



2021 Asset Management Plan City of Markham

September 13, 2021

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AGENDA

1. Purpose
2. Background
 - Definitions
 - O. Reg. 588/17 - Phases
 - Legislative Requirements
 - Assumptions
3. 2020 Replacement Cost Distribution Chart
4. 2016 vs 2020 City-wide Comparison
5. 5-Point Asset Condition Rating System
6. Condition of City's Infrastructure Assets
7. Asset Management Framework & Strategy
8. Risks
9. Enhanced Asset Management
10. Conclusion
11. Next Steps



Purpose

The purpose of this presentation is to seek Council's endorsement of the City of Markham updated 2021 Asset Management Plan, which will ensure that the City remains in compliance with Ontario Regulation 588/17 (O. Reg. 588/17) – *'Asset Management Planning for Municipal Infrastructure'* and continues to receive Canada Community Building Fund payments under the *Federal Gas Tax Agreement*.



Background

- O. Reg. 588/17 was created under the *Infrastructure for Jobs and Prosperity Act* and took effect on January 01, 2018. The regulation requires municipalities to:
 - Create a strategic asset management policy.
 - Create a strategic asset management plan in respect to its infrastructure assets.
- This is required by all municipalities in Ontario to maintain eligibility for Canada Community Building Fund.
- Compliance with O. Reg. 588/17 will also enable compliance with recommendations of 2019 Asset Management Audit by MNP LLP, the City's Auditor General.



Background (Contd.)

- To coordinate, develop and implement activities relating to asset management the Asset Management Steering Committee (AMSC) was created.
- AMSC members are;

Chair	Graham Seaman, Director, Sustainability & Asset Management
Member	Alice Lam, Director, Operations
Member	Eddy Wu, Director, Environmental Services
Member	Frank Clarizio, Director, Engineering
Member	Joel Lustig, Treasurer, Financial Services
Member	Mary Creighton, Director, Recreation Services
Member	Ned Sirry, Acting Chief Information Officer, ITS
Coordinator	Sameem Shah, Acting Manager, Corporate Asset Management



Definitions

- **Core Assets** – As per O. Reg. 588/17, Water Asset, Wastewater Asset, Stormwater Management Asset, Roads and Bridges/Culverts are considered as core assets.
- **Non-Core Assets** – Tangible assets that are not included in the definition of Core Assets; Facilities, Fleet, Information Technology Hardware Infrastructure, and Parks are Non-Core Assets.
- **Levels of Service (LOS)**
 - Community/Customer - What the community/customer expects to receive.
 - Technical - How the organization delivers the expected levels of service, often using operational or technical measures.
- **Life cycle Cost** – Cost of activities undertaken with respect to a municipal asset over its service life including reconstructing, maintaining, renewing, operating and decommissioning including associated design and engineering fees. For this update staff is using 2019 dollars that were submitted in early 2020.
- **Missing Assets** – Assets that were not included in 2016 Asset Management Plan.
- **Replacement Cost** – One time cost of constructing/acquiring a new infrastructure asset from ground up. This is not the same as Life cycle Costs defined above. For this update staff is using 2019 dollars that were submitted in early 2020. Excludes land acquisition costs.



O. Reg. 588/17 – Phased Implementation

PHASES/REGULATORY REQUIREMENTS	STATUS
Phase I – Develop an AMP by July 01, 2022 in accordance with the regulation in respect to Municipal Core Assets	Complete
Phase II – Develop an AMP by July 01, 2024 in accordance with the regulation in respect to all (Core & Non-Core) Municipal Assets	Complete
Phase III – Develop an AMP by July 01, 2025 in accordance with the regulation in respect of all Municipal Assets including the levels of service that the municipality proposes to provide for each of the 10 years following the latest approved AMP	Scheduled
Phase IV (Continuing) – City shall review and update its asset management plan at least five years after the year in which the plan is completed under Section 6 of O. Reg. 588/17 and at least every five years thereafter	Scheduled



Phase I & II – O. Reg. 588/17 Requirements

The city is currently in compliance with O. Reg. 588/17, however by July 1, 2022 Council approved municipal asset management plans should include the following:

- Current LOS for Core Assets as set out in O. Reg. 588/17 – In addition to 2016 LOS, LOS are included in accordance with the qualitative descriptions and technical metrics provided in the regulation
- Current LOS for Non-Core Assets established by the municipality – Reviewed 2016 LOS and revised as necessary per the latest practices
- Updated State of Infrastructure (Summary, Replacement Cost, Average Age, Condition, Condition Assessment Strategy) with data available at the end of 2019
- 10-Year Life Cycle Activities Cost (City of Markham includes 25-Year rolling Life Cycle Activities Cost)
- The estimated 10-year capital expenditures and significant operating costs to accommodate the anticipated demand due to growth for provision of current levels of service – Updated DC Study
- From Schedule 3 of 2017 Growth Plan, municipalities with population 25,000 or more, the portion of population and employment forecast allocated to the lower-tier municipality in the official plan of upper-tier municipality of which it is a part - **NEW**
- Climate Change Strategy for each asset category - **NEW**



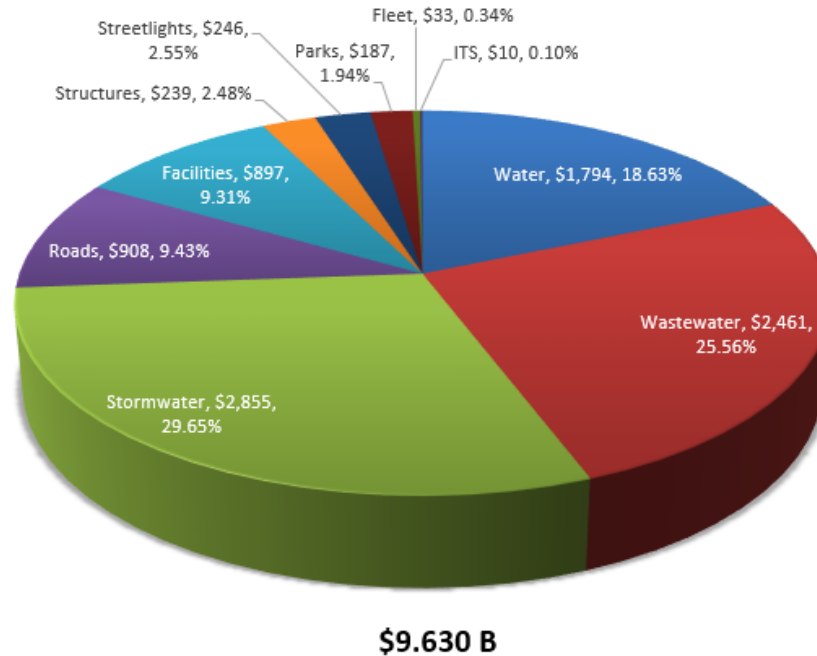
Assumptions

- 2016 Asset Management Plan forms the basis of the 2021 Asset Management Plan.
- Data as of end of 2019 is used for this update of Asset Management Plan.
- State of Infrastructure update includes;
 - Inventory update capturing newly acquired assets and missing assets.
 - Replacement Cost update based on latest tender pricing or estimation tools such as RS Means.
 - Use of **5-Point Condition Rating System** developed by staff to ensure a more accurate representation of city owned assets by providing criteria to evaluate the actual condition.
 - Use of Actual Condition Data vs Remaining Useful Life
- **Population and employment growth numbers will be used from 2006 as the Region has not been able to complete their implementation of the updated forecasts due to provincial updates/revisions.** Province released a draft update to Schedule 3 on June 16, 2020 extending the planning horizon to 2051 for growth.
- Current Levels of Service will also be included for Non-Core Assets in addition to those for Core Assets, similar to 2016 Asset Management Plan.
- Climate Change Strategy includes the current relevant initiatives and practices of the City. Further, this section includes a commitment to continually improve adaptation, mitigation and resilience based on best practices.



2020 Replacement Cost Distribution Chart

Asset Distribution (%) by Replacement Value (Million)



This is included in the 2021 Asset Management Plan.



2016 vs 2020 City-wide Comparison

Staff analysed the updated Replacement Costs to be included in 2021 Asset Management Plan by comparing them with Replacement Costs included in 2016 Asset Management Plan. Drivers identified are below:

- **Volume:** Increase due to volume change represents the collective increase due to addition of formerly missing assets and any new assets that the City acquired from 2016 to 2020.
- **Unit Rate:** Increase due to unit rate change represents the collective increase due to inflation and latest unit costs. Latest unit costs have changed due to variety of reasons that includes but are not limited to, change in; technology, standards and/or regulatory requirements, obsolescence.

Notes:

- These numbers have been reviewed and approved by the Asset Management Steering Committee (AMSC) and Finance.
- This information is not included in the 2021 Asset Management Plan and only shared with Council to provide the basis of replacement cost increase of City's infrastructure assets.



2016 vs 2020 City wide Comparison (Outcomes)

Service Area	2016 Replacement Cost	Volume Increase \$	Unit Rate Increase \$	Total Increase Volume + Unit Rate	2020 Replacement Cost
Water	\$1,581.22M	\$65.33M	\$147.06M	\$212.39M	\$1,793.61M
Wastewater	\$2,093.58M	\$38.20M	\$329.68M	\$367.88M	\$2,461.46M
Stormwater	\$2,334.59M	\$64.94M	\$455.17M	\$520.12M	\$2,854.70M
Structures	\$219.96M	\$8.49M	\$10.24M	\$18.73M	\$238.69M
Streetlight	\$220.43M	\$7.56M	\$18.02M	\$25.57M	\$246.01M
Roads	\$682.74M	\$87.32M	\$137.74M	\$225.06M	\$907.80M
Parks	\$123.18M	\$59.94M	\$4.12M	\$64.06M	\$187.24M
Fleet	\$24.65M	\$2.91M	\$5.62M	\$8.52M	\$33.17M
Facilities	\$653.68M	\$81.21M	\$162.09M	\$243.31M	\$896.99M
ITS	\$8.69M	NA	NA	\$1.64M	\$10.33M
TOTAL	\$7,942.73M	\$415.90M (5.24%)	\$1,269.74M (15.99%)	\$1,687.28M (21.24%)	\$9,630.01M

Note: This comparison will not become part of the 2021 Asset Management Plan.



5-Point Asset Condition Rating System

Formerly in 2016 City used a 3-Point Asset Condition Rating System.

To develop a common condition rating scale across the City's assets, staff reviewed rating structures provided in International Infrastructure Management Manual (IIMM-2015 Edition) and structures adopted by a number of Ontario Municipalities and developed 5-Point Asset Condition Rating System for the City of Markham.

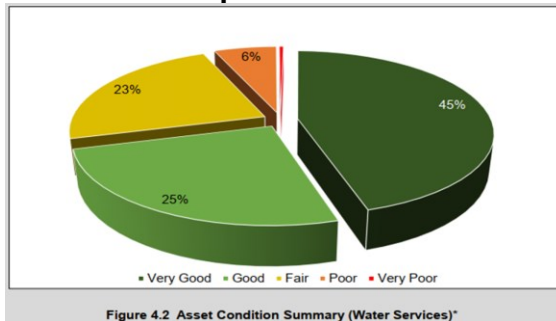
Benefits:

- Adoption of **best industry practice** as the 5-Point Asset Condition Rating System is the most commonly used rating system in the latest Asset Management Plans adopted by a number of municipalities across Ontario. Examples provided on next slide.
- Adoption of the core approach as specified in the **International Infrastructure Management Manual (IIMM – 2015 Edition)**.
- Enables reporting that better represents the assets actual functionality and condition, aligning with our current practices.



5-Point Asset Condition Rating System

- Examples:



City of London – 2019 CAMP

How is the Condition Graded?

When the condition of individual assets is assessed, a wide range of techniques are used as appropriate to the infrastructure. Peel's State of Good Repair (SoGR) Condition Grades provide a common way to look at the condition of all the diverse infrastructure that the Region owns.

A	New or like new condition
B	In a good state of repair
C	Some non-critical defects; some critical repairs in the near term
D	Some critical defects; many critical repairs in the near term
F	Many critical defects; immediate repair or replacement required

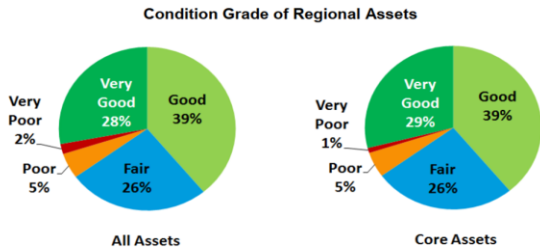


Region of Peel – 2019 EAMP

Table 3.16 – Five Point Infrastructure Rating Scale

Rank	Condition	Definition
1	Very Good	The infrastructure in the system is in generally good condition, typically new or recently rehabilitated. A few elements show signs of deterioration that require attention.
2	Good	The infrastructure in the system is in good condition; some elements show signs of deterioration that require attention. A few elements show sign of significant deficiencies
3	Fair	The infrastructure in the system or network is in fair condition; it shows general signs of deterioration and requires attention. Some elements exhibit significant deficiencies.
4	Poor	The infrastructure in the system or network is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration.
5	Very Poor	The infrastructure in the system or network is in unacceptable condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which is affecting service.

City of Brampton – 2019 CAMP



Assets in poor and very poor condition are planned for renewal

York Region – 2018 CAMP



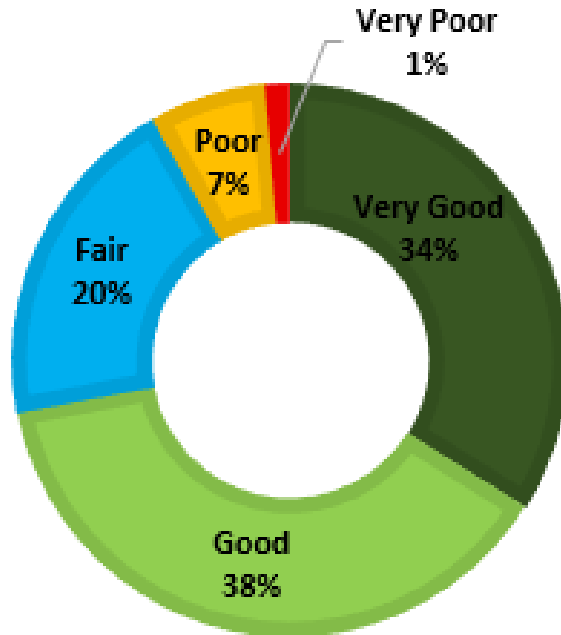
5-Point Asset Condition Rating System

Condition	Design Fulfillment	Service Level	Remaining Useful Life %	Action
Very Good	Performing as Designed	Provides desired service level with basic/necessary preventative maintenance	>80	No Action Required
Good	Performing as Designed	Provides desired service level with monitoring and preventative maintenance	60 – 80	No Action Required
Fair	Performing as Designed	Provides desired service level with occasional disruption due to repair/maintenance	40 – 59	No Action Required
Poor	Performance issues due to design limitation <i>and/or</i> May perform as designed with high risk of failure	Frequently out of service requiring extensive repairs <i>and/or</i> Needs ongoing monitoring and frequent maintenance to achieve service levels	20 – 39	Plan Rehabilitation/ Replacement
Very Poor	May fail to meet current applicable codes, standards or legislations	Asset is becoming or may become health and/or safety concern; Unserviceable <i>and/or</i> approaching end of service life	<20	Schedule Rehabilitation/ Replacement



Condition of City's Infrastructure Asset

CITY WIDE



- **92% performing as designed** - are in 'Very Good' to 'Fair' condition
- 7% monitored and planned for rehabilitation/replacement
- 1% currently being rehabilitated/replaced



Condition of City's Infrastructure Asset

Asset Category	Very Good	Good	Fair	Poor	Very Poor
Water	30.7%	34.3%	16.3%	13.8%	4.9%
Wastewater	25.8%	36.5%	31.4%	6.3%	0%
Stormwater	35%	42.1%	18.8%	3.9%	0.2%
Roads	21.8%	45.2%	23.3%	8%	1.7%
Facilities	89.2%	6.1%	2.4%	2%	0.3%
Structures*	NA	87.5%	10%	2.5%	NA
Streetlights	31%	32%	16.5%	16.5%	4%
Parks	1.4%	91.2%	0.6%	6.4%	0.4%
Fleet	0%	100%	0%	0%	0%
IT	9%	3%	15%	6%	67%
Overall	33.88%	38.13%	19.75%	6.89%	1.34%

*Rating based on MTO – Ontario Structures Inspection Manual (OSIM, 2008) that evaluates the ratings on scale of Good, Fair and Poor

**92% of City assets in 'Very Good' to 'Fair' condition, amongst the highest in Ontario.
Assets in Poor to Very Poor condition have plans in place to raise to Very Good.**



Asset Management Framework

The City of Markham Asset Management Framework links the City's goals with infrastructure asset management practices with outcomes that align with Excellence Markham principles





Asset Management Strategy

- The AM strategy is driven by the Asset Management Policy that has been approved by Council also attached as Appendix A to 2021 AMP.
- The City's Asset Management Strategy includes an overall framework that enables the linkages between City of Markham goals (BMFT) and the management of the infrastructure, the relationship of the AMP to municipal planning (e.g. Official Plan, Department Business Plan) and financial documents (e.g. budget documents).
- The strategy outlines the various activities at different intervals of the asset life cycle to enable assets to provide the approved levels of service in a sustainable way, while managing risk, at the lowest total cost of ownership.
- The strategy also captures the City's overall Climate Change Strategy and growth forecast.



Financial Strategy

- City of Markham has successfully maintained its financial health while sustainably delivering satisfactory levels of service.
- The City annually updates its Life Cycle Replacement and Capital Reserve Study using a rolling 25-year planning horizon to confirm adequacy of funding required to maintain City's existing infrastructure assets in a state of good repair.
- Annual reviews enables the City to adapt to changes in asset management practices and explore reinvestment opportunities to mitigate increasing costs due to inflation, past growth and new assets.
- Council approved an annual 0.5% infrastructure investment from 2019 to 2022 for a total of 2.0%. Based on known inflows and outflows, the 2021 Budget identified sufficient funds in the current 25-year planning horizon.



Risks

Risks that will impact the City's ability to continue providing the approved levels of service to its residents and businesses in the future, include but are not limited to impacts due to:

- Aftermath of Global Pandemic/Loss of Revenue
- Data Gaps and Inaccuracies
- Climate Change
- Standards and Legislative Changes
- Growth
- Inflation
- Increasing Number of Aging Assets



Enhanced Asset Management

- In order to reduce the impact of anticipated risks and to ensure the City continues to provide satisfactory levels of service in a sustainable manner, ongoing investment is required to enhance the overall Asset Management Program.
- Enhanced AM Strategy will offer the following benefits;
 - Detailed risk analysis of infrastructure assets
 - Prioritized infrastructure investment to maximize benefits and reduce risk
 - Informed decision making over the life of assets
 - More efficient and effective delivery of services
- The cost of Corporate Asset Management Program in near future is estimated to be less than 1% of the average annual \$100 Million/year that the City spends to maintain its tangible assets in a good state of repair.



Alignment with Strategic Priorities

- The 2021 Asset Management Plan serves to be a guide for management of City of Markham infrastructure assets.
- The 2021 Asset Management Plan aligns with the following goals of 'Building Markham Future Together: 2020 – 2023 Strategic Plan';
 - **Exceptional Services by Exceptional People:** Leverage technology to push information out to stakeholders
 - **Engaged, Diverse, Thriving & Vibrant City:** City assets enable and support
 - **Safe, Sustainable & Complete Community:** Ensure business continuity of our services and infrastructure
 - **Stewardship of Money & Resources:** Proactively manage our assets to maximize the return on taxpayer investment and increase transparency and accountability of our stewardship of services, policies, processes, money and resources.



Conclusion

- City is in compliance with O. Reg. 588/17.
- City continues to proactively and sustainably manage its infrastructure assets while delivering satisfactory levels of service
- Our Asset Management Program is working:
 - 92% of City's infrastructure assets are performing as intended,
 - Those that are nearing end of life (Poor to Very Poor) have plans in place to address

Asset Management will enable the City to continue to achieve levels of service, ensure strategic alignment with infrastructure investments and to continually evolve our business process to improve quality and contain cost increases.



Next Steps

- Develop roadmap and identify resources required to further enhance City of Markham Corporate Asset Management Program – **End of 2021**
- Achieve compliance with the recommendations of 2019 Asset Management Audit report as committed by Senior Management and Council – **2022-2023**
 - Some recommendations identified in AG Report are slightly behind schedule however, Staff has a plan in place and are making progress in achieving full compliance with the AG Report.



Presentation to: General Committee

Meeting Date: September 13, 2021

Subject: 2021 Asset Management Plan (AMP)
Prepared by: Sameem Shah, Acting Manager, Corporate Asset Management
Graham Seaman, Director, Sustainability and Asset Management

Recommendation:

1. THAT the presentation titled “2021 Asset Management Plan (AMP) Endorsement” be received;
2. AND THAT Council endorse the 2021 Asset Management Plan (AMP) and adopt the proposed asset management strategy and framework;
3. AND THAT staff be authorized and directed to do all things necessary to give effect to this resolution.