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VERSION 2.0

Transportation Services

Asset Management Plan

Introduction

1.1 BACKGROUND

Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (Sections 5 and 6) requires all municipalities to prepare asset management plans for all their assets. The purpose of this legislation is to have municipalities demonstrate they can maintain their assets, balancing affordability, risk, and service levels for the next ten years.

To meet the provincial requirements, the City has created this latest version of its Transportation Asset Management Plan. It reports the current state of the assets, target and expected levels of service, strategies and activities applied by the City, historical and forecasted financial details, risks and non-financial strategies and potential improvement actions. It is a strategic document that provides a snapshot of current conditions and establishes a basis for future asset management planning and decision making.

1.2 SUPPORT FOR CITY GOALS

This Asset Management Plan supports the City's 2023-2026 City Strategic Plan and the strategic priority of *a city that is more connected with reliable, safe and accessible mobility options and a city that is green and resilient*. Specifically, it aligns with the strategic objectives to:

- Improve active transportation.
- Deliver transit and roads to support growth.
- Improve road safety.
- Support sustainable transportation for residents with accessibility needs.
- Reduce emissions associated with the City's operations and facilities.
- Increase resiliency to extreme weather and changing climate conditions.
- Improve key infrastructure through asset management.

1.3 ASSET CLASSES AND TYPES

The regulation requires that for each asset category a summary of the assets is provided. The Transportation Services Asset Management Plan includes assets that support the movement of people and goods across the entire city in both rural and urban areas, excluding Transit, which is covered in its own Asset Management Plan. This includes roads, structures, active transportation assets, facilities and equipment, fleet and traffic assets.

Transportation Asset Classes and Types

Roads	
• City Freeway	• Gravel Roads
• Arterials	• Local Roads
• Collectors	• Lanes

Bridges and Bridge Culverts	
• Bridges	• Bridge-Culverts

Other Structures	
• Medium Culverts	• Guiderails
• Small Culverts	• Noise Barriers
• Retaining Walls	

Active Transportation	
• Sidewalks	• Separated Cycling Facilities
• Pathways	

Parking and Roads Facilities and Equipment	
• Roads Services Buildings	• Parking Equipment
• Parking Facilities	• Electric Vehicle (EV) Charging Stations

Roads and Traffic Services Fleet	
• Parking Operations Fleet	• Traffic Services Fleet
• Roads Services Fleet	

Traffic Assets	
• Flashers	• Traffic Signals – Controller Timer Units (CTUs)
• Pedestrian Crossovers (PXOs)	• Traffic Signals – Cabinets
• Streetlights	• Traffic Signals – Other
• Traffic Cameras	

There are limitations, gaps and assumptions in the data and analysis underlying this Asset Management Plan, which affect the findings that are presented.

State of Local Infrastructure

The regulation requires that for each asset category a summary of the replacement costs, average age of the assets, information available on the condition and a description of the municipality's approach to assessing condition is provided. The values in this section are based on asset data from March 2024.

2.1 ASSET INVENTORY AND VALUATION

The total replacement cost of Transportation Services assets is approximately $33.6 billion as summarized in the table below.

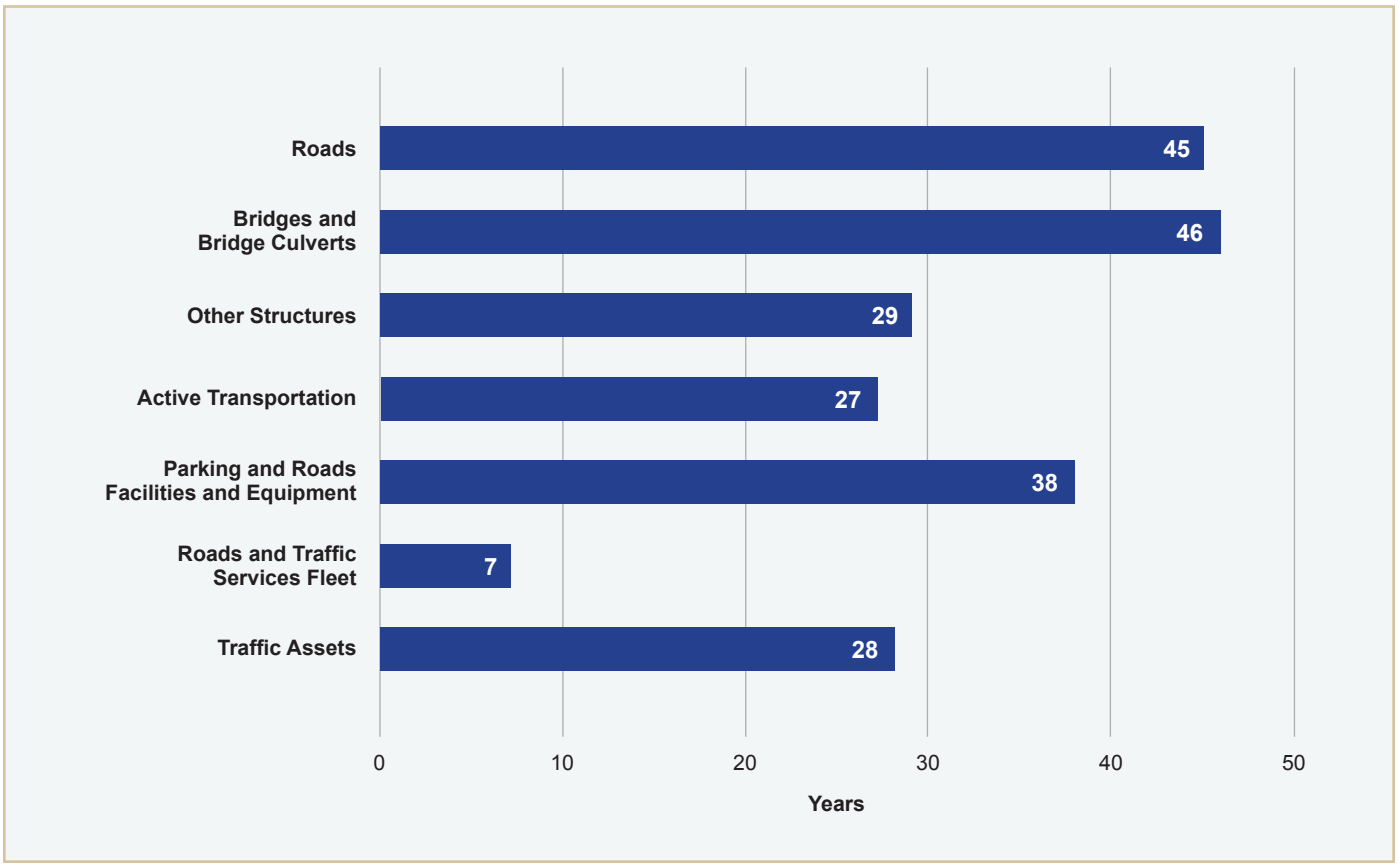
Transportation Asset Inventory and Replacement Cost

Asset Class	Inventory	Replacement Cost (Millions; 2024$)
Roads	12,758 lane-km	$24,964.0
Bridges and Bridge Culverts	734	$3,965.9
Other Structures	7,006 375 km	$1,202.2
Active Transportation	2,681 km	$1,469.5
Parking and Roads Facilities and Equipment	889	$774.0
Roads and Traffic Services Fleet	862	$157.1
Traffic Assets	61,642	$1,068.8

2.2 ASSET AGE AND CONDITION

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

Average Age of Transportation Assets



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

Condition Data Collection Methods for Transportation Assets

Asset Class	Condition Data Collection Technique	Frequency
Roads	Pavement condition data is collected using an Automatic Road Analyzer. Collected data includes data related to surface distresses and riding comfort, pavement images every 10m. Automated data is integrated into one Pavement Quality Index. Gravel Roads are visually inspected. The visual inspection is done by driving the road to assess condition, identify problem spots, and prioritize treatments. Spot repairs are made as needed.	• City Freeway: Every 2 years. • Arterials and Collectors: Every 3 years. • Local Roads and Lanes: Every 5 years. • Gravel Roads: Twice a year (spring and fall)
Bridges and Bridge Culverts	Bridges and Bridge Culverts are inspected in compliance with Ontario Structure Inspection Manual requirements	• Every 2 years *Note: For Bridge Culverts with 3 to 6 metre spans the inspection interval can be increased to 4 years*
Other Structures	Medium and Small Culverts are being inspected using a risk-based approach. Retaining Walls are inspected in compliance with Ontario Structure Inspection Manual requirements Condition assessment of Noise Barriers and Guiderails is based on on-site visual inspections and are mainly reactive	• Medium and Small Culverts: Typically, every 10 years *Note: The City is currently working through a program to inspect the full inventory of Medium and Small culverts, but not all culverts have been inspected yet*
Active Transportation	A high-level condition assessment conducted by Asset Management Services. Detailed assessment by Public Works Department to identify tripping hazards and maintenance requirements	• High-level condition assessment: Every 2 years • Detailed hazard/maintenance assessment: Every year
Parking and Roads Facilities	Roads Services Buildings and Parking Lots are inspected in compliance with varying regulatory bodies and standards, such as the Ontario Building Code, National Building Code, and Professional Engineers Ontario	• Roads Services Buildings: Every 10 years • Parking Facilities: Every 5 years

Asset Class	Condition Data Collection Technique	Frequency
Parking Equipment	Physical inspections of every machine using a standardized inspection procedure. Results recorded and entered into Excel and each machine given a graded condition based on the results	• Annually
Roads, Parking, and Traffic Services Fleet	Inspection and maintenance	• 6 months and original equipment manufacturer maintenance schedule
Traffic Assets	Inspection during annual preventative maintenance	• Annually • Cabinets and CTUs inspected every 6 months

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

Five-point Scale for Transportation Asset Condition

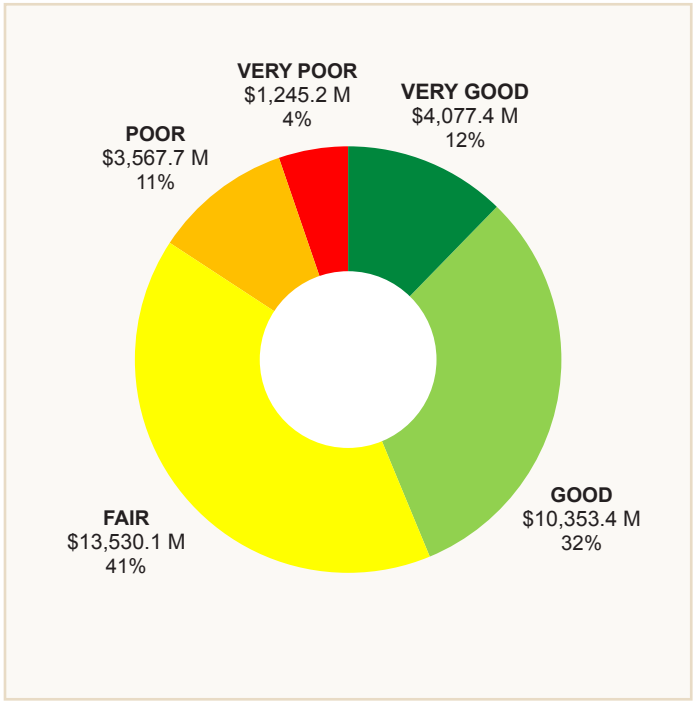
Rating	Rating Description	Pavement Quality Index	Bridge Condition Index	100-point scale	Facility Condition Index (FCI)[1]	Performance based	Subject Matter Expert Opinion	Life Remaining	Life Remaining
		(Roads)	(Bridges and Bridge Culverts and Other Structures)	(Sidewalks and Pathways)	(Roads Services Buildings and Parking Lots)	(EV Chargers)	(Traffic Signals)	(Parking and Traffic Equipment)	(Roads, Parking and Traffic Services Fleet)
Very Good	**Sound Physical Condition** No short-term failure risk and no work required	80 to 100	80 to 100	80 to 100	0% to 2%	Expected Performance	Expert Opinion	>75%	>75%
Good	**Adequate for Now** Acceptable, generally in mid stage of expected service life	60 to 80	70 to 80	60 to 80	2% to 5%			51% - 75%	51% - 75%
Fair	**Requires Attention** Signs of deterioration, requires attention, some elements exhibit deficiencies	40 to 60	60 to 70	40 to 60	5% to 15%	Limited Performance		26% - 50%	26% - 50%
Poor	**Increasing Potential of Affecting Service** Approaching end of service life, condition below standard, large portion of system exhibits significant deterioration	20 to 40	40 to 60	20 to 40	15% to 30%			0% - 25%	0% - 25%
Very Poor	**Unfit for Sustained Service (built infrastructure) / Nearing End of Life (fleet)** Near or beyond expected service life, widespread signs of advanced deterioration, some built assets may be unusable	Less than 20	Less than 40	Less than 20	More than 30%	Poor Performance		<0% (outside of lifecycle)	<0% (outside of lifecycle)

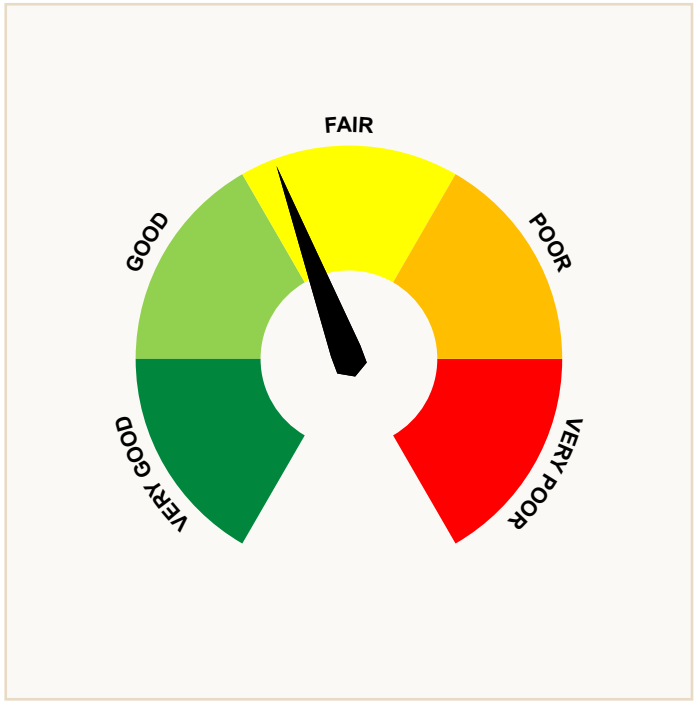
1: Where FCI = 0, or no deferred maintenance is reported, or required maintenance is reported but has not yet been deferred, condition is reported based on typical useful life consumed as follows:

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

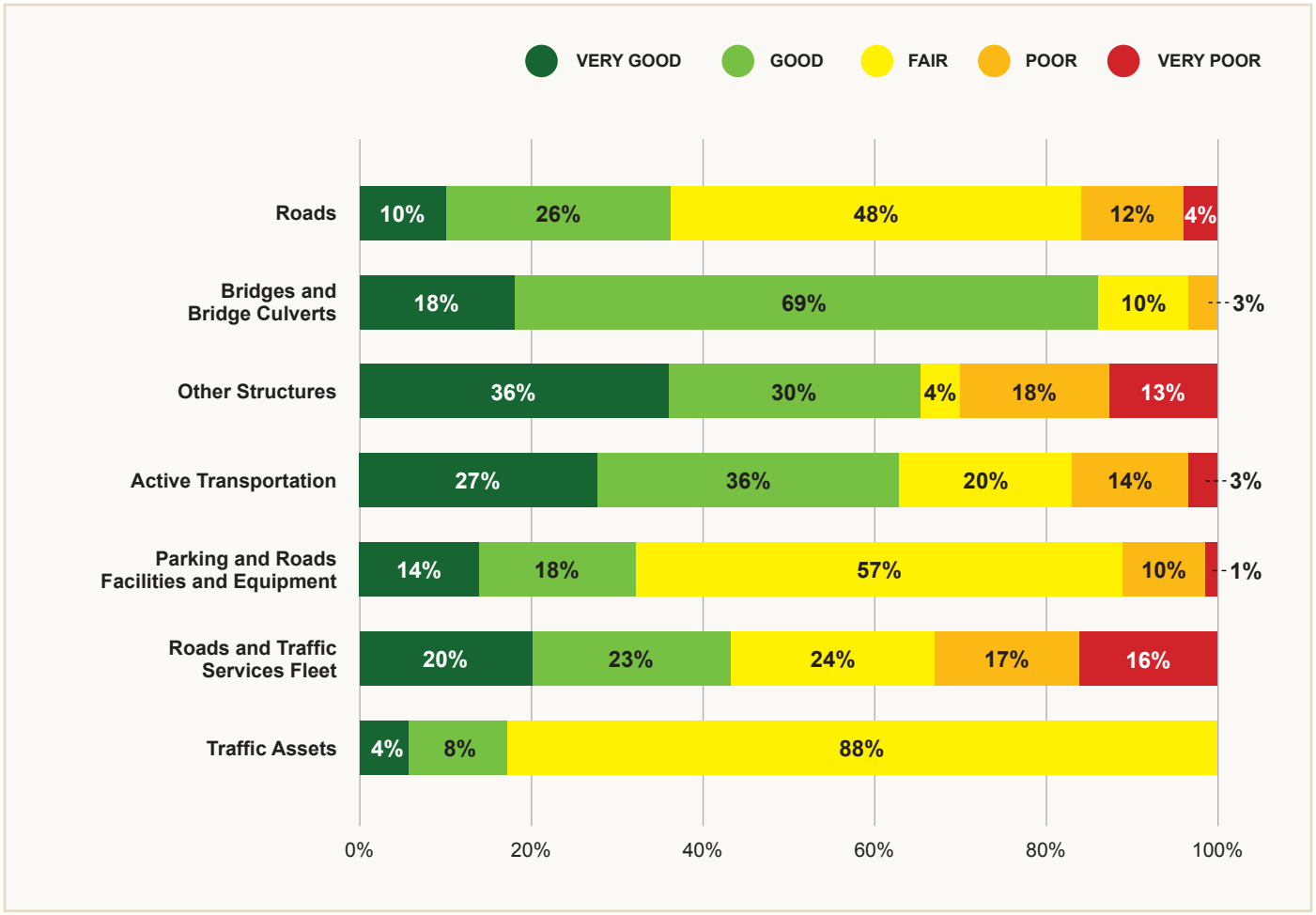
The overall condition rating for Transportation Services assets is Fair to Good and a breakdown for the various asset classes is shown in the figures below. Condition distribution percentages are weighted based on replacement cost.

Overall Condition Profile of Transportation Services Assets





Condition Profile of Transportation Services Assets



The condition reporting excludes streetlights and flashers, which are included in a detailed asset management plan that is now underway. Information on these assets will be captured in the next update to this plan.

Levels of Service

3.1 LEVEL OF SERVICE CONTEXT

The City's assets exist to deliver service to customers. Levels of service measure the actual service delivered so that decisions can be made about the assets based on the service that they provide rather than simply on their condition. The regulation requires that the Asset Management Plan includes for each asset category the levels of service that the municipality proposes to provide for each of the 10 years following the year in which the plan is published.

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

- Provides a well-connected road network that serves drivers, pedestrians, cyclists and goods movement.
- Includes bridges that support a wide range of users and vehicle types.
- Includes an active transportation network that is connected and accessible.
- Provides adequate car and bicycle parking.
- Offers safety, comfort and mobility for all users of the street regardless of their age, ability, or mode of transportation.
- Reduces emissions associated with the City's operations and facilities.
- Increases resiliency to extreme weather and changing climate conditions.
- Maintains roads, structures, sidewalks, pathways and other assets in a state of good repair.
- Provides sustainable and affordable services over the long-term.

3.2 HISTORICAL AND CURRENT LEVELS OF SERVICE

The level of service measures for Transportation Services are shown in the table below.
The performance reported includes:

- Historical performance, showing the service levels reported in the previous version of the Asset Management Plan.
- Current performance, showing the service levels being provided by the City based on the latest available information.

Levels of Service for Transportation Services

Service Attribute	Community Level of Service	Technical Level of Service	Historical Performance (2019)	Current Performance (2023)
Capacity and use	Description, which may include maps, of the road network in the municipality and its level of connectivity[2]*	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality*	Arterial: 1.19 Collector: 1.38 Local: 1.89	Arterial: 1.18 Collector: 1.37 Local: 1.98
	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)[3]*	Percentage of bridges with loading or dimensional restrictions*	3%	3%
	Provide an active transportation network that is connected and provides access across the city	Percent of roads compliant with the City's sidewalk policy (local roads with a sidewalk and arterials/collectors with sidewalks on both sides, within the Urban Area and Villages)	Not reported	38%
		Percent of arterials/collectors compliant with the City's policy for cycling facilities (with a dedicated cycling facility, within the Urban Area and Villages)	Not reported	20%
		Total length of pathways (km)	Not reported	353 km
	Provide car and bicycle parking across the city	Number of vehicular (parking lots and on-street) and bicycle parking spaces provided by the City	Not reported	Car (paid on-street): 3,790 Car (paid off-street): 2,749 Bicycle: 5,660

2: Maps of the City's road network can be found in the Official Plan Schedule C4, Schedule C5 and Schedule C9.
3: The City's bridges support a range of users including pedestrians, cyclists and vehicles (including light-duty vehicles, medium and heavy trucks, buses, motorcycles and mopeds). They facilitate travel for commuting, shopping, leisure and recreation, work-related purposes, emergency services, education, public transportation, freight and logistics.

Service Attribute	Community Level of Service	Technical Level of Service	Historical Performance (2019)	Current Performance (2023)
Function	Provide safe travel for all users	Number of fatal and major injury collisions per 100,000 population (5 year rolling average)	15.3	12.3 (2022)
	Reduce emissions associated with the City's operations and facilities	Annual GHG emissions from Transportation buildings per thousand square feet (tonnes CO_2e)	Not reported	2.3 t/1,000 sq. ft.
		Annual GHG emissions from Transportation fleet (tonnes CO_2e)	Not reported	10,814 t
	Reduce emissions associated with transportation in the community	Annual community GHG emissions from on-road transportation (kt CO_2e)	1,948 kt	2,094 kt
	Increase resiliency to extreme weather and changing climate conditions	Percent of facilities with backup power for critical systems	Not reported	9%
	Support equitable outcomes across the community	Average road pavement condition (PQI) in areas of strong equity concern relative to other areas of the city	Not reported	Strong equity concern: 51.4 (Other areas of the city: 57.6)
		Proportion of roads compliant with the City's sidewalk policy in areas of strong equity concern relative to other areas of the city (within the Urban Area)	Not reported	Strong equity concern: 46% (Other areas of the city: 35%)
		Proportion of arterials/collectors compliant with the City's policy for cycling facilities in areas of strong equity concern relative to other areas of the city (within the Urban Area)	Not reported	Strong equity concern: 26% (Other areas of the city: 19%)
	Incentivize and provide options, encouraging and enabling travel by all modes (especially walking, cycling and transit)	Sustainable mode share	Not reported	City-wide: 41.5% (2022) Within Greenbelt: 50.6% (2022)

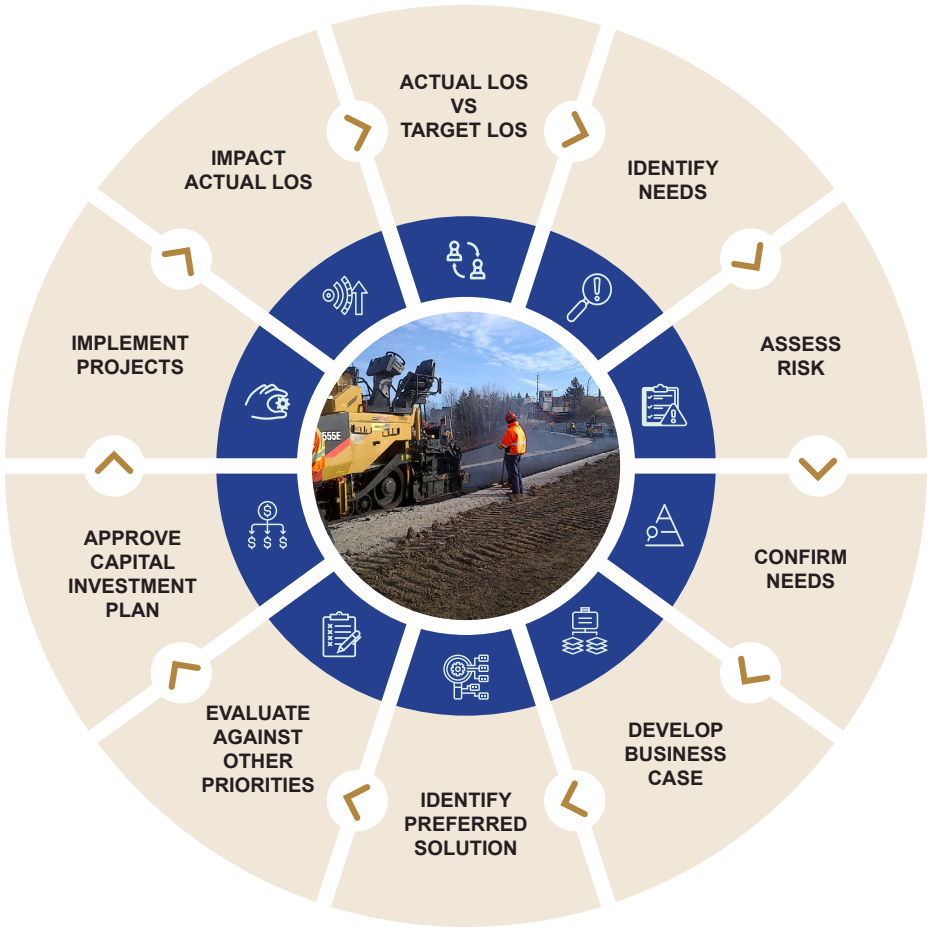
Service Attribute	Community Level of Service	Technical Level of Service	Historical Performance (2019)	Current Performance (2023)
Reliability	Keep transportation assets in good working condition	For paved Roads, the average pavement condition index value (PQI on a scale of 0 to 100)*	59	57
		For Gravel Roads, the average surface condition (Very Good to Very Poor on a 5-point scale)*	Good	Good
		For Bridges, the average bridge condition index value (BCI on a scale of 0 to 100)*	74	74
		For Bridge Culverts (structural culverts), the average bridge condition index value (BCI on a scale of 0 to 100)*	67	78
		Percent of Other Structures in fair or better condition	55%	69%
		Percent of Active Transportation assets in fair or better condition	88%	83%
		Percent of Parking and Roads Facilities and Equipment in fair or better condition	Not reported	89%
		Percent of Roads and Traffic Services Fleet assets in fair or better condition	88%	67%
		Percent of Traffic Assets in fair or better condition	Not reported	52%
Affordability	Provide sustainable and affordable services over the long-term	Asset renewal funding ratio (renewal funding as a share of replacement cost) for roads	Not reported	0.3%
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for bridges and bridge culverts	Not reported	0.7%
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for other structures	Not reported	2.0%
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for Active Transportation	Not reported	1.0%
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for Parking and Roads Facilities and Equipment	Not reported	0.8%
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for Roads and Traffic Services Fleet	Not reported	5.4%
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for Traffic Assets	Not reported	0.5%

**Required by Ontario Regulation 588/17 – see Appendix A for additional information.*

Asset Management Strategy

4.1 PRACTICES, PROCEDURES AND TOOLS

The regulation requires that the Asset Management Plan defines a lifecycle management strategy with respect to the assets in each asset category for the 10-year period. One of the key objectives of asset management is to recognize the objectives of the City and align them with the City's long term financial plans. This will allow Council to make informed decisions and provide clear direction on how the City will balance service levels, risks, and costs.



The City has well-established practices to assess the risk of not meeting community and technical level of service standards and to determine the lowest lifecycle cost activities to reduce the risks to acceptable levels and the associated costs of undertaking them. The Asset Management Plan provides the needs forecast associated with achieving target levels of service and compares it to the planned budget to determine service area gaps or surpluses.

The various lifecycle activities are delivered by different parts of the organization. The asset management process is an opportunity to take a holistic view of the asset lifecycle and identify any assets that would benefit from coordinated implementation of lifecycle strategies. It is important that each type of asset has an appropriate blend of activities across its lifecycle and that staff interacting with the asset understand the interrelations between the various activities and their impact on cost, risk and service level.

4.2 GROWTH, ENHANCEMENT AND RENEWAL

In developing the Transportation Services Asset Management Plan, a preliminary estimate was prepared of the cost of achieving the target levels of service. The estimates are based on 2024 data and include forecasts of:

- Growth needs based on the 2024 City-wide and Area-Specific Development Charges Background Study (March 15, 2024), the 2024 Development Charge Background Study Amendment Report and By-laws (October 2024) and the 2022 Community Benefits Charge Strategy and By-law, required to serve the city's growing population.[4]
- Enhancement needs that were assumed to be equal to the planned budget, required to improve services, meet new or updated standards, or address accessibility.
- Renewal needs based on lifecycle modelling, building condition audits and forecasted lifecycle renewal needs for fleet, required to maintain assets in a state of good repair.[5] These activities include major repairs, rehabilitation and replacement.
- Other renewal needs for the opportunistic renewal of roads coordinated as part of other projects, as well as renewal-related activities that do not contribute directly to improvements in asset condition (such as planning, condition assessment, inspections, etc.), which are categorized as "Renewal – Other" to distinguish them in the funding analysis, and which are assumed to be equal to the planned budget.

4: Growth needs include only the projects that are identified as being affordable and do not include all the projects needed to support growth (i.e., the projects in the Transportation Master Plan "network concept"). Growth needs (and the Development Charges Background Study) will be updated in 2025 based on the infrastructure projects identified in the Transportation Master Plan Update.
5: Renewal needs are assumed to be equal to the planned budget for Noise Barriers, Traffic Signals, Traffic Cameras, Flashers and Streetlights. Renewal needs forecasts were not available for Gravel Roads, Retaining Walls, Guiderails and PXOs.

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

City of Ottawa Population Projections for 2046

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

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

The tables below summarize the future growth, enhancement and renewal needs forecasts for Transportation Services assets.

Growth and Enhancement Needs Forecast for Transportation

	10-Year Needs (millions; 2024$)		
Asset Class	**Growth[6]**	**Enhancement**	**Total**
Roads, Bridges and Bridge Culverts, Other Structures, Active Transportation, Traffic Assets[7]	$1,418.5	$498.9	$1,917.4
Parking and Roads Facilities and Equipment	$10.6	Not applicable	$10.6
Roads, Parking and Traffic Services Fleet	$19.4	Not applicable	$19.4
Total	**$1,448.5**	**$498.9**	**$1,947.3**

Totals may not sum exactly due to rounding.

6: Growth needs presented in the Transportation Asset Management Plan are based on the 2024 City-wide and Area-Specific Development Charges Background Study (March 2024), which provides an investment forecast that is limited by financial constraints. The Transportation Master Plan (June 2025) also identifies an unconstrained, "needs-based" network to address growth-related mobility needs and support the City's mobility objectives. The needs-based network involves significant additional investment in transportation infrastructure, not expressed in the Transportation Asset Management Plan (June 2025). This will be reflected in the next update of the Transportation Asset Management Plan.
7: Growth needs for different asset classes are aggregated because the Development Charges Background Study data does not distinguish needs by asset class.

Renewal Needs Forecast for Transportation

	10-Year Needs (millions; 2024$)		
Asset Class	**Renewal**	**Renewal-Other**	**Total**
Paved Roads	$2,590.6	$472.4	$3,063.0
Bridges and Bridge Culverts	$1,054.3	$36.6	$1,090.9
Other Structures	$286.6	$0.0	$286.6
Active Transportation	$ 309.9	$1.1	$311.0
Parking and Roads Facilities and Equipment	$ 194.8	$0.0	$194.8
Roads, Parking and Traffic Services Fleet	$140.5	$0.0	$140.5
Traffic Assets	$52.3[8]	$0.0	$52.3
Total	**$4,629.0**	**$510.2**	**$5,139.2**

Totals may not sum exactly due to rounding.

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

8: In the absence of a reliable forecast of the future renewal needs for Traffic Assets, it was assumed that these needs would align with the projected 10-year budget.

Estimated Additional Future Costs Due to Climate Change for Transportation Services

Additional Costs Due to Climate Change	Estimated 10-year Total Additional Cost (millions; 2024$)
Increased operations and maintenance costs due to gradual, long-term impacts of climate change[9]	$18.8
Increased capital renewal costs due to gradual, long-term impacts of climate change[9]	$261.0
Increased operations and maintenance costs due to extreme weather events[10]	$14.8
Increased capital costs to implement climate change mitigation actions including active mode infrastructure, municipal fleet electrification and building retrofits[11]	$817.5
Total	**$1,112.1**

The estimates do not capture damage to capital infrastructure due to catastrophic/extreme weather events (e.g., tornadoes); increased capital renewal needs due to accelerated asset deterioration; increased growth costs to meet climate change requirements; increased capital renewal costs for assets other than buildings (such as fleet and equipment); and gradual, long-term impacts due to climate hazards other than extreme heat and extreme rainfall (such as drought, ice storms and wildfires).

4.3 OPERATIONS AND MAINTENANCE

Operations strategies are developed to deliver the services and involve consumption of resources such as human resources, energy, chemicals and materials. Maintenance strategies are the regular ongoing activities necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again.

New assets acquired or constructed by the City due to growth will incur additional future operations and maintenance costs beyond current expenditures. It is crucial for the City to evaluate these prospective costs and their affordability when making decisions regarding new asset acquisition or construction.

9: Estimated costs due to gradual, long-term impacts of climate change are based on the Financial Accountability Office of Ontario's "Costing Climate Impacts to Public Infrastructure" study.
10: Estimated operations and maintenance costs due to extreme weather events are based on historical City financial data and Task Force on Climate-Related Financial Disclosures (TCFD) reporting for recent significant weather events.
11: Estimated capital costs to implement climate change mitigation actions are based on the Energy Evolution study (2020) and subsequent detailed studies such as the Green Fleet Strategy.

Financing Strategy

The regulation requires that the Asset Management Plan defines a financial strategy with respect to the assets in each asset category for the 10-year period. The City continues to invest responsibly in maintaining infrastructure and has been increasing its capital investments to align with long-range financial plans. Funding targets recommended in the 2017 Comprehensive Asset Management Program were focused on maintaining critical infrastructure in a state of good repair. There will be a need to update the long range financial plans once new service levels are defined to ensure financial sustainability.

5.1 EXPENDITURE HISTORY

For information on historical operating and capital expenditures, refer to the City's historical annual budget documents. Note that historical budget values function as estimates for expenditures, and actual spending may differ from the budgeted amounts shown.

5.2 EXPENDITURE FORECAST

Over the next 10 years, the City will continue investing in infrastructure to support operational expenses, respond to renewal needs, serve growth, and provide enhancements. The planned operating budget is based on Financial Service's 2024 operating budget forecast for Parking, Roads and Traffic Services, Transportation Planning Services and other support services, and the planned capital budget is based on the City's 2024 10-year capital budget forecast.

Budget Forecast for Transportation Services

Component	Budget Forecast (Millions; 2024$)										
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	Total
Operating Budget[12]	$212.0	$222.8	$232.3	$242.3	$253.0	$264.2	$276.2	$288.9	$302.4	$316.8	**$2,611.0**
Capital Budget – Growth	$88.3	$104.4	$70.5	$86.2	$81.3	$83.3	$56.6	$69.2	$70.2	$61.4	**$771.5**
Capital Budget – Enhancement	$46.8	$81.2	$96.1	$113.0	$36.1	$22.8	$25.6	$24.5	$26.1	$26.7	**$498.9**
Capital Budget – Renewal	$178.1	$142.7	$135.5	$142.4	$148.0	$150.7	$153.1	$153.7	$158.3	$166.0	**$1,528.5**
Capital Budget – Renewal - Other	$49.4	$53.9	$49.9	$54.5	$50.2	$47.8	$ 48.9	$48.9	$53.2	$53.6	**$510.2**

Totals may not sum exactly due to rounding.

12: Values shown are net operating budget requirement after expenditure recoveries.

Funding Analysis

The regulation requires that an identification of the annual funding projected to be available to undertake lifecycle activities is summarized in the Asset Management Plan. If, based on the funding projected to be available, the municipality identifies a service area shortfall for the lifecycle activities identified, the regulation requires an explanation of how the municipality will manage the risks associated with not undertaking any of the lifecycle activities needed.

The future capital funding needs are compared to planned budgets in order to identify potential service area shortfalls (or "gaps"), the risks to service that could result, and possible strategies to mitigate them.

6.1 SERVICE AREA GAP

An Asset Management Plan provides a forecast of where the City will be in 10 years with respect to some service level targets based on historic decisions on how the City invests in and manages assets. The service area gap is the difference between the forecasted capital investment needs and the investment that the City has budgeted. As a result, service area gaps can and will change as a result of future changes to policy, masterplans, population, service delivery, asset inventory, or investment by the City and other orders of government. Over the next 10 years, the total needs for Transportation Services assets exceeds the planned budget, leading to a service area gap. The forecasted investment needs, planned budgets and service area gaps are summarized in the table and figure below.

Capital Service Area Gap for Transportation Services

Asset Class	10-Year Need ($ millions; 2024$)	10-Year Funding ($ millions; 2024$)	10-Year Gap ($ millions; 2024$)
Growth			
Active Transportation, Bridges and Bridge Culverts, Other Structures, Roads, Traffic Assets	$1,418.5	$741.8	($676.7)
Parking and Roads Facilities and Equipment	$10.6	$17.1	$6.5
Roads, Parking and Traffic Services Fleet	$19.4	$12.6	($6.8)
Growth Total	**$1,448.5**	**$771.5**	**($677.0)**

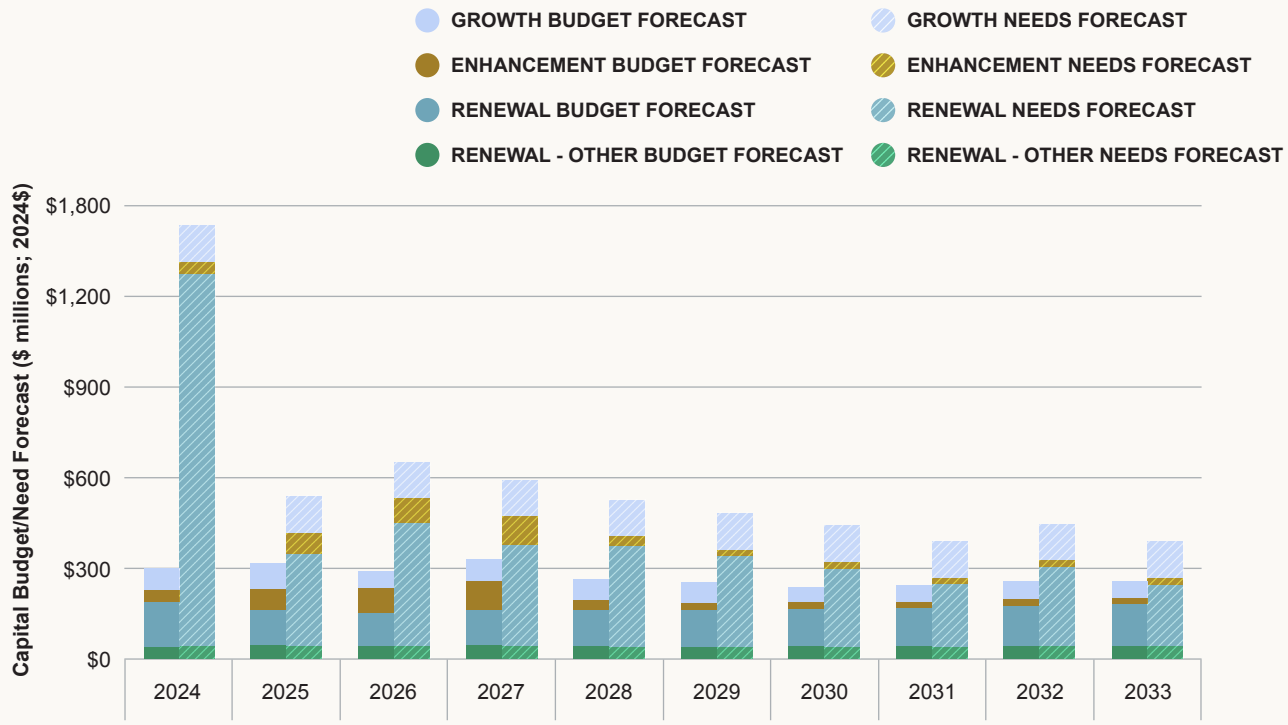
Asset Class	10-Year Need ($ millions; 2024$)	10-Year Funding ($ millions; 2024$)	10-Year Gap ($ millions; 2024$)
Enhancement			
All Transportation Assets	$498.9	$498.9	-
Enhancement Total	**$498.9**	**$498.9**	**-**
Renewal			
Roads	$2,590.6	$665.5	($1,925.1)
Bridges and Bridge Culverts	$1,054.3	$274.3	($780.0)
Other Structures	$286.6	$236.8	($49.8)
Active Transportation	$309.9	$153.4	($156.5)
Traffic Assets	$52.3	$52.3	-
Parking and Roads Facilities and Equipment	$194.8	$60.7	($134.1)
Roads, Parking and Traffic Services Fleet	$140.5	$85.6	($55.0)
Renewal Total	**$4,629.0**	**$1,528.5**	**($3,100.5)**
Renewal - Other			
Roads[14]	$472.4	$472.4	-
Bridges and Bridge Culverts	$36.6	$36.6	-
Other Structures	-	-	-
Active Transportation	$1.1	$1.1	-
Traffic Assets	-	-	-
Parking and Roads Facilities and Equipment	-	-	-
Roads, Parking and Traffic Services Fleet	-	-	-
Renewal - Other Total	**$510.2**	**$510.2**	**-**
Grand Total	**$7,086.6**	**$3,309.1**	**($3,777.5)**

Totals may not sum exactly due to rounding.

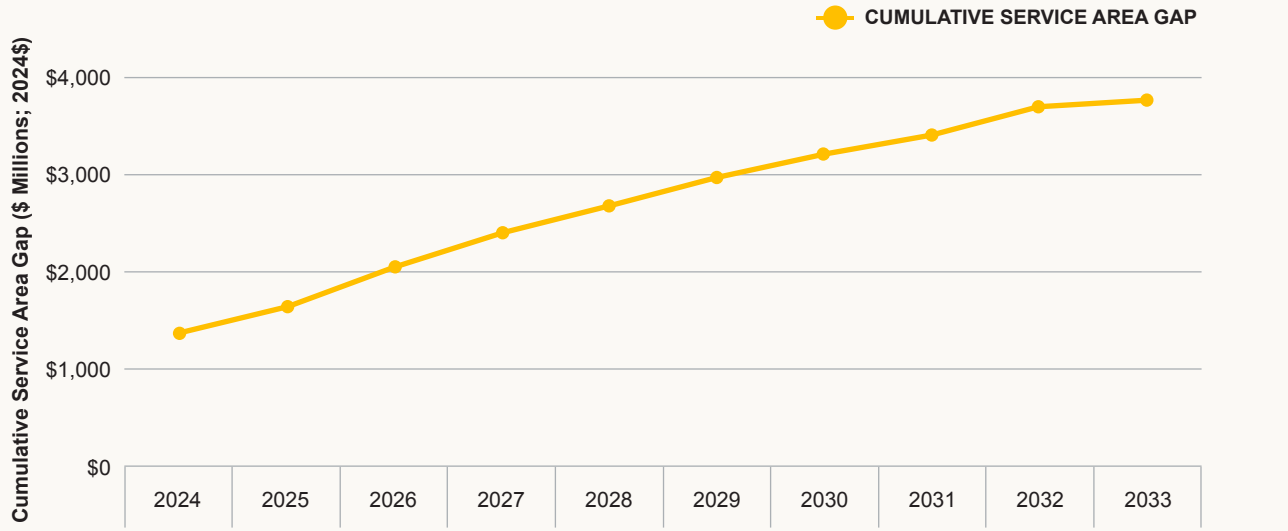
In the absence of a reliable forecast of the future renewal needs for Traffic Assets, it was assumed that these needs would align with the projected 10-year budget. Additional information is currently being captured and will be included in the next update to this plan.

14: Roads renewed through the integrated renewal program are typically renewed prior to their end-of-life in order to take advantage of coordination opportunities, and therefore improve condition of lower priority assets. The analysis assumed that 100% of integrated funding is allocated to these "opportunistic" renewals (which are categorized as "Renewal – Other") rather than contributing to road lifecycle renewal needs.

Capital Budget and Capital Needs Forecast for Transportation Services



Cumulative Capital Service Area Gap for Transportation Services



The above capital service area gap does not include the estimated additional future costs due to climate change outlined in Section 4.2. The City has planned dedicated funding over the next 10 years to support climate change needs through the Climate Change Master Plan and annual GHG and Emissions program. The funding supports not only transportation services, but all other services provided by the City. The climate change capital funding needs identified for the various City services and the total planned capital funding for climate change initiatives are summarized in the table below. These are preliminary estimates that are being refined and prioritized through various initiatives, but they give a sense of the order-of-magnitude of future planned budget and potential needs. These estimates do not include infrastructure repair or replacement costs for extreme weather events such as tornadoes, riverine flooding or ice storms. The analysis does not capture funding from external sources such as other levels of government. Capital funding will need to be integrated across departmental budgets.

The analysis is based on the City's 2024 ten-year capital budget forecast. It is important to note that the 2024 funding forecast shown is $155 million higher than the final approved 2025 budget forecast, which allocates $91.2 million over 10 years (versus $246.4 million as shown in the table).

Estimated Future Climate Change Capital Budgets and Capital Needs for All City Services[15]

	10-Year Need (millions; 2024$)	10-Year Funding (millions; 2024$)	10-Year Gap (millions; 2024$)
Climate Change	$1,700	$246.4	($1,453.6)

6.2 EXPECTED AND TARGET LEVELS OF SERVICE

For levels of service, the City has established performance targets as well as anticipated performance. These metrics can be compared to assess the alignment between expected and target performance. The table below includes:

- Current performance, showing the service levels being provided by the City based on the latest available information.
- Arrows to show whether the measure is expected to trend upward, downward, or remain relatively stable, with colours to show whether that trend is positive (green) or negative (red) relative to the target level of service.
- Expected performance, showing the service levels expected to be achieved based on the City's planned budget.
- Target performance, showing the City's target level of service based on Council direction, City policy, strategy or master plan, or other reference.

15: Needs and budgets for Solid Waste and Transit are excluded because all financial analysis for these services is captured in the respective Long Range Financial Plan.

Expected and Target Levels of Service for Transportation Services

Service Attribute	Community Level of Service	Technical Level of Service	Current Performance (2023)	Trend (2024-2033)	Expected Performance (2033)	Target Performance (2033)	Source for Target
Capacity and use	Description, which may include maps, of the road network in the municipality and its level of connectivity*	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality*	Arterial: 1.18 Collector: 1.37 Local: 1.98	↑	Increase	Not applicable	
	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)*	Percentage of bridges with loading or dimensional restrictions*	3%	→	Maintain	Maintain	Asset Management Services staff
	Provide an active transportation network that is connected and provides access across the city	Percent of roads compliant with the City's sidewalk policy (local roads with a sidewalk and arterials/ collectors with sidewalks on both sides, within the Urban Area and Villages)	38%	↑	Increase	Increase	Official Plan
		Percent of arterials/collectors compliant with the City's policy for cycling facilities (with a dedicated cycling facility, within the Urban Area and Villages)	20%	↑	Increase	Increase	2023 Transportation Master Plan Policies
		Total length of pathways (km)	353 km	↑	Increase	Increase	2023 Transportation Master Plan Policies
	Provide car and bicycle parking across the city	Number of vehicular (parking lots and on-street) and bicycle parking spaces provided by the City	Car (paid on-street): 3,790 Car (paid off-street): 2,749 Bicycle: 5,660	↑	Increase	Refer to Municipal Parking Management Strategy and Public Bike Parking Strategy	

Service Attribute	Community Level of Service	Technical Level of Service	Current Performance (2023)	Trend (2024-2033)	Expected Performance (2033)	Target Performance (2033)	Source for Target
Function	Provide safe travel for all users	Number of fatal and major injury collisions per 100,000 population (5 year rolling average)	12.3 (2022)	Expected performance not available		Decrease	Road Safety Action Plan
	Reduce emissions associated with the City's operations and facilities	Annual GHG emissions from Transportation buildings per thousand square feet (tonnes CO_2e)	2.3 t/1,000 sq. ft.	↓[16]	Decrease[16]	0.9 t/1,000 sq. ft.	Climate Change Master Plan
		Annual GHG emissions from Transportation fleet (tonnes CO_2e)	10,804 t	Refer to Green Fleet Strategy		Refer to Green Fleet Strategy	
	Reduce emissions associated with transportation in the community	Annual community GHG emissions from on-road transportation (kt CO_2e)	2,094 kt	↓[16]	Decrease[16]	Decrease	Climate Change Master Plan
	Increase resiliency to extreme weather and changing climate conditions	Percent of facilities with backup power for critical systems	9%	↑	Increase	No set target	
	Support equitable outcomes across the community	Average road pavement condition (PQI) in areas of strong equity concern relative to other areas of the city	Strong equity concern: 51.4 (Other areas of the city: 57.6)	Expected performance not available		No set target	
		Proportion of roads compliant with the City's sidewalk policy in areas of strong equity concern relative to other areas of the city (within the Urban Area)	Strong equity concern: 46% (Other areas of the city: 35%)	Expected performance not available		No set target	
		Proportion of arterials/collectors compliant with the City's policy for cycling facilities in areas of strong equity concern relative to other areas of the city (within the Urban Area)	Strong equity concern: 26% (Other areas of the city: 19%)	Expected performance not available		No set target	

16: Emissions are expected to trend downward, however planned funding levels are not expected to be sufficient to reach 2030 and 2040 GHG emissions reduction targets.

Service Attribute	Community Level of Service	Technical Level of Service	Current Performance (2023)	Trend (2024-2033)	Expected Performance (2033)	Target Performance (2033)	Source for Target
Reliability	Incentivize and provide options, encouraging and enabling travel by all modes (especially walking, cycling and transit)	Sustainable mode share	City-wide: 41.5% (2022) Within Greenbelt: 50.6% (2022)	↑	Increase	Greater than 50% (by 2046)	Official Plan
	Keep transportation assets in good working condition	For paved Roads, the average pavement condition index value (PQI on a scale of 0 to 100)*	57	↓	40	65	Lifecycle modelling
		For Gravel Roads, the average surface condition (Very Good to Very Poor on a 5-point scale)*	Good	→	Maintain	Maintain	Asset Management Services staff
		For Bridges, the average bridge condition index value (BCI on a scale of 0 to 100)*	74	↓	69	74	Lifecycle modelling
		For Bridge Culverts (structural culverts), the average bridge condition index value (BCI on a scale of 0 to 100)*	78	↓	72	83	Lifecycle modelling
		Percent of Other Structures in fair or better condition	69%	↓	55%	69%	Lifecycle modelling
		Percent of Active Transportation assets in fair or better condition	83%	↓	81%	78%	Lifecycle modelling
		Percent of Parking and Roads Facilities and Equipment in fair or better condition	89%	↓	51%	98%	Lifecycle modelling
		Percent of Roads, Parking and Traffic Services Fleet assets in fair or better condition	67%	↓	52%	71%	Lifecycle modelling
		Percent of Traffic Assets in fair or better condition	52%	Expected performance not available		No set target	

Service Attribute	Community Level of Service	Technical Level of Service	Current Performance (2023)	Trend (2024-2033)	Expected Performance (2033)	Target Performance (2033)	Source for Target
Affordability	Provide sustainable and affordable services over the long-term	Asset renewal funding ratio (renewal funding as a share of replacement cost) for roads	0.3%	Not applicable		1.1%	Lifecycle modelling
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for bridges and bridge culverts	0.7%	Not applicable		2.7%	Lifecycle modelling
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for other structures	2.0%	Not applicable		2.9%[17]	Lifecycle modelling
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for Active Transportation	1.0%	Not applicable		2.1%	Lifecycle modelling
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for Parking and Roads Facilities and Equipment	0.8%	Not applicable		2.5%	Lifecycle modelling
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for Roads, Parking and Traffic Services Fleet	5.4%	Not applicable		8.9%	Lifecycle modelling
		Asset renewal funding ratio (renewal funding as a share of replacement cost) for Traffic Assets	0.5%	Not applicable		No set target	

**Required by Ontario Regulation 588/17.*

Positive upward trend	**Negative upward trend**	**Positive downward trend**	**Negative downward trend**	**Positive stable trend**	**Negative stable trend**

17: Target asset renewal funding ratio for other structures includes only Small and Medium Culverts because lifecycle modelling was not available for Retaining Walls, Guiderails and Noise Barriers.

6.3 RISK MANAGEMENT

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

Ontario Regulation 588/17 requires an analysis of the risks associated with the proposed levels of service and implementation of the Asset Management Plan. These key risks and how the City mitigates the most critical risks are summarized in the tables below.

Key Risks and Risk Mitigation for Levels of Service

Risk Area[18]	Potential Impacts	City Response
Funding for Growth	Underfunding may reduce ability to build new infrastructure to support growth in a timely fashion. This could put increased demand on existing infrastructure, reduced redundancy, higher reactive repair costs, and delayed development. Delayed growth projects may result in traffic congestion and delay, safety impacts, reduced quality of life, and impacts to goods movement and the city's economy.	The City regularly updates the master plans and Development Charges By-law that address growth funding needs. Increased growth needs can be incorporated into these updates, and into future updates of the Asset Management Plan.
Lifecycle Renewal Funding	Delays in renewal activities could impact service reliability and increase long-term costs (including operations and maintenance costs).	The City prioritizes capital projects by assessing the condition of infrastructure assets, using a risk-based approach to evaluate the potential impact on service levels, and coordinating with other projects to minimize disruptions. This structured approach prioritizes critical assets and within affordability constraints.

18: As per section 6 of Ontario Regulation 588/17: the Asset Management Plan shall identify the risks associated with the options for which lifecycle activities could potentially be undertaken to achieve the proposed levels of service as well as the risks associated with those options to the long term sustainability of the municipality.

Risk Area	Potential Impacts	City Response
Operations & Maintenance Funding	Underfunding may reduce service reliability and increase emergency repairs.	Operating budget allocations are optimized such that funds are directed towards essential operations, emphasize preventive measures to maintain service levels, and consider public feedback to align with community needs and within affordability constraints.
Climate Change Mitigation & Resilience	Deferral of climate-related initiatives may hinder adaptation, result in service disruptions, increase long-term costs, and put pressure on existing budgets, and risk missing emission reduction targets.	The Climate Change Master Plan (CCMP) and its supporting strategies provide direction for prioritizing climate investments in both mitigation and adaptation. The CCMP also identifies the need to apply a climate lens to asset management and capital projects, including through departmental capital planning and prioritization processes. Implementation of the CCMP and its supporting plans is a shared responsibility across all departments. The response to the 2024 CCMP audit will provide further direction on priorities.
Rising Asset Replacement Costs	Higher costs may lead to project delays and increased financial pressure. Less projects could be completed with the same amount of money.	The City uses comprehensive asset management, emphasizing preventive maintenance, and prioritizes investments based on risk and within affordability constraints. It also conducts long-term financial planning and explores innovative solutions to reduce costs and enhance service delivery.

Risk Area	Potential Impacts	City Response
Fleet Maintenance & Electrification	Higher maintenance costs or insufficient electrical infrastructure could affect fleet reliability and emergency response.	The Green Fleet Strategy recommends an approach that ensures the City has adequate infrastructure in place as it moves forward with vehicle electrification. The strategy recommends proactively developing energy supply and refueling infrastructure ahead of electrification as well as initiating building-level upgrades and civil infrastructure upgrades prior to the purchase of electric vehicles.
Extreme Weather Impacts	More frequent events may damage assets, disrupt services, and increase maintenance needs.	Climate Ready Ottawa – the City's draft climate resiliency strategy – is a long-term strategy and implementation plan that will guide City-wide action and investment to prepare for a much warmer, wetter and unpredictable climate. It includes conducting climate risk assessments for critical infrastructure to prioritize investments and actions. Insurance and City reserves are also available for unplanned costs due to extreme weather.
Operational Pressures from Climate Change	Increased demands on staff and resources may affect other service delivery or increase costs.	Climate Ready Ottawa considers future increased operating budget needs due to climate change by guiding long-term action and investment to ensure the city's resilience by 2050. Implementation of priority Energy Evolution projects may result in increases or decreases to operating budgets. Changes in operating budget pressures are considered annually as part of the budget process for specific projects and programs.

Risk Area	Potential Impacts	City Response
Non-Urgent Regulatory & Equity Needs	Delays may impact inclusivity, accessibility, and workplace suitability. Workforce pressures may impact staff retention and morale, which can affect continuity and capacity for emergency response.	The City strives to ensure that critical needs are met and within affordability constraints by prioritizing essential needs and services, seeking grants and partnerships, improving efficiency, engaging with the community, and conducting long-term financial planning. Accessibility and equity upgrades will be prioritized based on identified needs and risks.
Funding for Enhancements	Opportunities to include enhancements (e.g., pedestrian and cycling facilities) in renewal projects may be limited.	The City prioritizes projects based on need, coordinates with other infrastructure projects, and seeks external funding opportunities. It also engages residents to understand public priorities and reviews projects regularly to optimize resource allocation.

Key Risks and Risk Mitigation for Asset Management Plan Implementation

Key Risks to Asset Management Plan Implementation	Response
Population forecasts may change.	Changes to population forecasts will impact the growth needs forecasts, which will be reviewed and updated at least every 5 years as part of the Asset Management Plan update. Key issues can be identified as part of the annual review of the City's progress in implementing the asset management plan and in the "Asset Management Implications" section of individual reports to Council.
Future approved budgets may vary from the planned budgets assumed in the Asset Management Plan financial analysis.	The Asset Management Plan will be updated at least every 5 years, including an updated budget analysis. This will allow for a reassessment of future needs, expected levels of service, and risk. Key impacts due to budget changes can be addressed in the annual review of the City's progress in implementing the asset management plan and in the "Asset Management Implications" section of individual reports to Council.
Council may take on more assets than planned in the Asset Management Plan.	Additional assets will most impact the operations and renewal forecast. Key impacts can be addressed annually as part of the review of the City's progress in implementing the Asset Management Plan and in the "Asset Management Implications" section of individual reports to Council.
Council or changes in legislation/regulation may mandate higher/different target service levels.	Higher or different proposed service levels will impact spending needs which could result in a need to consider alternative approaches to service delivery, increases in revenue to support increased service levels, or a shifting of funding that re-prioritizes service levels and possibly increases risk in other areas. This will be reviewed and updated at least every 5 years as part of the Asset Management Plan update. As indicated above, key impacts can be addressed annually as part of the review of the City's progress in implementing the Asset Management Plan and in the "Asset Management Implications" section of individual reports to Council.

Key Risks to Asset Management Plan Implementation	Response
Changes in asset or financial data, which may affect the findings presented in the Asset Management Plan.	Changes in the data used to produce the Asset Management Plan will be reflected in the Asset Management Plan update at least every 5 years. As indicated above, key impacts can be addressed annually as part of the review of the City's progress in implementing the asset management plan and in the "Asset Management Implications" section of individual reports to Council.

6.4 NON-FINANCIAL STRATEGIES

There are various forms of viable non-financial solutions that could support the City's overall financial strategies to overcome identified service area gaps. Existing and potential non-financial strategies include:

- Convert low-traffic rural roads to gravel and medium-traffic roads to surface treatment.
- Prioritize roads within villages and close unmaintained rights-of-way.
- Enforce seasonal load restrictions more strictly in high-development areas.
- Use innovative materials and techniques to reduce renewal and maintenance needs.
- Bundle projects for cost-efficiency and phase projects to manage costs.
- Manage expectations through deliberate communication programs.
- Promote transit-oriented development and increase land use densities.
- Strengthen preventive maintenance programs to reduce lifecycle costs.
- Implement initiatives from the Fleet Service Review.

Any new strategies may have impacts on residents and services and should be subject to further study prior to being pursued.

Improvement Plan

The regulation requires that the Asset Management Plan demonstrate the municipality's approach to continuous improvement and adoption of appropriate practices regarding asset management planning. Based on the snapshot of current conditions and existing plans presented in this Asset Management Plan, areas of potential improvement include:

- Continue to address data gaps, data management, and record keeping
- Update cost estimates
- Review, track and report levels of service
- Improve and expand needs forecasts, financial forecasts and funding analysis
- Continue populating expected level of service projections
- Further integrate climate change mitigation and adaptation
- Expand the application of an equity and inclusion lens

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

MORE INFORMATION

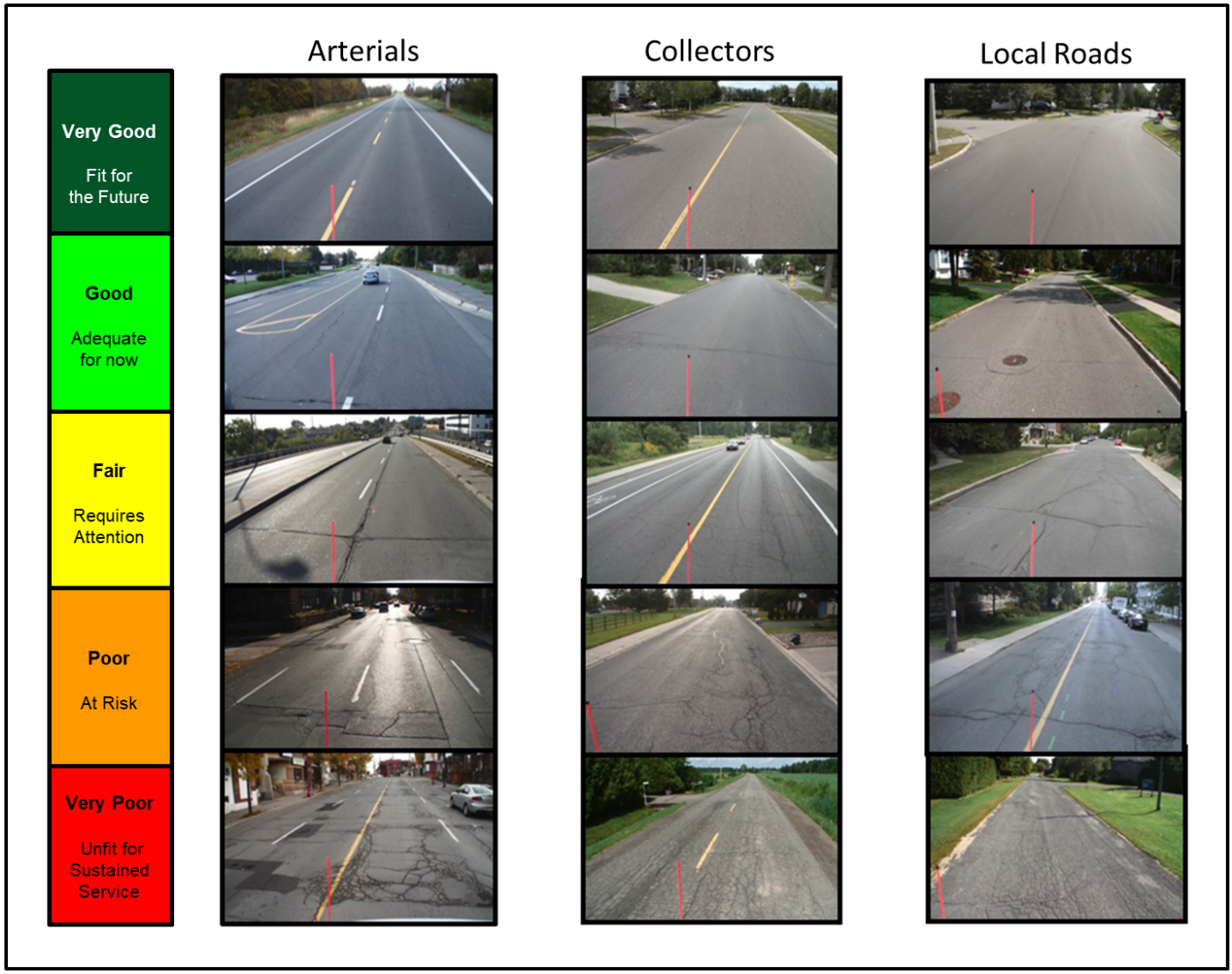
For more information about the Asset Management Plan, and the background information and reports upon which it is based, please visit Ottawa.ca or contact the City of Ottawa Asset Management Service.

Appendix A:

Supplementary Level of Service Information

The figures below illustrate examples of a range of different conditions for roads and structures and indicate how this impacts use.

Condition Framework for Roads



Condition Framework for Structures

	Bridges	Culverts (3 m and greater)
Very Good Fit for the Future		
Good Adequate for now	 Good to Very Good	 Good to Very Good
Fair Requires Attention	 Fair	 Fair
Poor At Risk	 Poor to Very Poor	 Poor to Very Poor
Very Poor Unfit for Sustained Service		