ASSET MANAGEMENT PLAN

City of Cambridge

December 2019

CAMBRIDGE CANADA
PEOPLE • PLACE • PROSPERITY

cambridge.ca

Document Review and Approval

Revision history

Version	Author	Date	Revision

Cambridge at a Glance

The City of Cambridge (the City) was officially formed by the Province of Ontario on January 1, 1973. Made up of the former communities of Galt, Preston, Hespeler and Blair, the history of this area dates to a far earlier period.

Today, Cambridge is a modern, inclusive city with a rich architectural heritage providing a window to that past. Economic diversity, natural beauty, and vibrant culture has helped to make Cambridge the second largest community within the fast-growing Waterloo Region with a population of approximately 130,000 people, and 49,000 households as of 2018[1].

Managing Our Assets

Our City provides essential services for our communities that enable its strategic vision of "a place for people to prosper". The sustainable delivery of these services is dependent on a wide range of assets that must be managed effectively and maintained in a good state of repair in order to meet expectations. The management of these assets is influenced by a range of factors that impact the cost of service delivery and requires the City to proactively coordinate its planning to balance expenditures, services, and risk across its diversified portfolio of assets – a process referred to as Asset Management.

The City has long recognized the need for effective asset management to sustain effective service delivery and has adopted increasingly progressive strategies in the last 10 years through application of leading asset management practices. Refer to Figure 1 for our asset management journey over the last 10 years.

Figure 1: City of Cambridge asset management timeline

[1]Statistics Canada, Census Profile, 2016 Census, Retrieved from: https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=3530010&Geo2=CD&Code2=3530&Data=Count&SearchText=Cambridge&SearchType=Begins&SearchPR=01&B1=Population&Custom=&TABID=1

Advancing Asset Management

We are proud contributors to the knowledge and communities of asset management. We actively participate in industry organizations, and share knowledge, experience and leading practices through conference presentations, partnerships and research initiatives in the field of asset management. We have engaged in initiatives to share our experiences and develop the asset management leading practices with the following organizations:

- Institute of Asset Management
- Canadian Network of Asset Managers
- Asset Management Ontario
- National Water & Wastewater Benchmarking Initiative

Through our dedicated application of leading practices and industry collaboration, we remain committed to sharing of knowledge and advancement of an asset management culture to deliver our communities essential services.

Executive Summary

The City of Cambridge is responsible for providing our communities of approximately 130,000 residents with essential services needed to realize our vision of a place for people to prosper. Our infrastructure assets with a replacement value of $2.7 billion are the foundation for delivery of these vital services and we must therefore ensure appropriate investment is planned to renew our assets and enhance our portfolio as needed to maintain these services.

We have long recognized the benefits of adopting leading practice with respect to asset management. This includes working progressively to implement leading practice approaches that support sustainable service delivery efficiently while managing risks.

With the introduction of Ontario Regulation 588/17 for Asset Management, we have furthered our approaches to develop an updated asset management plan that is fully compliant with requirements of the first regulation milestone in 2021 and presents advanced compliance with future milestones for specified asset areas. At the same time, we have undertaken an assessment to determine areas in need of additional development to achieve compliance and will be implementing improvement plans to develop the capabilities needed to ensure compliance in advance of the future regulation milestones.

As assets age, their condition degrades which can ultimately impact service delivery. We have adopted leading processes and technologies for condition assessment of assets to gain valuable ongoing insight into the state of our infrastructure that informs our monitoring and management of levels of service ("LoS") and planning for investment in new and existing infrastructure. The application of these techniques on our assets indicates a decline in the overall condition of our assets, however maintaining a Good condition rating overall. In 2017, approximately 74% of assets rated as being in very good or good condition, which has since fallen to 70%. Meanwhile, in 2017 the City had 9% of its assets rated as in poor or very poor condition, and this has since increased to 11%.

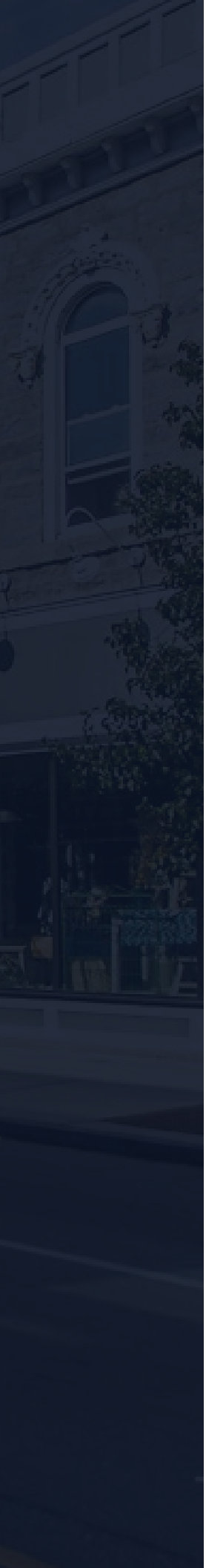
The current condition of our infrastructure assets informs the analysis of the financial investment needed for asset renewal to sustain the current level of service over the 10 year planning period. The resulting analysis for

this AMP indicates a total investment need of $496.5 million for all service areas in the period 2020-2029 (excluding development charges).

Our Capital Investment Plan 2020-2029 draws on multiple funding sources including capital levies, water and wastewater capital reserves, federal gas tax grants and other reserves to fund $346.1 million (excluding development charges) of these needs. In addition, the plan also has a provision of $45.3 million over next 10 years in debt financing to minimize infrastructure financing gap. Our drinking water and wastewater infrastructure needs are fully funded through the long-range financial plans for the 10 year period to 2029 as such additional $12.9 million required for water and wastewater infrastructure will be provided through future capital investment plan. The resulting gap between our assessed investment needs and current capital investment funding demonstrates that we are challenged to meet investment needs in key areas such as transportation, environmental services, recreation and resource management with a funding gap of $92.2 million.

We continuously assess opportunities for additional funding options and revenue streams to address our funding gaps. We have assessed a range of funding options to meet the funding gap identified through this asset management plan, these include options that have successfully been applied by other municipalities such as stormwater management funding, special infrastructure levies or increased capital levies, user rates and fees, debt financing, sponsorship strategies and partnerships among others. We will continue to review options for implementation of these strategies and report on our progress to utilize these sources for management of our funding gap in future revisions of our Asset Management Plan.

We are pleased to present an asset management plan to our communities and stakeholders that is fully compliant with all requirements of the initial regulation milestones for 2021 and many of those for future milestones. As we progress to the future milestones we will ensure a well governed plan that manages implementation risks to meet our outstanding requirements in advance of the upcoming milestones and support our efforts to close our financial gap, improve our LoS and enhance interaction with our communities about the services we deliver.



Contents

Appendices

Figures

Tables

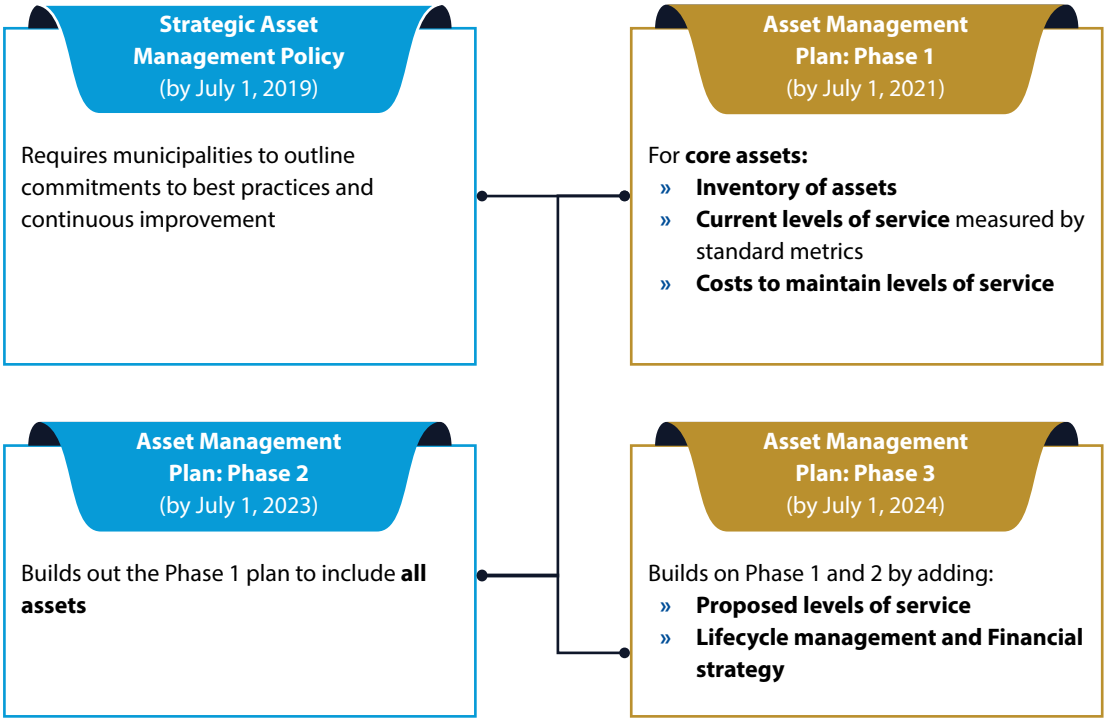
Introduction

This Asset Management Plan ("AMP") describes our approach to effectively plan for our assets to secure our stated strategic outcomes and deliver expected services in compliance with the requirements set out in the newly introduced regulation, and will replace the AMP developed in 2013.

Overview of Ontario Asset Management Regulation

Under the Infrastructure for Jobs and Prosperity Act, 2015, the province published Regulation 588/17 'Asset Management Planning for Municipal Infrastructure' ("O.Reg.588/17") in December 2017[2]. The regulation outlines specific requirements and content to be featured in each of these documents over a phased period until 2025 as illustrated in Figure 2.

Figure 2: Ontario Asset Management Regulation Overview



This regulation requires every municipality to prepare a Strategic Asset Management Policy and an Asset Management Plan linked to their strategic objectives with the expectation that outputs of the asset management planning process inform financial long-term and budgetary planning processes. The City is currently in the process of revising its "Strategic Plan 2016-2019 Cambridge Connected: Our Vision, Our Voice" in order to identify and prioritize action items for 2020-2024. This Strategic Plan document has been used to shape the development of a fully compliant Strategic Asset Management Policy adopted in April 2019, as well as this Asset Management Plan.

[2]Government of Ontario. O.Reg.588/17: Asset Management Planning for Municipal Infrastructure, filed December 27, 2017, under Infrastructure for Jobs and Prosperity Act, 2015, S.O. 2015, c.15. Retrieved from: https://www.ontario.ca/laws/regulation/r17588

The structure and sequence of the regulation's requirements is highlighted below along with our compliant documents.

Figure 3: Structure and Sequence of O.Reg.588/17 Requirements

The City is advancing its approaches in asset management to achieve early compliance with the regulation while developing a continuous improvement program to improve its approach to targeting investment for today and ensuring future generations have infrastructure that is well taken care of and operates efficiently and effectively.

O.Reg.588/17 AM System	**Organizational Strategic Plan** *Vision, mission and values, business policies stakeholder requirements, goals and risk management*	**Strategic Asset Management Policy** *Published commitment, mandated requirements, link between strategic objectives and priorities to improve asset management planning*	**Asset Management Plans** *Tactical plans guiding use of the asset management system in life cycle planning to deliver agreed level of service and achieve asset management objectives.*	**Annual Budget** *The outputs of the asset management process are expected to inform the budgeting process*
Cambridge AM System	**Connected Cambridge Our Voice Our Vision, Strategic Plan 2016 2019**	**City of Cambridge Strategic Asset Management Policy *April 2019***	**Asset Management Plan *2019***	**Cambridge Capital Investment Plan and Operating Budget**

Purpose of the Asset Management Plan

This Asset Management Plan has been drafted in compliance with the O.Reg.588/17. It is a comprehensive, strategic document outlining how our assets are to be managed over a 20-year planning horizon to maintain service delivery. The process of developing an AMP fosters a long-term perspective that enables capital and operational sustainability and efficiency. It seeks to achieve the following outcomes.

Figure 4: Asset Management Plan Outcomes

01 Commitment and Consistency
Committing the City to support the implementation of asset management methods that are consistent with the organization in order to Implement the goals and objectives of our Strategic Plan informed by community and Council priorities.

02 Transparency and Accountability
Provide transparency and accountability and to demonstrate to stakeholders the legitimacy of decision-making processes which combine strategic plans, budgets, service levels and risks

03 Stakeholder Communication
Communicate the endorsed management principles and approach to stakeholders

04 Strategic Framework
Provide a framework for implementing asset management to enable a consistent and strategic approach while developing an Asset Management culture at all levels of the organization

05 Service Sustainability & Affordability
Embed asset management principles for a sustainable approach to service delivery that delivers optimal value for our stakeholders while maintaining affordability

Scope of the Asset Management Plan

As the City's AMP, it focuses on the approaches adopted for effective management of infrastructure, facilities and assets directly owned and/or managed by the City of Cambridge to deliver levels of service ("LoS") and support future growth. This AMP focuses on the services provided directly by the City and so, we have outlined the services provided by the City and the Region of Waterloo to provide clarity.

While the regulation requires full compliance of all non-core assets in the AMP by 2023, the City has included its non-core assets within this AMP to demonstrate its commitment to advance efforts in effective planning for all of the services provided by the City and its associated assets. In addition, inclusion of the non-core assets has provided a valuable early opportunity for us to identify gaps and develop a road map for organizational readiness to meet O.Reg.588/17 for all assets prior to the established deadline.

The best possible information currently available has been presented for non-core assets in this plan. Future revisions of the plan will see improved planning and processes for non-core assets as improvement initiatives currently underway are realized and incorporated. Table 1 presents a summary of the assets and service areas classed as core and non-core. The comprehensive list of assets in each area is located in Additional Appendix G.

- **Transportation** (parking, roads, sidewalks, street lighting, traffic management, trails, and winter maintenance)
- **Environmental Services** (stormwater, wastewater, water)
- **Emergency Services** (city-wide emergency planning and management, and fire services)
- **Parks** (parks, sports fields, play grounds, cemeteries, forestry, horticulture)
- **Recreation & Culture** (arenas, pools, community/ senior centre, market, theatre, museums etc.)
- **Libraries**
- **City Support Services** (economic development, land development, planning services, and tourism)

- **Regional Transportation** (including Waterloo Regional International Airport, Grand River Transit, ION, and regional roads)
- **Waste Management and Water/Waste Water Treatment**
- **Regional Police and Emergency Response Services** (paramedics)
- **Public Health and Social Services** (harm reduction and affordable services)
- **Regional Planning** (including environmental and economic development)

Table 1: Core and non-core assets

	Service Area	Asset Class	Infrastructure Summary
Core Assets	Transportation	Roads	The road assets are used by both local and transient users to allow people to travel through and around Cambridge via our road network including bridges and major culverts, street lighting etc.
		Active Transportation	Assets that enable travel around Cambridge through biking and/or walking. Assets include sidewalks, walkways, trails, and pedestrian bridges.
		Parking	Parking lots or street parking to provide drivers a place to park their vehicles around Cambridge.
	Environmental Services	Stormwater	The infrastructure that delivers stormwater services to the community via pipe network, culverts and ponds (stormwater management facilities).
		Drinking water	The assets that deliver drinking water services to the community, via pipe network, service connections and metering infrastructure. Treatment plants, pumping stations and storage facilities are owned by the Region of Waterloo, so are not considered as part of this AMP.
		Wastewater	The assets that deliver wastewater services to the community, via pipe network and pumping stations. Wastewater treatment plants are owned by the Region of Waterloo, so are not considered as part of this AMP.
Non-Core Assets	Emergency Services	Fire Protection	Fire stations and fleet used to respond to and deal with emergencies when they occur.
	Parks	Cemeteries	Assets to provide the community with methods to dispose of human remains in a dignified way.
		Parks	Assets that provide natural areas and green spaces for leisure pursuits and outdoor activities.
		Forestry & Horticulture	Tree assets, horticulture beds and planters that provide natural areas that benefit the community and the environment
		Outdoor Recreation	Assets that provide space for outdoor activities for the community including bike and skateboard parks, sports fields, play grounds etc.
	Recreation & Culture	Indoor Recreation & Culture	Assets serving the purposes of indoor recreational pursuits. Assets include arenas, pools, libraries, community/senior centres, theatres, the market etc.
	Resource Management	Corporate Facilities	The assets that enable the City of Cambridge to provide the amenities and services. Assets include corporate facilities and leased buildings.
		Fleet and Equipment	The assets that support the City in delivering the amenities and services. Assets include vehicles and equipment.
		Information and Communications Technology Infrastructure	The assets that provide communications and connectivity to enable the City of Cambridge to deliver services. Assets include IT equipment.

Table 2 provides a summary of the information required for the AMP in accordance with O.Reg.588/17. The following sections of this document describe the processes used to determine and manage the infrastructure needs for the City's assets. The Asset Specific Appendices (A-F) provide the information for each asset category as required by the regulation in Table 2. In cases for non-core assets where compliance is not required until 2023 and information is not currently available to meet these requirements, this will be highlighted in the individual Asset Specific Appendices.

Table 2: Required information for AMP

Summary of AMP Requirements	Section of AMP
General	
The municipality shall prepare an asset management plan in respect of its core municipal infrastructure assets by July 1, 2021 (Phase 1), and in respect of all of its other municipal infrastructure assets by July 1, 2023 (Phase 2). The municipality shall prepare a revised asset management plan for July 1, 2024 (Phase 3) to include proposed levels of service, financial strategy and asset lifecycle management strategy.	Appendices A-F
The municipality must post its current strategic asset management policy by July 1, 2019 and asset management plan on a website that is available to the public, and shall provide a copy of the policy and plan to any person who requests it.	Plan Governance
The municipality shall review and update its asset management plan at least five years after the year in which the plan is completed and at least every five years thereafter.	Plan Governance
Every asset management plan prepared or updated, must be, » endorsed by the executive lead of the municipality; and » approved by a resolution passed by the municipal council.	Plan Governance
Every municipal council shall conduct an annual review of its asset management progress on or before July 1 in each year, starting the year after the municipality's asset management plan is completed.	Plan Governance
The annual review must address: » The municipality's progress in implementing its asset management plan; » any factors impeding the municipality's ability to implement its asset management plan; and » a strategy to address the factors impeding municipalities' ability to implement its asset management plan.	Plan Governance
Levels of Service	
Current Levels of Service **Required for Phase 1 for core assets, Phase 2 for non-core assets:** For each asset category, the current levels of service being provided, determined in accordance with qualitative descriptions and technical metrics, based on data within the past two calendar years; » With respect to core municipal infrastructure assets, the qualitative descriptions and the technical metrics set out in the Regulation. » With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality. The current performance of each asset category, determined in accordance with the performance measures established by the municipality, based on data within the past two calendar years.	Levels of Service Appendices A-F
Proposed Levels of Service **Required for Phase 3 (July 1, 2024):** For each asset category, the levels of service that the municipality proposes to provide for each of the 10 years following, is included in the asset management plan, determined in accordance with the following qualitative descriptions and technical metrics: » With respect to core municipal infrastructure assets, the qualitative descriptions and the technical metrics set out in the Regulation. » With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.	Levels of Service Appendices A-F

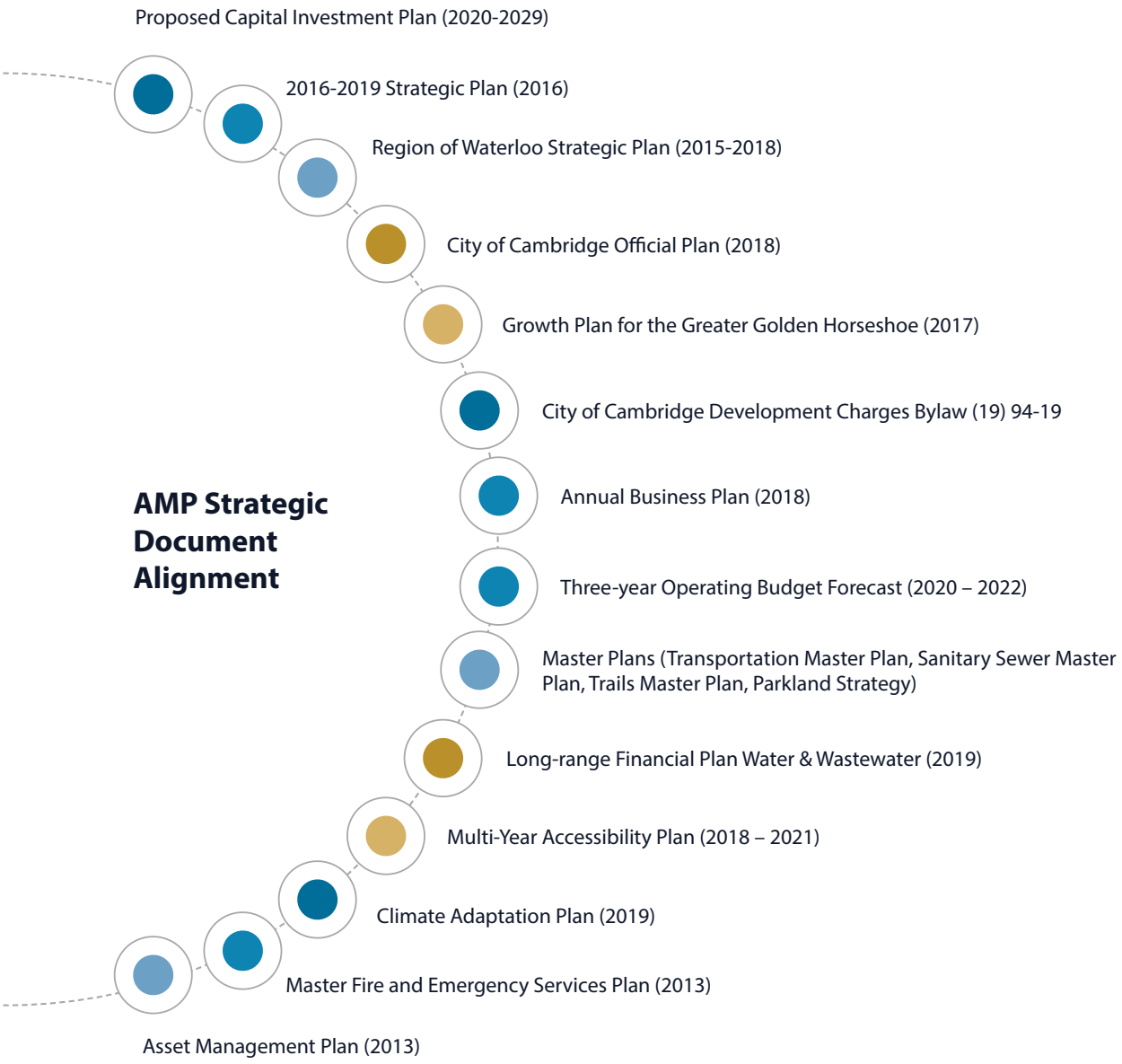
Table 2: Required information for AMP (contd.)

Summary of AMP Requirements	Section of AMP
Levels of Service	
Proposed Levels of Service **Required for Phase 3 (July 1, 2024):** An explanation of why the proposed levels of service are appropriate for the municipality, based on an assessment of the following: » The options for the proposed levels of service and the risks associated with those options to the long-term sustainability of the municipality » How the proposed levels of service differ from the current levels of service » Whether the proposed levels of service are achievable » The municipality's ability to afford the proposed levels of service.	Levels of Service Appendices A-F
Required for Phase 3 (July 1, 2024): The proposed performance of each asset category for each year of the 10-year period, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency.	Levels of Service Appendices A-F
State of Infrastructure	
Required for Phase 1 for core assets, Phase 2 for non-core assets: For each asset category: » A summary of the assets in each category » The replacement costs of the assets in the category » The average age of the assets in the category » The information available on the condition of the assets in the category » A description of the municipality's approach to assessing the condition of the assets in the category	State of Infrastructure Appendices A-F
Asset Lifecycle Management Strategy	
Required for Phase 3 (July 1, 2024): For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service for the next 10 years and the costs of providing those activities based on an assessment of the following: » The full lifecycle of the assets; » The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service; » The risks associated with the options for lifecycle activities; and » The lifecycle activities defined that can be undertaken for the lowest cost to maintain the current levels of service.	Asset Lifecycle Management Strategy Appendices A-F
Financial Strategy	
Required for Phase 3 (July 1, 2024): For each of the 10 years following the year for which the current levels of service are determined, the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth, including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets.	Financial Strategy Appendices A-F
Required for Phase 3 (July 1, 2024): An identification of the annual funding projected to be available to undertake lifecycle activities and an explanation of the options examined by Cambridge to maximize the funding projected to be available	Financial Strategy Appendices A-F
Required for Phase 3 (July 1, 2024): If, based on the funding projected to be available, the municipality identifies a funding shortfall for the lifecycle activities, » An identification of the lifecycle activities that the municipality will undertake, and » If applicable, an explanation of how the municipality will manage the risks associated with not undertaking any of the lifecycle activities.	Financial Strategy Appendices A-F

Strategic Planning Alignment

We are engaged in a range of planning processes designed to meet regulations, strategic objectives and communicate our approach to planning for successful outcomes on multiple initiatives. As many of these planning processes have implications for the City's assets, it is important that the commitments made with these plans are fully integrated within the AMP. The Asset Management Policy we have adopted encompasses the goals that have been identified in existing strategic documents. The document will further integrate those commitments through assessing the impacts and requirements on assets that should be considered in future financial planning for assets. Figure 5 highlights the strategic documents in place at the City with a linkage to the AMP. A full description of the linkage between each of these documents and the AMP is featured in Additional Appendix H.

Figure 5: Strategic documents at the City



Navigating the Asset Management Plan

The AMP consists of three main components outlined in Figure 6 with a description of the content located in each component.

Figure 6: AMP structure

Main Body

This document describes the City's approaches to effective asset management planning to deliver its strategic outcomes. Each section within the main body provides the relevant information required by and refers to all asset groups. Where necessary, the reader will be referred to the appendices for additional information.

01

Asset Specific Appendices (A-F)

Appendices A-F of this document provide information on each of the asset portfolios under ownership or management by the City. These sections provide all of the information specified by the regulation for core assets and the currently available information for non-core assets. Where necessary, the reader will be referred to the appendices for additional information.

02

Additional Appendices (G-L)

Appendices G-L provide additional information referenced in the preceding sections of the main body in relation to the asset hierarchy, the strategic planning alignment documentation, the basic asset attributes list, and the asset maps.

03

State of Infrastructure

This section is intended to provide insight into the condition and details regarding the City's municipal infrastructure at this point in time, providing a greater level of awareness into the service areas that are performing well and those that will require greater investment. An understanding of important infrastructure metrics, such as replacement value or condition, is critical as it serves as a basis for lifecycle management strategies and long-term financial planning. O.Reg.588/17 requires that the City outline the following information for each asset category:

- A summary of the assets in the category;
- The replacement costs of the assets;
- The average age of the assets, determined by assessing the average age of the components of the assets;
- The information available on the condition of the assets; and
- A description of the City's approach to assessing the condition of assets in the category, based on recognized and generally accepted good engineering practices where appropriate.

In compliance with the Regulation, this section contains summaries of asset categories and condition assessment approaches, as well as quantitative outputs, such as asset replacement costs, average age, and condition information. Details on the state of infrastructure can be found in the Asset Specific Appendices that follow.

Asset Data Management

The effective management of assets relies on the processing of large volumes of data and information related to our assets such as their condition, costs, and repair and maintenance activity. This information plays a critical role in providing an understanding of assets to support decision-making and targeting investment where it is most needed to meet our community priorities. Our asset management, therefore, relies on the processes and systems that help us collect, manage and report this information effectively.

The application of appropriate data is critical to effective asset management – it provides vital information and insight into asset condition and capability to sustain service to target effective solutions and support effective decision-making. The effective management of data is therefore a critical process to support asset management. In recognition of this importance, the City has implemented an Asset Information Management Process describing the objectives, standards, definitions, and expectations relating to information management for assets.

Asset Attributes

To support consistency across asset classes, Cambridge maintains a database of key attributes for each asset.

Basic Information (Asset ID, Description, Status, Ownership, Size, Material, and Maintenance Responsibility)

Location Information (based on Address, Road Segment, Utility Corridor, Park Name, etc.)

Asset Source and Rehabilitation History (Construction Year, Construction Year Estimate if Construction Year is unknown, Project ID, Regulation Plan ID, Warranty Start, Warranty End, Last Treatment Type, Last Treatment Year)

Asset Valuation (Current Replacement Cost and Replacement Cost Year)

Condition (Asset Condition, Last Inspection Date, Remaining Service Life)

Risk Profile (Consequence of Failure, Asset Risk Score)

Lifecycle Information (Replacement Year Life, Replacement Year Condition, Next Replacement Year)

Tangible Capital Asset (TCA) Information (TCA Class, TCA Category, TCA Status, FIR Code).

Appendix I – Basic Asset Attributes List contains definitions of these attributes.

Identification

Each asset has a unique identifier for its lifecycle consisting of a two-digit asset code (e.g. 'SP' for Sanitary Pipe) and a one to five digit numeric code. The information stored within systems is integrated using this unique identifier.

Status

All assets within the system have a 'Status' column to record existing servicing status. Once an asset has been recorded in the system, it shall never be deleted, unless it was added due to a recording error. When an asset is removed or decommissioned, the status of the asset is changed to 'Removed' or 'Abandoned'. The following are valid system status values:

- **Planned:** The asset is planned to be installed, constructed, acquired, or currently under instruction
- **In Service:** The asset is currently providing its intended service to the end user(s)
- **Out of Service:** The asset is temporarily taken out of service but will be put back in service at some point
- **Abandoned:** The asset is abandoned and there is no plan to use it for providing any future service(s)
- **Removed:** The asset is permanently removed from its service location and disposed.

Data Administration and Management Controls

The City understands that maintaining its data and continuously improving its accuracy results in more informed decision-making for assets and service delivery investment. As such, the IT protocols in place at the City safeguard access to the systems maintaining asset data to ensure access is extended solely to valid users and prohibits invalid users. Through effective identity management, the City creates, provisions and controls different users, roles, groups for its asset systems. Any access to asset data is restricted to the permissions included within user role profiles.

In most cases, the Asset Management division of the City is responsible for asset creation and changes such as updates or removal of the asset. They also function as the core users with capability to approve user requests for updates. All other users are typically granted access to view and report information only.

Inventory Overview

Cambridge routinely monitors the condition and state of its assets through well-defined processes for collection and management of asset information. Information gathered from these processes are reported in compliance with state of infrastructure reporting every two years.

Table 3 provides further information about the condition, average age and replacement value for the asset types within each service area.

Table 3: Asset Portfolio Summary

Service Area	Asset Class	Asset Quantity	Average Age	Replacement Cost ($'000s)	Condition
Transportation	Active Transportation	665 km of sidewalk 9 km of walkway 104 km of trails 47 pedestrian bridges	28 years	$594,614	Good
	Roads	1,006 lane-km pavement 604 retaining walls 26 bridges 4 km of guiderail	31 years		
	Parking	22 parking lots	11 years		
Environmental Services	Stormwater	87 ponds 1,195 culverts 371 km of pipes	27 years	$529,148	Good
	Drinking Water	40,235 water meters 509 km of pipes	33 years	$544,864	Fair
	Wastewater	17 pumping stations 532 km of pipes	31 years	$556,102	Very Good
Emergency Services	Fire Protection	6 fire halls 30 fleet vehicles	27 years	$41,618	Good
Parks	Cemeteries	17,700 sq. ft. buildings 14 columbarium 9 km of roads	N.A.	$72,390	Good
	Parks	41 park facilities 16 parking lots	29 years		
	Forestry & Horticulture	3 greenhouses 60,077 trees	15 years		
	Outdoor Recreation	64 playgrounds 95 sportsfields 11 splash pads 1 bike park 3 skateboard parks	16 years		
Recreation & Culture	Indoor Recreation & Culture	6 arenas/ 5 pools, 1 soccer dome/ 6 community centres/ 2 fitness-gymnastic facilities/ 1 museum/ 2 arts-theatres/ 1 market/ 6 libraries/ 9 parking lots	47 years	$249,547	Good
Resource Management	Corporate Facilities	3 corporate facilities 11 operations facilities 6 parking lots 35 maintenance and storage facilities 3 corporate leased facilities	N.A.	$169,028	Good
	Fleet & Equipment	280 fleet and equipment	N.A.		
	Information and Communication Technology Infrastructure	IT infrastructure	N.A.		
Total				**$2,757,311**	**Good**

Further information of the state of infrastructure for each of these asset types can be found in Asset Specific Appendices of the AMP.

Ownership

Although only City owned assets are required to be recorded in our registry, due to business needs assets owned by other public and private authorities are also recorded in the system. The asset repository also needs to include all assets being maintained by the city irrespective of the ownership and location of the assets. This may include sports fields, play structures and other recreation infrastructure being maintained by the City within schools and/or private lands with or without an easement in favor of the City.

Basic asset information for roads, water distribution system and storm sewer system infrastructure owned by Region of Waterloo within municipal jurisdiction of City of Cambridge is being maintained by City of Cambridge. It provides consistent dataset for future demand and growth studies, hydraulic studies and master plans. The asset owners are responsible for condition assessment, operational maintenance, capital renewal plans and other lifecycle planning activities.

All new assets created with default ownership as 'CAMBRIDGE'. Ownership needs to be changed manually if it is not owned by Cambridge.

Ownership	Description
CAMBRIDGE	The asset is owned by City of Cambridge.
REGION	The asset is owned by Region of Waterloo.
KITCHENER	The asset is owned by City of Kitchener.
GRCA	The asset is owned by Grand River Conservation Authority.
PRIVATE	The asset is owned by private resident or business.
	The asset is owned by Waterloo Region District Public School Board.
	The asset is owned by Waterloo Region Catholic District School Board.
UNKNOWN	Asset ownership is unknown to be determined.

Replacement Cost

The current replacement costs for each asset and/or asset components are required to forecast future capital replacement cost and financial needs of the corporation to continue the current services.

The replacement cost can be calculated / estimated based on asset parameters like asset size (diameter, depth and width) and material. The replacement cost can also be dependent on its location and proximity to environmentally sensitive features and/or major transportation features. This valuation is achieved by utilizing information from recent procurement contracts for the similar works. The unit cost of replacement is used to estimate current replacement cost of an asset. These unit costs are also useful for the estimation of future capital projects.

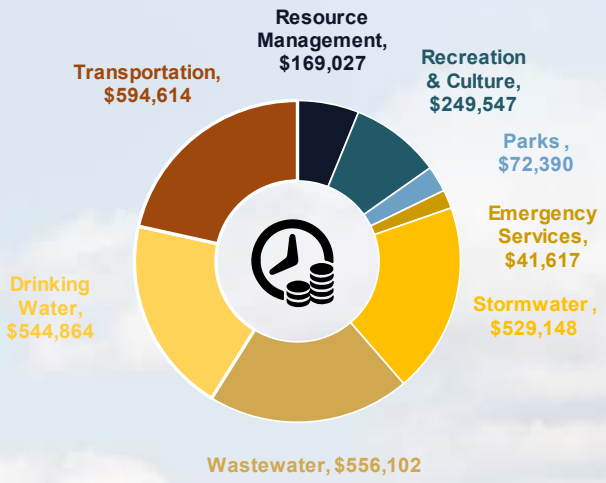
The City of Cambridge calculates its building replacement costs using Handscomb Yardstick for the Canadian construction industry. The Yardstick for costing is based the listed costs for 8 Canadian cities and is updated on an annual basis. The costing guide provides square foot and meter costs for public buildings such as recreation centres, libraries and fire stations. The costing guide hard cost estimates do not include architectural fees, contingencies allowances, furniture or equipment.

Reconstruction costs are based on the replacement cost estimate and include labor, materials, and equipment costs needed to rebuild a structure. Replacement cost is the estimated cost to construct, at current prices, a building with equal utility to the building being appraised. These costs are highly localized and often fluctuate, requiring periodic updating.

The replacement cost calculation also needs to account for future enhancement to assets either due to legislative changes and/or service improvements. (i.e. replacement of existing play structure with CSA complied play structure, replacing Vitrified Clay pipe with PVC pipe etc.).

Figure 7 provides a summary of assets owned by City of Cambridge based on Replacement Value by each Service Area, with the exception of Environmental Services that is split out by Asset Class. The graph shows that the largest replacement value of assets is transportation, drinking water, wastewater, and stormwater, however, it is important to note that Drinking Water and Wastewater assets are fully funded assets. Therefore, the assets with the highest replacement value are transportation and stormwater assets, and are required to forecast future capital replacement cost and financial needs of the corporation to continue the current services.

Figure 7: Asset Portfolio Replacement Value ($2,757,311 thousand)



Condition Assessment Practices

As assets age, their condition degrades which can ultimately impact service delivery. We have adopted leading processes and technologies for condition assessment of assets to gain valuable ongoing insight into the state of our infrastructure that informs our monitoring and management of LoS and planning for investment in new and existing infrastructure. The application of these techniques on our assets indicates a decline in the overall condition of our assets. We routinely monitor the condition and state of its assets through well-defined processes to identify operational repairs, maintenance program planning as well as capital renewal needs. The information is also used for reporting State of Infrastructure.

Periodic inspections and condition assessment process for all major assets are well defined and operationalized. All core infrastructures including roads, bridges, drinking water, wastewater and storm water infrastructure have most robust process while others follow a standard inspection approach and are in various stage of implementation.

Asset Specific inspection and condition assessment approach is described in Appendix A-F.

Table 4: ISO 55000 condition assessment practices

Condition	Description	Source
Very Good	» Well-maintained with no deficiencies » New or recently rehabilitated asset	» Condition assessment » Asset age less than 20% of lifespan
Good	» Superficial wear and tear » May require minor operational maintenance » Asset is in an early stage of its useful life	» Condition assessment » Asset age within 20-40% of lifespan
Fair	» May show slight signs of deterioration and require maintenance » Asset is in mid-stage of its useful life	» Condition assessment » Asset age within 40-60% of lifespan
Poor	» Observable deterioration requiring repairs » Frequent component failures » May require monitoring and maintenance or rehabilitation » Has a history of asset failures causing service interruptions » Asset is in later stage of useful life	» Condition assessment » Asset within 60-80% of lifespan
Very Poor	» Shows major signs of deterioration and requires ongoing monitoring to prevent service interruptions » Potential to become unfit for providing service » Asset is in last stage of useful life	» Condition assessment » Asset age older than 80% of lifespan

In the absence of formal condition assessment information, condition is derived from the age and lifespan of the asset.

Once condition assessment information has been established for all of the assets, it is then used to support asset management decision-making at the City.

The assets are at varying stages in their lifespans and have varying conditions. Our asset condition has been deteriorating, indicating the City is not keeping pace in investing in the rehabilitation of its assets. In 2017, approximately 74% of assets were rated as being in very good or good condition, which has since fallen to 70%.

Meanwhile, in 2017 the City had 9% of its assets rates as in poor or very poor condition, and this has since increased to 11%.

Figure 8: Asset Condition of Cambridge and Canadian Municipalities

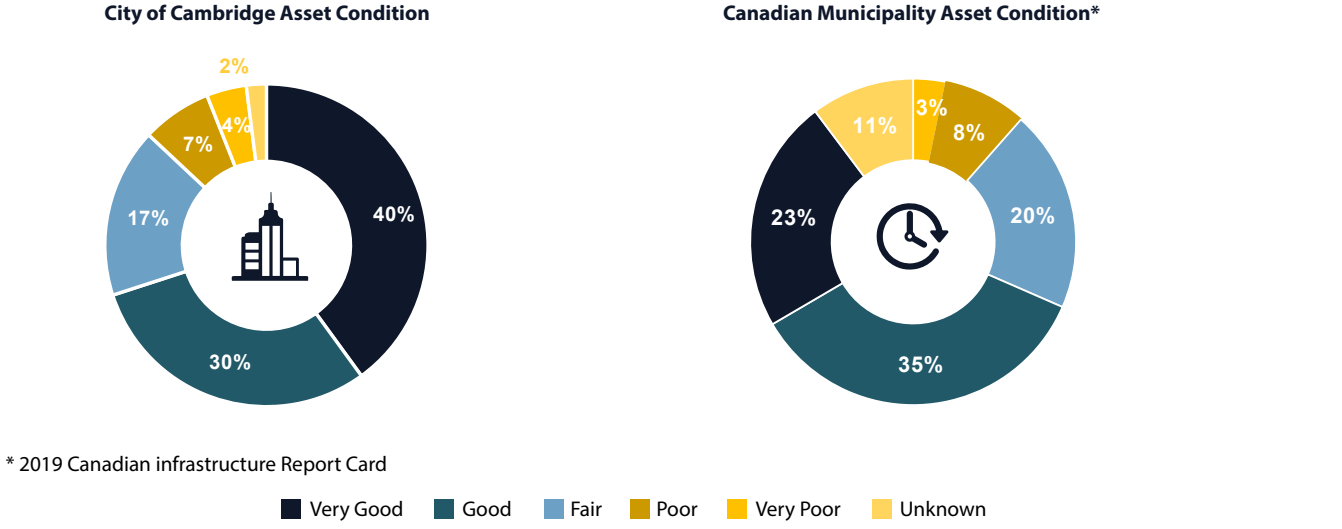
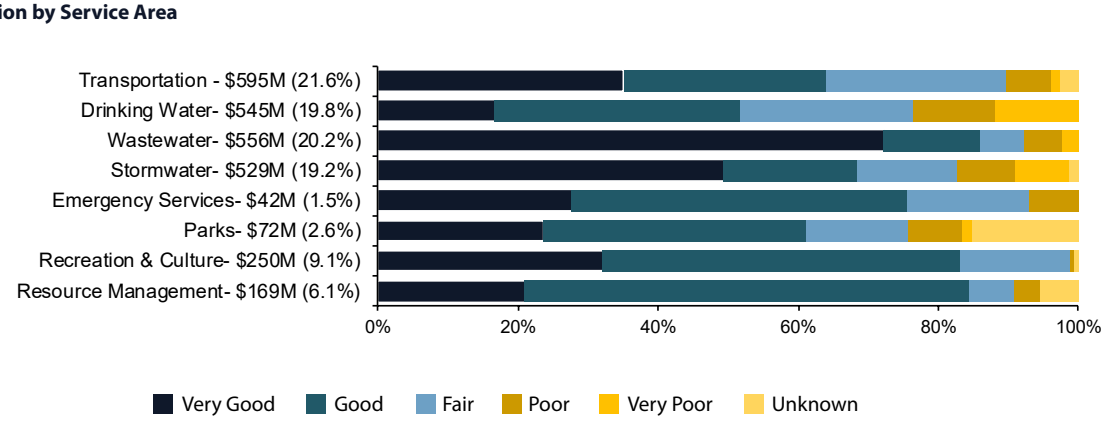


Figure 9: Asset Portfolio Condition



Background Information Access

The City is dedicated to maintaining a transparent and engaged relationship with its communities and stakeholders. We actively support requests for dialogue and information through inclusion of transparency and communication as two of the guiding principles of this plan outlined within the introduction.

Our primary mechanism for maintaining transparency of our asset management plans and approaches is through our City of Cambridge website. On the Asset Management page of the site, stakeholders have access to a wealth of information about our structure, efforts at asset management, processes, formal documents and history of asset management at the City.

In addition, we provide access to an online Geospatial Information System (GIS) via our website which enables our stakeholders to view our assets along with relevant information.

This document, along with the Asset Management Policy, will be made publicly available on the City's website as required by O.Reg.588/17 and other regulations pertaining to planning documents. The City will also respond to and facilitate information requests from stakeholders via the Clerk's Office at City Hall. The Clerk is responsible for establishing and implementing policies and procedures related to access and privacy.

Levels of Service

The Province requires that the AMP include for each asset class, the current LoS being provided and the LoS that the municipality proposes to provide for each of the 10 years following the publication of the AMP in 2024. The LoS must be determined in accordance with the qualitative descriptions and technical metrics documented in the Regulation for core assets, with allowance to describe by additional LoS measures.

The metrics documented in the Regulation and other regulatory requirements are the minimum level of service criteria to be addressed by the municipality; however, there is the expectation that additional LoS measures that are aligned and tailored with its community objectives should also be included.

This section describes our approach to developing LoS for all service areas, both core and non-core assets. We have presented information for the minimum LoS and associated costs as well as specified additional LoS to the exceed the requirements for the first milestone of the regulation. The financial strategy presented in this AMP is based on maintaining the current LoS presented in this section. Our continuous improvement plan for asset management will feature initiatives to target the desired LoS for our all of our defined measures including the required investment in accordance with future milestone requirements of O.Reg.588/17.

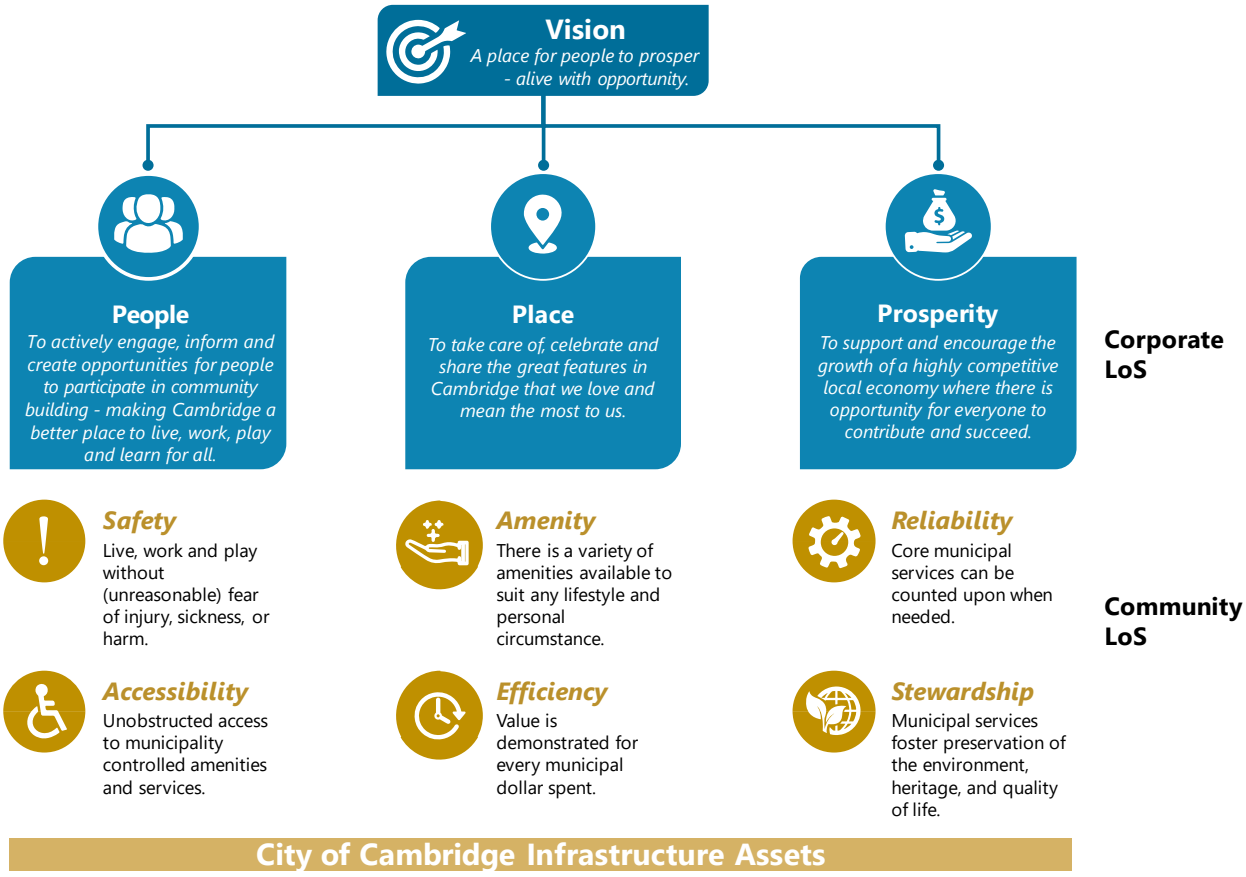
Levels of Service Framework

We aspire to advance our approach to LoS by moving beyond the regulation to develop measures that assess the extent to which we are meeting the needs and expectations of our communities. A leading practice LoS Framework has been designed to align the strategic objectives of our Strategic Plan with measures that reflect the services most valued by our residents and that have been developed based on the interpretation of City Administration. The Levels of Service Framework (or the LoS Framework) features the following:

- **Corporate LoS:** our core strategic outcomes as communicated in our vision from our Strategic Plan
- **Community LoS:** reflects the categories or themes that are most valued by our communities and are aligned to the Corporate LoS
- **Technical LoS:** detailed metrics that can be used to evaluate and report whether the community and subsequently corporate LoS are being achieved

Our LoS Framework, complete with definitions for each of the Community LoS, is illustrated in Figure 10.

Figure 10: Corporate and Community LoS Framework



The Framework effectively aligns the LoS to the issues and outcomes that are most important to Cambridge. It provides asset managers with insight into how capital and operating investments can translate into front-line service outcomes. The approach accommodates a variety of functions and asset classes, all within a common structure, and is adaptable, allowing for modifications to the various levels as organizational objectives and standards evolve over time.

The Framework builds upon Cambridge's 2016-2019 Strategic Plan, creating a line of sight between the community-informed objectives set out by the Strategic Plan and the mechanisms that will be used to monitor performance. In addition, the Framework reflects the collective vision of the community as the customer LoS are informed through the extensive community engagement undertaken for the Strategic Plan.

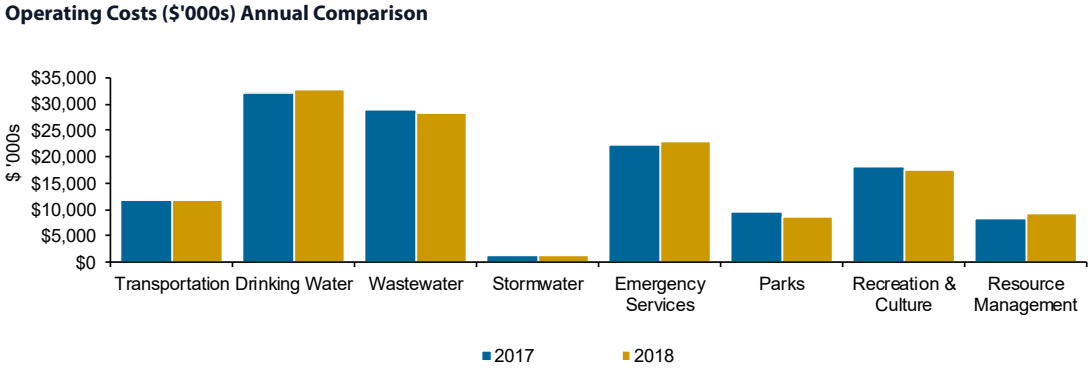
Current Levels of Service

O.Reg.588/17 states that municipalities shall prepare an AMP for core municipal infrastructure assets by July 1, 2021, and all other municipal infrastructure assets by July 1, 2023 for current LoS; for proposed LoS by 2024. The current LoS measures for core assets, as prescribed within the regulation have been integrated within its LoS Framework as the technical measures to evaluate performance of community LoS.

In accordance with the regulation, we have reported the current LoS for the prescribed measures in core assets in the Levels of Service sections of the relevant Asset Specific Appendices for the last two years as required by the regulation. In addition we have presented our current costs associated with service delivery based on a two year average in Figure 11 for all service areas based on a two year average for the performance reported in the LoS sections of the Asset Specific Appendices. The operating costs for each of the service areas are reflected within the corporate category which contain the overhead costs needed to effectively deliver services to our communities. It is important to note that drinking water and wastewater costs include treatment costs which are funded by the Region of Waterloo.

While measures for non-core assets are not required until July 2023, we have advanced our approach to develop initial measures for our non-core asset areas which are positioned within our LoS Framework. These measures are not presented currently as they will be tested and reviewed in the period leading up to 2023.

Figure 11: Current LoS costs associated with service delivery



Proposed Levels of Service

We have undertaken several LoS initiatives to determine the baseline services provided by our assets within all service areas before proceeding with development of our Framework. As part of these exercises, we have considered a comprehensive suite of technical measures for each of our asset portfolios beyond the minimum LoS outlined within the regulation.

The LoS Framework we have developed has been designed with two important objectives in mind to ensure that the measures are appropriate for the municipality. First, the measures are predominantly asset-focused; i.e., they are primarily influenced by the asset base as opposed to secondary factors, such as process or people. Second, the measures are quantifiable, allowing for data collection to enable reporting.

As we implement our improvement plans ahead of the next regulatory milestone we will assess the measures identified during this exercise along with stakeholder consultation to finalise a full suite of measures for all assets and service areas along with performance targets as required for the following milestone of the regulation.


PHARMASAVE
PHARMACY

Asset Lifecycle Management Strategy

Lifecycle management of assets refers to the series of activities undertaken to ensure optimum value and service delivery is obtained from assets through all stages of the asset life. The activities within these stages are determined by the outputs of a range of planning processes such as this AMP, master planning, and strategic plans which consider the internal and external drivers for defining the outcomes required by assets.

The Province requires that the AMP include the lifecycle activities that would need to be undertaken to maintain the current LoS for each asset category. The Province also requires that the AMP include the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current LoS in order to accommodate projected increases in demand caused by growth.

We have been engaged in a long-term improvement journey to progressively improve our approaches to lifecycle management to secure outcomes for sustainable service delivery, as well as deliver value for money investment in our assets.

We have been an early adopter of innovative approaches to lifecycle management of our assets, implementing advanced techniques to gain accurate insights into the condition of our assets and delivery sustainable renewal. Examples of these include:

- Participation in development of international sewer inspection standard PACP (Pipeline Assessment and Certification Program)
- Condition assessment of large diameter wastewater pipes and siphons in 2011 using CCTV and sonar
- Application of trenchless rehabilitation methods such as lining of water mains and wastewater pipes
- Collaborative research with IBM on software tool for capital planning roads, water, sewer using integrated planning approach.
- Implementation of work management software system to support Public Works operational processes
- Application of mobile computing devices to collect in field asset related data, such as for inspection of sidewalks
- First user in Canada of 'ice pigging' technology to clean wastewater siphons. For this project the City of Cambridge received the 2017 Municipal Innovation Award.

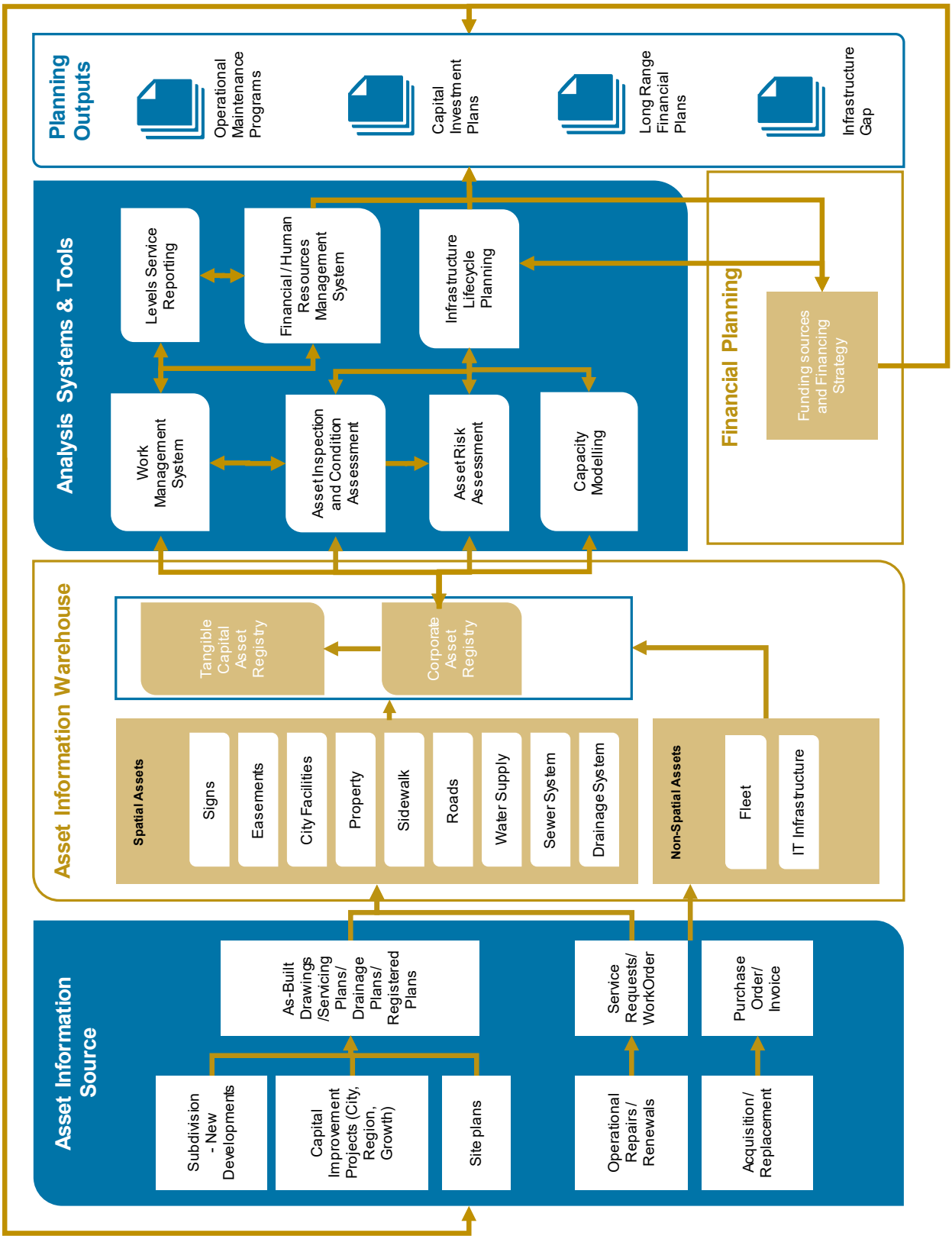
This section of the AMP describes our approach to management of assets in each stage of the lifecycle along with the associated capital and major operational expenditures associated with these phases.

Integrated Asset Management Planning

Our journey to implementing leading asset management approaches has seen adoption of an integrated asset management planning process across multiple stages of the asset lifecycle to deliver multiple benefits including enhanced visibility of our needs, improved response times as well as identify opportunities for synergies between service areas. This approach has enabled us to realize efficiencies in delivery of our capital needs and deliver affordable, value-added plans for our communities. Our integrated planning approach is data led and enabled by leading technologies in data warehousing, and end to end management activities executed on our assets. Furthermore our robust processes for capture and management of asset information described in the Asset Data Management Section ensure that asset data captured in each process of the integrated approach is available to support planning and reporting processes. Our Integrated Asset Management Planning process is represented in Figure 12 commencing with asset information sources and activities that generate information stored in an asset information warehouse comprised of multiple databases. This information is then used in various analysis systems and tools to support development of our strategies, plans and inform decisions for investment. The integrated approach is iterative with data informing work flows and updates throughout systems to ensure consistency, ongoing visibility of asset condition and continuous improvement.


GFD

Figure 12: Asset Management Planning process




LIBERTY TAX

Creation / Acquisition Plan

At Cambridge, we are committed to manage portfolio of our assets to continue provide existing services along with support future residential, commercial and industrial growth. We ensure that we invest and develop our infrastructure to maintain service delivery, as our city grows and changes with increased and diverse population. We also know that infrastructure creation and acquisition is vital to attracting business and commercial opportunities to support the economic health of our area.

Our growth and master plans outline our objectives for the City's asset portfolios. These plans help to identify our infrastructure needs since our assets support us on meeting and executing on the objectives. Typically, these infrastructure needs are then included in a needs assessment that is conducted for specific asset types, and/or identified within the City's Development Charges Background Study.

Operations and Maintenance Plan

Assets spend the majority of their life in this stage of the lifecycle, generating significant costs in inspection, planned maintenance and requiring response to unplanned events influenced by a wide variety of factors. Effective operations and maintenance practices present opportunities to enhance value in this stage and minimize risks to service delivery. As such, we have implemented processes supported by leading technologies to monitor our assets regularly informing our operational planning and responses to manage risks to service delivery for our communities and stakeholders. We have invested in leading techniques to inform us of asset condition that has allowed us to adopt a more proactive approach to effect repairs and capital renewals of our transportation and environmental infrastructure to reduce instances of unplanned maintenance events and failures impacting our residents.

As part of this proactive approach we maintain high levels of compliance with our planned maintenance, the requirements of the minimum maintenance standards and condition assessment programs to enhance our knowledge and responsiveness to our assets leading to more efficient service delivery. As a result of this efficient and value adding strategy, we invest annually in the activities required for operation and maintenance of our assets.

This section outlines our general approach to operations and maintenance of our assets. Specific operation and maintenance activities for each of our service areas is detailed within the Asset Specific Appendices.

Operations

We operate our assets according to the operation and maintenance requirements specified during the design or by the manufacturer to ensure proper function, prevent damage, minimize risk and comply with regulations. We ensure the operational procedures for our assets are clearly communicated to operators, access to manuals and operating procedural is provided, and the appropriate training and credentials needed to operate assets effectively with the capability to respond to any failures adequately are also provisioned.

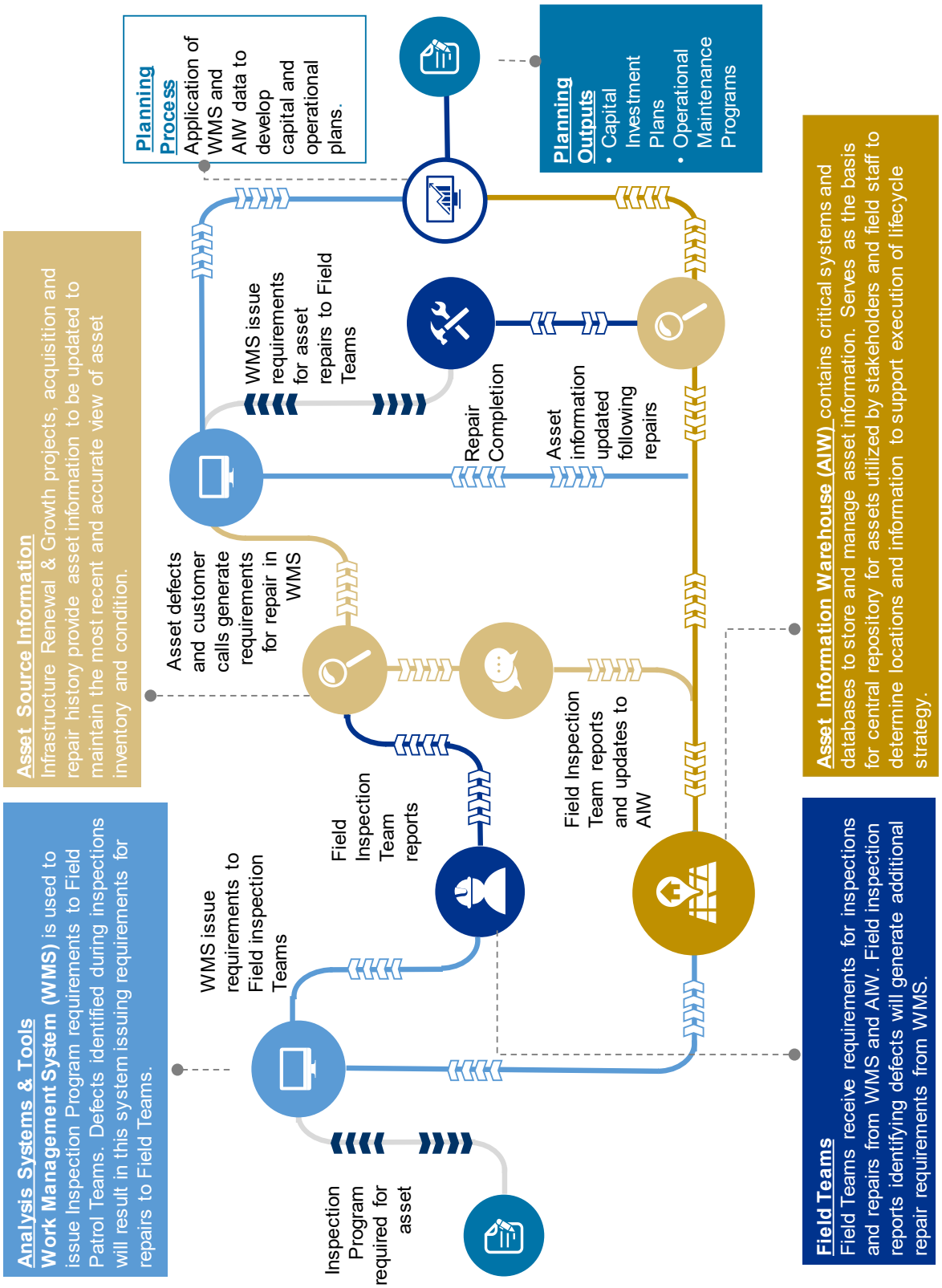
Maintenance

- **Condition Assessment and Inspection:** We regularly inspect our assets using leading practices and technology to identify any risks to asset condition and subsequent service delivery This approach supports early identification and resolution of risks to asset operation. In addition, inspections inform the asset condition and provide valuable information for assessing risk, targeting asset renewal, and identifying investment requirements. Each asset type follows its own inspection schedule, ranging from visual inspection to data-led techniques. Inspection programs are largely maintained within the City's work management system with frequent progress reports generated to monitor progress. The majority of non-core assets at the City follow a general condition assessment process outlined in this section and in the State of Infrastructure section, with additional detail included in the Asset Specific Appendices. Figure 13 presents the general condition assessment process applicable to most assets within the City with the exception of our sewer and stormwater assets that have a specific condition assessment process presented in the Environmental Services Asset Specific Appendix.
- **Planned Maintenance:** Our major maintenance needs are identified through prescribed maintenance of the assets, and inspection programs. These needs are resolved through operational maintenance activities if the cost can be borne by the operational budget. Otherwise, the major maintenance needs can be considered through the asset renewal process in consultation with Asset Management, Engineering and Operations teams on a risk-to-service delivery basis.
- **Unplanned Maintenance:** Our unplanned maintenance consists largely or repairs effected on a reactive basis identified through inspection programs, during planned maintenance activity or operation or an asset and through notification by our stakeholders and the public. In the event an asset defect is identified, a corresponding report is prepared and a work order is created. The inspection report is reviewed to prioritize defects, and then the work order is distributed to contractors or internal teams for repair as appropriate to the asset. Once the repair has been performed, the repairs are inspected to ensure completeness.

Prioritization of Response

Our assets provide a wide range of services to our communities. Some of these are essential to daily life; for example, the provision of clean drinking water and waste removal. We therefore ensure that any repairs or operational responses to known asset deficiencies are prioritized on the basis of customer priorities and essential service delivery.

Figure 13: Condition Assessment Process



Rehabilitation and Renewal Plan

As our infrastructure assets decline with age or with the influence of multiple factors, we periodically require rehabilitation and renewal to ensure their capability to maintain service delivery. Our teams engage in comprehensive, risk-based planning processes aligned to leading practices to identify the condition of our assets through inspection programs to inform investment planning and decision-making.

We use data driven decision-support software for the infrastructure renewal needs assessment and planning of core linear infrastructure. System identified renewal needs are reviewed for capital investment planning with respective business units and stake holders which includes engineering, public works, Region of Waterloo, finance and utilities(Hydro, Gas, Telecommunication).

Other core and non-core infrastructure renewal needs planning is supported through ongoing condition, risk assessment processes and capacity assessment through various master plans. Corporate strategic objectives, community priorities, corporate and community stewardship (such as heritage preservation, greenhouse gas reductions) and changing Regulatory requirements are also considered during infrastructure renewal planning process.

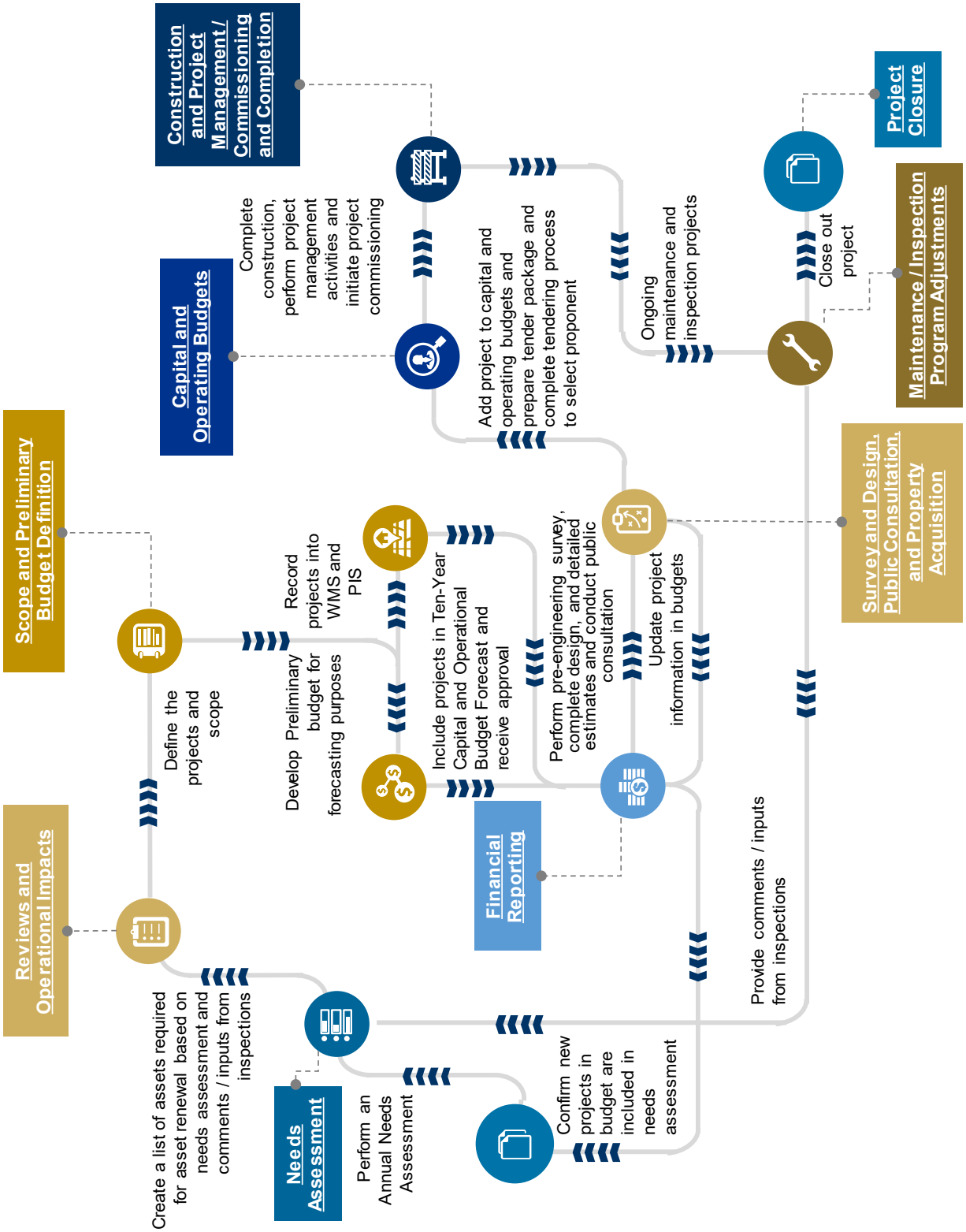
Our process for targeting rehabilitation and renewal of our assets is outlined in Figure 14, at its core it consists of assessing asset needs on an annual basis. We perform an annual needs assessment to determine the assets that require renewal or replacement. Our needs assessment process considers a range of options to target the most effective solution and value for money, this includes the consideration of non-infrastructure solutions such as process or policy changes that can mitigate risk or extend asset life. Based on the assets classified for renewal or replacement, the project scopes are established along with a preliminary estimate for the projects that are included in the Ten-Year Capital Budget Forecast and are provided to Council for approval. Following approval, the City performs pre-engineering surveys, develops detailed design drawings, and refines the project estimates to be included in the capital and operating budgets. For each of these projects, the Region of Waterloo is required to provide a Certificate of Approval, which then allows Cambridge to follow a public tendering process to determine the qualified proponent that will construct the project. After construction of the asset, commissioning and inspection activities are conducted and approval is provided to operate the asset. The asset is then deemed operational by the City. Ongoing maintenance activities are conducted on an ongoing basis, and information is filtered back to the needs based assessment annually. The Asset Management Division closes out the project by providing a Project Inventory of Asset Report to Finance and provides an update to Council.

Disposal Plan

In some cases, when an asset has reached its end of life, it may be necessary to dispose of rather than replace or renew the asset. The determination as to whether the asset can be renewed or must be replaced is informed by the inspection process. Depending on the condition of the asset, consideration is made around whether there is still a service delivery need the asset provides or a possible service delivery need the asset can fill, as every effort will be made to repurpose the asset to ensure maximum value is extracted at the asset's end of life.

In the event disposal of the asset is required, our Project Delivery or service area teams will coordinate with contractors and Engineering and Operations team to ensure safe removal of the asset or associated hazardous materials in accordance with regulations and our environmental sustainability policy. Disposal costs for most assets are integrated into the capital costs of the project to replace the asset. In the event the asset will not be replaced, the decommissioning costs will be determined via the capital planning process and prioritized for inclusion in the budget.

Figure 14: Rehabilitation and Renewal Process



Financial Strategy

The Province outlines a number of requirements for municipalities related to financial management of its assets. As part of the phased approach of the regulation, the Province determines that once LoS and lifecycle management strategies have been developed for the assets supporting service delivery, a financial strategy should be in place to demonstrate fiscal responsibility and value for its stakeholders. While municipalities are not required to comply with this requirement until 2024, many of these approaches are already in place at the City. We have therefore outlined the investment needs for our existing assets to maintain service delivery and development of new assets to meet demand for growth. In this section we will briefly describe our approach to the funding strategies applied to meet the identified funding gaps in this AMP, but will provide additional detail in 2024 as required by the regulation.

Asset Investment Needs

Our investment needs are identified through a range of mandated and industry leading planning processes supported by detailed analysis to ensure we identify our needs for investment to maintain service delivery, meet future demand growth and achieve our strategic objectives. The needs identified through these various planning processes are then prioritized through a Capital Project Prioritization Model, which evaluates projects using nine criteria to determine the most important needs and initiatives to be funded. This process including additional detail on the criteria used to prioritize identified needs is further described in Appendix L.

The outputs of this analysis are used to inform financial, budgetary and performance discussions across the City to confirm investment to achieve our priorities and those of our stakeholders.

The following sections describe our capital and operational investment needs to maintain existing infrastructure and associated service delivery along with the requirements for additional infrastructure to meet the growing needs and demands of our communities.

Asset Investment Needs: Asset Renewal

The City has undertaken a comprehensive analysis to determine the capital needs of its assets over a 10-year planning horizon to deliver the services expected by its communities and stakeholders. As part of its advanced approach to asset management and compliance with the regulation, this analysis has been undertaken for both core and non-core assets.

We have adopted an industry leading decision support system for identification of capital renewal needs for our core asset areas featuring an integrated risk based analysis supported by a decision support system. The resulting analysis for our core infrastructure indicates the City's current infrastructure backlog for linear infrastructure is $206 million. This backlog represents a significant investment needed to ensure these core assets continue to function and deliver services reliably.

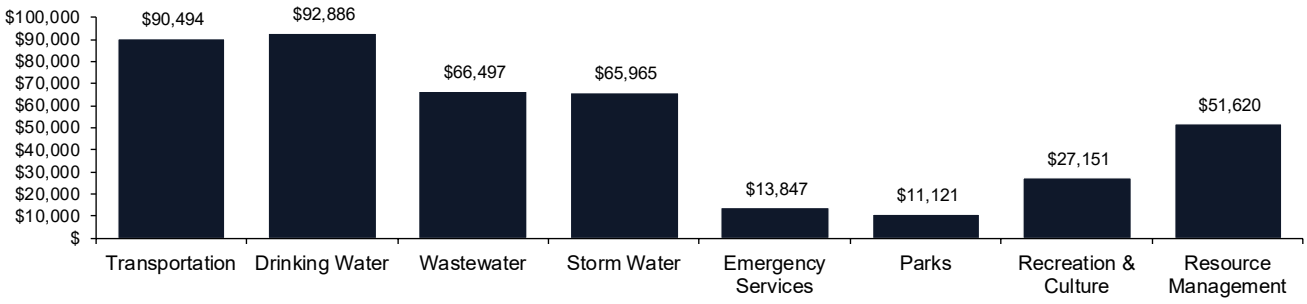
In recognition of the financial challenges associated with funding this backlog and the need to manage investment efficiently for our communities, this investment to address current backlog has been phased over a 15 year period for roads, stormwater, drinking water and phased over a 10 year period for wastewater assets. This will allow for continued improvement of the assets while reducing service disruption risks and management of costs during ongoing assessment of investment through our water and wastewater long range financial plan as well future updates to this asset management plan. Through continued delivery of our proactive maintenance programs and ongoing inspections of these core assets, we will continue to monitor their condition and respond effectively to any identified risks through operational intervention.

The needs of our core assets have been identified through data-driven analytics based on condition and associated service delivery risks. The resulting analysis indicates a capital investment of $315.6 million is needed for core infrastructure in the next 10 years.

The needs of our non-core assets have been identified through leading practice asset management approaches based on their condition and remaining useful life and ability to maintain service delivery. The resulting analysis of our non-core infrastructure indicates a total capital investment of $104 million is needed in the next 10 years to maintain these assets in their current condition while minimizing the service interruption.

Figure 15 presents the results of the analysis described for our assets to demonstrate the total investment needed to maintain our existing assets and associated service delivery in the period from 2020 to 2029. We have assessed our needs for a 10 year period to ensure visibility of any critical risks or onset of emerging risks requiring investment in our assets. This visibility will ensure that we are able to plan effectively to mitigate risks and manage costs efficiently while maintaining service delivery.

Figure 15: Existing Infrastructure Renewal Needs ($'000s)



Our resulting analysis of our existing infrastructure presented above indicates a total of $419.6 million in capital investment is needed for our current infrastructure to sustain service delivery. This represents annual infrastructure renewal needs of 1.5% of our total infrastructure portfolio of $2.7 billion in current replacement value as outlined in the state of infrastructure section.

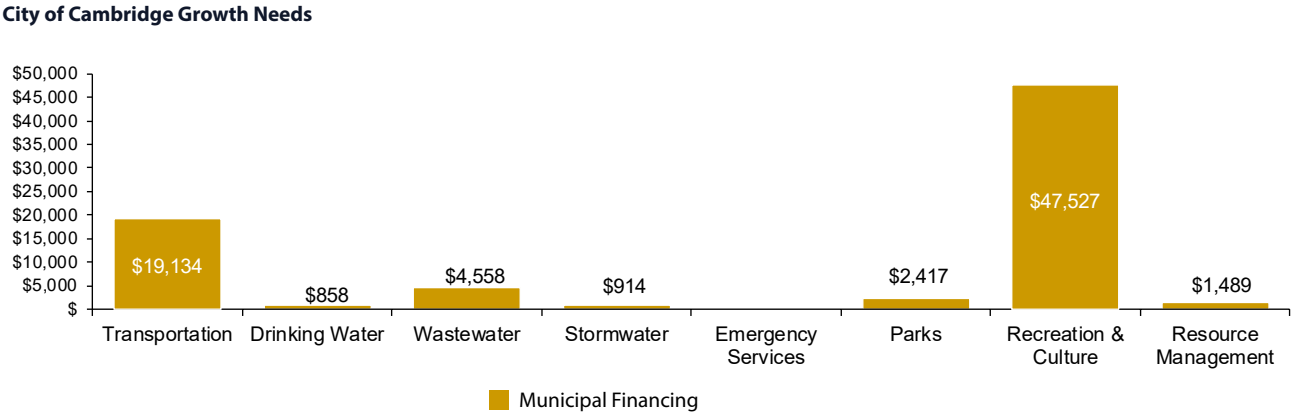
Asset Investment Needs: Growth Needs

In addition to targeting and prioritizing the investment needed to maintain existing assets, there are also planning processes in place to determine the additional assets needed to meet growing demand for service through population increases or demand for new services. The projects targeted to meet growth are mostly funded through Development Charges - the mechanism that enables recovery of growth-related capital expenditures from new development. These charges are governed by the Development Charges Act and are collected in accordance with our Development Charges By-law.

In most cases, growth related projects will be funded through a combination of development charges and other municipal financial sources such as tax levies, rates, fees and reserves to recognize the benefits these projects create for existing residents and to the wider community beyond the new development. For example a road in poor condition facing increased vehicular traffic due to industrial and residential growth will be reconstructed; the funding of this initiative will consist of development charges for the additional lanes and municipal financing for the existing road.

Our recent Development Charges Background Study conducted in early 2019 is based on the City's population growth forecast of 153,000 by 2029. The study identified infrastructure projects to support future residential and non-residential growth, which require investment of $366.0 million. Through Development Charges, the City is able to fund $290.0 million with the remaining $76.9 million to be funded from other municipal financial resources such as property tax, rates, user fees or reserves. Figure 16 illustrates the total municipal financing required for associated growth initiatives in our communities in the next 10 years.

Figure 16: Growth Needs – Municipal Financing ($'000s)



In addition, recent changes to the Planning Act and Development Charges Act as a result of Bill 108 have introduced the community benefit charge allowing municipalities to charge for capital expenses associated with development of new infrastructure, in replacement of certain development charges, parkland dedication, and returns for increased height and density (commonly referred to as density bonusing). This could particularly impact funding for non-core infrastructure assets such as parks and recreational facilities. As we continue to identify investment needs for new infrastructure to support future growth, we will establish and apply a Community Benefit Charges by-law as per regulatory requirements. Any future investment needs identified for funding through community benefit charges will be communicated in our financial plans and future versions of our asset management plans.

A portion of growth related projects will need to be undertaken in advance of new development construction, resulting in collection of the development charge post construction. In these cases, the growth related project will need to be financed through loans and fulfilled through the subsequent development charges collected post construction. Any interest costs incurred during financing are also eligible for collection through development charges and are included in development charge calculations.

However, the City is in the early stages of developing a policy regarding development charge credit agreements with developers. This would allow developers to opportunity to construct development charges eligible infrastructure based upon their desired timing for development in exchange for the City providing development charges credits which aligns with the City's timing for infrastructure in the Capital Budget. This approach would not require the City to finance applicable development charges eligible infrastructure for some development projects. The policy will need to be Council endorsed.

Alignment with Golden Horseshoe Growth Plan

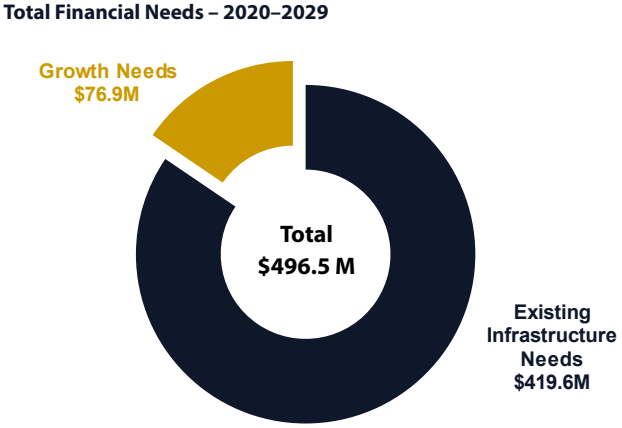
Our City is a lower tier municipality considered within the area and strategy for the Growth Plan for the Greater Golden Horseshoe governed by O.Reg.311/06. As such, our approach to growth planning must consider our responsibilities under this regulation and the associated act to ensure implementation of planning practices and growth forecasts to support this strategy under the Places to Grow Act 2005. In accordance with the requirements of both the asset management regulation O.Reg.588/17 and O.Reg.311/06 Transitional Matters – Growth Plans, our master planning and development charges background studies that target the initiatives needed to meet increased growth and demand according to growth forecasts have considered these collective requirements and are featured within the funding requirements for growth from 2020-2029 as presented in this section. Any specific initiatives within our service areas aligned to the Growth Plan for the Greater Golden Horseshow will be discussed within the relevant Asset Specific Appendix.

Asset Investment Needs

The resulting analysis of asset investment needs in our existing assets to maintain current service delivery and new assets to meet increasing growth indicates that a total of $496.5 million is needed for renewal needs and municipal financing for the period of 2020-2029. Figure 17 highlights the total investment required for existing infrastructure renewal and to support growth needs.

The following sections describe how these needs will be funded through our 2002-2029 Capital Investment Plan along with the associated funding sources, service areas reflecting funding gaps and potential sources of funding to fulfill the identified needs over the 10 year period.

Figure 17: Total Asset Investment Needs



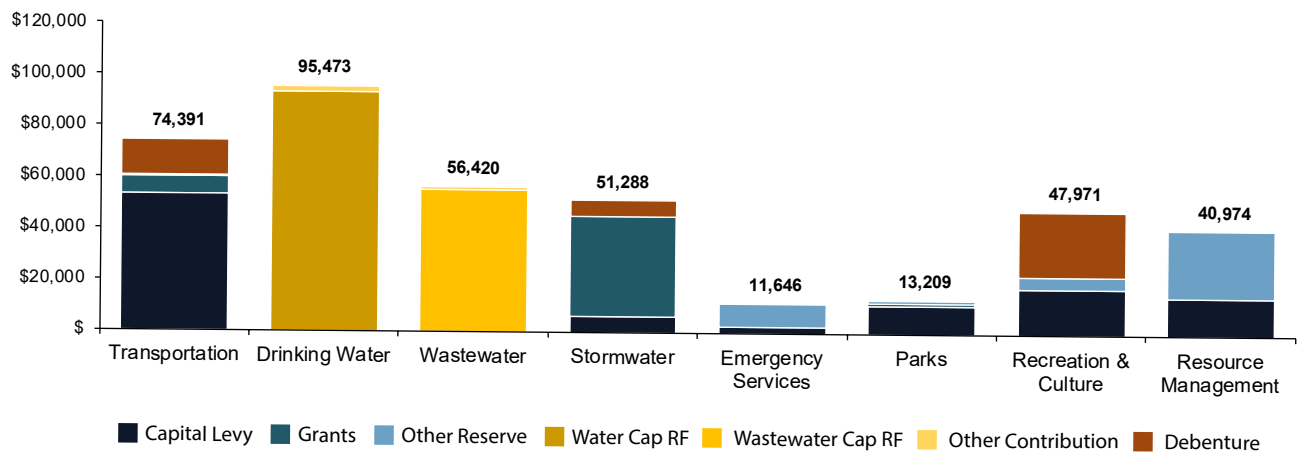
2020-2029 Capital Investment Plan

Our 2020-2029 Capital Investment Plan presents the capital investment proposed to sustain our current services for the next 10 years along with projects designed to meet our projected growth requirements. Figure 18 presents the 10-year capital investment forecast for our asset needs, with additional funding available through the long-range Financial Plan for drinking water and wastewater assets.

This plan features a total projected capital investment funding of $346.1 million (excluding development charges and debentures) over the 10 year period for investment in renewal of existing infrastructure including improvements in our core assets and corporate stewardship such as heritage building preservations, accessibility, energy conservations, and climate adaptation initiatives (shown in Figure 18). In addition, the plan also has a provision of $45.3 million over next 10 years in debt financing to minimize infrastructure financing gap. Also, the plan includes an additional $1.7 million of funding from the Region of Waterloo to replace a regional water main for drinking water assets.

Our current available financial resources are allocated to the identified needs based on our prioritization model discussed in the Investment Needs section. This analysis considers the available funding sources summarized in the Glossary in Appendix K to deliver our current investment plan effectively. Funding sources associated with specific assets are summarized within the Financial Strategy sections of the Asset Specific Appendices.

Figure 18: 2020-2029 Capital Investment Plan ($'000s)

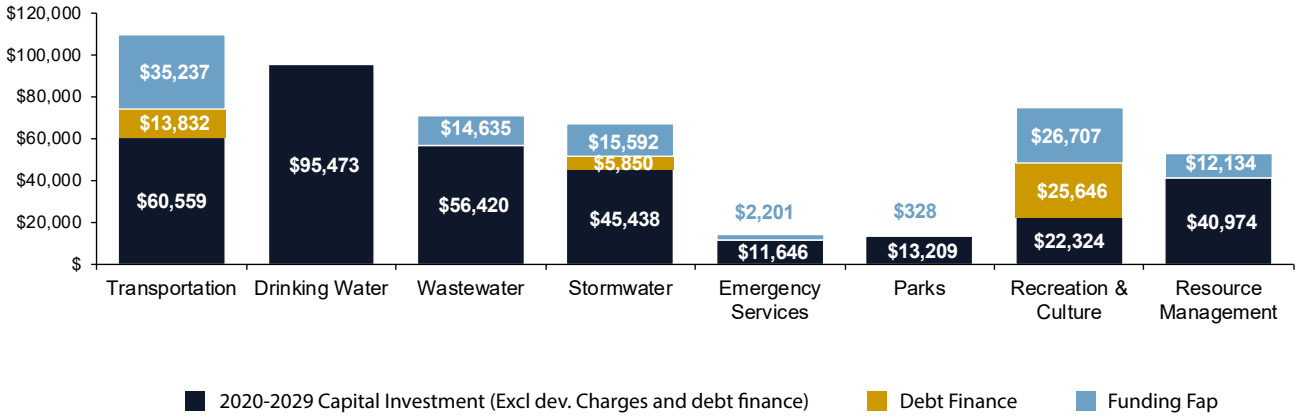


Current Funding Gap Assessment

As highlighted above, the City's current need is $496.5 million to maintain current service delivery and to deliver on growth needs, and the City currently has $391.4 million of funding provision (excluding development charges). This insufficient funding of the identified asset investments needs, is reported as a funding/infrastructure gap. Figure 19 highlights the expected funding gap of $105.1 million within the next 10 years.

Figure 19: Funding Gap Assessment ($'000s)

Portfolio Funding Gap Assessment



Our drinking water and wastewater infrastructure needs are fully funded through the long-range financial plans for the 10 year period to 2029 as such additional $12.9 million required for water and wastewater infrastructure will be provided through future capital investment plan.

Therefore, based on analysis presented above and City's proposed capital investment plan, our current 10 year infrastructure gap is $92.2 million as presented in Table 5.

Table 5: Funding Gap Analysis

Funding Gap Analysis	$ millions
Existing Infrastructure – Renewal Needs	$419.6
Growth Needs - Municipal Financing	$76.9
Total Financial Needs	**$496.5**
2020-2029 Capital Investment Plan (Excluding Development Charges and debentures)	($346.1)
Debentures	($45.3)
Total Funding Gap	**$105.1**
Funding available for drinking water and wastewater assets	($14.6)
Funding available from Region to replace regional water main	$1.7
Net Financial Gap	**$92.2**

Future Funding Strategies

We continuously assess opportunities for additional funding options and revenue streams to address our funding gaps. The following are options that have been used by other municipalities towards addressing their infrastructure gaps and we continue to review for implementation at the City of Cambridge.

Stormwater Management Funding

The assets that support stormwater management in the City have a total estimated replacement value of $529 million, representing 19.7% of the City's infrastructure. Over the next 10 years, these assets are estimated to have a financial funding gap of $15.6 million based on current funding levels. Historically, funding for the stormwater management program has come through property taxes, which makes it compete with other essential municipal services for limited resources of tax levy funding. Many municipalities in Ontario and Canada have adopted a designated stormwater user rate to help address the funding challenge, including the cities of Kitchener, Waterloo, and Guelph.

As a user fee, the stormwater rate works to charge the property owner based on the approximate amount of stormwater runoff generated by the property. It could also lead to incentives for property owners to reduce the amount runoff and pollutant that they create, potentially minimizing the future infrastructure needs. Additionally, by having a separate fee, the program would have a designated funding source allowing it to build to a sustainable funding level based on its actual needs.

We are currently underway with a stormwater funding study, with the objective of performing a full funding review of the stormwater management program and recommending sustainable funding methods.

Special Infrastructure Levy / Increased Capital Levy

To address infrastructure gaps and ensure sufficient funding will be provided to maintain service levels, some municipalities have implemented special capital levies or special infrastructure levies. These special levies effectively provide a certain percentage of a tax rate increase annually devoted towards asset sustainability.

The capital budget currently forecasts an increase to the capital levy of 4% annually. For 2021, this works out to a forecasted increase in funding of $390,100 or a tax rate increase of approximately 0.4%. This is the level of funding built into calculating the City's infrastructure funding gap over the next 10 years, indicating that level of funding is simply not sufficient to support current service level needs in terms of infrastructure rehabilitation and replacement.

An alternative or additional approach to the special infrastructure levy is to dedicate a certain percentage of assessment growth revenues as a contribution to capital reserves. This would ensure that we are setting aside for the future rehabilitation and replacement of new assets brought on stream at the City through new subdivisions. Currently assessment growth is used in the City's base budget. Under this alternative model, a portion would instead directly support the capital funding.

Future modelling will be prepared through a long range financial plan that will analyze what level of funding would be required to effectively work towards sustainability of the City's infrastructure.

User Rates and Fees

Many services provided by the City are funded in part through user fees, particularly in Recreation as well as room bookings at corporate facilities and lease agreements for long-term rental of certain City-owned facilities.

Under the City's User Fee Policy adopted through the financial review in 2014, the full cost of providing each user fee service shall be determined as the starting point for setting the rate regardless of whether the full cost is to be recovered. This includes the full cost associated with asset lifecycle costing to support rehabilitation and replacement of the assets used to provide the service.

We will continue to assess our cost of providing service, ensuring it includes lifecycle costing of assets and reflects full recovery of all costs. Even where programs are subsidized, this yields important information into understanding the full costing of our services. Additionally, reporting on the cost of service delivery is a requirement under O. Reg.588/17 Asset Management Planning for Municipal Infrastructure by July 1, 2024.

Debt Financing

The 2020-2029 Capital Investment Plan and the Asset Management Plan already include $45.3 million in debt financing. If it were not for this debt funding, the infrastructure gap would be higher at $137.5 million instead of $92.2 million. Debt financing allows us to proceed with work today and pay for it over time as the debt is repaid.

The Ministry of Municipal Affairs and Housing regulates the amount of debt that municipalities may carry by setting an annual repayment limit of 25% of a municipality's net own source revenues. To ensure financial sustainability and minimize risk, the City's debt policy further limits its debt capacity to 10% of its own source revenues for tax-supported debt and 15% of own source revenues for rate-supported debt charges.

As the City issues debt over the period of the capital forecast, it is projected that the City will reach its debt capacity limit of 10% for the tax-supported operating fund. Increasing this limit and taking on more debt financing than already projected in the capital forecast would lower the City's infrastructure gap. To ensure the City continues to maintain its strong financial position, staff will review the City's debt policy, review growth-funded debt needs relative to development charges revenue forecasts, and review the timing of debt funded capital projects.

Sponsorship Strategy

We are currently assessing options for implementing a sponsorship strategy, which may result in a new policy around accepting sponsorship of our facilities. The policy would also determine what the funds generated would be used for, and may include or even be solely devoted towards sustainability of those facilities. This would reduce the City's infrastructure funding deficit in those areas, particularly recreation.

Public-Private Partnerships

A public-private partnership is a cooperative arrangement between the public and private sector. Under this model, we could work with a third party to have them expand privately-owned infrastructure that would supply certain municipal services which otherwise the City would have to provide. Such a partnership could reduce the City's capital needs, and we continue to assess the feasibility of this option in the recreation growth area.

Community Benefits Charge

Part of the provincial government's More Homes, More Choice Act, 2019, allows municipalities to charge for community benefits in order to fund a range of capital infrastructure for community services that would benefit new development. Certain services formerly part of the Development Charges Act, as well as parkland dedication and benefits derived from "density bonusing" under the Planning Act, would effectively be replaced by the community benefits charge under this legislation. Based on information provided by the Province, it is anticipated that the changes would be revenue neutral for municipalities. As such it is unlikely that the act would reduce the City's infrastructure deficit. With detailed regulations yet to be provided at the time of preparing the City's asset management plan, it remains a possibility that the changes may in fact reduce the amount of growth funding available to the City, resulting in an increase to our infrastructure funding deficit. As the regulations get provided and the City undertakes a community benefits charge background study, further analysis will be prepared into the effects on our infrastructure gap.

Other Funding Strategies

Finally, while outside of the City's control, there are periodically additional funding opportunities provided by the provincial and federal governments towards certain infrastructure projects. These funding sources typically outline specific conditions and requirements that must be demonstrated in order to secure and maintain the funding. In many cases, these conditions require applicants to demonstrate capabilities in effective planning and financial management. The AMP provides a critical means to demonstrate our understanding of our assets, services, community priorities and abilities to assess these needs.

In our efforts to determine the most effective funding strategies to meet our future needs, we will consider how our asset management planning approaches can be used to demonstrate compliance with the requirements.

Any impacts to these funding studies as a result of the analysis in investment needs undertaken within the Asset Management Plan in compliance with O.Reg.588/17 will be communicated in future revisions of the AMP in advance of the 2024 requirement.

Ongoing O.Reg.588/17 Journey

At Cambridge, we have long recognized the benefits of adopting leading practice asset management approaches working progressively to implement leading practice approaches that support sustainable service delivery efficiently while managing risks.

With the introduction of O.Reg.588/17 for Asset Management, as demonstrated in this AMP we have furthered our approaches to develop an AMP that is fully compliant in order to meet the first phase in 2021. We recognize that this is only the first step in improving our asset management practices and meeting O.Reg.588/17 and so we remain committed to continuing on this journey to meet the future phases for the specified service areas by July 1, 2023 for Phase 2 and July 1, 2024 for Phase 3.

Our approach to the development of this AMP included an assessment of our asset management capabilities to determine improvement opportunities to support our strategic objectives and comply with all regulation requirements in advance of the milestone dates. This approach has enabled us to achieve early compliance with many areas of the regulation and identify areas for improvement in the coming years to improve service delivery and regulation compliance. Table 6 highlights our progress and opportunity areas to achieve regulation compliance across our service areas. Further information on the regulatory compliance of the assets within each service area is included in the Scope section of each Asset Specific Appendix.

As the table shows, we have already started on our journey to compliance for Phase 2 and 3 of the regulation by outlining the lifecycle management strategy and financial strategy where possible, and we have undertaken several LoS initiatives to determine the baseline services provided by our assets in order to support us in developing a LoS Framework. As part of these exercises, we have considered a comprehensive suite of measures for each of our asset portfolios and have developed a Proposed LoS Framework. We are currently in the process of testing these metrics internally to determine reporting requirements and undergoing external consultation ahead of publishing in future updates of the AMP.

Moving forward between 2020 and 2023 in preparation for compliance we will also be preparing additional long-range financial plans and financial strategies, where required for all our core and non-core assets.

Table 6: Compliance with O.Reg.588/17

O.Reg 588/17 Milestones	Phase 1 - July 1, 2021			Phase 2 - July 1, 2023			Phase 3 - July 1, 2024		
	Asset Inventory	Current LoS	Costs to maintain LoS	Asset Inventory	Current LoS	Costs to maintain LoS	Proposed LoS	Lifecycle Management Strategy	Financial Strategy
Transportation	●	●	●	●	●	●	◑	●	●
Environmental Services	●	●	●	●	●	●	◑	●	●
Emergency Services				●	○	○	◑	●	●
Parks				◑	○	○	◑	●	●
Recreation & Culture				●	○	○	◑	●	●
Resource Management				◑	○	○	◑	●	●

● Compliant ◑ Partially compliant ○ Not compliant ■ Not required for phase 1 of regulation.

Stakeholder Engagement

Stakeholder engagement is a key component of planning processes at the City and supports us in developing plans and strategies to meet the needs of our communities and stakeholders. Our engagement with stakeholders through a range of methods directly informs our organizational goals and creates the basis of effective strategy development. This section describes our efforts to engage our stakeholders.

Service Users

Our service delivery review has identified the key services delivered by our assets along with service user groups. These users are formed largely of those in our communities who receive and access the range of services along with more transient stakeholders who access the services in our area on a more temporary basis, such as visitors.

We engage our service users through a range of methods both formal and informal to inform operational improvements and strategic planning, including:

- **Formal stakeholder consultation:** We host a number of events aligned to our planning processes and service delivery areas designed to engage with stakeholders on topics of interest. Examples include public consultation sessions for master planning and growth and our strategic plan.

- **Surveys:** Various services offer their users the opportunity to provide dedicated feedback on occasion through completion of a survey. These surveys are valuable to support us in assessing their priorities and planning to meet their expectations.
- **Feedback:** Our users serve as a primary source of information with regard to quality of our service delivery. We invite stakeholders to access a range of mechanisms to provide spontaneous feedback on any number of items and raise any concerns regarding their services. We maintain open channels of communication accessible by phone, email, website, social media and mail.
- **Notifications:** We have processes in place to ensure our users are notified in cases where their services will be disrupted for execution of planned improvement work on assets that will result in temporary disruption of services.

Through all of these interactions and dedicated stakeholder engagement methods, we are able to assess stakeholder views on the delivery of services facilitated by our assets and identify areas of concern and priority by 2024. This feedback is used to inform our planning process, supporting prioritization of asset improvements and decision-making.

In addition, this AMP has been informed by Our Strategic Plan – the basis of which was an extensive public consultation exercise. We have also incorporated information and feedback from our service area teams who interact with our communities on a daily basis during service delivery and response to community raised service concerns to inform the development of our asset management processes.

We will continue to utilize these opportunities for engagement with our stakeholders and communities, and future revisions of our asset management plans will incorporate the outputs of these exercise and demonstrate how the outputs have informed our LoS.

Service Delivery Partners

Our partnerships and relationships with external parties are important to maintaining service delivery. We rely on partnerships to aid the delivery of service and improvements to our assets and implement appropriate controls and processes to ensure the impact of our work on stakeholders and delivery partners gets communicated to avoid risks and adverse impacts.

We highly value our partnerships and recognize the benefits of working with them to secure safe and effective delivery, incorporate leading practices and techniques, and achieve efficiencies in delivery. Examples of our service delivery partners include:

- **Contracted parties:** We maintain partnerships with and contract external parties to undertake work on our behalf. We manage our relationships through our well-defined procurement processes governed by regulation and leading practices in supply chain management.
- **Local Government Authorities:** Our assets and the services we deliver are integrated with those of the Region of Waterloo and other local government entities such as the Grand River Conservation Authority. We have established formal forums and means of engagement with these parties for ongoing areas of management such as transportation. As valued partners in government, we also actively consider impact on these parties in undertaking any service-related initiative and ensure careful coordination.

We maintain close relationships with these partners and have established processes for engagement when required to ensure collaborative and transparent ways of working for the betterment of our collective communities and stakeholders

Public and Private Infrastructure Owning Bodies

Interfaces between Cambridge and Region of Waterloo

Cambridge is the second largest city within the Waterloo Region. In addition to the federal and provincial services, Cambridge residents and businesses receive services from two levels of government: Cambridge, and the Region of Waterloo.

Local Private Utilities Coordination

Local private utilities (e.g., electricity, natural gas, and telecommunications) are a critical component to the overall service delivery model provided for residents of Cambridge. A Utility Coordination Committee has been established for coordination among the utility providers and City staff. Specifically, the Design and Approval representatives from Cambridge's Engineering Department meet with the representatives from local private utility companies on a monthly basis.

The schedule for these meetings is tied to Capital Budget Planning forecasts, and it is sent to utility providers so that the companies are aware of upcoming reconstruction plans. Further to this, Cambridge sends design drawings for each project to the utility companies, early in the design stage, for comment. This allows the utility companies to review potential conflict points and inform Cambridge of any upcoming needs for upgrades within the limits of construction.

Plan Governance

This AMP presents our approach to effective management of our assets incorporating leading practice approaches to demonstrate compliance with the requirements of O.Reg.588/17. It is intended to continuously communicate our approaches and plans for development with our communities and stakeholders as a mechanism to grow our internal culture serving as our formal point of reference for our investment needs informing our budgeting and financial strategy. It serves as a mechanism to communicate our investment needs to our stakeholders, and further develop a culture of service-focused asset management. We intend to build on these efforts and the development of this AMP to further our asset management objectives and secure full regulatory compliance in advance of the required milestones.

This section outlines our commitment to a continuous improvement approach for asset management at the City along with our plan to monitor and govern future updates for full compliance with regulatory milestones.

AMP Monitoring & Review

In order to maintain our continuous improvement approach and achieve regulatory compliance, we will implement monitoring controls and governance for ongoing review of our asset management plan and continuous improvement opportunities to advance our capabilities.

AMP Governance

The future development of the AMP and associated improvement initiatives will be governed by the stakeholders actively involved in advancement of asset management at the City. Figure 20 illustrates the governance structure of our AMP along a descriptions for each participating group.

Figure 20: Asset Management Plan Governance Structure

The application of this governance structure will provide multiple benefits to enhancing our asset management approaches, including:

- Maintain focus and priority of the asset management plan in supporting our service delivery and strategic objectives
- Continuously identify and review opportunities and progress of implementation to ensure efficiencies and improvements are realized
- Communication and awareness of asset management requirements and priorities to advance the culture of asset management
- Alignment with related City initiatives and strategic objectives for well-considered and streamlined approach to implementation of initiatives.

Our plan will be reviewed annually by our Asset Management Division and Steering Committee working in conjunction with our service areas and Senior Leadership teams. Updates to the plan will be published externally with council approval ahead of all required regulatory milestones outlining changes and compliance with milestone requirements. A review of the governance structure will also be undertaken as part of the annual review to ensure participation of appropriate stakeholder groups as processes advance.

Appendices

Appendix A

Asset Management Plan – Transportation

A.1.1 Introduction

The City maintains a diverse portfolio of transportation assets to provide safe and effective means to keep our communities moving. We have three different asset classes within transportation designed to facilitate movement across our area safely.

Table 7: Transportation Assets

Service Area:	**Transportation**		
Asset Class:	**Active Transportation**	**Roads**	**Parking**
Asset Type:	» Sidewalks » Trails » Pedestrian Bridges » Walkways » Bike Lanes » Street Furniture	» Roads and Laneways » Pavement Edges » Street Lighting » Road Bridges (including major culverts) » Retaining Walls & Sound Walls » Signage » Guiderails » Traffic Islands » Railway Crossings	» Public Parking Lots (excluding parking lots specific to parks and recreation) » Public Street Parking Stalls

This collection of assets is critical to our City. Enabling the safe movement of people and goods to support the economic prosperity of the community and to provide access to recreational activities helps us to realize our vision of a connected city. Like many of our assets, transportation assets currently face increased challenges as a result of aging infrastructure, climate change, and increasing demand. Our investment in these assets must therefore be carefully considered to ensure optimal investment for renewal while investing to meet the growing needs of our community.

Given the intricacies of our asset base, it is important to distinguish between the services provided by the City, the Region of Waterloo and Rail Authorities. The Region of Waterloo provides services including Grand River Transit, the ION, and Regional road services, among others. As such, the assets that provide these services are not included as part of this AMP. Rail Authorities are responsible for railway crossing infrastructure (signage, signals, lights, etc.) and the crossing condition including sidewalk, pavement & railway track that is located within their corridor. The City is responsible for pavement markings, advance warning signage and 50% of the maintenance cost for the railway crossing infrastructure.

This appendix provides information regarding our approach to management of transportation assets in the next 20 years, demonstrating our commitment to assessing and meeting the LoS valued by our residents.

A.1.2 Scope

This section identifies the requirements for each Phase of O.Reg.588/17 applicable to the assets within this service area. Our compliance with these requirements for the asset classes within this service area is presented in Table 8 to highlight areas of future development in advance of regulation phases. The following sections of this appendix will present further detailed information to meet the requirements for each section of the regulation.

Table 6 of the main body of our AMP provides a summary of compliance for all service areas along with our plans for continuous improvement to meet the remaining requirements in advance of the future regulatory phases.

Table 8: Compliance with O.Reg.588/17

Core Assets		Phase 1 – July 1, 2021						Phase 3 – July 1, 2024						
Service Area	Asset Class	Asset Inventory	Weighted average	Replacement Value	Average age	Current Levels of Service	Costs to maintain LoS	Proposed Levels of Service	Creation/ Acquisition Plan	Operations and Maintenance Plan	Rehab and Renewal Plan	Disposal Plan	Investment Needs	Funding Strategies
Transportation	Active Transportation	●	●	●	●	●	●	◑	◑	◑	◑	◑	◑	◑
	Roads	●	●	●	●	●	●	◑	◑	◑	◑	◑	◑	◑
	Parking	●	●	●	●	●	●	◑	◑	◑	◑	◑	◑	◑

● Compliant ◑ Partially compliant ○ Not compliant

Note: Phase 2 not reflected as only Phase 1 and 3 are applicable to core assets

Table 8 demonstrates that our assets within the transportation service area are fully compliant with the regulation requirements for Phase 1.

In addition we have achieved most of the requirements for Phase 3 with the exception of proposed LoS. We have undertaken an extensive exercise engaging multiple stakeholders to develop a LoS framework that identifies proposed LoS for all service as described in the LoS section of the main body and within Section A.3.2. of this appendix. We will continue to develop these identified proposed measures in consultation with stakeholders for reporting in advance of the 2024 milestone.

A.1.3 Strategic Connections

The strategic and master plans summarized in this section are all related to the transportation assets and have been considered while developing this AMP.

Table 9: Strategic Documents

Strategic Document	Linkage(s) to the AMP
Current Documents	
2016-2019 Strategic Plan (2016)	The Strategic Plan sets the stage for decision-making, prioritization, and ongoing performance management. Many of Cambridge's residents, employers, and visitors took time to share their ideas and contribute to the plan's development, identifying the positive aspects of Cambridge, as well as aspects they would like to see improve. The Strategic Plan sets a goal to make Cambridge "a place for people to prosper" – alive with opportunity, and the infrastructure that enables our people to thrive is a significant contributing factor to this initiative. This AMP shares a connection to the Strategic Plan in its direction and objectives, relating to decision-making, prioritization, and performance management, ultimately enabling us to continue making Cambridge "a place for people to prosper". More specifically, the Strategic Plan emphasizes transportation services as one of its primary goals and objectives in terms of creating and maintaining a highly effective, sustainable and coordinated local infrastructure and transportation network. This Strategic Plan was used to guide the City in developing its LoS Framework for transportation assets in this AMP. The City is currently in the process of revising the Strategic Plan.
Trails Master Plan (2010)	The 2010 Trails Master Plan was completed to review and update the 1996 City of Cambridge City-Wide Multi-Use Trail Study. The Trails Master Plan includes an update to the 1999 City of Cambridge Trails Maintenance Manual. The objectives and goals that are included as part of this master plan have been used in developing the processes that are included as part of the Asset Lifecycle Management Strategy and the LoS Framework for trail assets.
Region of Waterloo Transportation Master Plan (2018)	Moving Forward is the Region of Waterloo's Transportation Master Plan (TMP) which was approved by Regional Council June 27, 2018. It identifies the policies and projects that will meet the Region's long- and short-term transportation needs over the next 25 years. These include how and where to invest in regional road improvements, traffic controls, public transit services, and cycling and walking facilities. It also includes strategies to manage both ongoing travel demands, and the necessary accommodations required by evolving transportation technologies. Moving Forward also addresses transportation needs related to provincial highways within the Region, travel to and from the Region, emerging transportation trends, and passenger rail service. This AMP considered the Region of Waterloo Transportation Master Plan to ensure that service delivery and asset condition goals and objectives for the Region aligned with Cambridge transportation assets.
Development Charges Background Study (2019)	A by-law that imposes certain Development Charges in the Corporation of the City of Cambridge pursuant to the Development Charges Act, S.O., 1997, c. 27, as amended. The growth plans and infrastructure investment proposed within the AMP must consider whether development charges will be incurred pursuant to the City's bylaws. In accordance with the By-Law, Cambridge has developed a Development Charges Background Study. The Development Charges Background Study is essential to this AMP as it supports the City in identifying its funding gap included in the Financial Strategy.

Strategic Document	Linkage(s) to the AMP
In Development	
Cycling Master Plan	The Cycling Master Plan will build off the direction from the City's 2008 Bikeways Network Plan and 2010 Trails Master Plan, and will look for opportunities to develop a complete cycling network in the City for all ages and abilities. Cambridge is currently at the draft stage of developing this document, and the final Plan will be complete in Spring 2020. The final result will be produced in alignment with this AMP and in accordance with Government of Ontario regulations.
Transportation Master Plan	Moving Cambridge, the City's Transportation Master Plan, is a plan that will guide City and Region of Waterloo decisions on how to maintain and improve the City's transportation system as the City continues to grow over the next 25 years. Moving Cambridge seeks to achieve sustainable growth through the support of all travel modes – walking, cycling, transit and vehicles, while reducing dependency on single occupant vehicle trips. The Plan provides the need, justification, and preliminary planning for City investments such as road improvements and expansion of the walking and cycling network.

A.2.0 State of Infrastructure

Transportation Overview

Transportation assets are those that enable us to get to where we need to go throughout our City. Our transportation assets are some of our most highly utilized and visible assets within Cambridge. It includes everything from the pedestrian bridges throughout the City to some of our major arterial roads.

We recognize that the efficiency and value we can derive from our transportation assets extends into all other portfolios, which is what makes transportation particularly important.

For our transportation assets, 8% of our road assets are in poor or very poor condition, and 64% in good or very good condition in comparison to 15% and 56% respectively for Canadian municipalities reported on the 2019 Canadian Infrastructure Report Card. As such, it is evident that our assets are in better condition than other Canadian municipalities.

Replacement Value ('000s)

$594,614

Total replacement value of all assets within the transportation asset class

Condition

Good

Weighted average condition rating of transportation assets across all subclasses

Asset Class

Three

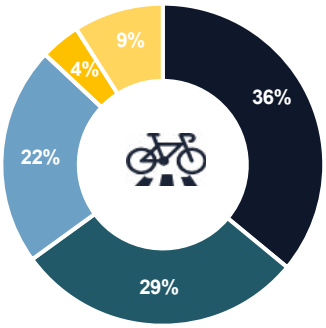
Distinct asset classes that we manage as part of our municipal transportation portfolio

Asset Class

Active Transportation

- 665 km of sidewalk
- 104 km of trails
- 47 pedestrian bridges
- 9 km of walkway

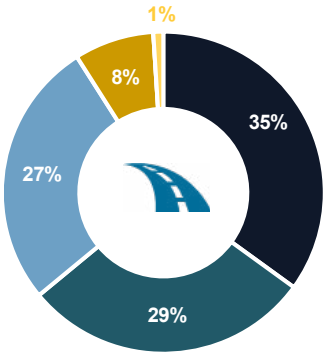
Active Transportation Condition*



Roads

- 1,006 lane km of pavement
- 26 bridges
- 10,442 streetlights
- 604 retaining walls
- 4 km of guiderail

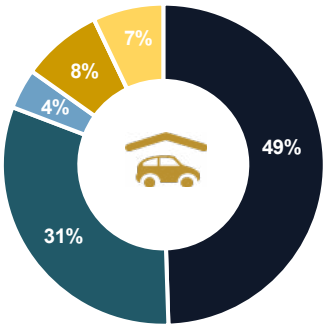
Roads Condition*



Parking

- 22 parking lots

Parking Lot Condition*



*Condition based on replacement value

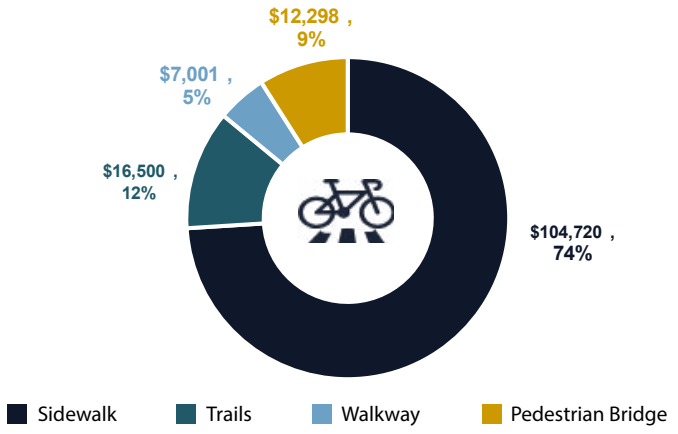
Very Good | Good | Fair | Poor | Very Poor | Unknown

Replacement Value ('000s)
$140,518

Weighted Avg. Condition Rating
Good

Average Age
28 years

Active Transportation

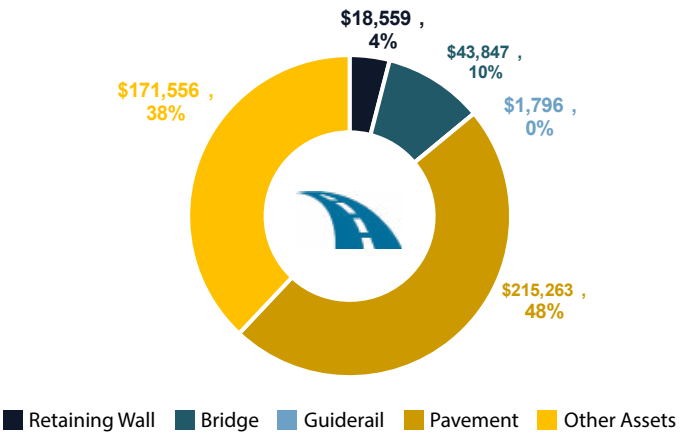


Replacement Value ('000s)
$451,021

Weighted Avg. Condition Rating
Good

Average Age
31 years

Roads



Replacement Value ('000s)
$3,075

Weighted Avg. Condition Rating
Good

Average Age
11 years

Parking

A.3.0 Levels of Service

A.3.1 Current Levels of Service

Under O.Reg.588/17, for our core assets, we are required to report the technical metrics for our current LoS. As such, we have reported the prescribed metrics from the regulation for roads, and bridges and culverts within our LoS framework as outlined below.

Table 10: Prescribed Levels of Service

Description		The existing road network in the City of Cambridge includes provincial, regional, and municipal roads, Provincial roads consist of three major highways, specifically Highway 401, Highway 8, and Highway 24. There are many more regional roads in the City, including Hespeler Road, Fountain Street, Maple Grove Road, Franklin Boulevard, Coronation Boulevard, Can-Amera Parkway, Dundas Street, and Main Street. Municipal roads in Cambridge are classified as either arterial roads, collector roads, or local roads, in decreasing order of size and capacity. Major municipal roads include Saginaw Parkway, Avenue Road, Blair Road, and Blenheim Road.		
Asset	**Service Attribute**	**Community levels of service (qualitative descriptions)**		
Roads	**Scope**	The City has outlined maps of its road network in Appendix J. The City has arterial, collector, highways and local roads that it operates and maintains to ensure high connectivity for the community.		
		Technical Measures of Service	**2017**	**2018**
		Number of lane-kilometres of each of arterial roads as a proportion of square kilometres of land area of the municipality *(Note: includes regional, provincial and Cambridge roads)*	2.46 lane km per square km of land area	2.46 lane km per square km of land area
		Number of lane-kilometres of collector roads as a proportion of square kilometres of land area of the municipality	4.75 lane km per square km of land area	4.75 lane km per square km of land area
		Number of lane-kilometres of local roads as a proportion of square kilometres of land area of the municipality	4.93 lane km per square km of land area	4.93 lane km per square km of land area
	Quality	**Community levels of service (qualitative descriptions)**		
		The City has outlined different levels of road class pavement condition in Appendix J. The City seeks to maintain the condition of the road pavement as good to very good to ensure that a high-level of service is retained and that safety of the community is maintained. The City aims to provide a balanced approach to service delivery with inspection focusing on those assets that are in poor condition by leveraging a risk based approach to prioritize renewal or rehabilitation of roads. The City ensures full compliance with Ontario Minimum Maintenance Standards.		
		Technical Measures of Service	**2017**	**2018**
		Average pavement condition index Paved Roads *(Note: equivalent to PQI measured by Cambridge)*	7.16	6.93
		Average surface condition (e.g., excellent, good, fair or poor) index Unpaved Roads	Not applicable since no unpaved roads	Not applicable since no unpaved roads

Table 10: Prescribed Levels of Service (Cont'd)

Asset	Service Attribute	Community levels of service (qualitative descriptions)		
Bridges & Culverts	Scope	The City's municipal bridges are used by all types of vehicles on the road, including heavy transport vehicles, motor vehicles, emergency vehicles, and cyclists since the City has 26 bridges / major culverts and 47 pedestrian bridges across the City.		
		Technical Measures of Service	**2017**	**2018**
		Percentage of bridges in the municipality with loading or dimensional restrictions *(Note: road bridges)*	3.8%	3.8%
	Quality	**Community levels of service (qualitative descriptions)**		
		The majority of the City's bridges are in Good condition; therefore, there are no major concerns regarding how the bridge condition could affect the use of the bridges. We also inspect our bridges every 2 years in line with the Ontario Structure Inspection Manual.		
		Technical Measures of Service	**2017**	**2018**
		Average bridge condition index value for Bridges *(Note: 2017 and 2018 are equivalent since inspection performed on bi-annual basis, includes road and pedestrian bridges)*	78.15	78.15
		Average bridge condition index value for culverts *(Note: 2017 and 2018 are equivalent since inspection performed on bi-annual basis, includes road and pedestrian bridges)*	78.65	78.65

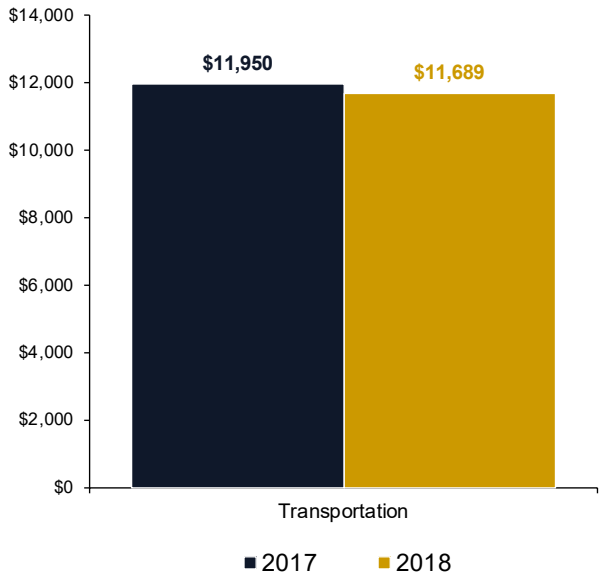
Additionally, we are pleased to report other current measures for asset classes active transportation and roads. These are outlined in Table 11.

Table 11: Additional Current LOS

Asset Type		2017	2018	Avg
Active Transportation	Km of bicycle paths, multi-use trails and seasonal trails per 100,000 population (km)	76.0	79.8	77.9
	Percentage of local roads with sidewalks (%) *(Note: 2017 and 2018 are equivalent since analysis performed bi-annually)*	76	76	76
	Km of trails open during winter season (km) *(Note: 2017 and 2018 are equivalent since analysis performed bi-annually)*	54	54	54
Roads	Number of service requests	1,761	1,909	1,835
	Average age of street light poles (years)	33	34	33.5

In order to deliver these current LoS for transportation assets, we have spent $11.9 million and $11.7 million in operations related costs for 2017 and 2018 respectively as shown in Figure 21.

Figure 21: Operating Costs Annual Comparison ($'000s)



A.3.2 LoS Maps

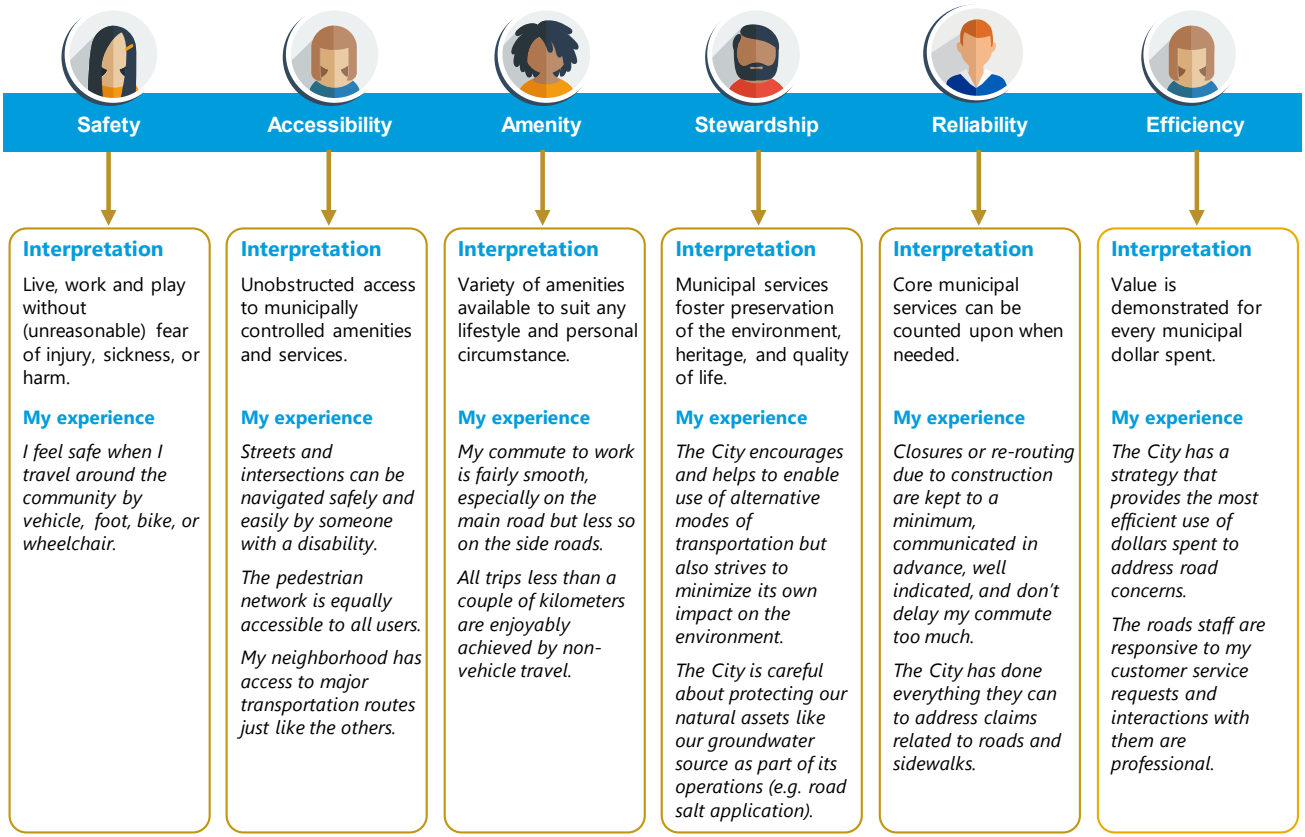
The maps cited in the Prescribed LoS for the City are shown in Appendix J.

A.3.3 Proposed Levels of Service

We have recently undertaken an exercise to develop a LoS framework that fully aligns our strategic objectives with LoS expected by customers, and technical metrics to determine whether our assets are achieving those expectations. Our intention is to use this framework going forward to position all reported metrics within this framework to demonstrate achievement of our outcomes and community needs.

While the proposed LoS are not required for reporting by the regulation until 2024, we have proactively developed proposed measures for review and consultation as part of the exercise to develop a LoS framework for all assets across our portfolio.

The starting point for this exercise was identification of our community priorities aligned to our strategic outcomes. The definitions for these priorities are provided in the main body and are referenced in the interpretation sections in the graphic below. We further this concept within each asset area by identifying the unique concerns of the community with regard to the asset. In the case of transportation assets, we have identified the concerns and priorities of our stakeholders in the "My Experience" headings below, from stakeholder feedback through everyday operational responses and dedicated feedback channels such as the engagement undertaken to support our Transportation Master Plan Moving Forward currently in development.



With the identification of stakeholder-informed transportation priorities, we have developed a series of technical measures designed to monitor performance of these priority community LoS, some of which have already been reported in Table 11. These preliminary metrics will be tested internally to determine reporting requirements and undergo external consultation ahead of publishing in future updates of the AMP.

A.4.0 Asset Lifecycle Management Strategy

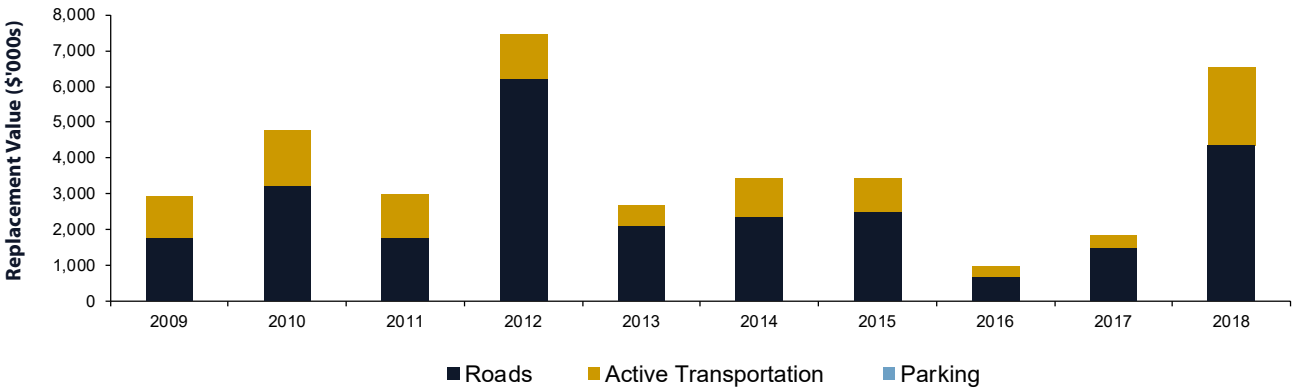
A.4.1 Creation / Acquisition Plan

Master planning documentation supports the City in identifying the objectives around the specific asset services that are necessary to meet the needs and growth of Cambridge. Since 2008, we have developed 17 master plans and strategic plans, including a Transportation Master Plan, in particular. The Master Plan is a framework that guides our investment in transportation to support growth and help shape Cambridge toward our vision. Creation and acquisition activities within our municipal boundaries are made in alignment with the objectives, stakeholder input, and long-term strategic plans set forth in the Transportation Master Plan that is under development. It is clear that transportation is a critical element in the activities necessary to meet the demands associated with population growth and economic development, as transportation as a service area directly affects the efficiency and capacity associated with how we move in and around Cambridge.

Once the Transportation Master Plan is complete, the City will be able to focus specifically on better understanding the specific assets that need to be created or acquired to deliver on the goals and objectives of the Master Plan. We also recognize that we are a part of the Ontario Government's Growth Plan for the Greater Golden Horseshoe. This Plan is an initiative to plan for growth and development of transportation assets in a way that supports economic prosperity, protects the environment and helps communities achieve a high quality of life. Documents such as these help the City to develop the creation and acquisition plans as we need to take these priorities and plans into consideration.

Looking at the growth we have had in the past, since 2001, we have made considerable effort to invest in the growth of our transportation assets across all asset types: parking, roads and active transportation as presented in Figure 22. Specifically, in 2018, we completed a new landmark pedestrian bridge in downtown Galt, providing pedestrian and cycling connections over the Grand River and to connecting trail systems.

Figure 22: Transportation Growth by Year



More specifically, we are pleased to demonstrate in Table 12, the growth our road and sidewalk network has experienced, where we have added 40 lane-km and 38 km respectively since 2009.

Additionally, the Development Charges Background Study Report from 2019 supports needs-based discussions by identifying whether the City has the capital to create or acquire new transportation assets in order to deliver on the services and goals outlined in the plans.

Table 12: Road and Sidewalk Growth by Year

Road and Sidewalk Growth by Year		
	Road (lane-km)	Sidewalk (km)
2009	3	3.9
2010	7	4.9
2011	4	4.9
2012	7	7.9
2013	2	3.2
2014	8	1.4
2015	2	5.6
2016	1	1.9
2017	1	1.0
2018	5	3.1
Total	**40**	**37.9**

A.4.2 Operations and Maintenance Plan

This stage of the asset lifecycle generates significant costs over time; therefore, we have implemented practices that enhance value through cost reduction and investment optimization. A successful operations and maintenance plan ensures that our assets also meet the level of service commitments and expectations from those in our community.

Condition Assessment and Inspection

At the City of Cambridge we follow the requirements outlined in the Ontario Structure Inspection Manual when performing condition assessments and inspections for bridges and large culverts, as well as, the Ontario Minimum Maintenance Standards for Highways (O.Reg. 239/02) for our road assets.

At the City, we have developed a general condition assessment process, which can be referenced in Figure 13 of the main body. Based on the standard Condition Assessment Process, maintenance of transportation assets begins with routine inspection to identify defects that could result in risks or higher costs in the future. This practice of early identification, through visual inspection and quantitative assessment allows for overall higher LoS and extended asset lifespans, as the outputs from the condition assessments are used in planning.

Asset types each have varying condition assessment and inspection procedures as shown in Table 13.

Table 13: Condition Assessment and Inspection Procedures

Asset	Condition Assessment and Inspection Procedure
Roads	Undergo a robust condition assessment program every three years consisting of photographic inspections that inform calculation of the Pavement Quality Index. This is performed by the asset management service area to target renewal planning. Routine road patrol is also performed on an ongoing basis, by Public Works. This information is captured in our systems for direct application in analysis.
Bridges and Culverts	Bridges and large culverts with a span of more than three metres undergo a formal inspection every two years as per Provincial requirements. Data is used as input for capital planning process.
Sidewalks and Walkways	An annual safety inspection program is performed for our sidewalks and walkways between May and September. The inspection is performed via City staff biking along all sidewalks in the City and recording defects. Defects are recorded according to provincial requirements and are categorized according to various defect types and three severity levels.
Bike Lanes	Inspection of bike lanes programs are performed as part of the road patrol program.

If a defect is uncovered during inspection, the next step is determining whether the defect will require minor or major maintenance.

Planned Operations and Maintenance

At the City we are committed to maintaining our assets in a state of good repair in order to ensure that we deliver a high level of service for our customers.

Typically, in the case of minor maintenance, it is incorporated into planned operations and maintenance programs in order to make repairs based on condition assessments and to extend the assets useful service life. Minor maintenance prescribes a work order that is distributed to Operations staff and contractors for repair, followed by a work inspection to ensure completeness and payment once complete.

Currently, there are a number of planned operations and maintenance activities that are performed for the City's transportation assets. In addition, we also have a maintenance agreement with the Region of Waterloo. Since the formation of the Region of Waterloo in 1973, general road maintenance of Regional roads within the urban boundaries of Cambridge has been provided by Cambridge and funded by the Region. An agreement was established in 2006 that included specifications/ performance standards for the maintenance activities and saw residents benefit from more seamless and efficient service delivery throughout the Region. The current Area Maintenance Agreement (AMA) between the Region, Cambridge, Kitchener and Waterloo runs from January 1, 2014 until December 31, 2020. In Table 14 we have outlined the planned maintenance activities that are City versus Regional responsibility.

If the inspection reveals that major maintenance is required but not required immediately, the City typically implements a rehabilitation and renewal plan.

Table 14: Planned Operations and Maintenance Activities

ACTIVITY	CITY ROADS	REGIONAL ROADS
Crack sealing	x	x
Spring Clean-up	x	x
Tree trimming/ brush control	x	x
Shouldering	City contracts this out	City contracts this out
Ditch Maintenance	City contracts this out	City contracts this out
Catchbasin clearing	x	x
Hole Maintenance	x	x
Sign Maintenance and replacement	x	x
New sign installation in New developments	City contracts this out	-
Grass cutting - boulevard	x	Region
Bridge - deck washing	x	x
Street Sweeping	x	x
Winter Maintenance Road	x	x
Winter Maintenance Roads - cul de sacs	City contracts this out	-
Winter Maintenance - Walkways	x	-
Winter Snow Removal	x	x
Winter Maintenance SideWalk	x	x
Parking Lot Winter Maintenance	City contracts this out	-
Winter Road inspections	x	x
Bike Lane Maintenance	x	x
Road Patrol and Inspections	x	x
Road Condition Assessments	City contracts this out	Region
Trench Inspections	x	x
Leaf Pick up and Disposal	x	x
Pedestrian Bridge maintenance	x	-
Stairs - walkways maintenance	x	-
Parking Lot maintenance	x	-
Pavement Markings	x	Region
Parking Stall - pavement markings	City contracts this out	City contracts this out

* x denotes the City of Cambridge staff perform this activity

Unplanned Operations and Maintenance

Our major maintenance needs are identified through a number of sources, namely activities prescribed through maintenance of assets. However, unexpected situations may occur which can result in unplanned maintenance activities. If major maintenance costs are significant, a more thorough review process becomes necessary and often involves consultation with various internal functions, such as our Asset Management service area, as well as our Engineering and Operations service area to decide if the repair meets the capital budget criteria. Generally, this service area relies on outside contractors for investigation and suggested repairs when the scope of the maintenance is not easily determined.

Despite the fact that, typically, minor maintenance is incorporated into planned operations and maintenance programs, there are cases where it is unplanned.

In Table 15 we have outlined the unplanned maintenance activities that are City versus Regional responsibility.

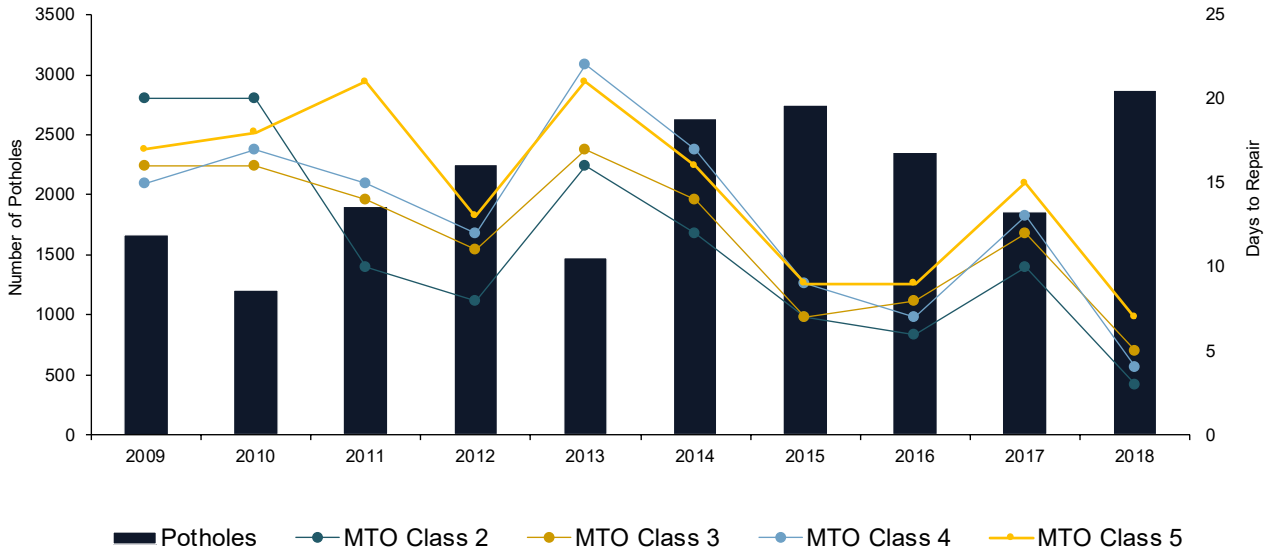
Table 15: Unplanned Operations and Maintenance Activities

ACTIVITY	CITY ROADS	REGIONAL ROADS
Pot hole patching	x	x
Guiderail Repair	x	x
Walk-way maintenance	x	-
Utility cut restorations	x	x
Snow Fence Installation/ Removal	x	Region
Traffic Signals	Region	Region
Trail/Multi-purpose Trails maintenance	x	-
Traffic Island repair	x	Region
Sidewalk Repair	x	x
Pavement Edge repair	x	x
Retaining Wall Repair	x	Region
Street Lights & Poles repairs	Contracted out to Energy Plus	Contracted out to Energy Plus
Emergency Response - Accident clean up, spills debris..etc)	x	x
Flood Wall Maintenance	Only located on Regional roads	x

* x denotes the City of Cambridge staff perform this activity

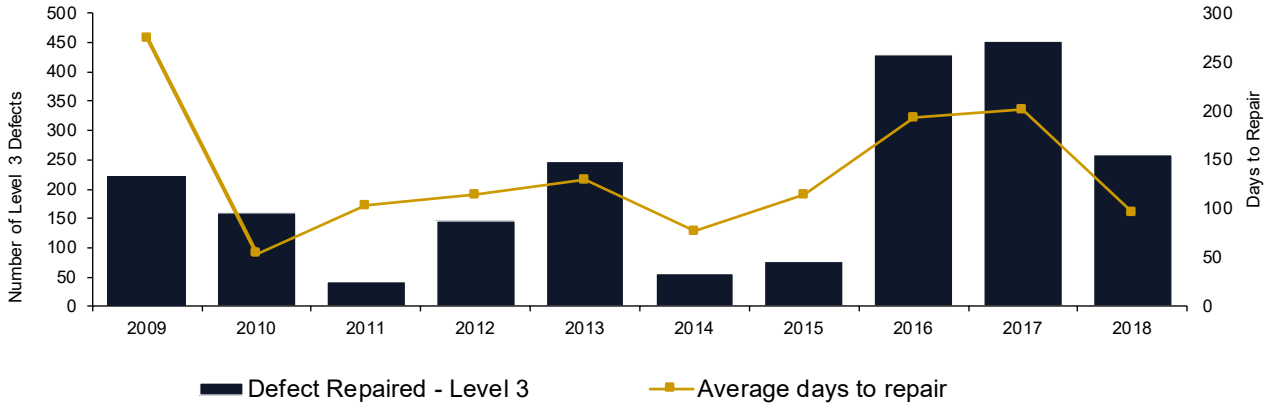
To demonstrate our commitment to unplanned operations and maintenance in Figure 23 and Figure 24, we present the Pothole Repair Summary and the Sidewalk Defects Repair Summary. Regarding the Pothole Repair Summary, it is evident that Cambridge has improved its response time for potholes over the past five years.

Figure 23: Pothole Repair Summary



Regarding the Sidewalk Defects Repair Summary, it is evident that Cambridge has also improved its average days to repair since 2017, and also experienced less Level 3 sidewalk defects in 2018.

Figure 24: Sidewalk Defects - Level 3 Repairs



A.4.3 Rehabilitation and Renewal Plan

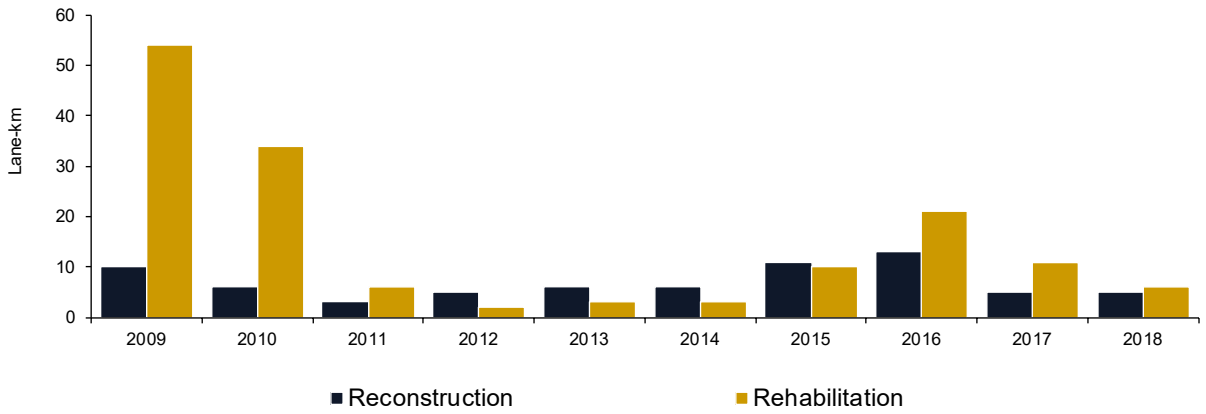
We employ a defined asset renewal process, as shown in Figure 14 of the main body, using supporting software and consultation among multiple internal functions. The supporting software are decision support tools that allow us to utilize our asset State of Infrastructure data and operations and capital budget information in order to target efficient rehabilitation and renewal of transportation assets.

The rehabilitation and renewal plan process begins with a needs assessment on an annual basis, followed by a review of the operational impacts of a potential investment. If the need for rehabilitation or renewal is significant enough, the item moves to a more detailed level of scope and budget definition, financial forecasting, and then Council approval. In some cases, for very large roads that will affect a significant number of people, public consultation is necessary to make sure that our decisions align with the expectations and needs of the people we serve. Most renewal projects require construction and project management, particularly as the projects increase in scale. Following the renewal, commissioning and inspection activities are performed to ensure that our personnel have the understanding of the materials and processes recommended to maintain the asset at a cost-effective, and optimal level.

The rehabilitation and renewal process for our roads is fully integrated with the renewal needs of all underground infrastructure such as drinking water, stormwater and waste water. This integrated approach ensures our renewal projects for these service areas are delivered with optimal timing to increase value and minimize disruption to our communities. For example if a road is targeted for renewal, coordination between service areas will determine whether the underlying stormwater, drinking water or sewer infrastructure is also of an age or condition that requires renewal to ensure these projects are delivered together to reduce disruption for our communities and deliver enhanced value. Additionally, we work in collaboration with the Region of Waterloo to rehabilitate and renew both Regional and City roads.

In order to ensure a state of good repair and service delivery, we have a road resurfacing program for those roads that only need pavement condition improvement and that do not require renewal of underground infrastructure, and we also have separate program for laneway reconstruction. To demonstrate this ongoing commitment to our road network, Figure 25 presents that during 2009 – 2018, we have reconstructed 70 lane-km and rehabilitated 151 lane-km of City owned roads. In 2009 and 2010 we rehabilitated 88 lane-km of City owned roads as we received a Federal infrastructure renewal grant. Many of these roads are reaching the end of their life within the next three to four years and will see a deterioration of the road network.

Figure 25: Road Network Renewal



For our other transportation assets, our bridges and culverts are primarily in good condition, as we have rehabilitated three bridges over the last 10 years, and we have completed Phase 1 of the conversion of our streetlights to efficient LED lighting.

A.4.4 Disposal Plan

In some cases, disposing of an asset is more appropriate than replacing or renewing it. Given the growth of our population and steadily increasing movement of people and goods, disposal is not a common activity for transportation assets. However, we make every effort to repurpose and incorporate materials from roads into our renewed or new construction. In 2018, the City was ranked second in Ontario for its diversion and re-use percentage of concrete and asphalt recycling. In other cases, we close our transportation assets for use, by limiting the maintenance performed or gating it off. The final approach used is that our Engineering and Operations service area coordinates with contractors to ensure safe removal and environmental sustainability compliance.

In very few instances are there dedicated projects specific for the disposal of a road asset.

A.5.0 Financial Strategy

A.5.1 Asset Investment Needs

Our investment needs are identified through a range of mandated and industry leading planning processes supported by detailed analysis to ensure we identify our needs for investment to maintain service delivery, meet future demand growth and achieve our strategic objectives. The needs identified through these various planning processes are then prioritized through a Capital Project Prioritization Model, which evaluates projects using nine criteria to determine the most important needs and initiatives to be funded.

The following sections describes our capital and operational investment needs to maintain existing infrastructure and associated service delivery along with the requirements for additional infrastructure to meet the growing needs and demands of our communities. We also highlight the Capital Investment Plan that was approved by the City for 2020-2029 and the current funding gap that exists for us to meet our target needs.

Capital Renewal

The City has undertaken a comprehensive analysis to determine the capital needs of its transportation assets to deliver the services expected by its communities and stakeholders. We have adopted an industry leading approach to identification of capital renewal needs for our core asset areas featuring an integrated risk based analysis supported by a decision support system. The resulting analysis for transportation assets demonstrates that the City has a renewal need of $90.5 million.

Key capital renewal transportation projects are outlined in more detail in Table 16.

Table 16: Capital Renewal Projects

Capital Renewal Project	Year	Project Description
Dickson St. Streetscaping	2021	Part of the Back to the Rivers project. Focus of this project is core area beautification and enhancement of existing or new amenities through improved access to the river for residents and visitors. Streets were identified through planning study in 2015.
Beverly St. Reconstruction, Multi-use Trail & Pedestrian Underpass	2021	Beverly Street Reconstruction from Dundas to Elgin Street North. Includes replacement of underground infrastructure, new dual use watermain, multi-use trail, new pedestrian underpass.
Elgin Street North – Phase 1 & Phase 2	2022-2023	Reconstruction of Elgin Street North including Storm Twinning (Galt to Mill Creek Outlet), Sanitary Sewer Replacement, and Shared Regional Watermain Upsizing. This project will be tendered as one project, however, will be a multi-year project, and requires two separate budgeted projects over two years.

Growth Needs

In addition to targeting and prioritizing the investment needed to maintain existing assets, there are also planning processes in place to determine the additional assets needed to meet growing demand for service through population increases or demand for new services. The projects targeted to meet growth are primarily funded through Development Charges – the mechanism that enables recovery of growth-related capital expenditures from new development. These charges are governed by the Development Charges Act and are applied in accordance with our Development Charges By-Law. Any additional growth needs gaps are typically funded through other municipal financing sources. The process for creation and acquisition of assets for growth is described in the Creation/Acquisition section of the Asset Lifecycle Management Strategy.

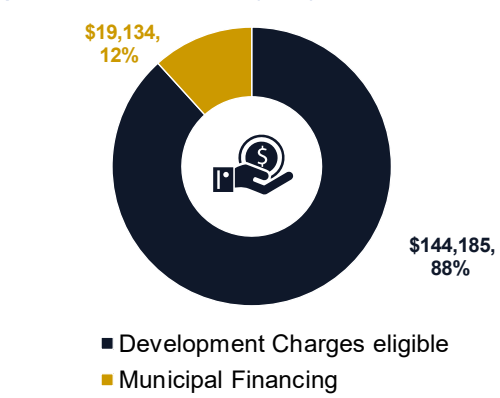
Specifically for transportation assets, the City has identified a number of growth related projects related to highway-specific projects for bridges, roads, roundabouts, and a proposed new pedestrian bridge in Blair and Preston. In Table 17, we have outlined these growth projects in more detail.

Table 17: Growth Projects

Growth Project	Year	Project Description
Guelph Ave. Trail – Construction	2022	Construction of a new trail connecting Guelph Ave to the Hespeler core area - southwest to Queen St. per 2005 Trail Plan.
Preston/ Blair Pedestrian Bridge Construction	2022	Construction of new trail and pedestrian bridge, starting at Fountain Street @ Preston Parkway/ Linden Dr, across RARE lands, crossing over the Speed River, and connecting to Linear Trail near Preston High School.
2096 Black Bridge Road & Bridge	2023	Construction of structure on Black Bridge Road over Speed River and road reconstruction from Guelph Ave to Townline Road, as determined through the Municipal Class Environment Assessment study.
Blenheim Road Reconstruction	2023	Realignment of Blenheim Road from the existing railway crossing near Devil's Creek to the western municipal boundary to improve traffic safety along with the development of the Cambridge West area. Reconstruction of Blenheim Road to include sanitary sewer, storm sewer, watermain, at-grade railway crossing and culvert replacement.
Towline Road Reconstruction	2024	Road reconstruction and improvements of Townline Road from County Road 34 to Black Bridge Road as determined through the Municipal Class Environment Assessment study.

These key projects, in addition to other transportation projects, result in a capital investment need of $163.3 million, of which $144.2 million are Development Charges eligible and $19.1 million require municipal financing as shown in Figure 26. The projects targeted for growth in the next 10 year period are expected to require an estimated increase in operations and maintenance costs of $10.6 million.

Figure 26: Growth Needs ($'000s)

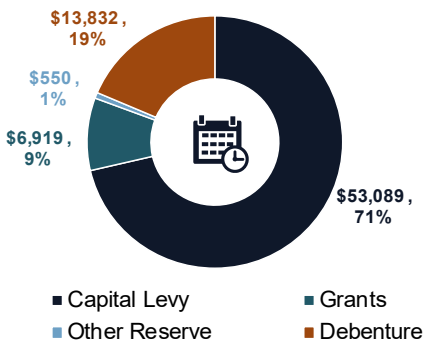


Capital Investment Plan 2020-2029

Our Capital Investment Plan 2020-2029 presents the capital investment proposed to sustain our current services for the next 10 years along with projects designed to meet our projected growth requirements.

Figure 27 outlines funding from capital levy, federal gas tax grants, other reserves, and debentures allocated through 2020-2029 Capital Investment Plan.

Figure 27: 2020-2029 Capital Investment Plan ($74,391 thousand)

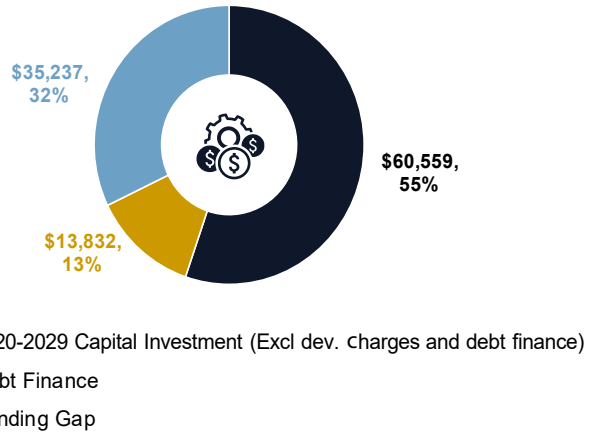


Current Funding Gap Assessment

Despite the various funding sources available to Cambridge (excluding Development Charges and debentures), we recognize that the City's identified investment needs for renewal of existing infrastructure and building new infrastructure to support growth remains insufficient to maintain current transportation infrastructure in good states of repair. With a view of our 10 year proposed plan, we are able to identify the funding gap that exists in order to meet our target needs.

Figure 28 highlights that after $13.8 million in debt financing over the next 10 years the remaining funding gap is $35.2 million.

Figure 28: Current Funding Gap Assessment ($'000s)



Therefore, based on the analysis presented above and the City's proposed Capital Investment Plan, Table 18 presents the journey to calculate our funding gap.

Table 18: Funding Gap Analysis

Funding Gap Analysis	$ millions
Existing Infrastructure – Renewal Needs	$90.5
Growth Needs - Municipal Financing	$19.1
Total Financial Needs	**$109.6**
2020-2029 Capital Investment Plan (Excluding Development Charges and debentures)	($60.6)
Debentures	($13.8)
Total Funding Gap	**$35.2**

A.5.2 Funding Strategies

To support our transportation assets that provide services within the City, we require sufficient funding in order to maintain the assets in a state of good repair, as well as to create new assets to support future growth. Our current strategies and revenue sources are allocated based on our prioritization model discussed in the Investment Needs section. This model considers the currently available funding sources for transportation assets in order to deliver our current investment plan effectively. Some of the funding sources we have available at Cambridge are outlined below:

- Reserve Funds: We have established reserve funds to provide stability to tax rates in the event of unforeseen economic events, to provide funding for one-time requirements, to make provisions for the acquisition and replacement of infrastructure, and to provide flexibility to manage debt levels.
- Federal Gas Tax – Funding the Federal Government provides the Association of Municipalities twice a year to support local infrastructure.
- Capital Works Reserve Fund: Through property tax collection, we are able to provide annual contribution to this reserve fund that supports infrastructure renewal needs for transportation assets.

Additionally, we continually assess opportunities for additional funding options and revenue streams to address our funding gaps. The following are options that have been used by other municipalities towards addressing their infrastructure gaps and we continue to review for implementation at City of Cambridge.

- Grants – Outside of the City's control, there are periodically additional funding opportunities provided by the provincial and federal governments towards certain infrastructure projects. These funding sources typically outline specific conditions and requirements that must be demonstrated in order to secure and maintain the funding. In many cases, these conditions require applicants to demonstrate capabilities in effective planning and financial management.
- Capital Levy – A special levy to provide a certain percentage of a tax rate increase annually devoted to asset sustainability.
- Increased Reserve Contribution – Opportunities to allow a certain percentage of assessment growth to be contributed to reserves for future replacement of assets donated through new subdivisions.
- Additional Debt Financing – As the City issues debt over the period of the capital forecast, it is projected that the City will reach its debt capacity limit of 10% for the tax-supported operating fund. Opportunities to increase the debt financing limit and take on more debt financing that already projected could help to lower the gap.

A.6.0 Stakeholder Engagement

A.6.1 Users of the Service

Our valued communities are the primary users of our transportation network along with transient users who are visiting or travelling throughout our area. This network is also vital for the movement of goods that contribute to the economic health of the Region. Our users therefore also include those providing commercial services and goods. We provide a range of engagement points for our users, including online (both through the website and social media), by email, phone, or letter. We also engage our users through multi-media engagement campaigns around road safety.

In addition to these traditional channels of engagement, our developing Transportation Master Plan – Moving Cambridge has undertaken a significant consultation exercise featuring a range of opportunities to consult with stakeholders directly on the subject of transportation in the City.

We also initiated a Public Works Open House in 2017, which is held annually, to provide an opportunity for our stakeholders to learn more about our work in transportation. The City and the Region also work together to address the communities' concern around intersection safety.

A.6.2 Service Delivery Partners

We rely on partnerships to aid the delivery of service and improvements to our assets and to implement appropriate controls and processes to ensure the impact of our work on stakeholders and delivery partners is communicated to avoid risks and adverse impacts.

Within transportation, it is particularly important that we work with our external contractors in delivery of our renewal programs, as well as with utility providers to minimize disruption and coordinate efforts for maximizing efficiency.

We maintain close relationships with both our internal and external partners and maintain processes to engage with each of our service delivery partners as required.

A.6.3 Public and Private Infrastructure Owning Bodies

The Region of Waterloo and our other local government partners are the most significant public-infrastructure owning bodies with assets integrated into our transport. As such, we maintain formal processes for working with the Region on our transportation plans, as well as, with our Operations staff.

On an annual basis, Region and City staff meet to review respective infrastructure replacement and road reconstruction plans. In advance of these meetings, Region staff provide draft copies of the Transportation Capital Program (TCP) (10-year plan for road) and the Water main Capital program (10-year plan for water/wastewater). City staff provide the draft 10-year capital forecast for infrastructure replacement and development plans. These meetings are typically held in summer months to assist both municipalities with capital budget preparation.

For projects identified by the Region in the approved TCP, Region staff generally prepare a Preliminary Design Report, which summarizes the requirements for the project. City staff from Asset Management, Transportation and Engineering are provided with the opportunity to identify City needs to be incorporated into that project. Once the Region initiates a specific capital project, the Region's project manager reaches out to the City for a representative for the project team. Generally, the representative is from the Development Engineering or Design & Approvals Divisions. The City representative is the point of contact for that Region project and will coordinate with other City service areas, including planning, heritage planning, public works, economic development and parks and recreation, to make certain all City interests are represented and addressed.

Additionally, the Operations staff meet separately with Regional representatives to review operational needs on regional roads and timing of work on regional roads as to not greatly reduce the service level and disruption to the public.


15216

Appendix B

Asset Management Plan – Environmental Services

B.1.1 Introduction

The City maintains a diverse portfolio of assets that are bundled under environmental services. We have three different asset classes within environmental services in order to effectively deliver clean water to our community, as well as manage precipitation and sewage collection throughout the City.

Table 19: Environmental Services Assets

Service Area:	**Environmental Services**		
Asset Class:	**Stormwater**	**Drinking Water**	**Wastewater**
Asset Type:	» Storm System » Stormwater Management Facilities » Culverts » Dams	» Water System	» Sanitary System » Sanitary Pumping Stations

This collection of assets is critical to our City. Ushering sound management of drinking water, wastewater, and stormwater for the community and local ecosystem helps us realize our vision of a clean and green city. Like many of our assets, environmental service assets are facing increased challenges as a result of aging infrastructure, climate change, and increasing demand due to growth in our City. Our investment in these assets must therefore be balanced to optimize investment for renewal with the growing needs of our community.

Given the intricacies of our asset base, it is important to distinguish between the City's services and the Region of Waterloo's services. The Region of Waterloo owns and manages treatment plants for drinking water and wastewater and provides waste management services. As such, the assets that provide these services are not included as part of this AMP.

This appendix provides information regarding our approach to management of environmental services assets in the next 20 years, demonstrating our commitment to assessing and meeting the LoS valued by our residents.

B.1.2 Scope

This section identifies the requirements for each Phase of O.Reg.588/17 applicable to the assets within this service area. Our compliance with these requirements for the asset classes within this service area is presented in Table 20 to highlight areas of future development in advance of regulation phases. The following sections of this appendix will present further detailed information to meet the requirements for each section of the regulation.

Table 6 of the main body of our AMP provides a summary of compliance for all service areas along with our plans for continuous improvement to meet the remaining requirements in advance of the future regulatory phases.

Table 20: Compliance with O.Reg.588/17

Core Assets		Phase 1 – July 1, 2021						Phase 3 – July 1, 2024						
Service Area	Asset Class	Asset Inventory	Weighted average	Replacement Value	Average age	Current Levels of Service	Costs to maintain LoS	Proposed Levels of Service	Creation/ Acquisition Plan	Operations and Maintenance Plan	Rehab and Renewal Plan	Disposal Plan	Investment Needs	Funding Strategies
Environmental Services	Stormwater	●	●	●	●	●	●	◑	◑	◑	◑	◑	◑	◑
	Drinking Water	●	●	●	●	●	●	◑	◑	◑	◑	◑	◑	◑
	Wastewater	●	●	●	●	●	●	◑	◑	◑	◑	◑	◑	◑

● Compliant ◑ Partially compliant ○ Not compliant Note: Phase 2 not reflected as only Phase 1 and 3 are applicable to core assets

Table 20 demonstrates that our assets within the environmental services area are fully compliant with the regulation requirements for Phase 1.

In addition we have achieved most of the requirements for Phase 3 with the exception of proposed LoS. We have undertaken an extensive exercise engaging multiple stakeholders to develop a LoS framework that identifies proposed LoS for all service as described in the LoS section of the main body and within Section B.3.2. of this appendix. We will continue to develop these identified proposed measures in consultation with stakeholders for reporting in advance of the 2024 milestone.

B.1.3 Strategic Connections

The strategic and master plans summarized in this section are all related to the environmental services assets and have been considered while developing this AMP.

Table 21: Strategic Documents

Strategic Document	Linkage(s) to the AMP
Current Documents	
2016-2019 Strategic Plan (2016)	The Strategic Plan sets the stage for decision-making, prioritization, and ongoing performance management. Many of Cambridge's residents, employers, and visitors took time to share their ideas and contribute to the plan's development, identifying the positive aspects of Cambridge, as well as aspects they would like to see improve. The Strategic Plan set a goal to make Cambridge "a place for people to prosper" – alive with opportunity, and the infrastructure that enables our people to thrive is a significant contributing factor to this initiative. This AMP shares a connection to the Strategic Plan in its direction and objectives, relating to decision-making, prioritization, and performance management, ultimately enabling us to continue making Cambridge "a place for people to prosper". More specifically, the Strategic Plan emphasizes the importance of our environment and rivers, and lists this as one of its seven goals. The goal expresses that the City looks to be good stewards of the rivers, waterways and natural environment that the community can enjoy. This Strategic Plan was used to guide the City in developing its LoS Framework for environmental services assets in this AMP. The City is currently in the process of revising the Strategic Plan.
Development Charges Background Study (2019)	A by-law that imposes certain Development Charges in the Corporation of the City of Cambridge pursuant to the Development Charges Act, S.O., 1997, c. 27, as amended. The growth plans and infrastructure investment proposed within the AMP must consider whether development charges will be incurred pursuant to the City's bylaws. In accordance with the By-Law, Cambridge has developed a Development Charges Background Study. The Development Charges Background Study is essential to this AMP as it supports the City in identifying its funding gap included in the Financial Strategy.
Sanitary Sewer Servicing Master Plan (2014)	The Sanitary Sewer Servicing Master Plan aims to identify gaps in the City's ability to sustainably meet sanitary sewer services to citizens and businesses. The Sanitary Sewer Servicing Master Plan also sought to determine the current system's ability to meet demands of current users and estimated future development from both a growth and intensification point of view. Furthermore, it updated governance and policy and design standards to align with current and expected future issues, and adopted a set of service-level objectives. This AMP leveraged the Sanitary Sewer Servicing Master Plan specifically with consideration to the system's ability to meet growth. This component of the Master Plan was incorporated as part of the Creation/ Acquisition phase of the Asset Lifecycle Management Strategy. In addition, the Master Plan emphasized the importance of sustainability of sanitary sewer systems, as such, this element was considered within the Proposed LoS Framework
Stormwater Management Master Plan (2011)	The Stormwater Management Master Plan was completed to develop strategies to manage the City's infrastructure related to flooding and stormwater quality. As part of the plan, the government policies and procedure regarding stormwater was updated. This plan includes an assessment of existing drainage infrastructure and deficiencies, development of management alternatives, and an established set of priority-based recommendations for future maintenance programs to address flood risk and stormwater quality issues throughout Cambridge. Despite that the Master Plan was developed in 2011, and is not pertinent for the State of Infrastructure component of this AMP, the analysis performed as part of this Plan still remains useful to consider for this AMP. The Master Plan identifies recommendations for future stormwater maintenance programs, which has been considered as part of the Asset Lifecycle Management Strategy of this AMP.

Strategic Document	Linkage(s) to the AMP
Current Documents	
Region of Waterloo Wastewater Treatment Master Plan (2018)	The 2018 Region of Waterloo's Wastewater Treatment Master Plan builds upon the 2007 plan of the same name. The goal of the 2018 plan was to develop a current, comprehensive, cost-effective and feasible strategy to address the anticipated wastewater treatment needs of the Region over the next 35 years that is consistent with the Region's 2015-2018 Strategic Plan. The 2018 plan was completed under the Environmental Assessment Act in accordance with Municipal Class Environmental Assessment requirements, and provides an overall plan for the upgrade and/or expansion of the Region's wastewater facilities until the year 2051. The Region's Master Plan was considered as part of the Asset Lifecycle Management Plan as the Region of Waterloo's plans for growth will directly impact the City of Cambridge and its creation/ acquisition needs for wastewater assets.
Region of Waterloo Water Supply Master Plan (2015)	Provides an update to the Water Supply Master Plan for the Region of Waterloo to guide the medium to long-term water supply planning for the Region of Waterloo's Integrated Urban System to ensure the availability of a sustainable water supply. The Master Plan identifies the updated strategies as a result of updated demand projections, updated supply rates and evaluation of supply alternatives. The updated strategy includes: addressing constraints in supply and distribution, increasing ground water as needed to maintain sustainable average day capacity at least 20% above projected demand, continued improvement of water efficiency and conservation, implementing peaking and capacity increases, updating the plan regularly and deferring the Great Lake Supply beyond 2051. The Region's Water Supply Master Plan was considered as part of the Asset Lifecycle Management Plan as the Region of Waterloo's strategies to address demands will directly impact the City of Cambridge and its creation/acquisition needs for drinking water assets.

B.2.0 State of Infrastructure

Environmental Services Overview

Environmental service assets are those that enable us to live in a clean and safe environment. Our environmental services assets are our most utilized and important assets, as our community would not thrive without them. It includes everything from water pipes that service our homes and businesses throughout the City to some of our stormwater management facilities.

We recognize that our environmental services assets are imperative to the livelihood of our community and extends into all other portfolios, which is what makes environmental services particularly important.

For our environmental assets: 24% of our drinking water assets are in poor or very poor condition, and 52% in good or very good condition in comparison to 9% and 67% respectively for Canadian municipalities reported on the Canadian Infrastructure Report Card; 8% of our wastewater assets are in poor or very poor condition, and 86% in good or very good condition in comparison to 11% and 57% respectively for Canadian municipalities reported on the 2019 Canadian Infrastructure Report Card; and 16% of our stormwater assets are in poor or very poor condition, and 69% in good or very good condition in comparison to 11% and 45% respectively for Canadian municipalities reported on the 2019 Canadian Infrastructure Report Card. As such, it is evident that our drinking water assets are in worse condition than other Canadian municipalities, however, in contrast, our wastewater and stormwater assets are in better condition.

Replacement Value ('000s)

$1,630,114

Total replacement value of all assets within the environmental service asset class

Condition

Good

Weighted average condition rating of environmental services assets across all subclasses

Asset Class

Three

Distinct asset classes that we manage as part of our municipal environmental services portfolio

Asset Class

Stormwater

- 87 Stormwater Management Facilities
- 1,195 Culverts
- 371 km of pipes
- 3 Dams

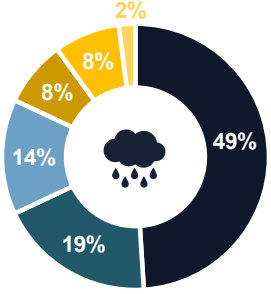
Drinking water

- 40,235 Water Meters
- 509 km of pipes

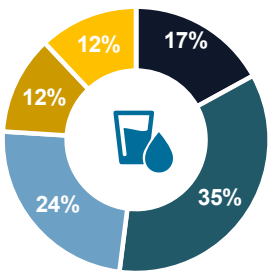
Wastewater

- 17 Pumping Stations
- 532 km of pipes

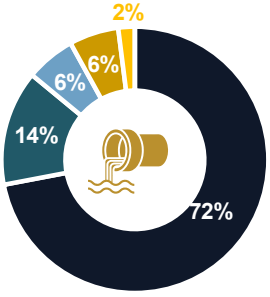
Storm Water Condition*



Water System Condition*



Wastewater Condition*



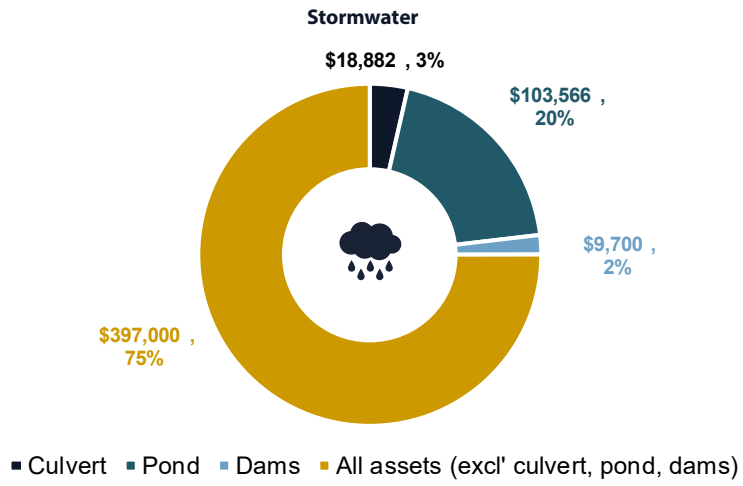
*Condition based on replacement value

Very Good | Good | Fair | Poor | Very Poor | Unknown

Replacement Value ('000s)
$529,148

Weighted Avg. Condition Rating
Good

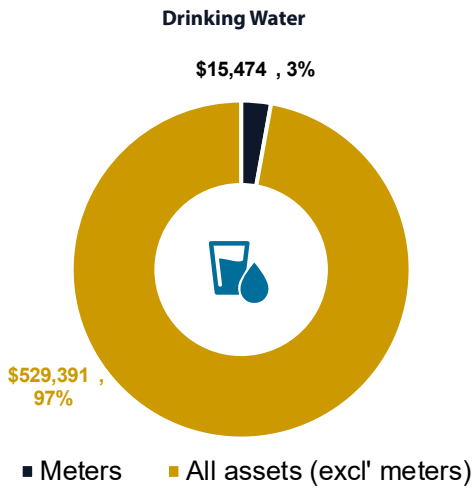
Average Age
27 years



Replacement Value ('000s)
$544,864

Weighted Avg. Condition Rating
Fair

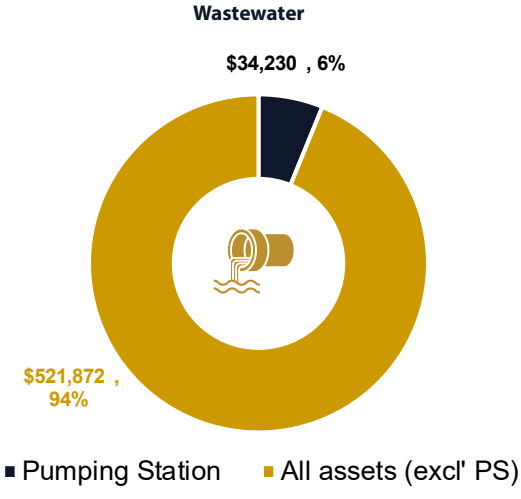
Average Age
33 years



Replacement Value ('000s)
$556,102

Weighted Avg. Condition Rating
Very Good

Average Age
31 years



B.2.1 State of Infrastructure Maps

Our environmental services assets are comprised of a number of different assets scattered throughout the City as shown in Appendix J.

B.3.0 Levels of Service

B.3.1 Current Levels of Service

Under O.Reg.588/17, for our core assets, we are required to report the technical metrics for our current LoS. As such, we have reported the prescribed metrics from the regulation for drinking water, wastewater and stormwater assets within our LoS framework, as outlined in Table 22.

Table 22: Prescribed Levels of Service

Description		Environmental Service assets in the City of Cambridge include stormwater, drinking water, and wastewater assets. Stormwater assets include the storm system and the stormwater management facilities. The drinking water system comprises the drinking water system in the City that provides water that is safe for drinking. Lastly, wastewater assets include the sanitary system and sanitary pumping stations. The City's assets do not include the treatment of drinking water and wastewater as the Region is responsible for this.		
Asset	**Service Attribute**	**Community levels of service (qualitative descriptions)**		
Stormwater	**Scope**	The municipal stormwater system mitigates the risk of flooding throughout the entire City. The City has outlined maps of its stormwater system in Appendix J. Specifically, those residences and businesses located near or on the flood plain benefit from having an effective stormwater management system. We strive to protect the environment and implement quality measures before releasing stormwater to the environment.		
		Technical Measures of Service	**2017**	**2018**
		Percentage of properties in the municipality resilient to a 100-year storm	93.7%	93.7%
		Percentage of the municipal stormwater management system resilient to a five-year storm	97.6%	97.5%
Drinking water	**Scope**	**Community levels of service (qualitative descriptions)**		
		The municipal drinking water system connects to most residential, commercial and industrial spaces in the City that are outlined in maps in Appendix J. The municipal drinking water system and hydrant network provides safe drinking water and fire protection to most residential, commercial and industrial spaces in the City.		
		Technical Measures of Service	**2017**	**2018**
		Percentage of properties connected to the municipal water system *(Note: average value for 2017/2018)*	99.0%	99.0%
		Percentage of properties where fire flow is available *(Note: average value for 2017/2018)*	99.0%	99.0%

Table 22: Prescribed Levels of Service (Cont'd)

Asset	Service Attribute	Community levels of service (qualitative descriptions)		
Drinking water system	Reliability	The City is constantly monitoring water quality and service to ensure minimal disruptions and complies with the Ontario Drinking Water Quality Management Standard. In the event of a water quality issue or service disruptions, a notice is issued citywide to ensure all users are aware and can take appropriate action. The City also has an objective to minimize water loss within the City by detecting leakage and repairing promptly.		
		Technical Measures of Service	**2017**	**2018**
		The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0 days to 38,312 properties	0 days to 38,772 properties
		The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system	0 days to 38,312 properties	6 days to 38,772 properties
Wastewater	Scope	**Community levels of service (qualitative descriptions)**		
		Most of the residential, commercial, and industrial spaces in the City receive service from the municipal wastewater system. The City has outlined maps of its wastewater network in Appendix J.		
		Technical Measures of Service	**2017**	**2018**
		Percentage of properties connected to the municipal wastewater system *(Note: average value for 2017/2018)*	94.0%	94.0%
	Reliability	**Community levels of service (qualitative descriptions)**		
		The number of overflow or wastewater home backup events due to the absence of overflow structures in the municipal wastewater system is low.		
		The City does not have any combined sewers.		
		Reducing stormwater infiltration into sanitary sewers and minimizing overloading of the municipal wastewater system is an objective of the City.		
		Sanitary sewers in the municipal wastewater system are resilient to major events.		
		The City is not responsible for sewage treatment plants.		
		Technical Measures of Service	**2017**	**2018**
		The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	0 days to 36,357 properties	0 days to 36,631 properties
		The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system	34.3 days to 36,357 properties	27.3 days to 36,631 properties
		The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0.5 effluent violations to 36,357 properties	0.5 effluent violations to 36,631 properties

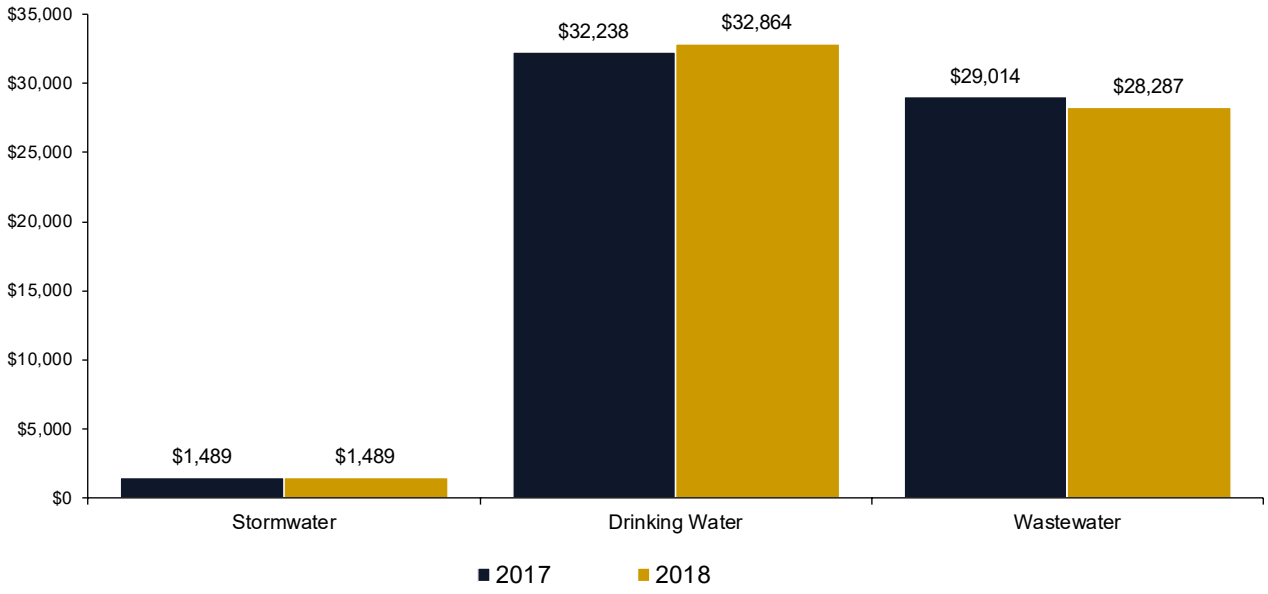
Additionally, we are pleased to report other current measures for asset classes: stormwater, wastewater, and drinking water system. These are outlined in Table 23.

Table 23: Additional Current LoS

Asset Type		2017	2018	Avg
Stormwater	Number of service requests	152	129	141
	Average age of stormwater pipe (years)	28	29	28.5
	Average PACP structural condition	1 (Very Good)	1 (Very Good)	1 (Very Good)
Drinking water	Overall water consumption per account (Non-Residential) per day (m3/day)	20.86	21.29	21.08
	Overall water consumption per account (Residential-Single Family) per day (m3/day)	0.42	0.51	0.47
	Overall water consumption per account (Residential-Multiple Family) per day (m3/day)	2.21	2.04	2.13
	Number of service requests	1,906	1,811	1,858
	Average age service connection (years)	28	29	28.5
	Average age Hydrant (years)	35	36	35.5
	Average age of water main (years)	32	33	32.5
	Number of water main breaks per year	17	32	24.5
	Percentage of non-revenue water (Volume of Non-Revenue water in % of water purchased) (%)	22	23	22.5
Wastewater	Number of service requests	963	712	837.5
	Number of pumping station major failures	0	0	0
	Number of blocked service connections (/1000 service connections)	10.9	8.8	9.8
	Average Age Wastewater Pipe (years)	32	33	32.5
	Average PACP structural condition	1 (Very Good)	1 (Very Good)	1 (Very Good)
	Percentage of infiltration and inflow of storm- or groundwater into sewage network (%)	31	26	29
	Annual number of wastewater main backups / 100 km length of wastewater main	2.65	1.50	2.08

In order to deliver these current LoS for environmental services assets, we have spent $1.5 million, $32.6 million and $28.6 million on average for stormwater, drinking water and wastewater for operations related costs, as shown in Figure 29.

Figure 29: Operating Costs Annual Comparison ($'000s)

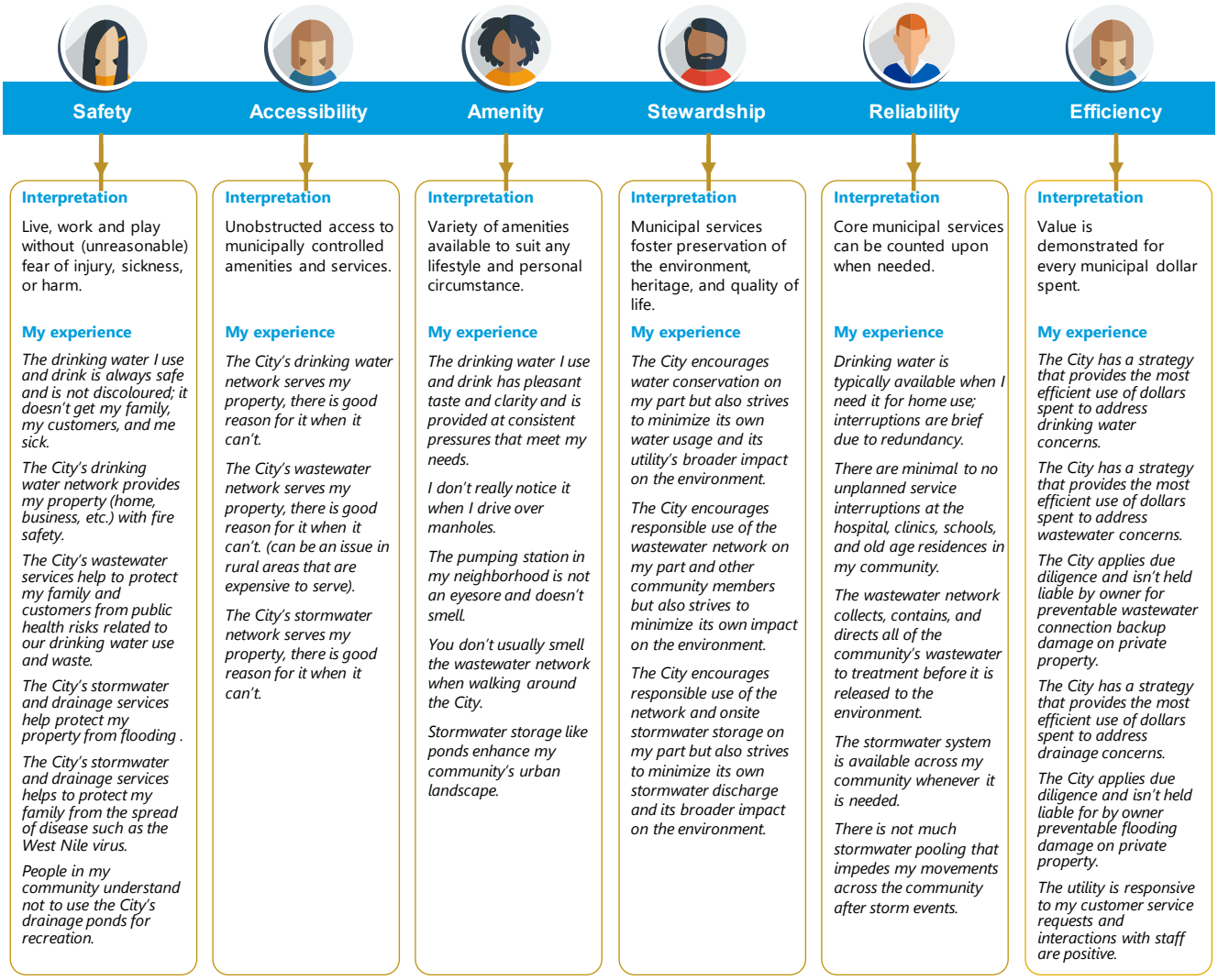


B.3.2 Proposed Levels of Service

We have recently undertaken an exercise to develop a LoS framework that fully aligns our strategic objectives with LoS expected by customers and technical metrics to determine whether our assets are achieving those expectations. Our intention is to use this framework going forward to position all reported metrics within this framework to demonstrate achievement of our outcomes and community needs.

While the proposed LoS are not required for reporting by the Regulation until 2024, we have proactively developed proposed measures for review and consultation as part of the exercise to develop an LoS framework for all assets across our portfolio.

The starting point for this exercise was identification of our community priorities aligned to our strategic outcomes. The definitions for these priorities are provided in the main body and are referenced in the interpretation sections in the graphic below. We further this concept within each asset area by identifying the unique concerns of the community with regard to the asset. In the case of environmental services assets, we have identified the concerns and priorities of our stakeholders in the "My Experience" headings below, from stakeholder feedback through everyday operational responses and dedicated feedback channels such as the engagement undertaken to support our noted environmental-service-related Master Plans.



With the identification of stakeholder informed environmental services priorities, we have developed a series of technical measures designed to monitor performance of these priority community LoS, some of which are reported in Table 23. These preliminary metrics will be tested internally to determine reporting requirements and undergo external consultation ahead of publishing in future updates of the AMP.

B.4.0 Asset Lifecycle Management Strategy

B.4.1 Creation / Acquisition Plan

Master planning documentation supports the City in identifying the objectives around the specific asset services that are necessary to meet the needs and growth of Cambridge. Master Plans such as the Stormwater Management Master Plan, a Sanitary Sewer Servicing Master Plan, and the Region's Water Supply Master Plan helps the City identify and prioritize the environmental services asset needs for the continued development of Cambridge.

The Stormwater Management Master Plan identifies required drainage system and other structural upgrades to meet anticipated weather pattern changes and increase service level expectations regarding the protection against flooding during major rain events.

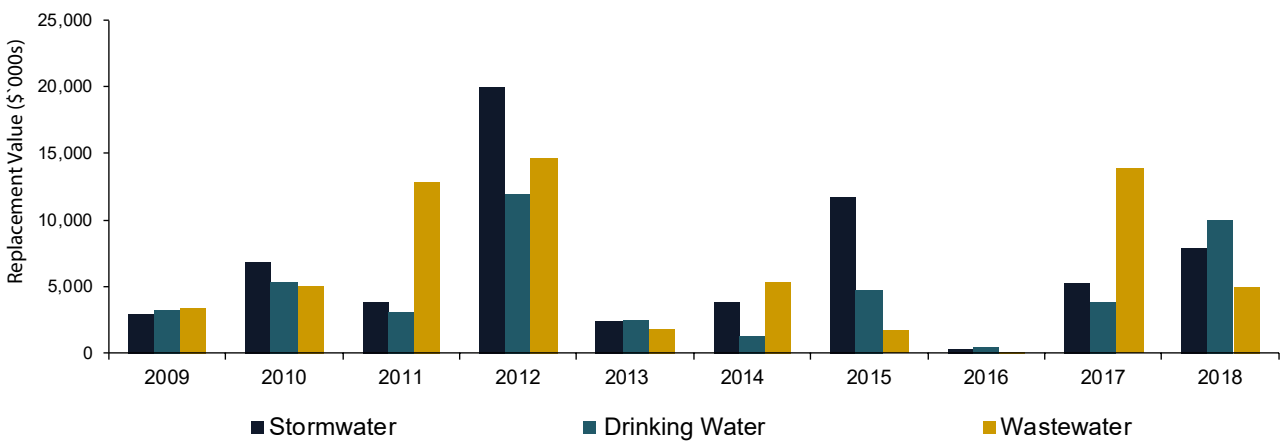
Sanitary Sewer Servicing Master Plan provides a comprehensive review of the City's pumping stations and sanitary hydraulic model, a criticality assessment, a LoS review, a policy & procedures review, identification of system needs to support future growth, and a review of operations and maintenance programs.

The Regional Water Supply Master Plan identifies that there are increased constraints on the supply and distribution of water. This plan will directly impact the City of Cambridge and its creation/acquisition needs for drinking water assets since decisions made at the Regional level will influence and add pressure to the City's assets specifically as it affects pressure zones and the valves used to maintain the zones.

All creation and acquisition activities within our municipal boundaries are made in alignment with the objectives, stakeholder input, and long-term strategic plans set forth in the noted Master Plans. As a defined municipal core service, environmental services assets are a critical element in the activities necessary to meet the demands associated with population growth and economic development. Ensuring strong environmental service assets directly affects the health, safety, and livability of Cambridge residents.

We also recognize that we are a part of the Ontario Government's Growth Plan for the Greater Golden Horseshoe. This Plan is an initiative to plan for growth and development of environmental services assets in a way that supports economic prosperity, protects the environment and helps communities achieve a high quality of life. Documents such as these help the City to develop the creation and acquisition plans as we need to take these priorities and plans into consideration. Looking at the growth we have had in the past, since 2009, Cambridge has made considerable effort to invest in the growth of our environmental services assets across all asset types, including drinking water systems, wastewater and stormwater as presented in Figure 30. Over the 10 year period, we have grown the length of our system by approximately 7% (26km), 6% (28km), and 9% (44km) for stormwater, drinking water, and wastewater respectively.

Figure 30: Asset Type Growth by Year ($'000s)



Additionally, the Development Charges Study Report from 2019 supports the needs-based discussions by identifying whether the City has the capital to create or acquire new environmental services assets in order to deliver on the services and goals outlined in the plans.

B.4.2 Operations and Maintenance Plan

Over time, significant costs are generated during the asset lifecycle. As a means of cost reduction and investment optimization, we have implemented practices that enhance value. Essential to this, is a strong operations and maintenance plan that positions our assets to satisfy LoS commitments and expectations from those in our community.

Condition Assessment and Inspection

As part of this AMP, we have developed a high-level condition assessment process, which can be referenced in Figure 13 of the main body, and a specific process for environmental services as shown in Figure 32. Based on this condition assessment process, maintenance of environmental services assets begins with routine inspections that will identify defects that could result in future risks or higher costs. This practice of early identification, through visual inspection and quantitative assessment, allows for overall higher LoS and extended asset lifespans, as the outputs from the condition assessments are used in planning.

Asset classes each have varying condition assessment and inspection procedures.

Table 24: Description of Environmental Services Condition Assessment & Inspection Procedures

Asset	Condition Assessment and Inspection Procedure
Stormwater	Stormwater assets, are subject to demands that vary with season and topography and are experiencing trends with more frequent high intensity rainfall events. As a result, assessing the useful life of stormwater infrastructure to address urban flooding is a function of modelled pipe system capacity, development intensification, climate change, grading and major overland flow paths To assess the condition of our stormwater assets we perform regular program of closed-circuit television (CCTV) camera inspections of existing storm mains. The condition is rated based on the widely accepted pipeline assessment certification program (PACP). Stormwater operations have a regular program of inspecting manholes, catch basins, and oil grit separators in addition to an annual program of flood wall testing. Replaced or new storm mains and services are also inspected using CCTV and minor culverts are visually inspected. The data collected is used to confirm inventory, connectivity, and drive capital project planning and, where required, perform reactive repairs or maintenance. The inspection process is fully electronic and linked to GIS systems having current and historical results online and accessible to all staff. In 2016, the City started an initial program for the inspection and condition assessments of stormwater management facilities. Eighty-nine stormwater management facilities and 29 oil grit separators were inspected for safety and operational deficiencies. Additionally, a full condition assessment of 21 of the 89 stormwater management facilities was completed leading to recommendations for sedimentation removal within 14 stormwater management facilities. Guidelines for inspection were developed and a regular program of inspection and condition assessment is recommended to be implemented within the next few years.

Table 24: Description of Environmental Services Condition Assessment & Inspection Procedures (Cont'd)

Asset	Condition Assessment and Inspection Procedure
Wastewater	Wastewater assets follow fairly predictable patterns for future capacity limitations and, in some cases, older infrastructure experiences a reduction of peak flows due to water conservation trends which can extend its useful life. The condition rating of the wastewater pumping stations is based on a 2013 assessment of wastewater pumping stations as part of the Sanitary Servicing Master Plan. Wastewater operations performs regular program inspections of pumping station components and an annual safety inspection. All diameter sanitary lines and siphons are inspected using CCTV (in a similar manner to storm mains as outlined in Figure 3), sonar or flow monitoring in order to identify, address and reduce inflow and infiltration, operational and maintenance emerging issues and capital renewal needs. Sanitary forcemains remain an outstanding item to be addressed and prioritized within the Sanitary Servicing Master Plan. Upon request from Engineering and Operations, flow volume is measured.
Drinking water	Water assets follow fairly predictable patterns for future capacity limitations and, in some cases, older infrastructure experiences a reduction of peak flows due to water conservation trends which can extend its useful life. At the City, we comply with the Ontario Drinking Water Quality Management Standard. The condition of the drinking water system is assessed based on a history of water main breaks, material, and vintage of construction. Deterioration is based on observed failure rates and probabilities. The City tracks and analyzes the break rate of water services and mains based on age and material. Drinking Water Operations has a dedicated crew to proactively detect leaks using acoustic leak-detection equipment in an effort to reduce water loss in the City.

At the City we are very committed to inspecting our environmental services assets, therefore, currently over 80% of our pipes have been inspected as shown in Figure 31.

If a defect is uncovered during inspection, the next step is determining whether the defect will require minor or major maintenance.

Figure 31: Environmental Services Inspections

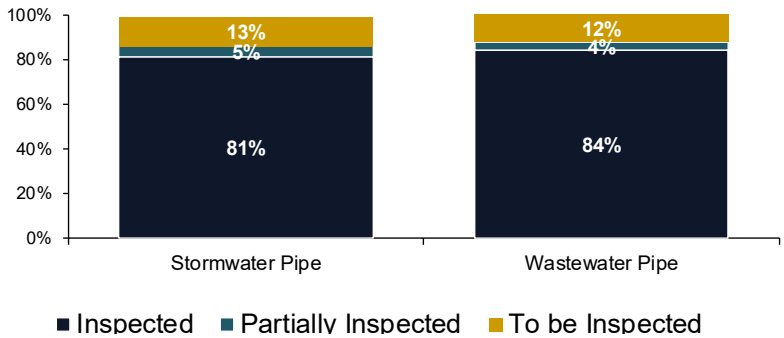
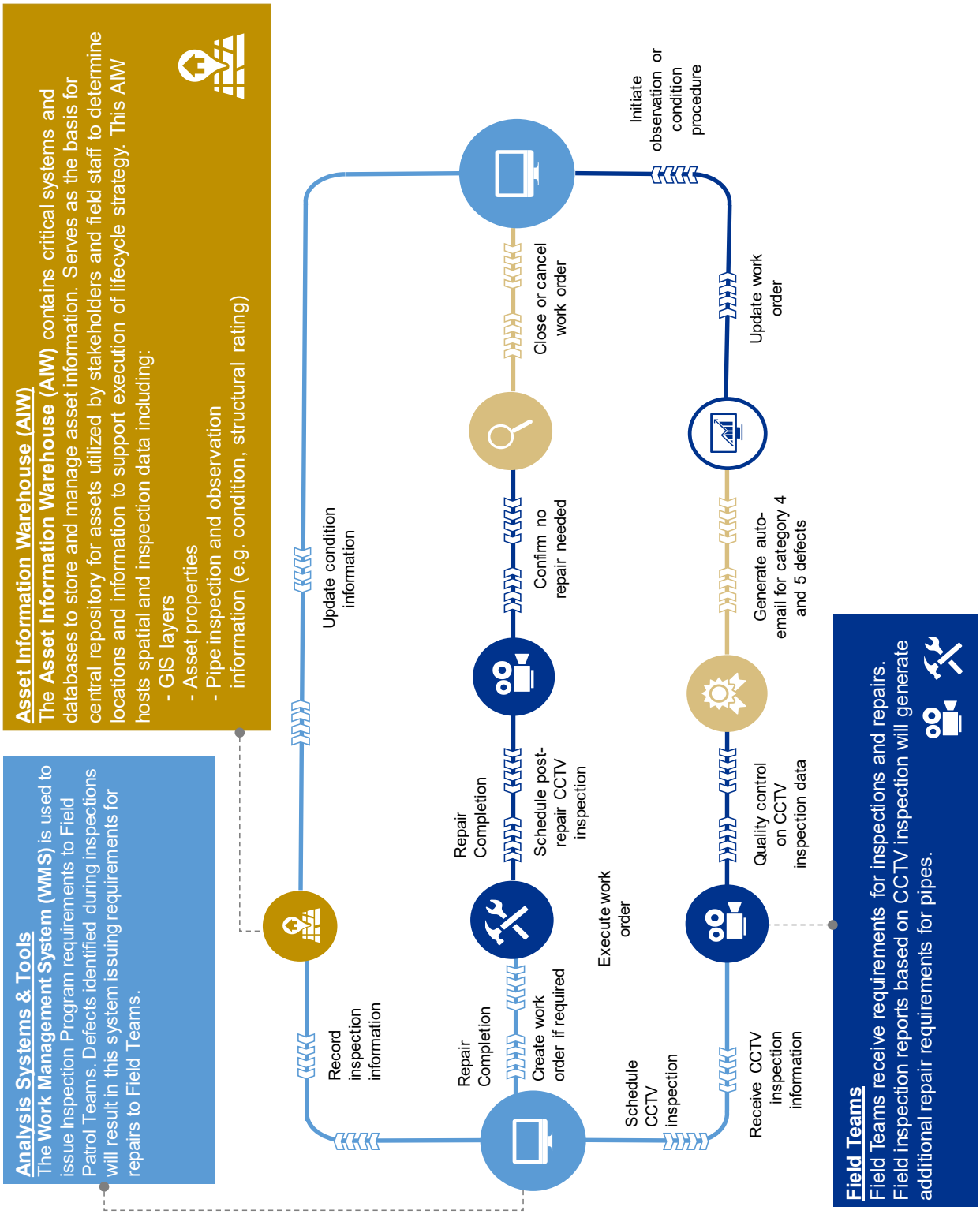


Figure 32: Environmental Services Condition Assessment Process



Planned Operations and Maintenance

At the City we are committed to maintaining our assets in a state of good repair in order to meet the requirements of the Ontario Drinking Water Quality Management Standard (DWQMS) in order to ensure that we deliver a high level of service for our customers.

Typically, in the case of minor maintenance, it is incorporated into planned operations and maintenance programs in order to make repairs based on condition assessments and to extend the assets useful service life. Minor maintenance prescribes a work order that is distributed to Operations staff and contractors for repair, followed by work inspection to ensure completeness, and payment once complete.

Currently, there are a number of planned operations and maintenance activities performed for environmental services assets. These are shown in Table 25 including the current frequency.

If the inspection reveals that major maintenance is required but not required immediately, the City typically implements a rehabilitation and renewal plan.

Table 25: Planned Operations and Maintenance Activities

Drinking Water		
Asset	**Planned Operations and Maintenance**	**Current Frequency**
Hydrant		
	Hydrant Painting	Every 5 years / As needed
	Fire Hydrant Inspection	Annually
Water Service		
	Curb Stop Assessment /Locate	Every 3 to 5 years
Water Meter		
	Water Meter Chamber Inspection	Ongoing
	Proactive Water Meter Replacement	Every 15 years. Currently converting to smart meters.
Watermain		
	Leak Detection	Daily
	Valve Turning	Every 3 to 5 years
	Water quality/Residual maintenance/Dead-end flushing	Daily / As needed
	Proactive swabbing and flushing of selected areas to remove build up (tuberculation) on pipe walls	Every 5 years or as needed
Wastewater		
Asset	**Planned Operations and Maintenance**	**Current Frequency**
Siphon		
	Siphon Inspection	Monthly
	Siphon Valve Turning - Spring/Fall	Bi-Annually
	Siphon Flushing	Bi-Annually / As needed
	Siphon CCTV /Sonar inspection	N.A.
Inflow and Infiltration (I & I)		
	CCTV Inspection / Investigation	Ongoing
	Inspection of Access issue Mainlines	Annual
	Combined Manhole Investigation	Completed
	I & I Repairs Contractor	Annual
	I & I repairs Internal (utilities)	As needed/ ongoing
	Flow Monitoring	Annually
	Sump Pump Disconnect Program	Does not formally happen

Table 25: Planned Operations and Maintenance Activities (Cont'd)

Wastewater		
Asset	**Planned Operations and Maintenance**	**Current Frequency**
Sanitary Mainline		
	Sanitary Mainline Cleaning	Daily
	Sanitary Known Issues	Weekly/Monthly
	CCTV Inspection	Daily/Weekly/ Monthly
	Sanitary Mainline Repair/Replace	As needed
	Forcemain Swabbing	Every 5 years
	Flow monitoring	Annually
Pump Station		
	Inspect and Record	Weekly
	Bi-Annual Wetwell Cleaning	Bi-Annual
	Annual Pump Inspection	Annual
	Annual Generator inspection	Annual
	Annual Alarm Testing	N/A
	Weekly Maintenance	Weekly
Manholes		
	Manhole Inspections	Daily
	I & I	Daily
	Zoom Inspections	As needed
	H2S Monitoring	On going ww
	Frame and Lid replacement	As needed
	Manhole Repair and Replace	As needed
	Manhole Rehabilitation	As needed
Laterals		
	Lateral Blockages	Emergency based / Daily
	Lateral CCTV Inspections	On going
	Lateral Relining	Annual
	Lateral Replacement	As needed
Stormwater Management Facilities		
Asset	**Planned Operations and Maintenance**	**Current Frequency**
Grates		
	Spring Grate Inspections	Annually
	Fall Grate Inspections	Annually
Stormwater Management Facilities		
	Storm Pond Inspection	Complaint based
Oil and Grit Separator		
	Oil/Grit Seperator Inspection	Annually
	Oil/Grit Seperator clean out	Annually /As needed
Manhole/ Catchbasins		
	Dual use Manhole Inspection and Valve Operation	Annually
	CatchBasin Cleaning	Annually (Approx 1/3 of city per year)
Storm Flap Gate		
	Storm Flap Gate inspections	Annually

Unplanned Operations and Maintenance

Our major maintenance needs are identified through a number of sources – namely activities prescribed through maintenance of assets. However, unexpected situations may occur which can result in unplanned maintenance activities. If major maintenance costs are significant, a more thorough process becomes necessary and often involves consultation with various internal functions, such as our Asset Management service area, as well as our Engineering and Operations service area to decide if the repair meets the capital budget criteria. Generally, this service area relies on outside contractors for investigation and suggested repairs when the scope of the maintenance is not easily determined.

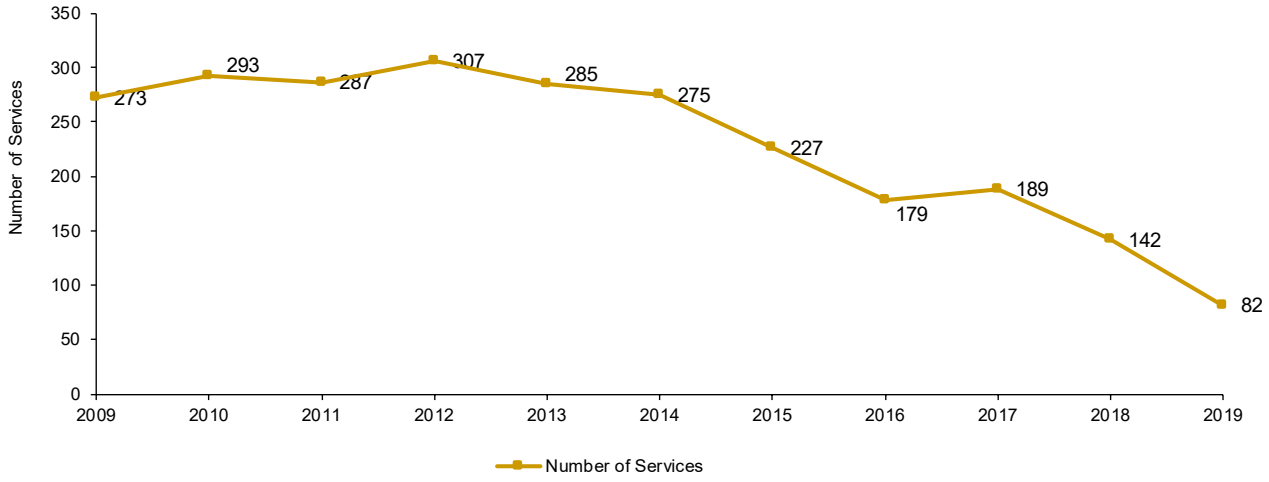
Despite the fact that, typically, minor maintenance is incorporated into planned operations and maintenance programs, there are cases where it is unplanned.

Some of the unplanned operations and maintenance includes:

- **Drinking water**
  - Repair of water main and service breaks
  - Investigations and repairs as follow-up on leak detection; reduction of water loss has a high priority in the City
  - Active repairs or adjustments to service boxes as required
  - Active repairs as required on water service lines (to property line from main)
  - Investigation of dirty water or low pressure when level of service impact is reported
  - Replace broken or missing valve box covers
  - Thawing (shallow) water services as required in colder weather
  - Applying cathodic protection on valves and fittings during installation (i.e., petrolatum, sacrificial anodes)
- **Stormwater**
  - Manhole repairs and manhole cover adjustments
  - Investigation and remediation of flooding reports
  - Removal of catch basin or pipe blockages
  - Stormwater Management System maintenance or repairs on a complaint basis
- **Wastewater**
  - Spot repair of sanitary pipes or manholes for identified problem areas
  - Removing blockages of sanitary pipes and services
  - Investigation of odour complaints

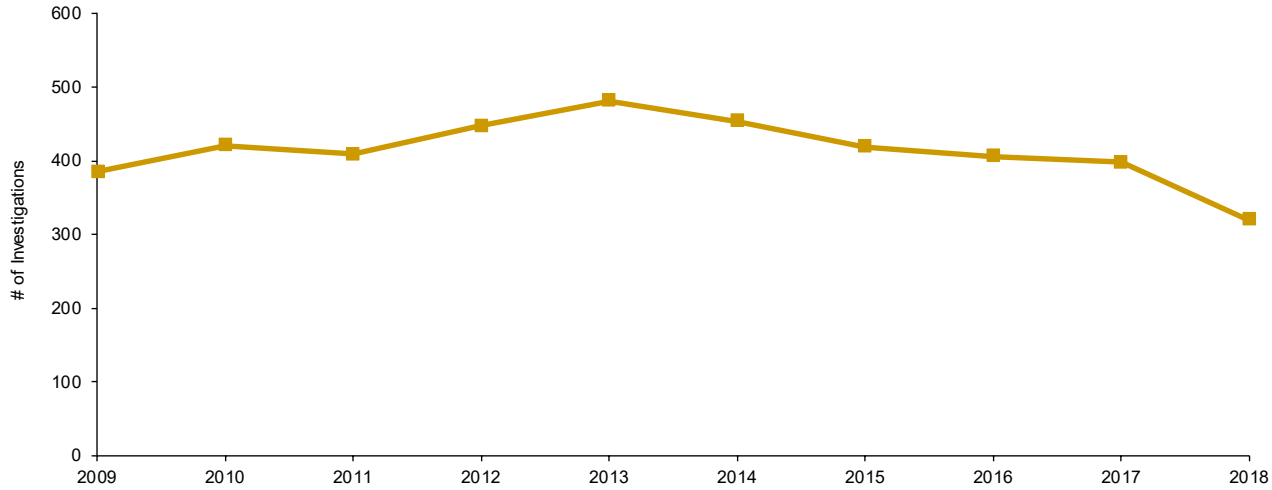
To demonstrate our commitment to unplanned operations and maintenance, Figure 4 shows that over the past 10 years, we have experienced a varying number of water main breaks, with a decline between 2014 and 2017, with a slight increase again in 2018 due to extreme winter weather conditions..

Figure 33: Water Service Repaired / Replaced



Similarly, Figure 34 shows that we have experienced a steady number of wastewater service blockages since 2009, with a decreasing trend since 2013.

Figure 34: Wastewater Service Blockage



B.4.3 Rehabilitation and Renewal Plan

We employ a defined asset renewal process, as shown in Figure 14 of the main body, using supporting software and consultation among many internal functions. The support software are decision support tools that allow us to utilize our asset State of Infrastructure data and operations and capital budget information in order to target efficient rehabilitation and renewal of environmental services assets.

The rehabilitation and renewal plan process begins with a needs assessment on an annual basis, followed by a review of the operational impacts of a potential investment. If the need for rehabilitation or renewal is significant enough, the item moves to a more detailed level of scope and budget definition, financial forecasting, and then Council approval. Most renewal projects require construction and project management, particularly as the projects increase in scale. Following the renewal, commissioning and inspection activities are performed to make sure that our personnel have the understanding of the landscaping, materials and processes recommended by the suppliers to maintain the asset at a cost-effective, and optimal level.

It is important to note that our environmental services assets are highly connected to the rehabilitation of our transportation assets, and therefore, we strive to have an integrated approach to rehabilitation and renewal of these assets.

At the City we are very committed to the rehabilitation and renewal of all of our environmental services assets. Below we have outlined the priorities for our assets:

Drinking water assets:

- Replacement of old 4 inch (100mm) water mains. These water mains are undersized and do not meet current design standards. Undersized water mains could freeze in extreme winter conditions
- Replacement of thin wall cast iron water mains which have a record of multiple water main breaks
- Looping of dead end water mains which require frequent flushing
- Reduction of water loss include implementing of Advanced Metering Infrastructure (AMI) for our citizens.

Wastewater assets:

- Replacement of old clay pipes
- Replacement of pipes which need increased capacity such as identified in masterplan
- Replacement of pipes which cause high level of I & I

Stormwater assets

- Replacement of the Riverside dam
- Replacement of pipes which need increased capacity such as identified in masterplan
- Upgrades to urban drainage systems that are subject to frequent but isolated flooding issues
- Replacement/rehabilitation of stormwater management facilities to remove sedimentation

To demonstrate our ongoing commitment to the rehabilitation and renewal of our environmental services assets, we have presented our investments in Figure 35 to Figure 37 since 2009. Specifically, in 2015, we made significant investment into the replacement of our drinking water, wastewater and stormwater systems to ensure that our assets are reliable and meeting our service delivery expectations. Over the 10 year period, we have rehabilitated approximately 5% (19km), 11% (49km), and 6% (35km) for stormwater, drinking water, and wastewater

Figure 35: Stormwater System Replacement

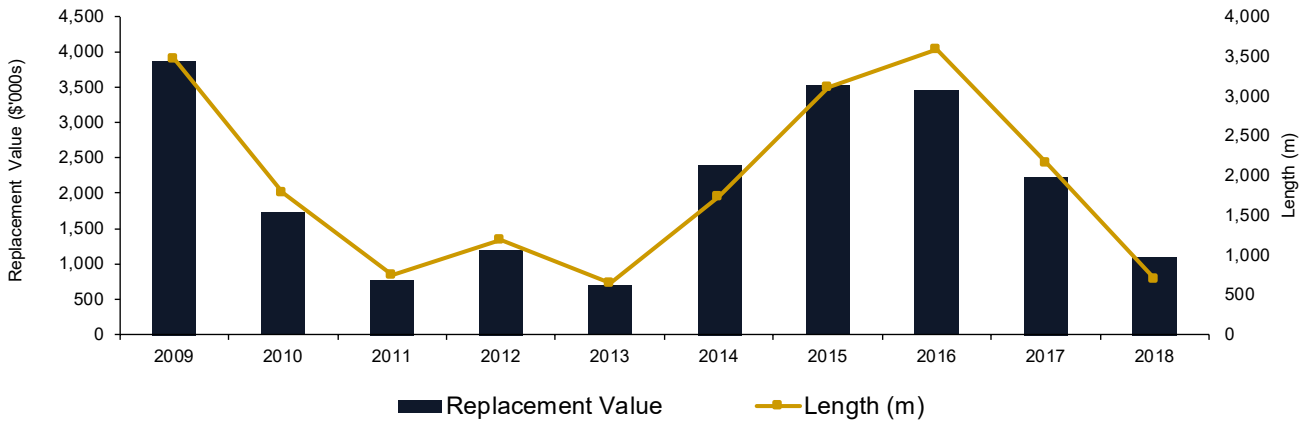


Figure 36: Water System Replacement

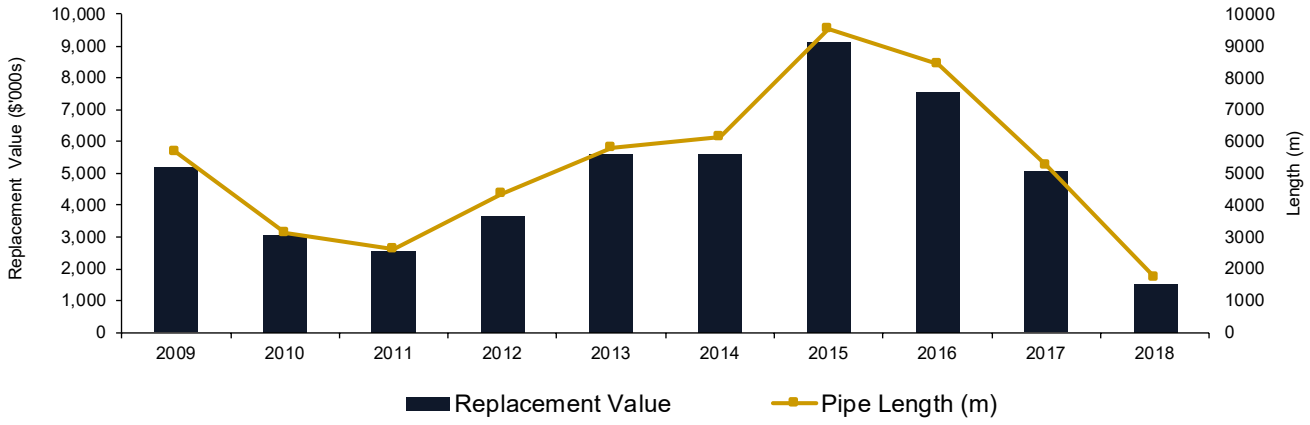
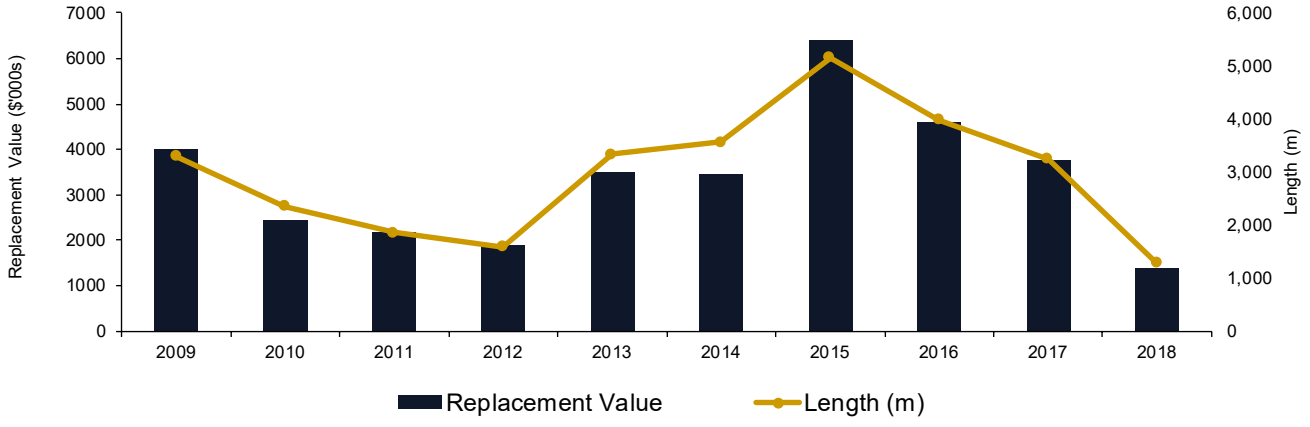


Figure 37: Wastewater System Replacement



B.4.4 Disposal Plan

In some cases, disposing of an asset is more appropriate than replacing or renewing it. Given the expected life of environmental services assets, and the growth of our population, disposal of these assets is uncommon. In the situations where replacement is necessary, our Engineering and Operations Service Area coordinates with contractors to ensure safe removal and environmental sustainability compliance. Therefore, any disposal costs associated with these assets are typically included with a capital project for renewal of creation.

B.5.0 Financial Strategy

B.5.1 Asset Investment Needs

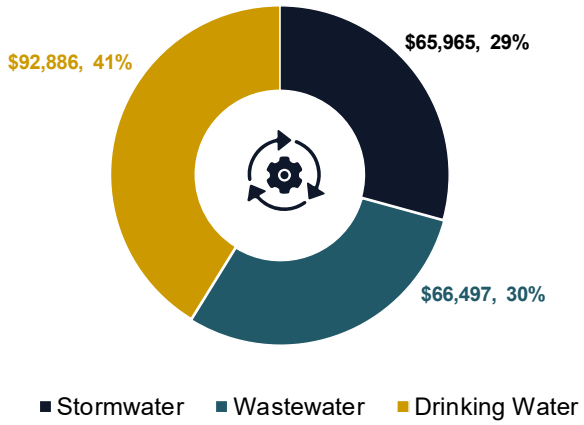
Our investment needs are identified through a range of mandated and industry leading planning processes supported by detailed analysis to ensure we identify our needs for investment to maintain service delivery, meet future demand growth and achieve our strategic objectives. The needs identified through these various planning processes are then prioritized through a Capital Project Prioritization Model, which evaluates projects using nine criteria to determine the most important needs and initiatives to be funded.

The following sections describes our capital and operational investment needs to maintain existing infrastructure and associated service delivery along with the requirements for additional infrastructure to meet the growing needs and demands of our communities. We also highlight the Capital Investment Plan that was approved by the City for 2020-2029 and the current funding gap that exists for us to meet our target needs.

Capital Renewal

The City has undertaken a comprehensive analysis to determine the capital needs of its environmental services assets to deliver the services expected by its communities and stakeholders. We have adopted an industry leading approach to identification of capital renewal needs for our core asset areas featuring an integrated risk based analysis supported by a decision support system. The resulting analysis for environmental services assets demonstrates that the City has total capital investment renewal needs of $225.2 million; $65.9 million in stormwater, $92.8 million in drinking water, and $66.5 million in wastewater as shown in Figure 38.

Figure 38: Renewal Needs ($'000s)



Key capital renewal environmental services projects are outlined in more detail in Table 26.

Table 26: Capital Renewal Projects

Capital Renewal Project	Year	Project Description
Dam Reconstruction – Riverside Dam – Sediment Removal	2021	Reconstruction of Dam Structure located on Speed River adjacent to Riverside park. This project is Phase 1 which includes sediment removal. Phase 2 will follow the dam construction. Cost based on latest high level estimate at the completion of the Environmental Assessment. Detailed design to begin in 2020.
Dam Reconstruction – Riverside Dam	2022	Reconstruction of Dam Structure located on Speed River adjacent to Riverside park. This project is Phase 2 which includes the removal of the existing dam and reconstruction. Phase 1 project precedes this and includes sediment removal. Cost based on latest high level estimate at the completion of the Environmental Assessment.
Beverly St. Reconstruction, Multi Use Trail Pedestrian Underpass	2021	Beverly Street Reconstruction from Dundas to Elgin Street North. Includes replacement of underground infrastructure, new dual use watermain, multi-use trail, new pedestrian underpass
Elgin Street North – Phase 1 & Phase 2	2022-2023	Reconstruction of Elgin Street North including Storm Twinning (Galt to Mill Creek Outlet), Sanitary Sewer Replacement, and Shared Regional Watermain Upsizing. This project will be tendered as one project, however, will be a multi-year project, and requires two separate budgeted projects over two years.
Upgrade or re-construction of King Street, Corydon, Riverside and Witmer Pumping station	2022 - 2027	Upgrade or reconstruction of diverse pumping stations

Growth Needs

In addition to targeting and prioritizing the investment needed to maintain existing assets, there are also planning processes in place to determine the additional assets needed to meet growing demand for service through population increases or demand for new services. The projects targeted to meet growth are funded primarily through Development Charges – the mechanism that enables recovery of growth-related capital expenditures from new development. These charges are governed by the Development Charges Act and are applied in accordance with our Development Charges By-Law. Any additional growth needs gaps are typically funded through other municipal financing sources. The process for creation and acquisition of assets for growth is described in the Creation/Acquisition section of the Asset Lifecycle Management Strategy.

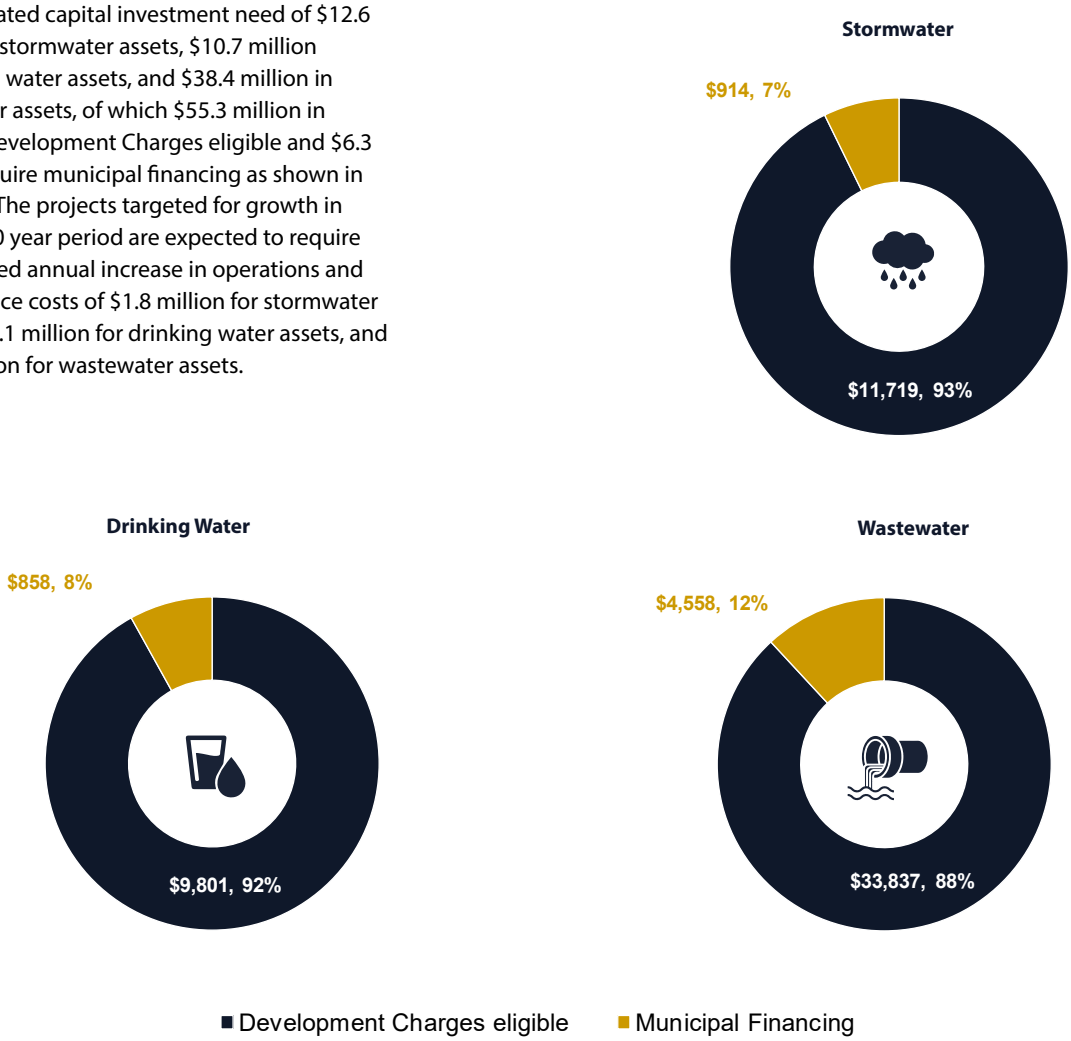
Specifically for environmental services assets, the City has identified several projects related to adding drainage, infrastructure upsizing, growth-related works, adding sewers, pumping stations, and more. In Table 27, we have outlined one of these growth projects in more detail.

Table 27: Growth Projects

Growth Project	Year	Project Description
Dover Street Pumping Station – Construction	2020	Reconstruction of the Dover Street Sanitary Pumping Station in accordance with the recommendations identified in the Dover Street Pumping Station Municipal Class Environmental Assessment.

These key projects, in addition to other environmental services projects, result in growth related capital investment need of $12.6 million for stormwater assets, $10.7 million in drinking water assets, and $38.4 million in wastewater assets, of which $55.3 million in total are Development Charges eligible and $6.3 million require municipal financing as shown in Figure 39. The projects targeted for growth in the next 10 year period are expected to require an estimated annual increase in operations and maintenance costs of $1.8 million for stormwater assets, $10.1 million for drinking water assets, and $10.4 million for wastewater assets.

Figure 39: Growth Needs ($'000s)



Capital Investment Plan 2020-2029

Our Capital Investment Plan 2020-2029 presents the capital investment proposed to sustain our current services for the next 10 years along with projects designed to meet our projected growth requirements.

To date, we have funding sources available including capital levy, grants, water cap reserve fund, wastewater cap reserve fund, other contributions and debentures. Additionally, the plan includes an additional $1.7 million of funding from the Region of Waterloo to replace a regional water main for drinking water assets.

Figure 40 outlines the environmental services municipal funding sources currently available excluding Development Charges.

Current Funding Gap Assessment

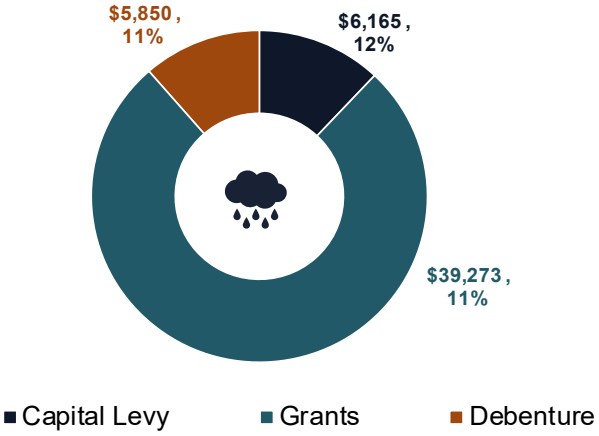
Despite the various funding sources available to Cambridge (excluding Development Charges and debt financing), we recognize that our City identified investment needs for renewal of existing infrastructure and build new infrastructure to support growth remains insufficient to maintain current stormwater infrastructure in good state of repairs. With a view of our 10 year proposed plan we are able to identify the funding gap that exists in order to meet our target needs.

Figure 41 highlights that there is no expected funding gap over the next 10 years for drinking water assets, there remains a funding gap of $14.6 million for wastewater assets, and a funding gap of $15.6 million for stormwater assets.

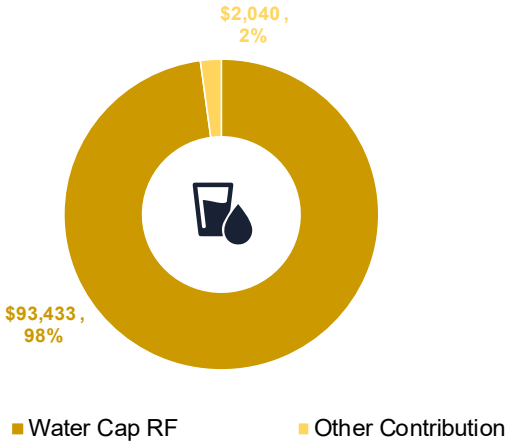
With that being said, even though there appears to be a $14.6 million funding gap for wastewater assets, additional funding of $14.6 million has been provisioned through recently completed long range financial plan for water and wastewater services and will be provided through future capital investment plans. Overall, after $5.6 million in debt financing for reconstruction of Riverside Dam, the remaining funding gap for environmental services assets is $15.6 million for stormwater assets only.

Figure 40: 2020-2029 Capital Investment Plan ($'000s)

Stormwater 2020-2029 Capital Investment Plan ($51,288 thousand)



Drinking Water 2020-2029 Capital Investment Plan ($95,473 thousand)



Wastewater 2020-2029 Capital Investment Plan ($56,420 thousand)

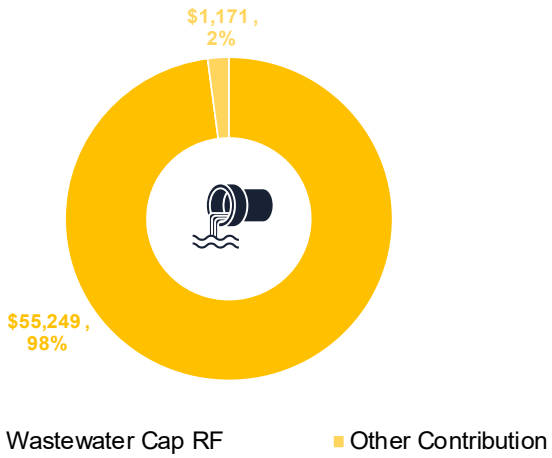
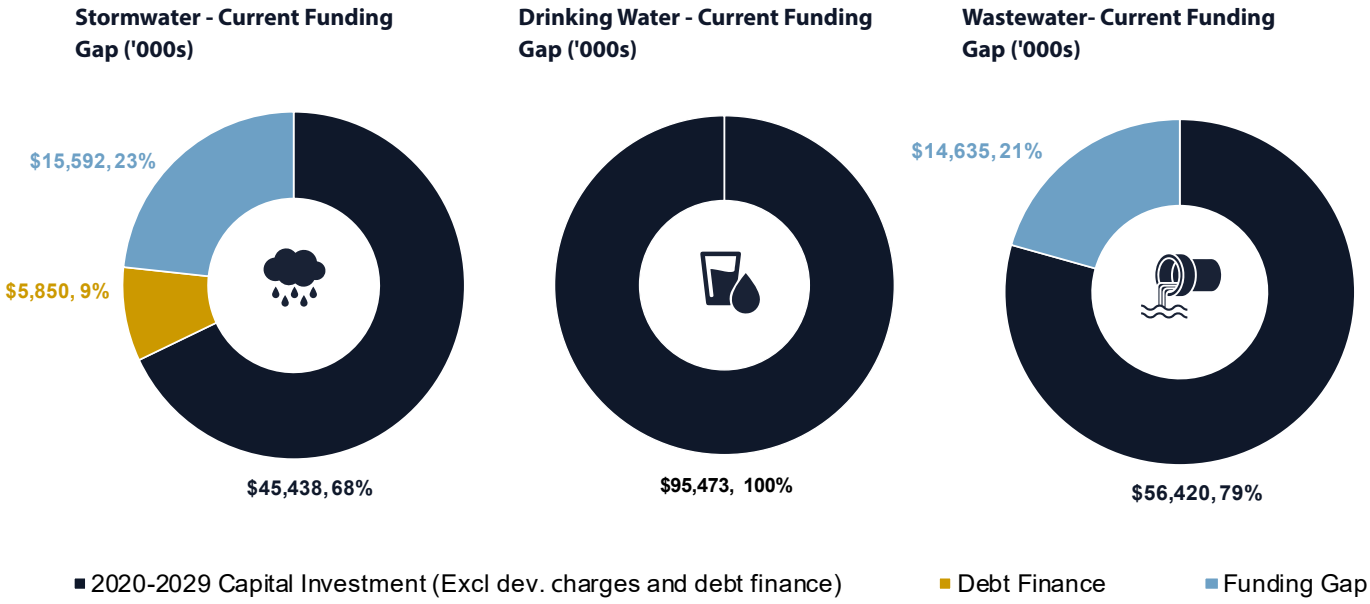


Figure 41: Current Funding Gap Assessment ($'000s)



Therefore, based on the analysis presented above and the City's proposed Capital Investment Plan, Table 28 presents the journey to calculate our funding gap.

Table 28: Funding Gap Analysis

Funding Gap Analysis	Stormwater ($ million	Drinking water ($ millions)	Wastewater ($ million
Existing Infrastructure – Renewal Needs	$65.9	$92.9	$66.5
Growth Needs - Municipal Financing	$1.0	$0.9	$4.6
Total Financial Needs	**$66.9**	**$93.8**	**$71.0**
2020-2029 Capital Investment Plan (Excluding Development Charges and debentures)	($45.4)	($95.5)	(56.4)
Debentures	($5.9)	($0.0)	($0.0)
Total Funding Gap	**$15.6**	**($1.7)**	**$14.6**
Funding available for drinking water and wastewater assets	($0)	($0.0)	($0.0)
Funding available from Region to replace regional water main	$0.0	$1.7	$0.0
Net Funding Gap	**$15.6**	**$0**	**$0**

B.5.2 Funding Strategies

To support our environmental services assets within the City, we require sufficient funding in order to maintain the assets in a state of good repair, as well as to create new assets as required. Our current strategies and revenue sources are allocated based on our prioritization model discussed in the Investment Needs section. This model considers the currently available funding sources for environmental services assets in order to deliver our current investment plan effectively:

- Reserve Funds: We have established reserve funds to provide stability to tax rates in the event of unforeseen economic events, to provide funding for one-time requirements, to make provisions for the acquisition and replacement of infrastructure, and to provide flexibility to manage debt levels.
- Capital Works Reserve Fund: Through property tax collection, we are able to provide annual contribution to this reserve fund that supports infrastructure renewal needs for transportation assets.

Additionally, we continually assess opportunities for additional funding options and revenue streams to address our funding gaps. The following are options that have been used by other municipalities towards addressing their infrastructure gaps and we continue to review for implementation at City of Cambridge.

- Stormwater Management Funding Study: The City of Cambridge is currently conducting a stormwater funding strategy with the objective of performing a full funding review of the stormwater management program to assess sustainable funding methods. Currently being considered is a stormwater user rate which would charge the property owner based on the approximate amount of stormwater runoff generated by the property. If the City is unable to achieve sufficient funding through this method, the City will investigate approaches such as:
  - Grants – Outside of the City's control, there are periodically additional funding opportunities provided by the provincial and federal governments towards certain infrastructure projects. These funding sources typically outline specific conditions and requirements that must be demonstrated in order to secure and maintain the funding. In many cases, these conditions require applicants to demonstrate capabilities in effective planning and financial management.
  - Capital Levy – A special levy to provide a certain percentage of a tax rate increase annually devoted to asset sustainability.
  - Reserve Contribution – Opportunities to allow a certain percentage of assessment growth to be contributed to reserves for future replacement of assets donated through new subdivisions.
  - Debt Financing – As the City issues debt over the period of the capital forecast, it is projected that the City will reach its debt capacity limit of 10% for the tax-supported operating fund. Opportunities to increase the debt financing limit and take on more debt financing that already projected could help to lower the gap.

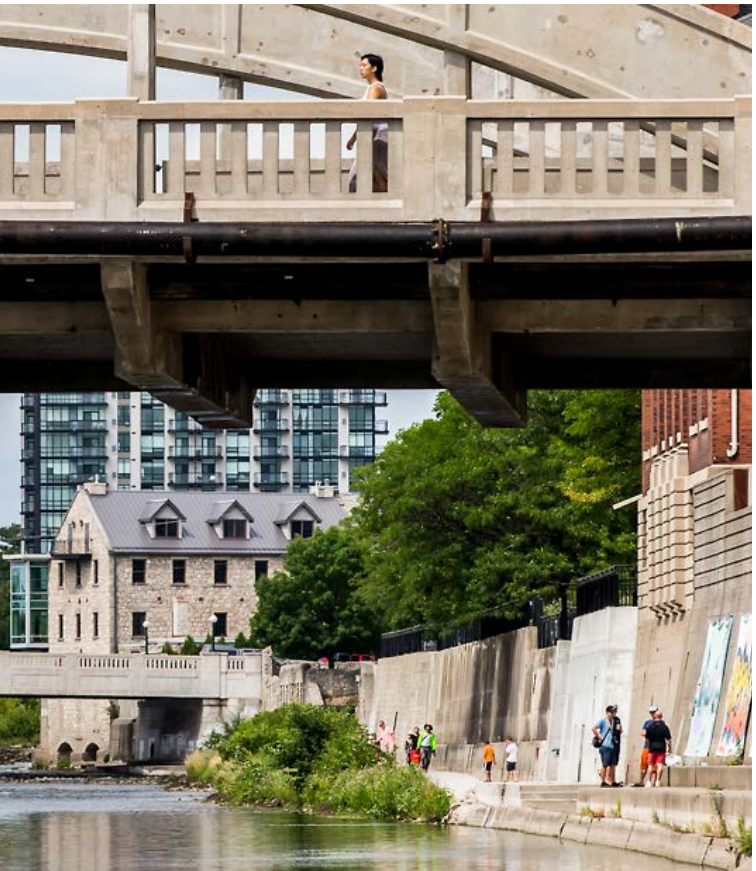
B.6.0 Stakeholder Engagement

B.6.1 Users of the Service

Our valued communities are the primary users of our environmental services assets along with transient users who are visiting or travelling throughout our area. This network is also vital for protecting the environment and the communities of other municipalities within the Region or those that may share environmental facilities or watersheds within the City. This requires coordination with these municipalities and the Region through constant engagement and collaborative planning. We provide a range of engagement points for our users, including online, by email, phone or letter.

In addition to these traditional channels of engagement, we take part in external stakeholder discussions for specific projects, or for the creation of Master Plans such as the Storm Master Plan and the Sanitary Master Plan.

We also initiated a Public Works Open House in 2017, which is held annually, to provide an opportunity for our stakeholders to learn more about our work in environmental services.



B.6.2 Service Delivery Partners

We rely on partnerships to support the delivery of services and improvements to our assets. These partnerships also aid in implementing appropriate controls and processes to ensure the impact of our work on stakeholders and delivery partners is communicated to avoid risks and adverse impacts.

Within environmental services we rely on our Cambridge Asset Management service area, and internal service areas, including Engineering, Transportation, Public Works, and Development Engineering.

We maintain close relationships with both our internal and external partners and maintain processes to engage with each of our service delivery partners as required.

B.6.3 Public and Private Infrastructure Owning Bodies

The Region of Waterloo and our other local government partners are the most significant public infrastructure owning bodies with assets integrated into our environmental services network.

Cambridge is part of a two-tier municipal system, where the Region of Waterloo supplies water to homes and businesses in the City of Cambridge, and processes wastewater through its treatment facilities, while the City is responsible for its distribution, maintenance, and repair of the system and its pipes.

The City also collaborates with the Grand River Conservation Authority since they own and manage three conservation areas within the City that are open to the public, the Chilligo Conservation Area, Dumfries Conservation Area, and Shade's Mills Park. The Grand River Conservation supports our work towards preventing and managing flooding.

Appendix C

Asset Management Plan – Emergency Services

C.1.1 Introduction

The City maintains a diverse portfolio of emergency service assets to enable a rapid and effective response emergencies to keep our community safe. We have one asset class within emergency services designed to facilitate effective emergency response for fire related services.

Table 29: Emergency Services Assets

Service Area:	**Emergency Services**
Asset Class:	**Fire Protection**
Asset Type:	» Fire Halls » Fleet (Fire)

This collection of assets is critical to our City. Ensuring that the City's emergency services area has the assets they need to keep residents safe help us to realize our vision of a safe and prepared city. Exercising strong due diligence in emergency service asset investment is essential to make sure that sound decision-making is made regarding our emergency services assets, given the importance and criticality of our fire services to our community.

Given the intricacies of our asset base, it is important to distinguish between the City's services and the Region of Waterloo's services. The Region of Waterloo provides services including Regional Police Services and paramedic emergency response services. As such, the assets that provide these services are not included as part of this AMP.

This appendix provides information regarding our approach to management of emergency service assets in the next 20 years, demonstrating our commitment to assessing and meeting the LoS valued by our residents.

C.1.2 Scope

This section identifies the requirements for each Phase of O.Reg.588/17 applicable to the assets within this service area. Our compliance with these requirements for the asset classes within this service area is presented in Table 30 to highlight areas of future development in advance of regulation phases. The following sections of this appendix will present the further detailed information to meet the requirements for each section of the regulation.

Table 6 of the main body of our AMP provides a summary of compliance for all service areas along with our plans for continuous improvement to meet the remaining requirements in advance of the future regulatory phases.

While the regulation requires full compliance of all non-core areas in the AMP by 2024, the City has included its non-core assets within this AMP to demonstrate its commitment and advancing efforts in effective planning for all of the essential services provided by the City and its associated assets.

Table 30: Compliance with O.Reg.588/17

Non-Core Assets		Phase 2 - July 1, 2023						Phase 3 – July 1, 2024						
Service Area	Asset Class	Asset Inventory	Weighted average	Replacement Value	Average age	Current Levels of Service	Costs to maintain LoS	Proposed Levels of Service	Creation/ Acquisition Plan	Operations and Maintenance Plan	Rehab and Renewal Plan	Disposal Plan	Investment Needs	Funding Strategies
Emergency Services	Fire Protection	●	●	●	●	○	○	◑	◑	◑	◑	◑	◑	◑

● Compliant ◑ Partially compliant ○ Not compliant

Note: Phase 1 not reflected as only Phase 2 and 3 are applicable to non-core assets

Table 30 demonstrates that our assets within the emergency services area are fully compliant with most regulation requirements for Phase 2 well in advance of the 2023 requirements for non-core assets. We will report current LoS for non-core assets along with associated costs to maintain the current LoS in advance of Phase 2 in 2023.

In addition we have achieved most of the requirements for Phase 3 with the exception of proposed LoS. We have undertaken an extensive exercise engaging multiple stakeholders to develop a LoS framework that identifies proposed LoS for all services as described in the LoS section of the main body and within Section C.3.2. of this appendix. We will continue to develop these identified proposed measures in consultation with stakeholders for reporting in advance of the 2024 milestone.

C.1.3 Strategic Connections

The strategic and master plans summarized in this section are all related to the emergency services assets and have been considered while developing this AMP.

Table 31: Strategic Documents

Strategic Document	Linkage(s) to the AMP
Current Documents	
2016-2019 Strategic Plan (2016)	The Strategic Plan sets the stage for decision-making, prioritization, and ongoing performance management. Many of Cambridge's residents, employers, and visitors took time to share their ideas and contribute to the plan's development, identifying the positive aspects of Cambridge, as well as aspects they would like to see improve. The Strategic Plan sets a goal to make Cambridge "a place for people to prosper" – alive with opportunity, and the infrastructure that enables our people to thrive is a significant contributing factor to this initiative. This AMP shares a connection to the Strategic Plan in its direction and objectives, relating to decision-making, prioritization, and performance management, ultimately enabling us to continue making Cambridge "a place for people to prosper". This Strategic Plan was used to guide the City in developing the Proposed LoS Framework for emergency services assets in this AMP. The City is currently in the process of revising the Strategic Plan.
Development Charges Background Study (2019)	A by-law that imposes certain Development Charges in the Corporation of the City of Cambridge pursuant to the Development Charges Act, S.O., 1997, c. 27, as amended. The growth plans and infrastructure investment proposed within the AMP must consider whether development charges will be incurred pursuant to the City's bylaws. In accordance with the By-Law, Cambridge has developed a Development Charges Background Study. The Development Charges Background Study is essential to this AMP as it supports the City in identifying its funding gap included in the Financial Strategy.
Master Fire and Emergency Services Plan (2013)	The Master Fire and Emergency Services Plan provides the City of Cambridge with a strategic framework to help the City make the best decisions regarding fire protection services based on local needs and circumstances. The analyses and recommendations of the plan were prepared in accordance with the Fire Protection and Prevention Act (FPPA) and the Occupational Health and Safety Act (OHSA). The Plan's strategic priorities have been leveraged to develop the Proposed LoS Framework for the City around emergency services assets. It was also leveraged with developing the Asset Lifecycle Management Strategy to identify some of the key processes that are and should be followed for these assets around condition assessment and inspection.
Emergency Response Plan (2017)	The City's Emergency Response Plan organizes human and physical assets, services and actions in the event of an emergency and is governed by the following principles; the protection and preservation of life and property, the minimization of negative impacts to the public and physical structures of Cambridge, and supporting the quick renewal of normal services. The Emergency Response Plan is important to recognize as part of this AMP as it identifies the conditions expected of the assets in order to deliver on the expected LoS during an emergency.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C.2.0 State of Infrastructure

Emergency Services Overview

Emergency service assets are those that enable a rapid and effective response to medical and fire emergencies. Our emergency service assets are some of our most recognizable assets. It includes the fire halls, as well as the fire service's vehicular fleet.

Our emergency service assets are essential services to our community in order to protect our residents 24 hours a day. Given the importance of these assets, it is important to manage and maintain these assets to ensure a smooth municipal operation.

Replacement Value ('000s)

$41,618

Total replacement value of all assets within the emergency services asset class

Condition

Good

Weighted average condition rating of emergency services assets across all subclasses

Asset Class

One

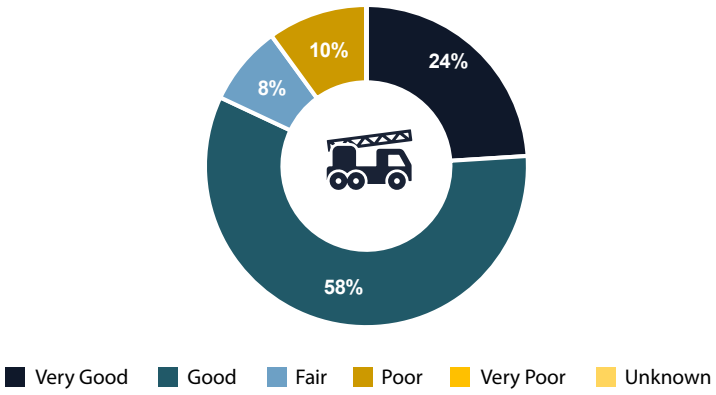
Distinct asset class that we manage as part of our emergency services portfolio

Asset Class

Fire Protection

- 6 Fire Halls
- 36 Fleet Vehicles

Fire Protection Condition*



*Condition based on replacement value

Replacement Value ('000s)

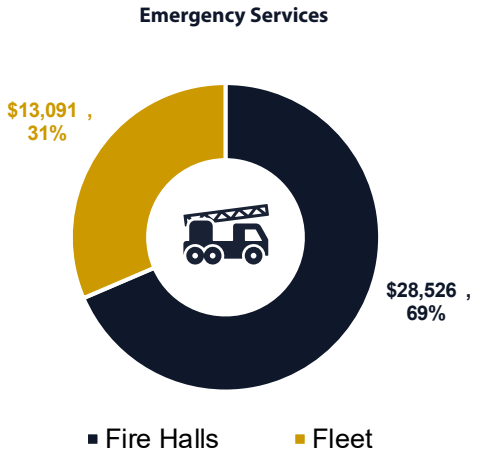
$41,618

Weighted Avg. Condition Rating

Good

Average Age

27 years



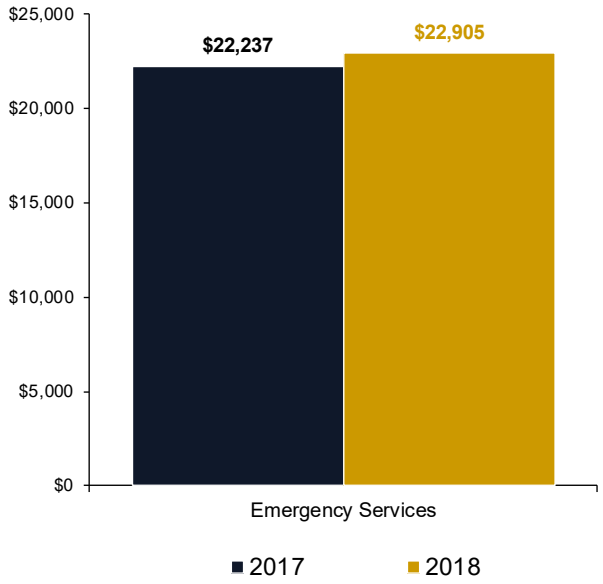
C.3.0 Levels of Service

C.3.1 Current Levels of Service

Since emergency service assets are classified as non-core assets under O.Reg. 588/17, we are not required to report any current LoS as part of this AMP. Despite that we are not including LoS as part of this AMP, we recognize the importance of providing a high level of service for our emergency services assets within Cambridge. As such, both the Fire Prevention and Public Education divisions' goal focuses on mitigating disasters by educating the public on fire safety and emergency preparedness and preventing fires through inspections and enforcement activities. The Ontario Fire Marshal's 3 lines of defense (Public Education, Prevention, Suppression) are entrenched in the Fire Protection and Prevention Act (FPPA). In preparation for Phase 2 of O.Reg. 588/17, we are in the process of measuring these current LoS.

At this time, we are able to demonstrate the costs associated with delivering this current LoS for our emergency services assets. In 2017 and 2018 respectively, we spent $22.2 million and $22.9 million in total operations related costs as shown in Figure 42.

Figure 42: Operating Costs Annual Comparison ($`000s)

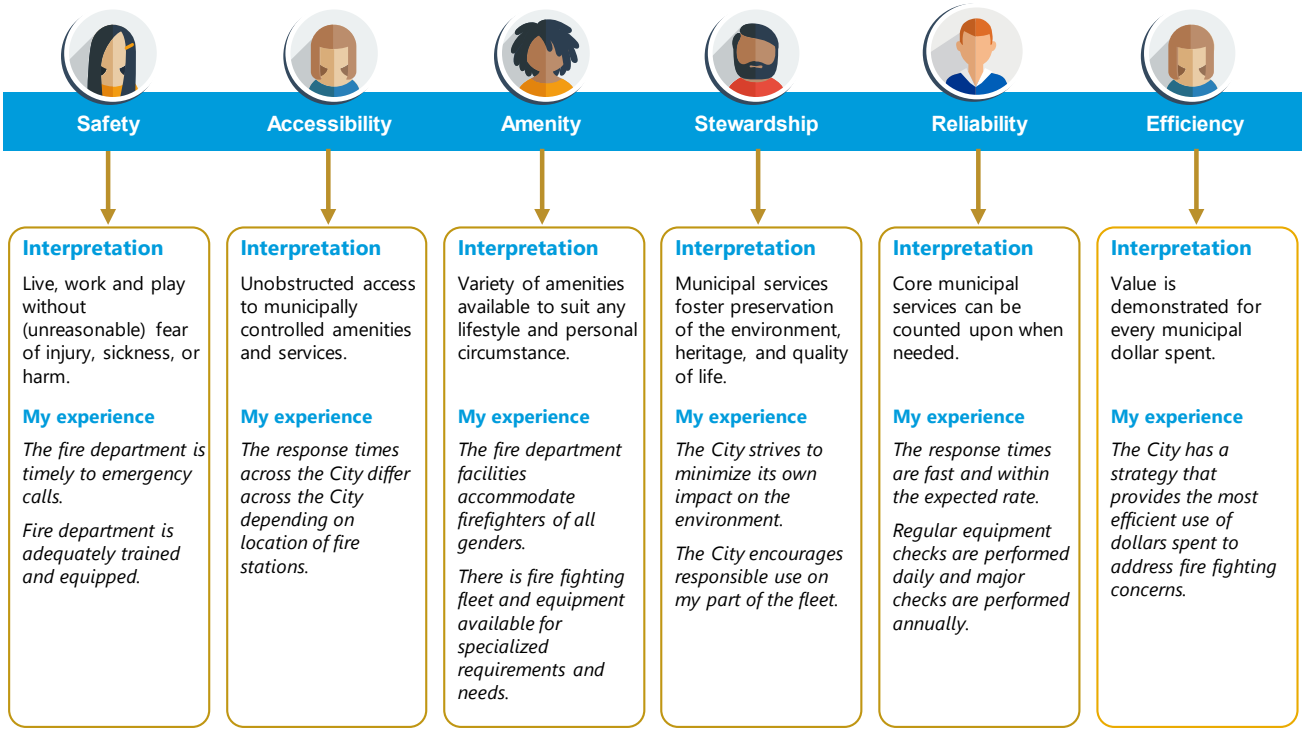


C.3.2 Proposed Levels of Service

We have recently undertaken an exercise to develop a LoS framework that fully aligns our strategic objectives with LoS expected by customers and technical metrics to determine whether our assets are achieving those expectations. Our intention is to use this framework going forward to position all reported metrics within this framework to demonstrate achievement of our outcomes and community needs.

While the proposed LoS we developed as part of the exercise are not required for reporting by the Regulation until 2024, we have proactively developed proposed measures for review and consultation as part of the exercise to develop a LoS framework for all assets across our portfolio.

The starting point for this exercise was identification of our community priorities aligned to our strategic outcomes. The definitions for these priorities are provided in the main body and are referenced in the interpretation sections in the graphic below. We further this concept within each asset area by identifying the unique concerns of the community with regard to the asset. In the case of emergency services assets, we have identified the concerns and priorities of our stakeholders in the "My Experience" headings below from stakeholder feedback through everyday operational responses and dedicated feedback channels such as the engagement undertaken to support our Master Fire and Emergency Services Plan.



With the identification of stakeholder informed emergency service priorities, we have developed a series of technical measures designed to monitor performance of these priority community LoS. These preliminary metrics will be tested internally to determine reporting requirements and undergo external consultation ahead of publishing in future updates of the AMP.

C.4.0 Asset Lifecycle Management Strategy

C.4.1 Creation / Acquisition Plan

Master planning documentation supports the City in identifying the objectives around the specific asset services that are necessary to meet the needs and growth of Cambridge. Since 2008, we have developed 17 master plans and strategic plans, including a Master Fire and Emergency Services Plan. The Master Plan is a framework that assists us as we consider which investments in emergency services are needed to align with growth and to ensure that residents can rely on emergency services in the event of a fire. Creation and acquisition activities within our municipal boundaries are made in alignment with the objectives, stakeholder input, and long-term strategic plans set forth in the Master Fire and Emergency Services Plan.

The objectives and actions outlined in the master plans support the City in identifying the need required to execute the goals, which may be accomplished through acquisition or creation or both. For example, the year of 2018 marked the opening of Fire Station 6, an LEED silver certified facility, as a means to expand our emergency services to the growing city. The exigent nature of emergency services assets is a critical element to the overall well-being of Cambridge residents since in the event of a fire or medical emergency, function assets help save lives.

The Development Charges Study Report from 2019 supports these decisions around the City's need to create or acquire assets to deliver on the services and goals outlined in the plans. The Study has identified the need for expansion of Fire Station 5, a new vehicle, bunker gear, and other gear before 2031.

We also recognize that we are a part of the Ontario Government's Growth Plan for the Greater Golden Horseshoe. This Plan is an initiative to plan for growth and development of emergency services assets in a way that supports economic prosperity, protects the environment and helps communities achieve a high quality of life. Documents such as these help the City to develop the creation and acquisition plans as we need to take these priorities and plans into consideration.

C.4.2 Operations and Maintenance Plan

This stage of the asset lifecycle generates significant costs over time; therefore, we have implemented practices that enhance value through cost reduction and investment optimization. A successful operations and maintenance plan ensures that our assets also meet the level of service commitments and expectations of those in our community that use emergency services assets.

Condition Assessment and Inspection

Based on the standard Condition Assessment Process, as shown in Figure 13 of the main body, maintenance of emergency service assets begins with facility condition inspections over regular intervals, and fleet-related inspections on a daily basis. Regular condition assessments and maintenance will minimize the risk of defects that could result in risks or higher costs down the road. This practice of early identification, through visual inspection and quantitative assessment, allows for overall higher LoS and extended asset lifespans, as the outputs from the condition assessments are used in planning.

For emergency services assets, a formalized building condition assessment is conducted for all city fire hall facilities. Seasonal inspections are performed for specialized equipment such as HVAC and fire equipment. Regarding our fire fleet, we perform daily circle checks as enforced by the Ministry of Transportation. In addition to daily fire fleet checks performed by our firefighters, we thoroughly inspect our trucks semi-annually and perform annual commercial vehicle safety inspections as required by the Ministry of Transportation. Other inspections such as after a repair is completed, or to investigate a suspected deficiency or malfunction are performed as required.

If a defect is uncovered during inspection, the next step is determining whether the defect will require minor or major maintenance.

Planned Operations and Maintenance

Typically, in the case of minor maintenance, it is incorporated into planned operations and maintenance programs in order to make repairs based on condition assessments and to extend the assets useful life. Minor maintenance prescribes a work order that is distributed to Operations staff and contractors for repair, followed by work inspection to ensure completeness, and payment once complete.

Planned operations and maintenance for emergency service assets includes general maintenance to the building which includes caulking around the doors, windows, snow clearing off steps, debris pick-up, grass cutting, changing lights etc. For our fire fleet, it receives planned maintenance following inspections to ensure our fleet remains reliable and to ensure we are able to deliver a high level of service.

If the inspection reveals that major maintenance is required but required immediately, the City typically implements a rehabilitation and renewal plan.

Unplanned Operations and Maintenance

Our major maintenance needs are identified through a number of sources, namely activities prescribed through maintenance of assets. However, unexpected situations may occur which can result in unplanned maintenance activities. If major maintenance costs are significant, a more thorough process becomes necessary and often involves consultation with various internal functions, such as our Asset Management service area, as well as our Facilities, Building Design & Construction service area to decide if the repair meets the capital budget criteria. Generally, this service area relies on outside contractors for investigation and suggested repairs when the scope of the maintenance is not easily determined.

Despite the fact that, typically, minor maintenance is incorporated into planned operations and maintenance programs, there are cases where it is unplanned.

Currently, the unplanned operations and maintenance for emergency services assets includes reactive work to repair damage by weather, vandalism, emergencies etc.

C.4.3 Rehabilitation and Renewal Plan

We employ a defined asset renewal process, as shown in Figure 14 of the main body, using consultation among many internal functions. The rehabilitation and renewal process begins with a needs assessment on an annual basis, followed by a review of the operational impacts of a potential investment. Needs assessments are also performed based on the replacement cycle for assets. For fire assets, we have the following replacement cycle: 15 years for a pumper, 20 years for an aerial, and seven to nine years for small vehicles. If the need for rehabilitation or renewal is significant enough, the item moves to a more detailed level of scope and budget definition, financial forecasting, and then Council approval. Most renewal projects require construction and project management, particularly as the projects increase in scale.

C.4.4 Disposal Plan

In some cases, disposing of an asset is more appropriate than replacing or renewing it. Given the growth of our population, more demands are being made of our emergency service assets, which means we are seeing an increase in the number of service calls. As such, we have not experienced a disposal of our fire halls in recent years; however, after the lifecycle for pumpers, aerials, and small vehicles are complete, these assets will be disposed and replaced as required.

C.5.0 Financial Strategy

C.5.1 Asset Investment Needs

Our investment needs are identified through a range of mandated and industry leading planning processes supported by detailed analysis to ensure we identify our needs for investment to maintain service delivery, meet future demand growth and achieve our strategic objectives. The needs identified through these various planning processes are then prioritized through a Capital Project Prioritization Model, which evaluates projects using nine criteria to determine the most important needs and initiatives to be funded.

The following sections describes our capital and operational investment needs to maintain existing infrastructure and associated service delivery along with the requirements for additional infrastructure to meet the growing needs and demands of our communities. We also highlight the Capital Investment Plan that was approved by the City for 2020-2029 and the current funding gap that exists for us to meet our target needs.

Capital Renewal

The City has undertaken a comprehensive analysis to determine the capital needs of its emergency services assets to deliver the services expected by its communities and stakeholders. We have adopted an industry leading approach to identification of capital renewal needs for our non-core asset areas based on their condition and remaining useful life and ability to maintain service delivery. The resulting analysis for emergency services assets demonstrates that the City has a capital renewal need of $13.8 million as shown in Figure 43.

Key capital renewal emergency services projects are outlined in more detail in Table 32.

Figure 43: Renewal Needs ($'000s)

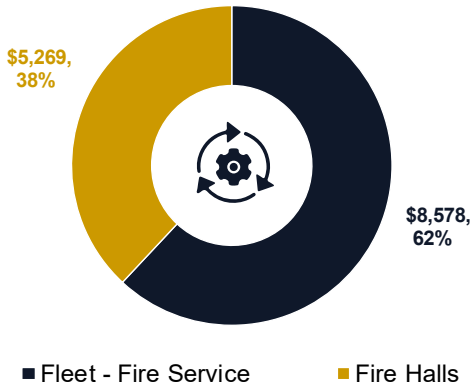


Table 32: Capital Renewal Projects

Capital Renewal Project	Year	Project Description
Energy Management – Station 1 & 2	2023	This project represents the Corporate Greenhouse Gas and Energy Conservation and Demand Management Plan (Plan) for the City of Cambridge has been developed to meet the reporting requirements for O. Reg. 397/11 (the Ontario Green Energy Act (GEA)) and the voluntary Partners for Climate Protection (PCP) Program in which the City is actively participating. Replace rooftop units, building envelope, install BAS, Demand control ventilation.
Energy Management – Station 3 & ARC	2024	Refer to project above.
Energy Management – Station 4 & 5	2025	Refer to project above.

Growth Needs

In addition to targeting and prioritizing the investment needed to maintain existing assets, there are also planning processes in place to determine the additional assets needed to meet growing demand for service through population increases or demand for new services. The projects targeted to meet growth are funded primarily through Development Charges – the mechanism that enables recovery of growth-related capital expenditures from new development. These charges are governed by the Development Charges Act and are applied in accordance with our Development Charges By-Law. The process for creation and acquisition of assets for growth is described in the Creation/ Acquisition section of the Asset Lifecycle Management Strategy.

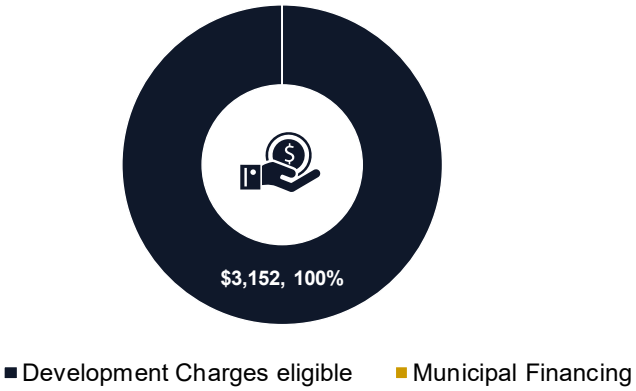
Specifically for emergency services assets, the City has identified a potential need for growth related projects related to the expansion of Fire Station 5. In Table 33, we have outlined these growth projects in more detail.

Table 33: Growth Projects

Growth Project	Year	Project Description
Fire Station 5 Expansion Design	2024	To design the expansion of Station 5 to accommodate the second Rescue Truck and Staffing in order to improve the depth of response performance of the CFD. Funded from Development Charges
Fire Station 5 Construction	2025	To construct Station 5 to accommodate the second Rescue Truck and Staffing in order to improve the depth of response performance of the CFD. Funded from Development Charges.

These key projects, in addition to other emergency services projects, result in a capital investment need of $3.2 million. All $3.2 million of these projects are Development Charges eligible, therefore, no municipal financing is required, meaning that these growth projects do not contribute to the City's funding gap as shown in Figure 44. The projects targeted for growth in the 10 year period are expected to require an estimated increase in operations and maintenance costs of $4.3 million.

Figure 44: Growth Needs ($'000s)

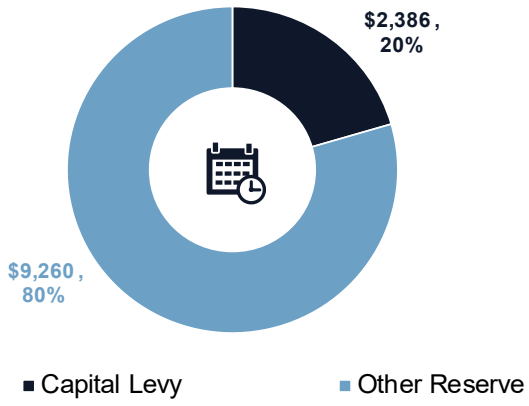


Capital Investment Plan 2020-2029

Our 2020 – 2029 Capital Investment Plan presents the capital investment proposed to sustain our current services for the next 10 years along with projects designed to meet our projected growth requirements.

Figure 45 outlines funding from capital levy and other reserves allocated for emergency services assets through 2020-2029 Capital Investment Plan.

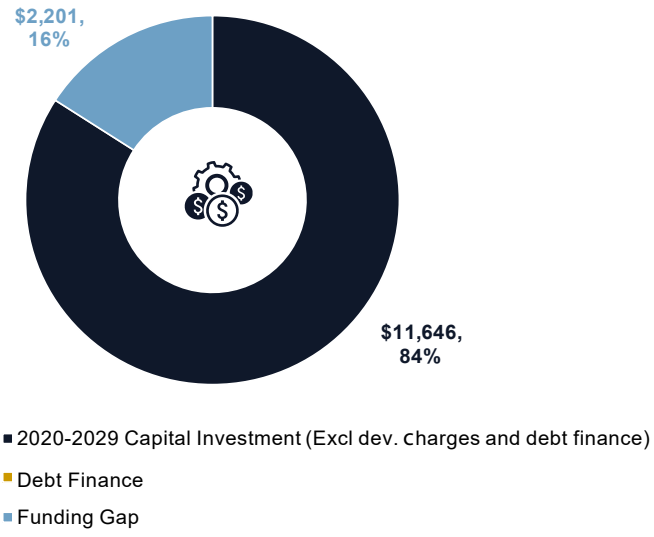
Figure 45: 2020-2029 Capital Investment Plan ($11,646 thousand)



Current Funding Gap Assessment

Despite the various funding sources available to Cambridge (excluding Development Charges and debt financing), we recognize our identified investment needs for renewal of existing infrastructure remains insufficient to maintain current emergency services infrastructure in good state of repair. With a view of our 10 year proposed plan we are able to identify the funding gap that exists in order to meet our target needs Figure 46 highlights that the expected funding gap within the next 10 years is $2.2 million for renewal needs since growth needs of existing Fire Stations and Fleet are fully covered by Development Charges.

Figure 46: Current Funding Gap Assessment ($'000s)



Therefore, based on the analysis presented above and the City's proposed Capital Investment Plan, Table 36 presents the journey to calculate our funding gap.

Table 34: Funding Gap Analysis

Funding Gap Analysis	$ millions
Existing Infrastructure – Renewal Needs	$13.8
Growth Needs - Municipal Financing	$0.0
Total Financial Needs	**$13.8**
2020-2029 Capital Investment Plan (Excluding Development Charges and debentures)	($11.6)
Debentures	($0.0)
Total Funding Gap	**$2.2**

C.5.2 Funding Strategies

To support our emergency service assets within the City, we require sufficient funding in order to maintain the assets in a state of good repair, as well as to create new assets as required. Our current strategies and revenue sources are allocated based on our prioritization model discussed in the Investment Needs section. This model considers the currently available funding sources for emergency services assets in order to deliver our current investment plan effectively:

- Capital Works Reserve Fund: Through property tax collection, we are able to provide annual contribution to this reserve fund that supports infrastructure renewal needs for emergency services assets.
- Other Reserves: Equipment Reserves – Reserve to replace vehicles, fire protection equipment and heavy construction equipment.

Additionally, we continually assess opportunities for additional funding options and revenue streams to address our funding gaps. The following are options that have been used by other municipalities towards addressing their infrastructure gaps and we continue to review for implementation at City of Cambridge.

- Capital Levy – A special levy to provide a certain percentage of a tax rate increase annually devoted to asset sustainability.

C.6.0 Stakeholder Engagement

C.6.1 Users of the Service

Our valued residents and businesses are the primary users of our emergency service network as they expect fast and reliable emergency services in the community. Additionally, our residents rely on our services for education purposes, as our firefighters and staff provide fire prevention and fire safety related activities, inspections, enforcement and seminars in the community.

The Ontario Fire Marshal's 3 lines of defense (Public Education, Prevention, and Suppression) are entrenched in the Fire Protection and Prevention Act (FPPA). As such our Master Fire and Emergency Services Plan undertook a consultation exercise featuring a range of opportunities to consult with stakeholders directly on the subject of emergency service in the City.

We also initiated a Community Information Open House in 2013 to provide an opportunity for our stakeholders to learn more about our emergency services capabilities.

C.6.2 Service Delivery Partners

We rely on partnerships to aid the delivery of service and improvements to our assets and to implement appropriate controls and processes to ensure the impact of our work on stakeholders and delivery partners is communicated to avoid risks and adverse impacts.

Within emergency services, it is particularly important that we work with our external contractors to ensure that our assets are operating efficiently and are repaired quickly in order to minimize disruption of this essential service given that our residents expect a high LoS.

We maintain close relationships with these partners and maintain processes to ensure we have constant communication.

C.6.3 Public and Private Infrastructure Owning Bodies

The Region of Waterloo and our other local government partners are the most significant public infrastructure owning bodies with assets that we rely on (roads, water, etc.) to execute our duty.

Furthermore, the City has an automatic aid agreement with the neighbouring municipalities of North Dumfries and Woolwich to support one another in emergency-related services. Consequently, we rely on their infrastructural assets when responding to calls for service within their jurisdiction.

Additionally, we rely on the Canadian Radio-television and Telecommunications Commission that regulates the telecommunications carriers who supply the network needed to direct and connect 9-1-1 call centers as this service is integral in our ability to deliver high levels of emergency services.

Appendix D

Asset Management Plan – Parks

D.1.1 Introduction

The City maintains a diverse portfolio of assets within the parks service area in four different asset classes that focus on providing the community with outdoor space for leisure activities including parks, sports fields, playgrounds, conservation areas, and cemetery space.

Table 35: Parks Assets

Service Area:	**Parks**			
Asset Class:	**Cemeteries**	**Parks**	**Outdoor Recreation**	**Forestry & Horticulture**
Asset Type*:	» Cemeteries » Columbarium » Mausoleums, Chapels » Facilities » Cemetery Roads » Parking (cemeteries)	» Parks » Park Amenities (facilities) » Parks and outdoor lighting » Monuments » Park Furniture (garbage bins, benches, gates, etc.) » Parking (parks and outdoor recreational parking)	» Sports Fields » Splash Pads » Play Grounds » Bike and Skateboard Parks	» Trees » Horticulture Beds » Horticulture Planters » Tree Grates & Cells

* land value associated with all asset types is not included in analysis and plan

This collection of assets is critical to our City as it provides natural areas and green spaces where residents can enjoy nature and recreational activities. These assets help us to realize our goal of community well-being through promotion of a caring community where people can make strong connections with others and lead safe, healthy, and productive lives. Like many of our assets, park assets are facing increased challenges as a result of climate change, increased use and growing demand for park related services.

Our City faces unique challenges given the variety of assets that comprise the parks portfolio as they range from biological assets (e.g., trees) to hard assets (e.g., cemetery buildings), which provide very different services for the community. This unique portfolio of assets leads to complex decision-making around asset management investment; therefore, careful consideration is required for renewal while also considering the growing needs of our community.

This appendix provides information regarding our approach to the management of parks assets in the next 20 years, demonstrating our commitment to assessing and meeting the LoS valued by our residents.

D.1.2 Scope

This section identifies the requirements for each Phase of O.Reg.588/17 applicable to the assets within this service area. Our compliance with these requirements for the asset classes within this service area is presented in Table 36 to highlight areas of future development in advance of regulation phases. The following sections of this appendix will present the further detailed information to meet the requirements for each section of the regulation.

Table 6 of the main body of our AMP provides a summary of compliance for all service areas along with our plans for continuous improvement to meet the remaining requirements in advance of the future regulatory phases.

While the regulation requires full compliance of all non-core areas in the AMP by 2024, the City has included its non-core assets within this AMP to demonstrate its commitment and advancing efforts in effective planning for all of the essential services provided by the City and its associated assets.

Table 36: Compliance with O.Reg.588/17

Non-Core Assets		Phase 2 - July 1, 2023						Phase 3 – July 1, 2024						
Service Area	Asset Class	Asset Inventory	Weighted average	Replacement Value	Average age	Current Levels of Service	Costs to maintain LoS	Proposed Levels of Service	Creation/ Acquisition Plan	Operations and Maintenance Plan	Rehab and Renewal Plan	Disposal Plan	Investment Needs	Funding Strategies
Parks	Cemeteries	●	●	●	○	○	○	◑	●	●	●	●	●	●
	Parks	●	●	●	●	○	○	◑	●	●	●	●	●	●
	Forestry & Horticulture	●	●	●	●	○	○	◑	●	●	●	●	●	●
	Outdoor Recreation	●	●	●	●	○	○	◑	●	●	●	●	●	●

● Compliant ◑ Partially compliant ○ Not compliant

Note: Phase 1 not reflected as only Phase 2 and 3 are applicable to non-core assets

Table 36 demonstrates that our assets within the parks service area are fully compliant with most regulation requirements for Phase 2 well in advance of the 2023 requirements for non-core assets. We will report current LoS for non-core assets along with associated costs to maintain the current LoS in advance of Phase 2 in 2023.

In addition we have achieved most of the requirements for Phase 3 with the exception of proposed LoS. We have undertaken an extensive exercise engaging multiple stakeholders to develop a LoS framework that identifies proposed LoS for all services as described in the LoS section of the main body and within Section D.3.2. of this appendix. We will continue to develop these identified proposed measures in consultation with stakeholders for reporting in advance of the 2024 milestone.

D.1.3 Strategic Connections

The strategic and master plans summarized in this section all relate to the parks assets and have been considered while developing this AMP.

Table 37: Strategic Documents

Strategic Document	Linkage(s) to the AMP
Current Documents	
2016-2019 Strategic Plan (2016)	The Strategic Plan sets the stage for decision-making, prioritization, and ongoing performance management. Many of Cambridge's residents, employers, and visitors took time to share their ideas and contribute to the plan's development, identifying the positive aspects of Cambridge, as well as aspects they would like to see improve. The Strategic Plan set a goal to make Cambridge "a place for people to prosper" – alive with opportunity, and the infrastructure that enables our people to thrive is a significant contributing factor to this initiative. This AMP shares a connection to the Strategic Plan in its direction and objectives, relating to decision-making, prioritization, and performance management, ultimately enabling us to continue making Cambridge "a place for people to prosper". As two of its seven goals, the Strategic Plan emphasizes community wellbeing to promote a caring community where people can make strong connections with others and lead safe, healthy and productive lives, as well that they can facilitate and deliver a wide range of accessible and diverse community recreation opportunities. The second goal emphasizes parks and recreation to facilitate and deliver a wide range of accessible and diverse community recreation opportunities. This Strategic Plan was used to guide the City in developing its LoS Framework for the parks assets in this AMP. The City is currently in the process of revising the Strategic Plan.
Development Charges Background Study (2019)	A by-law that imposes certain Development Charges in the Corporation of the City of Cambridge pursuant to the Development Charges Act, S.O., 1997, c. 27, as amended. The growth plans and infrastructure investment proposed within the AMP must consider whether development charges will be incurred pursuant to the City's bylaws. In accordance with the By-Law, Cambridge has developed a Development Charges Background Study. The Development Charges Background Study is essential to this AMP as it supports the City in identifying its funding gap included in the Financial Strategy.
Urban Forest Plan (2015)	The Urban Forest Plan provides a vision, guiding principles, and strategic objectives to address the need for proactive planning for and maintenance of trees. These strategic goals have been incorporated in developing the Proposed LoS Framework for Forestry assets.
Riverside Master Plan (2012)	The Riverside Master Plan outlines the future directions in terms of utilization of this Regional Park property. The varied land use types are identified as are the various natural features deserving of, or requiring protection.

Strategic Document	Linkage(s) to the AMP
In Development	
Parkland Strategy	Parkland Strategy and Master Plan is planned to be released for proposals before 2019 year end. The intent is to gather all required info metrics and data to help direct the future needs of parklands, and the maintenance level requirements for this community now and into the future 10- 15 years. The plan will take most of 2020 to complete with a draft report anticipated in the 2nd quarter of 2021.
Cemetery Master Plan	A 10 year plan to address current and future Cemetery needs.

D.2.0 State of Infrastructure

Parks Overview

Parks assets provide natural areas and green spaces for residents to enjoy nature and outdoor activities.

Our parks assets support the City's ability to provide outdoor enjoyment to our residents and guests that visit Cambridge by providing areas for outdoor play, and greenspace for trees and plants to flourish to better the environment. Focusing on these assets enables the City to celebrate its natural beauty, and positively contribute to the City meeting the service needs of its residents.

Replacement Value ('000s)

$72,390

Total replacement value of all assets within the parks asset class

Condition

Good

Weighted average condition rating of parks assets across all subclasses

Asset Class

Four

Distinct asset classes that we manage as part of our municipal parks portfolio

Asset Class

Cemeteries

- 7 cemeteries
- 17,700 sq. ft. of buildings
- 14 columbaria
- 9 km of roads

Parks

- 110 parks
- 41 park facilities (e.g. washrooms)
- 16 parking lots

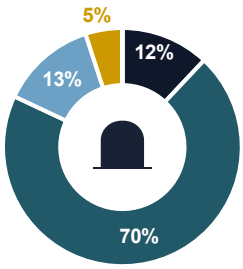
Forestry & Horticulture

- 3 greenhouses
- 60,077 Trees

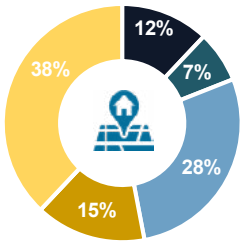
Outdoor Recreation

- 64 playgrounds
- 95 sports fields
- 11 splash pads
- 1 bike parks
- 3 skateboard parks

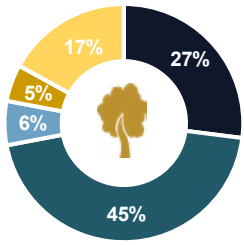
Cemetery Condition*



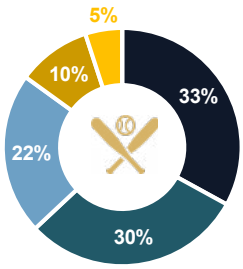
Parks Condition*



Forestry Condition*



Outdoor Recreation Condition*



Very Good | Good | Fair | Poor | Very Poor | Unknown

*Condition based on replacement value

Replacement Value ('000s)

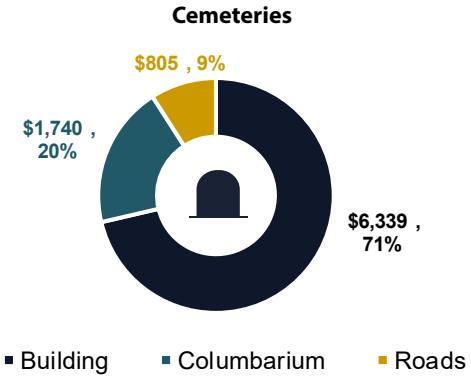
$8,884

Weighted Avg. Condition Rating

Good

Average Age

N.A.



Replacement Value ('000s)

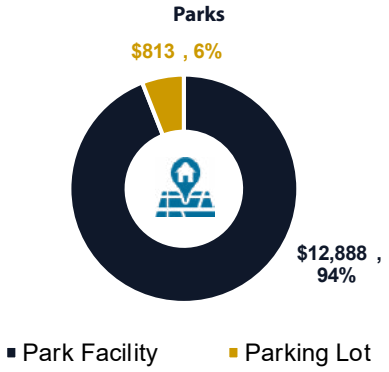
$13,701

Weighted Avg. Condition Rating

Fair

Average Age

29 years



Replacement Value ('000s)

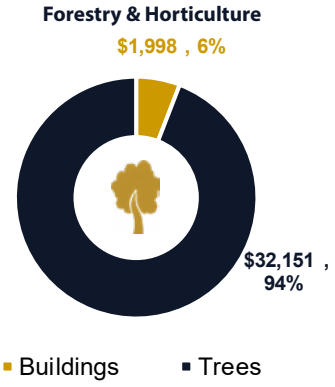
$34,149

Weighted Avg. Condition Rating

Good

Average Age

15 years



Replacement Value ('000s)

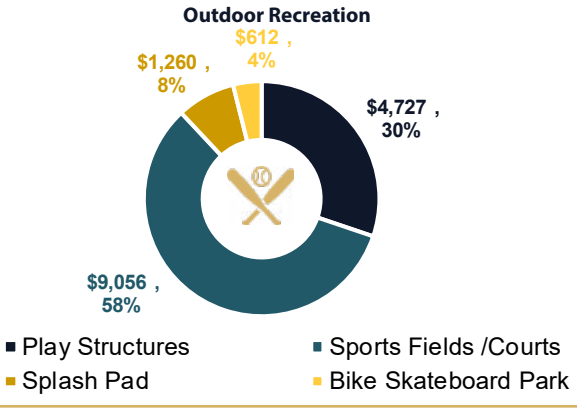
$15,655

Weighted Avg. Condition Rating

Good

Average Age

16 years



D.2.1 State of Infrastructure Maps

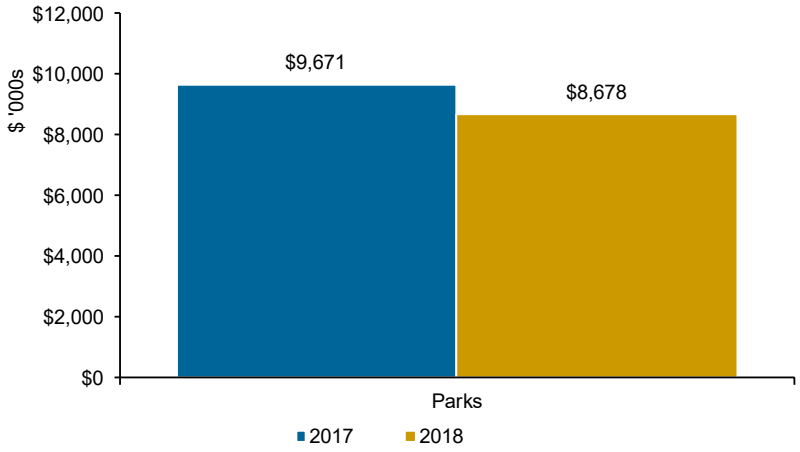
Our parks assets are comprised of a number of different assets located throughout the City and are included below and in Appendix J.

D.3.0 Levels of Service

D.3.1 Current Levels of Service

Since parks assets are classified as non-core assets under O.Reg.588/17, we are not required to report any current LoS as part of this AMP, however, we are in the process of measuring these current LoS to meet the requirements for Phase 2. Despite that we are not including current LoS as part of this AMP, we are able to demonstrate the costs associated with delivering parks related services. In 2017 and 2018 respectively, we spent $9.7 million and $8.7 million in total operations related costs as shown Figure 47.

Figure 47: Operating Costs Annual Comparison ($'000s)



D.3.2 Proposed Levels of Service

We have recently undertaken an exercise to develop a LoS framework that fully aligns our strategic objectives with LoS expected by customers and technical metrics to determine whether our assets are achieving those expectations. Our intention is to use this framework going forward to position all reported metrics within this framework to demonstrate achievement of our outcomes and community needs.

While the proposed LoS we developed as part of the exercise are not required for reporting by the Regulation until 2024, we have proactively developed proposed measures for review and consultation as part of the exercise to develop a LoS framework for all assets across our portfolio.

The starting point for this exercise was identification of our community priorities aligned to our strategic outcomes. The definitions for these priorities are provided in the main body and are referenced in the interpretation sections in the graphic below. We further this concept within each asset area by identifying the unique concerns of the community with regard to the asset. In the case of parks assets, we have identified the concerns and priorities of our stakeholders in the "My Experience" headings below from stakeholder feedback through everyday operational responses and dedicated feedback channels.

Interpretation

Live, work and play without (unreasonable) fear of injury, sickness, or harm.

My experience

The parks and outdoor rec. sites across the City are safe to use.

I feel safe walking through the parks and using the outdoor rec. sites during their open hours

The urban forest and the City's landscaping elements are safe to be around.

Burials are handled safely by the City

I feel safe walking through the cemeteries.

Interpretation

Unobstructed access to municipally controlled amenities and services.

My experience

The parks across the City are accessible to the diverse members of the community.

I can equally benefit from the value of trees and public landscaping in my neighborhood just like members of the community can in theirs.

The cemeteries across the City are accessible to the diverse members of the community that want to pay their respects.

Interpretation

Variety of amenities available to suit any lifestyle and personal circumstance.

My experience

The parks have an appearance that give a positive perception of cleanliness and upkeep that draws people in to make respectful (i.e. no vandalism) use of them.

There is a variety of things to do in the parks around my neighborhood.

The City's trees and landscaping match the character of my community and our environment.

The cemeteries have an appearance that give a positive perception of cleanliness and upkeep that show respect to those buried there.

There is a variety of burial options offered by my community.

Interpretation

Municipal services foster preservation of the environment, heritage, and quality of life.

My experience

The City strives to minimize its own impact on the environment in managing the park and outdoor recreation spaces.

The City makes it easy for me to help to keep parks across the City clean.

The City recognizes and manages the urban forest as a key element of the City's green infrastructure.

Properties are maintained and managed in a sustainable and environmental friendly way.

Interpretation

Core municipal services can be counted upon when needed.

My experience

Closures are kept to a minimum, communicated in advance, and well indicated.

Parks and outdoor rec. sites are usually open when I want to use them.

Equipment and fixtures are there and in a good state when it is my turn to use them.

The parks and recreation facilities across the City are not overcrowded and generally available when I want to use them.

The urban canopy is protected by the City and I know the role I play in that.

The cemetery's are in a good state when I visit the cemetery.

Burials are conducted when required.

Interpretation

Value is demonstrated for every municipal dollar spent.

My experience

The City has a strategy that provides the most efficient use of dollars spent to address outdoor recreation concerns.

The parks and outdoor recreation departments are responsive to my customer service requests and interactions with staff are positive.

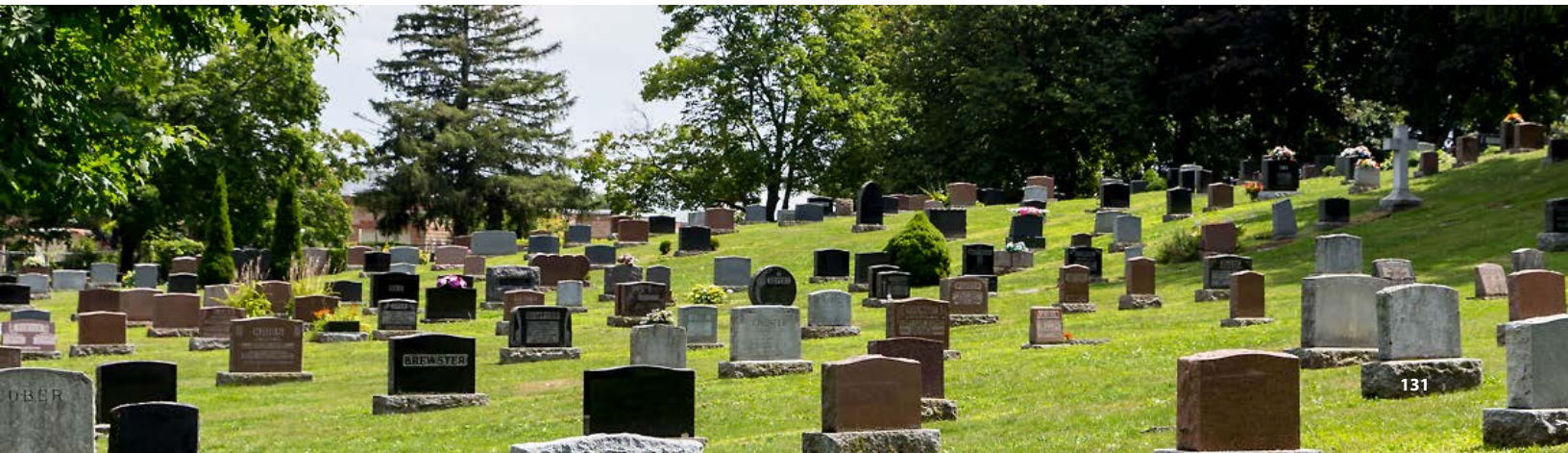
The City has a strategy that provides the most efficient use of dollars spent to address the tree and landscaping concerns.

The Forestry and Horticulture staff are responsive to my customer service requests and interactions with them are positive.

The City has a strategy that provides the most efficient use of dollars spent to address cemetery operations.

The cemetery services department is responsive to my customer service requests and interactions with staff are positive.

With the identification of stakeholder-informed parks priorities, we have developed a series of technical measures designed to monitor performance of these priority community LoS. These preliminary metrics will be tested internally to determine reporting requirements and undergo external consultation ahead of publishing in future updates of the AMP.



D.4.0 Asset Lifecycle Management Strategy

D.4.1 Creation / Acquisition Plan

Master planning documentation supports the City in identifying the objectives around the specific asset services that are necessary to meet the needs and growth of Cambridge. Since 2008, we have developed 17 master plans and strategic plans and are currently developing the Parkland Strategy. These Master Plans are frameworks that guide our investment in parks assets and helps shape Cambridge toward our vision. These Master Plans are useful resources to help the City to focus on better understanding the specific assets that need to be created or acquired to deliver on the goals and objectives of the Master Plan.

We also recognize that we are a part of the Ontario Government's Growth Plan for the Greater Golden Horseshoe. This Plan is an initiative to plan for growth and development of parks assets in a way that supports economic prosperity, protects the environment and helps communities achieve a high quality of life. Documents such as these help the City to develop the creation and acquisition plans as we need to take these priorities and plans into consideration.

The Development Charges Study Report from 2019 supports the City with needs-based discussions by identifying whether the City has the means to create or acquire assets to deliver on the services and goals outlined in the plans.

D.4.2 Operations and Maintenance Plan

This stage of the asset lifecycle generates significant costs over time; therefore, we have implemented practices that enhance value through cost reduction and investment optimization. A successful operations and maintenance plan ensures that our assets also meet the level of service commitments and expectations of those in our community that use parks assets.

Conditions Assessment and Inspection

Based on the standard Condition Assessment Process, as shown in Figure 13 of the main body, maintenance of parks assets begins with facility condition inspections over regular intervals for cemetery assets, and regular maintenance regimes for outdoor assets. Regular condition assessments and maintenance will minimize the risk of defects that could result in risks or higher costs down the road. This practice of early identification, through visual inspection and quantitative assessment, allows for overall higher LoS and extended asset lifespans, as the outputs from the condition assessments are used in planning.

Asset types each have varying condition assessment and inspection procedures, which are outlined in Table 38.

Table 38: Condition Assessment and Inspection Procedures

Asset	Condition Assessment and Inspection Procedure
Playgrounds	Daily inspections for health and safety issues, as well as monthly inspections by registered playground practitioners within playgrounds
Parking and Cemeteries	Visual and age-based inspections
	Formalized building condition assessments
Facilities	Formalized building condition assessments
Sports fields	Daily inspections for immediate safety concerns and/or damage related to turf standard quality, weed invasiveness and divots, and exposed and sunken areas
Splash pads	Daily inspections as per O.Reg.565 for Class C facilities
Forestry and Horticulture	Inspections through routine watering visits
Bike and skate parks	Daily inspection during the spring/summer season

Note: this list is not all encompassing and some condition assessment and inspection procedures may not be included

If a defect is uncovered during inspection, the next step is determining whether the defect will require minor or major maintenance.

Planned Operations and Maintenance

Typically, in the case of minor maintenance, it is incorporated into planned operations and maintenance programs in order to make repairs based on condition assessments and to extend the assets useful service life. Minor maintenance prescribes a work order that is distributed to Operations staff and contractors for repair, followed by a work inspection to ensure completeness, and payment once complete.

Currently, there are a number of planned operations and maintenance activities that are performed for parks assets including:

- Drain maintenance
- Start-up and shutdown checks/flushing of splash pads
- Maintenance to prevent cracking, shifting, tilting of cemetery assets and monuments
- Grass cutting, leaf pick-up, tree trimming, garbage receptacle pickup, winter maintenance of internal roads (only for specific parks/roads/)
- Maintenance of playground to CSA standards
- Debris pickup, grass/turf grooming and maintenance, and line painting for sports fields and playgrounds
- Winter maintenance of parking lots
- Regrading of gravel parking lots
- Ongoing planting, pruning, watering, fertilizing, de-weeding for forestry and horticulture assets
- Ongoing maintenance of cemetery grounds to ensure safety of the public and to preserve the dignity of the cemetery as required under the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002
- Snow clearing support to outdoor rinks
- Year round special event set up, tear down and clean up

If the inspection reveals that major maintenance is required, but not required immediately, the City typically implements a rehabilitation and renewal plan.

Unplanned Operations and Maintenance

Our major maintenance needs are identified through a number of sources, namely activities prescribed through maintenance of assets. However, unexpected situations may occur which can result in unplanned maintenance activities. If major maintenance costs are significant, a more thorough review process becomes necessary and often involves consultation with various internal functions, such as our Asset Management service area, Facilities, Building Design and Construction, and Parks Recreation and Operations service area to decide if the repair meets the capital budget criteria. Generally, this service area relies on outside contractors for investigation and suggested repairs when the scope of the maintenance is not easily determined.

Despite the fact that, typically, minor maintenance is incorporated into planned operations and maintenance programs, there are cases where it is unplanned.

Currently, the unplanned operations and maintenance for parks assets includes:

- Equipment repair, surface repair, and vandalism cleanup for splash pads
- Turf repairs and safety-related repairs for sports fields
- Washout repairs and regrading from weather events in the bike park
- Equipment repair and surface repair for playgrounds
- Bulk repair on outdoor lights in parks
- Repair due to damage from weather event or vandalism for forestry and horticulture assets, and at parks and cemeteries
- Gardening and tree trimming
- Bleacher, picnic and player's bench repairs
- Fence repair and maintenance
- Asphalt parking lot and concrete maintenance
- Pothole maintenance and curb replacement in parking lots or cemetery roads

In recent years the City has been impacted by nature and climate change which has impacted the condition of our assets. The maintenance required to repair these assets due to climate change is typically unplanned and can be costly.

D.4.3 Rehabilitation and Renewal Plan

We employ a defined asset renewal process, as shown in Figure 14 of the main body, using consultation among many internal functions. The rehabilitation and renewal process begins with a needs assessment on an annual basis, followed by a review of the operational impacts of a potential investment. If the need for rehabilitation or renewal is significant enough, the item moves to a more detailed level of scope and budget definition, financial forecasting, and then Council approval. Most renewal projects require construction and project management, particularly as the projects increase in scale. Following the renewal, commissioning and inspection activities are performed to ensure that our personnel have the understanding of the landscaping, materials and processes recommended by the suppliers to maintain the asset at a cost-effective, and optimal level.

D.4.4 Disposal Plan

In some cases, disposing of an asset is more appropriate than replacing or renewing it. Given the growth of our population and steadily increasing need for green space due to climate change and recreational activities due to a growing community, disposal is not common for parks assets. However, in the situations where it is necessary, our Realty service area coordinates with the parks service area and contractors to ensure safe removal and environmental sustainability compliance.

D.5.0 Financial Strategy

D.5.1 Asset Investment Needs

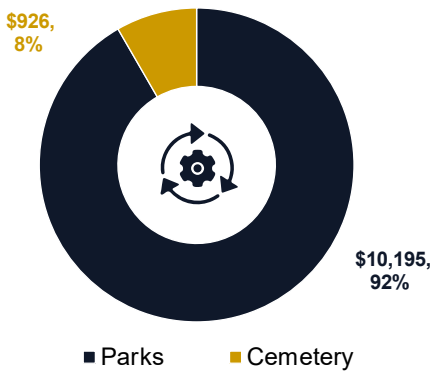
Our investment needs are identified through a range of mandated and industry leading planning processes supported by detailed analysis to ensure we identify our needs for investment to maintain service delivery, meet future demand growth and achieve our strategic objectives. The needs identified through these various planning processes are then prioritized through a Capital Project Prioritization Model, which evaluates projects using nine criteria to determine the most important needs and initiatives to be funded.

The following sections describes our capital and operational investment needs to maintain existing infrastructure and associated service delivery along with the requirements for additional infrastructure to meet the growing needs and demands of our communities. We also highlight the Capital Investment Plan that was approved by the City for 2020-2029 and the current funding gap that exists for us to meet our target needs.

Capital Renewal

The City has undertaken a comprehensive analysis to determine the capital needs of its parks assets to deliver the services expected by its communities and stakeholders. We have adopted an industry leading approach to identification of capital renewal needs for our non-core asset areas based on their condition and remaining useful life and ability to maintain service delivery. The resulting analysis for parks assets demonstrates that the City has a capital renewal need of $11.1 million as shown in Figure 48.

Figure 48: Renewal Needs ($'000s)



Key capital renewal parks projects are outlined in more detail in Table 39.

Table 39: Capital Renewal Projects

Capital Renewal Project	Year	Project Description
Mill Race Amphitheatre Consultation and Design	2021	Redesign the Mill Race amphitheatre space to include potential accessibility, lighting and electrical upgrades. Consultation with user groups, Heritage Committee and Accessibility Committee will be required as part of the design process.
Galt Riverbank Heritage Buildings – Storm Windows	2021	Repainting and protective glazing for energy savings and window protection at Landreth Cottage. Protective glazing for energy savings at Ferguson Cottage.
Mill Race Amphitheatre Renewal	2022	Construction of the Mill Race amphitheatre space to include potential accessibility, lighting and electrical upgrades. Design & consultation to be completed in 2021.
Willard Park – Splashpad Construction	2022	The construction of a new splashpad to be built in 2022 in Willard Park area to serve a community area that does not have one.
Riverside Park (Mickler) Stadium Renovations	2023	Reconstruction/Renovation of Riverside Park (Mickler) Stadium.
Riverside Park	2024/ 2025/ 2026	The work will include the relocation or elimination of certain sports fields, improvements along the river edge and internal roadway replacement. It will also include bollard replacements, lighting improvements, internal road reconstruction, the creation of separated walkways, and seating vistas on the river. Creek/pond flow control improvements are also intended. Park building and washroom upgrades to address improved space needs, accessibility, energy and water use, and interior design improvements are also part of this work.
Dickson Stadium Renovations	2024	Reconstruction/Renovation of Dickson Park Stadium

Growth Needs

In addition to targeting and prioritizing the investment needed to maintain existing assets, there are also planning processes in place to determine the additional assets needed to meet growing demand for service through population increases or demand for new services. The projects targeted to meet growth are funded primarily through Development Charges – the mechanism that enables recovery of growth-related capital expenditures from new development. These charges are governed by the Development Charges Act and are applied in accordance with our Development Charges By-Law. The process for creation and acquisition of assets for growth is described in the Creation/Acquisition section of the Asset Lifecycle Management Strategy.

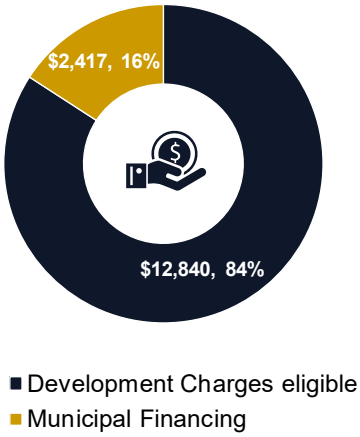
Specifically for parks assets, the City has identified the need for a new neighbourhood park development, multi-use trail development, a splash pad, and six new columbaria between 2020 and 2025. In Table 40, we have outlined these growth projects in more detail.

Table 40: Growth Projects

Growth Project	Year	Project Description
Fountain St Soccer Facility Design	2020	Fountain Street soccer facility design of multiple sports fields consisting of both grass and artificial fields of various sizes. Washroom facilities, play structure, parking, and natural amenities.
Fountain St Soccer Facility Construction	2021	Fountain Street soccer facility construction. Construction of multiple sports fields consisting of both grass and artificial fields of various sizes. Washroom facilities, play structure, parking, and natural amenities.
Chaplin Park Sportsfield Redevelopment	2029	Redevelop Chaplin Park reconfiguring the existing open space, adding a secondary soccer field, increase in size of parking lot to service park, removing ball diamond. Bathroom reconstruction.

These key projects, in addition to other parks projects, result in a capital investment need of $15.3 million, of which, $12.8 million are Development Charges eligible and $2.4 million require municipal financing as shown in Figure 49. The projects targeted for growth in the next 10 year period are expected to require an estimated increase in operations and maintenance costs of $1.9 million.

Figure 49: Growth Needs ($'000s)

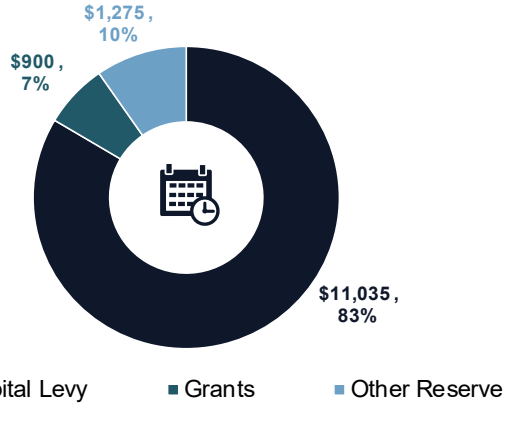


Capital Investment Plan 2020-2029

Our Capital Investment Plan 2020-2029 presents the capital investment proposed to sustain our current services for the next 10 years along with projects designed to meet our projected growth requirements.

Figure 50 outlines funding from capital levy, federal gas tax grants, and other reserves allocated through 2020-2029 Capital Investment Plan.

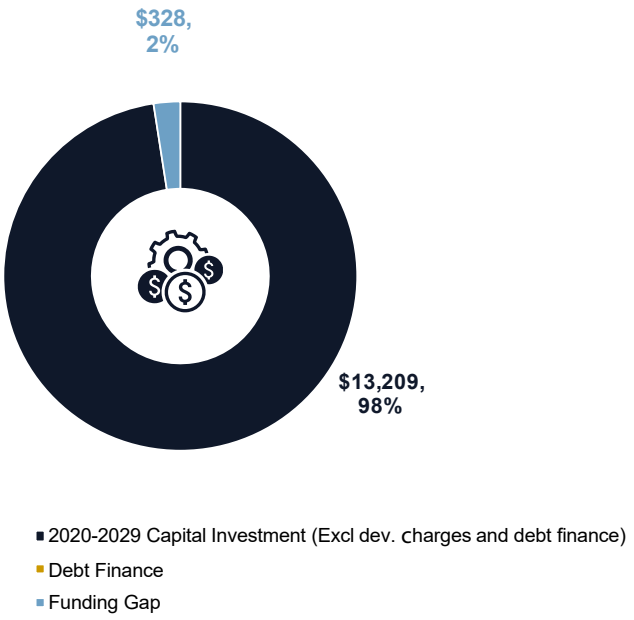
Figure 50: 2020-2029 Capital Investment Plan ($13,209 thousand)



Current Funding Gap Assessment

With a view of our 10 year proposed plan we are able to identify the funding gap that exists in order to meet our target needs. Figure 51 highlights that the expected funding gap over the next 10 years is $328 thousand.

Figure 51: Current Funding Gap Assessment ($'000s)



Therefore, based on the analysis presented above and the City's proposed Capital Investment Plan, Table 41 presents the journey to calculate our funding gap.

Table 41 Funding Gap Analysis

Funding Gap Analysis	$ millions
Existing Infrastructure – Renewal Needs	$11.1
Growth Needs - Municipal Financing	$2.4
Total Financial Needs	**$13.5**
2020-2029 Capital Investment Plan (Excluding Development Charges and debentures)	($13.2)
Debentures	($0)
Total Funding Gap	**$0.3**

D.5.2 Funding Strategies

To support our parks assets that provide services within the City, we require sufficient funding in order to maintain the assets in a state of good repair, as well as to create new assets to support future growth. Our current strategies and revenue sources are allocated based on our prioritization model discussed in the Investment Needs section. This model considers the currently available funding sources for parks assets in order to deliver our current investment plan effectively. Some of the funding sources we have available at Cambridge are outlined below:

- Reserve Funds: We have established reserve funds to provide stability to tax rates in the event of unforeseen economic events, to provide funding for one-time requirements, to make provisions for the acquisition and replacement of infrastructure, and to provide flexibility to manage debt levels. Reserves that are applicable for the parks assets include:
  - Cemetery Improvements Reserve Fund – provides funds for the perpetual care of City-owned cemeteries
  - Columbarium Purchase Reserve Fund – provides funds for the replacement of the City's columbarium units
  - Sports Field Revitalization Reserve Fund – holds funds for sports field capital improvements
  - Jacob Hespeler Field Reserve Fund – holds funds for future capital repairs, replacements and or additions to the field, track, and related facilities and infrastructure at Jacob Hespeler Secondary School
  - Soccer Facility Capital Expenditure – to hold funds for future capital repairs, replacements and/or additions to the indoor soccer facility
- Capital Works Reserve Fund: Through property tax collection, we are able to provide annual contribution to this reserve fund that supports infrastructure renewal needs for parks amenitieis and outdoor recreation infrastructure.

Additionally, we continually assess opportunities for additional funding options and revenue streams to address our funding gaps. The following are options that have been used by other municipalities towards addressing their infrastructure gaps and we continue to review for implementation at City of Cambridge.

- Grants – Outside of the City's control, there are periodically additional funding opportunities provided by the provincial and federal governments towards certain infrastructure projects. These funding sources typically outline specific conditions and requirements that must be demonstrated in order to secure and maintain the funding. In many cases, these conditions require applicants to demonstrate capabilities in effective planning and financial management.
- Capital Levy – A special levy to provide a certain percentage of a tax rate increase annually devoted to asset sustainability.
- Reserve Contribution – Opportunities to allow a certain percentage of assessment growth to be contributed to reserves for future replacement of assets donated through new subdivisions.

D.6.0 Stakeholder Engagement

D.6.1 Users of the Service

Parks assets are developed with the intention to support healthy lifestyles by providing affordable programs and activities, accessible play grounds, outdoor sports facilities, as well as to maintain sustainable green space and natural areas. Therefore, our citizens are the primary users of these assets. These assets are also vital to the City's commitment to good stewardship as parks, forestry and horticulture positively contribute to the environment, which is required by those that live and/or pass through as visitors.

Parks services through its assets such as parks and cemeteries are unrestricted during set hours.

D.6.2 Service Delivery Partners

We rely on partnerships to aid the delivery of service and improvements to our assets and to implement appropriate controls and processes to ensure the impact of our work on stakeholders and delivery partners is communicated to avoid risks and adverse impacts.

To maintain the quality of the amenity for the outdoor recreation, parks and cemeteries, the City, in isolated cases uses external contract services.

We maintain close relationships with both our internal and external partners and maintain processes to engage with each of our service delivery partners as required.

D.6.3 Public and Private Infrastructure Owning Bodies

The Region of Waterloo and our other local government partners are the most significant public infrastructure owning bodies with assets integrated into our parks assets given its commitment to Regional Planning. As such, we maintain formal processes for working with the Region to approve our official plan, as well as to ensure alignment with the Region's Official Plan.

The City works in collaboration with the Region to make sure that key programs and incentives are provided to redevelop vacant or underutilized properties in order to promote efficient use of land that could be used as green space, parks, forestry and/or outdoor recreational purposes.

The City also collaborates with the Grand River Conservation Authority since they own and manage three conservation areas within the City that are open to the public, the Chilligo Conservation Area, Dumfries Conservation Area, and Shade's Mills Park.

Appendix E

Asset Management Plan – Recreation & Culture

E.1.1 Introduction

The City maintains recreation & culture assets as part of its wider portfolio to benefit the wider Cambridge community by providing dedicated space for learning, recreation and sport through arts, programming and leisure areas.

Table 42: Recreation & Culture Assets

Service Area:	**Recreation & Culture**
Asset Class:	**Indoor Recreation & Culture**
Asset Type:	» Arenas » Pools » Community Centres/ Older Adult Centres » Market » Arts/ Theatres » Museums » Soccer Dome » Libraries » Recreational Parking

The recreation & culture collection of assets is critical to our City as it provides fundamental access to resources and recreation for residents of all income levels in the community. More specifically, museums, arts, theatres and community centres provide opportunity for the community's heritage and culture to evolve; libraries provide a dedicated location to foster an environment of curiosity to increase learning and creativity; and arenas and pools offer a location for residents to partake in physical activity.

Each of these assets helps us to realize our goal of community well-being through promotion of a caring community where people can make strong connections with others and lead safe, healthy and productive lives. Our investment in these assets must therefore be carefully considered to ensure optimal investment for renewal while investing to meet the growing needs of our community.

This appendix provides information regarding our approach to management of recreation & culture assets in the next 20 years, demonstrating our commitment to assessing and meeting the LoS valued by our residents.

E.1.2 Scope

This section identifies the requirements for each Phase of O.Reg.588/17 applicable to the assets within this service area. Our compliance with these requirements for the asset classes within this service area is presented in Table 43 to highlight areas of future development in advance of regulation phases. The following sections of this appendix will present the further detailed information to meet the requirements for each section of the regulation.

Table 6 of the main body of our AMP provides a summary of compliance for all service areas along with our plans for continuous improvement to meet the remaining requirements in advance of the future regulatory phases.

While the regulation requires full compliance of all non-core areas in the AMP by 2024, the City has included its non-core assets within this AMP to demonstrate its commitment and advancing efforts in effective planning for all of the essential services provided by the City and its associated assets.

Table 43: Compliance with O.Reg.588/17

Non-Core Assets		Phase 2 – July 1, 2023						Phase 3 – July 1, 2024						
Service Area	Asset Class	Asset Inventory	Weighted average	Replacement Value	Average age	Current Levels of Service	Costs to maintain LoS	Proposed Levels of Service	Creation/ Acquisition Plan	Operations and Maintenance Plan	Rehab and Renewal Plan	Disposal Plan	Investment Needs	Funding Strategies
Recreation & Culture	Indoor Recreation & Culture	●	●	●	●	○	○	◑	●	●	●	●	●	●

● Compliant ◑ Partially compliant ○ Not compliant Note: Phase 1 not reflected as only Phase 2 and 3 are applicable to non-core assets

Table 43 demonstrates that our assets within the recreation & culture service area are fully compliant with most regulation requirements for Phase 2 well in advance of the 2023 requirements for non-core assets. We will report current LoS for non-core assets along with associated costs to maintain the current LoS in advance of Phase 2 in 2023.

In addition we have achieved most of the requirements for Phase 3 with the exception of proposed LoS. We have undertaken an extensive exercise engaging multiple stakeholders to develop a LoS framework that identifies proposed LoS for all service as described in the LoS section of the main body and within Section E.3.2. of this appendix. We will continue to develop these identified proposed measures in consultation with stakeholders for reporting in advance of the 2024 milestone.

E.1.3 Strategic Connections

The strategic and master plans summarized in this section are all related to the recreation & culture assets and have been considered while developing this AMP.

Table 44: Strategic Documents

Strategic Document	Linkage(s) to the AMP
Current Documents	
2016-2019 Strategic Plan (2016)	The Strategic Plan sets the stage for decision-making, prioritization, and ongoing performance management. Many of Cambridge's residents, employers, and visitors took time to share their ideas and contribute to the plan's development, identifying the positive aspects of Cambridge, as well as aspects they would like to see improve. The Strategic Plan sets a goal to make Cambridge "a place for people to prosper" – alive with opportunity, and the infrastructure that enables our people to thrive is a significant contributing factor to this initiative. This AMP shares a connection to the Strategic Plan in its direction and objectives, relating to decision-making, prioritization, and performance management, ultimately enabling us to continue making Cambridge "a place for people to prosper". The Strategic Plan emphasizes arts, culture heritage and architecture as its third goal as the City strives to promote a creative environment that encourages arts, culture, and heritage and values the unique architectural assets of the community. This Strategic Plan was used to guide the City in developing its LoS Framework for the recreation & cultures assets in this AMP. The City is currently in the process of revising the Strategic Plan.
Development Charges Background Study (2019)	A by-law that imposes certain Development Charges in the Corporation of the City of Cambridge pursuant to the Development Charges Act, S.O., 1997, c. 27, as amended. The growth plans and infrastructure investment proposed within the AMP must consider whether development charges will be incurred pursuant to the City's bylaws. In accordance with the By-Law, Cambridge has developed a Development Charges Background Study. The Development Charges Background Study is essential to this AMP as it supports the City in identifying its funding gap included in the Financial Strategy.
Five-Year Strategic Plan for Libraries (2008) and Galleries (2010)	A plan to identify actions for libraries and galleries in the City in order to optimize libraries through self-service, redeployment of staff, in-creasing brand recognition, and increasing cultural service offerings. Libraries are included in the recreation & culture assets; therefore, this plan helps to identify the goals and objectives for libraries across the City. As such, this five-year Plan outlines the goals and objec-tives that need to be met for libraries and galleries, which has been considered as part of this AMP around asset lifecycle management assets.
Arts & Culture Master Plan (2009)	The Arts and Culture Master Plans provide a collection of initiatives in four areas: (1) policy direction, (2) direct provision of services, (3) funding initiatives, and (4) sector support that have a vision of cele-brating the uniqueness of Cambridge's communities and cultural heritage. These initiatives have provided important considerations for this AMP around its cultural recreation assets including theatres, and museums to ensure that they are created/acquired to meet fu-ture goals for the City, but also that they are managed and main-tained in a state of good repair in order to meet expected levels of service.
Indoor Recreation Needs Assessment (2015)	As part of the Community Services Master Plan, a needs assess-ment was developed to provide direction on major capital require-ments related to indoor recreation facilities at Cambridge. The needs assessment is used by the City as part of this AMP in the Creation and Acquisition phase of the Asset Lifecycle Management Strategy, as this assessment informs the type of indoor recreation assets needed by the City.

Strategic Document	Linkage(s) to the AMP
In Development	
Older Adult Strategy	A strategy that will recognize that the City of Cambridge plays an instrumental role in meeting the recreation, leisure and support ser-vice needs of local older adults. It will outline Cambridge's priorities for continuing to deliver these necessary services for our older adults. This strategy will support Cambridge in developing their AMP, as it will identify the assets required to deliver their services, which will need to be considered and incorporated into the AMP.
Centralized Facilities Management Strategy	The Centralized Facilities Management Strategy will review the cur-rent operational and maintenance practices throughout facilities buildings within the Corporate portfolio in order to develop a corpo-rate facilities management function responsible for managing all City facilities. This will include building operations, preventative/regular maintenance and coordination of capital projects. This project will specifically focus on defining current service/contractor rosters and service agreements for the purposes of streamlining standardized processes for operations and maintenance and centralizing current operations and maintenance activities from individual service areas to a centralized facilities management model.

E.2.0 State of Infrastructure

Recreation & Culture Overview

Recreation & culture assets provide fundamental access to assets that deliver leisure, healthy living and learn-ing to all residents of Cambridge.

We recognize the important role these assets play in providing recreational space to the broader community throughout the year to deliver leisure services and programming to help create a safe, accessible and productive community.

Replacement Value ('000s)

$249,547

Total replacement value of all assets within the recreation & culture asset class

Condition

Good

Weighted average condition rating of recreation & culture assets across all subclasses

Asset Class

One

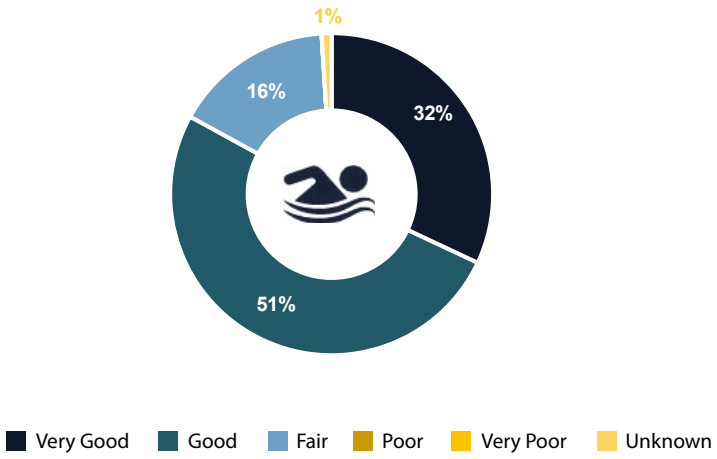
Distinct asset classes that we manage as part of our municipal recreation & culture portfolio

Asset Class

Recreation & Culture

- 6 arenas
- 5 pools (indoor and outdoor)
- 1 soccer dome
- 6 senior/community centres
- 2 fitness/gymnastic facilities
- 1 museum
- 2 arts/theatres
- 1 market
- 6 libraries
- 9 parking lots (*additional parking lots included in transportation and parks service areas*)

Recreation & Culture Condition*



*Condition based on replacement value

Replacement Value ('000s)

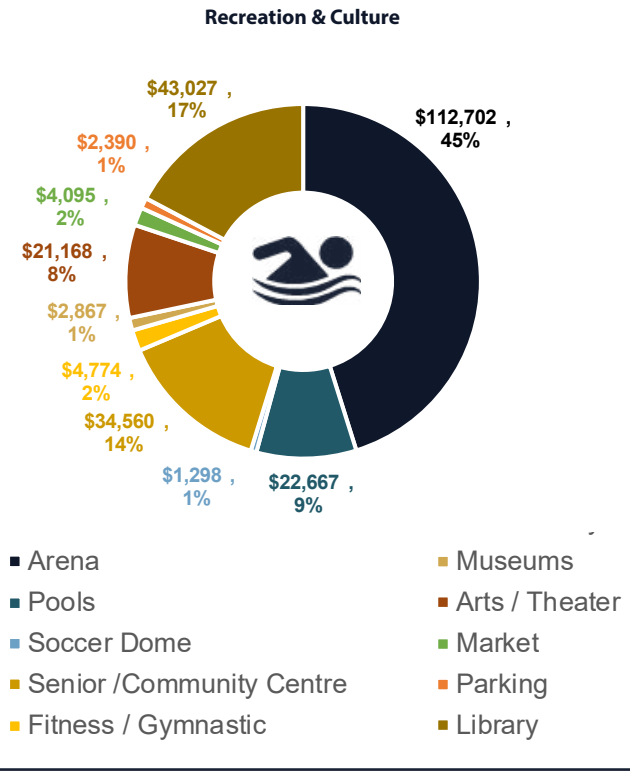
$249,547

Weighted Avg. Condition Rating

Good

Average Age

47 years



E.2.1 State of Infrastructure Maps

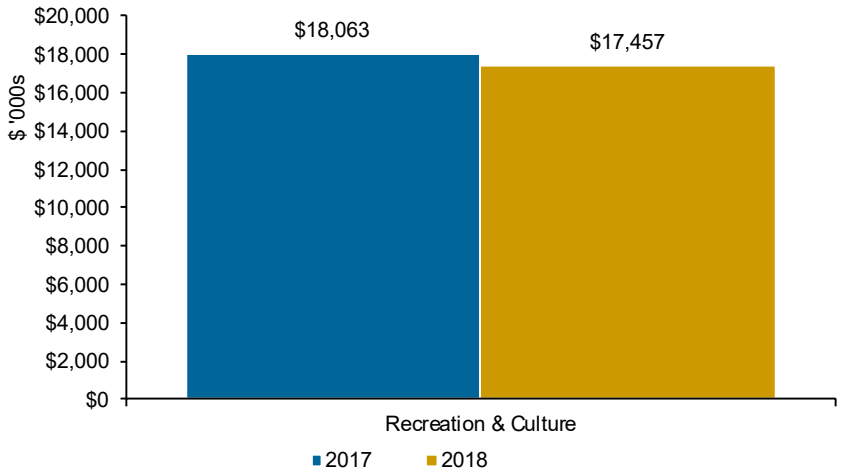
Our indoor recreation assets are comprised of a number of different assets located throughout the City and are included in Appendix J.

E.3.0 Levels of Service

E.3.1 Current Levels of Service

Since recreation & culture assets are classified as non-core assets under O.Reg.588/17, we are not required to report any current LoS as part of this AMP, however, we are in the process of measuring these current LoS to meet the requirements for Phase 2. Despite that we are not including current LoS as part of this AMP, we are able to demonstrate the costs associated with delivering recreation & culture related services. In 2017 and 2018 respectively, we spent $18.1 million and $17.5 million in total operations related costs as shown in Figure 52.

Figure 52: Operating Costs Annual Comparison ($'000s)



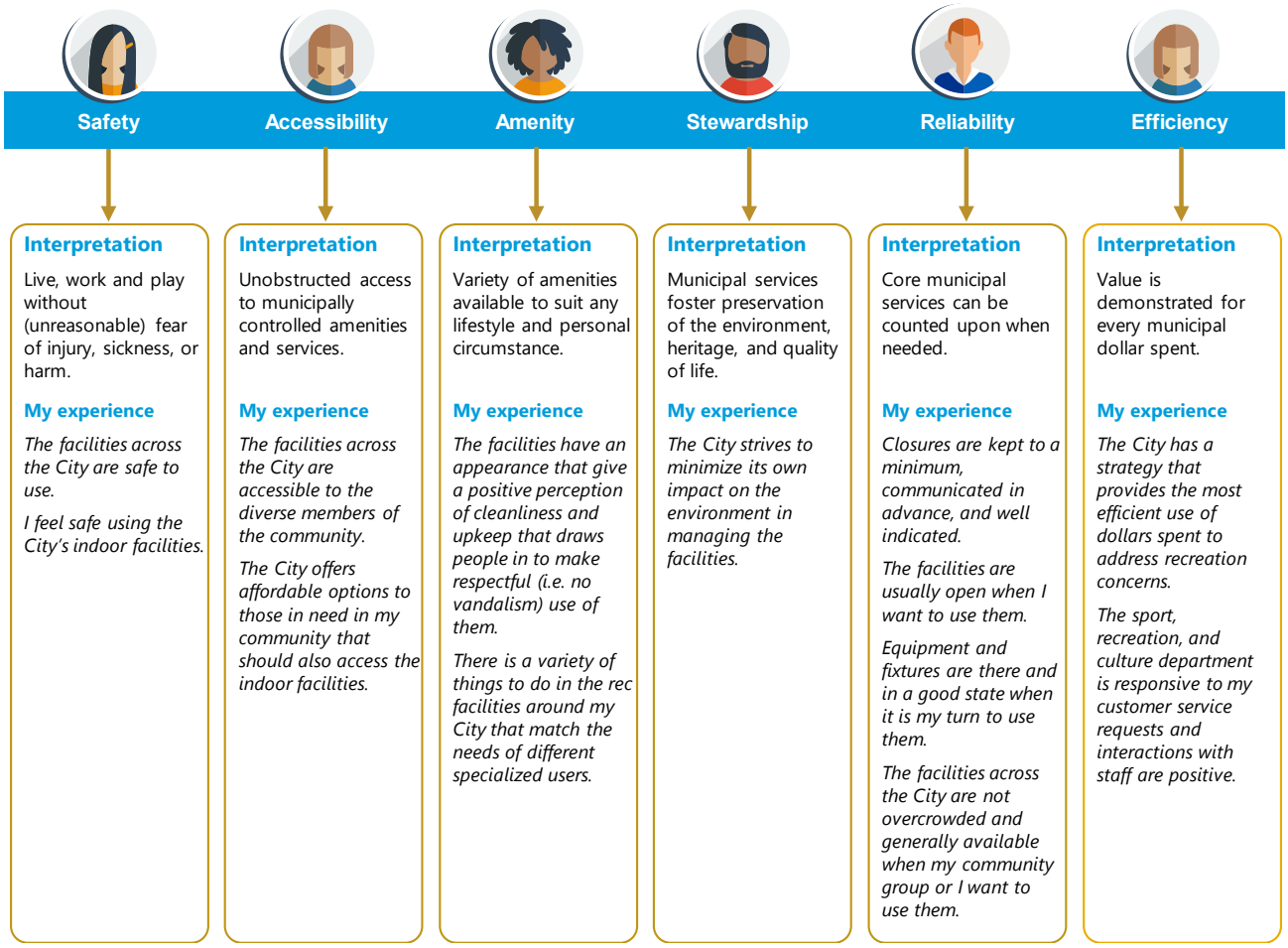
E.3.2 Proposed Levels of Service

We have recently undertaken an exercise to develop a LoS framework that fully aligns our strategic objectives with LoS expected by customers and technical metrics to determine whether our assets are achieving those expectations. Our intention is to use this framework going forward to position all reported metrics within this framework to demonstrate achievement of our outcomes and community needs.

While the proposed LoS we developed as part of the exercise are not required for reporting by the Regulation until 2024, we have proactively developed proposed measures for review and consultation as part of the exercise to develop a LoS framework for all assets across our portfolio.

The starting point for this exercise was identification of our community priorities aligned to our strategic outcomes. The definitions for these priorities are provided in the main body and are referenced in the interpretation sections in the graphic below. In the case of recreation & culture assets, we have identified the concerns and priorities of our stakeholders in the "My Experience" headings below from stakeholder feedback through everyday operational responses and dedicated feedback channels.

With the identification of stakeholder informed recreation & culture priorities, we have developed a series of technical measures designed to monitor performance of these priority community LoS. These preliminary metrics will be tested internally to determine reporting requirements and undergo external consultation ahead of publishing in future updates of the AMP.


Safety
Accessibility
Amenity
Stewardship
Reliability
Efficiency
Interpretation
Live, work and play without (unreasonable) fear of injury, sickness, or harm.
My experience
The facilities across the City are safe to use.
I feel safe using the City's indoor facilities.
Interpretation
Unobstructed access to municipally controlled amenities and services.
My experience
The facilities across the City are accessible to the diverse members of the community.
The City offers affordable options to those in need in my community that should also access the indoor facilities.
Interpretation
Variety of amenities available to suit any lifestyle and personal circumstance.
My experience
The facilities have an appearance that give a positive perception of cleanliness and upkeep that draws people in to make respectful (i.e. no vandalism) use of them.
There is a variety of things to do in the rec facilities around my City that match the needs of different specialized users.
Interpretation
Municipal services foster preservation of the environment, heritage, and quality of life.
My experience
The City strives to minimize its own impact on the environment in managing the facilities.
Interpretation
Core municipal services can be counted upon when needed.
My experience
Closures are kept to a minimum, communicated in advance, and well indicated.
The facilities are usually open when I want to use them.
Equipment and fixtures are there and in a good state when it is my turn to use them.
The facilities across the City are not overcrowded and generally available when my community group or I want to use them.
Interpretation
Value is demonstrated for every municipal dollar spent.
My experience
The City has a strategy that provides the most efficient use of dollars spent to address recreation concerns.
The sport, recreation, and culture department is responsive to my customer service requests and interactions with staff are positive.

E.4.0 Asset Lifecycle Management Strategy

E.4.1 Creation / Acquisition Plan

Master planning documentation supports the City in identifying the objectives around the specific asset services that are necessary to meet the needs and growth of Cambridge. To identify the objectives and needs for our services, we have developed strategic and master planning documents:

- The Arts & Culture Master Plan, which outlines our vision for supporting arts and culture and an implementation plan for how to support this vision through services and in turn the assets that service them.
- A five-year Strategic Plan for Libraries and Galleries that identifies actions to be taken to meet the changing landscape of the library services.

The objectives and actions outlined in the master and strategic plans support the City in identifying the need required in order to execute on these goals, which may be accomplished through acquisition or creation or both. The Development Charges Background Study Report from 2019 outlines the assets that need to be created or acquired by the City to deliver on expectations and goals.

We also undertake needs assessments to identify requirements for our indoor recreational assets when required. These assessments aim to provide direction on major capital requirements related to indoor recreation facilities. Our most recent needs assessment for this service area was the March 2015 Indoor Recreation Facility Needs Assessment to identify the following:

- key trends and demand indicators that may impact indoor recreation facility provisions,
- assess existing municipal indoor recreation facilities and summarize known challenges
- opportunities, and to identify current and future indoor recreation facility needs, including possible building components.

The needs assessment suggested that only one aquatic centre is required for the Southeast Galt area and that it should be combined as part of a Multi-Purpose Sport and Recreation Facility, which should also support gymnasiums, meeting and activity rooms, indoor walking tracks etc. This project has now been endorsed by Council as in 2019.

We also recognize that we are a part of the Ontario Government's Growth Plan for the Greater Golden Horseshoe. This Plan is an initiative to plan for growth and development of indoor recreation assets in a way that supports economic prosperity, protects the environment and helps communities achieve a high quality of life. Documents such as these help the City to develop the creation and acquisition plans as we need to take these priorities and plans into consideration.

E.4.2 Operations and Maintenance Plan

This stage of the asset lifecycle generates significant costs over time; therefore, we have implemented practices that enhance value through cost reduction and investment optimization. A successful operations and maintenance plan ensures that our assets also meet the level of service commitments and expectations of those in our community that use our recreation & culture assets.

Condition Assessment and Inspection

Based on the standard Condition Assessment Process, as shown in Figure 13 of the main body, maintenance of indoor recreation & culture assets begins with facility condition inspections over regular intervals since regular condition assessments ensure that maintenance can be performed as required in order to minimize deferred maintenance that could result in higher costs down the road. This practice of early identification, through visual inspection and quantitative assessment, allows for overall higher LoS and extended asset lifespans, as the outputs from the condition assessments are used in planning.

Asset types each have varying condition assessment and inspection procedures; however, the majority of the assets within this portfolio are required to receive regular building condition assessments based on a risk-based prioritization. Pools are inspected daily with a requirement for detailed documentation, whereas arenas have daily visual inspection. Inspections for recreational facilities are also performed in alignment with the Ontario Recreations Facilities Association, best practices, and guidelines documentation. For specialized equipment, seasonal inspections are performed for food preparation, HVAC and fire protection in the community centres.

If a defect is uncovered during inspection, the City determines whether the defect will require minor or major maintenance.

Planned Operations and Maintenance

Typically, in the case of minor maintenance, it is incorporated into planned operations and maintenance programs in order to make repairs based on condition assessments and to extend the assets useful service life. Minor maintenance prescribes a work order that is distributed to Operations staff and contractors for repair, followed by a work inspection to ensure completeness, and payment once complete.

Currently, there are a number of planned operations and maintenance activities that are performed for recreation & culture assets including:

- General maintenance to the building envelopes, including caulking around doors, windows, changing out lights
- Winter maintenance performed seasonally
- Property maintenance, including tree trimming, debris pick-up, general landscaping, etc.
- Regular maintenance on internal equipment such as pumps, filters, boilers, pool equipment
- Regular maintenance to community rooms / arenas to ensure doors, showers, walls, fixtures, rink infrastructure, etc. to ensure assets are in proper working order, and meet health and safety standards.
- Ongoing snow cleaning, parking lot sweeping, crack sealing, debris pick-up, curb replacement, grading, and installation of walkway ramps to parking lots for parking lots

If the inspection reveals that major maintenance is required but not required immediately, the City typically implements a rehabilitation and renewal plan.

Unplanned Operations and Maintenance

Our major maintenance needs are identified through a number of sources, namely activities prescribed through maintenance of assets. However, unexpected situations may occur which can result in unplanned maintenance activities. If major maintenance costs are significant, a more thorough review process becomes necessary and often involves consultation with various internal functions, such as our Asset Management service area, Facilities, and Building Design and Construction service area to decide if the repair meets the capital budget criteria. Generally, this service area relies on outside contractors for investigation and suggested repairs when the scope of the maintenance is not easily determined.

Despite the fact that, typically, minor maintenance is incorporated into planned operations and maintenance programs, there are cases where it is unplanned.

- reactive work to repair damage by weather or vandalism
- reactive work due to emergencies, including flooding, heavy snow load, windstorms etc.
- reactive repairs due to building component failures including roof repairs, basement leaks, pool slab failures, etc.
- reactive repairs for pot / sink holes or damage due to drainage issues for parking lots.

E.4.3 Rehabilitation and Renewal Plan

We employ a defined asset renewal process, as shown in Figure 14 of the main body, using consultation among many internal functions. The rehabilitation and renewal process begins with a needs assessment, using current building condition assessment data, followed by a review of the operational impacts of a potential investment. If the need for rehabilitation or renewal is significant enough, the item moves to a more detailed level of scope and budget definition, financial forecasting, and then Council approval. In cases, for rehabilitating a recreation & culture asset, where a significant number of people are impacted, public consultation is necessary to make sure that our decisions align with the expectations and needs of the people we serve. Most renewal projects require construction and project management, particularly as the projects increase in scale. Following the renewal, commissioning and inspection activities are performed to ensure that our personnel have the understanding of the materials and processes recommended by the suppliers to maintain the asset at a cost-effective, and optimal level.

E.4.4 Disposal Plan

In some cases, disposing of an asset is more appropriate than replacing or renewing it. Given the growth of our population, the current needs and demands for a recreation & culture asset are likely to change as a result of changes with facility use reviews, demographic changes, programming interests, population growth, sport trends and new sport development, and changes in immigration populations. Additionally, as assets reach the end of their useful life, there is rationale for disposing of an asset. Both of these reasons may result in the need for disposing of an asset as it no longer can deliver the expected level of service required by our communities. That said, we make every effort to repurpose our buildings that are no longer able to deliver on a service but may be appropriate for another use. An example of this was the conversion of an 1885 National Historic Post Office in Galt to a digital library. The repurposing of buildings is not always feasible and so, in the situations where it is necessary to dispose of our Recreation & Culture assets, our Facilities, Building Design and Construction, Realty service area and Operations service area coordinates with contractors to ensure safe removal and environmental sustainability compliance.

Decommissioning our recreation & culture assets is moderately common to address aging facilities in order to provide operational efficiencies and reduce capital improvement costs; however, typically are not part of their own project. Therefore, any disposal costs associated with these assets are typically included with a capital project for renewal or creation.

E.5.0 Financial Strategy

E.5.1 Asset Investment Needs

Our investment needs are identified through a range of mandated and industry leading planning processes supported by detailed analysis to ensure we identify our needs for investment to maintain service delivery, meet future demand growth and achieve our strategic objectives. The needs identified through these various planning processes are then prioritized through a Capital Project Prioritization Model, which evaluates projects using nine criteria to determine the most important needs and initiatives to be funded.

The following sections describes our capital and operational investment needs to maintain existing infrastructure and associated service delivery along with the requirements for additional infrastructure to meet the growing needs and demands of our communities. We also highlight the Capital Investment Plan that was approved by the City for 2020-2029 and the current funding gap that exists for us to meet our target needs.

Capital Renewal

The City has undertaken a comprehensive analysis to determine the capital needs of its recreation & culture assets to deliver the services expected by its communities and stakeholders. We have adopted an industry leading approach to identification of capital renewal needs for our non-core asset areas based on their condition and remaining useful life and ability to maintain service delivery. The resulting analysis for recreation & culture assets demonstrates that the City has a capital renewal need of $27.1 million as shown in Figure 53.

Key capital renewal recreation & culture projects are outlined in more detail in Table 45.

Figure 53: Renewal Needs ($'000s)

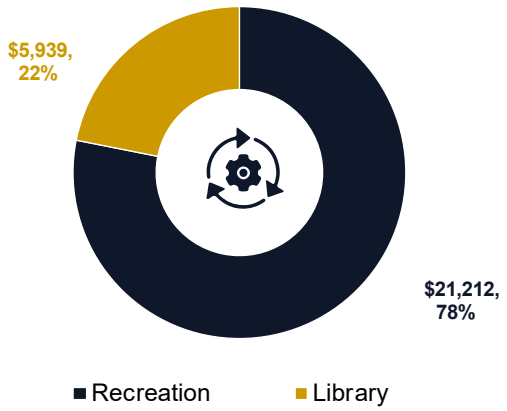


Table 45: Capital Renewal Projects

Capital Renewal Project	Year	Project Description
Market Building Renovations	2020	Improvements to floor, walls, dishwashing sinks, coun-ter tops and washroom on the main floor of the building to keep the facility in compliance of Ontario Food Premise regulations, as well as, address some of the structural deficiencies identified through building condi-tion assessment.
DDC & Arts Centre - Roof	2020	As per IRC report from March 27, 2019, this project is based on lifecycle analysis of safety, service deteriora-tion and life expectancy of roof components and mate-rials. (Heritage restoration of east facade as per pre-pared specs and drawings done by the professional heritage consultant has started in 2019)
Decommisioning of John Dolson pool and Karl Homuth arena	2023-2024	John Dolson Centre and St Ambrose School to be de-commissioned once the Recreation Complex is opera-tional. Karl Homuth Arena will be decommissioned once the expansion to the Preston Memorial Auditori-um is complete.
Newland Pool	2024	To replace existing liner in the main pool and diving well, remove and replace the entire deck surface, re-move and replace the pool lines and the returns and inlets to the pool.
Indoor Pool Infrastructure - W.G. Johnson Pool	2027	To replace infrastructure in this indoor pool. This in-cludes but is not limited to pumps, heat exchanger, fil-ter room components, electrical panels, boilers, HVAC distribution piping and valves, domestic water boilers, hot water storage tanks, hot water circulation pumps, windows, doors, flooring etc.
Energy Management – (Dickson/MacIntosh Arenas, Market Building, Hespeler Arena, and other Heritage buildings	2020, 2027 - 2028	These projects represents the Corporate Greenhouse Gas and Energy Conservation and Demand Manage-ment Plan for the City of Cambridge which has been developed to meet the reporting requirements for O. Reg. 397/11 (the Ontario Green Energy Act (GEA)) and the voluntary Partners for Climate Protection (PCP) Program in which the City is actively participat-ing. Upgrades will include unitheaters, thermostats, hot water tanks, windows, geothermal and cogeneration at Hespeler Arena, re-lamping the rink floor at Dickson and MacIntosh arenas to LED and a lighting upgrade and controls, occupancy sensors, thermostats, water fixtures, exhaust fans, heating and cooling systems, insulation, storm windows, weatherstripping and the winterization of various heritage designated buildings.
Heritage Buildings Design and Renovations –Ferguson Homestead , Market Building and Hespeler Town Centre	2022-2027	These projects represents the Corporate Greenhouse Gas and Energy Conservation and Demand Manage-ment Plan for the City of Cambridge which has been developed to meet the reporting requirements for O. Reg. 397/11 (the Ontario Green Energy Act (GEA)) and the voluntary Partners for Climate Protection (PCP) Program in which the City is actively participat-ing. Upgrades will include unitheaters, thermostats, hot water tanks, windows, geothermal and cogeneration at Hespeler Arena, re-lamping the rink floor at Dickson and MacIntosh arenas to LED and a lighting upgrade and controls, occupancy sensors, thermostats, water fixtures, exhaust fans, heating and cooling systems, insulation, storm windows, weatherstripping and the winterization of various heritage designated buildings.

Growth Needs

In addition to targeting and prioritizing the investment needed to maintain existing assets, there are also planning processes in place to determine the additional assets needed to meet growing demand for service through population increases or demand for new services. The projects targeted to meet growth are funded primarily through Development Charges – the mechanism that enables recovery of growth-related capital expenditures from new development. These charges are governed by the Development Charges Act and are applied in accordance with our Development Charges By-Law. Any additional growth needs gaps are typically funded through other municipal financing sources. The process for creation and acquisition of assets for growth is described in the Creation/Acquisition section of the Asset Lifecycle Management Strategy.

Specifically, for recreation & culture assets, the City has identified a number of growth related projects including a new recreation facility and complex that includes a 25-metre swimming pool, gymnasiums, fitness track and multi-purpose rooms (endorsed by City Council on June 18, 2019); a new community centre space in North Cambridge; and a new library for the southeast Galt area. In Table 46, we have outlined these growth projects in more detail.

As identified through the 2024 Indoor Recreational Facility Needs Assessment Report, existing aging facilities may require decommissioning as a new larger facility with modern amenities is being built. John Dolson Centre pool will also be decommissioned as a new recreation complex is being built near the existing pool. It is also recognized that a twin pad arena provides operational efficiency compared to a single pad arena. Cambridge currently operates one twin pad arena and 5 single pad arenas. The Preston Memorial single pad arena will be expanded to a twin pad arena, while the Karl Homuth Arena located across the street will be decommissioned. The City is also working with the Cambridge Sports Park operator to expand the existing twin pad arena to a four pad facility on City owned land. This will also provide an option to build a new twin pad arena followed by the decommissioning of two existing aging single pad arenas.

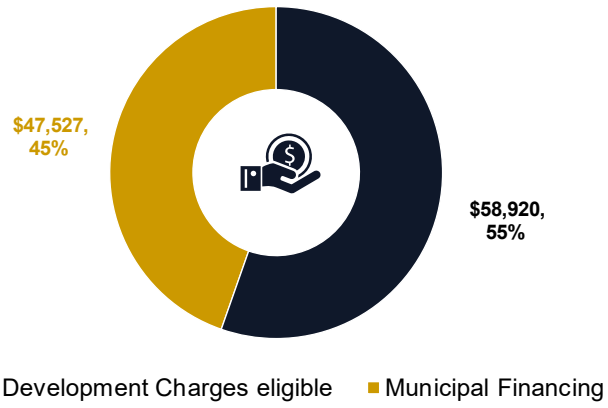
While the growth projects will be indicated in Table 46 of this section, the associated capital decommissioning projects are included in Table 45 of the previous section.

Table 46: Growth Projects

Growth Project	Year	Project Description
Preston Auditorium – Design	2020	Design of Preston Memorial Auditorium expansion. Preston Memorial Auditorium to be expanded to a twin ice pad facility.
Recreation Complex – Design	2020	Detailed design of recreation complex. To include triple gymnasium, 10 lane 25 m pool, multipurpose room and fitness track along with other amenities.
Recreation Complex – Construc-tion	2021	This project is to establish a large multi-purpose sport and recreation complex consisting of a triple gymnasium, a ten lane 25m pool, a leisure pool and a therapy pool, a fitness track and program rooms.
Preston Auditorium Expansion – Construction	2022	Construction of improvements and an expansion to the Preston Memorial Arena as part of the Recreation Complex Program.
Library in Southeast Galt Design	2022	Design fees for a new branch in Southeast Galt.
Library in Southeast Galt Construction	2024	Construction of a new library branch in Southeast Galt.

These key projects, in addition to other recreation & culture projects, result in a capital investment need of $106.5 million, of which, $58.9 million are Development Charges eligible and $47.5 million require municipal financing as shown in Figure 54. The projects targeted for growth in the next 10 year period are expected to require an estimated increase in operations and maintenance costs of $5.8 million.

Figure 54: Growth Needs ($'000s)

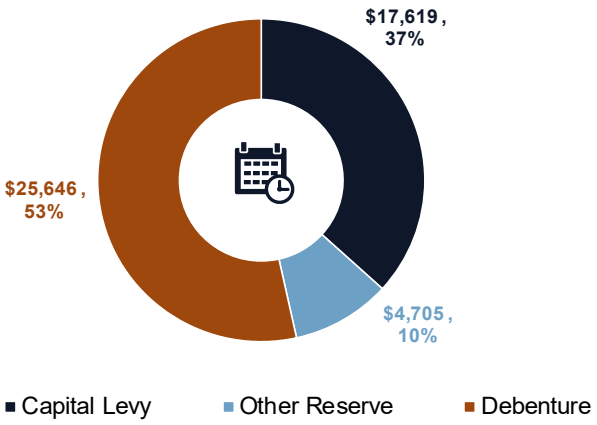


Capital Investment Plan 2020-2029

Our Capital Investment Plan 2020-2029 presents the capital investment proposed to sustain our current services for the next 10 years along with projects designed to meet our projected growth requirements.

Figure 55 outlines funding from capital levy, other reserves, and debentures allocated through the 2020-2029 Capital Investment Plan.

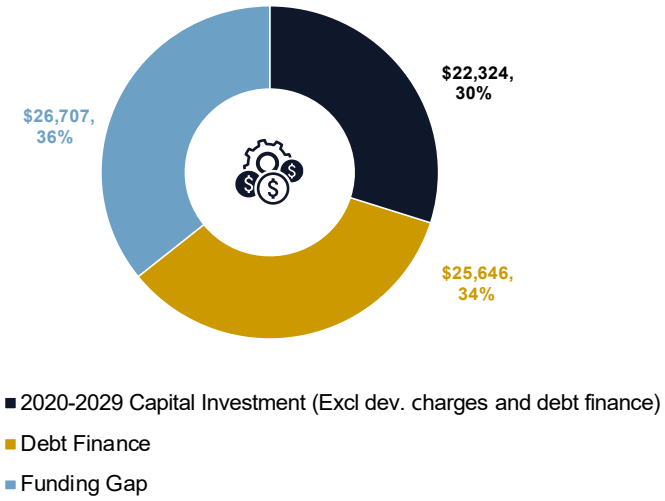
Figure 55: 2020-2029 Capital Investment Plan ($47,971 thousand)



Current Funding Gap Assessment

Despite the various funding sources available to Cambridge (excluding Development Charges), we recognize that our City's identified investment needs for renewal of existing infrastructure and build new infrastructure to support future community needs remains insufficient to maintain current indoor recreation facilities in good state of repairs. With a view of our 10 year proposed plan, after allocating $25.6 million in debt financing, the remaining funding gap that exists in order to meet our target needs. Figure 56 highlights that the expected funding gap within the next 10 years is $26.7 million.

Figure 56: Current Funding Gap Assessment ($'000s)



Therefore, based on the analysis presented above and the City's proposed Capital Investment Plan, Table 47 presents the journey to calculate our funding gap.

Table 47: Funding Gap Analysis

Funding Gap Analysis	$ millions
Existing Infrastructure – Renewal Needs	$27.1
Growth Needs - Municipal Financing	$47.5
Total Financial Needs	**$74.6**
2020-2029 Capital Investment Plan (Excluding Development Charges and debentures)	($22.3)
Debentures	($25.6)
Total Funding Gap	**$26.7**

E.5.2 Funding Strategies

To support our recreation & culture assets that provide services within the City, we require sufficient funding in order to maintain the assets in a state of good repair, as well as to create new assets as required. Our current strategies and revenue sources are allocated based on our prioritization model discussed in the Investment Needs section. This model considers the currently available funding sources for recreation & culture assets in order to deliver our current investment plan effectively:

- Reserve Funds: We have established reserve funds to provide stability to tax rates in the event of unforeseen economic events, to provide funding for one-time requirements, to make provisions for the acquisition and replacement of infrastructure, and to provide flexibility to manage debt levels.
- Capital Works Reserve Fund: Through property tax collection, we are able to provide annual contribution to this reserve fund that supports infrastructure renewal needs for recreation facilities.

Additionally, we continually assess opportunities for additional funding options and revenue streams to address our funding gaps. The following are options that have been used by other municipalities towards addressing their infrastructure gaps and we continue to review for implementation at City of Cambridge.

- Public-Private Partnerships – A public-private partnership is a cooperative arrangement between the public and private sector. Under this model, we could work with a third party to have them expand privately-owned infrastructure that would supply certain municipal services which otherwise the City would have to provide. Such a partnership could reduce the City's capital needs, and we continue to assess the feasibility of this option in the Recreation growth area.
- Sponsorship Strategy – A policy that would outline the City's approach to accepting sponsorship for facilities and assets, as it would outline what the funds generated would be used for (i.e. the sustainability of those facilities).
- Grants – Outside of the City's control, there are periodically additional funding opportunities provided by the provincial and federal governments towards certain infrastructure projects. These funding sources typically outline specific conditions and requirements that must be demonstrated in order to secure and maintain the funding. In many cases, these conditions require applicants to demonstrate capabilities in effective planning and financial management.
- Capital Levy – A special levy to provide a certain percentage of a tax rate increase annually devoted to asset sustainability.
- Reserve Contribution – Opportunities to allow a certain percentage of assessment growth to be contributed to reserves for future replacement of assets donated through new subdivisions.
- User Rates & Fees – Opportunities to assess costs of providing City services to ensure that user fees include the lifecycle costing of assets and reflect full recovery of all costs.
- Debt Financing – As the City issues debt over the period of the capital forecast, it is projected that the City will reach its debt capacity limit of 10% for the tax-supported operating fund. Opportunities to increase the debt financing limit and take on more debt financing that already projected could help to lower the gap.

E.6.0 Stakeholder Engagement

E.6.1 Users of the Service

Our valued communities, residents and families are the primary users of our recreation & culture services through programs and services at our arenas and pools. Residents of the City are able to access these assets through programming or for free (e.g. free swim). Transient users from neighbouring communities also use our recreation & culture assets as our facilities are used for hockey tournaments or summer camps.

While recreation & culture asset usage is predominately residential-based, there is some use of the facilities by non-residential users passing through the City as visitors through sport tourism or for other educational purposes such as research.

E.6.2 Service Delivery Partners

We rely on partnerships to aid in the delivery of services, and improvements to our assets to ensure the impact of our work on stakeholders and delivery partners is communicated to avoid risks and adverse impacts.

Service delivery partners include, but are not limited to, the following:

- Within recreation & culture services, it is particularly important that we work with our external contractors in delivery of our renewal programs, as well as with utility providers to minimize disruption and coordinate efforts for maximizing efficiency.
- The Chaplin Family YMCA has an arrangement to provide indoor aquatic services, and gymnasium services.
- The Cambridge Youth Soccer has an arrangement to deliver youth soccer through a 15-year lease agreement.
- Neighbourhood associations that we partner with in order to operate our facilities.

We maintain close relationships with both our internal and external partners and maintain processes to engage with each of our service delivery partners as required.

E.6.3 Public and Private Infrastructure Owning Bodies

The Region of Waterloo and our other local government partners are the most significant public infrastructure owning bodies with assets integrated into our recreation & culture assets given its commitment to Regional Planning. As such, we maintain formal processes for working with the Region to approve our official plan, as well as to ensure alignment with the Region's Official Plan.

We also work closely with other cities within the Region of Waterloo, such as the City of Waterloo. Recently, we were involved in discussions with the City of Waterloo with regard to community identity, service delivery, and program funding as part of the development of our Arts and Culture Master Plan.

Appendix F

Asset Management Plan – Resource Management

F.1.1 Introduction

The City maintains a portfolio of assets that support and enable all of the services that we, and our partners, provide for the benefit of residents. These assets are categorized into three asset types, outlined in the table below.

Table 48: Resource Management Assets

Service Area:	**Resource Management**		
Asset Class:	**Corporate Facilities**	**Fleet and Equipment**	**Information and Communication Technology Infrastructure**
Asset Type:	» Corporate Facilities » Leased Buildings	» Fleet and Equipment	» IT Infrastructure

This collection of assets is critical to the City as it is what makes us operational.

- It is within the corporate facilities that our service area plans, organizes, and works to achieve our purpose and vision.
- Our leased buildings to others are what enable our partners to work alongside us to provide residents with the services they desire.
- Our fleet and equipment are what enable municipal employees to move around to inspect and maintain our assets.
- Information and communication technologies are what drive efficiency through greater insight into asset performance, effective communication, and data storage and analysis.

If it were not for these assets, we would not be able to provide the services that we do today; nor would we be able to achieve our vision for the future.

This appendix outlines our plan to manage our portfolio of assets relating to resource management over the next 20 years, demonstrating our commitment to meeting the LoS valued by our residents, as efficiently as possible.

F.1.2 Scope

This section identifies the requirements for each Phase of O.Reg.588/17 applicable to the assets within this service area. Our compliance with these requirements for the asset classes within this service area is presented in Table 49 to highlight areas of future development in advance of regulation phases. The following sections of this appendix will present the further detailed information to meet the requirements for each section of the regulation.

Table 6 of the main body of our AMP provides a summary of compliance for all service areas along with our plans for continuous improvement to meet the remaining requirements in advance of the future regulatory phases.

While the regulation requires full compliance of all non-core areas in the AMP by 2024, the City has included its non-core assets within this AMP to demonstrate its commitment and advancing efforts in effective planning for all of the essential services provided by the City and its associated assets.

Table 49: Compliance with O.Reg.588/17

Non-Core Assets		Phase 2 – July 1, 2023						Phase 3 – July 1, 2024						
Service Area	Asset Class	Asset Inventory	Weighted average	Replacement Value	Average age	Current Levels of Service	Costs to maintain LoS	Proposed Levels of Service	Creation/ Acquisition Plan	Operations and Maintenance Plan	Rehab and Renewal Plan	Disposal Plan	Investment Needs	Funding Strategies
Resource Management	Corporate Facilities	●	●	●	○	○	○	◑	●	●	●	●	●	●
	Fleet & Equipment	●	●	●	○	○	○	◑	●	●	●	●	●	●
	Information and Communication Technology Infrastructure	●	●	●	○	○	○	◑	●	●	●	●	●	●

● Compliant ◑ Partially compliant ○ Not compliant

Note: Phase 1 not reflected as only Phase 2 and 3 are applicable to non-core assets

Table 49 demonstrates that our assets within the resource management service area are fully compliant with most regulation requirements for Phase 2 well in advance of the 2023 requirements for non-core assets. We will report current LoS for non-core assets along with associated costs to maintain the current LoS in advance of Phase 2 in 2023.

In addition we have achieved most of the requirements for Phase 3 with the exception of proposed LoS. We have undertaken an extensive exercise engaging multiple stakeholders to develop a LoS framework that identifies proposed LoS for all service as described in the LoS section of the main body and within Section F.3.2. of this appendix. We will continue to develop these identified proposed measures in consultation with stakeholders for reporting in advance of the 2024 milestone.

F.1.3 Strategic Connections

The strategic and master plans summarized in this section are all related to the resource management assets and have been considered while developing this AMP.

Table 50: Strategic Documents

Strategic Document	Linkage(s) to the AMP
Current Documents	
2016-2019 Strategic Plan (2016)	The Strategic Plan sets the stage for decision-making, prioritization, and ongoing performance management. Many of Cambridge's residents, employers, and visitors took time to share their ideas and contribute to the plan's development, identifying the positive aspects of Cambridge, as well as aspects they would like to see improve. The Strategic Plan set a goal to make Cambridge "a place for people to prosper" – alive with opportunity, and the infrastructure that enables our people to thrive is a significant contributing factor to this initiative. This AMP shares a connection to the Strategic Plan in its direction and objectives, relating to decision-making, prioritization, and performance management, ultimately enabling us to continue making Cambridge "a place for people to prosper". This Strategic Plan was used to guide the City in developing its LoS Framework for resource management assets in this AMP. The City is currently in the process of revising the Strategic Plan.
Development Charges Background Study (2019)	A by-law that imposes certain Development Charges in the Corporation of the City of Cambridge pursuant to the Development Charges Act, S.O., 1997, c. 27, as amended. The growth plans and infrastructure investment proposed within the AMP must consider whether development charges will be incurred pursuant to the City's bylaws. In accordance with the By-Law, Cambridge has developed a Development Charges Background Study. The Development Charges Background Study is essential to this AMP as it supports the City in identifying its funding gap included in the Financial Strategy.
Corporate Technology Strategic Plan (2014)	Technology is central to our ability to deliver a high LoS. For instance, we use a variety of technological solutions to collect taxes, manage traffic, distribute water, and manage recreation program registrations. The Corporate Technology Strategic Plan was developed to help us take advantage of advancements in technology to improve the efficiencies of our services. As it relates to our resource management assets, this strategic plan focuses on areas such as providing education and improving awareness of technology at the management level; adopting approaches and governance frameworks to coordinate and prioritize information technology (IT) resources, increasing funding and staff, and shifting IT staff to focus on main business platforms and applications.

Strategic Document	Linkage(s) to the AMP
In Development	
Facilities Master Plan	The Facilities Master Plan project is intended to develop a comprehensive Master Plan that will provide recommendations and guidelines for enhancing existing workshops and maintenance buildings that service the public works and parks, recreation & culture operations service areas and will forecast any future facilities development of these facilities for the next 10 to 15 years. The Master Plan will focus on assessing the existing condition of PW and PRC facilities, defining facilities needs to support and im-prove operations and developing long-range facilities management functions.
Centralized Facilities Management Strategy	The Centralized Facilities Management Strategy will review the current operational and maintenance practices throughout facilities buildings within the Corporate portfolio in order to develop a corporate facilities manage-ment function responsible for managing all City facilities. This will include building operations, preventative/regular maintenance and coordination of capital projects. This project will specifically focus on defining current ser-vice/contractor rosters and service agreements for the purposes of streamlining standardized processes for operations and maintenance and centralizing current operations and maintenance activities from individual service areas to a centralized facilities management model.

F.2.0 State of Infrastructure

Resource Management Overview

Our resource management assets are central to our ability to provide municipal services. While not as prominent as our core assets, we would not be able to inspect, manage, maintain, plan, and communicate without these.

We recognize that the efficiency and value we can derive from our resource management assets extends into all other portfolios, which is what makes them particularly important.

Replacement Value ('000s)

$169,028

Total replacement value of all assets within the resource management asset class

Condition

Good

Weighted average condition rating of resource management assets across all subclasses

Asset Class

Three

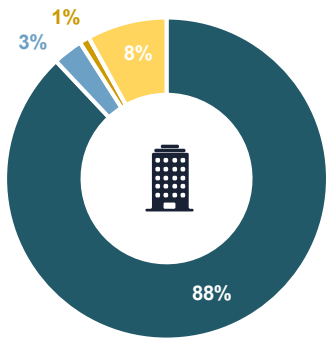
Distinct asset types that we manage as part of our resource management portfolio

Asset Types

Corporate Facilities

- 3 corporate facilities
- 11 operations facilities
- 6 parking lots
- 35 maintenance and storage facilities
- 3 corporate leased facilities

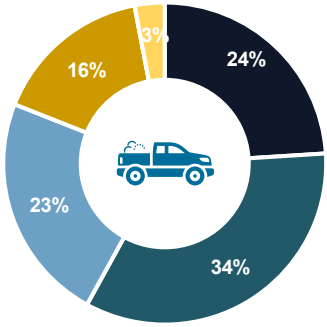
Corporate Facilities Condition*



Fleet and Equipment

- 280 fleet and equipment

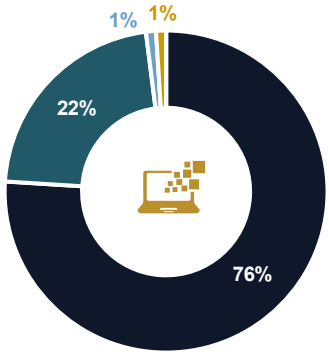
Fleet and Equipment Condition*



Information and Communication Technology Infrastructure

- IT infrastructure

Information and Communication Technology Infrastructure Condition*



Very Good | Good | Fair | Poor | Very Poor | Unknown

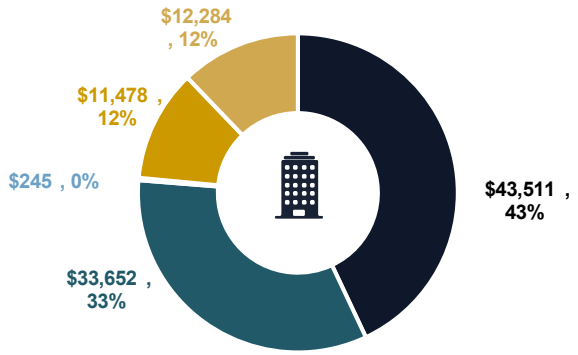
*Condition based on replacement value

Replacement Value ('000s)
$101,170

Weighted Avg. Condition Rating
Good

Average Age
N.A.

Corporate Facilities

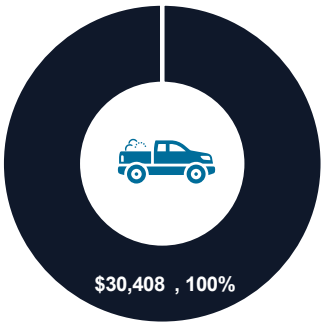


Replacement Value ('000s)
$30,408

Weighted Avg. Condition Rating
Good

Average Age
N.A.

Fleet and Equipment

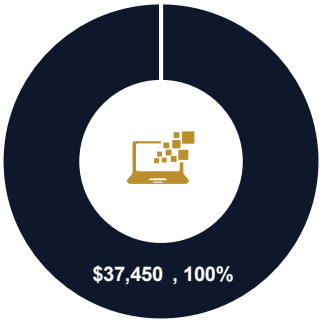


Replacement Value ('000s)
$37,450

Weighted Avg. Condition Rating
Very Good

Average Age
N.A.

Information and Communication Technology Infrastructure

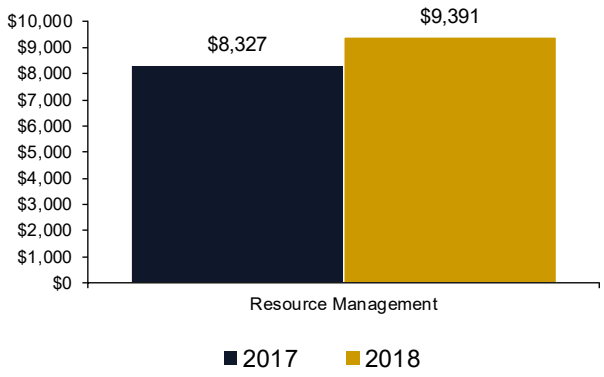


F.3.0 Levels of Service

F.3.1 Current Levels of Service

Since resource management assets are classified as non-core asset under O.Reg.588/17, we are not required to report any current LoS part of this AMP, however, we are in the process of measuring these current LoS to meet the requirements for Phase 2. Despite that we are not including current LoS as part of this AMP, we are able to demonstrate the costs associated with delivering resource management related services. In 2017 and 2018 respectively, we spent $8.3 million and $9.4 million in total operations related costs as shown in Figure 57.

Figure 57: Operating Costs Annual Comparison ($'000s)



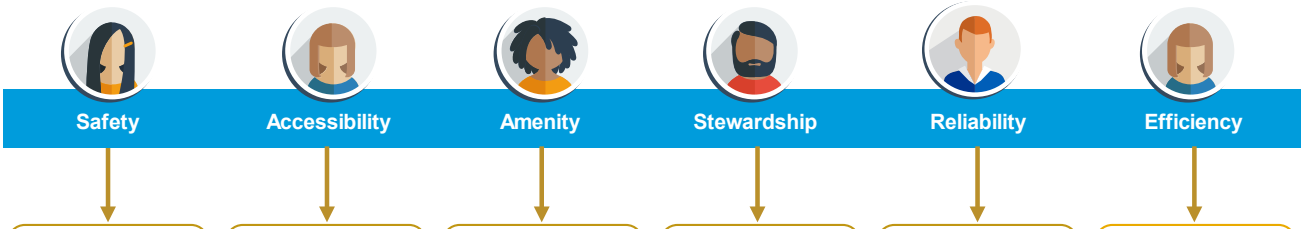
F.3.2 Proposed Levels of Service

We have recently undertaken an exercise to develop a LoS framework that fully aligns our strategic objectives with LoS expected by customers and technical metrics to determine whether our assets are achieving those expectations. Our intention is to use this framework going forward to position all reported metrics within this framework to demonstrate achievement of our outcomes and community needs.

While the proposed LoS we developed as part of the exercise are not required for reporting by the Regulation until 2024, we have developed proposed measures for review and consultation as part of the exercise to develop a LoS framework for all assets across our portfolio.

The starting point for this exercise was identification of our community priorities aligned to our strategic outcomes. The definitions for these priorities are provided in the main body and are referenced in the interpretation sections in the graphic below. We further this concept within each asset area by identifying the unique concerns of the community with regard to the resource management asset. In the case of resource management assets, we have identified the concerns and priorities of our stakeholders in the "My Experience" headings below from stakeholder feedback through everyday operational responses and dedicated feedback channels.

With the identification of stakeholder informed resource management priorities, we have developed a series of technical measures designed to monitor performance of these priority community LoS. These preliminary metrics will be tested internally to determine reporting requirements and undergo external consultation ahead of publishing in future updates of the AMP.



Safety

Interpretation

Live, work and play without (unreasonable) fear of injury, sickness, or harm.

My experience

The facilities across the City are safe to use.

The City applies due diligence in managing its fleet and ensuring employee safety and follows regulations of MTO.

Daily circle checks are performed every day and reported to a supervisor.

Accessibility

Interpretation

Unobstructed access to municipally controlled amenities and services.

My experience

The corporate facilities across the City are accessible to all of its employees.

There are similar standards of facility quality across service areas.

The City's vehicles should be available to support my function or service.

Amenity

Interpretation

Variety of amenities available to suit any lifestyle and personal circumstance.

My experience

The overall corporate facilities have sufficient specialized work spaces to support service delivery.

The overall City fleet has sufficient vehicles to support service delivery.

Amenities that are specific to my role should be available for use in a vehicle.

Stewardship

Interpretation

Municipal services foster preservation of the environment, heritage, and quality of life.

My experience

The City is managing its corporate facilities in a way that minimizes its impact on the environment, for example by reducing building related GHG emissions.

Reliability

Interpretation

Core municipal services can be counted upon when needed.

My experience

Corporate facilities are in a good state of repair.

Equipment and vehicles are in a good state when it is my turn to use them and are inspected on an ongoing basis.

Efficiency

Interpretation

Value is demonstrated for every municipal dollar spent.

My experience

The corporate facilities department is responsive to my customer service requests and interactions with staff are positive.

The City has a strategy that provides the most efficient use of dollars spent to address concerns about its fleet.

The City has a strategy that provides the most efficient use of dollars spent to address concerns about its corporate facilities.

The fleet department is responsive to my customer service requests and interactions with staff are positive.

F.4.0 Asset Lifecycle Management Strategy

F.4.1 Creation / Acquisition Plan

Master planning documentation supports the City in identifying the objectives around the specific asset services that are necessary to meet the needs and growth of Cambridge. To identify the objectives and needs for our services, we have developed master planning documents, including:

- Corporate Technology Strategic Plan is central to our ability to deliver services across the City since technology is used throughout the City. These strategic plans help us to determine where we need more resource management assets to deliver against our plans.
- Facilities Master Plan is intended to develop a comprehensive Master Plan that will provide recommendations and guidelines for enhancing existing workshops and maintenance buildings that service the Public Works (PW) and Parks, Recreation and Culture (PRC) operations service areas and will forecast any future facilities development of these facilities for the next 10 to 15 years..

These plans are starting to be leveraged to support the City in identifying the need required to execute on these goals, which may be accomplished through acquisition and/or creation.

The Development Charges Study Report from 2019 outlines resource management assets that need to be created or acquired by the City in order for support services provided by other areas such as transportation and outdoor recreation to meet expectations. These additional assets include facilities, major equipment and fleet.

We also recognize that we are a part of the Ontario Government's Growth Plan for the Greater Golden Horseshoe. This Plan is an initiative to plan for growth and development of resource management assets in a way that supports economic prosperity, protects the environment and helps communities achieve a high quality of life. Documents such as these help the City to develop the creation and acquisition plans as we need to take these priorities and plans into consideration.

F.4.2 Operations and Maintenance Plan

This stage of the asset lifecycle generates significant costs over time; therefore, we are starting to consider and implement practices that enhance value through cost reduction and investment optimization, such as work management systems. A successful operations and maintenance plan ensures that our resource management assets are operating at a high-level in order to support the City in delivering on its service commitments to other service areas and/or the general public they serve.

Condition Assessment and Inspection

Based on the standard Condition Assessment Process, as shown in Figure 13 of the main body, maintenance of resource management assets begins with condition inspections over regular intervals. Regular condition assessments and maintenance will minimize the risk of defects that could result in risks or higher costs over the long term. This practice of early identification, through visual inspection and quantitative assessment, allows for overall higher LoS and extended asset lifespans, as the outputs from the condition assessments are used in planning.

Asset classes each have varying condition assessment and inspection procedures. Below we have outlined some of the condition assessment and inspection procedures that are followed within the City for resource management assets:

- Regular, formalized building condition assessment for all major city facilities,
- Daily inspections for fleet assets and annual commercial vehicle safety inspections as required by the Ministry of Transportation.

If a defect is uncovered during inspection, the next step is determining whether the defect will require minor or major maintenance.

Planned Operations and Maintenance

Typically, in the case of minor maintenance, it is incorporated into planned operations and maintenance programs in order to make repairs based on condition assessments and to extend the assets useful service life. Minor maintenance prescribes a work order for fleet assets that are distributed to Operations staff and contractors for repair, followed by a work inspection to ensure completeness, and payment once complete. The City is working towards implementing a work management system for corporate facilities assets.

Planned operations and maintenance is required for most fleet and equipment, which is derived based on the number of kilometres driven or hours used. Maintenance also includes the seasonal conversion of vehicles and/or attachments such as snow plowing attachments to trucks.

For corporate facilities, planned maintenance activities includes caulking around the doors, windows, snow clearing off steps, debris pick-up, grass cutting, changing lights, planned minor interior repair or renovation to existing dwelling etc.

If an inspection reveals that major maintenance is required but not required immediately, the City typically implements a rehabilitation and renewal plan.

Unplanned Operations and Maintenance

Our major maintenance needs are identified through a number of sources, namely activities prescribed through maintenance of assets. However, unexpected situations may occur which can result in unplanned maintenance activities. If major maintenance costs are significant, a more thorough review process becomes necessary and often involves consultation with various internal functions, such as our Asset Management service area, as well as our Fleet, Facilities and Building Design & Construction service areas to decide if the repair meets the capital budget criteria. Generally, this service area relies on external contractors for investigation and suggested repairs when the scope of the maintenance is not easily determined.

Despite the fact that, typically, minor maintenance is incorporated into planned operations and maintenance programs, there are cases where it is unplanned. In these cases, the practice is to determine whether there is room in the operational budget. If so, reactive repairs are made.

Unplanned maintenance for fleet assets include repairs of vehicle or equipment breakdowns or repair of minor accidental damage.

Currently, the unplanned operations and maintenance for corporate facilities typically involves reactive work to repair damage by weather, and vandalism.

F.4.3 Rehabilitation and Renewal Plan

We employ a defined asset renewal process, as shown in Figure 14 of the main body, using consultation among many internal functions. The rehabilitation and renewal process begins with a needs assessment on an annual basis, followed by a review of the operational impacts of a potential investment. If the need for rehabilitation or renewal is significant enough, the item moves to a more detailed level of scope and budget definition, financial forecasting, and then Council approval. Most corporate facility projects require construction and project management, particularly as the projects increase in scale.

F.4.4 Disposal Plan

In some cases, disposing of an asset is more appropriate than replacing or renewing it. In other cases, assets may be repurposed or re-used, if possible.

Resource Management corporate facility assets are unique, in that, these assets, can be the recipient of the facilities or assets that are diverted or re-used from other service areas. Given the growth of the City, these repurposed assets can be leveraged quite effectively in order to keep the City operational.

However, in the situations where it is necessary to dispose a facility, our Facilities service area coordinates with contractors to ensure safe removal and environmental sustainability compliance.

Our fleet assets are typically not rebuilt or refurbished to extend their useful life; however, they are disposed through auction so that the assets can be leveraged for alternate uses or for spare parts.

F.5.0 Financial Strategy

F.5.1 Asset Investment Needs

Our investment needs are identified through a range of mandated and industry leading planning processes supported by detailed analysis to ensure we identify our needs for investment to maintain service delivery, meet future demand growth and achieve our strategic objectives. The needs identified through these various planning processes are then prioritized through a Capital Project Prioritization Model, which evaluates projects using nine criteria to determine the most important needs and initiatives to be funded.

The following sections describes our capital and operational investment needs to maintain existing infrastructure and associated service delivery along with the requirements for additional infrastructure to meet the growing needs and demands of our communities. We also highlight the Capital Investment Plan that was approved by the City for 2020-2029 and the current funding gap that exists for us to meet our target needs.

Capital Renewal

The City has undertaken a comprehensive analysis to determine the capital needs of its resource management assets to deliver the services expected by its communities and stakeholders. We have adopted an industry leading approach to identification of capital renewal needs for our non-core asset areas based on their condition and remaining useful life and ability to maintain service delivery. The resulting analysis for resource management assets demonstrates that the City has a capital renewal need of $51.6 million as shown in Figure 58.

A key capital renewal resource management project are outlined in more detail in Table 51.

Figure 58: Renewal Needs ($'000s)

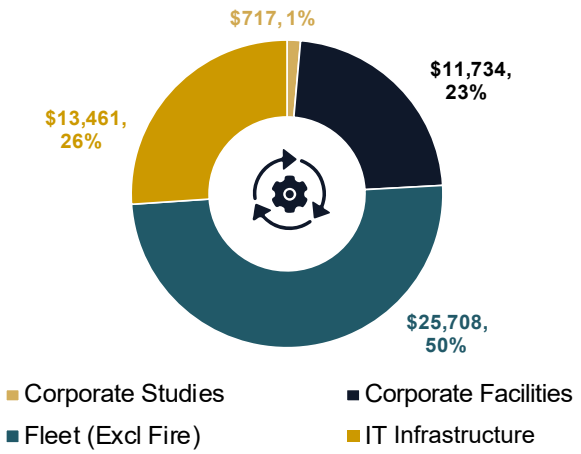


Table 51: Capital Renewal Projects

Capital Renewal Project	Year	Project Description
Bishop Operations Centre – Energy Management	2021	This project represents the Corporate Greenhouse Gas and Energy Conservation and Demand Management Plan in order to meet the reporting requirements for O. Reg. 507/18 of the Electricity Act. Installation of a Building Automation System and replace lighting to LED throughout facility where required.
City Hall Renovations	2024	This project includes replacing ceiling panels, floor finishes, meeting room furnishings, moveable walls. Creating accessible entrance & ramp, rejuvenating of exterior landscapes/ hardscapes. Replacing green wall & duct work changes. Repainting interior & elevator cab retrofit. Replacing gates at public counters.
Fleet Replacement	2028	In general the expected life for fleet vehicles is 10 to 14 years. It is the expectation that most of our current fleet vehicles will need to be replaced in the next 10 years.

Growth Needs

In addition to targeting and prioritizing the investment needed to maintain existing assets, there are also planning processes in place to determine the additional assets needed to meet growing demand for service through population increases or demand for new services. The projects targeted to meet growth are funded primarily through Development Charges – the mechanism that enables recovery of growth-related capital expenditures from new development. These charges are governed by the Development Charges Act and are applied in accordance with our Development Charges By-Law. Any additional growth needs gaps are typically funded through other municipal financing sources. The process for creation and acquisition of assets for growth is described in the Creation/Acquisition section of the Asset Lifecycle Management Strategy.

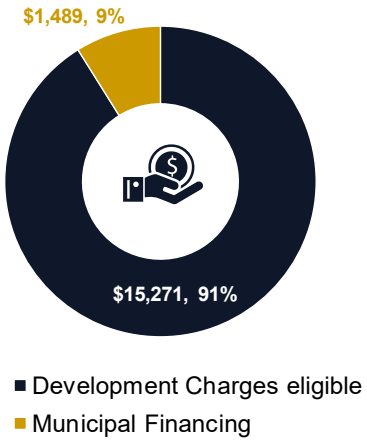
Specifically for resource management assets, the City has identified a number of growth related projects including EV Charging Infrastructure. In Table 52, we have outlined these growth projects in more detail.

Table 52: Growth Projects

Growth Project	Year	Project Description
EV Charging Infrastructure	2020	Installation of electric vehicle charging stations at select facilities and parking lots throughout the city.

These key projects, in addition to other resource management projects (i.e. new fleet equipment to maintain additional roads, sidewalks and parks, operations facilities and various studies and master plans), result in a capital investment need of $16.8 million, of which $1.4 million and are expected to require municipal financing as shown in Figure 59. The projects targeted for growth in the next 10 year period are expected to require an estimated increase in operations and maintenance costs of $1.2 million.

Figure 59: Growth Needs ($'000s)

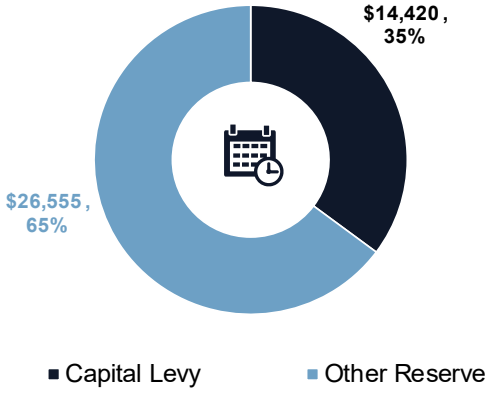


Capital Investment Plan 2020-2029

Our Capital Investment Plan 2020-2029 presents the capital investment proposed to sustain our current services for the next 10 years along with projects designed to meet our projected growth requirements.

Figure 60 outlines funding from capital levy, and other reserves (such as equipment reserve and facility reserves) allocated through 2020-2029 Capital Investment Plan.

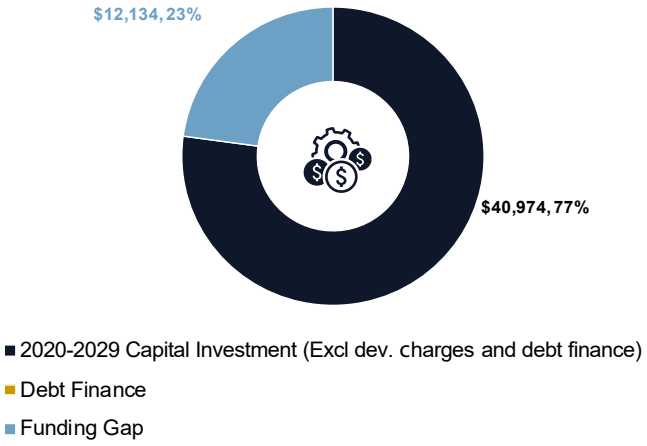
Figure 60: 2020-2029 Capital Investment Plan ($40,974 thousand)



Current Funding Gap Assessment

Despite the various funding sources available to Cambridge (excluding Development Charges and debt financing), we recognize that our City's identified has ambitious goals for renewal and growth, and there remains insufficient funds to meet the identified asset investment needs. With a view of our 10 year proposed plan we are able to identify the funding gap that exists in order to meet our target needs. Figure 61 highlights that the expected funding gap within the next 10 years is $12.1 million.

Figure 61: Current Funding Gap Assessment ($'000s)



Therefore, based on the analysis presented above and the City's proposed Capital Investment Plan, Table 53 presents the journey to calculate our funding gap.

Table 53: Funding Gap Analysis

Funding Gap Analysis	$ millions
Existing Infrastructure – Renewal Needs	$51.6
Growth Needs - Municipal Financing	$1.5
Total Financial Needs	**$53.1**
2020-2029 Capital Investment Plan (Excluding Development Charges and debentures)	($41.0)
Debentures	($0.0)
Total Funding Gap	**$12.1**

F.5.2 Funding Strategies

To support our resource management assets that provide services within the City, we require sufficient funding in order to maintain the assets in a state of good repair, as well as to create new assets as required. Our current strategies and revenue sources are allocated based on our prioritization model discussed in the Investment Needs section. This model considers the currently available funding sources for resource management assets in order to deliver our current investment plan effectively:

- Reserve Funds: We have established reserve funds to provide stability to tax rates in the event of unforeseen economic events, to provide funding for one-time requirements, to make provisions for the acquisition and replacement of infrastructure, and to provide flexibility to manage debt levels. Reserves that are applicable for the resource management assets include:
  - Capital Works Reserve Fund: Through property tax collection, we are able to provide annual contribution to this reserve fund that supports general infrastructure renewal, studies and service improvements needs.
  - Equipment Reserve Fund – funds the replacement of fleet vehicles and equipment
  - Facility Maintenance Reserve Fund – provides long-term, sustainable funding for repairs, replacements, retrofits and renovations of city facilities

Additionally, we continually assess opportunities for additional funding options and revenue streams to address our funding gaps. The following are options that have been used by other municipalities towards addressing their infrastructure gaps and we continue to review for implementation at City of Cambridge.

- Grants – Outside of the City's control, there are periodically additional funding opportunities provided by the provincial and federal governments towards certain infrastructure projects. These funding sources typically outline specific conditions and requirements that must be demonstrated in order to secure and maintain the funding. In many cases, these conditions require applicants to demonstrate capabilities in effective planning and financial management.
- Capital Levy – A special levy to provide a certain percentage of a tax rate increase annually devoted to asset sustainability.
- Reserve Contribution – Opportunities to allow a certain percentage of assessment growth to be contributed to reserves for future replacement of assets donated through new subdivisions.
- User Rates & Fees – Opportunities to assess costs of providing City services to ensure that user fees include the lifecycle costing of assets and reflect full recovery of all costs.

F.6.0 Stakeholder Engagement

F.6.1 Users of the Service

Our City staff are the primary users of our resource management assets. Our staff use these assets to provide support services that allow our City to operate effectively to meet the needs of our communities. Assets such as facilities provide the locations where the City Support services can be provided, equipment allows our staff to perform their roles to enable these key services, and our fleet enables our staff to travel across the City and support city services.

In addition to City staff, our assets are used by the broader Cambridge community as our facilities are the front office where our residents are able to engage with City staff to voice their concerns, submit inquiries, apply for permits and/or learn about programming. These facilities are critical in order for us to continue delivering high-quality services to our communities.

F.6.2 Service Delivery Partners

We rely on partnerships to aid the delivery of service and improvements to our assets and implement appropriate controls and processes to ensure the impact of our work on stakeholders and delivery partners communicated to avoid risks and adverse impacts.

For resource management assets, our relationship with external service delivery partners is extremely important since our corporate facilities need to be accessible to the public during weekdays throughout the year. We work closely with our partners in order to minimize disruption and closures to ensure that our services will continue to be delivered.

We maintain close relationships with these partners and maintain processes to engage with and document interactions with each of service delivery partners as required.

F.6.3 Public and Private Infrastructure Owning Bodies

The Region of Waterloo and our other local government partners are the most significant public infrastructure owning bodies with assets integrated into our ability to deliver resource management services.

Recently, the Region of Waterloo in conjunction with the cities of Waterloo, Kitchener and Cambridge developed a seamless, 24-7 access to a real-time information app called Pingstreet that provides a one-touch access to helpful information and services that allows users to interact with the cities and Region through two way communication. Apps like this allow us to continue delivering effective information to our communities using current technology, while alleviating some pressures on our facilities so that we can focus on delivering other higher service levels.

Appendix G

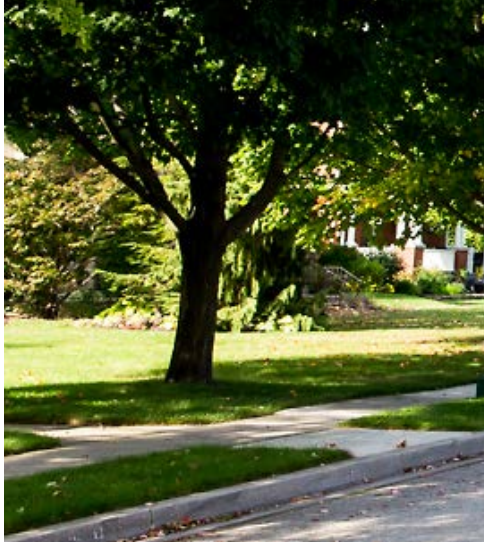
Asset Management Plan – Asset Summary

Service Area	Asset Class	Asset Type
Transportation	Active Transportation	Sidewalks
		Trails
		Pedestrian Bridges
		Walkways
		Bike Lanes
		Street Furniture
	Roads	Roads and Laneways
		Pavement Edges
		Street Lighting
		Road bridges (including major culverts)
		Retaining walls & Sound walls
		Signage
		Guiderails
		Traffic Islands
		Railway Crossings
	Parking	Public Parking Lots (excluding parking lots specific to parks and recreation)
		Public Street Parking Stalls
Environmental Services	Stormwater	Storm System
		Storm Water Management Facilities
		Culverts
		Dams
	Drinking Water	Water System
	Wastewater	Sanitary System
		Sanitary Pumping Stations
Emergency Services	Fire Protection	Fire Halls
		Fleet (Fire)
Parks	Cemeteries	Cemeteries
		Columbarium
		Mausoleums, Chapels
		Facilities
		Cemetery Roads
		Parking (Cemeteries)

Service Area	Asset Class	Asset Type
Parks (Con'd)	Parks	Parks
		Parks Amenities (Facilities)
		Parks and outdoor lighting
		Monuments
		Park Furniture (Garbage bins, benches, gates, etc.)
		Parking (Parks and Outdoor Rec parking)
	Forestry & Horticulture	Trees
		Horticulture Beds
		Horticulture Planters
		Tree Grates & Cells
	Outdoor Recreation	Sports Fields
		Splash Pads
		Play Grounds
		Bike and Skateboard Parks
Recreation & Culture	Indoor Recreation & Culture	Arenas
		Pools
		Community Centres / Older Adult Centres
		Market
		Arts / Theatres
		Museums
		Soccer Dome
		Libraries
		Recreational Parking
Resource Management	Corporate Facilities	Corporate Facilities
		Leased Buildings
	Fleet and Equipment	Fleet and Equipment
	Information and Communication Technology Infrastructure	IT Infrastructure

Appendix H

Asset Management Plan – Strategic Planning Alignment



Strategic Document	Linkage(s) to the AMP
Proposed Capital Investment Plan (2020-2029)	Cambridge is in the process of implementing its multi-year Capital Investment Plan in conjunction with preparing an integrated capital and operating budget. The most recent capital budget was proposed in 2019. The Capital Investment Plan includes the proposed budget for 2020 and a capital forecast for 2021 to 2029 and includes a substantive list of projects that are organized by function (e.g., planning, fire services, sanitary sewer, library, etc.). Each project detail sheet included the project, year, type of project, status, start and completion dates, names of those who prepared and approved the project, descriptions and justifications, expenditure and revenue allocations, priority ranking, project milestones, and staffing impacts. The AMP and the policies outlined align with the Proposed Capital Investment Plan is an example of the processes, rationale, and evaluation criteria that are in place to analyze and prioritize investment. The detail sheets provided for each project provide transparency and fiscal responsibility, ensuring that each project moves through a thorough due diligence process.
Climate Adaptation Plan (2019)	The Climate Adaption Plan describes the City's current understanding of current and future climate conditions in the City of Cambridge and the risks presented to the City's infrastructure. Its core focus is how best to protect the City's facilities from anticipated effects of changing global clients by presenting a series of initiatives to support the City to adapt to these changing conditions.
Development Charges Background Study (2019)	A by-law that imposes certain Development Charges in the Corporation of the City of Cambridge pursuant to the Development Charges Act, S.O., 1997, c. 27, as amended. The growth plans and infrastructure investment proposed within the AMP must consider whether development charges will be incurred pursuant to the City's bylaws. In accordance with the By-Law, Cambridge has developed a Development Charges Background Study. The Development Charges Background Study is essential to this AMP as it supports the City in identifying its funding gap included in the Financial Strategy.
City of Cambridge Official Plan (2018)	The Official Plan outlines a long-range, comprehensive land-use strategy for areas located within Cambridge's municipal boundaries. The Plan provides a framework for land-use decisions for all development and public works project for the next 20 years by protecting, managing, and enhancing the natural environment; directing, influencing, and managing growth patterns; and facilitating the vision of the city. The Official Plan is particularly important as it provides an avenue through which Provincial and Regional policies are implemented in the local context. As a community of opportunity, Cambridge encourages efficiency in government and the provision of municipal services. This Official Plan is the foundation upon which this AMP builds, as the plan – an Avenue through which Provincial and Regional policies are implemented – is considered in all relevant decisions including its LoS Framework, Asset Lifecycle Management Strategy, Stakeholder Engagement, Financial Strategy etc.
Annual Business Plan (2018)	Based on the Strategic Plan, the Business Plans set out the City's blueprint for the work that will be done within the organization over the next 12 months. It links to this AMP in its budgeting, performance indicators, forecasting, sustainability, asset management initiatives. It also includes various asset management initiatives, including the development of this Asset Management Plan, which aligns with the Prosperity strategic theme.

Strategic Document	Linkage(s) to the AMP
Multi-Year Accessibility Plan (2018 – 2021)	The 2018 to 2021 Accessibility Plan outlines the policies and actions that Cambridge is putting in place to improve opportunities for people with disabilities in accordance with the requirements communicated under Ontario Regulation 191/11: Integrated Accessibility Standards. The City of Cambridge takes active steps to offer public spaces, services, and facilities that are accessible to achieve the provincial goal of an accessible Ontario by 2025. These initiatives, along with accessibility standards, have been considered in the development of our desired levels of service across all asset classes. In fact, one of the six Levels of Service categories is Accessibility, as it is a critical component of the service provided to citizens.
Growth Plan for the Greater Golden Horseshoe (2017)	The Growth Plan for the Greater Golden Horseshoe describes a vision for the region continuing to be a great place to live, stating "its communities will be supported by a strong economy, a clean and healthy environment, and social equity." The Plan identifies factors for success, including: livability, vibrancy, and productivity for health and well-being; integrated transportation that is fast, convenient, and affordable; and a healthy, natural environment with clean air, land, and water. It is said that these "will translate into a place where residents enjoy a high standard of living and an exceptional quality of life." The Document outlines Policies for Infrastructure to Support Growth, specifically highlighting key areas such as planning, land-use planning, coordinated investment, long-range scenario-based planning and financial planning, asset management plans, etc. This AMP, including the integrated planning and long-range scenario-based financial plans, aligns with the Growth Plan for the Greater Golden Horseshoe as Cambridge's evolving and improving asset management maturity benefits the overall vitality of the region and enables greater value for money for residents – within Cambridge and in the surrounding areas.
2016-2019 Strategic Plan (2016)	The Strategic Plan sets the stage for decision-making, prioritization, and ongoing performance management. Many of Cambridge's residents, employers, and visitors took time to share their ideas and contribute to the plan's development, identifying the positive aspects of Cambridge, as well as aspects they would like to see improve. The Strategic Plan sets a goal to make Cambridge "a place for people to prosper" – alive with opportunity, and the infrastructure that enables our people to thrive is a significant contributing factor to this initiative. This AMP shares a connection to the Strategic Plan in its direction and objectives, relating to decision-making, prioritization, and performance management, ultimately enabling us to continue making Cambridge "a place for people to prosper". This Strategic Plan was used to guide the City in developing the LoS Framework for this AMP, specifically the Corporate LoS: people, place, prosperity. The City is currently in the process of updating the Strategic Plan.
Region of Waterloo Strategic Plan (2015 – 2018)	The Region's Strategic Plan describes a future view of what the Region is working to achieve, providing a common focus for Council and staff, and helping to guide priorities and ensure programs and services address community needs. Five areas of focus were identified in the Plan, including: a thriving economy; sustainable transportation; environment and sustainable growth; healthy, safe, and inclusive communities; and responsive and engaging government services. Asset Management, and specifically this AMP, enables an integrated, shared vision and roadmap to ensure our infrastructure meets the needs of residents in a way that enables the achievement of the five focus areas. For instance, our infrastructure and the levels of service it provides are the foundation for innovation and economic development; integrated and accessible transportation will enable sustainability and affordability for our community members and visitors; natural environments create spaces and places that enhance living, working, and travelling; affordable and supportive housing options contribute to safe and inclusive communities; and organizational processes, facilities, and resources that are reliable, cost-efficient and effective, provide greater value to the community.

Strategic Document	Linkage(s) to the AMP
Asset Management Plan Documents (2013)	The 2013 AMP was intended to describe the infrastructure owned, operated, and maintained by the City of Cambridge to support its core services. It is a compilation of many documents that describe the evolution of asset management in Cambridge over the seven-year period since implementation had begun in 2006. Similar to this new AMP, the document provided information relating to the current state of the infrastructure, along with current and future activities. A lot has changed in Cambridge since 2013, and this AMP highlights some of the most notable changes. Some of these changes can be seen due to legislative policies, while other changes have occurred more naturally, as Cambridge's asset management journey has continued to evolve. At their cores, both the 2013 AMP and this new AMP provide improved accountability and a deeper understanding of the extent and long-term effect of new and aging infrastructure as it relates to funding.
Three-Year Operating Budget Forecast	The Operating Budgets reflect the key initiatives and priorities, which are developed through Council direction and the community feedback received in the preceding year. It details the costs of providing City services. The costs include staff salaries, program materials and supplies, and utility costs. After user fees and funding from other levels of government, the primary source of funding to pay for the costs in the operating budget is the tax levy – property taxes. As the AMP goes into detail on current levels of service and desired levels of service, the gap between these two will be used to inform Council on which areas to focus on over time. This will make sure that the funding is allocated to infrastructure where it is most needed, and where citizens will receive the greatest value.
Master Plans	The City has approved 17 master plans and strategic plans since 2008. These plans include important strategic directions and actions for the implementation of the Strategic Plan and corporate business planning process. Included in this collection are plans relating to infrastructure, such as energy management, stormwater management, trails, transportation, leisure services and facilities, etc. The strategic objectives in these plans serve as a basis for decisions, priorities, performance management, and direction for the respective asset classes within this AMP.
Long-Range Financial Plans	Each year, City Council approves an annual budget made up of the Operating Budget (annual operations of city facilities and services, primarily funded through property taxes and user fees, excluding water and sewer); Water and Sewer Budget (annual operations of water and sewer distribution, funded through user rates); and the Capital Budget (capital program for all city projects, funded through taxes, water and sewer fees, development charges, debts, grants, or other reserve funds). These budgets are fully integrated to provide Council with a more complete financial picture. The integration of the three multi-year budget components provides insight into the operating implications of capital costs, ensuring that the investments that are made today, along with their desired levels of service, are sustainable over the long run.

Appendix I

Asset Management Plan – Basic Asset Attributes

Attribute	Comments
Basic Information	
ASSET_ID	Unique identifier of the asset for the same asset type
DESCRIPTION	A generalized description of the asset based on information contained in the source table/ layer
STATUS	Current status of the asset
OWNERSHIP	Ownership of the asset
SIZE	Size of the asset (in Established measurement Unit)
MATERIAL	Material of the asset
MAINTAINED_BY	Responsibility(Department/ Division) to maintain asset in good state of repair
Location Information (Based on Address, Roadsegment, Utility corridor, park etc)	
LOCATION_ID_DESCRIPTION	Generated using Address I Street name, Park name etc
LOCATION_ID	Generalize location identifier used to consolidate assets for TCA purposes
Asset Source and Rehabilitation History	
CONS_YEAR	Year asset was installed based on available records (if blank, then value is assigned in an estimated construction year in CONS_YEAR_EST based on adjacent asset information or subjective assessment)
CONS_YEAR_EST	Estimated year of construction if installation year is not known
PROJECTID	Reference to a specific renewal or development project for the purpose of matching assets with project information
REG_PLAN_ID	Reference to a specific subdivision plan which the asset was built
WARRANTY_START	Date the warranty period begins on this asset (if known)
WARRANTY_END	Date the asset has been accepted to be free from defects and end of warranty is accepted
LAST_TREATMENT_TYPE	Last rehabilitation type for this asset
LAST_TREATMENT_YEAR	Last rehabilitation year for this asset
Asset valuation	
REPLACEMENT_COST_CURRENT	Replacement value of the asset calculated by system based on unit rates from recent tenders and appropriate attributes (i.e. size, depth, etc.). Note this is updated regularly by the system
REPLACEMENT_COST_YEAR	Year in which the replacement value was assigned

Attribute	Comments
Condition - Based on inspection Program	
ASSET_CONDITION	Condition of Asset as per last condition assessment
LAST_INSPECTION_DATE	Date of Last Inspection
REM_SERVICE_LIFE	Remaining service life of asset
Risk Profile -Information based on Risk Analysis	
ASSET_COF	Consequence of Failure Score (1 low - 3 High)
ASSET_RISK_SCORE	Asset Risk Score (COF x Likelihood of failure(condition)
Life Cycle Information • Information based on Analysis	
REPLACEMENT_YEAR_LIFE	Standard end of life year based on typical serviceable life values based on appropriate parameters (most commonly material)
REPLACEMENT_ YEAR_ CONDITION	Adjusted end of life year based on condition information received through inspection programs
NEXT_REPLACEMENT_YEAR	Approved end of life year based on project listed in approved capital budget forecast
TCA Information - Auto Maintained	
TCA_CLASS	Tangible Capital Asset Classification as defined by Finance
TCA_CATEGORY	Tangible Capital Asset Category as defined by Finance
TCA_STATUS	Status of asset for financial purposes WIP (Work in Progress) all new assets have this status until related project or plan financial status is changed to 'CLOSED' as directed by Finance
FIR_CODE	D-Donated, C-Contributed, T-Transferred. This not typically known and updated as 'D' if related to a subdivision plan. Information is input by finance as appropriate in TCA PSAB system

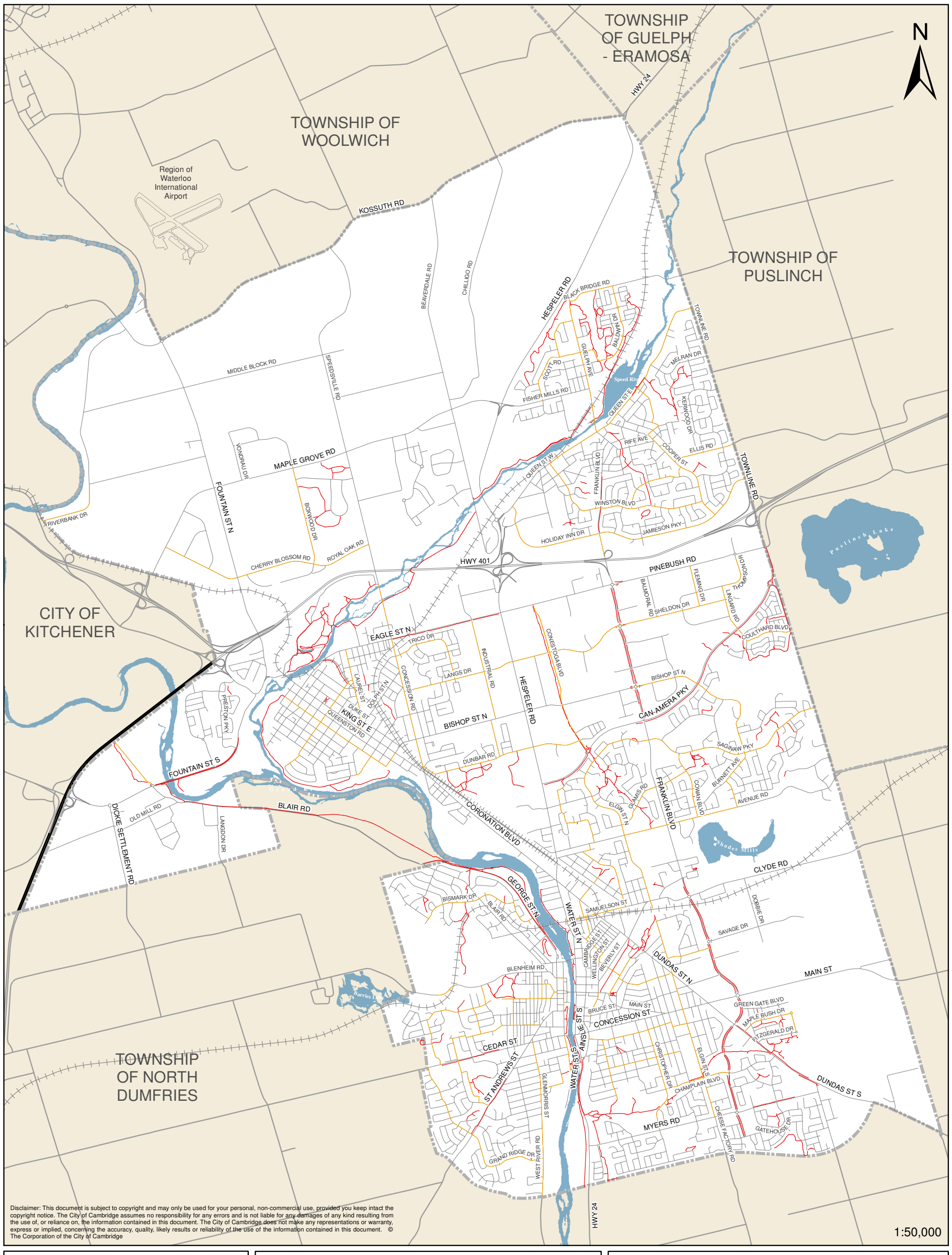
Appendix J

Asset Management Plan – Asset Maps

Service Area Maps

Service Area	Map	Section
Transportation	Active Transportation	J.1.0
	Pavement Condition 2019	J.1.0
	Road System Overview	J.1.0
Environmental Services	Storm System Overview	J.2.0
	Water System Overview	J.2.0
	Sanitary System Overview	J.2.0
Parks	Parks and Outdoor Recreation	J.3.0
Recreation & Culture	Indoor Recreation & Culture Buildings	J.4.0

J.1.0 Transportation Maps - Active Transportation



City of Cambridge Asset Management Plan

CANADA CAMBRIDGE

Active Transportation

Legend

- Trail
- Bike Lane
- Railway
- Municipal Boundary
- Rivers and Lakes

Type	Kilometres
Trail	104
Bike Lane on Road	99
Walkway	9
Sidewalk	665
Totals	**877**

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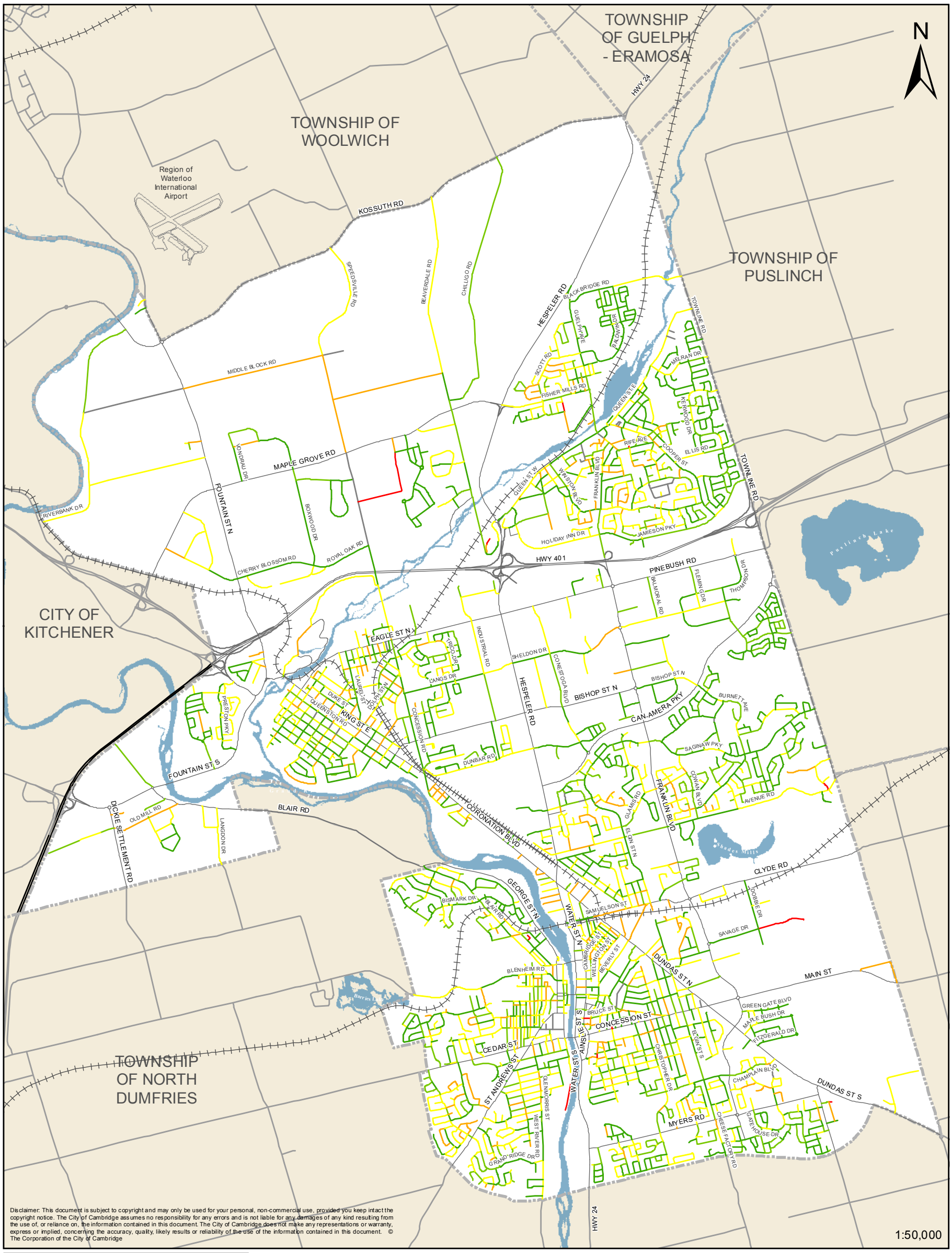
J.1.0 Transportation Maps - Pavement Condition 2019



City of Cambridge
Asset Management Plan

Pavement Condition 2019

Legend

Pavement Condition
- Very Good
- Good
- Fair
- Poor
- Very Poor
- Unknown

- Railway
- Municipal Boundary
- Rivers and Lakes

Pavement Condition	Total Lane Kilometre	Percentage
Very Good	383	39%
Good	210	21%
Fair	306	30%
Poor	95	9%
Very Poor	6	0%
Unknown	6	1%
Totals	**1006**	**100%**

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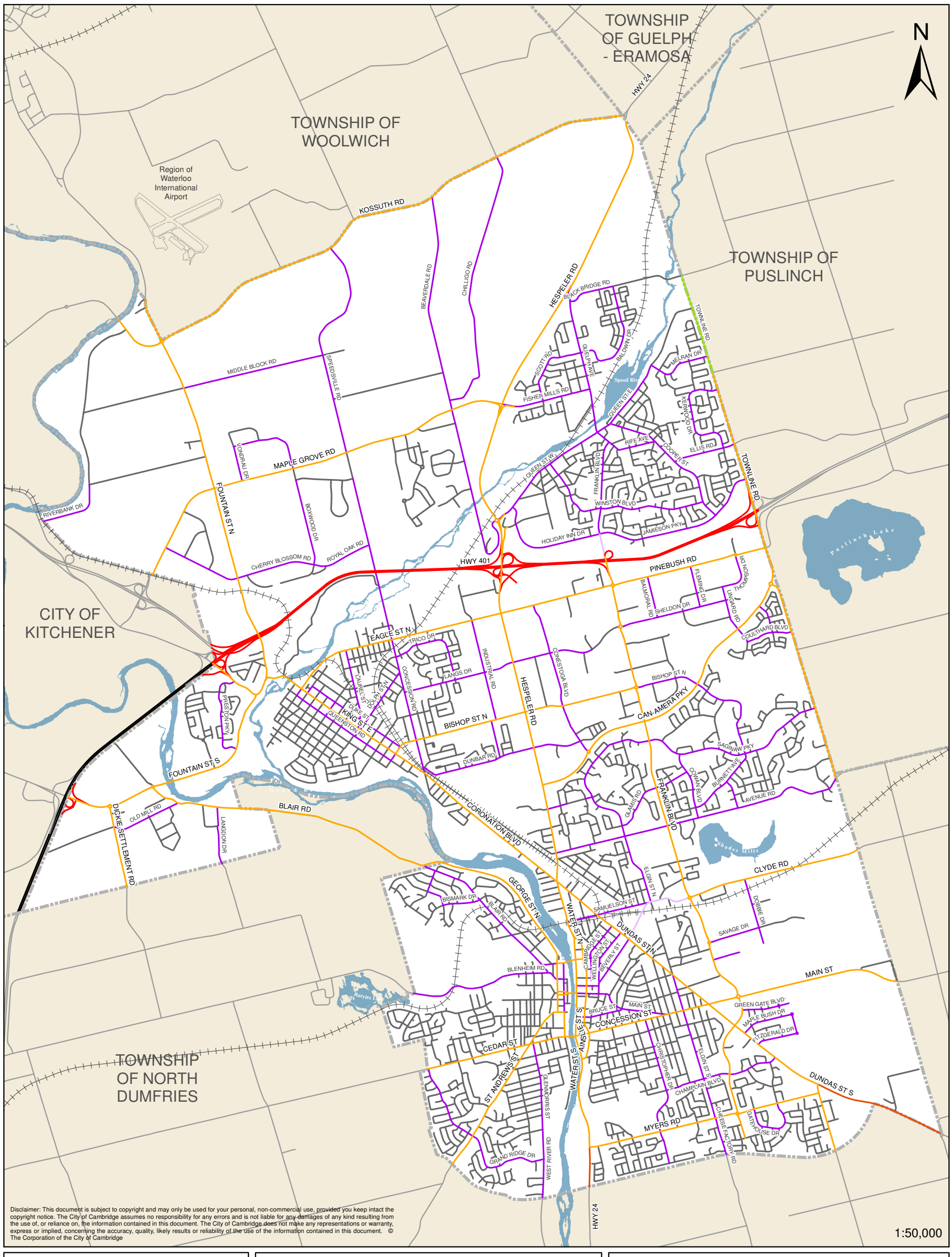
J.1.0 Transportation Maps - Road System Overview



City of Cambridge Asset Management Plan

CANADA CAMBRIDGE

Road System Overview

Legend

Roads

Shared Ownership
- Collector

Region of Waterloo
- Major Arterial

Province of Ontario
- Highway
- Major Arterial

City of Cambridge
- Major Arterial
- Collector
- Local
- Railway
- Municipal Boundary
- Rivers and Lakes

Note: Road Classification under review as per Transportation Master Plan

Road Class	Lane Kilometres
Shared Ownership	
Collector	3
Province of Ontario	
Highway	68
Major Arterial	7
Region of Waterloo	
Major Arterial	319
City of Cambridge	
Major Arterial	2
Collector	255
Local	748
Totals	**1402**

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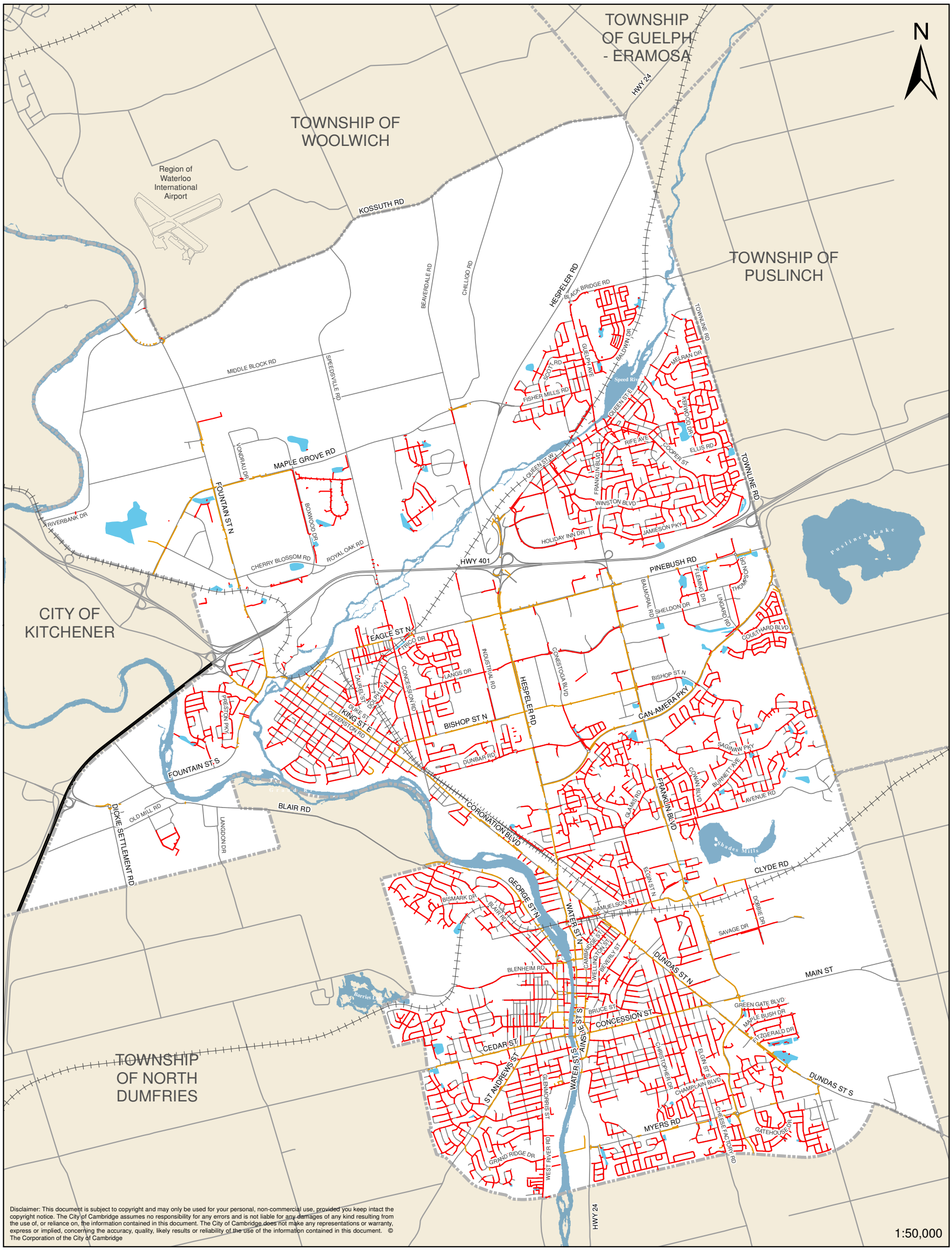
J.2.0 Environmental Services Maps - Storm System Overview



City of Cambridge Asset Management Plan

Storm System Overview

Legend

- City of Cambridge Storm Pipe
- Region of Waterloo Storm Pipe
- Stormwater Management Facility
- Roads
- Railway
- Municipal Boundary
- Rivers and Lakes

Ownership	Length in Kilometres
City of Cambridge	372
Region of Waterloo	69
Totals	**440**

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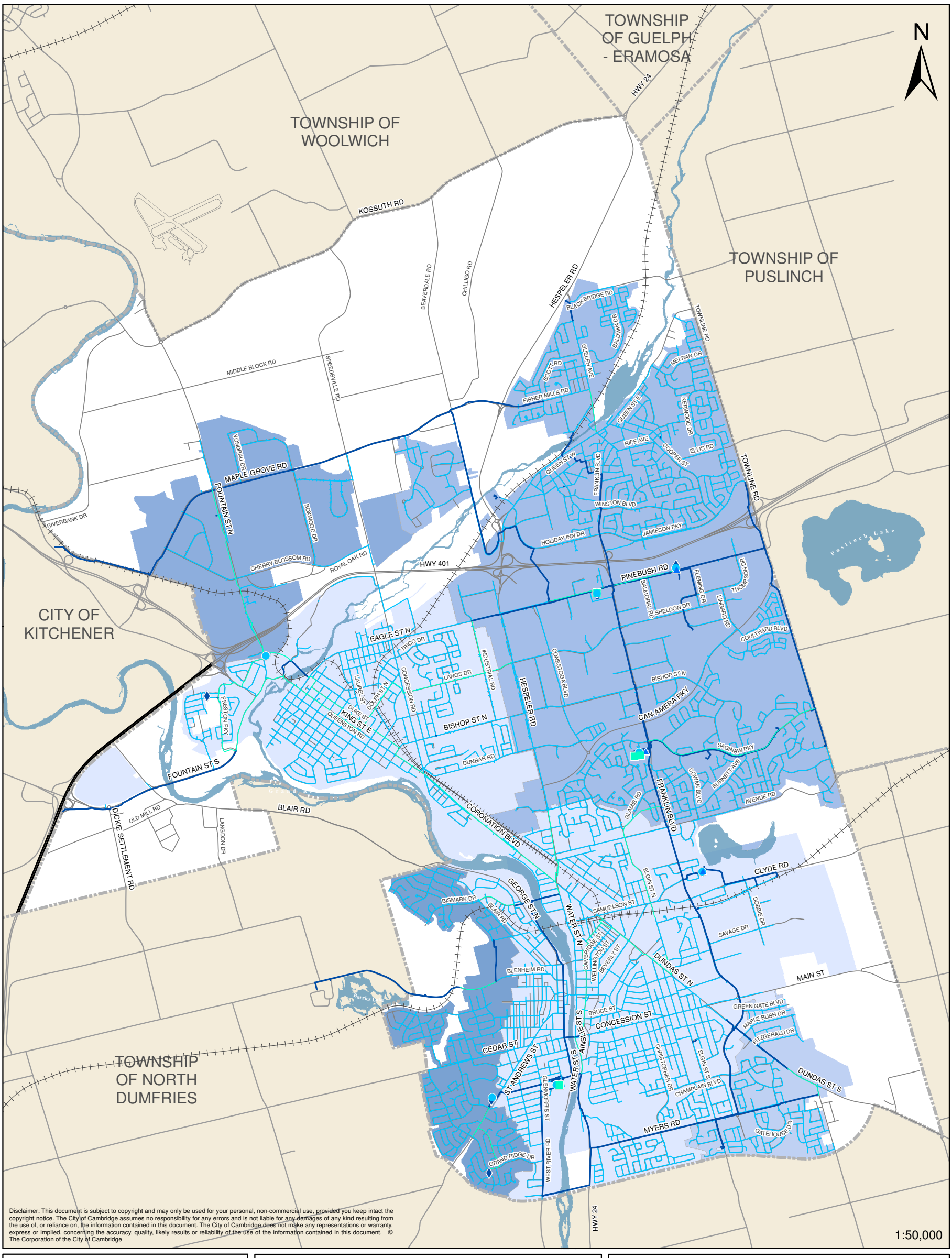
J.2.0 Environmental Services Maps - Water System Overview



City of Cambridge
Asset Management Plan

CANADA CAMBRIDGE

Water System Overview

Legend

- Region Water Treatment Plant
- Region Pumping Station
- Region Water Tank
- Region Water Resevoir
- Water Main City of Cambridge
- Water Main Region of Waterloo
- Water Main Shared

Water Pressure Zones

- 1
- 1A
- 2
- 2 WEST
- 3
- Roads
- Railway
- Municipal Boundary
- Rivers and Lakes

Ownership	Length in Kilometres
City of Cambridge	493
Region of Waterloo	64
Shared	32
Totals	**589**

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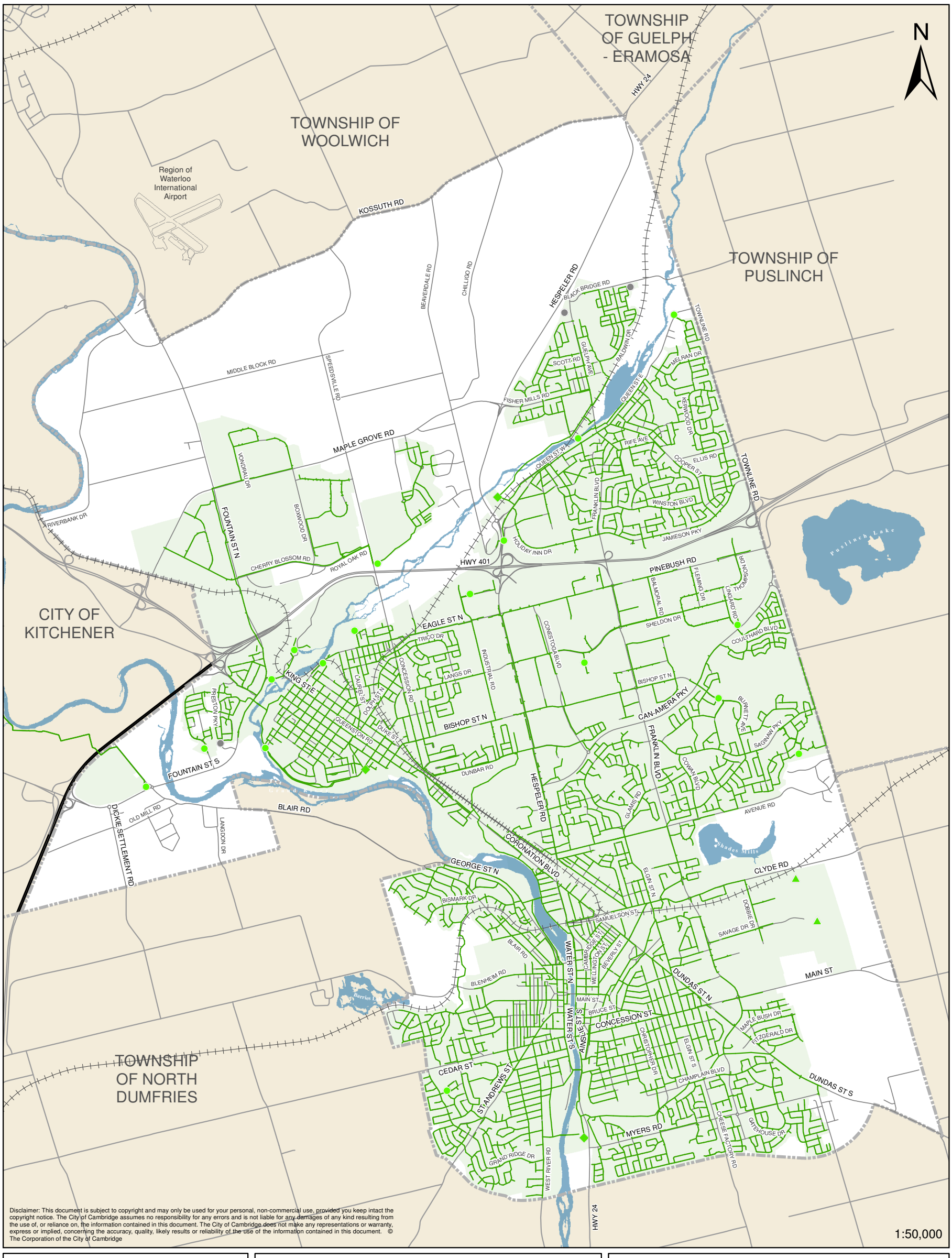
J.2.0 Environmental Services Maps - Sanitary System Overview



City of Cambridge Asset Management Plan

Sanitary System Overview

Legend

- City of Cambridge Pumping Station
- Region of Waterloo Pumping Station
- Private Pumping Station
- Region of Waterloo Sewage Treatment Plant
- Sanitary Pipe
- Area of Sanitary Service
- Roads
- Railway
- Municipal Boundary
- Rivers and Lakes

Service	Count
Sanitary Pipe	533 km
City of Cambridge Pumping Station	17
Region of Waterloo Pumping Station	2
Private Pumping Station	3
Region of Waterloo Sewage Treatment Plant	3

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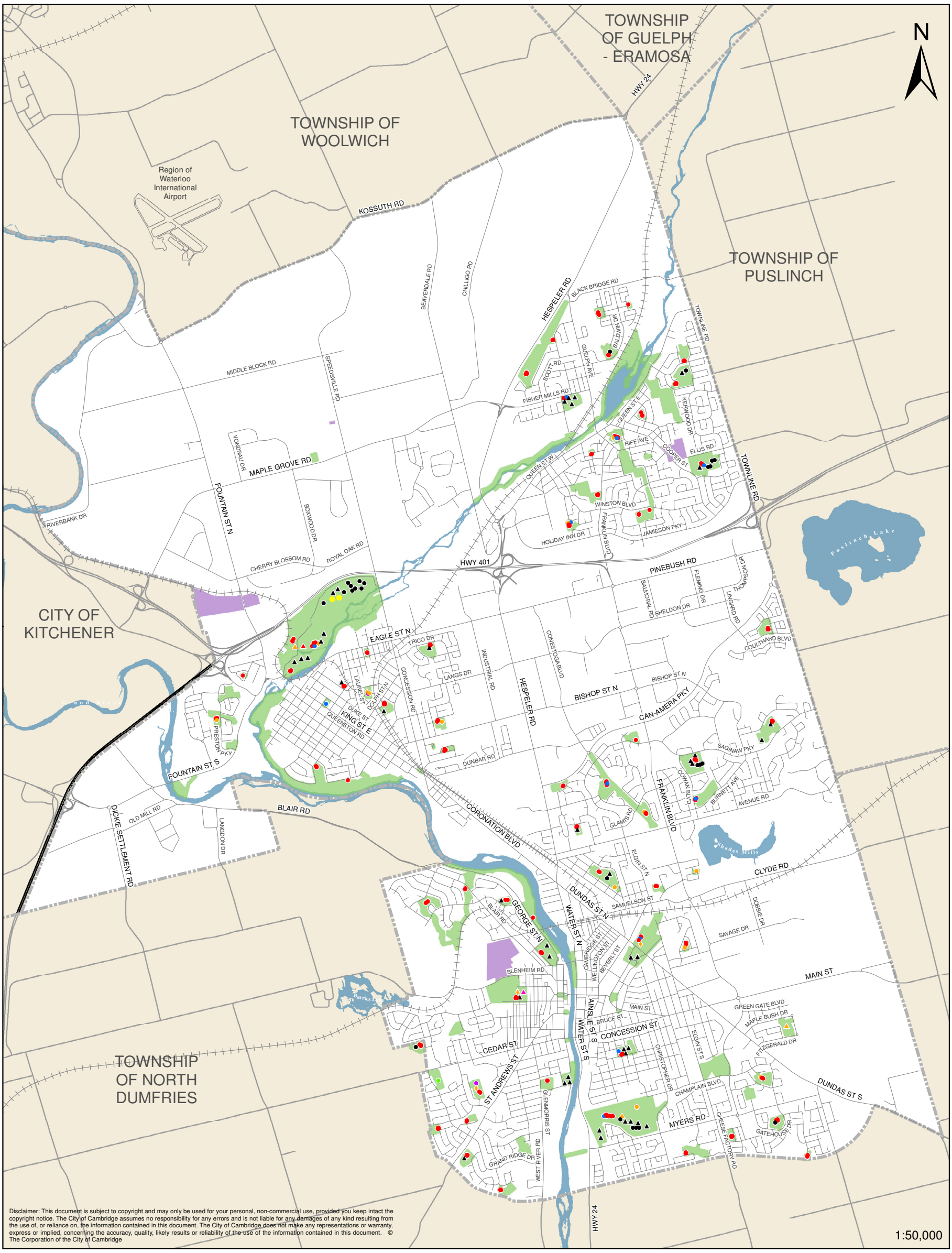
J.3.0 Parks Maps - Parks and Outdoor Recreation



City of Cambridge
Asset Management Plan

CANADA CAMBRIDGE

Parks and Outdoor Recreation

Legend

- Skateboard Park
- Bike Park
- Splash Pad
- Playground
- Baseball Field
- Soccer Field
- Basketball Court
- Tennis Court
- Volleyball Court
- Multi-Use
- Cricket Pitch
- Field Hockey
- Roads
- Railway
- Municipal Boundary
- Park
- Cemetery
- Rivers and Lakes

Type	Count	Type	Count
Skateboard Park	3	Tennis Court	11
Bike Park	1	Volleyball Court	4
Splash Pad	11	Multi-Use	2
Playground	64	Cricket Pitch	1
Baseball Field	42	Field Hockey	1
Soccer Field	25	Park	100
Basketball Court	9	Cemetery	6

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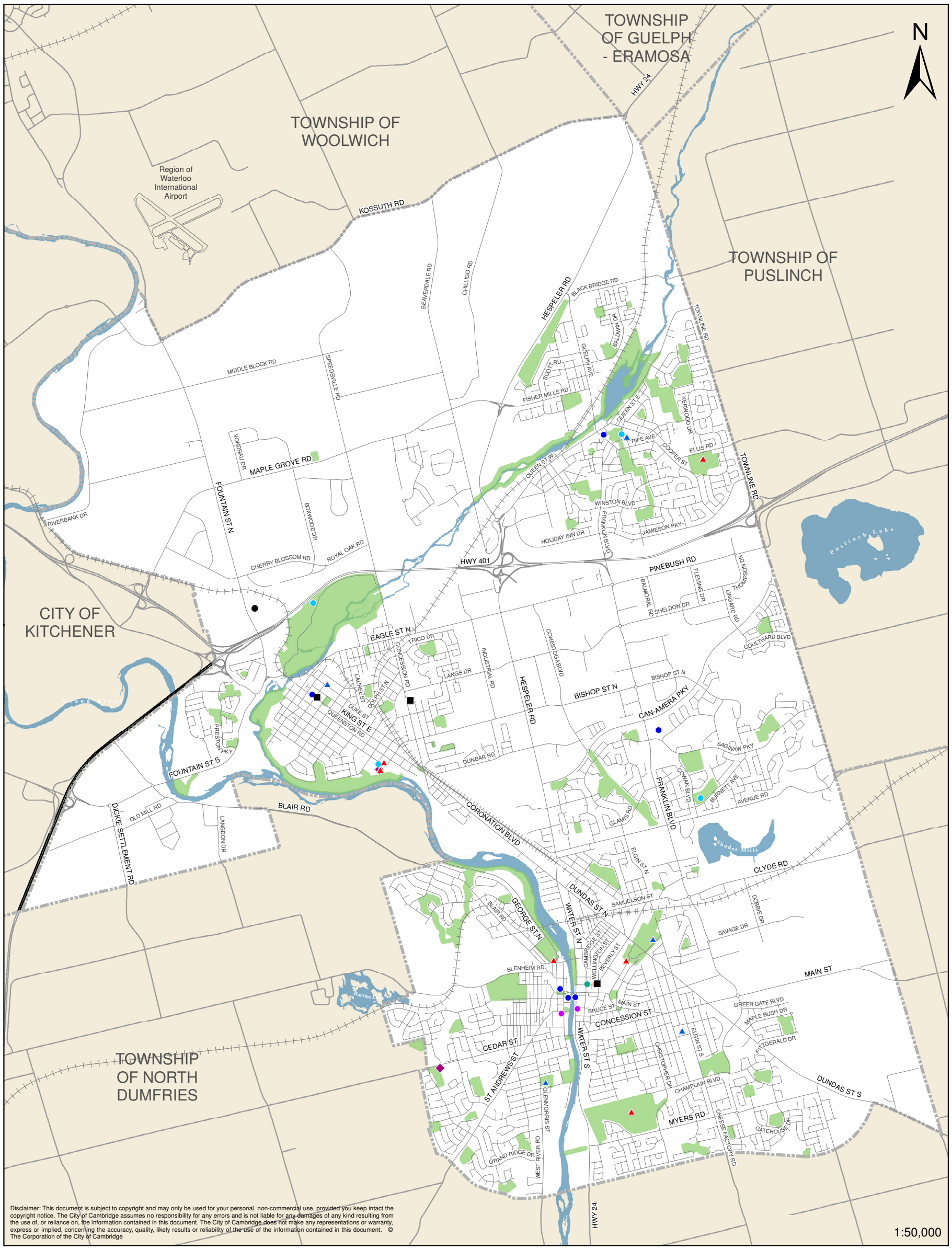
J.4.0 Indoor Recreation Maps - Indoor Recreation and Culture Buildings



City of Cambridge
Asset Management Plan

CANADA CAMBRIDGE

Indoor Recreation and Culture Buildings

Legend

- Museum
- Market
- Soccer Dome
- Arena
- Community/Older Adult Centre
- Fitness/Gymnastic
- Arts Theatre
- Aquatic Centre
- Library
- Roads
- Railway
- Municipal Boundary
- Park
- Rivers and Lakes

Type	Count
Museum	1
Market	1
Soccer Dome	1
Arena	6
Community Centre/Older Adult Centre	6
Fitness/Gymnastic	2
Aquatic Centre	5
Arts/Theatre	2
Library	6

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Appendix K

Glossary

Main Glossary	
Asset Attributes	A database of key attributes for each asset such as basic information, location information, asset source and rehabilitation history, asset valuation, condition, risk profile etc.
Asset Class	An aggregate of municipal infrastructure assets that provide a similar type of service
Asset Condition	Measure of the health of an asset that ranges from very good, to very poor
Asset Lifecycle Management Strategy	Requirement of O.Reg.588/17 to outline the lifecycle activities that would need to be undertaken to maintain the current levels of service for the next 10 years
Asset Type	The individual municipal infrastructure assets that exhibit similar characteristics and perform the same service
Average Age	The average age of all asset types, or asset classes
Capital Cost	Fixed costs incurred for a one-time acquisition or creation of an asset to bring it to operational status or fixed cost for disposal of assets.
Capital Planning Software	Software designed to support the analysis of assets to determine asset needs and forecast investment over defined periods.
Capital Investment Plan	Capital investment proposed to sustain the current services for the next 10 years along with projects designed to meet projected growth requirements
Corporate Levels of Service	Core strategic outcomes as communicated in our vision from our Strategic Plan
Community Levels of Service	Reflects the categories or themes that are most valued by the community and is aligned to the Corporate LoS
Core Asset	Any infrastructure asset that is a: » Water asset that relates to the collection, production, treatment, storage, supply or distribution of water; » Wastewater asset that relates to the collection, transmission, treatment, or disposal of wastewater, including any wastewater asset that from time to time manages storm water; » Storm water management asset that relates to the collection, transmission, treatment, retention, infiltration, control, or disposal of storm water; » Road; or » Bridge or culvert.
Debenture	A type of debt instrument unsecured by collateral. The City has a debt policy that balances several considerations when determining whether projects should be funded from pay as you go approach versus debt
Debt Financing	Refer to Debenture

Main Glossary	
Drinking Water Quality Management Standard	The purpose of this Standard is to assist owners and operating authorities in the effective management and operation of their municipal residential drinking water systems. This Standard outlines requirements for a Quality Management System (QMS) to ensure high quality drinking water. In the development of a QMS, the Operating Authority must create an Operational Plan; this document defines the QMS and is subject to internal and external audits for accreditation. As referenced in the Standard, the QMS must be embraced by all those with active rolls in the water system, from front line staff to the highest level of management to Council. City Staff have developed and implemented a QMS specific to the City of Cambridge. Certification was originally obtained on February 2009. Recertification was successfully achieved in 2013, 2016, and 2019.
Financial Strategy	Requirement of O.Reg.588/17 to outline the cost to maintain the current levels of service.
Funding Gap	Instances where an investment requirement does not have dedicated funding sources identified or assigned to execute the targeted activity associated with the investment.
Geospatial Information System (GIS)	Geographic Information System is a framework for gathering, managing, and analyzing data. Capable of integrating multiple data sets to produce spatial location and layers of information into visualizations using maps and 3D scenes.
Infrastructure for Jobs and Prosperity Act (2015)	An Act that establishes mechanisms to encourage principled, evidence based and strategic long-term infrastructure planning that supports job creation and training opportunities, economic growth and protection of the environment, and incorporate design excellence into infrastructure planning.
Levels of Service (Los)	Requirement of O.Reg.588/17 to outline both qualitative descriptions and technical metrics that describe our commitments, standards, and expectations that we have set for ourselves regarding asset measures, such as usage, reliability, condition, and quality.
Lifecycle Cost	Refers to the total costs required for an asset or service over all stages of its life; e.g., acquisition/creation, operation and maintenance, renewal and disposal.
Life Span	The expected length of time an asset can be operational and deliver the required level of service.
Lifecycle Management	The structures and processes we have in place with respect to our municipal infrastructure assets over the course of an asset's service life, including acquisition, creation, construction, maintenance, renewal, operations, disposal, and all engineering and design work associated with those activities.

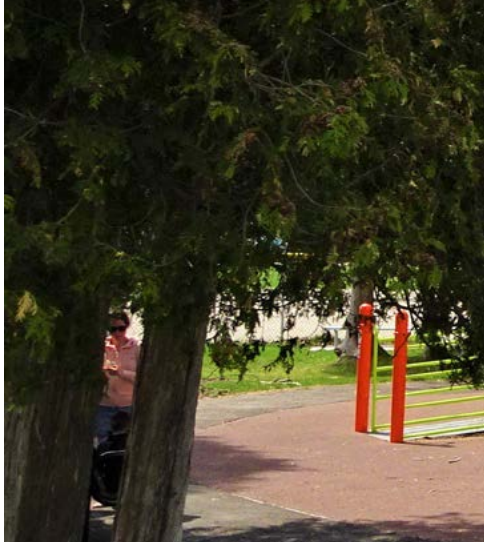
Main Glossary	
Non-Core Assets	Any infrastructure asset that does not fall under one of the Core Asset categories, but is still owned and operated by the City, such as fleet and equipment, parks, building facilities, and fire halls, garbage bins, and horticulture planters.
O.Reg.588/17	An Ontario Regulation entitled, "Asset Management Planning for Municipal Infrastructure," made under the Infrastructure for Jobs and Prosperity Act of and filed in December 2017, which prescribes the policies and requirements relating to the preparation of this asset management plan by applicable municipalities.
Operating Costs	The aggregate of costs, including energy costs, of operating a municipal infrastructure asset over its service life
Replacement Cost	The replacement cost can be calculated / estimated based on asset parameters like asset size (diameter, depth and width) and material. The replacement cost can also be dependent on its location and proximity to environmentally sensitive features and/or major transportation features.
Service Area	Grouping of asset types and classes that produce a similar service
Service Life	The total period during which a municipal infrastructure asset is in use or is available to be used.
State of Infrastructure	Requirement of O.Reg.588/17 to outline a summary of the assets for the replacement costs, the average age, the condition of the assets in the category etc.
Strategic Asset Management Policy	Requirement of O.Reg.588/17 for each municipality to prepare a strategic asset manage-ment policy.
Technical Levels of Service	Detailed metrics that can be used to evaluate and report whether the community and subse-quently corporate LoS are being achieved

Current Funding Sources Glossary	
Water and Wastewater rates	The annual operation of water and sewer distribution is funded through user rates for asset needs identified in the water and wastewater long range financial plan 2019-2028.
Reserve Funds	We have established reserve funds to provide stability to tax rates in the event of unforeseen economic events, to provide funding for one-time requirements, to make provisions for the acquisition and replacement of infrastructure, and to provide flexibility to manage debt levels. A summary of the available reserve funds, allocation, and performance is located in our Annual Reports uploaded to our website.
Rates and User Fees	In addition to the water and wastewater rates, our city levies other taxes and charges to support service delivery and improvement in other programs such as roads and parks.
Other Government Grants	There are a range of government funds such as Gas Tax and other infrastructure renewal grants available to our City to support funding of infrastructure needs. These funds can be used for those projects who meet the eligibility criteria associated with these funds.
Investment Income Debentures	Our City receives revenue from its investments that can be used to fund infrastructure needs. We also utilize long-term, fixed interest debt financing to secure funding and delivery of our city's most important priorities.
Development Charges	The City of Cambridge collects development charges in accordance with the Development Charges Act and our Development Charges By-law. These charges can be used to offset the capital costs required to support growth-related infrastructure identified within our infrastructure needs.

MTO Classes Glossary	
MTO Class 1	Expressway – Greater than 40,000 vehicles per day, and speed limits 80 to 100 km/h
MTO Class 2	Major Arterial Road – Greater than 20,000 vehicles per day, and speed limits 50 to 60 km/h
MTO Class 3	Minor Arterial Road – 8,000 to 20,000 vehicles per day, and speed limits 40 to 60 km/h
MTO Class 4	Collector Road – 2,500 to 8,000 vehicles per day, and signalized intersections at arterial road
MTO Class 5	Local Road – less than 2,500 vehicles per day, and low traffic speed

Appendix L

Capital Investment Prioritization Criteria



#	Criteria	Description	Selection Code	Max Value	Scoring Description	Assigned Value	Weight	Score
1	**Project Category**	5 categories of projects that support different classifications of projects which vary depending on importance and impact to the public	A	1000	Mandatory Projects - this category includes capital projects that have prior legally binding commitments or have a legal, safety, regulatory or other mandated minimum requirements where not achieving these requirements would lead to legal action, fines, penalties or high risk of liability against the City.	600	20%	120
			B	900	Critical Projects - this category includes projects required to maintain critical components in a state of good repair. These projects are not mandatory but will maintain critical components at current service levels, and are projects that will otherwise become mandatory within five years.			

#	Criteria	Description	Selection Code	Max Value	Scoring Description	Assigned Value	Weight	Score
1	**Project Category**	5 categories of projects that support different classifications of projects which vary depending on importance and impact to the public	C	800	Community Planning / Maintenance / Efficiency Projects - This category includes studies/design projects that set the long-term direction for the City related to infrastructure and community needs. It also includes projects required to maintain capital infrastrucutre in a good state of repair based on standards approved by Council. Projects that result in operational efficiencies or savings are also included under this category.	600	20%	120
			D	700	Stategic Projects - This category includes projects identified by Council to be a priority to move forward with that have a positive impact for the community.			
			E	600	Enhance / Growth Related Projects - this category includes projects which will increase the current service level, are for new facilities or expansion of existing facilities or new initiatives.			

#	Criteria	Description	Selection Code	Max Value	Scoring Description	Assigned Value	Weight	Score
2	**Alignment with Corporate Strategic Direction**	The extent to which the project fits with the goals and objectives of various corporate and departmental plans	A	1000	Aligned with the goals and objectives of Corporate Strategic Plan or Direction of Council	500	10%	50
			B	750	Aligned with the Corporate Sustainability Plan / Departmental Business Plans			
			C	500	Not Aligned with any Corporate or Departmental Plan			
3	**Operating Budget Impact**	The extent to which the project will result in reductions in operating costs	A	1000	Significant decrease in operating costs (> $100,000)	500	10%	50
			B	750	Moderate decrease in operating costs (between $25,000 and $99,999)			
			C	500	Little or no decrease / increase in operating costs			
4	**Risk Assessment**	The extent to which the project will mitigate corporate risk	A	1000	Will mitigate corporate risk defined as "significant"	500	10%	50
			B	750	Will mitigate corporate risk defined as "medium"			
			C	500	Will mitigate corporate risk defined as "low" or little or no impact			
5	**Cost/Benefit (Payback)**	Project will generate cost savings and/ or revenue enhancements that will provide a positive return on investment over a defined payback period	A	1000	Able to measure a positive ROI with a payback period of less than 5 years	500	10%	50
			B	750	Able to measure a positive ROI with a payback period of greater than 5 years			
			C	500	ROI difficult to measure in financial terms			

#	Criteria	Description	Selection Code	Max Value	Scoring Description	Assigned Value	Weight	Score
6	**Service Levels**	Impact on the service levels to the public as a result of the project	A	1000	Address a current service level deficiency so level of service standard is achieved	500	10%	50
			B	750	Increase level of service			
			C	500	Has no impact on level of service			
7	**Infrastructure Impact**	Inpact of project in addressing the infrastructure deficit	A	1000	Direct impact in reducing the City's total infrastructure gap	500	10%	50
			B	750	Indirect impact in reducing the City's total infrastructure gap			
			C	500	Has no impact in reducing the City's total infrastructure gap			
8	**Community Impact**	Impact on community in terms of promoting the City as an attractive place to live (parks, trails, recreation, arts and culture, etc.)	A	1000	Has significant impact by improving or enhancing amenities available to the community	500	10%	50
			B	750	Has moderate impact by improving or enhancing amenities available to the community			
			C	500	Has no direct community impact			
9	**Economic Impact**	Impact on both the Corporation's and the City's businesses and economy in terms of revenue generation (job creation, assessment growth, increased tourism etc.)	A	1000	Generates a significant economic benefit for the local economy	500	10%	50
			B	750	Generates a moderate economic benefit for the local economy			
			C	500	Limited, minimal or no economic benefit for the local economy			
Total Score							**100%**	**520**

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The preparation of this project was carried out with assistance from the Government of Canada and the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.