecycle activities, e.g. service improvements and growth-related activities, will need additional investment to achieve targets, accommodate growth, and address capacity deficiencies.
- Transit garages and terminals are at capacity and require expansion and/or relocation to accommodate increasing fleet and service expansions
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Transit funding levels will occur, it is expected that Stakeholder LOS for Reliability/Quality will be maintained with no significant risk impacts to the City however it is expected that transit service demands due to growth will increase over the 10-year forecast.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Transit				
Scope	A transit system with access to all areas of the City	Map showing the extent of the transit route system throughout the City	Peterborough Transit Routes are shown in Figure 3 in Section 2.0 above	Transit routes are expected to increase due to projected growth
Reliability/Quality	Providing reliable Transit that meets the needs of the community	Transit facilities and assets are maintained in a state of good repair	Transit facilities and assets are proactively maintained and reliable for intended use	Same level of service expected

Table 7 below outlines the Transit Service Area Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used. A 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Transit Services				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Conventional Bus Vehicle hours per person	1.70 vehicle hours	Likely to remain the same over the 10-year planning period. Projected costs are associated with the Transit ITS Program software to provide real time bus arrival times and enhanced travel info for customers
		Level of Funding:	Historical 3-yr Annual Average: $200K	Annual Average: $200K
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Transit O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has	Number of facilities with overall condition rating of 'Poor' or better	2 Facilities	Facility conditions are expected to be maintained over 10-year forecast at current level of investment with plans for garage expansion or relocations.

	reached the end of its useful life.	Percentage of vehicles that past their useful life	14%	Overall historical renewal funding levels are sufficient to address most forecasted renewal needs however, anticipated expenditures to replace bus fleet are expected to increase over the planning period and will require additional investment. LOS expected to remain the same over the 10-year planning period.
		Level of Funding:	Historical 3-yr Annual Average: $3.3M	Annual Average: $2.6M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No Transit disposals planned for the 10-yr period	No Transit disposals planned for the 10-yr period
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/ Service Improvements	Capacity/ service improvements Support development and growth	Provide various routes and services to suit ridership needs	4 Services - 10 Regular Routes, Community Bus Service, Trans-Cab Service, Snow Routes	Likely to increase due to growth demands in the 10-year forecast
		Access to a service is provided to customers by providing bus stops within distance of addresses	97% of the population is within 450m of bus stop	% of POP expected to increase over the 10-year forecast

		Level of Funding:	Historical 3-yr Annual Average: $3.3M	Annual Average: $9.8M

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Lifecycle Management Plan – Transit Service Area

The transit strategy will primarily focus on the fleet assets with some strategies for the building assets. Options for which lifecycle activities that could potentially be undertaken have been explored in various studies and reports such as the Transportation Master Plan, Transit Route Review and Long-Term Growth Study. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Transit – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	Older fleet rotated into daily driving fleet less often
	Extended warrantee provisions in purchasing process
	Linking the asset management plan to other studies, master plans and strategies
	Public consultation on levels of service
	High priority in procurement for purchasing fleet compatible with current fleet to improve parts and maintenance costs
	Training programs for mechanics and operators to optimally maintain and operate vehicles
	Redundancy of parts and fleet for the system
	Annual contribution made to transit management budget from operational budget to prepare for repairs and replacements
	Budget yearly for accessibility upgrades
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	High standard for preventative maintenance that exceeds the Original Equipment Manufacturer (OEM) schedule
	Biannual government inspections legislated
	Annual HVAC, Undercoating, Mirror Replacement programs
	Fluid monitoring with lab analysis performed every other service to gain insight of future failures
	Third party tire checks 2x a year
	Monitor OEM bulletins/recalls and be ready to replace and repair

Strategy Type	Current Practice
	Facilities are part of the corporate wide facility preventative maintenance program
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	Software license upgrades yearly to ensure system works and meets applicable legislation and standards for Stop Call system
	Reactive renewals program
	Reuse of tire casings
	Transit vehicles have an engine overhaul at mid-life (approximately 5 years of age).
	Refurbishment line item on budget
	Retrofitting buildings to automated systems
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	Subject to funding, schedule made yearly
	18-year bus replacement cycle (standard in industry as best practice life cycle)
	Use gas tax when available to replace fleet
	Facility components replaced when at end of useful life through capital planning/business case
	Transit procurement initiative to allow for joint procurement of various transit related vehicles and equipment
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	Sell problematic fleet (very rare)
	Auction retired fleet
	Facilities that are no longer needed for the intended service are either sold, re-purposed or demolition.
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	Use transit reserve potentially when required
	Cost recovery contract programs used for expansion programs for post-secondary school routes
	Tie accessible stop improvement program to road reconstructions
Future Strategies	Review alternate fuels periodically for potential use
	Consider electric vehicles
	Updating the vehicle storage to increase fleet capacity
	Expanding the use of sponsorship to fund projects
	Adding real-time GPS to buses

Strategy Type	Current Practice
	Reviewing partnership with MetroLinx for fleet purchases if feasible in the long term and with customization fees

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with Transit services subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 8: Transit – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include preventative maintenance programs for both fleet and facilities, legislated inspections on vehicles, undercoating and mirror replacement for fleet, etc.

Refer to Table 8: Transit – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are considered adequate to meet projected service levels. Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Forecasted renewal needs are expected to increase over the 10-year planning period and with Transit fleet and some facility assets not meeting current LOS targets, it is expected that levels of service will decline over the long-term without intervention. Planned acquisitions to address growth/service improvements will also impact renewal funding needs in the long-term. Without adequate funding to address growth/service improvement needs for facilities, this may result in delays in bus maintenance activities due to space constraints in the garage, service interruptions related to ageing bus

mechanical failures, reduced route frequencies due to bus operator shortages and or shortages in bus quantities to cover additional required routes. Where service interruptions take place, the City is committed to ensuring that risks are minimized where possible, and stakeholders are aware of service alternatives.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include facility expansions, relocations to a larger facility to address capacity deficiencies, additional fleet to meet service demands, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily service demand increases due to growth. Additional conventional buses are needed, and existing transit garages and terminals are at capacity. The City of Peterborough's City-Wide Development Charges (DC) Background Study has identified anticipated residential and non-residential growth capital program requirements to meet growth demands. Even though DC charges are intended to pay for the initial round of capital costs needed to service new development over an identified planning period, the City will need to commit the funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond). The current levels of funding for ongoing lifecycle activities will likely need to increase to support the acquisition of Transit assets and to deliver proposed levels of service.

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Transit Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Transit Services	Forecast Year ($M)										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Fleet	$2.0	$2.0	$2.1	$2.1	$2.2	$2.3	$2.3	$2.4	$2.5	$2.6	$2.3
Facilities	$4.8	$4.9	$5.1	$5.2	$5.4	$5.5	$5.7	$5.9	$6.1	$6.2	$5.5
Transit Services - other	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Total Proposed Funding	$6.8	$7.0	$7.2	$7.4	$7.6	$7.8	$8.1	$8.3	$8.6	$8.8	$7.7
Lifecycle Costs											
Fleet	$3.3	$4.1	$0.0	$2.5	$2.5	$2.6	$2.7	$2.8	$2.8	$2.9	$2.6
Facilities	$13.4	$17.8	$15.1	$0.8	$0.8	$0.8	$0.8	$0.8	$0.9	$0.9	$5.2
Transit Services - other	$0.0	$17.7	$30.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$4.8
Total Lifecycle Costs	$16.7	$39.5	$45.1	$3.2	$3.3	$3.4	$3.5	$3.6	$3.7	$3.8	$12.6
Funding Shortfall	**-$10.0**	**-$32.5**	**-$37.9**	**$4.2**	**$4.3**	**$4.4**	**$4.6**	**$4.7**	**$4.8**	**$5.0**	**-$4.8**

Based on the lifecycle assessment of the Transit service area, it is estimated that the City would need to spend an average of $12.6 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $7.7 million, leaving an average shortfall of $4.8 million per year over the 10-year forecast. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast. Average annual funding for Facilities used the historical 2021-2023 investments which more accurately represents the level of funding the City allocates to service improvements. Due to the timing of the garage replacement, capital funding in years 2022-2024 overinflated typical costs the City allocates on an annual basis.

The overall forecasted lifecycle costs to deliver levels of service for the Transit service area exceeds the current levels of funding over the 10-year forecast. Risk management strategies related to managing the shortfall are discussed in Section 3.3 of this attachment.

Assuming current levels of funding remain consistent, without intervention, the City will likely experience declining service levels and increased risk exposure over the long-term that will need to be managed. As conventional buses and facilities are acquired and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures. The City will need to consider opportunities to

manage the shortfall and assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Transit services are**:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Managing the Risks

The projected lifecycle costs for the Transit service area exceeds the current levels of funding over the 10-year planning period and service levels/performance will likely decrease. The number of existing Transit fleet and facility assets in poor and very poor condition are expected to increase over the long-term and will likely require additional funding to keep assets in a state of good repair (replacement and refurbishment activities). It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds, external grant opportunities to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects such as grouping transit renewal projects with other service area projects.

- Seek approvals to implement recommendations and strategies set forth in the Transportation Master Plan.

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of transit assets.

All City services, including Transit services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining Transit assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

Attachment #5: Solid Waste Management Service Area

Infrastructure Value	$60.5M	
Overall Condition	4.0	Good
High Risk Asset Value	$10M	17%
Trend		

1.0 Summary of Solid Waste Management

Asset classes that fall under the solid waste management service area are facilities (landfill and surrounding buffer zones), houses on the landfill buffer land, Hazardous Household Waste Depot at 400 Pido Rd., Recycling Centre at 390 Pido Rd., fleet vehicles and equipment.

Table 1 below details the City of Peterborough's inventory for the solid waste management service area. The force mains that move leachate from the landfill to the wastewater treatment plant have been included in the wastewater analysis. Fleet inventory was updated to 2024 to reflect large investments made for new garbage trucks in 2023. The Recycling Centre overall facility condition rating was updated to reflect recent investments to improve the condition rating to 'Good'. This improved the overall service area condition rating to 'Good' from 'Fair' compared to the last approved asset management plan in 2024.

1.1 Inventory Details

Table 1: Solid Waste Management Asset Inventory

Asset Class	2023 Quantity	Unit of Measure
Facilities		
Landfill	411,365	Sq.m
Hazardous Waste Depot	169	Sq.m
Recycling Centre	44,052	Sq.m

Asset Class	2023 Quantity	Unit of Measure
Access Drive/Roadways	1	Each
Fleet		
Garbage Trucks	20	Each
Light Duty Truck	2	Each
Land		
Landfill Buffer	969	Sq.m

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the solid waste management service area totalled $60.5 million. Replacement costs were determined using different valuation methods, such as unit cost multipliers based on recent construction projects, condition assessments or historical costs inflated to 2023 where recent assessments or costing information was not available.

Figure 1: Solid Waste Management –Replacement Cost by Asset Class

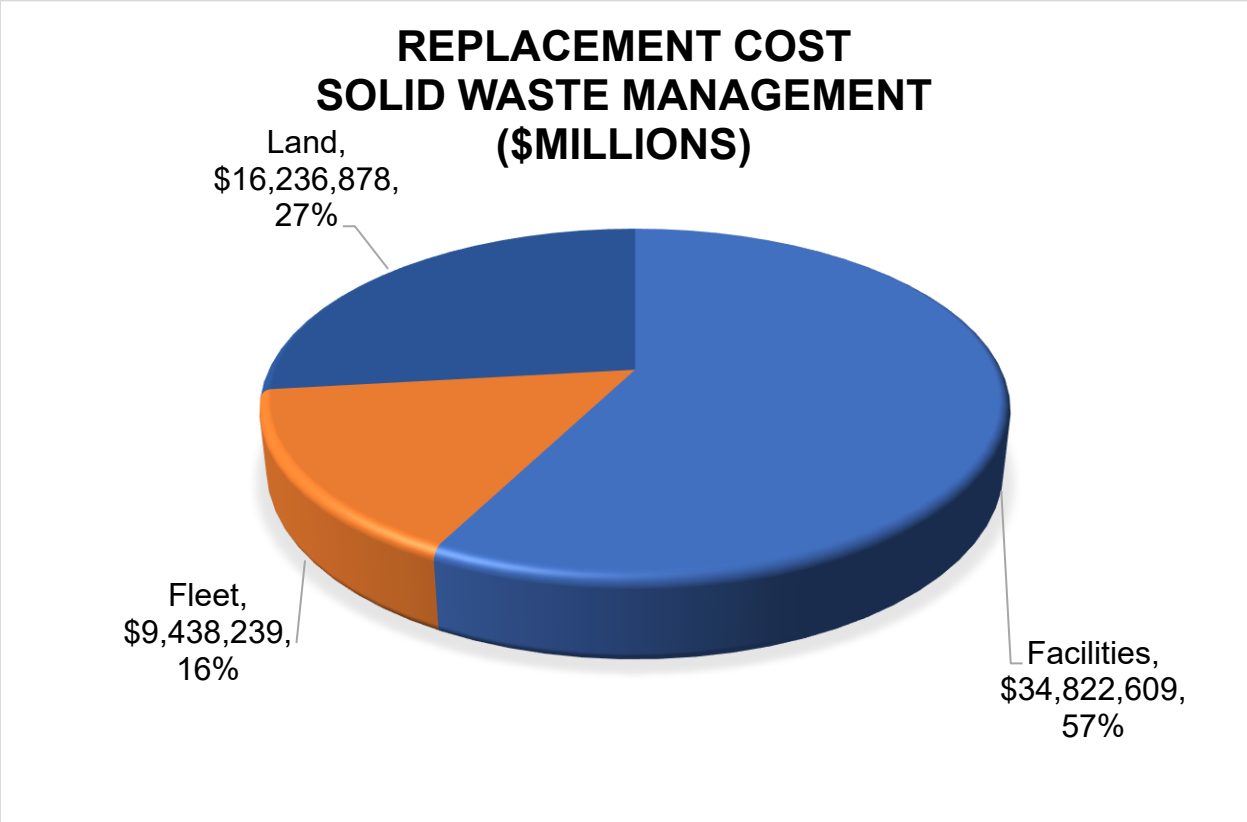


Table 2: Solid Waste Management – Replacement Costs by Asset Class

Asset Category & Class	2023 Replacement Cost
Facilities	**$34,822,609**
Landfill	$24,198,800
Hazardous Waste Depot	$157,598
Recycling Centre	$9,759,602
Access Drive/Roadways	$706,610
Fleet	**$9,438,239**
Garbage Trucks	$9,357,420
Light Duty Truck	$80,819
Land	**$16,236,878**
Landfill Buffer	$16,236,878
Solid Waste Management Total	**$60,497,727**

1.3 Asset Condition and Remaining Useful Life

The City's solid waste management service area is currently rated in overall fair condition (weighted average). A building condition assessment was completed for the Recycling Centre and Landfill Scale house in 2021-2022 and is anticipated to be updated in 2028. Where building condition assessments are not completed, age-based ratings or recommended high level ratings by staff are applied. Based on replacement cost, 30% or $18 million are rated very good, 65% or $40 million are rated good, 1% or $0.7 million are fair and 4% or $2 million are rated poor to very poor. Figure 2 and Table 3 provide condition details of the solid waste management service area.

Figure 2: Solid Waste Management - Distributed Condition and Replacement Cost

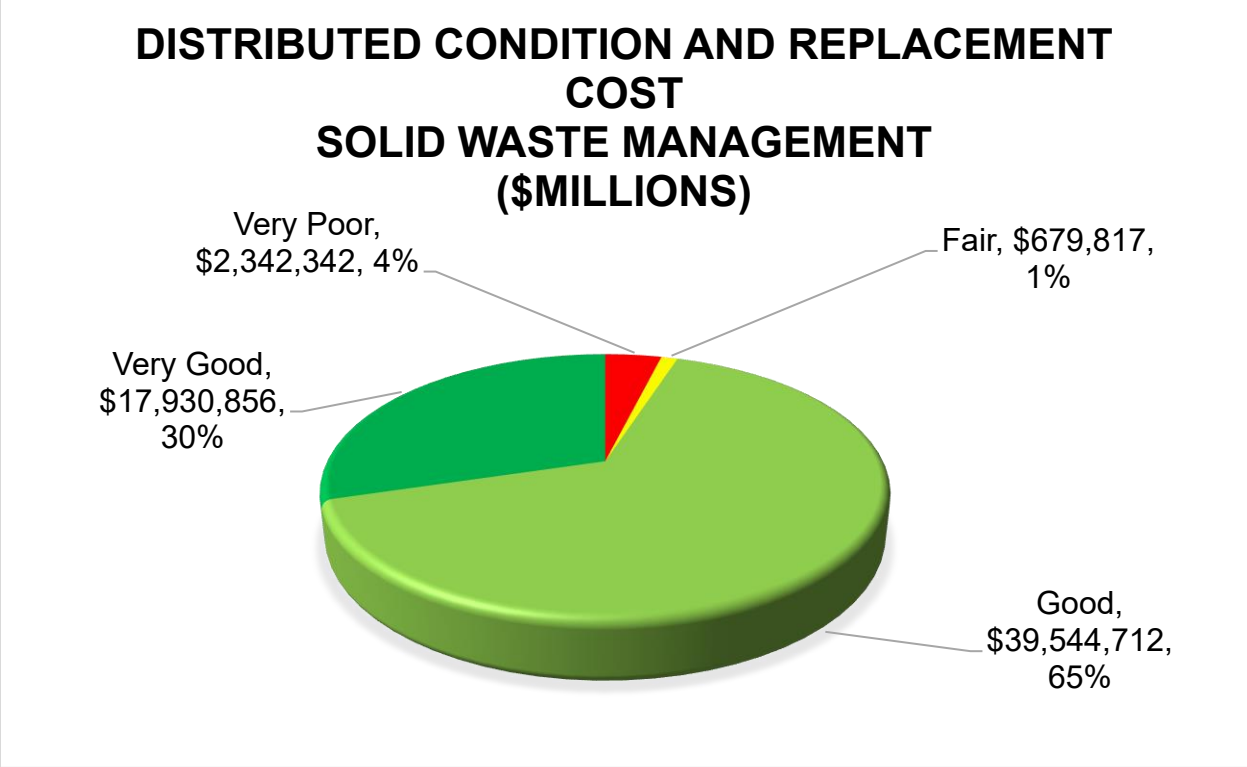


Table 3: Solid Waste Management – Asset Class Condition Ratings

Asset Category & Class	2023 Condition Rating
Facilities	
Landfill	Good
Hazardous Waste Depot	Good
Recycling Centre	Good
Access Drive/Roadways	Good
Fleet	
Garbage Trucks	Good
Light Duty Truck	Very Good
Land	
Landfill Buffer	Very Good
Solid Waste Management Overall Condition[1]	**Good**

[1] Weighted by replacement cost

Facilities

Solid waste facilities are rated in overall Good condition. The City of Peterborough and County of Peterborough entered into an agreement in 2002 to jointly own and operate the Bensfort Rd Landfill on a 50-50 cost share basis. The Hazardous Waste Depot, Recycling Centre and Landfill site are currently rated good (high level recommendation by City staff). Landfill assets include weigh scales, rental properties (houses) surrounding the landfill, sitework/roadways, gas capture system and leachate system. Cell 2 of the north fill area is nearing completion and will be capped in 2020. Cell 3 will continue to receive waste for an estimated four to five more years with Cell 4 design and construction planning anticipated to start in 2020.

Fleet

Solid Waste Management fleet ratings are based on both age and recommended ratings provided by staff. Fleet vehicles include garbage trucks and light duty pick up trucks. The City's fleet maintenance plan incorporates ministry requirements and industry best practices which maintains a high level of vehicle health. Predictive processes are utilized when scheduling major repairs such as engine, transmission and axle repairs. This ensures that the right maintenance activities are being carried out at the correct time throughout the vehicle's life cycle. Garbage trucks past their useful life and decommissioned for garbage collection are not disposed/sold but utilized only in summer months for green waste pick to ensure maximum useful life is achieved and minimize breakdowns.

Remaining Useful Life

The following summarizes the solid waste management service area remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the calculated age (not observed age) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age would be used in calculating remaining useful life. The age of the solid waste management service area is variable and with efforts to extend the life by application of lifecycle treatments, there isn't necessarily a linear relationship between age and condition. Table 4 shows the solid waste management remaining useful life details.

Table 4: Solid Waste Management Remaining Useful Life

Asset Inventory	Expected Useful Life (Yrs)[2]	Ave. Remaining Useful Life (Yrs)	Percent of Useful Life Remaining
Facilities	33	14	42%
Fleet	10	5	50%
Land Buffer	189	167	88%
Solid Waste Remaining Useful Life[3]	**77**	**62**	**81%**

1.4 Asset Risk Assessment

Currently, the consequences of failure for solid waste assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The condition of the assets (inspected where available) was used to evaluate the likelihood that an asset would fail.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Solid Waste high risk assets is $10 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will discuss LOS as they are currently being provided. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

[2] Uses average of asset classes/assets
[3] Overall RUL and Percent Useful Life remaining are weighted by replacement cost

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the 2022 City of Peterborough Waste Management Master Plan Update.

Stakeholder and technical levels of service, performance measures and current targets for the Solid Waste service area are outlined in Table 5 below.

Table 5: Levels of Service – Solid Waste Management Service Area

Service Area: Solid Waste Management								
Service Objective Statement: The City strives to manage solid waste in an environmentally and fiscally sustainable manner that is responsive, reliable and available to all, along with meeting legislative requirements.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Responsiveness	Waste is not missed during allocated pick-up times	Average number of complaints per month	Average of 106 complaints per month	Average of 87 complaints per month	Compliance with Ministry of the Environment and Climate Change	100% Compliance based on Audits/Inspections	Compliant	Compliant
					Minimum collected tonnage of organics, and household hazardous waste	6,640 tonnes of organics collected 240 hazardous waste collected	Organics - N/A HHW – 317 tonnes	Organics - Landfill only: 7160 tonnes HHW – 400 tonnes
Scope/Availability	Facilities are available during business operation hours	Facilities open during the hours of 8:00am-4:30pm Monday to Friday	Household Hazardous Waste Depot open Wednesday to Saturday from 8:00am-4:00pm Landfill open from 8:00am-4:45pm Monday	Household Hazardous Waste Depot open Wednesday to Saturday from 8:00am-4:00pm Landfill open	Percent of waste diverted from the Landfill	Minimum 40% of waste diverted	55% of waste diverted	76% of waste diverted

Service Area: Solid Waste Management								
Service Objective Statement: The City strives to manage solid waste in an environmentally and fiscally sustainable manner that is responsive, reliable and available to all, along with meeting legislative requirements.								
			to Friday and Saturday 8:00am-3:45pm	from 8:00am-4:45pm Monday to Friday and Saturday 8:00am-3:45pm				
Reliability/Quality	Providing reliable solid waste management facilities and assets that meet the needs of the community	Solid waste management facilities and assets are maintained in a state of good repair	Solid waste management facilities assets are proactively maintained and reliable for intended use	Solid waste management facilities assets are proactively maintained and reliable for intended use	Number of facilities with FCI of 10% or better	Number of facilities with FCI of 10% or better	2 Facilities	2 Facilities
					Percentage of vehicles that past their useful life	Max 10%	50%	1% (Lower percentage due to large fleet acquisition year end of 2023 and not accounted for in previous AMP)
					Unassigned ratio of Vehicles	Max 10%	10%	24% - older garbage trucks used for seasonal green waste ops

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Solid Waste Management Service Area:

- Current LOS solid waste management assets are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, council approved strategic plans, policies, and service area studies and budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year and 25-year forecast to understand impacts to assets and services.
- The current funding levels are affordable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees.
- LOS are achievable over the short term with for most lifecycle activities, however renewal lifecycle activities will require additional investment to achieve targets, accommodate growth, and adapt/mitigate against climate change impacts in the long-term.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Solid Waste Management funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Solid Waste Management				
Scope	Facilities are available during business operation hours	Hours of operation are Monday to Friday 8:00am to 4:30pm	Household Hazardous Waste Depot open Wednesday to Saturday from 8:00am-4:00pm Landfill open from 8:00am-4:45pm Monday to Friday and Saturday 8:00am-3:45pm	Hours of operation expected to remain the same over the planning period
Responsiveness	Waste is not missed during allocated pick-up times	Average number of complaints per month	87 Garbage complaints/month	Same level of service expected
Reliability/Quality	Providing reliable solid waste management facilities and assets that meet the needs of the community	Solid waste management facilities and assets are maintained in a state of good repair	Solid waste management facilities assets are proactively maintained and reliable for intended use	Same level of service expected

Table 7 below outlines the Solid Waste Management Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the expected performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used. A 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City only approving current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Solid Waste Management				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Currently not measured in Technical LOS	Currently not measured in Technical LOS	Actions or policies not tracked in this AMP will continue at current levels of service. LOS measures will be tracked in the AMP where and when available.
		Level of Funding:	Historical 3-yr Annual Average: $0K	Annual Average: $0k
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Compliance with Ministry of the Environment and Climate Change	100% Compliance based on Audits/Inspections	Likely to remain the same over the 10-year planning period.
		Percent of waste diverted from the landfill	76% of waste diverted	Likely to remain the same in the 10-year planning period
		Level of Funding:	Historical 3-yr Annual Average: $3.7M	Annual Average: $1.5M
Renewals	Significant repairs are designated to extend the life of the asset.	Number of facilities with FCI of 10% (poor) or better	2 Facilities	Overall facility conditions are meeting levels of service. Material Recovery Facility

	Activities that are expected to occur once an asset has reached the end of its useful life.			recently underwent renovation with no renewal activities planned in the short term. Levels of service are likely to remain the same over the 10-year planning period however can expect asset conditions to decline beyond the 10-year forecast.
		Level of Funding:	Historical 3-yr Annual Average: $178K	Annual Average: $10K
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No solid waste disposals planned for the 10-yr period	No solid waste disposals planned for the 10-yr period
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Minimum collected tonnage of recycling, organics, and household hazardous waste	Organics: 7160 tonnes HHW - 400 tonnes	Historical costs to deliver LOS are due to service expansion to include the organic waste program. There are no further planned expansion/service improvements over the 10-year forecast. LOS is expected to remain the same.
		Level of Funding:	Historical 3-yr Annual Average: $3.1M	Annual Average: $0

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource

provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time

3.0 Lifecycle Management Plan – Solid Waste Management

Solid waste management includes the collection and transport of waste and the processing of that waste. Recycling and hazardous waste management have been contracted out to external agencies. Most of the strategies currently in place for these streams have been explored and analyzed by the contractor however the City remains involved to ensure current levels of service are maintained. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Solid Waste Management – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	Training of backup staff for landfill staff coverage.
	Ensure that contracted staff at recycling and hazardous waste facilities training is renewed yearly.
	Linking the asset management plan to other studies, master plans and strategies
	Public consultation on levels of service
	Yearly inspection programs for the landfill,
	Regulations require some inspections more frequently.
	Hourly tracking of equipment usage.
	CCTV program for leachate system.
	Property Management division inspects rental properties in landfill buffer.
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	Contractors apply an approved preventative maintenance program for equipment.
	Scales are calibrated and checked twice a year.
	Facility maintenance for recycling centre is currently Ad Hoc.
	Landfill inspections trigger maintenance program changes at landfill.
	Hours of operations are tracked and trigger preventative maintenance activities.

Strategy Type	Current Practice
	Leachate collection system maintained based on Environmental Compliance Approval (ECA) requirements.
	Garbage Truck fleet is part of the City's fleet management program for maintenance.
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	Ad Hoc renewals at hazardous waste depot.
	Recycling centre rehabilitations managed by the City Facility Manager.
	Rental properties maintained by City Facility Manager.
	Pumps in leachate system are rebuilt.
	Completed based on review of records gathered from operating/maintenance activities. If issues are identified by O&M activities, then the asset is scheduled for renewal/rehabilitation
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	Replacement of landfill equipment is determined by age of the asset, the number of hours in service and the cost of continued maintenance.
	Fleet is replaced based on the age of the assets.
	Service truck is traded in when replaced.
	Facility assets are replaced based on actual findings and recommendations from building condition assessments or during in-field inspections by staff during maintenance activities.
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	Dispose of assets when cost of maintenance is greater than value or replacement parts are no longer available.
	Compost site at Harper road to be abandoned in 2019 based on ECA.
	Landfill once closed will be maintained by the City for environmental purposes for 175 years.
	Landfill will be retired once capacity has been reached.
	Rental properties sold/removed based on cost to maintain vs. revenue from rental generated.
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	Consultation regarding waste disposal capacity capabilities in 4-5 years.

Strategy Type	Current Practice
Future Strategies	Provincial regulation changes may lead to city no longer managing materials recycling facilities in the future.
	The Province currently proposing many changes to solid waste management the City and County are preparing to be ready for these changes.
	Source separated organics to be introduced to the City once a site, process and fleet are in place.

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Solid Waste Management subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 8: Solid Waste Management – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include weigh scale calibration, landfill inspections for ensuring proper preventative maintenance activities are scheduled, leachate collection system maintenance based on ECA compliance.

Refer to Table 8: Solid Waste Management – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are considered adequate to meet projected service levels. Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

With the Material Recovery Facility renovation recently completed, there are no major renewal/replacement activities planned in the 10-year forecast. Fleet replacement schedule and associated replacement costs are acquired and maintained by the Public Works department.

Levels of service are likely to remain the same over the 10-year planning period however it is anticipated that asset conditions will decline beyond the 10-year forecast at current levels of funding primarily due to ageing assets falling into conditions below acceptable levels. Additional assets that are acquired due to growth/service improvements may also impact renewal funding needs in the long-term. Any shortfalls may result in major landfill rehabilitation and fleet replacement programs being deferred. Where deferred renewal takes place, the City is committed to ensuring that risks are minimized where possible.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include new landfill cells, MRF expansion, solid waste collection route expansions, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily growth related, new construction costs and other capacity improvement costs. The City of Peterborough's City-Wide Development Charges (DC) Background Study has identified anticipated residential and non-residential growth capital program requirements to meet growth demands. Even though DC charges are intended to pay for the initial round of capital costs needed to service new development over an identified planning period, the City will need to commit the funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond). The current levels of funding for ongoing lifecycle activities will likely need to increase to support the acquisition of solid waste management assets and to deliver proposed levels of service.

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Costs shown are the costs needed to minimize lifecycle costs associated with delivering proposed LOS. Shortfalls between lifecycle activity costing and investment levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Solid Waste Management Total Lifecycle Activity Costs and Projected funding – Proposed Levels of Service

Solid Waste Management	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Solid Waste Management	$3.8	$4.0	$4.1	$4.2	$4.3	$4.5	$4.6	$4.7	$4.9	$5.0	$4.4
Total Proposed Funding	$3.8	$4.0	$4.1	$4.2	$4.3	$4.5	$4.6	$4.7	$4.9	$5.0	$4.4
Lifecycle Costs											
Solid Waste Management	$6.6	$4.0	$1.0	$1.0	$1.5	$0.3	$1.0	$0.0	$0.0	$0.0	$1.5
Total Lifecycle Costs	$6.6	$4.0	$1.0	$1.0	$1.5	$0.3	$1.0	$0.0	$0.0	$0.0	$1.5
Funding Shortfall	**-$2.8**	**$0.0**	**$3.1**	**$3.2**	**$2.8**	**$4.2**	**$3.6**	**$4.7**	**$4.9**	**$5.0**	**$2.9**

Based on the lifecycle assessment of Solid Waste Management service area, it is estimated that the City would need to spend an average of $1.9 million per year to deliver LOS. The average annual funding is an estimated $4.4 million. Average annual funding is calculated using the 3-year historical (2021-2023 for O&M and 2022-2024 for other) level of capital investment for similar lifecycle activities and used as a proxy for the forecast.

The overall forecasted lifecycle costs to deliver levels of service for the Solid Waste service area is sufficient over the 10-year forecast.

Assuming current levels of funding remain consistent, the City will likely maintain current service levels and manage risk exposure over the short and long-term. As fleet assets are acquired and program expansions implemented, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures. Over time, if there are insufficient funds to complete renewal activities, this will likely lead to accelerated deterioration of assets resulting in increasing treatment costs to ensure assets are maintained in a state of good repair. The City will need to consider opportunities to manage any shortfall and assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to **effectively deliver established services** are:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)
- Changes to Regulatory/Legislated standards

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety – assets not adequate/available for emergency response
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)

- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The projected funding for the Solid Waste service area is sufficient to deliver proposed levels of service over the 10-year planning period. Recently acquired fleet assets in 2023/2024 and recent renovations to the material recovery facility improved the overall state of the Solid Waste Management asset portfolio and will continue to deliver established LOS over the life of the assets with adequate operation and maintenance funding. It is expected that operation and preventative maintenance investments will increase in the long-term as assets age, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects together to minimize costs.

- Seek approvals to implement recommendations and strategies set forth in the City's Waste Management Master Plan

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of solid waste management assets.

Risks relating to asset failure are mitigated though condition assessment programs, maintenance programs (legislated and best practices) and scheduled renewal programs which ensure assets are in acceptable condition and are available to achieve the determined levels of services. Risks related to fleet asset failures are addressed through proactive fleet maintenance and adequate vehicle storage to ensure adequate service readiness.

The Solid Waste Management service area actively invests in maintaining landfill, fleet and HHW assets in order to meet provincial regulations. It is recommended to align asset management lifecycle strategies with capital plans highlighting the impact that budget decisions have on the condition, useful life, maintenance costs, future rehabilitation/replacement funding needs, levels of service and risk/liability.

All City services, including Solid Waste Management are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining Solid Waste Management assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

Attachment #6: Community Housing Service Area

Infrastructure Value	$326M	
Overall Condition	3.0	Fair
High Risk Asset Value	$31.9M	10%
Trend		

1.0 Summary of Community Housing

Asset classes that fall under the Community Housing service area include Peterborough Housing Corporation owned assets and City owned housing assets. These include detached homes, semi-detached, townhomes and apartments. The City of Peterborough is the legislated Service Manager for the City and County of Peterborough and is also the sole shareholder for the Peterborough Housing Corporation (PHC). Currently, the housing stock owned by PHC including assets in the Service Manager area (Peterborough Region) consists of Rent-Geared-to-Income (RGI) units and affordable housing units.

Overall condition rating is based on the average Facility Condition Index (FCI) for the housing facilities covered in this Plan. The overall FCI is 6.5% or 'Fair' (or a score of 3.0 compared to the standard condition rating scoring scale). Details of how the FCI is calculated can be found in section 1.3 of this attachment. Overall condition rating trends show an improvement from the previous Plan due to transitioning from the weighted building element condition assessment to the FCI methodology.

1.1 Inventory Details

Table 1 details the City of Peterborough's inventory for the Community Housing service area.

Table 1: Community Housing Service Area Asset Inventory

Asset Class	2023 Quantity (units)	Unit of Measure
Detached/Semi Detached Homes	44	Units
Townhomes	466	Units
Apartments	627	Units
Total	**1,137**	**Units**

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the Community Housing service area totalled $326.3 million. Replacement costs were determined using construction unit cost multipliers for the different types of facility element. Unit costs are taken from the current asset management & planning software solution[1] database and inflated (2023 dollars) to determine the updated facility replacement costs.

Table 2: Community Housing – Replacement Cost by Facility Element Asset Class

Asset Class	2023 Replacement Cost
Substructures	$52,084,735
Shell	$139,582,144
Interior Finishes	$68,837,138
Services – electrical and mechanical	$45,635,643
Equipment and Furnishings	$2,624,428$
Special Construction	$116,567
Sitework	$17,428,282
Community Housing Overall Condition	**$326,308,937**

[1] PHC is currently using Ameresco's AssetPlanner

1.3 Asset Condition and Remaining Useful Life

The most recent BCA's for the housing portfolio was last completed in 2020. Based on replacement cost of overall facility building elements, 3% or $9.8 million are very good, 5% or $16.9 million are good, 30% or $98.1 million are rated fair, and 62% or $15.6 million are rated poor and very poor Figure 1 and Table 3 provide condition details of the social housing service area by element and by type of housing facility.

Figure 1: Community Housing - Distributed Condition and Replacement Cost

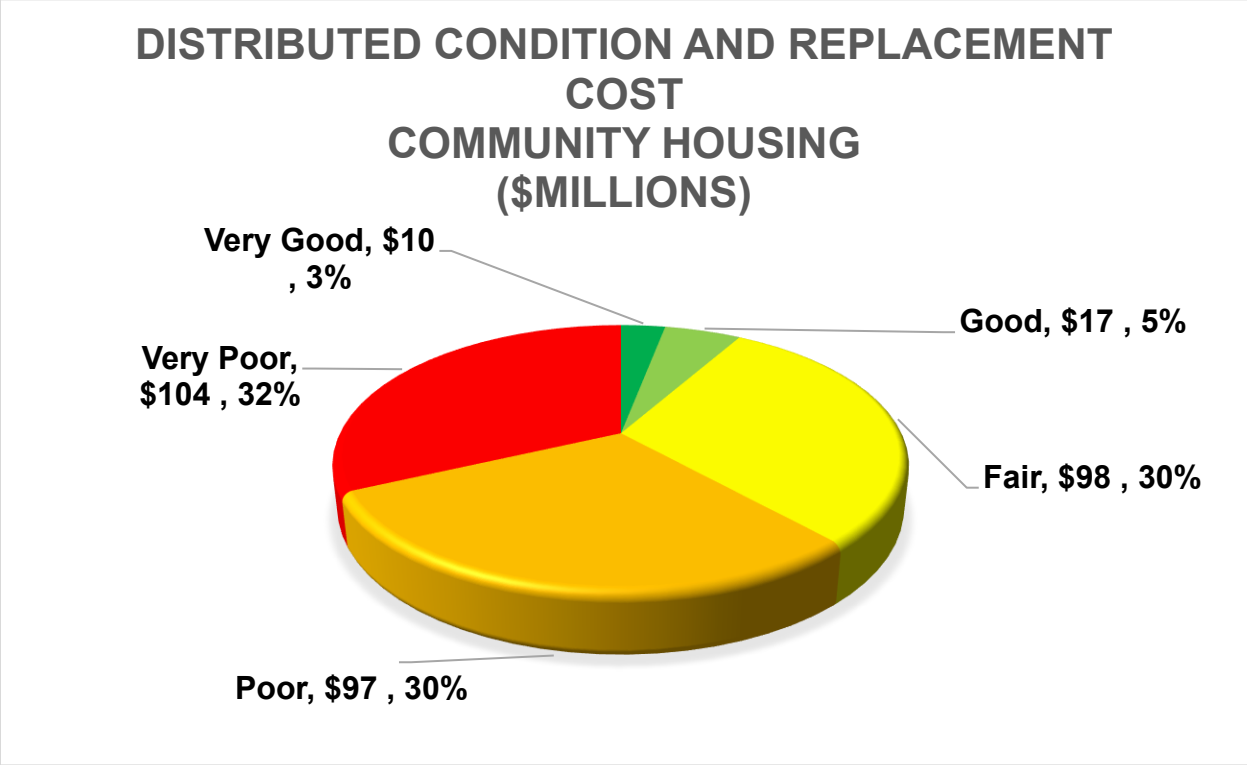


Table 3: Community Housing – Overall FCI by Facility Type

Type	2023 Facility Condition Index (FCI)
Detached/Semi-Detached	10.44 (Poor)
Townhomes	9.0 % (Fair)
Apartment	7.4% (Fair)

Condition Ratings

Condition ratings for building elements (Figure 1) and overall facility condition index (Table 3) were calculated using data in the asset management & planning software system. Condition ratings of building elements are based on observed conditions at the time of the assessment. The asset management & planning software also calculates the FCI's for each facility type which is summarized in Table 3 above.

The Facility Condition Index (FCI) is a standard facility management benchmark that is used to assess the current and/or projected needs of a facility. It is defined as the ratio of the required renewal costs to current replacement value of the facility. The calculated ratio is compared to an FCI scale as follows:

0%-5% = Good
5%-10% = Fair
10%-20% = Poor
Greater than 20% = Very Poor

Facility Condition Index results are based on the three-year projected needs from the most recent building condition assessment rather than using only the current year needs. This ensures that the overall facility rating is not based on a single high dollar capital project needed in the current year and takes into consideration mid-term needs for a better reflection of the state the facility is in.

Building condition assessments (BCA'S) are anticipated to be undertaken every five to seven years (includes both City and County of Peterborough housing sites). In conjunction with the City's asset management strategy, BCA's will significantly improve monitoring of Community Housing providers' capital reserves as well as identify capital repair needs and provide capacity to pay.

Remaining Useful Life

The following summarizes the Community Housing service area remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the average of the observed age and do not take into consideration any betterments that extend the useful life of the asset(s). Facility assets shown in Table 4 below are based primarily on the on an average life span for facility structures of 75 years. The age of the Community Housing service area is variable and with efforts to extend the life by application of lifecycle treatments, there isn't necessarily a linear relationship between age and condition. Table 4 shows the social housing remaining useful life details.

Table 4: Community Housing Remaining Useful Life

Asset Inventory	Expected Useful Life (Yrs)	Ave. Remaining Useful Life (Yrs)	Percent of Useful Life Remaining
Facilities	41	6	15%
Community Housing Remaining Useful Life [2]	**41**	**6**	**15%**

[2] Overall RUL and Percent Useful Life remaining are weighted by replacement cost

1.4 Asset Risk Assessment

The consequences of failure for Community Housing assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Community Housing high risk assets is $31.9 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the Peterborough 10-Year Housing and Homelessness Plan and its latest update in 2023.

Stakeholder and technical levels of service, performance measures and current targets for the Community Housing service area are outlined in Table 5 below.

Table 5: Levels of Service – Community Housing

Service Objective Statement: The Peterborough Housing Corporation strives to be recognized as a community leader and housing provider of choice that delivers safe, quality and affordable accommodation to engage residents in a vibrant and inclusive community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Legislative/Regulatory	Quantity of RGI (rent geared to income) provided meets provincial minimum requirements	Provision of a minimum of 1569 units	n/a - not reported. New Measure	1569 units	Number of households on waiting list for housing	Less than 1000 households are waiting for housing	1514	1924
Efficiency	Workorders responded to in a timely manner	All work orders are responded to within 24 hours of submission	100% of work orders were responded to within 24 hrs.	100% of work orders were responded to within 24 hrs.				
Reliability/Quality	Providing reliable and high-quality Community Housing that meets the needs of the community	Community Housing is maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Facilities are proactively maintained and reliable for intended use	Building Condition Assessments	Maintain 5-year cycle of BCA's	BCA cycle maintained. BCAs scheduled for completion in 2026 (last completed in 2021)	BCA cycle maintained. BCAs scheduled for completion in 2026 (last completed in 2021)

Service Objective Statement: The Peterborough Housing Corporation strives to be recognized as a community leader and housing provider of choice that delivers safe, quality and affordable accommodation to engage residents in a vibrant and inclusive community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
					Maintain a minimum facility condition rating	Average facility condition rating of 'Fair' or better.	Fair	Fair
					Average Facility Condition Index (FCI) value for all facilities	Fair (Between 5% and 10%)	6.48% (Fair)	6.48% (Fair)
					Number of facilities with FCI of 10% or better	All community housing Facilities (100%)	84%	84%

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Community Housing Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, legislative requirements, the Official Plan, financial policies, council approved strategic plans, PHC Board of Directors plans and policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as the **Housing and Services Act, 2011** and its amendments, and level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the 10-year forecast, but they are not sufficient to deliver lifecycle management activities without intervention (additional funding).
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Community Housing funding levels will occur, it is expected that Stakeholder LOS for Reliability/Quality will be maintained with no significant risk impacts to the City however it is expected that Housing unit demands due to growth will increase over the 10-year forecast.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Community Housing				
Legislative/Regulatory	Quantity of RGI (rent geared to income) units provided meets provincial minimum requirements	Provision of a minimum of 1569 units	1569 units	Number of RGI units expected to increase over the 10-year period. However, alternative funding models will be utilized to create the additional RGI units. e.g., rent

				supplements units.
Reliability/Quality	Providing reliable and high-quality Community Housing that meets the needs of the community	Community Housing is maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Same level of service expected

Table 7 below outlines the Community Housing Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the expected performance over the 10-year forecast.

The proposed performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used except for renewal needs (sourced from lifecycle modelling as described in Section 3.1). For all other lifecycle activities, a 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	**Purpose of Activity**	**Performance Measure**	**Proposed LOS**	**Proposed Performance (2025-2034)**
Technical LOS – Community Housing Services				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Number of households waiting for housing	1514 households	Number of waiting households likely to increase over the planning period
		Building Condition Assessment	Currently on a 5-yr cycle with next round anticipated in 2026	Cycle expected to remain the same
		Level of Funding:	Historical 3-yr Annual Average: $1.2M	Annual Average: $1.5M

Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Housing O&M activities are carried out and funded through the operating budget with PHC under a shareholder agreement. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Average facility condition index for all facilities	Fair	Facility condition index is expected to decline significantly without increased funding to address capital repairs
		Level of Funding:	Historical 3-yr Annual Average: $1.0M	Annual Average: $11.4M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	Disposals are carried out as per Council approved PHC Disposition Policy outlined in Report PLHD14-046 Prior to surplus property being offered to open market, the City has first right of refusal then offered to non-profit or housing organizations for affordable housing then offered for sale to PHC tenants.	Budget is expected to remain the same over the 10-year planning period Proceeds from dispositions are used to develop new housing more appropriate to client needs.
		Level of Funding:	Historical 3-yr Annual Average: $0M	Annual Average: $0M
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Housing targets set forth in the Community Housing Strategic Plan	Projects implemented to increase affordable housing units as per Capital Financing and Community Revitalization Plan (historical funding not available at this time)	Project costs expected to increase over the planning period to achieve housing targets (cost for projected performance not available at this time)

		and per legislation		
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Community Housing

The following table describes the current strategies and activities for the Community Housing service area to maintain the current levels of service. Options for which lifecycle activities that could potentially be undertaken are analyzed when an asset is no longer meeting service levels or its intended purpose. An asset will either be rehabilitated (for the interim or for the long term) or eliminated through sale or demolition. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Community Housing – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	PHC review of housing in 2015 for suitability, and sustainability Capital Financing and Community Revitalization Plan to understand demand, needs and develop direction
	Model suites available to view by prospective customers
	Linking the asset management plan to other studies, master plans and strategies
	Public consultation on levels of service
	Reduces vacancy
	Help prospective customers determine if the suite will suit their needs
	PHC organizes capital projects in groups to reduce the costs or with other housing organizations
	Non-smoking policy in Affordable Housing Units Portfolio and new units to reduce damage to units
	Bulk tendering for the supply of property insurance and gas utilities
	Stakeholder (The City) reports to secure funding that include
	Creative capital planning strategies
	Identification and cultivation of partnerships
	Partner specific plans
	Maintaining, and updating maintenance training and certifications for maintenance staff
	Financing strategy to save some capital budget yearly for unplanned maintenance activities fund
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	Legislative maintenance programs for Fire safety implemented
	Have onsite personnel for maintenance of units
	Some personnel are shared between sites
	Seasonal maintenance activities tendered
	Have a dedicated carpentry shop to work on cabinetry, doors, windows and other housing carpentry
	Introduced a modern computerize maintenance management system (CMMS) to track work orders and staff time
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron	Carpet replacement program to replace with longer life span flooring
	Energy efficiency renewals strategy to improve housing energy costs

Strategy Type	Current Practice
watermains can defer the need for replacement).	Seek to renew assets with modern and resilient materials
	Responsive renewals/rehabilitation when tenant vacates facility
	Targeted renewals in programs such as performing all renewals of specific items over a period, area, or floor
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	End of debenture period could trigger replacement of a unit
	Replace assets when they reach the end of their service lives
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	Properties sold based on not meeting housing needs any more (unit size or location)
	Sell properties deemed too expensive to continue to maintain
	Sell properties when market changes make a property attractive for sale such as location, local service changes, school locations or access to health care
	End of Service/End of Mortgage agreements will be negotiated with housing providers to ensure they can meet contractual obligations within approved budgets
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	Expand properties deemed needed for redevelopment using Ontario's Places to Grow density targets as a guide
	Expand locations that have marketable qualities (same as the market changes in disposals)
	Expansion limited to municipal bylaws and regulations
	Some properties have limitations due to local environment and size for future expansion
	Expansion requires access to debt funding, municipal/provincial/federal funding opportunities
	Creative capital planning applied to seek expansion
Future Strategies	Looking into bulk purchasing agreement for energy utilities
	Seeking opportunities to find energy efficiency and generation where possible including green energy
	Intensification of units/properties during site redevelopments
	Adjust development layouts to increase emergency response access and community development
	Increase accessibility of units when redeveloped
	Debenture period ending opening opportunities for investigating new strategies for housing needs
	Using social bonds for housing strategies

3.1 Lifecycle Models, Interventions, and Cost of Service

Overview of Lifecycle Models

Service area lifecycle models have been developed[3] in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Community Housing services subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated facility condition assessments, land use planning and demand management, process optimization, etc.

Current funding levels are not adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 8: Community Housing – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include preventative maintenance programs for facility HVAC, plumbing and electrical assets, landscape maintenance, snow clearing, etc.

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[3] Request for Proposal RFP 22-22 Consulting Services to Support Asset Management Planning Updates

Refer to Table 8: Community Housing – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Forecasted renewal needs are expected to increase over the 10-year planning period. At current funding levels, it is expected that levels of service will decline over the short and long-term. The 3-year historical capital budget indicates that current funding levels for existing assets are not sufficient to address renewal needs, and additional assets being acquired due to growth/service improvements will also impact renewal funding needs in the long-term. This shortfall may result in premature facility elemental failures, increased treatment costs or significantly increased maintenance activities due the assets not performing as intended, possibly causing service interruptions or limited accessibility (i.e. failed asphalt, leaking roof, etc.). Where service interruptions take place, the City is committed to ensuring that risks are minimized where possible and stakeholders are aware of service alternatives.

As the Service Manager for the City and County of Peterborough, community housing is a publicly- funded asset and an important component of the local housing system. Although legislation mandates Service Managers to fund rent-geared-to-income assistance and not capital repair costs, they are obligated to finance projects in a way that ensures sustainability and viability. Insufficient funding from the City also poses a risk of loss of Rent Geared to Income housing units.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Individual tangible assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. It is anticipated that environmental disposal costs related to designated substance remediation/abatement will increase over the long term as housing facilities age and are renovated or demolished. Additional funding to carry out necessary disposal activities, as well as ensuring safe removal of identified designated substances, will be required.

In 2022, market conditions and available resources were very different. The vacancy rate was at 1%, the number of people experiencing chronic homelessness is increasing, and more people are applying to the Centralized Waiting List for Rent Geared to Income Housing year over year. Construction costs are increasing at an unprecedented rate to be able to build new affordable housing and interest rates are rising. At the same time, federal-provincial contributions for new rental housing development are decreasing. In this environment, losing any form of affordable housing – even to fund the construction of more - is harder to justify.

In response to these changes, and in consultation with the Housing Services Manager, PHC developed a new Disposition Policy that works to balance the priority of generating revenues from the sales of properties with the equally urgent priority of preserving affordable housing assets.

The new Disposition Policy states that before a surplus property is offered on the open market, that the City will have first right of refusal, next, it would be offered to non-profit housing organizations for affordable housing, and finally, for sale to PHC tenants. This policy prioritizes keeping the units as affordable rental stock.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include facility expansions, relocations to a larger facility to address capacity deficiencies, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Acquisition/service improvement costs are primarily due to growth. Forecasted population growth of over 10,000 individuals is anticipated over the 10-year planning period. Forecasted population and housing growth in the City of Peterborough are expected to be driven by a few key growth drivers including:

- Residential intensification in the built-up area and development in the designated greenfield areas, specifically Chemong West and Coldsprings. Services in both are intended to accommodate both the residential and non-residential uses.
- Intra-provincial migration, where residents are moving to the City of Peterborough from across the province.

The 2024 City of Peterborough Housing Review Final Report by TWC (Report CSSS24-0063) includes 3 recommendations that will support an increased number of affordable, transitional, and supportive housing units:

- Acquire Existing Units
- Development of a Service Expansion Strategy
- Incentivize Development

Potential action items to address these recommendations include:

- Developing a strategy for the immediate expansion of housing options to meet critical needs, engaging critical stakeholder partners.
- Offering a tax incentive for building affordable and supportive housing through Community Improvement Plans, etc. (new program anticipated to be in place June 1st 2025 - Affordable Housing Community Improvement Plan).

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Community Housing Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Community Housing	Forecast Year ($M)										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Community Housing	$2.2	$2.3	$2.4	$2.5	$2.5	$2.6	$2.7	$2.8	$2.8	$2.9	$2.6
Total Proposed Funding	$2.2	$2.3	$2.4	$2.5	$2.5	$2.6	$2.7	$2.8	$2.8	$2.9	$2.6
Lifecycle Costs											
Community Housing	$12.0	$12.3	$12.1	$12.1	$12.5	$12.9	$13.3	$13.6	$14.1	$14.5	$12.9
Total Lifecycle Costs	$12.0	$12.3	$12.1	$12.1	$12.5	$12.9	$13.3	$13.6	$14.1	$14.5	$12.9
Funding Shortfall	**-$9.8**	**-$10.0**	**-$9.7**	**-$9.7**	**-$10.0**	**-$10.3**	**-$10.6**	**-$10.9**	**-$11.2**	**-$11.6**	**-$10.4**

Based on the lifecycle assessment of existing community housing facility assets, it is estimated that the City would need to spend an average of $12.9 million per year to deliver proposed LOS over the 10-yr forecast. The average annual funding is an estimated $2.6 million, leaving an average shortfall of $10.4 million per year over the 10-year forecast. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast.

The overall forecasted lifecycle costs to deliver levels of service for the Community Housing service area exceeds the current levels of funding over the 10-year forecast. Assuming levels of funding remain consistent, without intervention, the City will likely experience declining service levels and increased risk exposure over the long-term that will need to be managed. Risk management strategies related to managing the shortfall are discussed in Section 3.3 of this attachment.

Overall, there are substantial capital repair costs to ensure long-term sustainability of the Community Housing stock. These costs cannot solely be addressed through subsidies from the City of Peterborough. The housing strategic framework will be established to guide the discussions with housing providers on what municipal investment is required for the continued provision of RGI and affordable units. It will also address funding opportunities through the Canada-Ontario Community Housing Initiative (COCHI).

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Community Housing services are**:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The projected lifecycle costs for Community Housing exceeds the current levels of funding over the short term (10-yr forecast) and long-term (10-year to 25-year). At the current level of funding, it is expected that asset conditions will deteriorate, operation and preventative maintenance investments will also increase in the long-term as assets age.

Where a shortfall in funding for City owned assets are identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Continue to pursue all senior government funding options as they become available to offset the future operating and capital liabilities discussed in this report.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects together to minimize costs

- Implement robust preventative maintenance plans to help extend the lifespan of assets and avoid costly unplanned repairs

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of housing stock assets.

Risks relating to asset failure are mitigated though condition assessment programs, maintenance programs (legislated and best practices) and scheduled renewal programs which ensure assets are in acceptable condition and are available to achieve the determined levels of services.

Assets within the facility that are associated with the safety, health, and well being of the tenants (e.g. building shell, stairs, structural, fire & life safety, and elevating devices) are considered high consequence of failure due to the nature of the service it provides to the tenants. These are considered priority projects for repair/replacement relative to other assets. Where health and life safety factors are not an issue, projects are prioritized based on established criteria. In undertaking repair, preventative maintenance and capital work, it is PHC’s practice to consider energy conservation measures where possible.

All City services are reviewed and identified in the Business Continuity Plan (BCP) and prioritization process. In parallel, PHC is required to develop and maintain its own Business Continuity Plan to uphold service delivery standards. The BCP identifies the

key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

Attachment #7: Recreation

Infrastructure Value	$227M	
Overall Condition	3.0	Fair
High Risk Asset Value	$32M	14%
Trend		

1.0 Summary of Recreation

Recreation assets include Aquatics & Equipment, Arenas, the Marina, & Recreation Facilities, Parks Buildings, Parks Amenities and Recreational Land – Developed Parkland locations. Condition rating trends remain neutral from the previous Plan with an overall condition rating of Fair.

1.1 Inventory Details

Table 1 details the City of Peterborough's Recreation inventory:

Table 1: Recreation Asset Inventory

Asset Category & Class	2023 Quantity	Unit of Measure
Aquatics & Equipment		
Splash Pads and Wading Pools	10	Each
Public Beaches	2	Each
Arenas and Recreation Facilities		
Peterborough Memorial Centre	11,082	Sq.m
Healthy Planet Arena	8,710	Sq.m
Kinsmen Arena	5,224	Sq.m
Morrow Park (total)	**4,033**	**Sq.m**
Bi-Centennial Building (Gymnastics Club)	620	Sq.m
Multi-purpose Building (Morrow Building)	2,125	Sq.m
Peterborough Agricultural Office	76	Sq.m
East Horse Barn	627	Sq.m
West Horse Barn	586	Sq.m
Events Equipment	13	Each

Asset Category & Class	2023 Quantity	Unit of Measure
Marinas	1	Each
Community and Wellness Centres	2	Each
Park Amenities		
Wharfs & Barges	4	Each
Boat ramps	5	Each
Baseball Diamonds	23	Each
Rectangular Fields	10	Each
Tennis Courts	8	Each
Basketball Courts	24	Each
Play Equipment	60	Each
Lacrosse Bowls	1	Each
Picnic Shelters/Pavilions	3	Each
Skate Parks	1	Each
Parking Lots	11	Each
Park Lighting & Signs	Pooled	Pooled
Park Bleachers & Seating	Pooled	Pooled
Park Buildings		
Boathouses	2	Each
Changerooms/Washrooms	10	Each
Maintenance Buildings	1	Each
Fieldhouses	1	Each
Parkland		
Regional Parks	12	Each
Community Parks	38	Each
Neighbourhood Parks	79 total (12 embedded in Regional Parks)	Each
Pocket Parks	14	Each

1.2 Replacement Costs

The estimated year end 2023 replacement costs for Recreation totalled $227 million. Replacement costs for Recreation assets were taken from multiple sources including development charge studies, Parks and Open Space Studies, financial records and historical costs inflated to 2023 dollars. Inventory counts for various parks and open spaces (land) throughout the City have been shown for information purposes. Replacement costs for land have not been included in the overall analysis.

Figure 1: Recreation – Replacement Cost by Subservice

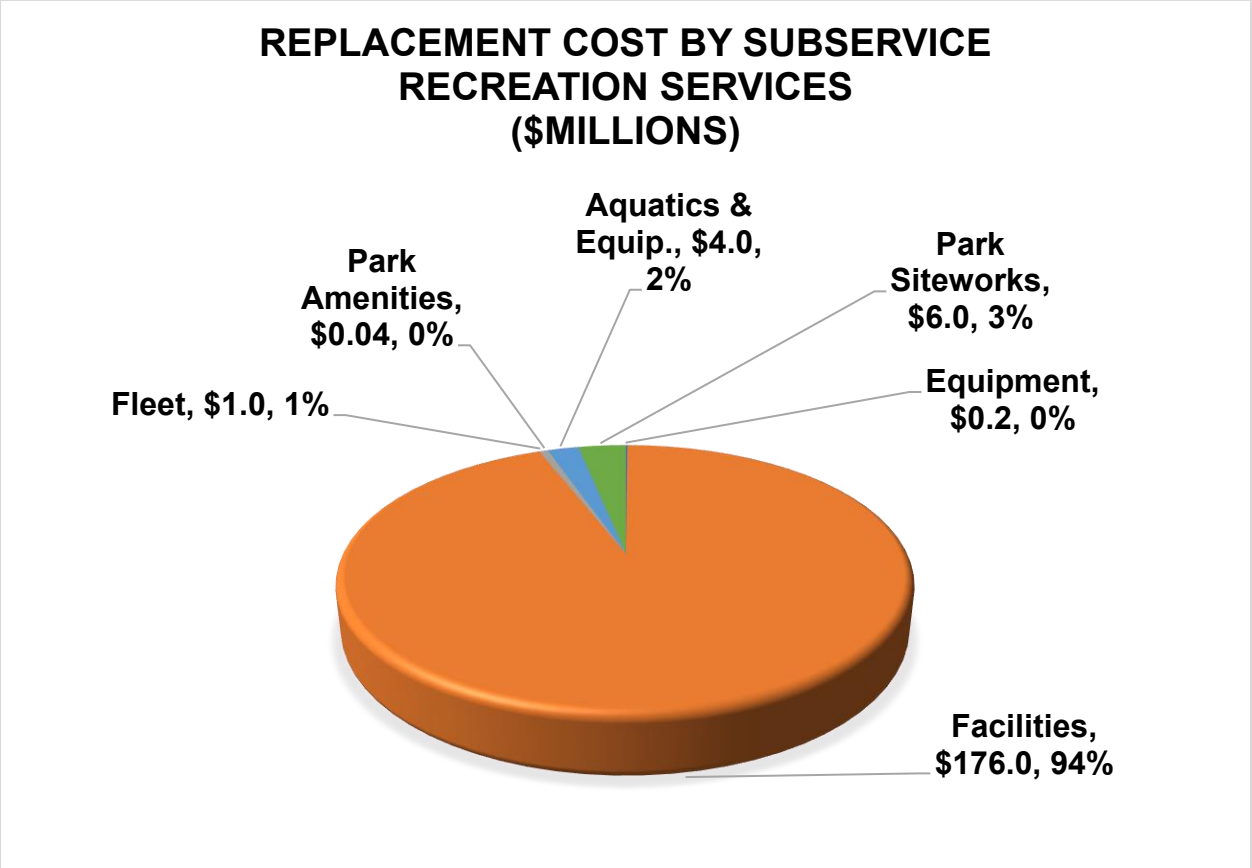

Table 2: Recreation – Replacement Cost by Asset Sub-Class

Asset Category & Class	2023 Replacement Cost
Aquatics & Equipment	
Splash Pads and Wading Pools	$3,693,866
Public Beaches	$237,313
Arenas and Recreation Facilities	
Arenas	$96,851,816
Events Equipment	$210,000
Fleet (zamboni, light duty trucks)	$1,115,000
Morrow Park	$16,851,474
Community and Wellness Centres	$53,025,117
Park Amenities	
Park Structures (Picnic shelters, pavilions, wharfs & barges)	$2,187,402
Park Bleachers & Seating	$181,947
Structures (boat ramps)	$871,807
Fields & Sports Pads	$29,666,775
Playgrounds & Water Plays	$7,314,801
Park Facilities	
Boathouses	$2,214,734

Asset Category & Class	2023 Replacement Cost
Changerooms/Washrooms	$4,207,148
Maintenance Buildings	$302,917
Fieldhouses	$405,516
Marinas	$2,337,322
Park Siteworks	
Parking Lighting & Signs	$4,247,277
Parking Lots	$1,322,008
Recreation Total	**$227,243,924**

1.3 Asset Condition and Remaining Useful Life

The overall condition rating for Recreation is currently rated fair. Recreation facilities that have had building condition assessments (previously completed in 2021-2022) have ratings shown from the assessments otherwise all other assets are rated using an age-based methodology. Based on replacement cost, 1% or $17M are rated very good, 29% or $67 million in good condition, 40% or $91 million in fair condition and 23% or $54 million in poor to very poor condition. Figure 2 and Table 3 provide condition details of the Recreation assets.

Figure 2: Recreation - Distributed Condition and Replacement Cost

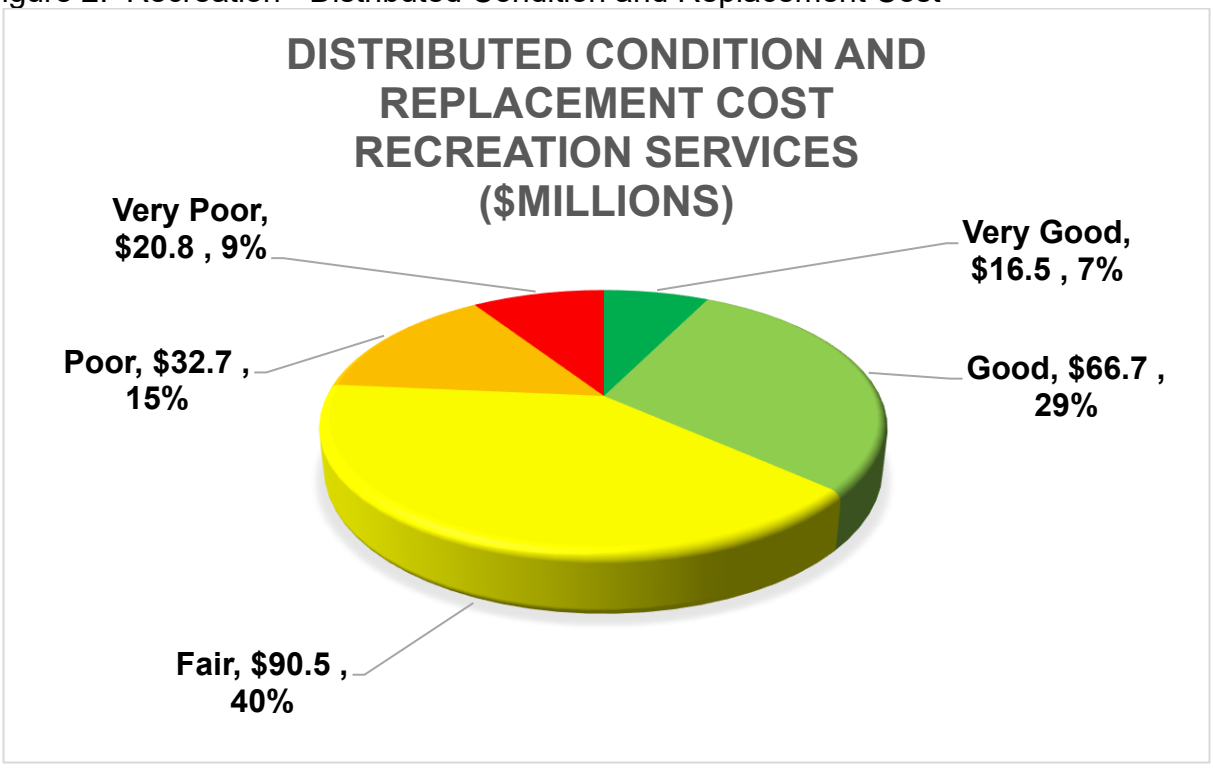

Table 3: Recreation – Asset Class Condition Ratings

Asset Class	2023 Condition Rating
Aquatics & Equipment	
Splash Pads & Wading Pools	Good
Public Beaches	Good
Arenas and Recreation Facilities	
Facilities	Fair
Equipment	Fair
Fleet	Fair
Park Amenities	
Fields and Sports Pads	Fair
Park Bleachers and Seating	Good
Park Structures	Fair
Playgrounds & Water Plays	Poor
Structures	Fair
Park Facilities	
Boathouses	Good
Marinas	Poor
Maintenance Buildings	Fair
Fieldhouses	Fair
Park Siteworks	
Parking Lighting & Signs	Poor
Parking Lots	Poor
Recreation Overall Condition	**Fair**

Aquatics & Equipment
Condition ratings for the aquatics and equipment assets are age-based ratings provided by City staff based on expert knowledge of the assets as they currently exist.

Arenas and Recreation Facilities
Condition ratings for the arena and recreation facilities are based on the most recent building condition assessments completed in 2021-2022 and use observed age of the facility elements at the time of the assessment. Other assets use an age-based rating methodology and have been reviewed by staff to ensure that it reflects the current conditions until detailed assessments are completed. The City plans to complete BCA's on a seven to ten year cycle with the next round of assessments anticipated to be completed in 2028.

Condition ratings for events equipment and fleet is currently rated overall fair, as assessed based on age. Ice resurfacing equipment condition ratings have been calculated based on the age and volume of usage of the equipment, assuming a standard average life cycle of ten years.

The Peterborough Marina operation includes a 92-slip marina operating over a six-month period, receiving 900-1,000 boats annually. The Marina has been identified as a need for expansion as it has exhausted its functional space. The expansion is

necessary to provide growth opportunities and attract more transient boater tourism to Peterborough.

The Peterborough Sport and Wellness Centre is a leisure recreational complex that offers community recreational programs and services, lifestyle wellness fitness program. The facility includes leisure and therapy pools; exercise studio, fitness centre, three gymnasiums, child minding room and three meeting rooms. The PSWC services the City of Peterborough and surrounding community to the full-time student body at Sutherland Campus, in partnership with Fleming College.

Parks

In 2019 a Parks and Open Space Assessment was completed. The purpose of the assessment was to provide a document on the findings of the current state of the existing parks and open spaces in Peterborough (focusing on neighbourhood parkland) and develop a Park Development Standards document. The Assessment document recommended solutions to improve quality and access to the City's existing and future parkland.

As part of the assessment, quantity, quality/functionality and accessibility to neighbourhood parks were evaluated. Findings show that overall, the City is below the recommended standard for quantity of neighbourhood parks per Planning Area (minimum 1 HA/1,000 population). Quality and functionality of parks were assessed using a 'minimum' and 'variable' design feature and standards guide. All these aspects were integrated into a 'Park Equity' assessment methodology in which the quality, access (to parkland) and inclusivity (the degree to which ALL residents can access parks and open spaces) of all parks were evaluated. As a result, a prioritized list of 43 parks in need for was provided to the City for consideration.

Remaining Useful Life

The following summarizes Recreation assets remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the calculated age (not observed age) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age would be used in calculating remaining useful life. The ages of Recreation assets are variable and with efforts to extend the life by application of lifecycle treatments, there isn't necessarily a linear relationship between age and condition.

The City had a lease with the Gymnastics Club (end date of September 2020). Future plans include re-purposing the Bi-Centennial Building at Morrow Park as a City storage facility due to the mechanical/plumbing and electrical elements reaching the end of life.

Table 4 shows the Recreation service area remaining useful life details.

Table 4: Recreation Remaining Useful Life

Asset Inventory	Expected Useful Life (Ave Yrs.) [1]	Ave. Remaining Useful Life (Yrs.)	Percent of Useful Life Remaining
Aquatics & Equipment			
Splash Pads and Wading Pools	50	28	56%
Public Beaches	100	68	68%
Recreation Facilities			
Arenas, Park Facilities, Other recreation facilities	33	20	39%
Equipment			
Events Equipment	10	0	0%
Fleet			
Zambonis and light duty vehicles	10	1	13%
Park Amenities			
Fields and Sports Pads	24	4	15%
Park Bleachers and Seating			
Park Structures			
Playgrounds & Water Plays			
Structures			
Park Siteworks			
Park Utilities	29	0	0%
Recreation Remaining Useful Life	**32**	**12**	**37%**

[1] Uses average of asset classes/assets

1.4 Asset Risk Assessment

The consequences of failure for Recreation assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Recreation high risk assets is $31.8 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the Official Plan (April 2023) and the 2019 Assessment of Parks and Open Spaces.

Stakeholder and technical levels of service, performance measures and current targets for Recreation are outlined in Table 5 below.

Table 5: Levels of Service – Recreation

Asset Class: Recreation – Arenas and Recreation Facilities								
Service Objective Statement: The City will strive to ensure that reliable, quality facilities are provided and affordable ice times are available.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance**		**Technical Measure**		**Technical Performance**	
			Year of Measure				**Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Availability	Primetime hour usage is within specified capacity range	Primetime hour usage between 80%-90% capacity	95% capacity	95% capacity	Provision of ice time to community	1 ice surface for every 11,000 people	1 ice surface to 16,730 people	1 ice surface to 16,730 people
	Provision of Recreation and Culture Facilities	Available Recreation Facilities with indoor swimming pool	3 Facilities (1 indoor swimming pool)	3 Facilities (1 indoor swimming pool)	Ratio of indoor pools to current population	1:25,000 population	1:83,651 population	1:83,651 population
Affordability	Access to facilities and service is affordable and cost effective	Rental cost per hour for ice time	$238.90/hr for adults (incl. HST) $207.03/hr for youths (incl. HST)	$252.05/hr for adults (incl. HST) $218.15/hr for youths (incl. HST)	Average arena facility condition rating	Minimum condition rating of Fair	Fair	Fair
Reliability/Quality	All Arenas and Recreation Facilities are maintained in a	Arena and Recreation Facilities are proactively	All recreation and arena facilities are proactively	All recreation and arena facilities are proactively	Average Facility Condition Index (FCI) value Arenas and Recreation Facilities	Minimum Fair (5% - 10%)	8% (Fair)	8% (Fair)

Asset Class: Recreation – Arenas and Recreation Facilities								
Service Objective Statement: The City will strive to ensure that reliable, quality facilities are provided and affordable ice times are available.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance**		**Technical Measure**		**Technical Performance**	
			Year of Measure				**Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
	state of good repair	maintained and reliable for intended use	maintained and reliable for intended use.	maintained and reliable for intended use.	Number of facilities with FCI or 10% or better	6 Facilities	3 Facilities (1 Facility with no BCA)	3 Facilities (1 Facility with no BCA)
					Percentage of Arena fleet (zamboni) in poor or better condition	100% of fleet replacement value	52% of Fleet CRV is rated poor or better.	52% of Fleet CRV is rated poor or better.
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities that meet our environmental objective	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions.	Annual energy consumption per Sq.m	1.65 GJ/m2	1.59 GJ/m2	1.59 GJ/m2

Asset Class: Recreation – Parks								
Service Objective Statement: The City will strive to provide a public park system that provides opportunites for physical recreation, socialization, cultural pursuits, community identification, active transportation, nature appreciation and education.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance**		**Technical Measure**		**Technical Performance**	
			Year of Measure				**Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope/Availability	Provide public park and open space system within the City	Classifications of parkland and open spaces available	12 Regional Parks 38 Community Parks 67 Neighbourhood Parks (plus 12 embedded in Regional Parks) 14 Pocket Parks	12 Regional Parks 38 Community Parks 67 Neighbourhood Parks (plus 12 embedded in Regional Parks) 14 Pocket Parks	Average Ratio of neighborhood parks to current population	1 hectare/1,000 population	0.75ha/1,000 pop	0.76ha/1,000 pop
					Ratio of outdoor aquatic facilities to current population	1:25,000 of pop. for pools 1:7,500 of pop. for splash pads/wading pools	1:85,000 of pop. for pools 1:9,444 for splash pads/wading pools	1:83,651 of pop. for pools 1:9,295 for splash pads/wading pools
					Ratio of play equipment to current population	1:1,500 of population	1:1,394 of population	1:1,394 of population
Reliability/Quality	Providing reliable and high-quality recreation facilities and parks that meet	All recreation facilities and parks amenities are maintained in a state of good repair	Recreation facilities and parks amenities are proactively maintained and	Recreation facilities and parks amenities are proactively maintained and	Meet minimum design standards for neighborhood parks	Meet minimum design standards	43 neighborhood parks not meeting minimum design standard	43 neighborhood parks not meeting minimum design standard

Asset Class: Recreation – Parks								
Service Objective Statement: The City will strive to provide a public park system that provides opportunites for physical recreation, socialization, cultural pursuits, community identification, active transportation, nature appreciation and education.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
	the needs of the community		reliable for intended use	reliable for intended use	Park Facilities with condition rating of poor or better	15 Facilities	13 Facilities	13 Facilities
					Percentage of Parks Amenities assets in poor or better condition	100% of parks amenities rated poor or better.	70%	70%

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Recreation Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, legislative requirements, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as the level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the 10-year forecast and are sufficient to deliver lifecycle management activities.
- Strategic risks and risk trade-offs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Recreation services funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Recreation Services				
Availability	Provision of recreation and culture facilities	Available Recreation Facilities with indoor swimming pool	3 Facilities (I indoor swimming pool)	Number of Facilities is expected to remain the same. Inventory will account for Miskin Law Complex in future update of the AMP
	Provide public park and open space system within the City	Classifications of parkland and open spaces available	12 Regional Parks 38 Community Parks 67 Neighbourhood Parks (plus 12 embedded in Regional Parks) 14 Pocket Parks	Same level of service is expected Inventory will account for Quaker Foods City Square future update of the AMP
Reliability/Quality	All arena and recreation facilities are maintained in a state of good repair	Arena and Recreation facilities are proactively maintained and reliable for intended use	Facilities are proactively maintained and reliable for intended use	Same level of service expected

Table 7 below outlines the Recreation Services Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the expected performance over the 10-year forecast.

The performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the

City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2033 were used. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Recreation Services				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Annual energy consumption per sq.m	1.59 GJ/m2	Energy consumption expected to remain the same for existing assets. Long term planning period will show increase in total average when new recreation facilities are included in future iterations of the AMP
		Not currently tracked as technical LOS	Service area studies and master plans are conducted as required	Costs for service area studies is expected to remain the same over the 10-yr planning period
		Level of Funding:	Historical 3-yr Annual Average: $161K	Annual Average: $161K

Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Recreation O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Minimum facility condition index of Fair (8%)	Fair	Facility condition index is expected to remain the same or improve at current levels of funding. Lower proposed annual average reflects the capital plan for renewals from recent BCA's that maintains state of good repair.
		Level of Funding:	Historical 3-yr Annual Average: $4.9M	Annual Average: $2.8M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No disposals planned for the 10-yr period	No disposals planned for the 10-yr period

		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Ratio of recreation facilities and amenities to current population	Current ratio of ice surfaces, swimming pools and parks not meeting targets Higher than anticipated annual average shown is due to Del Crary Park Upgrade costs as per Little Lake Master Plan and not typical level of investment	Likely to increase over the 10-year planning period (ice surfaces and swimming pools will show improvement with inclusion of Miskin Law Complex in next AMP iteration). Parks - likely to remain the same over the planning period.
		Level of Funding:	Historical 3-yr Annual Average: $3.2M	Annual Average: $2.5M

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Recreation

The following table describes the current, preferred strategies and activities for the Recreation service area to maintain the current levels of service. Options for which lifecycle activities that could potentially be undertaken have been explored in various needs studies and reports such as the Arenas Needs Study, the Outdoor Water Play Facilities 10 Year Capital Strategy and the Parks and Open Space Assessment. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Recreation – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	Linking the asset management plan to other studies, master plans and strategies
	Public consultation on levels of service
	Arenas & Recreation Facilities
	Programs are rotated to arenas in order to make use of facilities that have the appropriate resources
	Staffing changed during events to create staffing efficiency
	Rotate older equipment into backup pool
	Share mobile equipment between the Arena facilities and the Wellness Centre
	Investigations into when the cost to maintain is greater than the cost to replace
	Arena needs studies to assess how the services are being delivered to the community and what the needs of the community are
	Building Condition Assessments completed on a 7-year cycle
	Parks (Aquatics, Equipment, Buildings, Amenities)
	Development of Parks and Open Spaces study (2019) to understand needs and develop rejuvenation strategy
	Implement Outdoor Water Play Facilities 10-Year Capital Strategy
	Program reviews increase in frequency as a facility ages
	Conduct needs assessments to identify areas of need for new waterplay equipment
	Parks assets are inspected bi-annually by staff at the beginning of season and end of season. These inspections include equipment that is not under the umbrella of the building condition assessment program (ex. Zambonis).
	Building Condition Assessments completed on a 7-year cycle
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more	**Arenas & Recreation Facilities**
	Preventative maintenance programs for Ice Plants and HVAC and mechanical systems which also include efficiency tests

Strategy Type	Current Practice
significant repair and activities associated with unexpected events.	Maintenance Check Logs for all mobile equipment, compressor rooms and facility maintenance activities
	Public works maintenance program for fleet
	Structural reviews of all load bearing assets above head height and flooring
	Predictive maintenance program in place for critical assets.
	Parks (Aquatics, Equipment, Buildings, Amenities)
	Preventive maintenance program for playgrounds, basketball courts, beaches and waterways. City has 2 permanent parks staff, they don't have people/funding.
	Maintenance as needed for baseball diamonds and irrigation systems.
	Predictive maintenance program in place for critical assets.
	Redundancy in equipment to allow rotations and minimize reactive maintenance downtime
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	**Arenas & Recreation Facilities**
	Upgrading to high efficiency mechanical equipment changed the use of the system and improved the service it delivered
	Addition of cold-water flood systems for ice resurfacing. Eliminate potential hot water requirements and equipment
	Updated to new building codes when asset needs renewals
	Upgrading projects focus on removing asset exposure to elements
	Updating of refrigeration plant equipment and components based on life cycle analysis
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	**Arenas & Recreation Facilities**
	Combine projects to include the investigations, renewals and replacements
	Replace large assets based on condition or efficiency
	Operating vs. Replacement cost to strategize
	Review engineering specifications to plan for future replacements

Strategy Type	Current Practice
	Replacement programs include groups of assets from several facilities to reduce costs
	Replacements considered within the context of the facility
	Building codes updates drive programs for replacement of assets
	Parks (Aquatics, Equipment, Buildings, Amenities)
	To eliminate the need of lifeguards, reduce operating costs and extend the waterplay season, phase out wading pools and replace with splash pads
	Replace spray posts with in-ground geysers to reduce vandalism occurrences and still provide the same flexibility of use
	Replacement considered when age and conditions do not meet minimum standards or capacity of facility (based on public use) has been reached
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	**Arenas & Recreation Facilities**
	No updates made to facilities deemed beyond service life
	Trade in old ice machines as a part of the procurement process to reduce the cost of new machines
	Scheduled tear downs and reviews rotated across facilities
	Parks (Aquatics, Equipment, Buildings, Amenities)
	Phase out wading pools and replace with splash pads due to limited time for use, higher operating costs and need for lifeguards
	Considered when age and condition do not meet minimum standards and capacity of facility (based on public use) has been reached
Expansion Programs Planned activities required to extend the services to previously un-serviced	**Arenas & Recreation Facilities**
	Automation for doors added where possible to reduce wear and tear on walls, door frames, glass and accessible opening switches

Strategy Type	Current Practice
areas – or expand services to meet growth demands.	Light replacement program to LED lights to provide a greater return on investment
	Seek partnerships with schools and private industry to expand with shared costs
	Building code changes often drive expansion programs to meet new codes
	Arena service expectations have changed since buildings constructed leading to the need for expansion
	Changes to accessibility requirements for public buildings drive expansions, use grants where possible to meet these requirements
	Gender inclusive projects to increase the availability and opportunity for co-ed sports
	Professional Sports League requirements for sports facilities to remain compliant
	Adding multi-purpose rooms to facilities to improve use during off seasons and for other events
	Keeping more mobile equipment available to increase the redundancy
	Expansion of renewable energy programs and systems to reduce energy costs for operation
	Seek out and apply for appropriate grants to upgrade facilities to new codes and standards
	Parks (Aquatics, Equipment, Buildings, Amenities)
	Increased demand at Beavermead park from growth/Little Lake Master Plan implementation requires additional splash pad for maintaining levels of service
	Install splash pads in the southwest and west areas of the City to meet growth demands
	As opportunities arise, purchase land to create new Neighbourhood parks or enlarge a small/school site
	Where feasible, develop a portion of a Community Park or a Regional Park to provide Neighbourhood park functions
	Alignment of capital plan with studies and master plans to help project long term needs

Strategy Type	Current Practice
	Improve usability and appeal of poor-quality Neighbourhood parks through redevelopment and if possible and required, through enlargement
	The City also hears from facility user groups, who express their increasing needs for additional facilities, to accommodate growth.
Future Strategies	**<u>Arenas & Recreation Facilities</u>**
	Follow more recommendations from the Arena Needs Study and Vision 2025, A 10-Year Strategic Plan for Recreation, Parks, Arena and Culture (2016)
	Seek out new partnership opportunities to share the cost of development
	Naming rights and sponsorship partners for additional service funding
	<u>Parks (Aquatics, Equipment, Buildings, Amenities)</u>
	Carry out needs assessments to help identify best suited locations for additional waterplay assets to meet demands/levels of service
	Partner with school boards to enhance a portion of a school site to meet functions of a Neighbourhood Park
	Utilize signalized crosswalks and intersections to reduce barrier effect created by major roads for easier access to recreational locations
	Seek opportunities to increase the integration of services among major providers (school boards, Peterborough County, community groups, commercial sector, neighboring townships, etc.)

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Recreation services subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated park facility condition assessments, land use planning, and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 8: Recreation – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include preventative maintenance programs for facility HVAC, plumbing and electrical assets, landscape maintenance, snow clearing, etc.

Refer to Table 8: Recreation – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Where building condition assessments have been completed, the capital renewal plan is based on actual inspected observations. Parks and aquatics asset renewal needs have been reviewed by staff with a proposed 10-year forecast presented. Renewal budget levels are considered adequate to maintain proposed LOS over the 10-year planning period.

Additional assets being acquired due to growth/service improvements will also impact renewal funding needs in the long-term and should be considered with long-term financial planning. If current funding levels are not maintained, it may result in renewal project deferrals such as arena heating and refrigeration unit replacements, facility roof and exterior façade replacements, interior finishes, and exterior site work renewals (asphalt repaving). Park project deferrals may impact the renewals to sports fields, ball diamonds

and fieldhouses. Where deferred renewals/replacements take place, the City is committed to ensuring that risks are minimized where possible and stakeholders are aware of service alternatives.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Individual tangible assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include facility expansions, relocations to a larger facility to address capacity deficiencies, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily service demand increases due to growth. The City of Peterborough's City-Wide Development Charges (DC) Background Study has identified anticipated residential and non-residential growth capital program requirements to meet growth demands. Even though DC charges are intended to pay for the initial round of capital costs needed to service new development over an identified planning period, the City will need to commit the funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond). The current levels of funding for ongoing lifecycle activities will likely need to increase in the long-term to support the acquisition of Recreation assets and to deliver proposed levels of service.

The total costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Recreation Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Recreation Services	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Recreation Services	$8.3	$8.5	$8.8	$9.1	$9.3	$9.6	$9.9	$10.2	$10.5	$10.8	$9.5
Total Proposed Funding	$8.3	$8.5	$8.8	$9.1	$9.3	$9.6	$9.9	$10.2	$10.5	$10.8	$9.5
Lifecycle Costs											
Recreation Services	$14.6	$7.5	$8.1	$8.8	$12.6	$5.4	$4.8	$2.6	$2.2	$2.2	$6.9
Total Lifecycle Costs	$14.6	$7.5	$8.1	$8.8	$12.6	$5.4	$4.8	$2.6	$2.2	$2.2	$6.9
Funding Shortfall	**-$6.4**	**$1.1**	**$0.7**	**$0.2**	**-$3.3**	**$4.2**	**$5.1**	**$7.6**	**$8.3**	**$8.6**	**$2.6**

Based on the lifecycle assessment of the Recreation service area, it is estimated that the City would need to spend an average of $6.9 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $9.5 million. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast.

The overall projected average funding level is sufficient to achieve proposed levels of service however increased planned renewals and service improvement initiatives for parks, arenas/recreation facilities between 2024 and 2028 are anticipated. Revenues for these projects are primarily sourced from DC's and reserves, provincial and federal grant opportunities, and tax supported revenues. Projects will likely be deferred to the next year where shortfalls are indicated.

Assuming current levels of funding remain consistent, the City will likely achieve proposed levels of service with no significant financial or risk impacts in the short term however will need to explore other funding options or review appropriateness of service levels in the long term (25-year outlook). As recreation facilities and park amenities are acquired and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Recreation Services are:**

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The projected funding for the Recreation service area is sufficient over the short term (10-yr) forecast and service levels/performance will likely remain the same and/or improve. The number of facility assets and park amenity assets in poor and very poor condition are however, expected to increase over the long-term and will likely require additional funding to keep assets in a state of good repair (replacement and refurbishment activities). It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds, external grant opportunities to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects such as grouping renewal projects with other service area projects, or seeking partnerships with neighboring towns, county, municipalities, educational institutions, etc.

- Seek approvals to implement recommendations and strategies set forth in the Parks and Open Space Study (2020), and other council approved strategic plans.

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of recreational assets.

Risks relating to asset failure are mitigated though condition assessment programs, maintenance programs (legislated and best practices) and scheduled renewal programs which ensure assets are in acceptable condition and are available to achieve the determined levels of services. Risks related to fleet asset failures are addressed through proactive fleet maintenance and adequate vehicle storage to ensure adequate service readiness.

The choice of strategy for maintaining Recreation assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain levels of service.

All City services, including Recreation services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available

and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

Risks associated with Recreation strategies are primarily related to growth and ensuring sustainable funding is available to meet growth demands and maintain levels of service. Strategic plans discuss the implications of growth and that there will be increasing demand from all generations and age groups for most types of leisure pursuits, since the population could increase by as much as 36,500 between 2011 and 2041. The most significant increase in demand should come from the age groups that will exhibit the most growth, namely the 55 and older age group. This implies that activities of interest to that generation will increase significantly in demand by 2041 and the service level of supporting facilities will have to be increased. Activity examples include: the performing arts, hand crafts and other creative arts, attending concerts, festivals and community events, walking for fitness and pleasure, bicycling, all manner of health and wellness programming and therapeutic aquatic programming, nature appreciation and associated activities, visiting museums and historic sites - and appreciating cultural heritage and, gentle individual and team sports (e.g., pickleball, badminton, casual skating, swimming, dancing, walking for pleasure, fitness).

Strategic Priorities

The Council approved Vision 2025 strategic plan provides direction to assist decision making for the Recreation service area. Projects proposed for the capital budget are prioritized if they are aligned with of the following strategic directions (no order of priority):

1) Continue to move toward an increasingly collaborative and better integrated recreation and culture delivery system;
2) Provide an increasingly enhanced and better-connected park and open space system
3) Continue to provide quality recreation and culture facilities
4) Continue to provide quality recreation and culture programming, community events and sport tournaments

Recommended actions based on these strategic directions and objectives in the Vision 2025 Action Plan have informed the 10-year capital budget estimates and are brought forward for consideration through the annual budget deliberation process.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

Attachment #8: Airport Service Area

Infrastructure Value	$92.2M	
Overall Condition	4.0	Good
High Risk Asset Value	$39M	42%
Trend		

1.0 Summary of Airport Service Area

The Peterborough Airport is an aviation industrial park, a service to area businesses, and a community gateway for the public, tourism, business and general aviation. The Peterborough Airport supports over 20 businesses and educational institutions, employing over 500 full-time employees. Seneca College School of Aviation and Flight Technology is also located at the Airport with 130 to 150 students. Major improvements and expansions have been made since the purchase of the Airport in 1967, with the most recent major expansion including the addition of a 2,000 ft paved crosswind runway and supporting parallel taxiway and a 1,000 ft extension of taxiway Bravo in 2013. In 2015, a new development area was established east of airport road to accommodate two 45,000 sq. ft. hangars.

Asset classes that fall under the Airport service area are facilities and airport support assets which include airside and groundside assets. Airside assets consist of airfield visual aids, aprons, tie down areas, runways and taxiways. Groundside assets consist of food service assets and land improvements (fencing, hardscaping, access roadways, outdoor lighting & signs and parking lots, etc.).

1.1 Inventory Details

Table 1 details the City of Peterborough's inventory for the Airport service area

Table 1: Airport Asset Inventory

Asset Category and Class	2023 Quantity	Unit of Measure
Facilities		
Airport Beacon Tower	1	Each
Operations Centre	1	Each
Airport Pumping Station	1	Each
Airport Terminal	511	Sq.m
Field Electrical Centre	1	Each
Airport Support Assets		
Airside Assets	29	Each
Groundside Assets	8	each

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the Airport service area totalled $92.2 million. Replacement costs were taken in combination of the City's most recent building condition assessments (2021-2022) and using other valuation methods, such as unit cost multipliers based on recent construction projects or historical costs inflated to 2023 where recent assessments or costing information was not available.

Figure 1: Airport Service Area –Replacement Cost by Asset Class

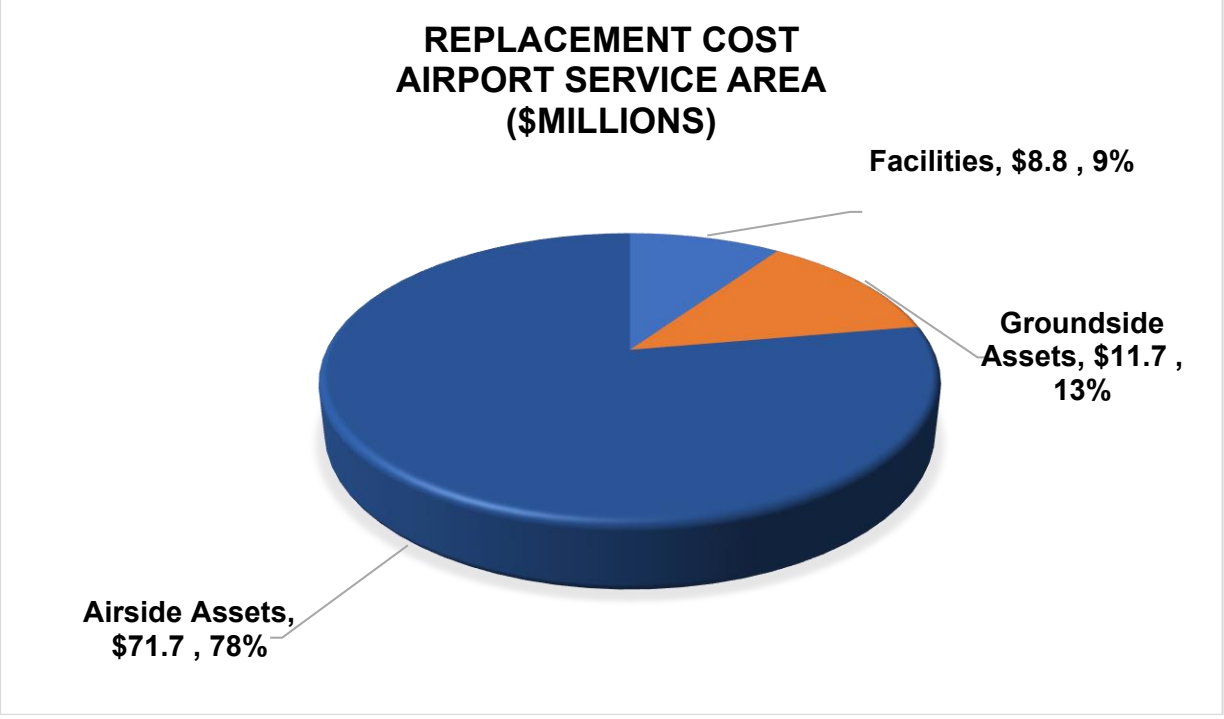

Table 2: Airport – Replacement Cost by Asset Class

Asset Class	2023 Replacement Cost
Facilities	
Airport Beacon Tower	$74,865
Operations Centre	$2,473,949
Airport Pumping Station	$1,018,195
Airport Terminal	$4,706,513
Field Electrical Centre	$494,868
Airport Support Assets	
Airside Asset	$71,671,440
Groundside Assets	$11,749,998
Airport Total	**$92,189,828**

1.3 Asset Condition and Remaining Useful Life

The City's Airport service area is currently rated in overall good condition. Facility ratings shown based on the most recent building condition assessments completed in 2021-2022 and use observed age of facility elements at the time of assessment. Other assets use an age-based rating methodology and have been reviewed by staff to ensure that it reflects the current conditions until detailed assessments are completed. Based on replacement cost, 54% or $85.5 million are rated very good and good. Figure 2 and Table 3 provide condition details of the Airport service area.

Figure 2: Airport - Distributed Condition and Replacement Cost

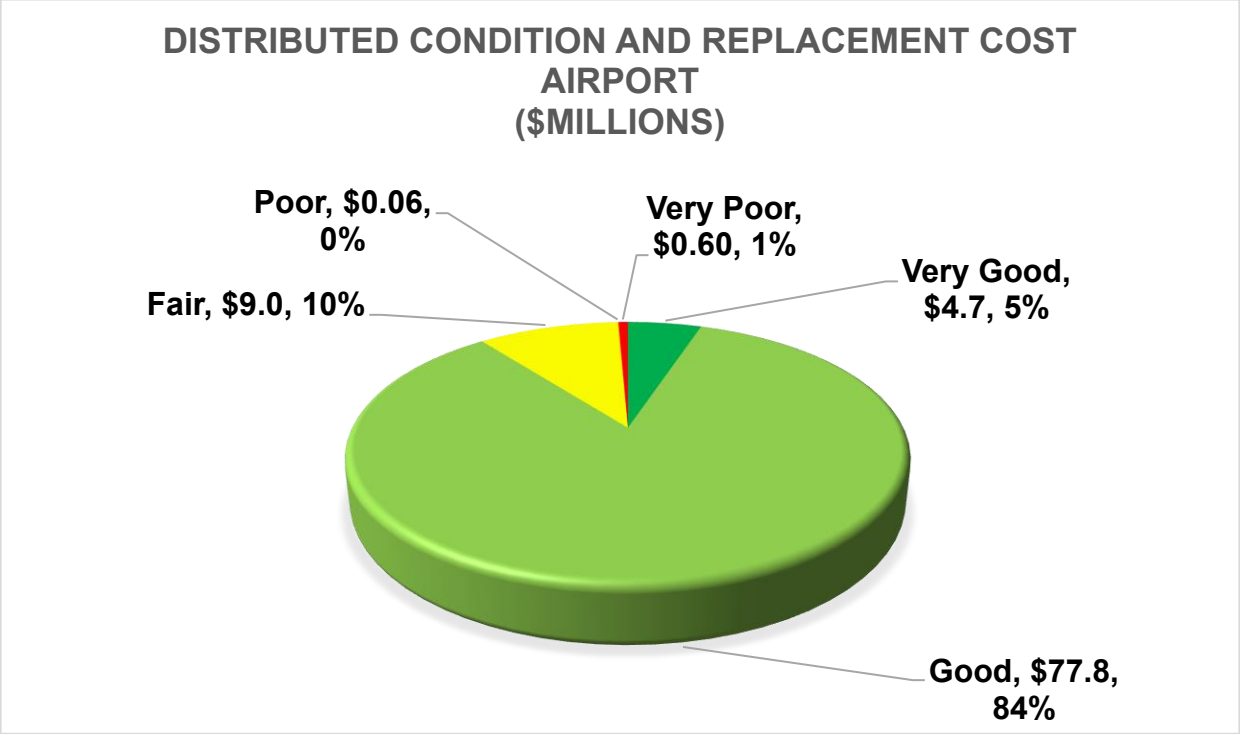

Table 3: Airport – Asset Class Condition Ratings

Asset Class	2023 Condition Rating
Facilities	
Airport Beacon Tower	Good
Operations Centre	Very Good
Airport Pumping Station	Good
Airport Terminal	Very Good
Field Electrical Centre	Very Good
Airport Support Assets	
Airside Asset	Good
Groundside Assets	Fair
Airport Overall Condition[1]	**Good**

Remaining Useful Life

The following summarizes the Airport service area remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on a combination of the calculated age which do not take into consideration any betterments that extend the useful life of the asset(s) and observed age (for facilities only). The age of the Airport service area is variable and with efforts to extend the life by application of lifecycle treatments. Table 4 shows the airport remaining useful life details.

Table 4: Airport Remaining Useful Life[2]

Asset Inventory	Ave. Expected Useful Life (Yrs.)	Ave. Remaining Useful Life (Yrs)	Percent of Useful Life Remaining
Facilities			
Airport Beacon Tower	30	16	54%
Operations Centre	31	17	57%
Airport Pumping Station	35	15	44%
Airport Terminal	30	18	58%
Field Electrical Centre	37	25	31%
Airport Support Assets			
Airside Asset	29	16	54%
Groundside Assets	21	10	48%
Airport Overall	**31**	**17**	**55%**

[1] Weighted by replacement value
[2] ESL, RUL, and percent of useful life remaining are based on calculated average of asset classes

1.4 Asset Risk Assessment

Currently, the consequences of failure for Airport assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Airport services high risk assets is $39.1 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies, and policies such as the Official Plan.

Stakeholder and technical levels of service, performance measures and current targets for the Airport service area are outlined in Table 5 below.

Table 5: Levels of Service – Airport

Asset Class: Airport								
Service Objective Statement: The City strives to deliver a safe and compliance airport service, accessible to diverse tenants and users, accompanied by reliable customer service while minimizing disturbances to neighbours.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Availability	Service is not denied for reasons other than accident/incidents and maintenance	No occurrences where service is denied	16 runway closures 8 - Incidents 8 - Maintenance	10 runway closures 1 - Incidents 9 - Maintenance	Staff coverage during published hours of operation	100% Coverage during published hours of operations	100%	100%
	Serviced Land is available for leasing	Lot absorption of at least 1 new build per year	21.0 acres of service lots available	18 acres of service lots available	Number of tenant buildings	Greater than 44	45 tenant buildings	47 tenant buildings
	Aircraft movements per year (movement classified as landing or take-off)	Annual aircraft movements	48,339 aircraft movements	47,759 aircraft movements	Complaints per 1000 aircraft movements	Less than 35	15	17.8
		Number of jet & turbine movements	882 Jet/Turbine Movements	1040 Jet/Turbine Movements	Year over year increase in percentage of movements	3% of total movements	1.85%	2.18%
Reliability/Quality	Providing a reliable Airport that meets the needs of the community	Airport facility and assets are maintained in a state of good repair	Airport facility and assets are proactively maintained	Airport facility and assets are proactively maintained	Maintain average Facility Condition Index (FCI) at minimum 5% or	Minimum Good (0% - 5%)	0.23% (Good)	0.23% (Good)

Asset Class: Airport								
Service Objective Statement: The City strives to deliver a safe and compliance airport service, accessible to diverse tenants and users, accompanied by reliable customer service while minimizing disturbances to neighbours.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
			and reliable for intended use	and reliable for intended use	'Good' for all facilities			
					Percentage of Airside Assets in fair or better condition (CRV $)	100%	99%	99%
					Percentage of Groundside Assets in fair or better condition (CRV $)	70%	100%	100%
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities that meet our environmental objective	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to	Annual energy consumption per Sq.m	Energy Use Intensity (EUI) of 0.86 GJ/m2 or less	1.23 GJ/m2	1.23 GJ/m2

Asset Class: Airport								
Service Objective Statement: The City strives to deliver a safe and compliance airport service, accessible to diverse tenants and users, accompanied by reliable customer service while minimizing disturbances to neighbours.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
			reduce GHG emissions	reduce GHG emissions				

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Airport Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees. However, the current funding levels are not sufficient to achieve LOS over the long term.
- LOS are achievable over the short term for renewal activities and some lifecycle activities, e.g. service improvements and growth-related activities, will need additional investment to achieve targets, accommodate growth, and address capacity deficiencies.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and expected performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Airport funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Airport				
Availability	Service is not denied for reasons other than accident/incidents and maintenance	No occurrences where service is denied	16 runway closures 8 - Incidents 8 - Maintenance	Less closures expected
	Aircraft movements per year (movement classified as landing or take-off)	Annual aircraft movements	47,759 aircraft movements	Increased aircraft movements expected
Reliability/Quality	Providing a reliable Airport that meets the needs of the community	Airport facility and assets are maintained in a state of good repair	Airport facility and assets are proactively maintained and reliable for intended use	Same level of service expected

Table 7 below outlines the Airport Service Area Technical LOS lifecycle activities to be provided under the proposed levels of funding, and the expected performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2033 were used. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected

expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Airport Services				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Year over year increase in percentage of movements Environmental Monitoring and studies currently not tracked in Technical LOS	2.18% YOY increase Historical funding in budget is for studies, environmental monitoring and Airport development and marketing studies	Likely to remain the same
		Level of Funding:	Historical 3-yr Annual Average: $440K	Annual Average: $381K
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Airport O&M activities are carried out and funded through the operating budget. Airport maintenance activities reported in the capital budget include airside/groundside tree maintenance	Likely to require additional funds beyond year 2025 to manage obstacle limitations and O&M activities related to additional assets acquired (e.g., taxiway extensions, runway widening, change in runway level of service)
		Level of Funding:	Historical 3-yr Annual Average: $67K	Annual Average: $20K

		Maintain average Facility Condition Index (FCI) value for all facilities at minimum 5% or 'Good'.	0.23% (Good)	Facility conditions are expected to be maintained over 10-year forecast at current level of investment.
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Percentage of Airside Assets in fair or better condition (CRV $)	99%	Historical funding levels are not sufficient to deliver proposed LOS and conditions are expected to decline over the 10-year planning period without increased funding. Increased expected costs shown below are due to airside assets requiring renewals are high capital investment assets (runways and taxiways), water and sewer upgrades required, aviation lot preparation activities required. The strategic direction of airport will drive priority and level of investment in new infrastructure.
		Percentage of Groundside Assets in fair or better condition (CRV $)	100%	Likely to remain the same
		Level of Funding:	Historical 3-yr Annual Average: $820K	Annual Average: $2.23M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is	Currently not measured in Technical LOS	No Airport disposals planned for the 10-yr period	No Airport disposals planned for the 10-yr period

	otherwise no longer needed by the City			
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Year over Year (YOY) increase in percentage of aircraft movement	2.18% YOY increase	Costs to accommodate growth/service improvements are likely to increase. Airside assets do not accommodate larger aircrafts and/or volume of expected aircrafts. Taxiways will require extension over the 10-year planning period
		Level of Funding:	Historical 3-yr Annual Average: $543K	Annual Average: $1.4M

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Airport

The Airport strategy considers facilities and Airport support assets (airside and groundside assets). For leased lands, only the servicing infrastructure is considered for development of strategy. The following table documents the set of planned actions or 'activities' that the City undertakes for each asset class to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Airport – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
	Operational inspections carried out daily

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	Linking the asset management plan to other studies, master plans and strategies
	Public consultation on levels of service
	Implementation of Wildlife Management Plan
	Cyclical runway friction testing
	Pavement condition assessments yearly
	Hazard identification with Safety Management System
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	Airfield Visual Aids replaced immediately upon failure
	Airside pavement sweeping
	Crack-sealing to preserve pavement condition
	Ditching and culvert cleanout
	Ground-side roads sanded and maintained during winter to remain open
	Line painting
	Plant removals
	Repair of drainage structures should any cracking or heaving take place
	Repair, clean, treat or remove concerns identified in daily inspections
	Snow clearing including bank removals
	Scheduled maintenance of airfield visual aids
	Tree cutting and removal to protect Obstacle Limitation Surfaces
	Vegetation maintained to Wildlife Management Plan specifications
	Winter restoration of friction levels on runways
	Winter runway monitoring
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	Rebuild subsurface and repave runway sections if sections fail code specifications
	Rehabilitation of internal public roadway & parking
	20-year plan to fully renew asphalt surface

Strategy Type	Current Practice
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	Replacement of assets prior to the end of their service life
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	-
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	Properties purchased for expansion as they become available
	Watermain and Sanitary sewer upgrades to accommodate growth
	Commercial and General Aviation Lots prepared for leasing
	Strategic Development Plan recommendations followed
	Bravo Taxiway extension as airport growth requires for safe operations
	Passing Area on Apron III as recreational growth increases
	Upgrade Runway Designation to Non-Precision (to support lower landing minima for flying by instrument flight rules), improving accessibility to airport during inclement weather
	Construct access roads to new lots
	Rehabilitation of internal road commercial area
	Environmental Assessments for future development areas
	Growth requirements as per additional studies and master plans (e.g., DC Study and Airport Master Plan)
	Expansion of terminal building to meet increased demand.
	Widening of primary runway from 100 to 150 ft to improve service.
	Extension of taxiway system to full length of runway to improve safety and efficiency.

Strategy Type	Current Practice
	Emergency access road at west end of runway
Future Strategies	Strategic development plan completed in 2017 complimenting and updating the master plan
	Airport Servicing Master Plan and functional servicing studies for new tenants to ensure future water and sewer needs are met
	Land development review for excess lands not suitable for aviation related use.

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Airport service area subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, land use planning and demand management, process optimization, etc.

Current funding levels are sufficient to address non-infrastructure solution needs over the 10-year forecast. Environmental contamination management and monitoring around the airport will continue over the planning period with expected remediation activities beyond the 10-year forecast

Refer to Table 8: Airport – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include tree cutting and removal to protect Obstacle Limitation Surface, culvert and service line repairs, friction measurement of runway, airside runway sweeping, facility preventative maintenance activities, etc.

Refer to Table 8: Airport Assets – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are not sufficient to meet projected service levels. As infrastructure is extended or acquired, additional funds to maintain service levels will be required.

Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Forecasted renewal costs are projected to increase to accommodate upgrades to airport water and sewer infrastructure, aviation lot preparation for future expansion activities, and airside asset renewals/replacements. The 3-year historical capital budget indicates that current funding levels for existing assets are insufficient to address short-term renewal needs. Additional assets acquired due to growth/service improvements will also impact renewal funding needs in the long-term. This shortfall may result in deferrals of projects related to airport expansion initiatives, airside asphalt renewal, and lot preparation to accommodate future growth needs. Where deferred renewal takes place, the City is committed to ensuring that risks are minimized where possible.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include new runway/taxiway extensions, new hydro servicing, lot acquisitions, and aviation lot expansion activities, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily growth related, new construction costs and other capacity improvement costs. The City of Peterborough's Airport Master Plan has identified medium to long term development to 2037 by guiding future expansion at the Peterborough Airport. Key objectives are concentrated on driving business development, improving efficiency and sustainability of operations, and adapting to the changing needs of the community and stakeholders. Funds for airport expansion/acquisition are sourced from reserves, capital levy and debt. The City will need to commit increased funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond).

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below for each asset category. Costs shown are the costs needed to minimize lifecycle costs associated with delivering proposed LOS. Shortfalls between lifecycle activity costing and investment levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Airport Total Lifecycle Activity Costs and Projected funding – Proposed Levels of Service

Airport Services	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Non-Infrastructure Solutions	$0.4	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.5	$0.6	$0.6	$0.5
Operations and Maintenance Activities	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1
Renewal Activities	$0.8	$0.8	$0.9	$0.9	$0.9	$1.0	$1.0	$1.0	$1.0	$1.1	$0.9
Disposals/Abandonment Policies	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Service Improvement Activities	$0.2	$0.2	$0.2	$0.2	$0.2	$0.2	$0.3	$0.3	$0.3	$0.3	$0.2
Growth Activities	$0.3	$0.3	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4
Total Proposed Funding	$1.9	$1.9	$2.0	$2.0	$2.1	$2.2	$2.2	$2.3	$2.4	$2.4	$2.1
Lifecycle Costs											
Non-Infrastructure Solutions	$0.5	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4	$0.4	$0.0	$0.4
Operations and Maintenance Activities	$0.1	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Renewal Activities	$0.8	$15.3	$1.8	$0.0	$3.8	$0.0	$0.0	$0.0	$0.0	$0.0	$2.2
Disposals/Abandonment Policies	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Service Improvement Activities	$0.5	$0.5	$5.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.6
Growth Activities	$0.2	$0.2	$6.6	$0.2	$0.2	$0.0	$0.0	$0.0	$0.0	$0.0	$0.8
Total Lifecycle Costs	$2.2	$16.5*	$13.8*	$0.6	$4.4*	$0.4	$0.4	$0.4	$0.4	$0.0	$3.9
Funding Shortfall	**-$0.3**	**-$14.5**	**-$11.8**	**$1.4**	**-$2.3**	**$1.8**	**$1.8**	**$1.9**	**$1.9**	**$2.4**	**-$1.8**

*Peaks in budgeted lifecycle costs shown in year 2025, 2026 and 2028 are attributed to the Airport and Water Sewer Upgrade project (renewal) with an estimated total project cost of $19.1 million forecasted over the next 10 years, the Bravo Taxiway extension (service improvement) with an estimated total project cost of $5.5 million over the next 10 years, and the Industrial Park East of Airport Rd. North Development project (growth related) with an estimated total project cost of $6.0 million over the next 10 years. These projects are needed to support airport expansion servicing, allow safer movement for larger aircrafts, and proactively prepare for continued airport growth by developing industrial and commercial lands for new large tenants.

Based on the lifecycle assessment of the Airport service area, it is estimated that the City would need to spend an average of $3.9 million per year to deliver LOS. The average annual funding is an estimated $2.1 million, leaving an average shortfall of $1.8 million per year over the 10-year forecast. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital investment for similar lifecycle activities and used as a proxy for the forecast.

The overall forecasted lifecycle costs to deliver levels of service for the Airports service area exceeds the current levels of funding over the 10-year forecast. Risk management strategies related to managing the shortfall are discussed in Section 3.3 of this attachment.

Assuming current levels of funding remain consistent, without intervention, the City will likely experience gradually declining service levels and increased risk exposure over the long-term that will need to be managed. As airside assets and groundside assets are acquired and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures. Over time, insufficient funding to complete renewal activities will likely lead to accelerated deterioration of assets resulting in increasing treatment costs to ensure assets are maintained in a state of good repair. The City will need to consider opportunities to manage the shortfall and assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Airport services are**:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs:

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The projected lifecycle costs for the Airport service area exceeds the current levels of funding over the short term (10-yr forecast) and long-term (10-year to 25-year) forecast and service levels/performance will likely decrease. Airport assets currently in good condition are expected to decline over the long-term and will likely require additional funding to keep assets in a state of good repair (replacement and refurbishment activities), particularly for asphalt surfaces of runways, taxiways and parking lots. It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds, external grant opportunities to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Maintain annual contributions to the Airport Development Debt Servicing Reserve to fund the City's share of the ISF Airport Expansion Capital Project

- Seeking approvals to increase the Pavement Reserve contribution to support continued maintenance of the asphalt surfaces

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects such as grouping transit renewal projects with other service area projects.

- Seek approvals to implement recommendations and strategies set forth in the 2022 Airport Master Plan and 2017 Strategic Development Plan.

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of groundside and airside assets.

"Introducing year-round scheduled service would allow the airport to qualify for a broader range of funding under Transport Canada's Airport Capital Assistance Program (ACAP), significantly reducing municipal costs for infrastructure renewal. ACAP could cover up to 100% of eligible safety-related capital projects, such as runway resurfacing, lighting upgrades, and drainage improvements, easing the financial burden of long-term asset management. This shift would enhance the airport's financial sustainability while improving regional connectivity, economic opportunities, and compliance with Transport Canada's safety standards."

All City services, including Airport services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining Airport services assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

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Attachment #9: Urban Forest Service Area

Infrastructure Value	$169.3M	
Overall Condition	3.0	Fair
High Risk Asset Value	$7M	4%
Trend		

1.0 Summary of Urban Forest

Asset classes that fall under the urban forest service area include street trees, park and open space trees, fleet and tree maintenance equipment. The urban forest is an often-overlooked critical asset class. This asset assists in the protection of water sources, flood management, protection from erosion and provides public health benefits. Condition rating trends are neutral since the last reported Plan in 2024.

1.1 Inventory Details

The tree inventory currently includes trees on public right of ways and in parks and open spaces. Over time this inventory will include complex trees and trees in forest stands.

Table 1 details the City of Peterborough's inventory for the urban forest service area.

Table 1: Urban Forest Asset Inventory

Asset Category & Class	2023 Quantity	Unit of Measure
Trees		
Street Trees, Park & Open Space Trees	31,111	Each
Fleet		
Vehicles	3	Each
Equipment		
Tree pruning equipment	5	Each

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the Urban Forest service area totalled $169.3 million. Replacement costs of trees were calculated using the 'CTLA trunk formula method'. The CTLA method is based on measuring the trunk cross-sectional area and multiplying it by a monetary value per square centimetre, based on the species of the tree. Fleet and Equipment replacement costs are based on original purchase cost and escalated to current day value.

Figure 1: Urban Forest Service Area –Replacement Cost by Asset Class

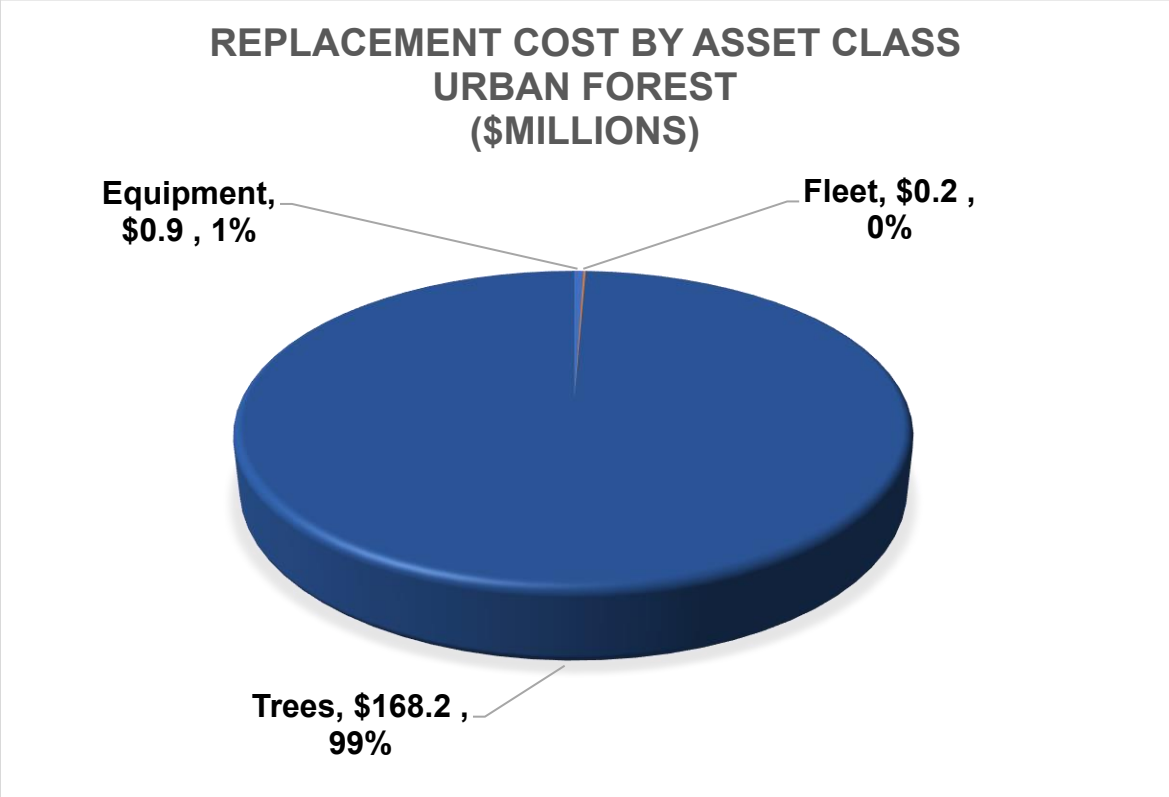

Table 2: Urban Forest – Replacement Cost by Sub-Class

Asset Category & Class	2022 Replacement Cost
Trees	
Street Trees	$145,284,602
Park and Open Space Trees	$22,955,784
Fleet	
Vehicles	$221,125
Equipment	
Tree pruning equipment	$852,878
Urban Forest Total	**$ 169,314,389**

1.3 Asset Condition and Remaining Useful Life

The City's Urban Forest service area is currently rated in overall fair condition. Condition assessments ratings for trees were assigned using the physiological condition data found in the City's tree inventory database. Where no physiological data is available, age-based condition ratings were estimated. Fleet and equipment condition ratings have been assessed based on age. Based on asset replacement value, 47% or $79.4 million are in good condition, 35% or $59 million in fair condition and 19% or $32 million in poor to very poor condition. Figure 2 and Table 3 provide overall condition details of the Urban Forest service area.

Figure 2: Urban Forest - Distributed Condition and Replacement Cost

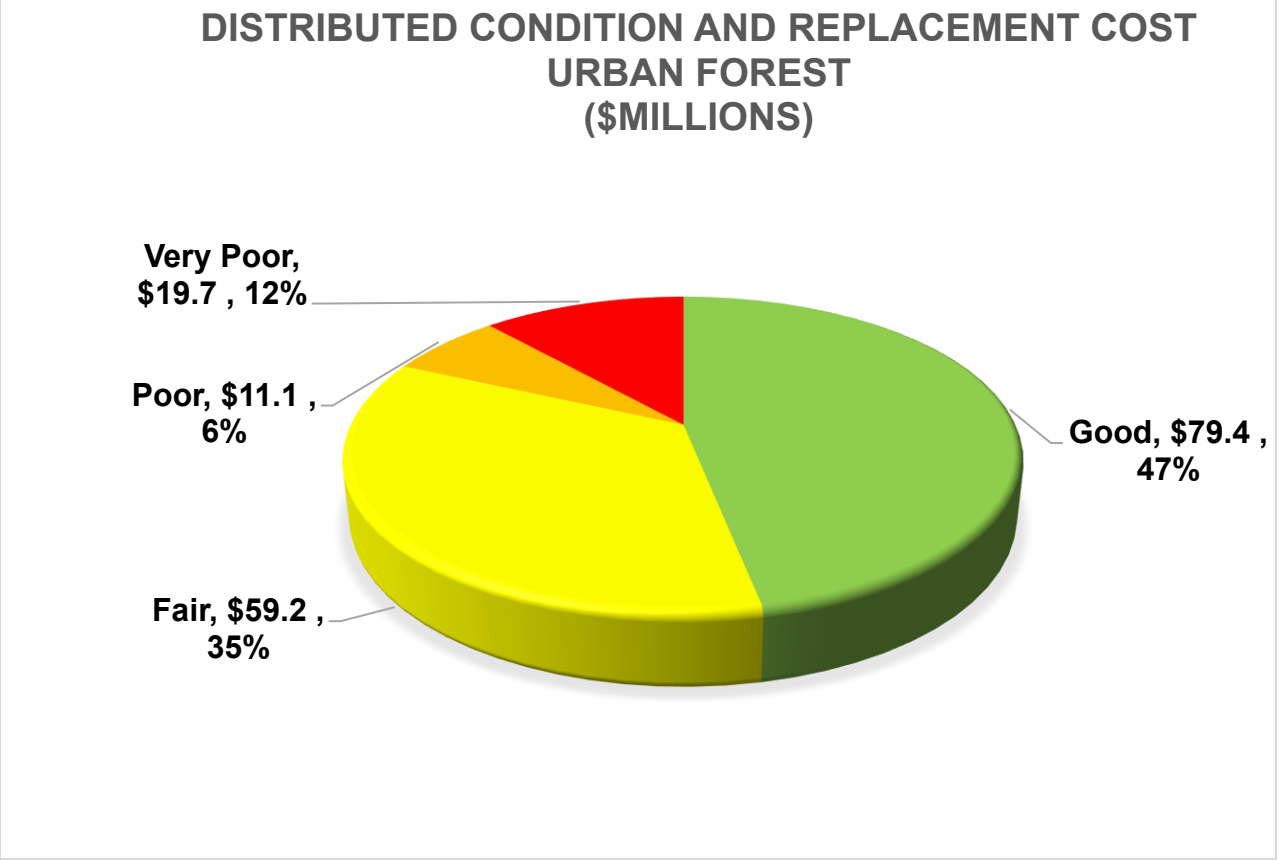

Table 3: Urban Forest – Asset Class Condition Ratings

Asset Category & Class	2023 Condition Rating
Trees	
Street Trees	Fair
Park and Open Space Trees	Poor
Fleet	
Vehicles	Poor
Equipment	
Tree pruning equipment	Poor
Urban Forest Overall Condition[1]	**Fair**

Remaining Useful Life

Table 4 shows the Urban Forest remaining useful life details.

Table 4: Urban Forest Remaining Useful Life[2]

Asset Inventory	Ave. Expected Useful Life (Yrs)	Ave. Remaining Useful Life (Yrs)	Percent of Useful Life Remaining
Trees			
Street Trees	18	0	0%
Park and Open Space Trees	34	10	31%
Fleet			
Vehicles	10	0	0%
Equipment			
Tree pruning equipment	15	0	0%
Urban Forest Overall	**20**	**0**	**0%**

[1] Weighted by replacement value.
[2] ESL, RUL, and percent of useful life remaining are based on calculated average of asset classes

1.4 Critical Assets and Asset Risk Assessment

Critical assets are those that, if impacted, cause significant loss or reduction of service. These assets may not result as 'high-risk' however are identified as having a 'high' consequence of failure (consequence score of 1 or 2). The consequences of failure for Urban Forest assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix C). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Table 5 below summarizes the identified Urban Forest critical assets, along with the typical failure modes and impacts on service delivery.

Table 5: Critical Assets

Critical Asset(s)	Failure Mode	Impact
No assets in the Urban Forest Service Area have been identified with a high consequence of failure or as a critical asset.	n/a	n/a

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Urban Forest high risk assets is $9.0 million.

The City continues to prioritize the operational, maintenance and renewal needs of high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the 2011 Urban Forest Strategic Plan and the 2013 Emerald Ash Borer Management Plan, etc.

Stakeholder and technical levels of service, performance measures and current targets for the Urban Forest service area are outlined in Table 5 below.

Table 5: Levels of Service – Urban Forest

Asset Class: Urban Forest								
Service Objective Statement: The City is committed to managing the urban forest by promoting community stewardship and strategic practice to preserve, renew and enhance the essential resource								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance**		**Technical Measure**		**Technical Performance**	
			Year of Measure				**Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Safety	Maintenance of the street trees and potentially dangerous trees	The City will maintain the street trees by pruning and removal of dangerous trees	Removals: 367 trees 660 ash trees Total:1,027 214 Pruned	Removals: 417 trees 1000 ash trees 292 Pruned	Service requests are processed and reviewed	Review and process a minimum of 2,700 service requests	2207	958
Sustainability	New trees planted yearly	Greater than 500 trees planted yearly	515 trees planted	2000 trees planted	All street trees within City limits inspected	All of current tree inventory inspected	All trees have been inspected	All trees have been inspected
	Trees are treated for Emerald Ash Borer	Greater than 650 trees treated yearly	750 trees treated	750 trees treated				
	Preservation of tree canopy to support community health and well being	Percent of urban forest tree canopy within the City	30% of urban forest tree canopy	31.9% of urban forest tree canopy				

Asset Class: Urban Forest								
Service Objective Statement: The City is committed to managing the urban forest by promoting community stewardship and strategic practice to preserve, renew and enhance the essential resource								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance**		**Technical Measure**		**Technical Performance**	
			Year of Measure				**Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing quality Urban Forest assets that meet the needs of the community	Urban Forest assets are maintained in a state of good repair	Urban Forest assets are maintained and reliable for intended use	Urban Forest assets are maintained and reliable for intended use	Percentage of Trees in poor or better condition	100% of trees in poor or better condition	94%	94%
					Percentage of vehicles that past their useful life	Max 5%	0%	0%

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Urban Forest Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable and achievable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Urban Forest funding levels will occur, it is expected that Stakeholder LOS will be maintained with a slight decline in urban forest tree canopy cover.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Airport				
Sustainability	Preservation of tree canopy to support community health and well being	Percent of urban forest tree canopy within the City	31.9% of urban forest tree canopy	Percent of tree canopy likely to decrease over the 10-year planning period
Reliability/Quality	Providing quality Urban Forest assets that meet the needs of the community	Urban Forest assets are maintained in a state of good repair	Urban Forest assets are maintained and reliable for intended use	Same level of service expected

Table 7 below outlines the Urban Forest Service Area Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used. A 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Airport Services				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	All street trees within City limits are inspected	All trees are inspected. Work program created to develop and implement the Emerald Ash Borer Management Plan	Likely to remain the same
		Level of Funding:	Historical 3-yr Annual Average: $800K	Annual Average: $800K
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Urban Forest O&M activities are carried out and funded through the Public Works operating budget.	Likely to remain the same
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to	Trees are treated for Emerald Ash Borer	Greater than 650 trees treated yearly	Likely to remain the same

	extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Greater than 500 trees planted annually	2000 trees planted annually	Qty of trees planted likely to decline due to budget constraints and not adequately funding the 1:3 tree replacement strategy as per Urban Forest Strategic Plan
		Percentage of Trees in poor or better condition	94%	Likely to remain the same
		Level of Funding:	Historical 3-yr Annual Average: $748K	Annual Average: $800K
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No disposals planned for the 10-yr period	No disposals planned for the 10-yr period however trees that are dead from EAB are removed and planted under the EAB Management Plan
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Currently not measured in Technical LOS	Trees planted in new development areas are the responsibility of the developer until development area has been assumed by the City	Likely to remain the same and as per Urban Forest Strategic Plan recommendations
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Current performance is based on existing resource

provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Urban Forest

The urban forest has two distinct but united strategies. One strategy considers maintaining the health of the City's trees; and the other seeks to grow the urban forestry and the replacement of the urban forest. The following table describes the current, preferred strategies and activities for the Urban Forest service area to maintain the current levels of service, while managing risk. Options for which lifecycle activities that could potentially be undertaken at the lowest cost are reviewed and compared when developing annual budgets. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Urban Forest – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Updating Arborist training
	· Linking the asset management plan to other studies, master plans and strategies
	· Public consultation on levels of service
	· Public education in the field regarding the importance of the urban forest
	· Public relations and education around treatments
	· Routine inspections of trees and inspections triggered by calls from citizens/businesses
	· General inspections
	· Use of species approval list for developers
	· Web education program
	· Holding developers accountable for planting via new planting inspections
	· Cityworks (computerized maintenance management software) upgraded
	· Improved maintenance record keeping
	· Cityworks modelling
	· Enforcement of tree by laws
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant	· Pruning activities (currently reactive)
	· Treatments for pest control and elimination
	· Safety maintenance (hanger and split removals)
	· Crown raising
	· Crown cleaning (dead wooding)

Strategy Type	Current Practice
repair and activities associated with unexpected events.	· Watering of young trees
	· Mulching and weeding
	· Updating/maintaining equipment
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	· Pruning of suckers
	· Cabling of trees
	· Emerald Ash Borer Management Plan/Treatment
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· One for one strategy for dead or dying trees
	· Three for one tree replacement plan for any single healthy tree removed on private property
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Field cost-benefit analysis of pruning vs. removal
	· Fee for removal of healthy trees on public property
	· Removals of trees are completed based on health and safety risks.
	· Engineering infrastructure conflicts due to repairs, upgrades, and replacements
	· Ash tree removals to control the spread of emerald ash borers
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· Strategic Planning using Urban Forest Strategic Plan (UFSP)
	· Leaf-on aerials to determine planting areas for optimum canopy growth
	· Partnership planting programs
	· Otonabee Regional Conservation Authority (ORCA)
	· TreesCanada
	· Inventory gap filing program
	· Expanding the wood utilization program from ash trees to other lumber
	· Implement “no net loss of canopy” from UFSP
Future Strategies	· Fertilization program for young trees
	· Greater public education on tree value
	· Setting an inspection schedule
	· Update the species approval list
	· Remove and replant trees which are not the best choices for urban forestry

Strategy Type	Current Practice
	· Change pruning schedule to be more proactive
	· Cost of removals billed to the organization whom removed the tree (Utilities etc.)
	· Planting locations identified through models
	· Succession planning for planting and removals
	· Donor program for memorials
	· Climate change planning
	· Update the forestry job descriptions
	· Update the urban forest bylaw 1982-82
	· Develop a heritage tree program
	· License the arborists

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Urban Forest services subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better updating arborist training, linking asset management plan to other Urban Forest studies, master plans, and strategies, public relations and education around tree treatments, routine inspections of trees, etc.

Current funding levels are sufficient to address non-infrastructure solution needs over the 10-year forecast.

Refer to Table 8: Urban Forest – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Maintenance Plan

Maintenance includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include tree pruning, watering of young trees, mulching and weeding, pest control, etc.

Refer to Table 8: Urban Forest – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Currently, trends in maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Forecasted renewal costs are projected to increase to achieve the 35% urban forest canopy cover target by 2041 and the healthy tree replacement strategy of 2 caliper trees for every healthy tree on private property removed. The 3-year historical capital budget indicates that current funding levels for existing assets are insufficient to address short-term renewal needs, with tree replacement activities reduced to 1 caliper tree for every healthy tree removed. Additional assets acquired due to growth/service improvements will also impact renewal funding needs in the long-term. This shortfall may result in less tree planting opportunities resulting in longer time period to achieve target tree canopy cover. Where deferred renewal takes place, the City is committed to ensuring that risks are minimized where possible.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the operating and capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include new subdivision boulevard trees, street trees, new park tree planting, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily growth related, new construction costs and other capacity improvement costs. For new subdivisions, tree planting and associated costs are the responsibility of the developer until the development has been assumed by the City. The City will need to commit increased funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond).

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below for each asset category. Costs shown are the costs needed to minimize lifecycle costs associated with delivering proposed LOS. Shortfalls between lifecycle activity costing and investment levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Urban Forest Total Lifecycle Activity Costs and Projected funding – Proposed Levels of Service

Urban Forest Services	Forecast Year ($M)										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Urban Forest Services	$1.5	$1.6	$1.6	$1.7	$1.7	$1.8	$1.8	$1.9	$2.0	$2.0	$1.8
Total Proposed Funding	$1.5	$1.6	$1.6	$1.7	$1.7	$1.8	$1.8	$1.9	$2.0	$2.0	$1.8
Lifecycle Costs											
Urban Forest Services	$1.6	$1.6	$1.6	$1.6	$1.6	$1.7	$1.7	$1.8	$1.8	$1.9	$1.7
Total Lifecycle Costs	$1.6	$1.6	$1.6	$1.6	$1.6	$1.7	$1.7	$1.8	$1.8	$1.9	$1.7
Funding Shortfall	**-$0.1**	**$0.0**	**$0.1**	**$0.1**	**$0.1**	**$0.1**	**$0.1**	**$0.1**	**$0.1**	**$0.1**	**$0.1**

Based on the lifecycle assessment of the Urban Forest service area, it is estimated that the City would need to spend an average of $1.7 million per year to deliver LOS. The average annual funding is an estimated $1.8 million. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital investment for similar lifecycle activities and used as a proxy for the forecast.

The average annual funding is sufficient to deliver levels of service for the Urban Forest service area over the 10-year forecast. However, it is expected that costs for tree replacement, maintenance of new trees and additional equipment to maintain the urban forest will increase in the long term, and current levels of funding will not be sufficient deliver levels of service. Risk management strategies related to managing the shortfall are discussed in Section 3.3 of this attachment.

Assuming current levels of funding remain consistent, without intervention, the City will likely experience gradually declining service levels and increased risk exposure over the long-term that will need to be managed. As new trees are planted, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures. Over time, insufficient funding to complete renewal activities will likely lead to accelerated deterioration of assets resulting in increasing treatment costs to ensure assets are maintained in a state of good repair. The City will need to consider opportunities to manage the shortfall and assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Urban Forestry Services are**:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The current level of funding is sufficient to deliver lifecycle activities over the short term (10-yr forecast) forecast and service levels/performance will likely be maintained.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds, external grant opportunities to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects such as grouping multiple renewal/replacement projects together.

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of the urban forest and equipment assets.

The Urban Forest service area has many concerns about the cost to maintain the current urban forest. Currently there is a single team of arborist responsible for service calls and to complete maintenance activities as deemed necessary. This has left the program in a position of only reactive work.

Trees do not follow the standard degradation curves of other non-living assets and generally remain healthy for most of their natural life then rapidly decline. A major consideration for the urban forest team is planning for tree replacement using succession planning. This means that sometimes a healthy tree should be removed early so that the replacement of trees in subdivisions creates an urban forest of different ages, and species of trees. This creates a healthy natural environment which is more resistant to pests and disease. This concept may seem to be against best practices in other areas of infrastructure asset management which would seek to extend the life of an asset rather than actively remove good assets.

The urban forest strategic plan set out to have a goal of 30% canopy cover for the city overall. However, city development and tree removals (for safety reasons) have led to a reduction in canopy cover. The urban forest strategic plan recommends that the City apply a replacement ratio of 3 to 1 for all healthy trees that are removed. Currently this replacement ratio has been closer to 1 to 1. Young trees do not have the same canopy for up to 25 years as healthy mature trees and the rate of death of a tree is higher while the tree is young. The City recently implemented bylaws to improve the overall canopy on private property.

Attachment #10: Social Services – Childcare Service Area

Infrastructure Value	$1.2M	
Overall Condition	5.0	Very Good
High Risk Asset Value	$0.3M	24%
Trend		

1.0 Summary of Childcare Services Facilities

The Peterborough Daycare Centre facility is a 4,390 square foot facility originally constructed in 1972 and acquired by the City in 1989. The City directly owns and operates the Peterborough Daycare Centre which offers full day care for up to 49 children between the ages of eighteen months to six years old at this location. Although not owned facilities, the City also operates an additional full day childcare program for children (between 18 months and 6 years old) and two school age programs (JK through to grade 6) at three other leased locations. Condition rating trends remain neutral since the last reported Plan with an overall condition rating of Very Good.

Table 1 details the City's inventory for Daycare facilities.

1.1 Inventory Details

Table 1: Peterborough Daycare

Asset Class & Sub-class	2023 Quantity	Unit of Measure
Daycare Facility		
Peterborough Daycare Centre, 127 Aylmer St. S	4,390	Sq. Ft

1.2 Replacement Costs

The estimated year end 2023 replacement costs for Peterborough Daycare Centre totalled $1.2 million. Replacement costs have been determined using the elemental replacement costs as reported in the most recent building condition assessment (BCA) completed in 2019 and inflated to 2023 dollars.

Figure 1: Peterborough Daycare Centre – Replacement Cost by Element

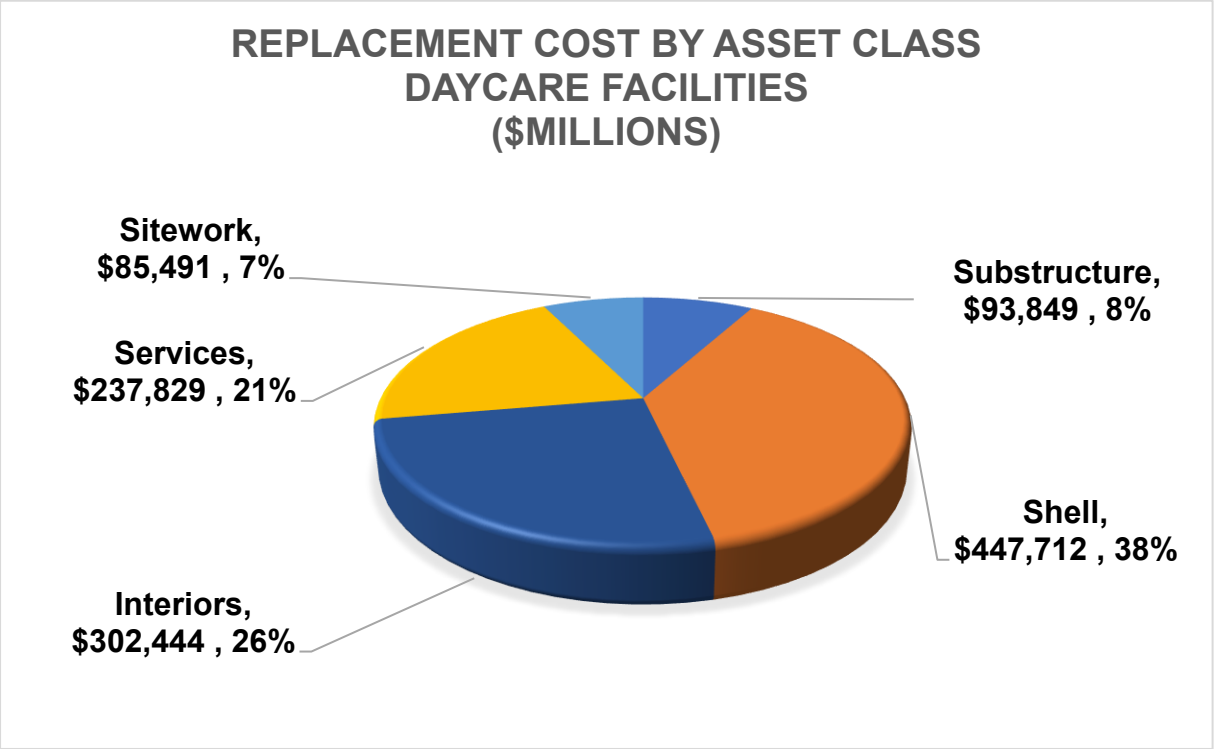

Table 2: Peterborough Daycare Centre - Replacement Costs by Building Element Classification

Building Element Classification	2023 Replacement Cost
A - Substructure	$93,849
B - Shell	$447,712
C - Interiors	$302,444
D - Services	$237,829
G - Sitework	$85,491
Daycare Centre Total	**$1,167,325**

1.3 Asset Condition and Remaining Useful Life

The overall condition rating for the Peterborough Daycare Centre is currently rated very good. Condition ratings are based on the most recent building condition assessment

information available (2021). The City plans to complete BCA's on a five year cycle with the next round of assessments anticipated to be completed in 2026.
Based on replacement cost, 64% or $0.8 million are rated very good, 19% or $0.2 million rated good and 17% or $0.2 million rated fair. Figure 2 and Table 3 provide condition details of the Daycare building.

The current layout of the Peterborough Daycare Centre has presented challenges for staff to carry out day-to-day program activities. Since original construction, the facility has not had significant upgrades and/or renovations completed to accommodate evolving childcare program needs. Future plans for the facility and childcare programs offered are currently being reviewed by City staff.

Figure 2: Peterborough Daycare Centre - Distributed Condition and Replacement Cost

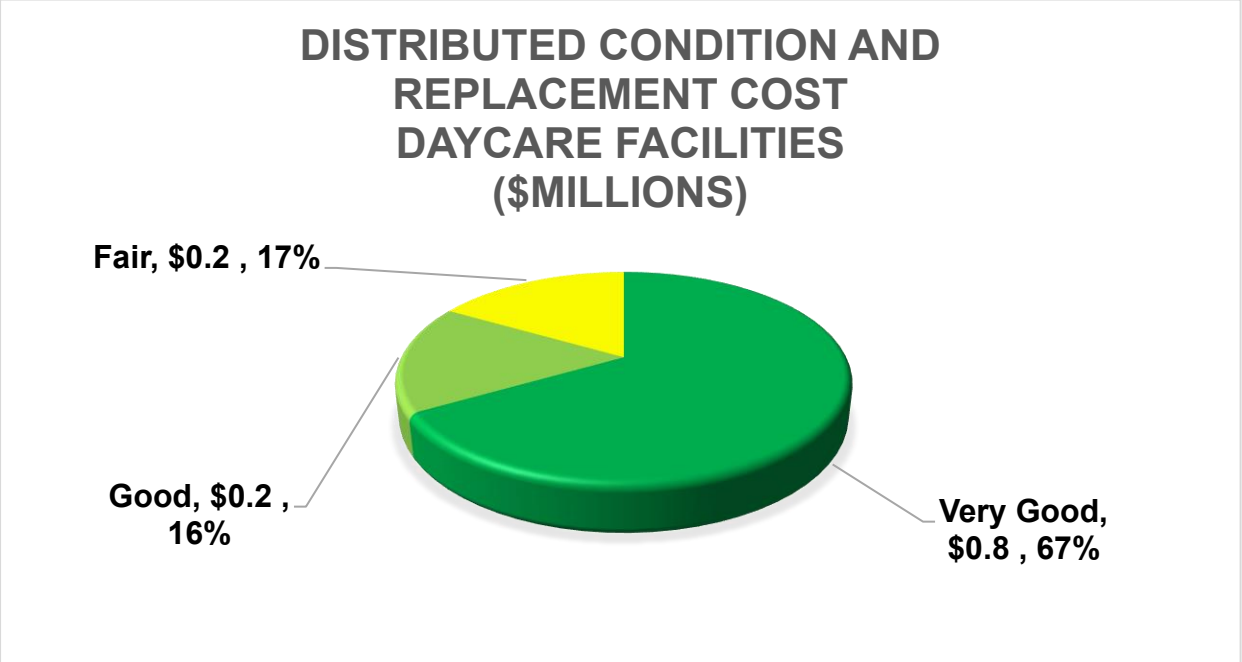

Table 3: Peterborough Daycare Centre - Asset Condition Ratings

Building Element Classification	2023 Overall Condition Rating
A - Substructure	Good
B - Shell	Good
C - Interiors	Very Good
D - Services	Very Good
G - Sitework	Very Good
Daycare Overall Condition Rating	**Very Good**

Remaining Useful Life
The following summarizes the Daycare building element average useful life and average remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are primarily based on the observed

age (where condition assessments have been completed) and take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age will be used in calculating remaining useful life. The ages of the assets are variable and with efforts to extend the life by application of lifecycle treatments, there isn't necessarily a linear relationship between age and condition.

Table 4 shows the Daycare facility average remaining useful life details by building element.

Table 4: Peterborough Daycare Remaining Useful Life[1]

Asset Inventory	Ave. Expected Useful Life (Yrs.)	Ave. Remaining Useful Life (Yrs.)	Percent of Useful Life Remaining
Daycare Facility – Building			
Peterborough Daycare Centre, 127 Aylmer St. S	43	23	53%
Peterborough Daycare Centre Average Remaining Useful Life	**43**	**23**	**53%**

1.4 Asset Risk Assessment

The consequences of failure for Daycare facility assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of the Daycare facility high risk assets is $0.3 million.

[1] Uses average of asset classes (building elements)

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration Ontario's vision for the early years and childcare in which the City of Peterborough is aligning itself with, as well as the City's standards in facility maintenance.

The City of Peterborough follows the guiding principles as those outlined in the EarlyON Child and Family Centre programs. They are intended to guide the development, delivery and evaluation of EarlyON Child and Family Centre programs.

Stakeholder and technical levels of service, performance measures and current targets for the Daycare service area are outlined in Table 5 below.

Table 5: Levels of Service – Daycare

Asset Class: Daycare Facility								
Service Objective Statement: The City will strive to provide families access to high quality and accessible childcare and early learning that fosters success for every child.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality Daycare Facilities that meet the needs of the community	Daycare Facilities are maintained in a state of good repair	The City of Peterborough directly owns and operates: Full day childcare program for children 18 months to 6 years old at Peterborough Childcare Centre	The City of Peterborough directly owns and operates: Full day childcare program for children 18 months to 6 years old at Peterborough Childcare Centre	Condition of Daycare Facility	Minimum facility condition rating of 'Fair'	Very Good	Very Good
			The City of Peterborough directly operates: Full day childcare program for children 18 months to 6 years at Pearson Child Care Centre and school age programs at Edmison Heights	The City of Peterborough directly operates: Full day childcare program for children 18 months to 6 years at Pearson Child Care Centre and school age	Average Facility Condition Index (FCI) value for all facilities	Minimum Fair (5% - 10%)	Fair (8%)	Fair (8%)

Asset Class: Daycare Facility								
Service Objective Statement: The City will strive to provide families access to high quality and accessible childcare and early learning that fosters success for every child.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
			Elementary and Westmount Elementary for kids JK through to Grade 6	programs at Edmison Heights Elementary and Westmount Elementary for kids JK through to Grade 6				
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities meet our environmental objective	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Annual energy consumption per Sq.m	Energy Use Intensity (EUI) of 0.71 GJ/m2 or less	0.97 GJ/m2	0.97 GJ/m2

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Daycare Facility Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the short term (10-year forecast) to deliver lifecycle management activities with no significant impacts to tax rates/user fees.
- LOS are achievable over the short term (10-year forecast)
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and expected performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to facility funding levels will occur, it is expected that Stakeholder LOS for Reliability/Quality will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Daycare				
Reliability/Quality	Providing reliable and high-quality Daycare Facilities that meet the needs of the community	Daycare Facilities are maintained in a state of good repair	The City of Peterborough directly owns and operates: Full day childcare program for children 18 months to 6 years old at Peterborough Child Care Centre The City of Peterborough directly operates: Full day child care program for children 18 months to 6 years at Pearson Child Care Centre and school age programs at Edmison Heights Elementary and Westmount Elementary for kids JK through to Grade 6	Same level of service expected

Table 7 below outlines the Daycare Service Area Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The level of funding uses projected expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Daycare Services				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Providing reliable and high-quality Daycare Facilities that meet the needs of the community	Child Care services and facilities are appropriate, and facilities are maintained in a state of good repair Child Care program needs are assessed and maintained by social services staff. Facility condition assessments are completed on a 5-year cycle and are funded from the facility management capital budget	Likely to decline over the 10-yr planning period
		Level of Funding:	Annual Average: $0	Annual Average: $0

Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	Child Care O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to decline over the 10-yr planning period
		Level of Funding:	Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Minimum Facility Condition Index (FCI) of 5% (Fair) or better	Very Good	Facility conditions are expected to be maintained over 10-year forecast at current level of investment.
		Level of Funding:	Annual Average: $68K	Annual Average: $68K
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No disposals planned for the 10-yr period	No disposals planned for the 10-yr period
		Level of Funding:	Annual Average: $0	Annual Average: $0

Growth/Service Improvements	Capacity/ service improvements Support development and growth	Currently not measured in Technical LOS	No growth/service improvements planned for the 10-yr period	No growth/service improvements planned for the 10-yr period
		Level of Funding:	Annual Average: $0	Annual Average: $0

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Peterborough Daycare Centre

The Peterborough Daycare assets include the facility and all associated building elements. The following table describes the current strategies and activities for the Peterborough Daycare Centre to maintain the current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Daycare Facility – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Detailed Building Condition Assessments (BCA's) completed on an 8 to 10-year cycle
	· Linking the asset management plan to other studies, master plans and strategies
	· Public consultation on levels of service
	· Conduct regular energy audits of facilities to identify opportunities for improved efficiency
	· Align facility expansion planning with population growth forecasting/growth studies and needs studies
	· On a case-by-case basis the City will explore options including alternatives to building new assets, for any major developments being considered
	· Leverage incentive programs offered through utilities that are for low carbon emissions or energy efficiency projects
	· Educate staff on climate change initiatives and energy efficiency opportunities with respect to building operations/ownership
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	· Preventative and corrective maintenance programs for facilities
	· Consider sustainability and environmental opportunities in operating and maintenance decisions

Strategy Type	Current Practice
	· Service contracts for regulatory building elements requiring annual inspection/certification (ESA, TSSA, Fire suppression, etc.)
	· Asbestos management program for current condition and all abatement requirements as needed
	· Seasonal maintenance contracts such as snow clearing and cleaning
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	· Building element renewal/rehabilitation needs are reviewed at on a case-by-case basis to determine the best option
	· Activities are coordinated with other building lifecycle activities to minimize costs
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· Facility components replaced when at end of useful life through capital planning/business case
	· Replace large assets based on condition or efficiency
	· Context of replacement is specific to the facility, i.e. Assets that are replaced should not have a longer useful life than the useful life of the facility. Facilities are continually maintained and assets inside are perpetually replaced
	· Updates to building codes drive programs for replacement needs
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Facilities that are no longer needed for the intended service are either sold, re-purposed or demolished
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· Demand for childcare services increases over time leading to the need for expansion/addition to existing facility when feasible (adding infant rooms, growth needs, etc)
	· Building code changes often drive expansion programs to meet new codes
	· Retrofitting buildings to automated systems to optimize asset functionality/operations where feasible

Strategy Type	Current Practice
	· Implementation of interior and exterior LED lighting retrofit program
	· Upgrade insulation/building envelope while conducting other essential building work (where feasible)
	· Update building elements according to new building codes when asset needs renewals
	· Planning strategies are based on manufacturer and/or industry standards for recommended renewal/rehabilitation activities and timelines to extend life of building element in order to avoid premature replacement costs
	· Replace windows and doors with high efficiency according to replacement schedule/need
	· Replace mechanical equipment with high efficiency according to replacement schedule/need
	· Changes to accessibility requirements for public buildings drive expansion needs, use grants/incentives where possible
Future Strategies	· On a case-by-case basis, seek new partnership opportunity to relocate and/or increase childcare locations (i.e. partner with schoolboards to lease/rent space in existing or new build schools to open a new childcare location.

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the facility management subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, conducting energy audits and building condition assessment, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 8: Peterborough Daycare – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include preventative maintenance programs for facilities, service contracts for regulatory building elements requiring annual inspection/certification (ESA, TSSA, fire suppression, etc.), asbestos management programs and all abatement requirements as needed, seasonal maintenance contracts such as snow clearing and cleaning

Refer to Table 8: Peterborough Daycare – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are considered adequate to meet projected service levels. Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Forecasted renewal needs are considered adequate to meet projected service levels. Facility renewal needs are identified through the building condition assessment and included in the 10-year capital plan for approvals each year. The Peterborough Daycare facility assets are maintained in a state of good repair and will achieve targets over the short- and long-term forecast.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible

decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include facility expansions, relocations to a larger facility to address capacity deficiencies, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Daycare Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Daycare Facility Services	Forecast Year ($M)										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Daycare Facility Services	$0.0	$0.0	$0.2	$0.0	$0.0	$0.5	$0.0	$0.0	$0.0	$0.0	$0.1
Total Proposed Funding	$0.0	$0.0	$0.2	$0.0	$0.0	$0.5	$0.0	$0.0	$0.0	$0.0	$0.1
Lifecycle Costs											
Daycare Facility Services	$0.0	$0.0	$0.2	$0.0	$0.0	$0.5	$0.0	$0.0	$0.0	$0.0	$0.1
Total Lifecycle Costs	$0.0	$0.0	$0.2	$0.0	$0.0	$0.5	$0.0	$0.0	$0.0	$0.0	$0.1
Funding Shortfall	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**

Based on the lifecycle assessment of the Daycare service area, it is estimated that the City would need to spend an average of $0.1 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $0.1 million, with no financial shortfall.

Assuming current levels of funding remain consistent, daycare facility assets are expected to be maintained in a state of good repair and achieve proposed levels of service with minimal risk exposure.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver services related to Daycare Facilities are:**

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety – assets not adequate/available for emergency response
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The current level of funding is sufficient to deliver lifecycle activities over the short term (10-yr forecast) forecast and service levels/performance will likely be maintained. As assets age, it is expected that additional funding will be required to keep assets in a state of good repair (replacement and refurbishment activities). Operation and preventative maintenance investments will also increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds, external grant opportunities to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects such as grouping multiple renewal/replacement projects together.

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of facility assets.

Risks relating to asset failure are mitigated though condition assessment programs, maintenance programs (legislated and best practices) and scheduled renewal programs which ensure assets are in acceptable condition and are available to achieve the determined levels of services.

All City services, including childcare services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining daycare facility assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur,

development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

Attachment #11: Arts, Culture & Heritage Service Area

Infrastructure Value	$65M	
Overall Condition	4.0	Good
High Risk Asset Value	$3.2M	5%
Trend		

1.0 Summary of Arts, Culture & Heritage

Asset classes that fall under the Arts, Culture & Heritage (ACH) service area include the museum and City archives, libraries and collections, the art gallery, public art and the market hall and tower. Condition rating trends remain neutral since the previous Plan with an overall condition rating of good.

Table 1 details the City's inventory for the ACH and related assets service area.

1.1 Inventory Details

Table 1: Arts, Culture & Heritage Service Area Inventory

Asset Inventory	2023 Quantity	Unit of Measure
Museum		
Peterborough Museum and Archives	929	Sq.m
Museum Curatorial Centre	836	Sq.m
Libraries		
Main Library	5,342	Sq.m
Library Equipment	Pooled	Pooled
Library Collections	361,131	Each
Art Gallery		
Art Gallery and Storage Facility	1,193	Sq.m
Public Art		
Public Art Collections	29	Each
Heritage		
Market Hall/Clock Tower	1,068	Sq.m

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the Arts, Culture & Heritage service area totalled $64.6 million. Replacement costs were determined using different valuation methods such as condition assessments, risk insurance appraisals, or historical costs inflated to 2023 where recent assessments or costing information was not available.

Figure 1: Arts, Culture & Heritage Service Area –Replacement Cost by Asset Class

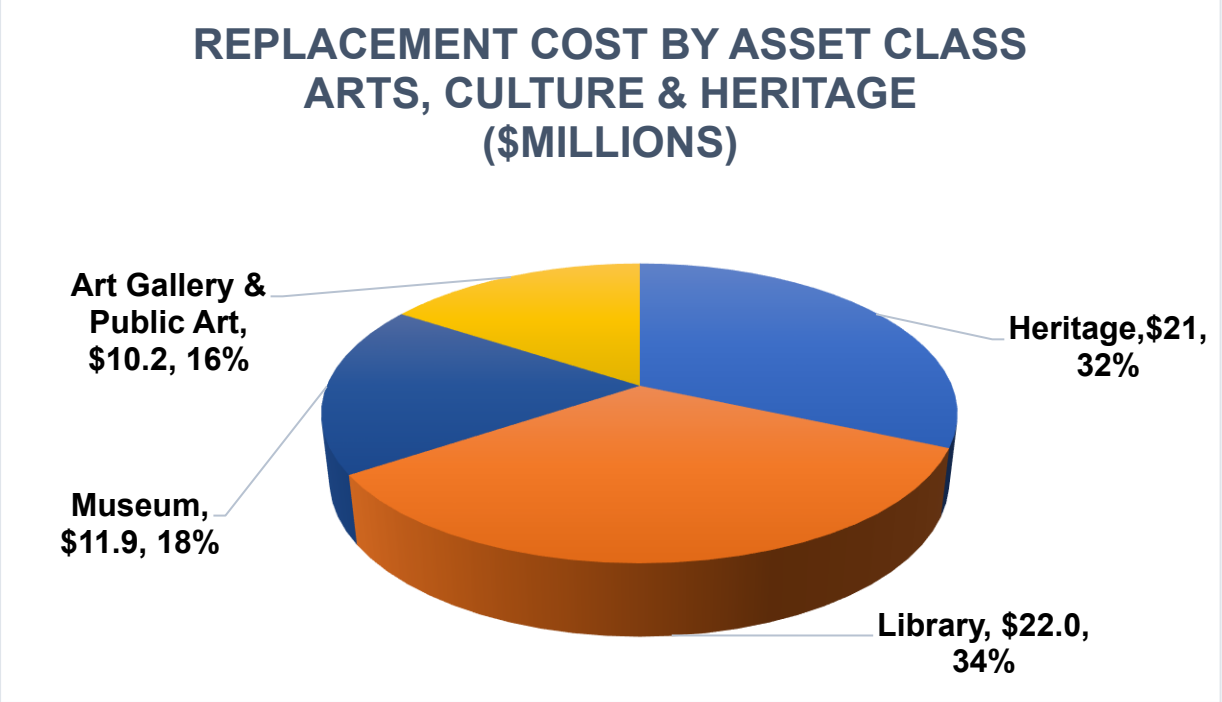

Table 2: Arts, Culture & Heritage - Replacement Costs by Asset

Asset Inventory	2023 Replacement Cost
Museum	
Peterborough Museum and Archives & Memorial Pavilion	$7,112,670
Museum Curatorial Centre	$4,618,699
Ashburnham Memorial Park Lookout Structure[1]	$173,386
Libraries	
Main Library	$17,240591
Library Equipment	$613,642
Library Collections	$4,178,984
Art Gallery	
Art Gallery and Storage Facility	$4,806,815
Public Art	
Public Art Collections	$5,361,300

[1] Lookout Structure is located within Ashburnham Park but accounted for under the Museum portfolio

Asset Inventory	2023 Replacement Cost
Heritage	
Market Hall/Clock Tower[2]	$20,299,665
Arts, Culture & Heritage Total	**$64,405,756**

1.3 Asset Condition and Remaining Useful Life

The ACH service area is currently rated in overall good condition. Condition ratings for facilities are based on the most recent building condition assessments (BCA's) completed in 2021-2022 with updates anticipated in 2028. Age based ratings have been used where assessments are not available. Based on replacement cost, 29% or $18.6 million are rated very good, 32% or $20.4 million rated good, 31% or $20.1 million rated fair and 9% or $5.5 million rated poor and very poor. Figure 2 and Table 3 provide condition details of ACH assets.

[2] Partially city owned. Replacement cost of the full facility is shown until further analysis is carried out to determine the City's share in terms of replacement cost.

Figure 2: Art, Culture & Heritage - Distributed Condition and Replacement Cost

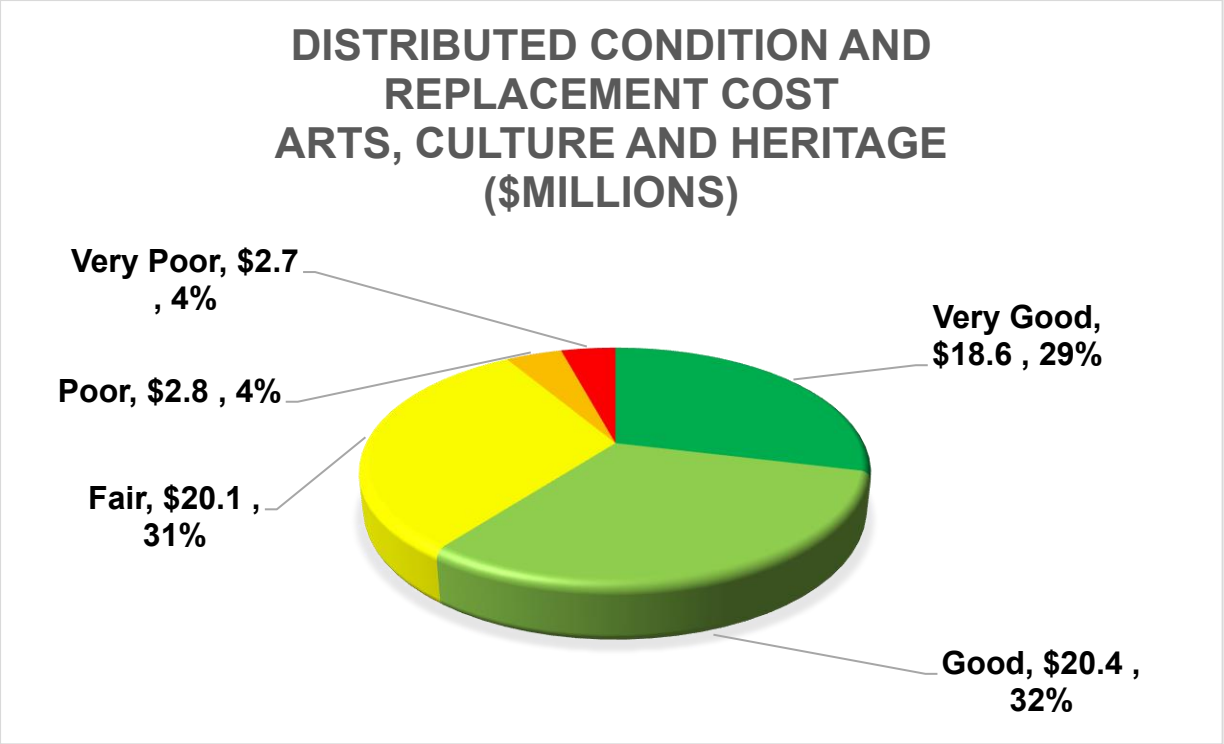

Table 3: Arts, Culture & Heritage - Asset Condition Ratings

Asset Inventory	2023 Condition Rating
Museum	
Peterborough Museum and Archives & Curatorial Centre	Good
Libraries	
Main Library, Equipment & Collections	Good
Art Gallery	
Art Gallery, Storage Facility & Public Art	Good
Heritage	
Market Hall/Clock Tower	Fair
Overall ACH Condition[3]	**Good**

Museum and Archives

The recent $3.3 million Museum renewal project consisting of three phases was completed in 2017. Renewal and construction activities included renovations to 3,000 square feet of the existing facility along with exterior improvements, the construction of an additional 9,000 square foot dedicated storage building, new HVAC systems, the purchase and installation of custom collection storage systems, exterior insulation, siding and windows.

[3] Weighted by replacement value

Library Main Branch

Recent renovations in 2018 to the Main Branch included include slab repairs, hazardous materials abatement, HVAC replacements, roofing replacement and internal reorganization, a new entrance, two new elevators, improved accessibility both inside and outside, and cold weather heated walkways. Expansion and renovations improved core library services and result in a net gain of 9,000 square feet of public space.

Art Gallery of Peterborough

In 2011 a functional analysis of the Art Gallery[4] was completed, followed by a feasibility study in 2014[5] and an update to the feasibility study in 2019. Identified needs include the expansion of the existing facility to better meet the demands of the community and current standards for public institution. Although currently rated in good condition, renovations and expansion is being planned over the next 5 years with design development anticipated to start in 2024-2025.

Public Art Collections

The Public Art Collection is one branch of the civic collection, representative of significant public artworks/projects, funded in whole or in part by the City, that have been undergone the City's public art selection process, as defined in the public art policy and related procedures. The collection includes original works of art, in any media that have been planned and executed with the specific intention of being installed or presented in a public space, accessible to all citizens either temporarily or permanently. The City is responsible for maintaining the Public Art Collection to reasonable and safe standards. A Public Art Collection Management Plan provides a coherent program of maintenance, conservation and preservation, and a management strategy that details the location, condition, and maintenance requirements/procedures of each work. Permanent artworks are made of durable materials and have been fabricated and acquired by the City with the intention that they be maintained and preserved over the long-term or in perpetuity. Temporary or transient works are intended to activate a space and engage the public over a short period of time; it is understood that these pieces have a shorter lifespan and long-term conservation efforts are not applicable. These Artworks are maintained as part of the Public Art Collection for the timeframe identified at the time of acquisition and/or for agreed upon increments thereafter.

Market Hall and Clock Tower

The Market Hall and Clock tower, a designated heritage building, is a small to mid-size, multi-functional space that hosts a variety of performing arts, fundraising events, and educational programmes. The facility underwent interior LED lighting upgrades and exterior façade repairs in 2018. The facility is partially owned by the City, which includes the clock tower, the second floor of the market hall and the east, south and west facades of the exterior. The recent upgrades to the interior lighting and exterior faces improved the overall condition to fair.

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[4] Lundholm Associates in association with Ginder Consulting and Lett Architects Inc., Art Gallery of Peterborough Functional Analysis Plan, City of Peterborough (2011).

[5] Lundholm Associates in association with Lett Architects Inc., Feasibility Plan, Art Gallery of Peterborough Feasibility Study, City of Peterborough (2014).

Remaining Useful Life

The following summarizes the ACH service area remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the calculated age or observed age (where condition assessments have been completed) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age will be used in calculating remaining useful life. The ages of the assets are variable and with efforts to extend the life by application of lifecycle treatments, there isn't necessarily a linear relationship between age and condition.

Table 4 shows the Arts, Culture & Heritage service area remaining useful life details.

Table 4: Arts, Culture & Heritage Remaining Useful Life[6]

Asset Inventory	Ave. Expected Useful Life (Yrs.)	Ave. Remaining Useful Life (Yrs.)	Percent of Useful Life Remaining
Museum			
Peterborough Museum and Archives & Curatorial Centre	35	19	54%
Libraries			
Main Library, Equipment & Collections	13	1	6%
Art Gallery			
Art Gallery, Storage Facility & Public Art	40	0	0%
Heritage			
Market Hall/Clock Tower	26	0	0%
ACH Remaining Useful Life	**27**	**3**	**11%**

1.4 Asset Risk Assessment

Currently, the consequences of failure for facilities have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The risk evaluation considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence. Building elements considered high risk are those that pose a high consequence of failure and typically are associated with the safety, health, and well being of the facility users/tenants. These elements include (but are not limited to): building structure, shell, fire and life safety systems, heat generating systems and elevating devices.

[6] ESL, RUL, and percent of useful life remaining are based on calculated average of asset classes

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Arts, Culture & Heritage high risk assets is $3.2 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the 2016 Vision 2025, A 10-Year Strategic Plan for Recreation[7], Parks, Arenas and Culture and the 2012 Municipal Cultural Plan.

Stakeholder and technical levels of service, performance measures and current targets for the ACH assets service area are outlined in Table 5 below.

[7] The RETHINK GROUP in association with C.Talbot & Assoc. Vision 2025, A 10-Year Strategic Plan for Recreation, Parks, Arenas and Culture, City of Peterborough (2016)

Table 5: Levels of Service – Arts, Culture & Heritage

Asset Class: ACH - Art Gallery of Peterborough								
Service Objective Statement: Strives to present a variety of visual art experiences and explorations to stimulate and expand public perception of art as art of our life and community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope	Showcase Permanent Collections, curate and exhibit local artists, and engage the community through art	An available facility to facilitate programming, exhibitions and external engagement	Provision of an Art Gallery, 11,000 sq. ft of space	Provision of an Art Gallery, 11,000 sq. ft of space	Ratio of galleries to current population	1 facility:45,000 of pop	1 facility: 83,651 of pop.	1 facility: 83,651 of pop.
					Meet environmental and care standards necessary to preserve works long-term	Meet 'Category A' Collecting Institution designation by the Department of Canadian Heritage	Designated Category A Collecting Institution	Designated Category A Collecting Institution
Reliability/Quality	Providing a reliable and high-quality Art Gallery that meets the needs of the community	Art Gallery is maintained in a state of good repair	Facility is proactively maintained and reliable for intended use	Facility is proactively maintained and reliable for intended use	Maintain facility condition rating	Minimum facility condition rating of 'Fair'	Fair	Fair
					Average Facility Condition Index (FCI) value for all facilities	Minimum Fair (5% - 10%)	10% (Fair)	10% (Fair)

Asset Class: ACH - Art Gallery of Peterborough								
Service Objective Statement: Strives to present a variety of visual art experiences and explorations to stimulate and expand public perception of art as art of our life and community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities meet our environmental objective	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Annual energy consumption per Sq.m	Energy Use Intensity (EUI) of 0.41 GJ/m2 or less	1.34 GJ/m2	1.34 GJ/m2

Asset Class: ACH - Libraries								
Service Objective Statement: The Library will inspire our community to become more literate and engaged. We are an agent for positive community transformation through interaction, discovery and learning.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope	Access to sufficient and suitably located branch libraries.	Maintain an adequate level of library space and service	Provision of 2 library branches: Main and DelaFosse, opening of a self-serve Library Kiosk at the Peterborough Sport & Wellness Centre (PSWC)	Provision of 1 library branch (Main) with a new construction planned to open in fall of 2024 (replacing DelaFosse). There are now 3 x self-serve kiosks in the City - one each of the following: PSWC, PRHC and Trent.	Ratio of library space to current population	0.8-1.25 gross sq. ft/capita	Main Branch - 28,792 sq.ft Kiosk - 20 sq.ft each x 3 = 60 sq.ft (0.3 gross sq.ft/capita)	Main Branch - 28,792 sq.ft Kiosk - 20 sq.ft each x 3 = 60 sq.ft (0.3 gross sq.ft/capita)

Asset Class: ACH - Libraries								
Service Objective Statement: The Library will inspire our community to become more literate and engaged. We are an agent for positive community transformation through interaction, discovery and learning.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality Libraries that meet the needs of the community	Libraries are maintained in a state of good repair	n/a – not reported	Facilities are proactively maintained and reliable for intended use	Maintain facility condition rating	Minimum facility condition rating of 'Fair'	Good	Good
					Average Facility Condition Index (FCI) value for all facilities	Minimum Fair (5% - 10%)	1% (Good)	1% (Good)
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities meet our environmental objective	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Annual energy consumption per Sq.m	Energy Use Intensity (EUI) of 1.03 GJ/m2 or less	0.97 GJ/m2	0.97 GJ/m2

Asset Class: ACH – Museum and Archives								
Service Objective Statement: The City strives to provide adequate, safe, welcoming and accessible environments serving the entire community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Scope	Access to sufficient and suitably located museum and archives	Maintain an adequate level of museum and archives space	Provision of one Community Museum & Archives location	Provision of one Community Museum & Archives location	Ratio of museum facilities to current population	1 facility: community	1 facility: 85,000 pop.	1 facility: 83,651 pop.
Reliability/Quality	Providing reliable and high-quality Museum and Archives Facility that meets the needs of the community	Museum and Archives Facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Facilities are proactively maintained and reliable for intended use	Maintain facility condition rating	Minimum facility condition rating of 'Fair'	Museum – Good	Museum – Good
					Average Facility Condition Index (FCI) value for all facilities	Minimum Fair (5% - 10%)	Museum - Good (3%)	Museum - Good (3%)
					Number of facilities with FCI or 10% or better	2 Facilities	Museum - 4/4 facilities	Museum - 4/4 facilities

Asset Class: ACH – Museum and Archives								
Service Objective Statement: The City strives to provide adequate, safe, welcoming and accessible environments serving the entire community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities meet our environmental objective	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Annual energy consumption per Sq.m	Energy Use Intensity (EUI) of 0.41 GJ/m2 or less	0.83 GJ/m2	0.83 GJ/m2

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Arts, Culture and Heritage Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, legislative requirements, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as the level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the 10-year forecast and are sufficient to deliver lifecycle management activities for library, museum and arts services. The current level of investment for maintaining the Market Hall facility is not sufficient for required renewal activities.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Arts, Culture and Heritage services funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – ACH Services				
Scope	Showcase Permanent Collections, curate and exhibit local artists, and engage the community through art	Available facility to facilitate programming, exhibitions and external engagement	Provision of an Art Gallery, 11,000 sq. ft of space	Plans include Art Gallery expansion within short term (pending budget approvals) Same level of service is expected until approved.
	Access to sufficient and suitably located branch libraries.	Maintain an adequate level of library space and service	Provision of 1 library branch (Main) with a new construction planned to open in fall of 2024 (replacing DelaFosse). There are now 3 x self-serve kiosks in the City - each one of the following: PSWC, PRHC and Trent.	Same level of service is expected
	Access to sufficient and suitably located museum and archives	Maintain an adequate level of museum and archives space	Provision of one Community Museum & Archives	Same level of service is expected
Reliability/Quality	Providing reliable and high-quality Libraries, Art Galleries, and Museum & Archives that meet the needs of the community	Facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Same level of service expected

Table 7 below outlines the Arts, Culture & Heritage Services Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used except for renewal needs (sourced from lifecycle modelling as described in Section 3.1). For all other lifecycle activities, a 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Arts & Culture				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Complete service area studies and plans on a regular basis	Studies are being completed, i.e. Municipal Cultural Plan, Neighbourhood Study, Downtown Heritage Conservation District Plan, AGP Strategic Plan, Museum Strategic Plan	Frequency of Studies likely to remain the same.
		Level of Funding:	Historical 3-yr Annual Average: $321K	Annual Average: $304K

Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Maintain facility condition rating of 'Fair'	Peterborough Art Gallery = Fair Libraries = Good Museum and Archives = Good	Facility conditions are expected to remain the same over the 10-yr planning period. However, conditions are expected to decline over the long-term (10- 25 yr outlook) as assets age and maintenance costs increase.
		Level of Funding:	Historical 3-yr Annual Average: $1.7M	Annual Average: $1.1M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No disposals planned for the 10-yr period	No disposals planned for the 10-yr period
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0

Growth/Service Improvements	Capacity/ service improvements Support development and growth	Ratio of Art Gallery, Museum and Archives and Library Facilities to current population	Ratio of facility to population not meeting targets. (New library at Miskin Law Community Centre will be included in future iterations of the AMP)	Population is expected to increase over long term. The Peterborough Art Gallery capital forecast includes expansion activities in the 10-year planning period to meet growth/service delivery demands
		Level of Funding:	Historical 3-yr Annual Average: $33K	Annual Average: $1.9M

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Arts, Culture & Heritage

The following table describes the current strategies and activities for the ACH service area to maintain the current levels of service, while minimizing risk at the lowest lifecycle costs. Options for which lifecycle activities that could potentially be undertaken have been explored in various needs studies and reports such as the Art Gallery of Peterborough Strategic Plan (2016) and Feasibility Study (2014), the Library Strategic Plan (2018) and the Vision 2025, A Ten-Year Strategic Plan for Recreation, Parks, Arenas and Culture (2016). The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Arts, Culture & Heritage– Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Building condition assessment program
	· Needs studies to assess community needs and how services are being delivered to the community
	· Linking the asset management plan to other studies, master plans and strategies

Strategy Type	Current Practice
	· Integrating infrastructure and land use planning
	· Public consultation on levels of service
	· Leverage incentive programs offered through utilities that are for low carbon emissions or energy efficiency projects
	· Educate staff on climate change initiatives and energy efficiency opportunities with respect to building operations/ownership
	· Partnership Policy to extend and enhance services is a sustainable way and coordinate and reduce overlap in efforts between agencies serving the same area.
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	· Service contracts for building life-safety and security alarm systems, elevating systems, and code/regulated building elements
	· Basic custodial services
	· General routine maintenance activities performed throughout the interior and exterior of each facility
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	· Renewal of facility elements or sub-systems such as structures, roofs, building exteriors, building services (HVAC, plumbing, electrical), interior finishes and sitework that are at the end of their useful life and renewal does not improve/expand the intended service initially provided
	· Upgrading projects focus on removing asset exposure to elements
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· Facility components replaced when at end of useful life through capital planning/business case
	· Replacement due to obsolescence or does not meet minimum design standards/intent
	· Replacements considered within the context of the facility
	· Combine projects to include the investigations, renewals and replacements

Strategy Type	Current Practice
	· Replace large assets based on condition or efficiency
	· Heritage facility replacements that are intended to preserve the heritage value of the property/facility – roof, exterior facades, windows, doors, trim/accents
	· Replacement of library collections are carried out according to the same selection criteria that apply to new materials
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Facilities that are no longer needed for the intended service are either sold, re-purposed or demolished
	· Library collection items that are damaged by patrons are repaired when possible or disposed of
	· For library collections, materials are withdrawn from the collection when: · No longer used by the community · Worn out, damaged or cannot be repaired · Outdated, unreliable or misleading · More current materials on a subject become available · Public demand no longer requires multiple copies · Space is required for new materials
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· When facility has reached its functional capacity and expansion is necessary for continued delivery of service
	· Changes to accessibility requirements for public buildings drive expansions. Grants are used, where possible to meet these requirements
	· Expansion of renewable energy programs and systems to reduce energy costs for operation
	· Update to new building codes when asset needs renewals
	· Ensure existing facility use is maximized before additional facilities are provided
Future Strategies	· Seek opportunities to co-locate ACH facilities with other compatible community facilities

Strategy Type	Current Practice
	· Seek opportunities to collaborate with others to provide arts, culture and heritage facilities; and associated programming and events.
	· Seek opportunities to increase the integration of services among major providers (school boards, Peterborough County, community groups, commercial sector, neighboring townships, etc.)
	· Align culture opportunities and services to the interests and perspectives of older adult community to meet future expected service level demands

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the ACH services subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated facility condition assessments, needs studies to assess community needs, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. Future studies, plans and needs assessments are required to better assess community needs and existing infrastructure.

Refer to Table 8: Arts, Culture & Heritage – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include preventative maintenance programs for facility HVAC, plumbing and electrical assets, landscape maintenance, snow clearing, etc.

Refer to Table 8: Arts, Culture & Heritage – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Current funding levels for existing assets are sufficient to address renewal needs over the 10-year planning period. Over the long-term forecast, it is expected that asset conditions will decline as they age and will likely require increased funding to sustain assets in a state of good repair. As assets are acquired, the City will plan to allocate sufficient funds for the future renewal needs over the life of the assets. Where deferred renewals/replacements take place, the City is committed to ensuring that risks are minimized where possible and stakeholders are aware of service alternatives.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Individual tangible assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include facility expansions, relocations to a larger facility to address capacity deficiencies, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily service demand increases due to growth. In 2011 a functional analysis of the Art Gallery was completed, followed by a feasibility study in 2014 and an update to the feasibility study in 2019. Identified needs include the expansion of the existing facility to better meet the demands of the community and current standards for public institution. The current levels of funding for ongoing lifecycle activities will likely need to increase in the long term to support the expansion of the Peterborough Art Gallery Facility and to deliver proposed levels of service.

The total costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

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Table 9: Arts, Culture & Heritage Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Arts, Culture & Heritage Services	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
ACH Services	$2.2	$2.2	$2.3	$2.4	$2.4	$2.5	$2.6	$2.7	$2.7	$2.8	$2.5
Total Proposed Funding	$2.2	$2.2	$2.3	$2.4	$2.4	$2.5	$2.6	$2.7	$2.7	$2.8	$2.5
Lifecycle Costs											
ACH Services	$2.7	$8.2	$14.5	$1.2	$1.4	$1.5	$1.0	$1.0	$1.0	$0.3	$3.3
Total Lifecycle Costs	$2.7	$8.2	$14.5	$1.2	$1.4	$1.5	$1.0	$1.0	$1.0	$0.3	$3.3
Funding Shortfall	**-$0.5**	**-$6.0**	**-$12.2**	**$1.2**	**$1.0**	**$1.1**	**$1.6**	**$1.7**	**$1.7**	**$2.6**	**-$0.8**

Based on the lifecycle assessment of the Arts, Culture & Heritage service area, it is estimated that the City would need to spend an average of $3.3 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $2.5 million, leaving an average shortfall of $0.8 million per year. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast.

The overall projected average funding level is not sufficient to achieve proposed levels of service.

Assuming current levels of funding remain consistent, service levels related to service improvements will likely decline without intervention over the long term (beyond 10-year outlook). Increased funding for service improvements and renewals will be required to achieve targets and minimize service risks. As ACH assets are acquired and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures.

3.1 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Arts, Culture & Heritage Services are**:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety – assets not adequate/available for emergency response
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The projected lifecycle costs for the Arts, Culture & Heritage service area minimally exceed the current levels of funding over the short term (10-yr forecast) and long-term. Lifecycle activities that are underfunded are related to the expansion of the Peterborough Art Gallery facility and long-term renewal needs of the Museum and Archives and Library facilities. It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing facility renewal and expansion projects together to minimize costs.

- Seek approvals to implement recommendations and strategies set forth in the 2019 updated Art Gallery Functional Analysis and Feasibility Study and Municipal Cultural Plan

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of ACH assets.

Risks relating to ACH building elements and infrastructure failures are mitigated though condition assessment programs and maintenance programs (legislated and best practices) which provide the data necessary to plan the actions at the right time to achieve the determined levels of services. Primarily, risks are financial in nature and without planned, adequate levels of funding, strategies are potentially at risk for limited implementation, resulting in the delivery of lower levels of service to stakeholders.

Currently, the limited art gallery space has been identified as an inherent risk associated with the ability to meet the demands of the visitors and artists, as well as with the ability to fulfill the Art Gallery mandate.

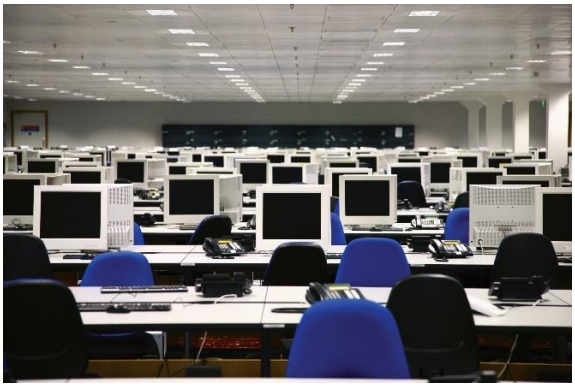
There is a risk associated with the increase in demand from population growth, primarily in the age 55 and older age group by the year 2041. The increase within this age group implies that activities of interest will significantly increase, and the service level of supporting facilities will have to be increased as well. Activities related to the Arts, Culture & Heritage service area include performing arts, attending community events,

visiting museums and historic sites and appreciating cultural heritage. Replacements, Expansion and Future Strategies will need to take aging demographics into consideration when being implemented.

All City services, including ACH services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining ACH assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. ACH projects seek to work with external stakeholders to align projects to minimize disruption of the use of the existing facilities/programs and reduce costs. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain levels of service.

Attachment #12: Information Technology Services



Infrastructure Value	$9.8M	
Overall Condition	4.0	Good**
High Risk Asset Value	$9M	96%
Trend		

**Suggested Rating

1.0 Summary of Information Technology Services

Asset classes that fall under the Information Technology Services (ITS) service area include audio-visual equipment, network appliances and servers, printers and scanners, security system, telephone, and voicemail equipment, back up power supply and workstations. Condition rating trends are neutral from the previous year and remain Good.

**Overall assigned condition rating of poor is based on calculated age of assets and not a true reflection of actual asset conditions. The City is assessing suitable condition assessment methodologies for IT hardware and software and will be incorporated in future iterations of the Plan when approved. ITS subject matter experts have suggested that the overall condition rating of ITS service area assets is 'Good'.

Table 1 details the ITS service area inventory.

1.1 Inventory Details

Table 1: ITS Service Area Inventory

Asset Category & Class	2023 Quantity	Unit of Measure
Equipment		
Audio-Visual	pooled	n/a
Network Appliances and Servers	68	Each

Asset Category & Class	2023 Quantity	Unit of Measure
Printers and Scanners	pooled	n/a
Security Systems	pooled	n/a
Telephones and Voicemail	pooled	n/a
Uninterrupted Power Supply Systems	pooled	n/a
Workstations	pooled	n/a
Software	pooled	n/a

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the ITS service area totalled $9.8 million. Replacement costs were determined using recent acquisition costs of like assets or historical inflated to 2023 dollars where recent costing information was not available.

Figure 1: ITS Service Area –Replacement Cost by Asset Category

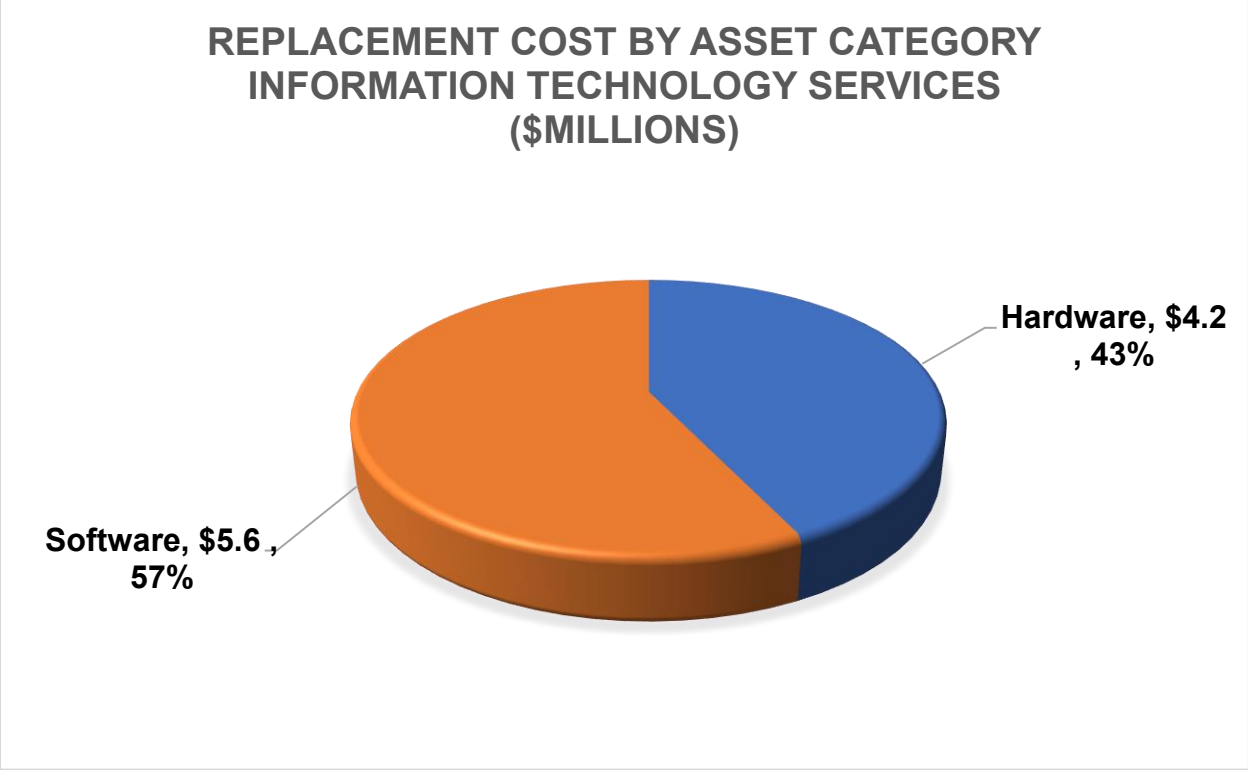


Table 2: ITS Assets - Replacement Costs by Asset Class

Asset Class & Sub-Class	2023 Replacement Cost
Hardware	
Audio-Visual	$358,033

Asset Class & Sub-Class	2023 Replacement Cost
Network Appliances and Servers	$1,914,249
Printers and Scanners	$133,190
Security Systems – Emergency System	$50,053
Telephones and Voicemail	$260,131
Uninterrupted Power Supply Systems	$83,924
Workstations	$1,407,140
Software	
Software	$5,572,834
ITS Assets Total	**$9,779,555**

1.3 Asset Condition and Remaining Useful Life

For the City's IT assets, asset age and estimated service life (ESL) has been used as a proxy for assigning condition ratings until a more formal condition assessment methodology is implemented. Using this methodology, the overall condition of IT assets is rated poor. However, through consultation with ITS subject matter experts, using professional judgement and taking into consideration the reliability, performance, and whether the asset is meeting business requirements, the recommended overall condition of ITS assets are rated 'good'. For various software systems and applications, hardware equipment, etc., the City strives to extend the useful life through regular inspections, maintenance, upgrades, and updates. The City ensures that, pending available budget, equipment refresh schedules are followed to mitigate against technological obsolescence, operational/functional inefficiencies and risks related to security and data integrity. Further advancements will need to be made to develop and implement a more robust condition assessment methodology for IT assets.

Based on replacement cost, 5% or $0.5 million are rated good and 40% or $3 million rated fair, and 63% or $7 million are rated poor and very poor. Figure 2 and Table 3 provide condition details of the ITS service area. The highest estimated replacement value of asset types that were rated very poor include enterprise software (estimated at $1.8 million), and servers & switches (estimated at $1.0 million), and desktop and mobile workstations (estimated at $0.5 million).

Figure 2: ITS Assets - Distributed Condition and Replacement Cost

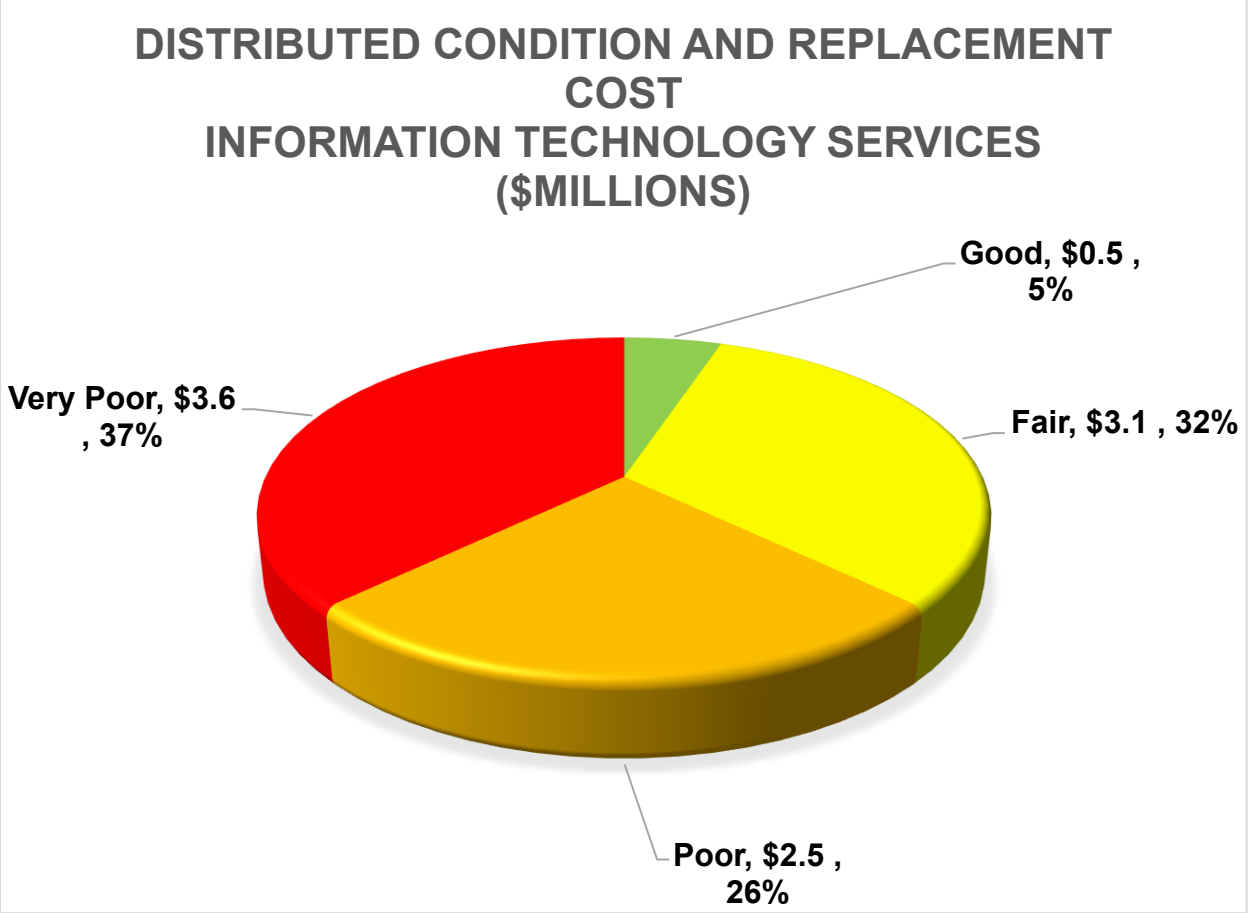


Table 3: ITS Assets - Asset Condition Ratings

Asset Class & Sub-Class	2023 Condition Rating
Hardware	
Audio-Visual	Fair
Network Appliances and Servers	Poor
Printers and Scanners	Poor
Security Systems – Emergency System	Good
Telephones and Voicemail	Very Poor
Uninterrupted Power Supply Systems	Poor
Workstations	Poor
Software	
Software	Poor
ITS Overall Condition	**Poor**

Remaining Useful Life

The following summarizes the Information Technology Services assets' remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates of ages are based on the calculated age or observed age (where condition assessments have been completed) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age will be used in calculating remaining useful life. The ages of the assets are variable and with efforts to extend the life by application of lifecycle treatments (such as upgrades to equipment or software updates). It shouldn't be assumed that there is a linear relationship between age and condition for both the calculated and observed age method.

Table 4 shows ITS assets remaining useful life details.

Table 4: ITS Assets Remaining Useful Life[1]

Asset Inventory	Expected Useful Life (Yrs.)	Ave. Remaining Useful Life (Yrs.)	Percent of Useful Life Remaining
Hardware	8	0	0%
Software	12	0	0%
ITS Assets Remaining Useful Life	**9**	**0**	**0%**

1.4 Asset Risk Assessment

The consequences of failure for ITS assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

[1] ESL, RUL, and percent of useful life remaining are based on calculated average of asset classes

The estimated replacement value of ITS high-risk assets is $9.4 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies.

Stakeholder and technical levels of service, performance measures and current performance for the ITS service area are outlined in Table 5.

Table 5: Levels of Service – Information Technology Services

Asset Class: Information Technology Services								
Service Objective Statement: Efficiently providing secure information technology at an appropriate quality and quantity to support the delivery of services.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality IT Assets that meet the needs of the community and stakeholders	IT Assets are maintained in a state of good repair	IT Assets are proactively maintained and reliable for intended use	IT Assets are proactively maintained and reliable for intended use	Unplanned downtime average that is high impact and has broad scope for key technology that the City relies on for critical functions.	Unplanned downtime less than 1 hour during production hours with less than four single incidences/device within 8 hours	Target met.	Target met.
					Distribution of hours allocated to Enterprise Application Support	Enterprise applications no more than 70% of hours dedicated to keep the lights on (run the business). Minimum 10% is dedicated to major capital projects (transforming the organization).	Target met.	Target met.
					Consistent performance for external Security Audit/Assessment.	80% of audit scores are equal to or better than previous year	Target met	Target met

Asset Class: Information Technology Services								
Service Objective Statement: Efficiently providing secure information technology at an appropriate quality and quantity to support the delivery of services.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
					Metric for service desk issues regarding end-user assets.	70% of requests addressed within 1 business day and 90% within three business days	Target met	Target met

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the ITS Service Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, legislative requirements, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as the level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the 10-year forecast and are sufficient to deliver lifecycle management activities for the City.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and expected performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to ITS services funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – ITS Services				
Reliability/Quality	Providing reliable and high-quality IT Assets that meet the needs of the community and stakeholders	IT Assets are maintained in a state of good repair	IT Assets are proactively maintained and reliable for intended use	Likely to remain the same over the 10-yr planning period

Table 7 below outlines the ITS Services Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the expected performance over the 10-year forecast.

The proposed LOS level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the

City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2033 were used. Capital projects in the budget were reviewed and assigned to a respective lifecycle activity category as appropriate. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

**Costs for lifecycle activities shown below are not inclusive and does not fully represent historical or proposed levels of funding. Various IT projects/initiative costs are accounted for within other Departmental budgets as presented in the City's capital budget. Costs shown below represent capital projects reported under *Finance and Corporate Support Services – Information Technology.*

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity**	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – ITS Services				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Currently not measured in Technical LOS Costs for portion of City Departmental Projects allocated to providing IT support or implementation of new software to improve efficiencies	Capital costs for technology initiatives for which business units have requested IT assistance.	Level of service will likely remain the same over the planning period. Lower forecasted costs are likely due to less departmental project support requests over the 10-year period.
		Level of Funding:	Historical 3-yr Annual Average: $533K	Annual Average: $411K
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to	Currently not measured in Technical LOS	Equipment replacements are scheduled regularly to ensure reliability	Likely will remain the same over the 10-yr planning period but will require additional

	extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Costs for City Technology and Capital Improvements and City Capital Expenditures including machinery and equipment/computer hardware and software renewals.	and performance is maintained	funding to support renewals of additional IT equipment and software acquisitions over the long term
		Level of Funding:	Historical 3-yr Annual Average: $1.2M	Annual Average: $1.1M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No significant disposals planned for the 10-yr period	No significant disposals planned for the 10-yr period
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Currently not measured in Technical LOS Costs for service improvement portion of City Departmental Projects in the capital budget	Service Improvements are carried out on a case-by-case basis	Level of service likely to remain the same. Lower costs for 10-yr planning period due to lower departmental service improvement requests
		Level of Funding:	Historical 3-yr Annual Average: $178K	Annual Average: $145K

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Information Technology Services

The following table describes the current strategies and activities for the Information Technology Services area to maintain the current levels of service. Options for which lifecycle activities that could potentially be undertaken have been explored on based on industry best practices, past trends, business requirements, etc. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the

necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Information Technology Services – Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Regular equipment monitoring and inspection
	· Linking the asset management plan to other studies, master plans and strategies
	· Public consultation on levels of service
	· Regular support provided by IT department
	· High priority in procurement for purchasing critical equipment
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	· Equipment maintained by IT department as needed
	· Reactive maintenance as required
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	- IT equipment undergoes regular maintenance program until replacement
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· Replace equipment when no longer functioning as intended
	· Replace equipment when obsolete
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Sell used equipment whenever possible
	· Retain retired critical equipment as required to maintain spare ratios
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· Upgrade equipment as required to meet user needs
	· Right-size equipment as needed to accommodate expansion of service and planned growth
Future Strategies	n/a

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with ITS subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include regular equipment monitoring and inspection, regular support provided by IT staff, high priority in procurement for purchasing critical equipment, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. Future LOS is dependent on departmental requests for IT support and can vary from time to time.

Refer to Table 8: Information Technology Services – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating.

Refer to Table 8: Information Technology Services – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Current funding levels for existing assets are sufficient to address renewal needs over the 10-year planning period. As assets are acquired, the City will plan to allocate sufficient funds for the future renewal needs and any required service improvements over the life of the assets. Where deferred renewals/replacements take place, the City is committed to ensuring that risks are minimized where possible and stakeholders are aware of service alternatives.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Individual tangible assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary.

Expansion/Acquisition Plan/Service Improvements

Expansion/acquisition/service improvement activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Currently, average funding levels are sufficient to deliver proposed LOS over the 10-year planning period, however over the long-term, increased internal resources, e.g., staffing levels, to support the ongoing and continued growth of information technology services at the City, will likely need to be increased. Limited/insufficient staffing to support the delivery of ITS lifecycle activities poses a risk to achieving LOS and is discussed further in Section 3.3 - Asset Management Strategies and Associated Risks, below.

The total costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Shortfalls that may occur between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: ITS Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Information Technology Services	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
ITS Services	$1.8	$1.8	$1.9	$1.9	$2.0	$2.0	$2.1	$2.2	$2.2	$2.3	$2.0
Total Proposed Funding	$1.8	$1.8	$1.9	$1.9	$2.0	$2.0	$2.1	$2.2	$2.2	$2.3	**$2.0**
Lifecycle Costs											
ITS Services	$2.0	$1.5	$1.2	$1.6	$1.6	$1.7	$1.7	$1.8	$1.8	$1.9	$1.7
Total Lifecycle Costs	$2.0	$1.5	$1.2	$1.6	$1.6	$1.7	$1.7	$1.8	$1.8	$1.9	$1.7
Funding Shortfall	**-$0.2**	**$0.3**	**$0.7**	**$0.4**	**$0.4**	**$0.4**	**$0.4**	**$0.4**	**$0.4**	**$0.4**	**$0.4**

Based on the lifecycle assessment of the ITS service area, it is estimated that the City would need to spend an average of $1.7 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $2.0 million. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast.

Assuming current levels of funding remain consistent, service levels will likely remain the same over the 10-year planning period. Over the long-term, as equipment and software are acquired and renewed, the maintenance and service improvement budget should be increased from year to year to perform the pro-active preventative maintenance measures and meet growth demands.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to **effectively deliver established IT Services are:**

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- IT asset replacement plans/schedules are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, flooding) that could cause physical damage to equipment and/or power outages

Risk Trade Offs

If the identified lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Reduced/interrupted emergency service support due to failed or obsolete 911 emergency dispatch equipment and software
- Threats to IT security - sensitive data/systems are more vulnerable to hackers, viruses, etc. if monitoring and detection tools are not in place
- Hardware and software become obsolete causing operational/functional delays
- Increased backlog of work for those business units requesting IT resources
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The projected lifecycle costs for the ITS service area are affordable and sufficient over the short term (10-yr forecast). It is expected that service improvement/growth investments, renewal investments, and operation and preventative maintenance investments will increase in the long-term due to increasing opportunities to use technology across all City departments, ageing hardware, and equipment no longer performing as intended or becoming obsolete. Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing IT renewal and expansion projects together to minimize costs

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of information technology assets.

Risks relating to IT security and loss of confidential data are mitigated though advanced monitoring and detection tools. Risks associated with not replacing IT assets at the end of useful life are mitigated by the implementation of the City Capital Expenditure Project in which the lifecycle management, new initiatives and enhancements of existing IT assets are funded.

All City services, including IT dependencies are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, available qualified resources, and a resource back up strategy should there be disruption to services. The BCP is reviewed and updated regularly to ensure that back up IT infrastructure is available where required and critical services are not interrupted, minimizing risks.

The choice of strategy for operating and maintaining IT assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is being reviewed and will be included in future versions of the asset management plan when completed.

Attachment #13: Emergency Services

Infrastructure Value	$66.3M	
Overall Condition	3.0	Fair
High Risk Asset Value	$27M	41%
Trend		

1.0 Summary of Emergency Services

The Emergency Services area includes Police and Fire Services. Asset classes that fall under both areas include facilities, fleet, and equipment. Condition rating trends are neutral from the previous year and remain Fair.

Table 1 details the City's inventory for Emergency Services.

1.1 Inventory Details

Table 1: Emergency Services Inventory

Asset Class & Sub-class	Asset	2023 Quantity	Unit of Measure
Fire Services			
Fleet	Vehicles	39	Each
Facilities	Fire Station #1	27,208	Sq. Ft
	Fire Station #2	3,500	Sq. Ft
	Fire Station #3	16,603	Sq. Ft
	Annex/Emergency Operations Centre	2,670	Sq. Ft
Miscellaneous Equipment	Various Equipment	Pooled	Pooled
Police Services			
Fleet	Vehicles	62	Each

Asset Class & Sub-class	Asset	2023 Quantity	Unit of Measure
Facilities	Peterborough Police & Parking Garage	55,590	Sq. Ft
Miscellaneous Equipment	Various Equipment	Pooled	Pooled

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the Emergency Services area totalled $66.3 million. Replacement costs were determined using different valuation methods, such as unit cost multipliers based on recent construction projects or replacements, condition assessments or historical costs inflated to 2023 where recent assessments or costing information was not available.

Figure 1: Emergency Services –Replacement Cost by Asset Category

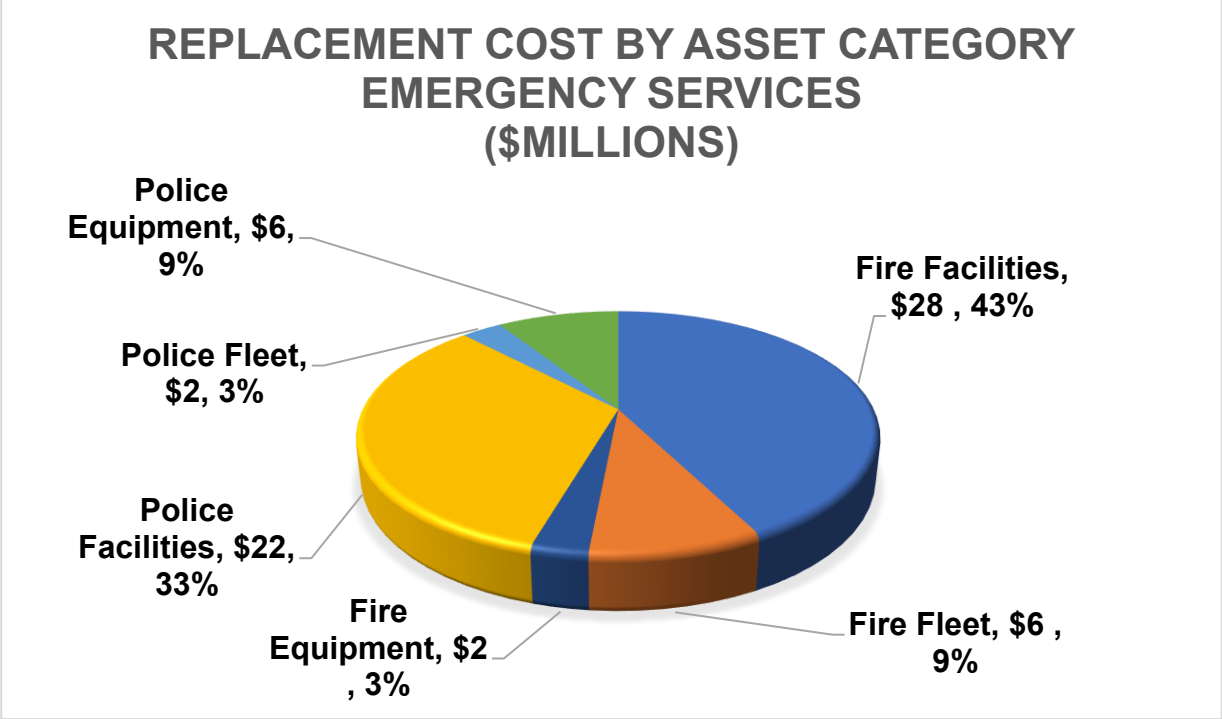


Table 2: Emergency Services - Replacement Costs by Asset

Asset Category & Class	Asset	2023 Replacement Cost
Fire Services		
Fleet	Vehicles	$6,325,186
Facilities	Fire Station #1	$15,165,490
	Fire Station #2	$1,546,793
	Fire Station #3	$10,316,259
	Annex/Emergency Operations Centre	$1,234,054
Equipment	Emergency and Non-Emergency Response equipment	$2,186,994
Police Services		
Fleet	Vehicles	$2,297,585
Facilities	Peterborough Police & Parking Garage	$21,516,414
Equipment	Emergency Response Equipment	$5,671,691
Emergency Services Total		**$66,260,466**

1.3 Asset Condition and Remaining Useful Life

The City's Emergency Services assets are currently rated in overall fair condition. Where condition inspections have not been completed, high-level ratings using professional judgement, or age-based ratings were used. Based on replacement cost, 11% or $7.0 million are rated very good, 19% or $12 million rated good, 42% or $28 million rated fair and 29% or $19 million are rated poor and very poor. Figure 2 and Table 3 provide condition details of Emergency Services.

Figure 2: Emergency Services - Distributed Condition and Replacement Cost

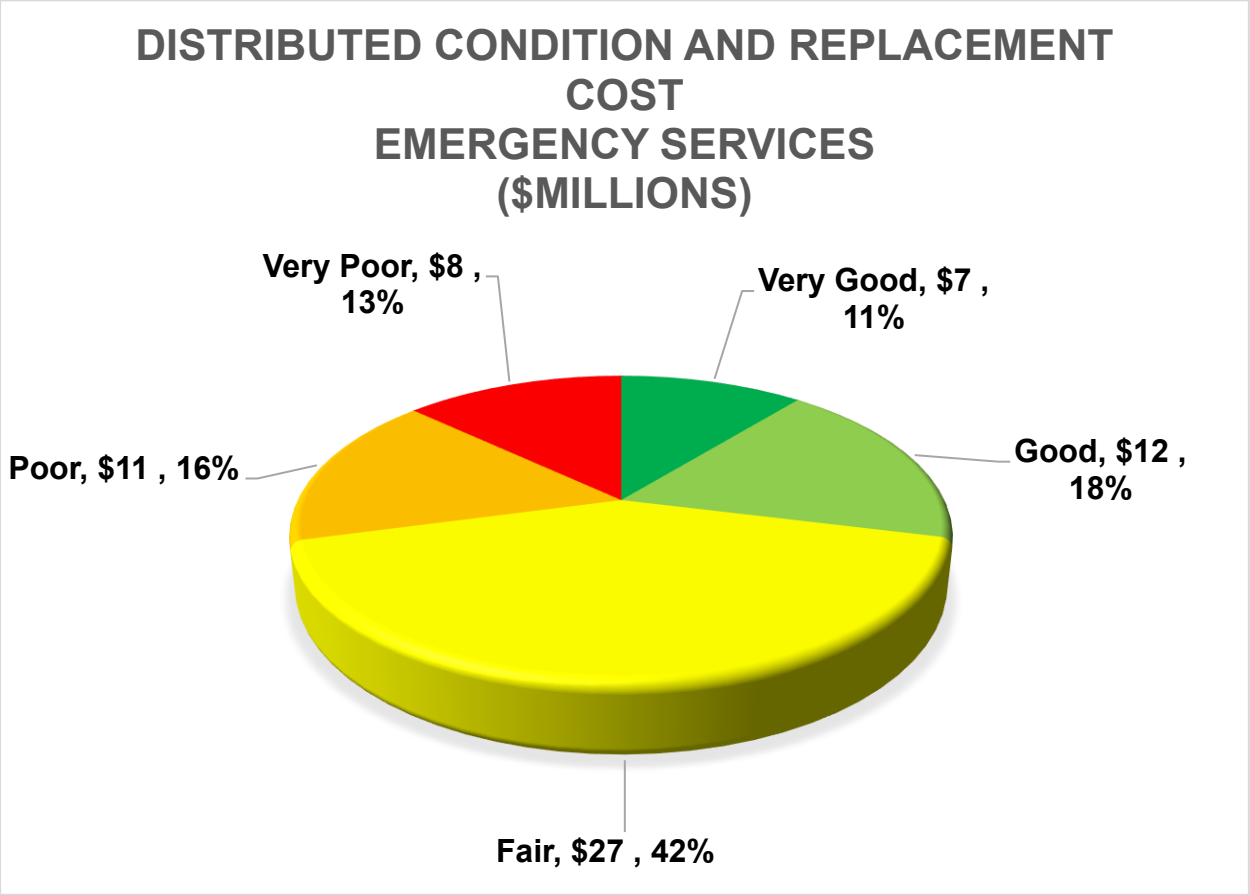


Table 3: Emergency Services - Asset Condition Ratings

Asset Category & Class	Asset	2023 Condition Rating
Fire Services		
Fleet	Vehicles	Fair
Facilities	Fire Station #1	Fair
	Fire Station #2 (Carnegie Ave.)	Poor
	Fire Station #3	Good

Asset Category & Class	Asset	2023 Condition Rating
	Annex/Emergency Operations Centre	Good
Equipment	Emergency and Non-Emergency Response equipment	Fair
Police Services		
Fleet	Vehicles	Good
Facilities	Peterborough Police & Parking Garage	Fair
Miscellaneous Equipment	Emergency Response Equipment	Poor
Emergency Services Overall Condition[1]		**Fair**

Fire and Police Services Facilities

Fire and Police facility ratings shown are based on the most recent building condition assessments completed in 2021-2022 and use observed age of facility elements at the time of assessment. Other assets use an age-based rating methodology and have been reviewed by staff to ensure that it reflects the current conditions until detailed assessments are completed. The City plans to complete BCA's on a seven-year cycle with the next round of assessments anticipated to be completed in 2028.

Construction of the new Fire Station #2 (estimated replacement value of $11 million) was completed in October 2024. Future plans for the old Fire Station #2 facility are currently under review and is included as part of the Fire Services inventory at this time. Inventory of the facility building elements, replacement costs, condition and estimated useful life review for the new Station #2 will be included in future iterations of the Plan when a building condition assessment is completed and available.

Fleet

Condition ratings for fleet are based on both inspected conditions and age-based ratings. For Fire Services, specialized heavy-duty vehicles (e.g., pumper trucks, aerial lift trucks) are estimated to reach the end of useful life (based on average kilometres and/or engine hours of the vehicle) and replaced every 20 years and every 15 years for light duty support vehicles. Police light duty vehicles (e.g., police cruisers, pick-pick up trucks, etc.) and miscellaneous fleet (e.g., motorcycles) are estimated to reach end of useful life and replaced every 9 to 10 years.

The City's fleet maintenance plan incorporates ministry requirements and industry best practices which aims to maintain a high level of vehicle health. Predictive processes

[1] Weighted by replacement cost

are utilized when scheduling major repairs such as engine, transmission, and axle repairs. This ensures that the right maintenance activities are being carried out at the correct time throughout the vehicle's life cycle and minimizing the total cost of ownership.

Police and Fire Services Equipment

Fire fighting equipment, personal protective equipment (PPE) and police protective equipment have an average operational life of 5-10 years and are part of a scheduled inspection and replacement program to ensure the fire and police staff are suitably equipped and to adhere to Ministry of Labour standards. Condition ratings shown are age-based and reviewed by service area subject matter experts.

Remaining Useful Life

The following summarizes the Emergency Services assets' remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates are based on the calculated age or observed age (where condition assessments have been completed) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age will be used in calculating remaining useful life. The ages of the assets are variable and with efforts to extend the life by application of lifecycle treatments, there isn't necessarily a linear relationship between age and condition.

Table 4 shows the Emergency Services remaining useful life details.

Table 4: Emergency Services Assets Remaining Useful Life[2]

Asset Inventory	Expected Useful Life (Yrs.)	Remaining Useful Life (Yrs.)	Percent of Useful Life Remaining
Facilities			
Fire Stations	34	12	34%
Peterborough Police Station & Parking Garage	34	14	41%
Fleet			
Emergency Response Fleet	12	2	0%
Non-Emergency Response Fleet	23	21	44%
Equipment			
Emergency Response Equipment	10	0	0%
Non-Emergency Response Equipment	10	0	0%
Emergency Services Assets Remaining Useful Life	**30**	**10**	**34%**

[2] ESL, RUL, and percent of useful life remaining are based on calculated average of asset classes.

1.4 Asset Risk Assessment

The consequences of failure for Emergency Services assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Emergency Services high risk assets is $26.1 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies and policies such as the Official Plan (April 2023).

Stakeholder and technical levels of service, performance measures and current performance for Emergency Services are outlined in Table 5 below.

Table 5: Levels of Service – Fire Services

Asset Class: Fire Services - Facilities								
Service Objective Statement: Providing effective and reliable emergency services that keep the community safe.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality Fire Services Facilities that meet the needs of the community	Fire Services Facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Facilities are proactively maintained and reliable for intended use	Percent of fire suppression incidents within NFPA response travel time.	90% of fire suppression incidents are within NFPA standards	Station 1: 86% Station 2: 71% Station 3: 95%	Station 1: 76% Station 2: 67% Station 3: 67%
					Maintain Facility Condition Index (FCI) value for all facilities	Good (Between 0% and 5%)	5% (Good)	5% (Good)
					Number of facilities assets in overall fair or better condition	4 Facilities	3 Facilities	3 Facilities

Asset Class: Fire Services - Facilities								
Service Objective Statement: Providing effective and reliable emergency services that keep the community safe.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities meet our environmental objectives	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Annual energy consumption per facility per square meter	Energy Use Intensity (EUI) of 0.66 GJ/m2 or less	1.10 GJ/m2	1.10 GJ/m2

Asset Class: Fire Services - Fleet and Equipment								
Service Objective Statement: Efficiently providing safe, reliable, and fuel efficient vehicles at a cost affordable to the client.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality Fire Fleet and Equipment that meets the needs of the community and stakeholders	Fire Fleet and Equipment is maintained in a state of good repair	Fleet and Equipment is proactively maintained and reliable for intended use	Fleet and Equipment is proactively maintained and reliable for intended use	Percentage of support vehicles that are past their useful life	Less than 5%	19%	19%
					Percentage of vehicles that past their useful life (fire apparatus and first response vehicles)	Less than 5%	25%	25%
					Unassigned/spare ratio of vehicles	Max 20%	20%	20%
					Percentage of fire equipment past their estimated service life	0%	21%	21%
					Unassigned/spare ratio of fire equipment	Max 20%	20%	20%
Climate Leadership	Providing vehicles and equipment with minimal greenhouse gas emissions	Fleet that meets our environmental objectives	60% of all new light duty fleet acquisitions are low carbon by 2030	60% of all new light duty fleet acquisitions are low carbon by 2030	Percentage of support vehicles that are electrified	5%	TBD	TBD

Table 6: Levels of Service – Police Services

Asset Class: Police Services - Facilities								
Service Objective Statement: Providing effective and reliable emergency services that keep the community safe.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability	Providing reliable and high-quality Police Facilities that meet the needs of the community	Police Facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Facilities are proactively maintained and reliable for intended use	Percentage of police stations that are able to meet response times	100%	100%	100%
					Maintain Facility Condition Index (FCI) value for all facilities	Good (Between 0% and 5%)	2% (Good)	2% (Good)
					Number of facilities assets in overall fair or better condition	2 Facilities	2 Facilities	2 Facilities
Accessibility	Providing facilities that are accessible and available to stakeholders to support service delivery	Description of facilities and level of accessibility	Facilities are accessible for intended use	Facilities are accessible for intended use	The facility meets parking needs for staff and service vehicles.	Yes	No	No

Asset Class: Police Services - Facilities								
Service Objective Statement: Providing effective and reliable emergency services that keep the community safe.								
Stakeholder Value/Service Attribute	Stakeholder LoS and Measures		Stakeholder Performance Year of Measure		Technical Measure		Technical Performance Year of Measure	
	Stakeholder LoS Statement	Stakeholder Performance Measure	2023	2024	Technical PM	Target	2023	2024
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities meet our environmental objectives	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Annual energy consumption per facility per square meter	Energy Use Intensity (EUI) of 0.66 GJ/m2 or less	1.05 GJ/m2	1.05 GJ/m2

Asset Class: Fleet								
Service Objective Statement: Efficiently providing safe, reliable, and fuel-efficient vehicles at a cost affordable to the client.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality Police Fleet that meets the needs of the community and stakeholders	Police Fleet is maintained in a state of good repair	Fleet is proactively maintained and reliable for intended use	Fleet is proactively maintained and reliable for intended use	Percentage of vehicles that are past their useful life	Less than 5%	2%	2%
					Unassigned/spare ratio of vehicles	Max 10%	10%	10%
Climate Leadership	Providing vehicles & equipment with minimal greenhouse gas emissions	Fleet that meets our environmental objectives	60% of all new light duty fleet acquisitions are low carbon by 2030	60% of all new light duty fleet acquisitions are low carbon by 2030	Percentage of vehicles that are electrified	5%	TBD	TBD

Asset Class: Police Services - Equipment								
Service Objective Statement: Efficiently providing police equipment at an appropriate quality and quantity to support the delivery of services.								
Stakeholder Value/Service Attribute	Stakeholder LoS and Measures		Stakeholder Performance Year of Measure		Technical Measure		Technical Performance Year of Measure	
	Stakeholder LoS Statement	Stakeholder Performance Measure	2023	2024	Technical PM	Target	2023	2024
Reliability/Quality	Providing reliable and high-quality Police Equipment that meets the needs of the community and stakeholders	Police Equipment is maintained in a state of good repair	Equipment is proactively maintained and reliable for intended use	Equipment is proactively maintained and reliable for intended use	Percentage of police equipment past their estimated service life	0%	50%	50%

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Emergency Services Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees. However, the current funding levels are not sufficient to achieve LOS over the long term.
- LOS are not achievable over the short term for police and fire service improvements and growth-related activities without increased levels of funding. Upcoming large capital projects for renewal, service improvement and growth activities for Police Facilities and the proposed new Fire Station #4 will require additional funding to achieve these targets.
- Police Headquarters is at capacity and requires expansion and/or relocation to accommodate increasing fleet, staff, and service expansions (relocation/expansion planning activities currently underway).
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 7 and Table 8 below outline Stakeholder and Technical LOS, current performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Fire and Police funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 7: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Emergency Services				
Reliability/Quality	Providing reliable and high-quality Fire and Police Service Facilities that meet the needs of the community	Fire Services Facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Same level of service expected
	Providing reliable and high-quality Police and Fire Fleet and Equipment that meets the needs of the community and stakeholders	Fleet and equipment are maintained in a state of good repair	Fleet and equipment are proactively maintained and reliable for intended use	Same level of service expected

Table 8 below outlines the Emergency Services Service Area Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used. A 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 8: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Emergency Services				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling,	Conduct regular Strategic Plan updates	Strategic Plans updated every 4 years	Likely to remain the same over the 10-year planning period.

	demand analysis, etc.			
		Level of Funding:	Historical 3-yr Annual Average: $110K	Annual Average: $110K
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	Maintain Facility Condition Index (FCI) value for all facilities	Fire Facilities = Good Police Facilities = Good	Fire facility conditions are expected to remain the same over 10-year planning period. Police – future plans include new facility location and major expansion activities to existing headquarters to address service expansion needs. Renewal needs will be re-evaluated after facility expansion and renovation activities have taken place.
		Level of Funding:	Historical 3-yr Annual Average: $3.7M	Annual Average: $2.7M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No significant disposals planned for the 10-yr period	No significant disposals planned for the 10-yr period
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements	Facility meets parking needs for staff and	Police Facility does not meet the needs	Police Headquarters planned for major expansion to meet

	Support development and growth	service vehicles.	for staff and service vehicles	growth/service demands Additional fleet and equipment to support growth demands will require increased funding Additional equipment/PPE/ Technology required to support growth demands
		Level of Funding:	Historical 3-yr Annual Average: $2.1M	Annual Average: $8.9M

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Proposed performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Emergency Services

Emergency Services assets include both Fire and Police services assets. Options for which lifecycle activities that could potentially be undertaken have been explored in various needs studies and reports such as the Fire Station #2 Relocation Study and the Peterborough Police Services Board Strategic Plan. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, where limited funding is available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 9: Emergency Services – Asset Management Lifecycle Strategies

Strategy Type - Facilities	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Building condition assessment program
	· Linking the asset management plan to other studies, master plans and strategies
	· Public consultation on levels of service
	· Needs studies to assess community needs and how services are being delivered to the community
	· Integrating asset management planning to drive lifecycle activities
	· Integrating infrastructure and land use planning
	· Educate staff on climate change initiatives and energy efficiency opportunities with respect to building operations/ownership
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	· Preventative and corrective maintenance programs for facilities
	· Service contracts for building life-safety and security alarm systems, elevating systems, and code/regulated building elements
	· Basic custodial services
	· Seasonal maintenance contracts such as snow clearing and cleaning

Strategy Type - Facilities	Current Practice
	· Service contracts for pest control and landscaping maintenance
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	· Renewal of facility elements or sub-systems such as structures, roofs, building exteriors, building services (HVAC, plumbing, electrical), interior finishes and sitework that are at the end of their useful life and renewal does not improve/expand the intended service initially provided
	· Upgrading projects focus on removing asset exposure to elements
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· Facility components replaced when at end of useful life through capital planning/business case (as identified through BCAs)
	· Replacement due to obsolescence or does not meet minimum design standards/intent
	· Replacements considered within the context of the facility
	· Asset replacement is coordinated with planned expansion wherever possible
	· Asset replacement is bundled with other dependent assets wherever possible
	· Operating vs. Replacement cost comparison
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Facilities that are no longer needed for the intended service are either sold, re-purposed or demolished
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· Expansion when facility has reached its functional capacity and expansion is necessary for continued delivery of service
	· Changes to accessibility requirements for public buildings where identified and there is an opportunity to do so.
	· Changes to building components to increase energy efficiency (ex. LED lighting, etc.) where possible
	· Expansion of renewable energy programs and systems to reduce energy costs for operation where possible
Future Strategies	- n/a
Strategy Type – Fleet and Equipment	**Current Practice**
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Training programs for mechanics and operators to optimally maintain and operate vehicles
	· Linking the asset management plan to other studies, master plans and strategies
	· Public consultation on levels of service
	· Regular vehicle inspection coordinated with planned maintenance
	· Redundancy of parts and fleet for the system
	· Redundancy of critical equipment
	· Annual government inspections legislated for Fire Services

Strategy Type - Facilities	Current Practice
	· High priority in procurement for purchasing fleet compatible with current fleet to improve parts and maintenance costs
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	· High standard for preventative maintenance that exceeds the Original Equipment Manufacturer (OEM) schedule
	· Reactive maintenance as required
	· Annual HVAC, Undercoating, Mirror Replacement programs
	· Fluid monitoring with lab analysis performed every other service to gain insight of future failures
	· Third party tire checks 2x a year
	· Monitor OEM bulletins/recalls and be ready to replace and repair
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	· Not applicable for most assets. Fleet and equipment undergo regular maintenance program until replacement
	· Heavy duty vehicles (ex. emergency vehicles) have an engine overhaul at mid-life (approximately 5 years of age).
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· Replace vehicles at end of service life
	· Replace equipment at end of service life
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Sell problematic fleet (very rare)
	· Auction retired fleet
	· Retain retired fleet as required to maintain spare ratios
	· Retain retired equipment as required to maintain spare ratios
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· Right-size fleet as needed to accommodate expansion of service and planned growth
	· Right-size equipment as needed to accommodate expansion of service and planned growth
Future Strategies	· Review alternate fuels periodically for potential use
	· Consider electric vehicles and equipment where possible and practical

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (e.g., rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (e.g., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical construction costs and financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Emergency services subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 9: Emergency Services – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include preventative maintenance programs for both fleet and facilities, legislated inspections on vehicles, undercoating and mirror replacement for fleet, etc.

Refer to Table 9: Emergency Services – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are considered adequate to meet projected service levels. Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Renewal budget levels are considered adequate to maintain proposed LOS over the 10-year planning period.

Significant facility expansion and renovation works will be undertaken over the 5-year forecast for Police Services. Renewal activities are being planned as part of the facility renovation/replacement project and more details will be available when the project scope of work is finalized. An updated in-depth renewal lifecycle needs assessment will be completed in the next iteration of the Plan.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include facility expansions, relocations to a larger facility to address capacity deficiencies, additional fleet to meet service demands, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

Forecasted acquisition/service improvement costs are primarily related to the new Peterborough Police Station expansion due to growth demands. Additional space is needed for Police Services and the existing headquarters facility is at capacity. The City of Peterborough's City-Wide Development Charges (DC) Background Study has identified anticipated residential and non-residential growth capital program requirements to meet growth demands. Even though DC charges are intended to pay for the initial round of capital costs needed to service new development over an identified planning period, the City will need to commit the funding for ongoing operation, maintenance and renewal costs of these acquired assets for the duration of the useful life (and beyond). The current levels of funding for ongoing lifecycle activities will likely need to increase to support the acquisition of Fire and Police assets and to deliver proposed levels of service.

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 10 below. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 10: Emergency Services Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Emergency Services	Forecast Year ($M)										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Fire Services	$1.9	$1.9	$2.0	$2.1	$2.1	$2.2	$2.2	$2.3	$2.4	$2.5	$2.2
Police Services	$5.3	$5.5	$5.6	$5.8	$6.0	$6.2	$6.3	$6.5	$6.7	$6.9	$6.1
Total Proposed Funding	$7.2	$7.4	$7.6	$7.9	$8.1	$8.3	$8.6	$8.8	$9.1	$9.4	**$8.2**
Lifecycle Costs											
Fire Services	$1.1	$4.2	$2.7	$7.5	$7.5	$1.6	$1.6	$1.7	$1.7	$1.8	$3.1
Police Services	$5.7	$2.9	$28.7	$22.7	$18.0	$2.8	$2.6	$2.9	$3.0	$2.8	$9.2
Total Lifecycle Costs	$6.8	$7.0	$31.5	$30.2	$25.6	$4.4	$4.3	$4.5	$4.7	$4.6	$12.4
Funding Shortfall	**$0.4**	**$0.4**	**-$23.8**	**-$22.4**	**-$17.5**	**$4.0**	**$4.3**	**$4.3**	**$4.4**	**$4.8**	**-$4.1**

Based on the lifecycle assessment of the Emergency Services Service Area, it is estimated that the City would need to spend an average of $12.4 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $8.2 million leaving an average annual shortfall of $4.1 million per year. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast. The current level of funding for Emergency Services is not sufficient to deliver proposed levels over the 10-year forecast.

Assuming current levels of funding remain consistent, without intervention, the City will likely experience declining service levels and increased risk exposure over the long-term that will need to be managed. The shortfall is primarily due to the forecasted costs required for the new police station renovation and expansion project anticipated to start in 2025 with completion in 2027. Although shown as a shortfall to highlight the capital investment required, capital budget pre-commitments for the design and construction of both locations were approved with the 2025 budget, with an estimated total of $48 million requested over three-year forecast (2025 through to 2027). As other assets such as fleet, equipment and facility building elements are acquired and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures. The City will need to consider opportunities to manage the shortfall and assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Emergency Services are:**

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Asset deterioration assessments/models are underestimated/miscalculated
- External/environmental factors such as climate change effects (more severe weather instances, increased demands due to growth)

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs

If lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Public health and safety – assets not adequate/available for emergency response
- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not a reflection of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected

Managing the Risks

The projected lifecycle costs for Emergency Services exceeds the current levels of funding over the short term (10-yr forecast) and service levels/performance will likely decrease. The number of existing equipment, fleet and facility assets in poor and very poor condition are expected to increase over the long-term and will likely require additional funding to keep assets in a state of good repair (replacement and refurbishment activities). It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds, external grant opportunities to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects such as grouping renewal projects with other service area projects.

- Seek approvals to implement recommendations and strategies set forth in Fire Services and Police Services needs studies and master plans.

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of Fire and Police assets.

Risks relating to asset failure are mitigated though condition assessment programs, maintenance programs (legislated and best practices) and scheduled renewal programs which ensure assets are in acceptable condition and are available to achieve the determined levels of services. Risks related to fleet asset failures are addressed through proactive fleet maintenance and adequate vehicle storage to ensure adequate service readiness.

All City services, including emergency services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining Emergency Services assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

Attachment #14: Public Works

Infrastructure Value	$44.9M	
Overall Condition	4.0	Good
High Risk Asset Value	$2M	4%
Trend		

1.0 Summary of Public Works Service Area

Asset classes that fall under the Public Works service area include the Municipal Operations Centre and Office Facility, Operations Storage Garage, the salt and sand storage facility, fleet, and equipment. Condition rating trends remain neutral with an overall condition rating of 'Good'.

Table 1 details the City's inventory for the Public Works service area.

1.1 Inventory Details

Table 1: Public Works Inventory

Asset Class & Sub-class	2023 Quantity	Unit of Measure
Facilities		
Municipal Operations Centre Office	16,100	Sq. Ft
Municipal Operations Centre and Storage Garage	53,916	Sq. Ft
Salt and Sand Storage Facility	21,720	Sq. Ft
Fleet		
Equipment and Vehicles	72	Each

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the Public Works service area totalled $44.9 million. Replacement costs were determined using recent acquisition

costs of like assets or historical costs inflated to 2023 dollars where recent costing information was not available.

Figure 1: Public Works Service Area –Replacement Cost by Asset Sub-Class

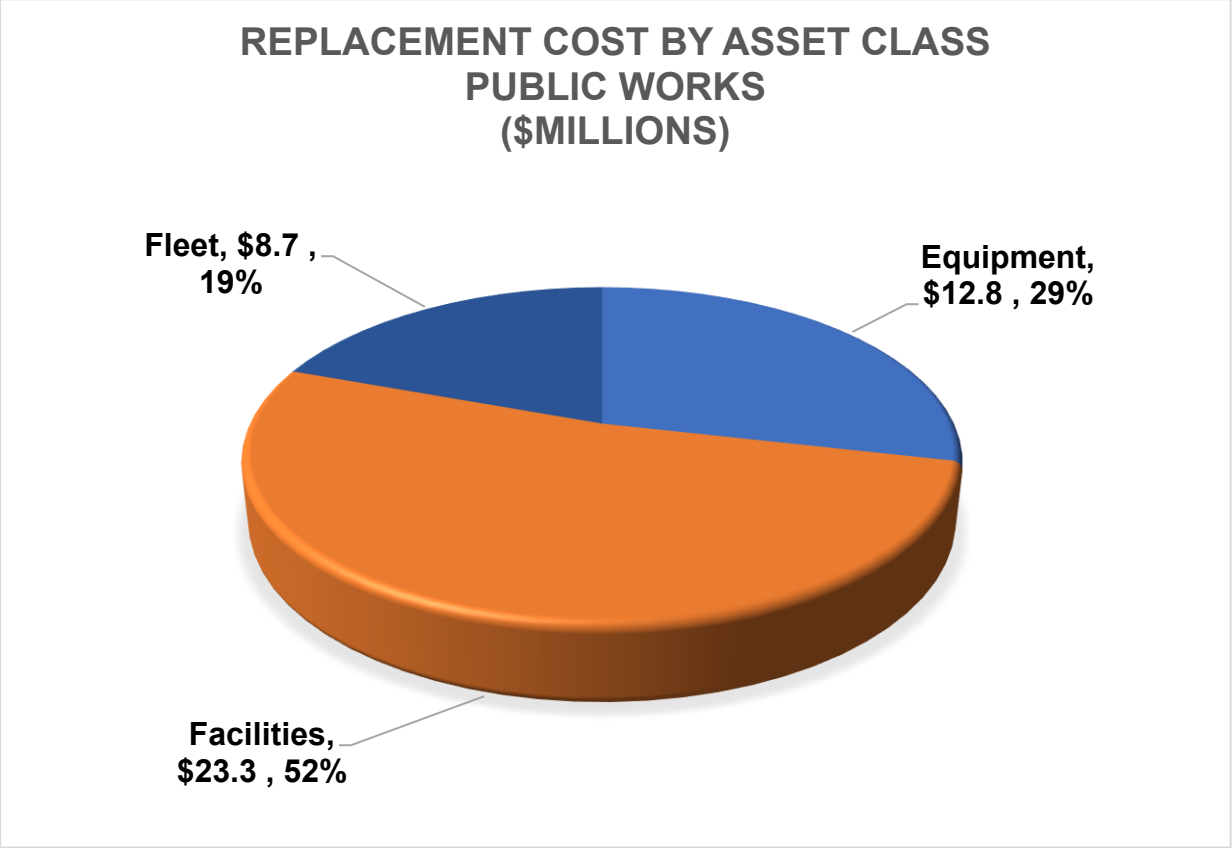


Table 2: Public Works Assets - Replacement Costs by Asset Class

Asset Category & Class	2023 Replacement Cost
Facilities	
Municipal Operations Centre Office	$4,363,020
Municipal Operations Centre and Storage Garage	$18,135,109
Salt and Sand Storage Facility	$831,795
Fleet & Equipment	
Fleet	$8,725,557
Equipment	$12,833,497
Public Works Total	**$44,888,977**

1.3 Asset Condition and Remaining Useful Life

Facilities

Public Works facility condition ratings shown are based on the most recent building condition assessment (BCA) completed in 2021-2022 and use observed age of facility elements at the time of assessment. The City plans to complete BCA's on a seven year cycle with the next round of assessments anticipated to be completed in 2028.

In 2019, the Public Works yard and operations office relocated from the overcrowded Townsend Street location into a newly purchased facility at 791 Webber Avenue, now called the Municipal Operations Centre. Other services operating from this location include Fleet Services and Traffic Operations. With significant renovations being completed, the new Municipal Operations Centre now provides more space to better suit staff, fleet, traffic, and public works operational needs, including a larger salt and sand dome storage facility.

Fleet and Equipment

Condition ratings for fleet are based on both inspected conditions and age-based ratings. The City's fleet maintenance plan incorporates ministry requirements and industry best practices which aims to maintain a high level of vehicle health. Predictive processes are utilized when scheduling major repairs such as engine, transmission, and axle repairs. This ensures that the right maintenance activities are being carried out at the correct time throughout the vehicle's life cycle.

Based on replacement cost, 42% or $19 million are rated very good, 14% or $5.6 million rated good, 20% or $8 million rated fair and 25% or $11.4 million rated poor and very poor. Figure 2 and Table 3 provide condition details of the Public Works service area.

Figure 2: Public Works Assets - Distributed Condition and Replacement Cost

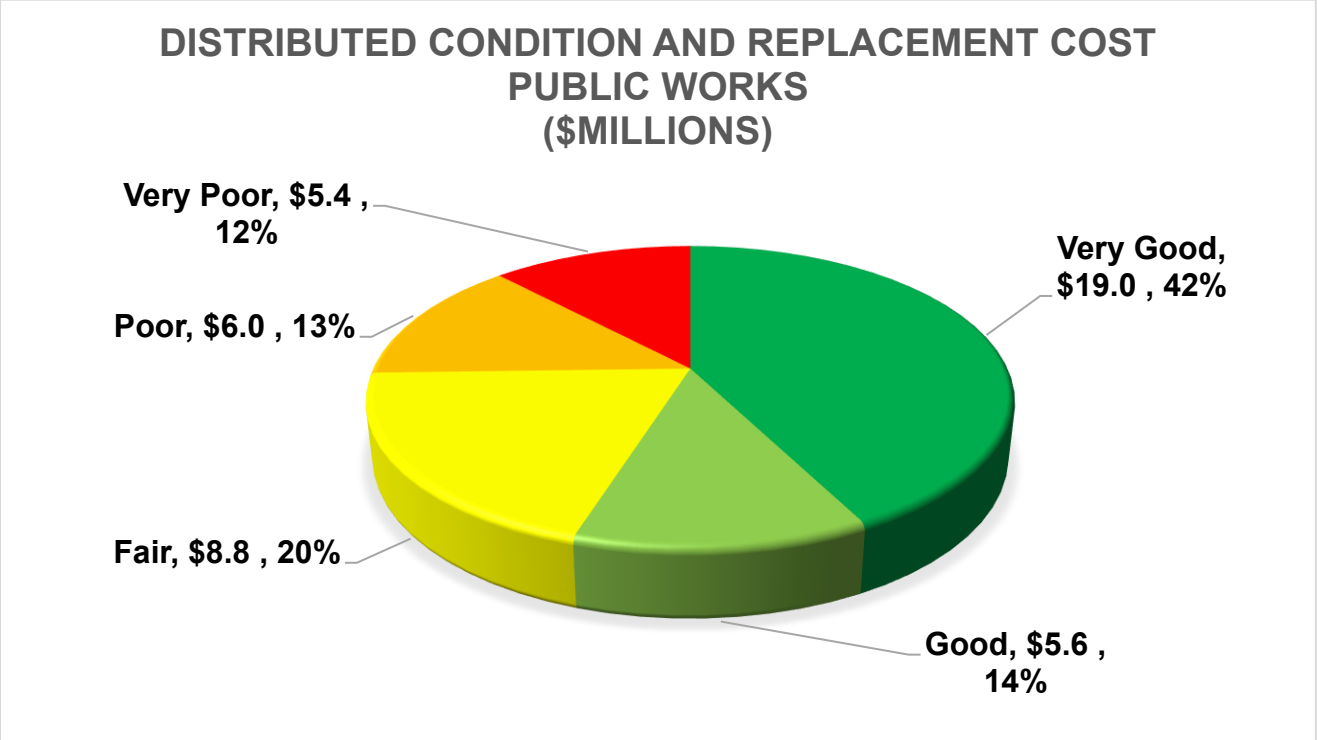


Table 3: Public Works Assets - Asset Condition Ratings

Asset Class & Sub-Class	2023 Condition Rating
Facilities	
Municipal Operations Centre Office	Good
Municipal Operations Centre Storage and Garage	Very Good
Salt and Sand Storage Facility	Very Good
Fleet & Equipment	
Fleet	Poor
Equipment	Poor
Public Works Overall Condition[1]	**Good**

Remaining Useful Life

The following summarizes the Public Works assets' remaining useful life. The useful life of an asset is the estimated period over which the City expects to use the asset. Estimates of ages are based on the calculated age or observed age (where condition assessments have been completed) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are

[1] Weighted by replacement cost

completed the 'observed' age will be used in calculating remaining useful life. The ages of the assets are variable and with efforts to extend the life by application of lifecycle treatments. It shouldn't be assumed that there is a linear relationship between age and condition for both the calculated and observed age method.

Table 4 shows Public Works assets remaining useful life details.

Table 4: Public Works Assets Remaining Useful Life[2]

Asset Class and Sub-Class Inventory	Ave. Expected Useful Life (Yrs.)	Ave. Remaining Useful Life (Yrs.)	Percent of Useful Life Remaining
Equipment	15	4	26%
Facilities	34	26	77%
Fleet	10	0	0%
Public Works Assets Remaining Useful Life	**28**	**20**	**70%**

1.4 Asset Risk Assessment

The consequences of failure for Public Works assets have been determined manually by City staff based on a standardized chart for consequence (found in Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Public Works high-risk assets is $1.9 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

[2] ESL, RUL, and percent of useful life remaining are based on calculated average of asset classes

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. The City will continue to deliver services at the current levels which will be referred to herein as *proposed levels of service.*

Table 5 below outlines the LOS descriptions the City proposes to provide for each year over the 10-year forecast (2024-2034). Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies, and policies.

Stakeholder and technical levels of service, performance measures and current performance for the Public Works service area are outlined in Table 5 below.
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Table 5: Levels of Service – Public Works

Asset Class: Public Works – Fleet								
Service Objective Statement: Efficiently providing safe, reliable, and fuel efficient vehicles at a cost affordable to the client.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality Public Works Fleet and Equipment that meet the needs of the community and stakeholders	Public Works Fleet and Equipment are maintained in a state of good repair	Vehicles and equipment are proactively maintained and reliable for intended use	Vehicles and equipment are proactively maintained and reliable for intended use	Percentage of vehicles that are past their useful life	Max 10%	36%	36%
					Percentage of machinery and equipment assets past their useful life	Max 10%	20%	20%
					Unassigned ratio of vehicles	Max 10%	5%	5%
					Unassigned ratio of equipment	Max 10%	5%	5%
Climate Leadership	Providing vehicles & equipment with minimal greenhouse gas emissions	Fleet that meets our environmental objectives	60% of all new light duty fleet acquisitions are low carbon by 2030	60% of all new light duty fleet acquisitions are low carbon by 2030	Percentage of vehicles that are electrified	5%	TBD	TBD

Asset Class: Public Works – Facilities								
Service Objective Statement: Providing high quality, accessible, and energy efficient facilities that are available and meet the needs of the community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality Public Works Facilities that meet the needs of the community and stakeholders	Public Works Facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Facilities are proactively maintained and reliable for intended use	Maintain Facility Condition Index (FCI) value for all facilities	Fair (Between 5% and 10%)	0.33% (Good)	0.33% (Good)
					Number of facilities with FCI or 10% or better	5 Facilities	5 Facilities	5 Facilities
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities meet our environmental objectives	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Annual energy consumption per facility per square meter	Energy Use Intensity (EUI) of 0.86 GJ/m2 or less	2.39 GJ/m2	2.39 GJ/m2

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Public Works Services Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the short term (10-year outlook) to deliver lifecycle management activities with no significant impacts to tax rates/user fees. However, the current funding levels are not sufficient to achieve LOS over the long term.
- LOS are not achievable over the short term for renewal activities and some lifecycle activities, e.g. service improvements and growth-related activities, will need additional investment to achieve targets, accommodate growth, and address capacity deficiencies for fleet storage.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 7 and Table 8 below outline Stakeholder and Technical LOS, current/proposed performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Public Works funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 7: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Public Works				
Reliability/Quality	Providing reliable and high-quality Public Works Fleet and Equipment that meet the needs of the community and stakeholders	Public Works fleet and equipment are maintained in a state of good repair	Fleet and equipment are proactively maintained and reliable for intended use	Same level of service expected
	Providing reliable and high-quality Public Works Facilities that meet the needs of the community and stakeholders	Public Works facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Same level of service expected

Table 8 below outlines the Public Works Service Area Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the proposed performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used. A 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 8: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Public Works				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Currently not measured in Technical LOS	Currently not measured in Technical LOS	Likely to remain the same over the 10-year planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments.	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Renewals	Significant repairs are designated to	Maintain Facility Condition Index (FCI) value for all	Good	Facility conditions are expected to be maintained over 10-year forecast at

	extend the life of the asset. Activities that are expected to occur once an asset has reached the end of its useful life.	facilities at minimum 'Fair'		current level of investment.
		Maximum 10% of vehicle inventory that are past their useful life	36%	Current funding levels are sufficient to address existing renewal needs LOS expected to be maintained. Expected forecasted fleet renewals are reviewed and budgeted on a case-by-case basis in the year prior to budget approvals. Lower annual average cost shown likely due to class of fleet assets forecasted with lower CRV.
		Level of Funding:	Historical 3-yr Annual Average: $2.8M	Annual Average: $1.6M
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No disposals planned for the 10-yr period	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Currently not measured in Technical LOS	Currently not measured in Technical LOS	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0M

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Public Works

The following table describes the current strategies and activities for the Public Works service area to maintain the current levels of service. Options for which lifecycle activities that could potentially be undertaken are based on industry best practices. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Public Works– Asset Management Lifecycle Strategies

Strategy Type - Facilities	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Building condition assessment program (7-year cycle)
	· Linking the asset management plan to other studies, master plans and strategies
	· Public consultation on levels of service
	· Needs studies to assess community needs and how services are being delivered to the community
	· Integrating asset management planning to drive lifecycle activities
	· Integrating infrastructure and land use planning
	· Educate staff on climate change initiatives and energy efficiency opportunities with respect to building operations/ownership
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	· Preventative and corrective maintenance programs for facilities
	· Service contracts for building life-safety and security alarm systems, elevating systems, and code/regulated building elements
	· Basic custodial services

Strategy Type - Facilities	Current Practice
	· Seasonal maintenance contracts such as snow clearing and cleaning
	· Secondary roofing program to re-inspect all facility roofs annually.
	· Service contracts for pest control and landscaping maintenance
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	· Renewal of facility elements or sub-systems such as structures, roofs, building exteriors, building services (HVAC, plumbing, electrical), interior finishes and sitework that are at the end of their useful life and renewal does not improve/expand the intended service initially provided
	· Upgrading projects focus on removing asset exposure to elements
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· Facility components replaced when at end of useful life through capital planning/business case (as identified through BCAs)
	· Major renovations occur to update building spaces as required
	· Replacement due to obsolescence or does not meet minimum design standards/intent
	· Replacements considered within the context of the facility
	· In the event of a required service expansion, entire facilities are replaced if an improvement or financial analysis justifies the need for a new building as opposed to upgrading the existing one
	· Asset replacement is coordinated with planned expansion wherever possible
	· Asset replacement is bundled with other dependent assets wherever possible
	· Operating vs. Replacement cost comparison

Strategy Type - Facilities	Current Practice
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Facilities that are no longer needed for the intended service are either sold, re-purposed or demolished
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· Expansion when facility has reached its functional capacity and expansion is necessary for continued delivery of service
	· Changes to accessibility requirements for public buildings where identified and there is an opportunity to do so.
	· Changes to building components to increase energy efficiency (ex. LED lighting, etc.) where possible
	· Expansion of renewable energy programs and systems to reduce energy costs for operation where possible
Future Strategies	- n/a

Strategy Type – Fleet and Equipment	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Training programs for mechanics and operators to optimally maintain and operate vehicles
	· Regular vehicle inspection coordinated with planned maintenance
	· Linking the asset management plan to other studies, master plans and strategies
	· Public consultation on levels of service
	· Redundancy of parts and fleet for critical items in the system
	· Redundancy of critical equipment

Strategy Type – Fleet and Equipment	Current Practice
	· Annual government inspections legislated for Fire services (all emergency vehicles and apparatus, heavy duty equipment for winter control)
	· High priority in procurement for purchasing fleet compatible with current fleet to improve parts and maintenance costs
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	· High standard for preventative maintenance that exceeds the Original Equipment Manufacturer (OEM) schedule
	· Reactive maintenance as required
	· Annual HVAC, Undercoating, Mirror Replacement programs
	· Fluid monitoring with lab analysis performed every other service to gain insight of future failures (for emergency fleet)
	· Third party tire checks 2x a year
	· Monitor OEM bulletins/recalls and be ready to replace and repair
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	· Not applicable for most assets. Fleet and equipment undergo regular maintenance program until replacement
	· Heavy duty vehicles (ex. plow trucks) have an engine overhaul at mid-life (approximately 5 years of age).
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· Replace vehicles at end of service life
	· Replace equipment at end of service life
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Sell problematic fleet (very rare)
	· Auction retired fleet
	· Retain some retired fleet to maintain spare ratios (emergency vehicles, sanitation, plows, i.e. all heavy-duty).
	· Retain some retired equipment as required to maintain spare ratios

Strategy Type – Fleet and Equipment	Current Practice
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· Right-size fleet as needed to accommodate expansion of service and planned growth
	· Right-size equipment as needed to accommodate expansion of service and planned growth
Future Strategies	· Review alternate fuels periodically for potential use
	· Consider electric vehicles (non-heavy-duty fleet) and equipment
	· Consider electric vehicles for sanitation trucks
	· Consider electric or hybrid vehicles (vactor truck)

3.1 Lifecycle Models, Interventions, and Cost of Service

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Public Works subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated infrastructure planning, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

Refer to Table 8: Public Works – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include preventative maintenance programs for both fleet and facilities, legislated inspections on vehicles, undercoating and mirror replacement for fleet, etc.

Refer to Table 8: Public Works – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Operation and Maintenance budget levels are considered adequate to meet projected service levels. Currently, trends in operation and maintenance funding levels were calculated using historical capital investments related to these types of activities. Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

The current funding levels are sufficient to deliver renewal lifecycle activities over the 10-year forecast. Where service interruptions take place, the City is committed to ensuring that risks are minimized where possible and stakeholders are aware of service alternatives.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Assets identified for possible decommissioning are identified by each service area and incorporated in the capital budget as necessary. Financial gains/losses related to disposals or repurposing are accounted for in the City's financial plans and budgets as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include facility expansions, relocations to a larger facility to address capacity deficiencies, additional fleet to meet service demands, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

As assets are acquired, the City will ensure they are incorporated into required inspection plans, strategies and optimization processes.

The costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

Table 9: Public Works Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Public Works	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Public Works Facilities, Fleet and Equipment	$2.8	$2.9	$2.9	$3.0	$3.1	$3.2	$3.3	$3.4	$3.5	$3.6	$3.2
Total Proposed Funding	$2.8	$2.9	$2.9	$3.0	$3.1	$3.2	$3.3	$3.4	$3.5	$3.6	**$3.2**
Lifecycle Costs											
Public Works Facilities, Fleet and Equipment	$2.6	$0.5	$1.8	$1.5	$1.5	$1.6	$1.6	$1.7	$1.7	$1.8	$1.6
Total Lifecycle Costs	$2.6	$0.5	$1.8	$1.5	$1.5	$1.6	$1.6	$1.7	$1.7	$1.8	$1.6
Funding Shortfall	**$0.2**	**$2.4**	**$1.1**	**$1.5**	**$1.6**	**$1.6**	**$1.7**	**$1.7**	**$1.8**	**$1.8**	**$1.6**

Based on the lifecycle assessment of the Public Works service area, it is estimated that the City would need to spend an average of $1.6 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $3.2 million. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast.

Assuming current levels of funding remain consistent, the City will maintain proposed levels of service. As fleet, equipment and facility assets are acquired and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures. The City will need to consider opportunities to manage any shortfall and assess the long-term sustainability of service levels, consider other strategies to decrease lifecycle costs and/or explore other sources of revenue where necessary.

3.3 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver established Public Works Services are**:

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement lifecycle strategies
- Growth and development not considered when establishing PW operational needs
- External/environmental factors such as climate change effects (more severe and more frequent weather instances, flooding) that could cause physical damage to Public Works facilities

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs:

If the identified lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

Fleet:

- Lack of/limited snow clearing activities (health and safety, legislated impacts)
- Lack of/limited resources to carry out repairs or rehabilitation activities (e.g. roads and related assets, bridges, underground infrastructure, etc.)
- Regulatory non-compliance (plows required for snow clearing)
- Delays to major or time sensitive construction works that depend on or rely on public works fleet to be completed
- Interrupted service/support to various other City departments that require PW fleet for service delivery.

Facilities:

- Major delays/service interruptions to operations
- Backlog of fleet service work impacting various other City services (including emergency services such as fire and police)
- Delays/interruptions to other core services that rely on Public Works Operations such as roads, sanitary sewer, stormwater, transit, etc.

General Consequences:

- Additional assets/expansion of services required to meet demand
- Reputation/image negatively affected
- Staff morale affected

Managing the Risks

The projected funding for the Public Works service area is sufficient to deliver proposed levels of service over the short term (10-yr forecast). It is expected that over the long term (10-year to 25-year outlook) the number of existing fleet, equipment, and facility assets in poor and very poor condition are expected to increase and will likely require additional funding to keep assets in a state of good repair (replacement and refurbishment activities). It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds, external grant opportunities to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing projects such as grouping renewal projects with other service area projects.

- Seek approvals to implement recommendations and strategies set forth in the Council approved strategic plans and needs assessments

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of public works assets.

Risks relating to asset failure are mitigated though condition assessment programs, maintenance programs (legislated and best practices) and scheduled renewal programs

which ensure assets are in acceptable condition and are available to achieve the determined levels of services. Risks related to fleet asset failures are addressed through proactive fleet maintenance and adequate vehicle storage to ensure adequate service readiness.

All City services, including Public Works services are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key interruption impacts, recovery time objectives, dependencies, qualified resources available and a resource back-up strategy should services be interrupted. The BCP is reviewed and updated regularly to ensure that critical services are not interrupted, minimizing risks.

The choice of strategy for maintaining Public Works assets considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.

Attachment #15: Administration Facilities

Infrastructure Value	$56.2M	
Overall Condition	3.0	Fair
High Risk Asset Value	$13M	23%
Trend		

1.0 Summary of Administration Facilities Service Area

Asset classes that fall under the Administration facilities service area include City Hall, Community Services (210 Wolfe St.), and the Provincial Court House. Condition trends remain neutral from the last Asset Management Plan with an overall condition rating of 'Fair'

Table 1 details the City's inventory for the Administration facilities service area.

1.1 Inventory Details

Table 1: Administration Facilities Inventory

Asset Category & Class	2023 Quantity	Unit of Measure
Facilities		
City Hall & Carnegie Wing	64,100	Sq. Ft
Community Services – 210 Wolfe St.	15,110	Sq. Ft
Provincial Court House	19,675	Sq. Ft

1.2 Replacement Costs

The estimated year end 2023 replacement costs for the Administration facility service area totalled $56.2 million. Replacement costs are based on the most building condition assessments completed in 2021-2022 or historical costs inflated to 2023 where condition assessments were not available.

Figure 1: Administration Service Area –Replacement Cost by Asset Class

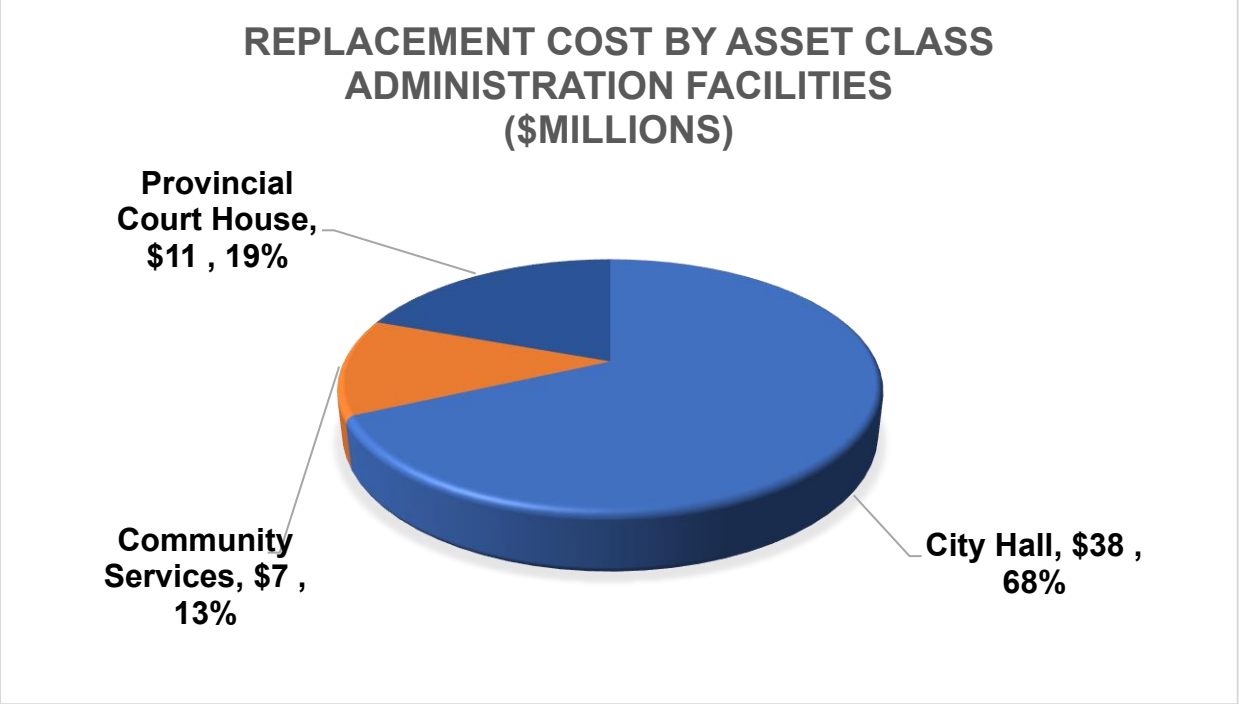

Table 2: Administration Service Area - Replacement Costs by Asset Class

Asset Category & Class	2023 Replacement Cost
Facilities	
City Hall & Carnegie Wing	$38,324,670
Community Services – Recreation Division at 210 Wolfe St.	$6,982,592
Provincial Court House	$10,895,572
Administration Total	**$56,202,833**

1.3 Asset Condition and Remaining Useful Life

Facilities

Condition ratings are based on the most recent building condition assessments (BCA'S) completed in 2021 and 2022 and use observed age of facility elements at the time of assessment. The City plans to complete BCA's on a 5 year cycle with the next round of assessments anticipated to be completed in 2026/2027.

Based on replacement cost of building elements, 22% or $12.4 million are rated very good and good, 56% or $31.2 million are rated fair, and 22% or $12.5 million are rated poor and very poor. Figure 2 and Table 3 provide condition details of the Administration facilities service area.

Figure 2: Administration Facilities- Distributed Condition and Replacement Cost

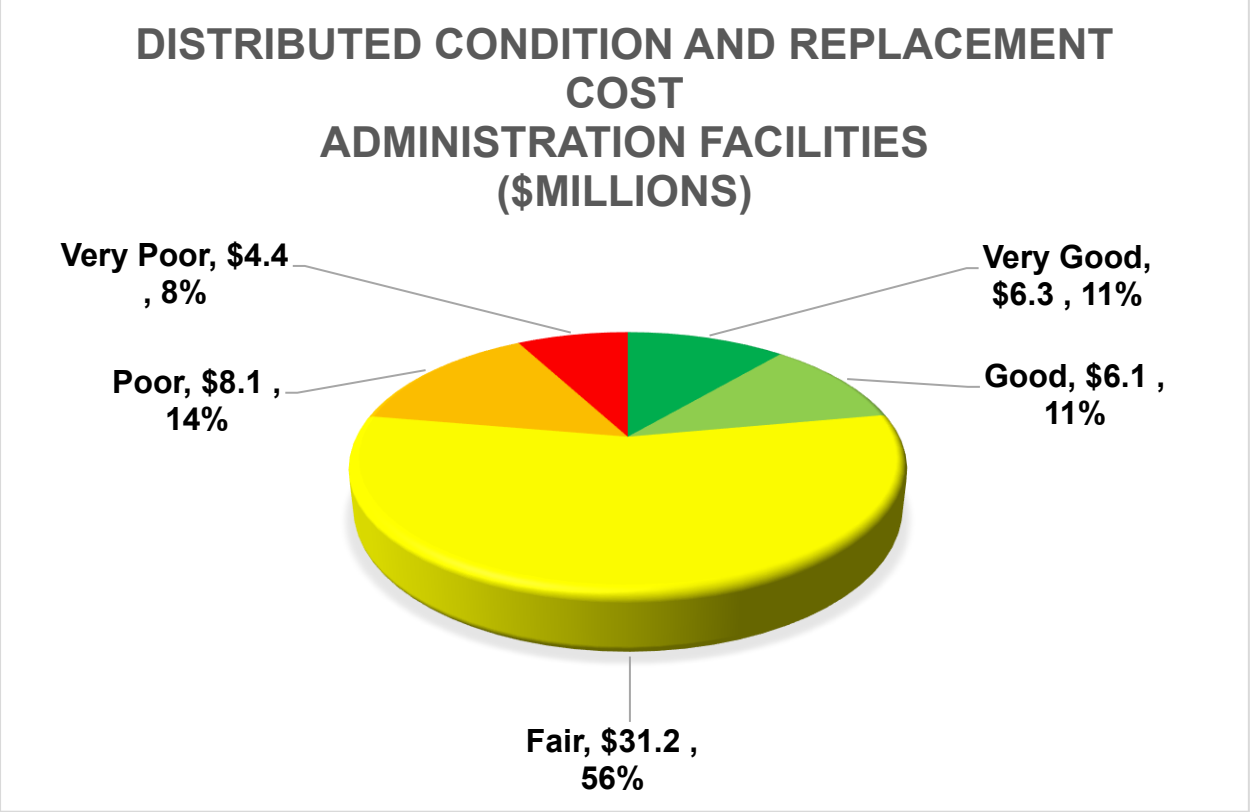

Table 3: Administration Facilities - Condition Ratings

Asset Category & Class	2023 Condition Rating
Facilities	
City Hall & Carnegie Wing	Fair
Community Services – Recreation Division at 210 Wolfe St.	Poor
Provincial Court House	Fair
Administration Overall Condition[1]	**Fair**

Remaining Useful Life

The following summarizes the Administration facilities' remaining useful lives. The expected useful life of an asset is the estimated period over which the City expects to use the asset. Estimates of ages are based on the calculated age or observed age (where condition assessments have been completed) and do not take into consideration any betterments that extend the useful life of the asset(s). Ideally, as condition assessments are completed the 'observed' age will be used in calculating remaining useful life. The ages of the assets are variable and with efforts to extend the life by application of lifecycle treatments.

Table 4 shows Administration Facilities remaining useful life details.

Table 4: Administration Facilities - Remaining Useful Life[2]

Asset Category & Class Inventory	Ave. Expected Useful Life (Yrs.)	Ave. Remaining Useful Life (Yrs.)	Percent of Useful Life Remaining
Facilities			
City Hall & Carnegie Wing	33	17	51%
Community Services – Recreation Division at 210 Wolfe St.	32	15	46%
Provincial Court House	32	12	38%
Administration Facilities Remaining Useful Life	**32**	**15**	**47%**

1.4 Asset Risk Assessment

The consequences of failure for Administration facility assets have been determined manually by City staff based on a standardized chart for consequence (found in

[1] Weighted by replacement cost
[2] ESL, RUL, and percent of useful life remaining are based on calculated average of asset classes

Appendix B). The assessment considers environmental, economical, social, life safety, legislation and corporate reputation as factors when scoring consequence.

Using the product of the scores for likelihood of failure (likelihood is higher as asset condition worsens) and the consequence of failure, the asset is assigned a risk rating using the ranges shown in the chart below:

Category	Range
High Risk	< 5
Medium Risk	5 – 20
Low Risk	> 20

The estimated replacement value of Administration high-risk assets is $13 million.

The City continues to prioritize the operational, maintenance and renewal needs of both the critical assets and high-risk assets to minimize health and safety risks and impacts to service delivery.

2.0 Levels of Service

This section will present levels of service as they are currently being provided by the City. Service area objective statements were developed by taking into consideration the goals, strategies and objectives defined in other overarching Council approved City plans, studies, and policies.

Stakeholder and technical levels of service, performance measures and current performance for Administration facilities are outlined in Table 5 below.
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Table 5: Levels of Service – Administration Facilities

Asset Class: Administration – Facilities								
Service Objective Statement: Providing high quality, accessible, and energy efficient facilities that are available and meet the needs of staff and community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
Reliability/Quality	Providing reliable and high-quality Administration Facilities that meet the needs of the community/stakeholders	Administration Facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Facilities are proactively maintained and reliable for intended use	Maintain Facility Condition Index (FCI) value of Fair (8%) or better	Fair (between 5% and 10%)	8% (Fair)	8% (Fair)

Asset Class: Administration – Facilities								
Service Objective Statement: Providing high quality, accessible, and energy efficient facilities that are available and meet the needs of staff and community.								
Stakeholder Value/Service Attribute	Stakeholder LoS and Measures		Stakeholder Performance Year of Measure		Technical Measure		Technical Performance Year of Measure	
	Stakeholder LoS Statement	Stakeholder Performance Measure	2023	2024	Technical PM	Target	2023	2024
Accessibility	Facilities are accessible for intended use	Description of facilities and level of accessibility	Administration Facilities include: City Hall - Public Administration. Accessible to Staff and Public. Public services hours of operation: Monday to Friday 8:30am to 4:30 pm Provincial Court House - Public Administration. Accessible to Staff and Public. Public services hours of operation: Monday to Friday 8:30am to 4:30	Administration Facilities include: City Hall - Public Administration. Accessible to Staff and Public. Public services hours of operation: Monday to Friday 8:30am to 4:30 pm Provincial Court House - Public Administration. Accessible to Staff and Public. Public services hours of operation: Monday to Friday 8:30am to	Facility meets parking needs of staff	Yes	City Hall and Provincial Courthouse - No 210 Wolfe St.- Yes	City Hall and Provincial Courthouse - No 210 Wolfe St.- Yes

Asset Class: Administration – Facilities								
Service Objective Statement: Providing high quality, accessible, and energy efficient facilities that are available and meet the needs of staff and community.								
Stakeholder Value/Service Attribute	**Stakeholder LoS and Measures**		**Stakeholder Performance Year of Measure**		**Technical Measure**		**Technical Performance Year of Measure**	
	Stakeholder LoS Statement	**Stakeholder Performance Measure**	**2023**	**2024**	**Technical PM**	**Target**	**2023**	**2024**
			pm 210 Wolfe St. - Social Services - Overflow Shelter. Accessible to Staff and Public. Public service hours of operation: 7-days a week, 10:00 pm to 8:00am.	4:30 pm 210 Wolfe St. - Social Services - Overflow Shelter. Accessible to Staff and Public. Public service hours of operation: 7-days a week, 10:00 pm to 8:00am.				
Climate Leadership	Facilities are energy efficient and demonstrate leadership on climate action	Facilities that meet our environmental objectives	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Facilities strive to lower energy usage by installing energy conservation measures that improve energy efficiency to reduce GHG emissions	Annual energy consumption per facility per square meter	Courthouse: 0.87 GJ/m2 City Hall: 0.86 GJ/m2 Wolfe St.: 0.87 GJ/m2	Courthouse: 0.76 GJ/m2 City Hall: 0.78 GJ/m2 210 Wolfe St.: 1.23 GJ/m2	Courthouse: 0.76 GJ/m2 City Hall: 0.78 GJ/m2 210 Wolfe St.: 1.23 GJ/m2

2.1 Proposed Levels of Service Assessment

Summary of LOS workshop conclusions for the Administration Facilities Area:

- Current LOS are appropriate and will establish the LOS the City proposes to provide over the next 10 years.
- Proposed LOS are aligned with service delivery objectives, legislative requirements, the Official Plan, financial policies, council approved strategic plans, policies, service area studies and are also within the City's budget constraints.
- Maintaining current LOS as the City's proposed LOS provides for consistent monitoring of service attributes, performance measures and trends, which are indicative of progress towards the achievement of defined service objectives.
- Proposed LOS will also ensure alignment with mandatory regulatory/legislative reporting requirements, such as the level of service descriptions and performance measures set forth in O.Reg 588/17 – *Asset Management Planning for Municipal Infrastructure.*
- Proposed LOS and affordability were assessed utilizing the historical 3-year average of capital investment as a baseline and projected over the 10-year forecast with a 25-year assessment to understand impacts to assets and services.
- The current funding levels are affordable over the 10-year forecast and are sufficient to deliver lifecycle management activities for Administration Facilities.
- Strategic risks and risk tradeoffs are discussed Section 3.1 of this attachment

2.2 Proposed Levels of Service – Projected Performance and Lifecycle Costs

Table 6 and Table 7 below outline Stakeholder and Technical LOS, current/proposed performance and proposed performance anticipated over the 10-year forecast based on current levels of capital funding.

Assuming no significant impacts to Facilities' funding levels will occur, it is expected that Stakeholder LOS will be maintained with no significant risk impacts to the City.

Table 6: Stakeholder LOS and Proposed 10-Year Performance

Service Attribute	Stakeholder LOS	Performance Measure	Current Performance	Expected Performance (2025-2034)
Stakeholder LOS – Administration Facilities				
Reliability/Quality	Providing reliable and high-quality Administration Facilities that meet the needs of the community/stakeholders	Administration Facilities are maintained in a state of good repair	Facilities are proactively maintained and reliable for intended use	Same level of service expected
Accessibility	Facilities are accessible for intended use	Description of facilities and level of accessibility	See below description	Same level of service expected
Accessibility Current Performance Description	Administration Facilities include: City Hall - Public Administration. Accessible to Staff and Public. Public services hours of operation: Monday to Friday 8:30am to 4:30 pm Provincial Court House - Public Administration. Accessible to Staff and Public. Public services hours of operation: Monday to Friday 8:30am to 4:30 pm 210 Wolfe St. - Social Services - Overflow Shelter. Accessible to Staff and Public. Public service hours of operation: 7-days a week, 10:00 pm to 8:00am.			

Table 7 below outlines the Administration Facilities Technical LOS lifecycle activities expected to be provided under the current levels of funding, and the expected performance over the 10-year forecast.

The proposed LOS performance level of funding is calculated using the 3-year (2022-2024) historical average of capital expenditures for undertaking like lifecycle activities as approved in the City's capital budget. The historical funding levels are assumed to be the same over the 10-yr forecast for purposes of performance projection and comparison.

Assumptions have been made for determining the projected costs to deliver services shown in the tables below. For this analysis, activities as shown in the capital budget for the year 2024 – 2026 were used except for renewal needs (sourced from lifecycle modelling as described in Section 3.1). For all other lifecycle activities, a 3-year average (2024-2026) of the budget was calculated and indexed 3% each year between 2027 – 2033. With the City approving only current year budgets, data confidence levels related to the accuracy of financial information for projected expenditures and funding sources are low. Estimations have been assumed for the LOS analysis.

Table 7: Technical LOS and Proposed 10-Year Performance

Lifecycle Activity	Purpose of Activity	Performance Measure	Proposed LOS	Proposed Performance (2025-2034)
Technical LOS – Administration				
Non-Infrastructure Solutions	Actions or policies that can lower costs or extend useful lives. Activities include strategic plans, modelling, demand analysis, etc.	Currently not measured in Technical LOS	Building Condition Assessments, facility energy monitoring, GHG Reduction Feasibility Study and CCAP being completed	Frequency of Studies likely to remain the same.
		Level of Funding:	Historical 3-yr Annual Average: $632K	Annual Average: $632K
Operations & Maintenance Activities	Activities required to deliver the service including regularly scheduled inspection and maintenance or more significant activities associated with unexpected events	Currently not measured in Technical LOS	O&M activities are carried out and funded through the operating budget. Future iterations of the AMP will incorporate operating budget investments. Costs shown are activities funded by capital for maintenance of facility signage and generator testing	Likely to remain the same in the 10-yr planning period.
		Level of Funding:	Historical 3-yr Annual Average: $50K	Annual Average: $50K
Renewals	Significant repairs are designated to extend the life of the asset. Activities that are expected to occur once an	Maintain minimum facility condition index of Fair (8%)	8% (Fair)	Facility conditions are projected to decline over the 10-yr planning period at current levels of funding. Forecasted needs indicate

	asset has reached the end of its useful life.			increasing costs for asset renewals.
		Level of Funding:	Historical 3-yr Annual Average: $298K	Annual Average: $578K
Disposals	Activities associated with disposing of an asset one it has reached the end of its useful life or is otherwise no longer needed by the City	Currently not measured in Technical LOS	No disposals planned for the 10-yr period	No disposals planned for the 10-yr period
		Level of Funding:	Historical 3-yr Annual Average: $0	Annual Average: $0
Growth/Service Improvements	Capacity/ service improvements Support development and growth	Currently not measured in Technical LOS	Accessibility improvements completed as required.	Same level of service expected
		Level of Funding:	Historical 3-yr Annual Average: $25K	Annual Average: $25K

Service levels, historical level of funding, and performance are monitored as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged that changing circumstances such as technologies and stakeholder priorities will change over time.

3.0 Asset Management Strategies – Administration Facilities

The following table describes the current strategies and activities for Administration facilities. Options for which lifecycle activities that could potentially be undertaken are based on recommendations from the most recent building condition assessments and

facility management best practices. The following table below documents the set of planned actions or 'activities' that the City undertakes to sustain current levels of service, while managing risk at the lowest lifecycle cost. The City plans the necessary lifecycle activities at the required time and does not need to alter the *type* of activity undertaken. However, with limited funding available, the interval and timing of the necessary lifecycle activities are affected, which can have an overall impact on the performance of the asset(s) over its useful life.

Table 8: Administration Facilities– Asset Management Lifecycle Strategies

Strategy Type	Current Practice
Non-infrastructure Solutions Actions or policies that can lower costs or extend asset life (e.g. better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc.).	· Building condition assessment program
	· Linking the asset management plan to other studies, master plans and strategies
	· Public consultation on levels of service
	· Needs studies to assess community needs and how services are being delivered to the community
	· Integrating asset management planning to drive lifecycle activities
	· Integrating infrastructure and land use planning
	· Educate staff on climate change initiatives and energy efficiency opportunities with respect to building operations/ownership
Maintenance Activities Activities include regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.	· Preventative and corrective maintenance programs for facilities
	· Service contracts for building life-safety and security alarm systems, elevating systems, and code/regulated building elements
	· Basic custodial services
	· Seasonal maintenance contracts such as snow clearing and cleaning
	· Service contracts for pest control and landscaping maintenance
Renewals/Rehabilitation: Includes significant repairs designed to extend the life of the asset (e.g. the lining of iron watermains can defer the need for replacement).	· Renewal of facility elements or sub-systems such as structures, roofs, building exteriors, building services (HVAC, plumbing, electrical), interior finishes and sitework that are at the end of their useful life and renewal does not improve/expand the intended service initially provided
	· Upgrading projects focus on removing asset exposure to elements

Strategy Type	Current Practice
Replacement Activities that are expected to occur once an asset has reached the end of its useful life and renewal/rehabilitation is no longer an option.	· Facility components replaced when at end of useful life through capital planning/business case (as identified through BCAs)
	· Replacement due to obsolescence or does not meet minimum design standards/intent
	· Replacements considered within the context of the facility
	· Asset replacement is coordinated with planned expansion wherever possible
	· Asset replacement is bundled with other dependent assets wherever possible
	· Operating vs. Replacement cost comparison
Disposals/Abandonment Policies Activities associated with disposing of an asset once it has reached the end of its useful life or is otherwise no longer needed by the municipality.	· Facilities that are no longer needed for the intended service are either sold, re-purposed or demolished
Expansion Programs Planned activities required to extend the services to previously un-serviced areas – or expand services to meet growth demands.	· Expansion when facility has reached its functional capacity and expansion is necessary for continued delivery of service
	· Changes to accessibility requirements for public buildings where identified and there is an opportunity to do so.
	· Changes to building components to increase energy efficiency (ex. LED lighting, etc.) where possible
	· Expansion of renewable energy programs and systems to reduce energy costs for operation where possible
Future Strategies	-n/a

3.1 Lifecycle Models, Interventions, and Cost of Service:

Overview of Lifecycle Models

Service area lifecycle models have been developed in which asset intervention thresholds and associated costs for lifecycle activities (rehabilitation and replacement) are documented.

Lifecycle models are mathematical, statistical and logic models of planned actions and of asset deterioration over time. This helps the City to forecast required asset lifecycle activities and their impacts on levels of service, risk, and funding needs. In short, lifecycle models are mathematical representation of the City's *Lifecycle Activities*.

Overview of Interventions

Interventions represent the major lifecycle activities carried out for assets over their service life and are typically accounted for as part of the capital planning process. The term 'intervention threshold' or 'intervention trigger' are used interchangeably, and they describe a point in an asset's lifecycle when the intervention typically occurs.

When an asset degrades and an intervention threshold is reached, the asset will require treatment (i.e., repair or rehabilitation). After the treatment is applied, the performance (condition) of that asset will increase to a higher value, at which point it will continue to degrade. This will extend the overall estimated service life (ESL) of the asset.

The costs associated with interventions can be used to establish capital funding needs and determine the most cost-effective solution to maintain level of service targets. Costs for thresholds were derived from the City's historical financial information for actual or similar interventions where available and applicable. Where replacement activities are determined, asset replacement costs were used.

3.2 Summary of Lifecycle Management Activities and Costs of Service – Proposed LOS

The options analysis of the lifecycle activities that could be undertaken were reviewed with the Facilities subject matter experts. Lifecycle activity options were discussed and determined that the current planned activities are appropriate and the most cost-effective option(s).

Non-Infrastructure Plan

Non-infrastructure activities include actions or policies that can lower costs or extend asset life. Examples include better integrated facility condition assessments, needs studies to

assess community needs, land use planning and demand management, process optimization, etc.

Current funding levels are adequate to address non-infrastructure solution needs over the 10-year forecast. Future studies, plans and needs assessments are required to better assess community needs and existing infrastructure.

Refer to Table 8: Administration Facilities – Asset Management Lifecycle Strategies for more details on Non-Infrastructure Solution activities.

Operations and Maintenance Plan

Operation and maintenance include regular activities to provide services and includes all actions necessary for retaining assets as near as practicable to an appropriate service condition including ongoing day-to-day work necessary to keep assets operating. Examples include preventative maintenance programs for facility HVAC, plumbing and electrical assets, landscape maintenance, snow clearing, etc.

Refer to Table 8: Administration Facilities – Asset Management Lifecycle Strategies for more details on Operating and Maintenance activities.

Future iterations of the Plan will incorporate the City's Operating budget to better understand historical operating and maintenance costs. Where budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this Plan.

Renewal/Replacement Plan

Renewal is major capital work which 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 over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional operating and maintenance costs.

Current funding levels for existing assets are not sufficient to address renewal needs over the 10-year planning period. Over the long-term forecast, it is expected that asset conditions will decline as they age and will likely require increased funding to sustain assets in a state of good repair. As assets are acquired, the City will plan to allocate sufficient funds for the future renewal needs over the life of the assets. Where deferred renewals/replacements take place, the City is committed to ensuring that risks are minimized where possible and stakeholders are aware of service alternatives.

Disposal Plan

Disposal includes any activity associated with the disposal or decommissioning of an asset including sale, demolition or relocation. Individual tangible assets identified for

possible decommissioning are identified by each service area and incorporated in the capital budget as necessary.

Expansion/Acquisition Plan

Expansion/acquisition activities include planned activities required to extend the services to previously un-serviced areas or expand services to meet growth demands or address service improvements. Examples include facility expansions, relocations to a larger facility to address capacity deficiencies, etc. Funding for future operation, maintenance, and the renewal of new acquisitions will need to be accommodated in both capital and operating budgets to ensure long-term sustainability and levels of service are achieved.

There are no planned expansion activities over the 10-year planning period for Administration Facilities.

The total costs to deliver proposed LOS per year over the 10-year forecast are summarized in Table 9 below. Shortfalls between lifecycle activity costing and funding levels is the basis of the discussion on achieving balance between costs, LOS and risk to achieve the best value outcome.

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Table 9: Administration Facilities Total Lifecycle Activity Costs and Projected Funding – Proposed Levels of Service

Administration Facilities	**Forecast Year ($M)**										
Projected Funding	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**Annual Average**
Administration Facilities	$1.0	$1.0	$1.1	$1.1	$1.1	$1.2	$1.2	$1.2	$1.3	$1.3	$1.2
Total Proposed Funding	$1.0	$1.0	$1.1	$1.1	$1.1	$1.2	$1.2	$1.2	$1.3	$1.3	**$1.2**
Lifecycle Costs											
Administration Facilities	$1.2	$1.7	$0.7	$1.2	$1.2	$1.3	$1.3	$1.3	$1.4	$1.4	$1.3
Total Lifecycle Costs	$1.2	$1.7	$0.7	$1.2	$1.2	$1.3	$1.3	$1.3	$1.4	$1.4	$1.3
Funding Shortfall	**-$0.2**	**-$0.7**	**$0.4**	**-$0.1**	**-$0.1**	**-$0.1**	**-$0.1**	**-$0.1**	**-$0.1**	**-$0.1**	**-$0.1**

Based on the lifecycle assessment of the Administration Facilities, it is estimated that the City would need to spend an average of $1.3 million per year to deliver LOS over the 10-yr forecast. The average annual funding is an estimated $1.2 million, leaving an average shortfall of $0.1 million per year. Average annual funding is calculated using the 3-year historical (2022-2024) level of capital funding for similar lifecycle activities and used as a proxy for the forecast.

Assuming current levels of funding remain consistent, service levels related to renewals will likely decline without intervention over the long term (beyond 10-year outlook). Increased funding for renewals will be required to achieve targets and minimize service risks. As Administration Facility components are acquired and renewed, the planned maintenance budget should be increased from year to year to perform the pro-active preventative maintenance measures.

3.1 Asset Management Strategies and Associated Risks

Strategic Risks

Strategic level risks are events or scenarios that may impact the ability of the City to deliver asset management strategies and minimize costs.

Potential strategic level risks associated with the City's ability to effectively **deliver Administration facility levels of service are (but not limited to):**

- Insufficient funding levels
- Insufficient staffing and resources to responsibly implement facility lifecycle strategies
- Growth not considered when establishing facility needs
- External/environmental factors such as climate change effects (more severe and more frequent weather instances, flooding) that could cause physical damage to facilities

Impacts associated with above risks include:

- Further/accelerated asset deterioration
- Increased backlog of work
- Increased treatment costs
- Level of treatment changes requiring increased resources/costs (maintenance now needing replacement)
- Planned budget/needs forecast not reflective of actual asset needs
- Additional assets/expansion of services required
- Reputation/image negatively affected
- Service interruptions

Risk Trade Offs

If the identified lifecycle activities (operations, maintenance, renewal, and other capital projects) are not undertaken, they may sustain or create risk consequences. These risk consequences may include (but not limited to):

- Major delays/service interruptions to public services delivered from City Hall, Provincial Court House
- Lack of public communications internally and externally
- Non-compliance with legislation (e.g. election related services)
- Backlog of court case/ court support services
- Delays/interruptions to other services that depend on the administrative work of the Recreation Division located at 210 Wolfe Street
- Reputation/image negatively affected

- Lack of public confidence
- Reduced staff morale

Managing the Risks

The projected lifecycle costs for the Administration Facility service area minimally exceed the current levels of funding over the short term (10-yr forecast) and long-term. Lifecycle activities that are underfunded are related to the renewals of existing facility HVAC and exterior facade elements for City Hall, and HVAC, interior finishes and parking lot renewals at the Provincial Court house. It is expected that operation and preventative maintenance investments will increase in the long-term due to ageing assets falling into condition ranges that are below acceptable standards, and due to the acquisition of new assets to support growth demands.

Where a shortfall in funding is identified, the City will endeavour to manage risks within available funding by:

- Seeking approval for additional capital and operating funds to carry out major operational, preventative maintenance, renewal and service improvement program activities for existing assets and as new assets are acquired.

- Prioritizing capital projects that have pre-committed expenditures and seek efficiencies in completing facility renewal and expansion projects together to minimize costs

- Prioritize health and safety, legislative and regulatory requirements as they relate to managing the lifecycle of facility assets.

Risks relating to Administration Facility building elements and infrastructure failures are mitigated though condition assessment programs and maintenance programs (legislated and best practices) which provide the data necessary to plan the actions at the right time to achieve the determined levels of services. Primarily, risks are financial in nature and without planned, adequate levels of funding, strategies are potentially at risk for limited implementation (or no implementation at all), resulting in the delivery of lower levels of service to stakeholders.

All City services, including services delivered from Administrative facilities are reviewed and identified in the City's Business Continuity Plan (BCP) and prioritization process. The BCP identifies the key business interruption impacts, recovery time objectives, dependencies, available qualified resources, and a resource back up strategy should there be disruption to services. The BCP is reviewed and updated regularly to ensure

that alternate locations are available where required and critical services are not interrupted, minimizing risks.

The choice of strategy for operating and maintaining Administration facilities considers the risk of failure of the assets, the risk to service delivery and the risk to other services dependant on this service area. Strategies implemented are at the lowest cost in order to reduce the burden on the tax base and user fees where possible and to maintain the current levels of service.

A full detailed, documented risk analysis in which the identification of credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and the development of a risk treatment plan for non-acceptable risks is planned and will be included in future versions of the asset management plan when completed.