2014 ASSET MANAGEMENT PLAN

Building, Stormwater & Linear Transportation

MISSISSAUGA

Version 1

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Executive Summary

1.1 Background

The City of Mississauga is committed to providing quality services through infrastructure while continuing to build a City in a fiscally responsible manner. To show this commitment **Build and Maintain Infrastructure** has become a key strategic goal in the City of Mississauga's Strategic Plan as well as a top priority in the Council's Business Plan. These goals and objectives are achieved by applying sound asset management practices, inventorying what the City owns, conducting regular inspections, prioritizing work needs, preparing appropriate asset renewal projections and programs to address asset renewal needs, and monitoring and reporting on projected asset conditions.

This Asset Management Plan (AMP) is prepared with guidance from the requirements as outlined within Ontario's **Building Together: Guide for Municipal Asset Management Plans,** and cover the asset inventory related to City Buildings, Stormwater and Linear Infrastructure as detailed below in Table 1.1.

Table 1-1: Asset Inventory Covered in the AMP

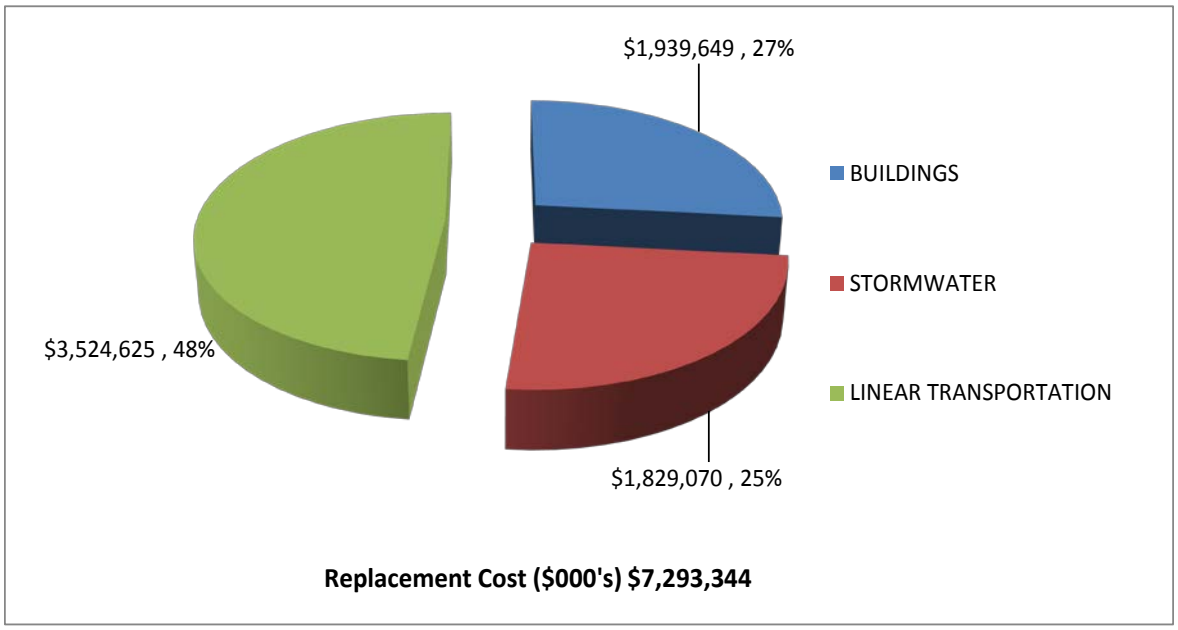
Service	Asset Type
Buildings	Building-Structure
Stormwater	SW-Stormsewer
	SW-Watercourse
	SW-Management Facilities
Linear Transportation	Linear Transportation-Pedestrian Network
	Linear Transportation-Bridge-Culvert
	Linear Transportation-Traffic Signal System
	Linear Transportation-Street Lighting System
	Linear Transportation-Noise Wall
	Linear Transportation-Public Parking
	Linear Transportation-Road Surface
	Linear Transportation-Road Subsurface

1.2 State of Local Infrastructure

The assets covered by the AMP are valued at a current replacement value of $7.3 billion. Linear Transportation assets account for most of the replacement values at approximately $3.5 billion (48% of total assets) followed by Buildings at $1.9 billion (27%) and Stormwater at $1.8 billion (25%). Given the timeline to complete the AMP not all City assets were considered. City assets not included in this version of the AMP relate to Parks, Fleet (including Transit and Fire), and Furniture and Equipment and have an associated replacement value of approximately $833 million. It is the intention to bring these assets into future versions of the City's AMP.

Figure 1.1 displays a high level overview of the assets covered by the AMP and their respective replacement values.

Figure 1-1: Replacement Cost Valuation of Assets Covered in the AMP ($000's)



In order to gain an overall perspective on the health of the City's infrastructure, a hybrid approach to assessing asset condition was used in the AMP. First asset age and estimated service life was considered to give each asset an aged based condition rating. These results were then scrutinized by departmental asset management teams comparing each asset with data sources available which included asset condition assessments, evaluations based on regular monitoring programs and expert judgment, where available, to establish a condition rating of each asset. Asset conditions were rated as either *Good, Fair, or Poor*.

Table 1.2 details the asset condition for each asset class and summarizes the total replacement value by condition category. In terms of replacement value, overall 87% or $6.3 billion of the City's assets contained in the AMP are rated in good condition, with 11% or $840 million of assets rated in fair condition, and 2% or $132 million rated in poor condition.

Table 1-2: Asset Condition by Replacement Value ($000's)

Asset	Condition Rating			Total
	Good	Fair	Poor	
Building-Structure	$ 1,599,950	$ 304,755	$ 34,944	$ 1,939,649
Total Buidling Assets	**$ 1,599,950**	**$ 304,755**	**$ 34,944**	**$ 1,939,649**
Percent (%)	**82%**	**16%**	**2%**	100%
SW-Stormsewer	$ 1,585,398	$ 99,680	$ -	$ 1,685,078
SW-Watercourse	$ 21,987	$ 27,675	$ 13,364	$ 63,026
SW-Management Facilities	$ 34,561	$ 21,453	$ 24,952	$ 80,966
Total Stormwater Assets	**$ 1,641,946**	**$ 148,808**	**$ 38,316**	**$ 1,829,070**
Percent (%)	**90%**	**8%**	**2%**	100%
Linear Transportation-Pedestrian Network	$ 171,212	$ 171,212	$ 6,988	$ 349,412
Linear Transportation-Bridge-Culvert	$ 649,964	$ 34,209	$ -	$ 684,172
Linear Transportation-Traffic Signal System	$ 45,438	$ 9,669	$ 2,406	$ 57,513
Linear Transportation-Street Lighting System	$ 280,076	$ 15,308	$ 2,042	$ 297,426
Linear Transportation-Noise Wall	$ 19,517	$ 954	$ 188	$ 20,659
Linear Transportation-Public Parking	$ 3,604	$ 466	$ 49	$ 4,119
Linear Transportation-Road Surface	$ 528,039	$ 101,546	$ 47,388	$ 676,973
Linear Transportation-Road Subsurface	$ 1,381,027	$ 53,324	$ -	$ 1,434,351
Total Linear Transportation Assets	**$ 3,078,877**	**$ 386,688**	**$ 59,061**	**$ 3,524,625**
Percentage (%)	**87%**	**11%**	**2%**	100%
Total Assets	**$ 6,320,773**	**$ 840,250**	**$ 132,321**	**$ 7,293,344**
Percent (%)	**87%**	**11%**	**2%**	**100%**

98% or $1.8 billion of the total $1.9 billion Building replacement values are in either good or fair condition. Only 2% or $35 million in Building values are considered in poor condition. 82% of the Stormsewers are in good condition, whereas only 35% of Watercourse and 43% of Stormwater Management Facilities values are considered in good condition. The majority of Linear Transportation assets are in good condition, ranging from 96% of Roads Subsurface asset values to 78% of Road Surfaces asset values. Only the Pedestrian Network has asset values of less than 50% that are in good condition.

1.3 Desired Levels of Service

Service level measures and targets are tools used to communicate to Council and the general public the state and trend of the City's infrastructure. Service level measurers and targets also allow the City to run funding scenarios and to describe to Senior Management and Council what service levels might look like given various funding scenarios.

Buildings

The City of Mississauga uses a Facility Condition Index (FCI) in assessing a building's condition. The City has set FCI targets according to building type (Region) which will determine the cost of the building asset management program. FCI targets were endorsed by City Council in 2012. Table 1.3 details the FCI targets and current performance by Region. The higher the FCI, the greater the risk of asset failure.

Table 1-3: Facility Condition Index Service Level Performance vs Targets

Facility Region	Corporate	Culture	Fire	Library	Parks	Recreation	Transit	Works	City Wide
Current FCI	0.04	0.06	0.07	0.04	0.18	0.10	0.09	0.22	0.09
Approved FC I Target	0.10	0.15	0.20	0.15	0.20	0.15	0.18	0.25	

Stormwater

The level of service for Stormwater Management Facilities, including performance targets and inspection and maintenance requirements, is typically stipulated in the Environmental Compliance Approval (ECA) issued by the Ontario Ministry of the Environment (Section 53 of the Ontario Water Resources Act) for each facility. Facilities which do not require an ECA are also regularly inspected to ensure they are in good working condition. The level of service for Watercourses (Engineered Watercourses in particular) as well as assets related to Stormsewers has been developed over time by staff based on best practices and professional judgement.

Linear Transportation

The City undertakes a condition survey on its roads every 3-4 years and utilizes a Pavement Management System to analyze results of the roads survey to forecast pavement condition and long-term financial needs.

The City has established the following condition targets to achieve a sustainable management plan for road pavement:

Table 1-4: Overall Condition Index Service Level Performance vs Target

Road Type	Overall Condition Index	
	Actual	Target
Major Roads	72	73
Residential Roads	83	70

A condition survey for all bridges and culverts is completed every two years in accordance with provincial and industry standards for safety and accessibility. At a network level, an average bridge condition index of 80 is the target set for the City's bridges and culverts.

In addition, other linear transportation assets such as sidewalks, trails, traffic signals, street lighting, parking lots and noise barriers are inspected and maintained regularly in accordance with provincial minimum maintenance standards, best practices and professional judgement. Further details regarding the inspections, maintenance and operations of linear transportation assets can be referenced in the City of Mississauga's level of Service Manual for the Works, Maintenance and Operations Division.

1.4 Asset Management Strategy

The City's approach to managing assets is a decentralized model managed within departments and includes having in place defined Levels of Service, obtaining an understanding of the condition of the asset base through condition assessments and regular inspections, and identifying optimal asset interventions. Prioritization techniques, including prioritization at the corporate level, are also utilized as an approach to determining the overall priority of asset renewal projects. Due to funding constraints however, and competing funding of needs of other service areas not considered in the AMP, not all asset renewal needs for Building, Stormwater and Linear Transportation could be funded. Table 1.5 shows the funded portions of the asset management strategies for each of these services.

Table 1-5: (2014-2023) Asset Management Strategy ($000's)

Building											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Building	$19,719	$55,203	$58,544	$29,398	$34,108	$42,963	$45,949	$52,361	$42,029	$36,753	$ 417,027
Stormwater											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Stormwater	$ 4,650	$ 4,490	$ 830	$ 5,730	$ 3,370	$ 9,400	$ 1,630	$ 3,330	$ 380	$10,990	$ 44,800
Linear Transportation											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Linear Transportation	$24,479	$15,558	$26,200	$34,600	$34,180	$29,500	$37,080	$30,500	$13,000	$38,080	$ 283,177
Asset Management Strategy											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total	$48,847	$75,252	$85,574	$69,728	$71,658	$81,863	$84,659	$86,191	$55,409	$85,823	$ 745,004

1.5 Financing Strategy

The City of Mississauga, like most municipalities, has been challenged in finding the balance between delivering services demanded by the community in an affordable manner that also provides adequate funding for asset renewal needs. The City currently has an estimated annual infrastructure deficit of $309 million, defined as the difference between the estimated annual depreciation based on the replacement values of City assets, and the City's annual contribution towards capital renewal. In order to address this infrastructure funding shortfall the City has developed enhanced infrastructure funding strategies and mechanisms.

Since 2012 the City's Business Plan and Budgets have included an incremental increase to a Capital Infrastructure and Debt Repayment Levy equal to two per cent of the City's prior year tax levy. Funds raised through the Capital Infrastructure and Debt Repayment Levy are used towards funding asset renewal decisions including servicing principal and interest on debt issued to finance asset renewal projects, making current budget contributions towards funding asset renewal projects, and contributing to capital reserves that will be available to fund future capital renewal work.

Table 1.6 shows the projected incremental increases in the Infrastructure and Debt Repayment Levy over the 2014-2023 AMP period as well as the projected total annual Infrastructure and Debt Repayment Levy by year. As can be seen, from 2014 to 2023 there is a projected increase in the annual Infrastructure and Debt Repayment Levy of $87 million, or an increase of 325%m from the 2014 funding level of $38.5 million, to the projected funding level of $125.2 million.

Table 1-6: Infrastructure and Debt Repayment Levy Projection ($000's)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Base Contribution to Capital Needs	$31,066	$38,460	$46,324	$54,581	$63,251	$72,355	$81,914	$ 91,951	$102,490	$113,555
2% Infrastucture and Debt Levy Increase	$ 7,394	$ 7,864	$ 8,257	$ 8,670	$ 9,104	$ 9,559	$10,037	$ 10,539	$ 11,065	$ 11,619
Total Annual Contribution to Capital Needs	$38,460	$46,324	$54,581	$63,251	$72,355	$81,914	$91,951	$102,490	$113,555	$125,174

In 2013 City Council approved the introduction of a Stormwater Charge where commencing in 2016 the City will see the funding for Stormwater managed through a charge on properties based on impervious area.

Table 1.7 provides a comparison of the projected average annual Stormwater funding obtained from the proposed user charge to the 2012 level of Stormwater funding provided from the property tax base, payments in lieu of taxes (PILT) and capital reserves. As can be seen there is expected to be a significant increase in annual capital funding of $7.5 million, and the expectation that on average, contributions of $3.0 million will commence being made to a Pipe Renewal Reserve for the eventual replacement of Stormsewers.

Table 1-7: Comparison of Stormwater Funding Levels ($000's)

Stormwater Program Item	Existing (2012) Tax. PILT, Capital Reserves	Future (Average Annual From User Charge)
Capital	$ 8,030	$ 15,540
Operating and Maintenance	$ 6,620	$ 7,950
Pipe Renewal Reserve	$ -	$ 3,120
Program Total	$ 14,650	$ 26,610

Further, starting in 2014 the City began to reallocate the use of Federal Gas Tax revenues to fund Linear Transportation asset renewal needs. Over the 10 year AMP period $58.7 million will be used to fund Linear Transportation asset renewal.

Even with the use of Federal gas tax receipts and the enhanced infrastructure funding strategies and mechanisms detailed above, the City of Mississauga, like all municipalities in Ontario, will continue to require increased infrastructure funding support from the provincial and federal governments to close the municipal infrastructures gap. The recent announcement of the new Building Canada Plan is a positive step toward achieving that support, however more senior government level support for infrastructure renewal will be needed if municipalities are to continue to deliver the quality service their citizens have come to expect.

Introduction

2.1 Importance of Infrastructure to Mississauga

The City of Mississauga is committed to providing quality services through infrastructure while continuing to build a City in a fiscally responsible manner. To show this commitment **Build and Maintain Infrastructure** has become key strategic goal in the City of Mississauga's Strategic Plan as well as a top priority in the Council's Business Plan. These goals and objectives are achieved by applying sound asset management practices, inventorying what the City owns, conducting regular inspections, prioritizing work needs, preparing appropriate asset renewal projections and programs to address asset renewal needs, and monitoring and reporting on projected asset conditions.

Although Mississauga has been debt free for many years, repairing and rehabilitating aging infrastructure will require an increased focus on the funding of its asset renewal needs. As such, enhanced infrastructure funding strategies and mechanisms have been developed to assist Mississauga in addressing its infrastructure funding challenges. Since 2012 the City's Business Plan and Budgets have included an incremental increase to a Capital Infrastructure and Debt Repayment Levy equal to two per cent of the City's prior year tax levy. In 2013 the City approved the introduction of a Stormwater User Charge that will create a dedicated funding source for Stormwater. And in 2014 the City has reallocated the use of Federal Gas Tax revenues to fund Linear Transportation asset renewal needs.

2.2 Relationship to Other Municipal Plans and Finance Documents

An asset management plan (AMP) is a key component of the municipality's planning process linking with multiple other corporate plans and documents, for example:

- **The Official Plan** – The AMP will both utilize and influence the land use policy directions for long-term growth and development as provided through the Official Plan;
- **Capital Budget and Forecast**– The decision framework and infrastructure needs identified in the AMP form the basis on which future capital budgets are prepared;
- **Master Plans** – The AMP will utilize goals and projections from infrastructure master plans and in turn will influence future master plan recommendations;
- **By-Laws, standards, and policies** – The AMP will influence and utilize policies and by-laws related to infrastructure management practices and standards;
- **Regulations** – The AMP must recognize and abide by industry and senior government regulations; and

- **Business Plans** – The service levels, policies, processes, and budgets defined in the AMP are incorporated into business plans as activity budgets, management strategies, and performance measures.

2.3 Purpose of the Asset Management Plan

Historically, the City of Mississauga has been proactively and responsibly managing its infrastructure. As infrastructure ages and demands increase, so will the challenge of ensuring the needs of the community are effectively met with the limited financial resources available. This initial AMP is prepared with guidance from the requirements as outlined within Ontario's **Building Together: Guide for Municipal Asset Management Plans**. The City will however continue to evolve its AMP approach to ensure a robust framework exists for considering, prioritizing, and optimizing asset management efforts, and providing direction for effective management of the City's infrastructure to best achieve established goals and objectives.

2.4 Assets Covered by the Plan

The City's asset inventory identified in the AMP is detailed in Table 2-1 and consist of asset types that relate to Building, Stormwater and Linear Transportation infrastructure. The Ministry of Infrastructure's ***Building Together – Guide for Municipal Asset Management Plans*** requires, at a minimum, that the following related assets be included in a municipality's asset management plan: Roads, Bridges, Water, Wastewater and Social Housing. Given that Water, Wastewater (excluding Stormwater) and Social Housing fall outside of the City's service delivery responsibilities, infrastructure associated with these services are not considered in the AMP. While not considered a "core" service by the Province, Building infrastructure was also included in the AMP as these assets represent approximately one quarter of the total asset value controlled by the City.

It is expected that all assets types will be considered in future versions of the AMP as best practice is to develop an asset management plan that covers all infrastructure assets for which the City is responsible. City assets not considered in the AMP include assets related to Parks, Fleet (including Transit and Fire), and Furniture and Equipment, and have an estimated replacement cost of approximately $833 million.

Table 2-1: Asset Inventory Covered in the AMP

Service	Asset Type
Buildings	Building-Structure
Stormwater	SW-Stormsewer
	SW-Watercourse
	SW-Management Facilities
Linear Transportation	Linear Transportation-Pedestrian Network
	Linear Transportation-Bridge-Culvert
	Linear Transportation-Traffic Signal System
	Linear Transportation-Street Lighting System
	Linear Transportation-Noise Wall
	Linear Transportation-Public Parking
	Linear Transportation-Road Surface
	Linear Transportation-Road Subsurface

2.5 Timeframe

Due to the strategic nature of the AMP, it covers planning horizons relevant to the nature of the asset base (i.e. reflect the expected service lives). As such, the AMP establishes a road map for a 10 year period (2014-2023) to assess critical infrastructure renewal needs and develop financing strategies to fund the work required to ensure that services are maintained at desired levels. The City's progress against the AMP will be monitored on an annual basis. It is planned that future versions of the AMP will be prepared once the City has undertaken improvement initiatives on how the City's AMP is to be monitored, improved and reviewed.

2.6 Plan Limitations

The City has a decentralized approach to asset management, whereby, departments utilize their own systems and methodologies to prioritize and rank infrastructure renewal needs. This model has served the City well as measured by the overall condition of the City's assets. However, limited financial resources and competing priorities suggest that a centralized approach in the future will assist in ensuring that the City's most critical needs continue to be addressed. Development of the first version of the City's AMP has provided a better understanding of the requirements for future AMP versions, and has helped to identify the AMP limitations.

The AMP was developed using the best information available and assumptions using professional judgement to address gaps. The limitations of the AMP include:

- The replacement cost valuation is based on inflated historical costs. No growth, technology change, or enhancement assumptions have been made for the replacement cost valuation;

- The use of age-based condition assessment was used in the absence of actual asset condition information; and
- Year of in-service and estimated service life obtained from the City's Tangible Capital Asset (TCA) data base were used in determining year of asset replacement. Many infrastructure assets however typically undergo a continual maintenance and rehabilitation process that extend their service life as well as improve the infrastructure's overall condition. Hence age may not be the most suitable indicator to use for asset management planning. This AMP limitation was mitigated where possible through discussions with departmental asset management teams to better understand asset service lives and asset condition assessments.

It is expected that improvement initiatives will be undertaken on how the City's AMP is to be monitored, improved and reviewed in the future. Key improvements to future AMPs will include condition assessment for all major asset classes, better alignment of asset data between asset data bases, assessment of asset data gaps, review of replacement cost valuation methodology, and refinements to the capital asset prioritization process.

State of Local Infrastructure

3.1 Asset

The City's asset inventory covered in the AMP is detailed in Table 3-1 and consist of asset types that relate to Building, Stormwater and Linear Transportation infrastructure. The Ministry of Infrastructure's ***Building Together – Guide for Municipal Asset Management Plans*** requires, at a minimum, that the following related assets be included in a municipality's asset management plan: Roads, Bridges, Water, Wastewater and Social Housing. Given that Water, Wastewater (excluding Stormwater) and Social Housing fall outside of the City's service delivery responsibilities, infrastructure associated with these services are not considered in this plan. While not considered a "core" service by the Province, building infrastructure was also included in the Plan as these assets represent approximately one quarter of the total asset value controlled by the City.

Table 3-1: Asset Inventory Details

Asset Group	Asset Type	Quantity	
Buildings	Building-Structure	310	Buildings and Structures
Stormwater	SW-Stormsewer	2,165	Kilometres of Storm Pipe
	SW-Watercourse	45	Kilometres of Engineered Channels
	SW-Management Facilities	60	Stormwater Facilities
Linear Transportation	Linear Transportation-Pedestrian Network	2,600	Kilometers of Multi-Use Trails
	Linear Transportation-Bridge-Culvert	229	Bridges and Culverts
	Linear Transportation-Traffic Signal System	511	Signalized Intersections
	Linear Transportation-Street Lighting System	49,234	Street Lights
	Linear Transportation-Noise Wall	56	Kilometers of Noise Walls
	Linear Transportation-Public Parking	24	Public Parking Locations
	Linear Transportation-Road Surface	5,220	Lane Kilometers
	Linear Transportation-Road Subsurface	5,220	Lane Kilometers

3.2 Asset Valuation

Based on the asset inventory data that was compiled for each service area from the City's Tangible Capital Asset (TCA) inventory data base, a valuation was undertaken for each asset covered in the AMP. Two perspectives of the asset valuation of the City's infrastructure are presented below:

- **Financial Accounting Valuation**: This is based on historical costs and amortization assumptions over the expected service life of the asset; and

- **Replacement Cost Valuation**: This is based on inflated historical costs. It should be noted that no growth, technology change, or enhancement assumptions have been made for the replacement cost valuation.

3.2.1 Financial Accounting Valuation

The financial accounting valuation is based on the City's TCA reporting as at December 31, 2013 and assumes straight line amortization over the service life of the asset. The financial valuation of assets by asset group is reflected in Table 3-2 and indicates the following:

- The total historical cost of all assets contained in the Plan is approximately $3.3 billion, out of the City total historical cost of these assets of approximately $4.0 billion.

- The accumulated amortization is approximately $1.2 billion and means that on average the total asset base contained in the AMP is approximately 36% through their service life expectancy; and

- The Net Book Value (NBV) of the asset base is approximately $2.1 billion.

On average the City's assets have approximately 64% of their service life remaining, with the Building and Stormwater assets being the newest with 71% and 74% of their respective service life remaining. The Linear Transportation assets however are estimated to have 57% of their service life remaining.

Table 3-2: Accounting (PASB) Valuation of Assets Covered in the Plan ($000's)

Service	Asset Group	Historical Cost	Net Book Value	Remaining Service Life
Buildings	Total Building Assets	$ 888,359	$ 627,385	71%
Stormwater	Total Stormwater Assets	$ 761,054	$ 565,095	74%
Linear Transportation	Total Linear Transportation Assets	$ 1,692,624	$ 960,197	57%
Total Assets		**$ 3,342,036**	**$ 2,152,678**	**64%**

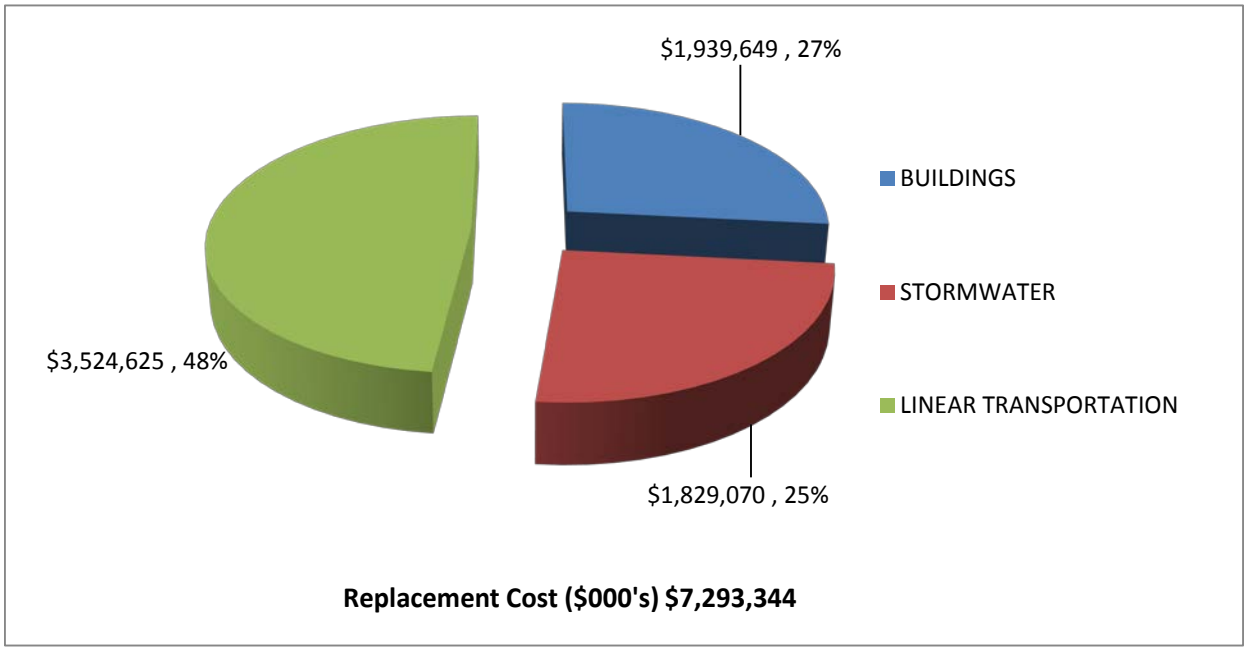
3.2.2 Replacement Cost Valuation

The replacement cost valuation is the estimated cost that would have to be incurred if the City were to replace all of its assets today. The replacement cost valuation is based on indexing historical costs to the current year. As noted previously, no growth, technology change, or enhancement assumptions are included in the replacement cost valuation.

Figure 3-1 provides a high-level overview of the Building, Stormwater and Linear Transportation assets replacement cost valuation. The total current replacement cost valuation is estimated at $7.3 billion for the assets covered in the AMP. The replacement cost valuation for Building, Stormwater and Linear Transportation

infrastructure make up over 90% of the City‘s estimated $8 billion in total asset value. Land values are not included in the AMP as land is not a depreciable asset.

Figure 3-1: Replacement Cost Valuation of Assets Covered in the AMP ($000’s)



Linear Transportation assets account for most of the replacement cost at approximately $3.5 billion (48% of total assets) followed by Buildings at $1.9 billion (27%) and Stormwater at $1.8 billion (25%). Overall, the replacement cost valuation of city assets covered in the AMP is greater than two times that of their historical cost, and nearly three and a half times that of the NBV of the assets.

It should be noted that replacement cost valuation along with an assessment of condition is a more useful indicator for decision-making compared to using the asset’s NBV since many assets may still be serviceable for some time to come, despite being fully amortized. As such the AMP will rely on the use of current replacement cost of assets as its basis for infrastructure financial planning.

3.2.3 Building Valuation

As detailed in Table 3-3, the City’s Building assets have a replacement value of $1.9 billion, over twice their historical cost of $888 million, and three times that of their NBV.

Table 3-3: Building Valuation ($000's)

Service	Asset Type	Replacement Value	Historical Cost	Net Book Value
Buildings	Building-Structure	$ 1,939,649	$ 888,359	$ 627,385

3.2.4 Stormwater Valuation

As detailed in Table 3-4, the City's Stormwater assets have a replacement value of $1.8 billion, approximately two and a half time their historical cost of $761 million, and over three times their NBV of $565 million. The majority of the Stormwater replacement value is related to linear Stormsewers which have a replacement value of $1.7 billion, Watercourses having a replacement value of $63 million, and Stormwater Management Facilities having a replacement value of $81 million.

Table 3-4: Stormwater Valuation ($000's)

Service	Asset Type	Replacement Value	Historical Cost	Net Book Value
Stormwater	SW-Stormsewer	$ 1,685,078	$ 676,609	$ 522,474
	SW-Watercourse	$ 63,026	$ 39,814	$ 19,328
	SW-Management Facilities	$ 80,966	$ 44,631	$ 23,294
	Total Stormwater Assets	$ 1,829,070	$ 761,054	$ 565,095

3.2.5 Linear Transportation Valuation

As detailed in Table 3-5, the City's Linear Transportation assets have a replacement value of $3.5 billion, over twice their historical costs of $1.7 billion and over three and a half times their NBV of $960 million. The majority of the replacement value of the Linear Transportation assets relate to Roads Surface and Roads Subsurface at $677 million and $1.4 billion respectively, with Bridges and Culverts replacement value of $684 million. The balance of assets types contained within Linear Transportation have a total replacement value of $729 million and consists of Pedestrian Networks, Traffic Signal Systems, Street Lighting Systems, Noise Walls, and Public Parking.

Table 3-5: Linear Transportation Valuation ($000's)

Service	Asset Type	Replacement Value	Historical Cost	Net Book Value
Linear Transportation	Linear Transportation-Pedestrian Network	$ 349,412	$ 164,132	$ 70,440
	Linear Transportation-Bridge-Culvert	$ 684,172	$ 287,839	$ 208,049
	Linear Transportation-Traffic Signal System	$ 57,513	$ 37,716	$ 25,071
	Linear Transportation-Street Lighting System	$ 297,426	$ 146,628	$ 88,657
	Linear Transportation-Noise Wall	$ 20,659	$ 15,421	$ 11,107
	Linear Transportation-Public Parking	$ 4,119	$ 2,841	$ 1,312
	Linear Transportation-Road Surface	$ 676,973	$ 436,904	$ 168,325
	Linear Transportation-Road Subsurface	$ 1,434,351	$ 601,143	$ 387,237
	Total Linear Transportation Assets	**$ 3,524,625**	**$ 1,692,624**	**$ 960,197**

3.3 Asset Age

For many asset types the estimated remaining service life of a physical asset is considered a good starting point to estimate the overall well-being of the asset. In some cases however the percentage of service life remaining may not be the most suitable indicator of current asset condition. Infrastructure assets in particular undergo a continual process of repair, rehabilitation and refurbishment in order to maintain their intended purpose. For example roads, bridges and buildings typically undergo a continual maintenance and rehabilitation process and hence age may not be the most suitable indicator to use for asset management planning. In many cases asset service life needs to be augmented with other information such as actual asset condition assessments, history of asset upgrades, and expert judgment.

Assumptions for asset service life used in the AMP were based on those used for TCA financial reporting. Each of the asset types estimated service lives are detailed in Table 3-6.

Table 3-6: Estimated Asset Service Life

Service	Asset Type	Estimated Asset Service Life (Years)
Buildings	Building-Structure	40
Stormwater	SW-Stormsewer	100
	SW-Watercourse	25
	SW-Management Facilities	25-50
Linear Transportation	Linear Transportation-Pedestrian Network	20-50
	Linear Transportation-Bridge-Culvert	20-100
	Linear Transportation-Traffic Signal System	20-50
	Linear Transportation-Street Lighting System	25-50
	Linear Transportation-Noise Wall	20-40
	Linear Transportation-Public Parking	20
	Linear Transportation-Road Surface	15-75
	Linear Transportation-Road Subsurface	50-75

A high-level overview of the Asset Age Distribution (in years) and the Asset Aged Condition (asset's age as a percentage of the asset's service life) for each asset type is detailed in Tables 3-7 to 3-12. These tables do not reflect the service life impacts that various maintenance and rehabilitation strategies have had on the asset or to the improvement of the asset's overall condition. The results of those efforts are better viewed in the Section 3.4 where actual condition assessments and individual asset knowledge was used to supplement the age based assessment of asset condition.

3.3.1 Building Age

The age distribution of the City's Buildings is detailed in Table 3-7. Over 80% or $1.6 billion of Building values are less than 40 years old. This is expected as the majority of investments into facilities in Mississauga have occurred since the creation of the City in 1974.

Table 3-7: Age Distribution of Building Assets ($000's)

Age of Building Assets											
Building Assets	Age (Years)										
	<10	10 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	>80	Total Replacement Value	Percent (%)
Total Building Assets											
Total Replacement Value	$ 345,803	$ 491,311	$ 514,689	$ 227,605	$ 98,641	$ 184,695	$ 2,032	$ 73,046	$ 1,827	$ 1,939,649	
Percent (%) by Age	17.83%	25.33%	26.54%	11.73%	5.09%	9.52%	0.10%	3.77%	0.09%		100%

The aged condition assessment of the City's Buildings is detailed in Table 3-8. Over 43% or $837 million of Building asset values are less than half way through their expected service life of 40 years. However 29% or $562 million of Building asset values are over 80% through their service life. As noted previously however, Buildings typically undergo a continual maintenance and rehabilitation process that extend their service life as well as improve the Building's overall condition.

Table 3-8: Aged Condition Assessment of Building Assets ($000's)

Aged Condition of Building Assets (Asset Age as a Percent of Expected Service Life)											
Building Assets	Percent Consumed										
	<10%	10% to 20%	21% to 30%	31% to 40%	41% to 50%	51% to 60%	61% to 70%	71% to 80%	>80%	Total Replacement Value	Percent (%)
Total Building Assets											
Total Replacement Value	$ 52,480	$ 230,908	$ 248,830	$ 218,629	$ 86,267	$ 457,729	$ 45,257	$ 36,651	$ 562,898	$ 1,939,649	
Percent (%) by Age	2.71%	11.90%	12.83%	11.27%	4.45%	23.60%	2.33%	1.89%	29.02%		100%

3.3.2 Stormwater System Age

The age distribution of the City's Stormwater system is given in Table 3-9. Overall, 90% or over $1.6 billion of the value of the city's Stormwater system is between 10 to 60 years old, which is reflective of the post war development of the city, up until the recent decline of greenfield development. The majority of Watercourse and Stormwater Management Facilities investments have been made over the last 30-40 years.

Table 3-9: Age Distribution of Stormwater System Assets ($000's)

Age of Stormwater System Assets											
Stormwater System Assets	Age (Years)									Total Replacement Value	Percent (%)
	<10	10 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	>80		
SW-Stormsewer											
Replacement Value	$ 103,561	$ 418,809	$ 482,566	$ 326,822	$ 262,286	$ 75,116	$ 15,296	$ 622	$ -	$ 1,685,078	
Percent (%) by Age	6.15%	24.85%	28.64%	19.40%	15.57%	4.46%	0.91%	0.04%	0.00%		100%
SW-Watercourse											
Replacement Value	$ 18,803	$ 27,072	$ 17,151	$ -	$ -	$ -	$ -	$ -	$ -	$ 63,026	
Percent (%) by Age	29.83%	42.95%	27.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		100%
SW-Management Facilities											
Replacement Value	$ 17,876	$ 30,268	$ 21,310	$ 11,011	$ 500	$ -	$ -	$ -	$ -	$ 80,966	
Percent (%) by Age	22.08%	37.38%	26.32%	13.60%	0.62%	0.00%	0.00%	0.00%	0.00%		100%
Total Stormwater Assets											
Total Replacement Value	$ 140,240	$ 476,149	$ 521,028	$ 337,833	$ 262,786	$ 75,116	$ 15,296	$ 622	$ -	$ 1,829,070	
Percent (%) by Age	7.67%	26.03%	28.49%	18.47%	14.37%	4.11%	0.84%	0.03%	0.00%		100%

The aged condition assessment of the City's Stormwater system is detailed in Table 3-10. Overall, 91% or $1.7 billion of Stormwater asset values are less than half way through their service life. This is reflective of the typical long life of Stormwater assets, specifically the estimated 100 year service life of Stormsewers. As such, due to the long life of Stormsewers approximately 95% or $1.6 billion of Stormsewers asset values are less than half way through their service life. However that due to the shorter service lives (25 – 50 years) of Watercourse and Stormwater Management Facilities, approximately a 33% or $47 million these asset values are now over 70% through their service life and would expect to be replaced in the near future.

Table 3-10: Aged Condition Assessment of Stormwater System Assets ($000's)

Aged Condition of Stormwater System (Asset Age as a Percent of Expected Service Life)											
Stormwater System Assets	Percent Consumed									Total Replacement Value	Percent (%)
	<10%	10% to 20%	21% to 30%	31% to 40%	41% to 50%	51% to 60%	61% to 70%	71% to 80%	>80%		
SW-Stormsewer											
Replacement Value	$ 103,561	$ 418,809	$ 482,566	$ 326,822	$ 262,286	$ 75,116	$ 15,296	$ 622	$ -	$ 1,685,078	
Percent (%) by Age	6.15%	24.85%	28.64%	19.40%	15.57%	4.46%	0.91%	0.04%	0.00%		100%
SW-Watercourse											
Replacement Value	$ 4,242	$ 12,550	$ 226	$ 4,152	$ 1,999	$ 9,053	$ 8,006	$ 5,646	$ 17,151	$ 63,026	
Percent (%) by Age	6.73%	19.91%	0.36%	6.59%	3.17%	14.36%	12.70%	8.96%	27.21%		100%
SW-Management Facilities											
Replacement Value	$ 948	$ 6,007	$ 16,159	$ 7,665	$ 10,790	$ 12,707	$ 2,954	$ 7,570	$ 16,168	$ 80,966	
Percent (%) by Age	1.17%	7.42%	19.96%	9.47%	13.33%	15.69%	3.65%	9.35%	19.97%		100%
Total Stormwater Assets											
Total Replacement Value	$ 108,751	$ 437,366	$ 498,951	$ 338,639	$ 275,075	$ 96,876	$ 26,256	$ 13,837	$ 33,320	$ 1,829,070	
Percent (%) by Age	5.95%	23.91%	27.28%	18.51%	15.04%	5.30%	1.44%	0.76%	1.82%		100%

3.3.3 Linear Transportation System Age

The age distribution of the City's Linear Transportation system is given in Table 3-11. Overall 85% or $3 billion of the value of the city's Linear Transportation system is between 10 to 60 years old, which again is reflective of the post war development of the city. It can also be noted that since creation of the City of Mississauga in 1974, close to 100% of the investments in Traffic Signal Systems, Street Lighting Systems, Noise Walls and Public Parking has occurred.

Table 3-11: Age Distribution of Linear Transportation System Assets ($000's)

Age of Linear Transportation Assets											
Linear Transportation Assets	Age (Years)									Total Replacement Value	Percent (%)
	<10	10 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	>80		
Linear Transportation-Pedestrian Network											
Replacement Value	$ 61,212	$ 88,829	$ 76,438	$ 59,386	$ 51,444	$ 10,689	$ 1,373	$ 19	$ 22	$ 349,412	
Percent (%) by Age	17.52%	25.42%	21.88%	17.00%	14.72%	3.06%	0.39%	0.01%	0.01%		100%
Linear Transportation-Bridge-Culvert											
Replacement Value	$ 46,425	$ 148,873	$ 124,417	$ 267,680	$ 52,364	$ 30,485	$ 11,041	$ 506	$ 2,382	$ 684,172	
Percent (%) by Age	6.79%	21.76%	18.19%	39.12%	7.65%	4.46%	1.61%	0.07%	0.35%		100%
Linear Transportation-Traffic Signal System											
Replacement Value	$ 21,696	$ 25,667	$ 6,560	$ 3,129	$ 462	$ -	$ -	$ -	$ -	$ 57,513	
Percent (%) by Age	37.72%	44.63%	11.41%	5.44%	0.80%	0.00%	0.00%	0.00%	0.00%		100%
Linear Transportation-Street Lighting System											
Replacement Value	$ 29,547	$ 111,066	$ 95,983	$ 42,310	$ 16,687	$ 1,470	$ 357	$ 6	$ -	$ 297,426	
Percent (%) by Age	9.93%	37.34%	32.27%	14.23%	5.61%	0.49%	0.12%	0.00%	0.00%		100.00%
Linear Transportation-Noise Wall											
Replacement Value	$ 10,952	$ 4,503	$ 5,204	$ -	$ -	$ -	$ -	$ -	$ -	$ 20,659	
Percent (%) by Age	53.01%	21.80%	25.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		100.00%
Linear Transportation-Public Parking											
Replacement Value	$ 2,654	$ 1,238	$ 227	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,119	
Percent (%) by Age	64.43%	30.07%	5.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		100.00%
Linear Transportation-Road Surface											
Replacement Value	$ 204,394	$ 330,732	$ 141,847	$ -	$ -	$ -	$ -	$ -	$ -	$ 676,973	
Percent (%) by Age	30.19%	48.85%	20.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		100.00%
Linear Transportation-Road Subsurface											
Replacement Value	$ 108,801	$ 362,133	$ 418,189	$ 281,136	$ 198,142	$ 55,703	$ 9,912	$ 335	$ 1	$ 1,434,351	
Percent (%) by Age	7.59%	25.25%	29.16%	19.60%	13.81%	3.88%	0.69%	0.02%	0.00%		100.00%
Total Linear Transportation Assets											
Total Replacement Value	$ 485,681	$1,073,041	$ 868,864	$ 653,640	$ 319,098	$ 98,347	$ 22,683	$ 867	$ 2,405	$ 3,524,625	
Percent (%) by Age	13.78%	30.44%	24.65%	18.54%	9.05%	2.79%	0.64%	0.02%	0.07%		100%

The aged condition assessment of the City's Linear Transportation system is detailed in Table 3-12. Overall, Linear Transportation asset values are somewhat evenly distributed in respect to their remaining service lives. However, in as much as over 36% or $247 million of the asset values for the Roads Surfaces are over 80% through their estimated service life, it should be noted that roads, like Buildings typically undergo a continual maintenance and rehabilitation process that extend their service life as well as improve overall condition, as such Roads Surface aged condition values may not be reflective of the actual Roads Surface service life remaining.

Table 3-12: Aged Condition Assessment of Linear Transportation System Assets ($000's)

Aged Condition of Linear Transportation Assets (Asset Age as a Percent of Expected Service Life)											
Linear Transportation Assets	Percent Consumed									Total Replacement Value	Percent (%)
	<10%	10% to 20%	21% to 30%	31% to 40%	41% to 50%	51% to 60%	61% to 70%	71% to 80%	>80%		
Linear Transportation-Pedestrian Network											
Replacement Value	$ 25,297	$ 32,151	$ 34,978	$ 27,087	$ 40,389	$ 40,402	$ 35,385	$ 31,602	$ 82,120	$ 349,412	
Percent (%) by Age	7.24%	9.20%	10.01%	7.75%	11.56%	11.56%	10.13%	9.04%	23.50%		100%
Linear Transportation-Bridge-Culvert											
Replacement Value	$ 45,011	$ 129,021	$ 81,506	$ 184,939	$ 154,656	$ 29,574	$ 27,170	$ 9,230	$ 23,066	$ 684,172	
Percent (%) by Age	6.58%	18.86%	11.91%	27.03%	22.60%	4.32%	3.97%	1.35%	3.37%		100%
Linear Transportation-Traffic Signal System											
Replacement Value	$ 6,895	$ 13,250	$ 10,341	$ 6,720	$ 4,711	$ 4,242	$ 4,412	$ 2,201	$ 4,741	$ 57,513	
Percent (%) by Age	11.99%	23.04%	17.98%	11.68%	8.19%	7.38%	7.67%	3.83%	8.24%		100%
Linear Transportation-Street Lighting System											
Replacement Value	$ 6,075	$ 29,876	$ 62,071	$ 38,782	$ 55,945	$ 38,895	$ 25,679	$ 16,429	$ 23,675	$ 297,426	
Percent (%) by Age	2.04%	10.04%	20.87%	13.04%	18.81%	13.08%	8.63%	5.52%	7.96%		100.00%
Linear Transportation-Noise Wall											
Replacement Value	$ 6,779	$ 3,500	$ 2,812	$ 527	$ -	$ 4,001	$ 162	$ -	$ 2,878	$ 20,659	
Percent (%) by Age	32.81%	16.94%	13.61%	2.55%	0.00%	19.37%	0.79%	0.00%	13.93%		100.00%
Linear Transportation-Public Parking											
Replacement Value	$ -	$ -	$ -	$ 2,550	$ 104	$ 205	$ 768	$ 265	$ 227	$ 4,119	
Percent (%) by Age	0.00%	0.00%	0.00%	61.90%	2.52%	4.98%	18.65%	6.44%	5.51%		100.00%
Linear Transportation-Road Surface											
Replacement Value	$ 22,173	$ 50,373	$ 49,768	$ 57,873	$ 52,166	$ 89,340	$ 47,430	$ 60,844	$ 247,006	$ 676,973	
Percent (%) by Age	3.28%	7.44%	7.35%	8.55%	7.71%	13.20%	7.01%	8.99%	36.49%		100.00%
Linear Transportation-Road Subsurface											
Replacement Value	$ 55,104	$ 187,953	$ 218,481	$ 236,064	$ 204,745	$ 199,015	$ 161,823	$ 79,928	$ 91,238	$ 1,434,351	
Percent (%) by Age	3.84%	13.10%	15.23%	16.46%	14.27%	13.87%	11.28%	5.57%	6.36%		100.00%
Total Linear Transportation Assets											
Total Replacement Value	$ 167,334	$ 446,122	$ 459,957	$ 554,542	$ 512,715	$ 405,674	$ 302,830	$ 200,500	$ 474,951	$ 3,524,625	
Percent (%) by Age	4.75%	12.66%	13.05%	15.73%	14.55%	11.51%	8.59%	5.69%	13.48%		100%

3.4 Asset Condition

In order to gain an overall perspective on the health of the City's infrastructure, a hybrid approach to assessing asset condition was used in the AMP. First asset age and estimated service life was considered to give each asset an aged based condition rating. These results were then scrutinized by departmental asset management teams comparing each asset with data sources available which included asset condition assessments, evaluations based on regular monitoring programs and expert judgment, where available, to establish a condition rating of each asset. Asset conditions were rated as either *Good, Fair, or Poor*.

Table 3-13 details the asset condition for each asset group and summarizes the total replacement value by condition category. In terms of replacement value, overall 88% or $6.3 billion of the City's assets contained in the AMP are rated in good condition, with 11% or $840 million of assets rated in fair condition, and 2% or $132 million rated in poor condition.

Table 3-13: Asset Condition by Replacement Value ($000's)

Asset Group	Condition Rating			Total Replacement Value
	Good	Fair	Poor	
Total Buidling Assets	$ 1,599,950	$ 304,755	$ 34,944	**$ 1,939,649**
Percent (%)	82%	16%	2%	100%
Total Stormwater Assets	$ 1,641,946	$ 148,808	$ 38,316	**$ 1,829,070**
Percent (%)	90%	8%	2%	100%
Total Linear Transportation Assets	$ 3,078,877	$ 386,688	$ 59,061	**$ 3,524,625**
Percentage (%)	87%	11%	2%	100%
Total Assets	**$ 6,320,773**	**$ 840,250**	**$ 132,321**	**$ 7,293,344**
Percent (%)	**87%**	**11%**	**2%**	**100%**

Table 3-14 details the condition of Building assets. The vast majority of Building assets are in good or fair condition, representing 98% or $1.8 billion of the total $1.9 billion Building replacement values. Only 2% or $35 million in Building values are considered in poor condition. The rating of Building assets relied on a Facility Condition Index (FCI) that is used by the City in establishing objective condition assessments, and allows for an understanding and relative rating of the City's portfolio of Building assets.

Table 3-14: Condition of Building Assets by Replacement Value ($000's)

Building Assets	Condition Rating			Total Replacement Value
	Good	Fair	Poor	
Building-Structure				
Replacement Cost	$ 1,599,950	$ 304,755	$ 34,944	$ 1,939,649
Percent (%)	82%	16%	2%	100%

Table 3-15 details the condition of Stormwater assets. The condition of Stormwater assets was determined based on the asset's age and estimated service life to establish an aged based condition rating. These ratings were then adjusted to reflect evaluations based on regular monitoring programs and expert judgment, where available, to establish a condition rating of each asset.

In terms of replacement values, 94 % of the Stormsewers are in good condition, whereas only 35% of Watercourse and 43% of Stormwater Management Facilities values are considered in good condition. Approximately 65% and 56% of Watercourse and Stormwater Management Facilities values respectively are in either fair or poor condition which would indicate the need for investment in the near to mid-term.

Table 3-15: Condition of Stormwater Assets by Replacement Value ($000's)

Stormwater Assets	Condition Rating			Total Replacement Value
	Good	Fair	Poor	
SW-Stormsewer				
Replacement Cost	$ 1,585,398	$ 99,680	$ -	$ 1,685,078
Percent (%)	94%	6%	0%	100%
SW-Watercourse				
Replacement Cost	$ 21,987	$ 27,675	$ 13,364	$ 63,026
Percent (%)	35%	44%	21%	100%
SW-Management Facilities				
Replacement Cost	$ 34,561	$ 21,453	$ 24,952	$ 80,966
Percent (%)	43%	26%	31%	100%

Table 3-16 details the condition of Linear Transportation assets. The condition of Linear Transportation assets was determined based on the asset's age and estimated service life to establish an aged based condition rating. These ratings were then vetted with experts for each Linear Transportation asset type and augmented with actual asset condition assessments, evaluations based on regular monitoring programs and expert judgment, where available, to establish a condition rating of each asset. Actual condition assessments were used in the AMP for Road Surface, and Bridges and Culverts assets.

The vast majority of Linear Transportation assets are in good condition, ranging from 96% of Roads Subsurface asset values to 78% of Road Surfaces asset values. Only the Pedestrian Network has asset values with less than 50% that are in good condition.

Table 3-16: Condition of Linear Transportation Assets by Replacement Value ($000's)

Linear Transportation Assets	Condition Rating			Total Replacement Value
	Good	Fair	Poor	
Linear Transportation-Pedestrian Network				
Replacement Cost	$ 171,212	$ 171,212	$ 6,988	$ 349,412
Percent (%)	49%	49%	2%	100%
Linear Transportation-Bridge-Culvert				
km	$ 649,964	$ 34,209	$ -	$ 684,172
Percent (%)	95%	5%	0%	100%
Linear Transportation-Traffic Signal System				
Replacement Cost	$ 45,438	$ 9,669	$ 2,406	$ 57,513
Percent (%)	79%	17%	4%	100%
Linear Transportation-Street Lighting System				
Replacement Cost	$ 280,076	$ 15,308	$ 2,042	$ 297,426
Percent (%)	94%	5%	1%	100%
Linear Transportation-Noise Wall				
Replacement Cost	$ 19,517	$ 954	$ 188	$ 20,659
Percent (%)	94%	5%	1%	100%
Linear Transportation-Public Parking				
Replacement Cost	$ 3,604	$ 466	$ 49	$ 4,119
Percent (%)	88%	11%	1%	100%
Linear Transportation-Road Surface				
Replacement Cost	$ 528,039	$ 101,546	$ 47,388	$ 676,973
Percent (%)	78%	15%	7%	100%
Linear Transportation-Road Subsurface				
Replacement Cost	$ 1,381,027	$ 53,324	$ -	$ 1,434,351
Percent (%)	96%	4%	0%	100%

Desired Levels of Service

Desired levels of service (LOS) are high level indicators comprising many factors that establish defined quality thresholds at which municipal services are supplied to the community. LOS support the organization‘s strategic goals and can be based on customer expectations, Council objectives, City policies, statutory requirements, standards and the financial capacity of the municipality to deliver those levels of service.

4.1 Service Level Measures

Discussed below are the service level measures and targets where available that are related to the service areas covered in the AMP. Service level measures and targets are tools used to communicate to Council and the general public the state and trend of the City’s infrastructure. Service level measures and targets also allow the City to run funding scenarios and to describe to Senior Management and Council what service levels might look like given various funding scenarios.

4.1.1 Buildings LOS

The City of Mississauga owns and operates a portfolio of approximately 310 buildings and structures of various sizes, complexity and usage. The current replacement value of these facilities is estimated at $1.9 billion.

The City of Mississauga uses a Facility Condition Index (FCI) in assessing the condition of these facilities. The FCI is a condition rating that is derived from the relationship between the total cost of deferred capital maintenance to the current replacement value of the building. The higher the FCI, the greater the risk of asset failure.

The FCI targets were approved by City Council in 2012 and are set according to building type (Region). Table 4.1 details the FCI targets and current performance by Region which is City is currently meeting.

Table 4-1: Facility Condition Index Service Level Performance vs Targets

Facility Region	Corporate	Culture	Fire	Library	Parks	Recreation	Transit	Works	City Wide
Current FCI	0.04	0.06	0.07	0.04	0.18	0.10	0.09	0.22	0.09
Approved FC I Target	0.10	0.15	0.20	0.15	0.20	0.15	0.18	0.25	

4.1.2 Stormwater LOS

The City manages over 2000 kilometers of Stormsewers network including 45 kilometers of Engineered Channels and 60 Stormwater Management Facilities with an estimated replacement value of $1.8 billion.

The level of service for Stormwater Management Facilities, including performance targets and inspection and maintenance requirements, is typically stipulated in the Environmental Compliance Approval (ECA) issued by the Ontario Ministry of the Environment (Section 53 of the Ontario Water Resources Act) for each facility. Facilities which do not require an ECA are also regularly inspected to ensure they are in good working condition. The level of service for Watercourses (Engineered Watercourses in particular) as well as assets related to Stormsewers has been developed over time by staff based on best practices and professional judgement.

4.1.3 Linear Transportation LOS

The City of Mississauga manages and maintains 229 bridges and culverts, over 5220 lane kilometers of roads, 2600 kilometers of sidewalks and trails, 511 signalized intersections, 49,235 streetlights, 56 kilometers of noise walls and 24 public parking locations with an estimated replacement value of $3.5 billion.

The City undertakes a condition survey on its roads every 3-4 years. The latest condition survey was completed in 2012. The City utilizes a Pavement Management System to analyze results of the survey and forecast pavement condition and long-term financial needs. Forecasts and condition targets are presented to City Council on a regular basis and highlighted annually during the Business Plan and Budget presentation for the Roads Service Area.

The City has established the following condition targets to achieve a sustainable management plan for road pavement:

Table 4-2: Overall Condition Index Service Level Performance vs Targets

Road Type	Overall Condition Index	
	Actual	Target
Major Roads	72	73
Residential Roads	83	70

A condition survey for all bridges and culverts is completed every two years in accordance with provincial and industry standards for safety and accessibility. At a network level, an average bridge condition index (BCI) of 80 is the optimal target set for bridges and culverts. The average condition of bridges and culverts is expected to remain at 80 BCI service level.

Asset Management Strategy

An asset management strategy is a set of actions that enable assets to provide the desired level of service in a sustainable way, while managing risk, at the lowest lifecycle cost. An Asset Management Strategy identifies and prioritizes asset renewal activities and results in the production of an asset renewal plan that ensures the best overall health and performance of the City's infrastructure given current funding constraints.

In the City of Mississauga each service area covered in the AMP undertake an individual approach to asset condition assessment and the identification and prioritization of asset renewal needs. Typically however, total asset renewal needs for the service areas exceed the available financial resources dedicated towards asset renewal. Therefore, in order to prioritize asset renewal needs across the City a corporate prioritization exercise is undertaken annually to identify projects with the greatest need. An overview of each service area's condition assessment programs and techniques, and the corporate prioritization exercise that contribute to the development of an asset management strategy is provided below.

Buildings

The City of Mississauga has used a Facility Condition Index (FCI) in assessing the condition of City facilities. The FCI is a condition rating that is derived from the relationship between the total cost of deferred capital maintenance to the current replacement value of the building. The higher the FCI, the greater the risk of asset failure.

The Building Asset Management Program relies on the FCI to establish objective condition assessments and allows the City to understand and rate the relative condition of the portfolio of building assets. The FCI enables the City to determine the impacts of setting target FCI's and/or expenditure levels on the long term quality and sustainability of the building portfolio. The FCI targets, set according to building type (Region) determines the cost of the Building asset management program. Also, varying targets by Region mitigates cost and recognize the diversity of the City's building inventory and their uses.

The last comprehensive assessment of each City building was completed in 2010 with reassessments undertaken every five years. The results of these reassessments may change the FCI depending on the observed condition of the facilities and their systems. In the interim, assessments of the building inventory are continually being updated with information received from maintenance reports and capital project work.

Based on the updated assessments, a multi-year forecast of asset renewal needs are developed given FCI targets and submitted for corporate prioritization and funding approval.

Stormwater

The City of Mississauga applies best practices through its regular inspection programs in assessing the condition of its Stormwater infrastructure. The state of repair and the associated risks to property and infrastructure are considered when determining priorities for asset renewal needs.

The City's Watercourse Asset Management Program deploys full inspection of watercourses every five years, with annual or biennial inspections of known problem sites. A channel stability index is typically employed to assess physical conditions, then an assessment of risks to property and infrastructure is conducted in order to provide a basis for asset renewal and prioritization of need.

The Stormwater Management Facility Program completes full inspection of the City's facilities every two years. Typically, facilities that provide quality control are inspected annually. The inspections document condition of engineered structures and soft components (slopes, vegetation, water quality, etc.) and record any found deficiencies. Sediment removal works are identified by Prioritization Studies and/or Pre-Engineering Studies and prioritized accordingly based on allowable sediment accumulation thresholds.

The City inspects Stormsewers approximately every ten years with closed circuit television (CCTV) equipment. Cleaning (flushing) of Stormsewers is performed on an as-needed basis and is based on the findings of these inspections. Storm Catchbasins are cleaned once every three years. Through these maintenance programs any asset renewal needs of Stormsewer and related infrastructure components are identified and submitted for corporate prioritization and funding approval.

Linear Transportation

The City of Mississauga carries out regular maintenance activities on its Road Network and associated Linear Asset components (ie. Sidewalks, Street Lights, Trails, Noise Barriers, Municipal Parking Lots and Traffic Signals) based on Minimum Maintenance Standards (MMS), Customer Service Requests (CSR's) and Standard Operating Procedures (SOP's).

In addition to ongoing regular maintenance practices for all its Linear Transportation assets the City undertakes a condition survey on its roads every 3-4 years. The latest condition survey was completed in 2012. The City utilizes a Pavement Management System to analyze results of the survey and forecast pavement condition and long-term asset renewal needs.

Bridges and Culverts are managed utilizing a comprehensive management system that includes full digital and photo inventory. A condition survey for all Bridges and Culverts

is completed every two years in accordance with the provincial and industry standards for safety and accessibility. When a structure is identified to have significant issues, a detailed condition survey is performed to determine its criticality, projected costs and define the scope of work. All renewal needs of Linear Transportation related infrastructure are identified, prioritizes and submitted for corporate prioritization and funding approval.

5.1 Capital Prioritization Process

The City of Mississauga develops its asset renewal strategies through an annual prioritization process of service area asset renewal submissions. The prioritization of the City's capital needs is delivered annually to City Council through the budget and business planning process. Capital needs are not only prioritized at the departmental level as detailed above, but are also prioritized at the corporate level. Corporate prioritization of capital needs is undertaken by the City to assist in the decision making process for the identification of the most critical projects across the corporation, and for the allocation of limited financial resources to fund asset renewal for the various service areas most in need. The capital prioritization results are reviewed by Senior Management through a variety of filters, and adjustments are made to ensure the most critical needs are approved for the delivery of the City's Asset Management Strategy. The five categories used by the City in the corporate capital prioritization process are defined below:

- **Mandatory:** These projects have locked in commitments or vital components associated with cash flowed projects approved by Council in prior years. These projects have prior legally binding commitments where contracts are signed or have a minimum legal, safety, regulatory or other mandated minimum requirements where not achieving these requirements will lead to legal action, fines, penalties or the high risk of liability against the City. These projects cannot be deferred or stopped;
- **Critical:** These projects maintain critical components in a state of good repair and at current service levels. If not undertaken, there would be a high risk of breakdown or service disruption;
- **Efficiency or Cost Savings:** Projects that have a break even or positive return business case over the life of the capital due to operational cost savings or cost avoidance;
- **State of Good Repair:** The funding for these projects are needed to maintain targeted service levels and reflects life cycle costing; and
- I**mprove:** These projects provide for service enhancements that increase current service levels or provide for new capital initiatives.

As the City's Asset Management Strategy evolves in future years, consideration will be given to a broad range of solutions, and a more robust implementation process will be developed that can be applied to the identification of capital needs including asset renewal, enhanced levels of service, growth, legislative and efficiency related projects, along with the prioritization of the lowest lifecycle cost asset management strategies. This will assist in the production of a more defensible 10 year AMP, including growth projections, to ensure the best overall health and performance of the City's infrastructure.

5.2 (2014-2023) Asset Management Strategy

The 2014-2023 asset renewal needs for Building, Stormwater and Linear Transportation as determined by departmental condition assessment programs and prioritization techniques are summarized below in Table 5.1. A total of $916 million in asset renewal needs were considered in the corporate prioritization process over the 2014 - 2023 AMP period.

Table 5-1: (2014-2023) Asset Renewal Needs ($000's)

Building	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Building	$27,090	$ 56,681	$ 60,137	$30,066	$34,128	$42,963	$45,969	$ 52,811	$42,487	$36,753	$ 429,085

Stormwater	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Stormwater	$ 6,460	$ 5,170	$ 4,660	$ 5,730	$ 6,170	$12,680	$ 4,300	$ 6,520	$ 7,150	$14,670	$ 73,510

Linear Transportation	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Linear Transportation	$35,419	$ 44,461	$ 35,750	$35,930	$41,312	$39,819	$40,946	$ 49,893	$49,466	$40,140	$ 413,136

Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total	$68,969	$106,311	$100,547	$71,726	$81,611	$95,462	$91,215	$109,224	$99,103	$91,563	$ 915,731

Due to funding constraints however, and competing funding needs of other service areas not considered in the AMP, not all asset renewal needs for Building, Stormwater and Linear Transportation could be funded. Table 5.2 shows the funded portions of the asset management strategies of these services. The majority of the deferrals reside in Linear Transportation where approximately $131 million in asset renewal needs are being unfunded. The deferral of the asset renewal needs will result, over time, in Linear Transportation assets delivering a lower level of service while increasing the overall risk of asset failures.

Table 5-2: (2014-2023) Asset Management Strategy ($000's)

Building											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Building	$19,719	$55,203	$58,544	$29,398	$34,108	$42,963	$45,949	$52,361	$42,029	$36,753	$ 417,027
Stormwater											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Stormwater	$ 4,650	$ 4,490	$ 830	$ 5,730	$ 3,370	$ 9,400	$ 1,630	$ 3,330	$ 380	$10,990	$ 44,800
Linear Transportation											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Linear Transportation	$24,479	$15,558	$26,200	$34,600	$34,180	$29,500	$37,080	$30,500	$13,000	$38,080	$ 283,177
Asset Management Strategy											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total	$48,847	$75,252	$85,574	$69,728	$71,658	$81,863	$84,659	$86,191	$55,409	$85,823	$ 745,004

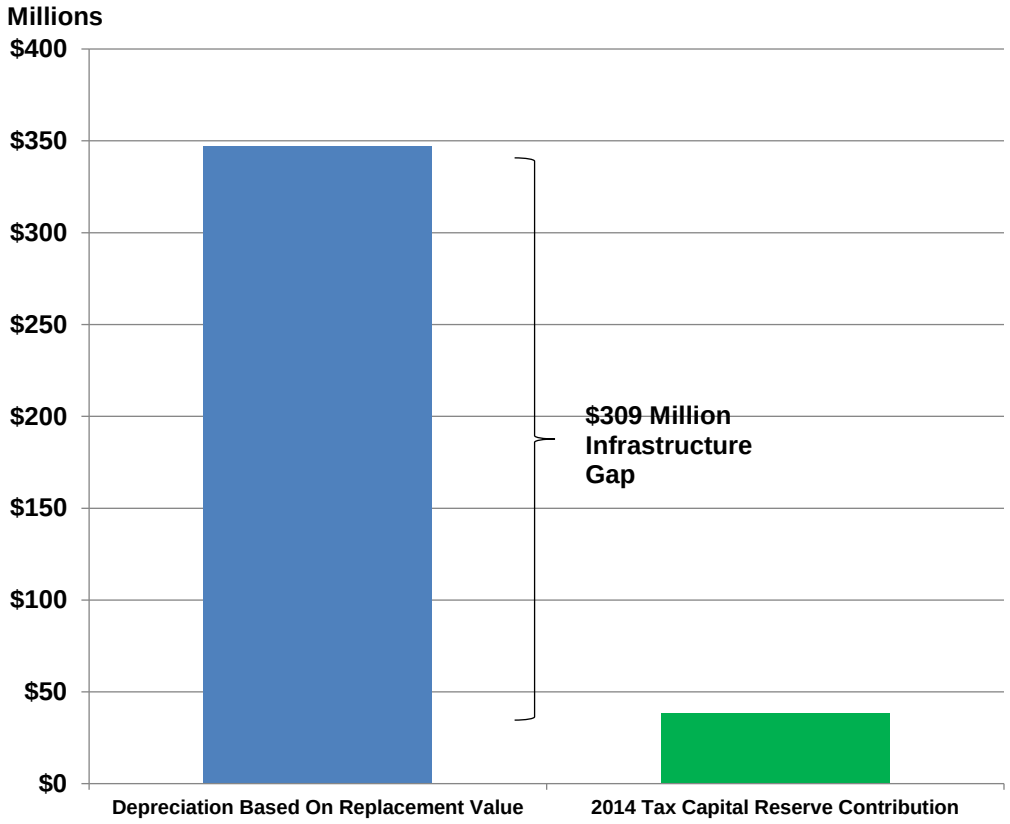
5.3 Risks to the Asset Management Strategy

An assessment of the risks to the delivery of the City's Asset Management Strategy has identified a number of areas that will require close monitoring in the future including asset data quality, condition assessments and staff education .The largest risk to the delivery of the City's Asset Management Strategy however is related to asset funding. The City is attempting to mitigate this risk with an ongoing incremental increase to the annual budgetary provision for infrastructure and debt repayment equivalent to two percent of the prior year's tax levy. The City will also introduce a Stormwater User Charge where commencing in 2016 the City will see the funding for Stormwater infrastructure renewal increase to sustainable levels through the imposition of a charge on properties based on impervious area. Furthermore, the City has now allocated a portion of Federal Gas Tax revenues towards roads rehabilitation. These infrastructure funding strategies are discussed in greater detail in Section 6 (Financing Strategy).

Financing Strategy

The City owns over $8 billion in infrastructure assets with approximately $7.3 billion or 90% of the total replacement value relating to Building, Stormwater and Linear Transportation assets. Currently the infrastructure gap for the City is estimated at $309 million as detailed in Table 6.1, and is defined as the difference between the estimated annual depreciation based on replacement values and the City's annual contribution towards capital needs.

Table 6-1: Infrastructure Gap Based on Replacement Values



To address the elimination of this infrastructure gap the City has committed to ensuring an increased focus on the funding its asset renewal needs. Since 2012 the City's Business Plan and Budgets have included incremental increases to the annual budgetary provision for infrastructure and debt repayment equivalent to two percent of the prior year's tax levy. As well, in 2013 the City approved the introduction of a Stormwater Charge where commencing in 2016 the City will see the funding for Stormwater, including Stormwater infrastructure renewal through the imposition of a charge on properties based on impervious area. Also, in 2014 the City reallocated Federal Gas Tax revenues to fund Linear Transportation asset renewal needs. These

enhanced infrastructure funding strategies and mechanisms detailed below will greatly assist Mississauga in addressing its infrastructure funding challenges.

6.1 Infrastructure and Debt Repayment Levy

Since 2012 the City's Business Plan and Budgets have included incremental increases to the annual budgetary provision for infrastructure and debt repayment equivalent to two percent of the prior year's tax levy. Out of the incremental increase equivalent of two per cent of the prior year's tax levy, on average, one percent will be allocated to increasing the transfer from operating to capital to advance pay as you go capital funding. The other one percent will be dedicated to servicing principal and interest payments on debt issued for the financing of capital needs. This ongoing incremental increase in the Infrastructure and Debt Repayment Levy will assist in enhancing the long-term financial sustainability of funding asset renewal needs. Without this levy, the City would have to accept reduced service levels and let the quality of infrastructure deteriorate. Table 6.2 shows the projected incremental increases in the Infrastructure and Debt Repayment Levy over the 2014-2023 AMP period as well as the projected total annual Infrastructure and Debt Repayment Levy. As can be seen, from 2014 to 2023 there is a projected increase in the Infrastructure and Debt Repayment Levy of $87 million, or an increase of 318% over the 2014 funding level $39.7 million.

Table 6-2: Infrastructure and Debt Repayment Levy Projection ($000's)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Base Contribution to Capital Needs	$32,396	$39,790	$47,654	$55,911	$64,581	$73,685	$83,244	$ 93,281	$103,820	$114,885
2% Infrastucture and Debt Levy Increase	$ 7,394	$ 7,864	$ 8,257	$ 8,670	$ 9,104	$ 9,559	$10,037	$ 10,539	$ 11,065	$ 11,619
Total Annual Contribution to Capital Needs	$39,790	$47,654	$55,911	$64,581	$73,685	$83,244	$93,281	$103,820	$114,885	$126,504

6.2 Stormwater Charge

The City of Mississauga's Stormwater infrastructure assets control Stormwater flow and protect the quality of the City's water. The aging Stormwater assets, combined with future asset renewal needs and competing financial pressures across the City has caused the City of Mississauga to consider new ways to fund Stormwater. In 2013 City Council approved the introduction of a Stormwater Charge where commencing in 2016, funding for Stormwater, including Stormwater infrastructure renewal and operations, will result in a new charge assessed to properties based on hard surface area.

The City's Stormwater infrastructure is currently valued at $1.8 billion, and includes Stormsewer, Watercourse and Stormwater Management Facility assets. All Stormwater infrastructure has a finite service life and will ultimately fail if these assets are not

renewed, replaced or rehabilitated over the long term. A large portion of Stormwater Management Facility and Watercourse assets in Mississauga are nearing the end of their useful service life. In as much as the City has been taking steps within the annual Business Plans and Budget process to allocate funds through prioritized capital projects - not all Stormwater asset renewal needs are being funded due to constrained capital funding. Also, given the relatively young age of the City's Stormsewer assets (average of 30 years in a 100 year service life), representing approximately $1.7 billion, there has not been any significant pressure to reinvest in this asset class. Stormsewer assets however cannot be ignored indefinitely and the City will eventually be fiscally responsible to provide for their inevitable renewal or replacement. Table 6.3 shows the projected increase in Stormwater funding by moving to a user charge, and provides a comparison of the projected average annual Stormwater funding obtained from the proposed user charge to the 2012 level of Stormwater funding provided from the property tax base, payment in lieu of tax (PILT) and capital reserves. As can be seen there is expected to be a significant increase in annual capital funding of $7.5 million, and the expectation that on average, contributions of $3.0 million will commence being made to a Pipe Renewal Reserve for the eventual replacement of Stormsewers.

Table 6-3: Comparison of Stormwater Funding Levels ($000's)

Stormwater Program Item	Existing (2012) Tax. PILT, Capital Reserves	Future (Average Annual From User Charge)
Capital	$ 8,030	$ 15,540
Operating and Maintenance	$ 6,620	$ 7,950
Pipe Renewal Reserve	$ -	$ 3,120
Program Total	$ 14,650	$ 26,610

6.3 Senior Government Level Support

Each year it is expected that the City will receive approximately $53.1 million in Provincial and Federal Gas Tax receipts, or $531 million over the 2014-2023 period. Starting in 2014 the City has reallocated the use of Federal Gas Tax revenues to fund Linear Transportation asset renewal needs. Over the10 year AMP period $58.7 million will be used to fund Linear Transportation asset renewal.

Even with the use of Federal gas tax receipts and the enhanced infrastructure funding strategies and mechanisms detailed above, the City of Mississauga, like all municipalities in Ontario, will continue to require increased infrastructure funding support from the provincial and federal governments to close the municipal infrastructures gap. The recent announcement of the new Building Canada Plan is a positive step toward

achieving that support, however more senior government level support for infrastructure renewal will be needed if municipalities are to continue to deliver the quality service their citizens have come to expect.