

City of Markham

# Asset Management Plan



## **On the Cover**

- Aaniin Community Centre & Library grand opening celebration, 2018
- Fire Trucks in front of Fire station 99
- Cornell Woodlot Park
- Rehabbed Dennison Road

# Table of Contents

1.	EXECUTIVE SUMMARY.....	5
1.1	PURPOSE .....	5
1.2	INFRASTRUCTURE ASSETS.....	5
1.3	LEVELS OF SERVICE.....	6
1.4	ASSET MANAGEMENT FRAMEWORK AND STRATEGY .....	6
1.5	FINANCIAL STRATEGY .....	7
1.6	CONCLUSION .....	7
2.	INTRODUCTION.....	9
2.1	PROVINCIAL GUIDELINES ON ASSET MANAGEMENT PLANS.....	9
2.2	CITY OF MARKHAM GOALS / STRATEGIC PLAN .....	10
2.3	CITY OF MARKHAM ASSET MANAGEMENT PLAN (AMP).....	10
2.4	WHICH INFRASTRUCTURE IS INCLUDED IN AMP? .....	11
2.5	DEVELOPMENT AND EVALUATION OF THE AMP.....	11
3.	STATE OF LOCAL INFRASTRUCTURE .....	13
3.1	DEFINITIONS.....	13
3.2	CITY INFRASTRUCTURE.....	16
3.3	WATER INFRASTRUCTURE.....	17
3.4	WASTEWATER INFRASTRUCTURE .....	20
3.5	STORMWATER INFRASTRUCTURE.....	23
3.6	STORMWATER MANAGEMENT (SWM) PONDS / NATURAL INFRASTRUCTURE.....	26
3.7	STREETLIGHTS .....	27
3.8	STRUCTURE – VEHICULAR BRIDGES, PEDESTRIAN BRIDGES, CULVERTS .....	29
3.9	ROADS AND SAFETY DEVICES.....	32
3.10	FACILITIES.....	35
3.11	PARKS .....	37
3.12	FLEET.....	42
3.13	INFORMATION TECHNOLOGY INFRASTRUCTURE HARDWARE.....	44

4.	LEVELS OF SERVICE.....	47
4.1	WATER ASSETS .....	47
4.2	WASTEWATER ASSETS.....	50
4.3	STORMWATER ASSETS.....	52
4.4	STORMWATER MANAGEMENT (SWM) PONDS / NATURAL INFRASTRUCTURE .....	53
4.5	STRUCTURES – VEHICULAR BRIDGES, PEDESTRIAN BRIDGES, AND CULVERTS .....	54
4.6	STREETLIGHTS .....	56
4.7	ROADS, SAFETY DEVICES AND TRAFFIC SIGNALS.....	57
4.8	FACILITIES.....	61
4.9	PARKS .....	62
4.10	FLEET .....	63
4.11	INFORMATION TECHNOLOGYINFRASTRUCTURE HARDWARE.....	63
5.	ASSET MANAGEMENT FRAMEWORK & STRATEGY .....	65
5.1	MARKHAM ASSET MANAGEMENT FRAMEWORK.....	65
5.2	CURRENT CITY OF MARKHAM ASSET MANAGEMENT STRATEGIES.....	70
5.3	WATER INFRASTRUCTURE.....	70
5.4	WASTEWATER INFRASTRUCTURE.....	72
5.5	STORMWATER INFRASTRUCTURE .....	73
5.6	STORMWATER MANAGEMENT (SWM) PONDS / NATURAL INFRASTRUCTURE .....	74
5.7	STRUCTURE – VEHICULAR BRIDGES, PEDESTRIAN BRIDGES, CULVERTS .....	76
5.8	STREETLIGHTS .....	78
5.9	ROADS AND SAFETY DEVICES.....	79
5.10	FACILITIES.....	83
5.11	TRAFFIC SIGNALS.....	84
5.12	PARKS .....	85
5.13	FLEET .....	86
5.14	INFORMATION TECHNOLOGY INFRASTRUCTURE HARDWARE.....	87
5.15	ENTERPRISE ASSET MANAGEMENT (EAM) .....	87
5.16	CLIMATE CHANGE MITIGATION .....	88
5.17	NON-INFRASTRUCTURE SOLUTIONS .....	89
6.	FINANCING STRATEGY.....	93
6.1	INTRODUCTION .....	93
6.2	FINANCIAL STRATEGIES.....	94
6.3	FINANCIAL MANAGEMENT .....	98
7.	Appendices.....	101
	Appendix A: 2019 Asset Management Policy.....	102
	Appendix B: Cashflow Projection – Capital Rehabilitation, Replacement, Maintenance and Repairs.....	110
	Appendix C: Cashflow Projection – Waterworks.....	112
	Appendix D: Cashflow Projection – Development Charges Reserves .....	114

## Table of Figures

Figure 3-1: Asset Distribution (%) by Replacement Value (\$M) – Citywide .....	16
Figure 3-2: Asset Distribution (%) by Replacement Value (\$M) – Water Infrastructure.....	17
Figure 3-3: % Useful Life by Component and Condition Rating by Age – Water .....	18
Figure 3-4: Average Asset Condition Distribution by Replacement Value – Watermain .....	19
Figure 3-5: Asset Distribution (%) by Replacement Value (\$M) – Wastewater.....	20
Figure 3-6: % Useful Life by Component and Condition Rating by Age – Waste Water .....	21
Figure 3-7: Average Asset Condition Distribution by Replacement Value – Wastewater (Sanitary Sewers) .....	22
Figure 3-8: Asset Distribution (%) by Replacement Value (\$M) – Storm-water .....	23
Figure 3-9: % Useful Life by Component and Condition Rating by Age – Stormwater .....	24
Figure 3-10: Average Asset Condition Distribution by Replacement Value – Storm Sewers .....	25
Figure 3-11: Asset Distribution (%) by Replacement Value (\$M) – Streetlights.....	27
Figure 3-12: Useful Life by Component and Condition Rating by Age – Streetlight .....	28
Figure 3-13: Average Asset Condition Distribution by Replacement Value – Streetlight Poles and Cables.....	28
Figure 3-14: Asset Distribution (%) by Replacement Value (\$M) – Structure.....	29
Figure 3-15: Average Bridge Condition Index (BCI) by Structure Type .....	30
Figure 3-16: Bridge Condition Index Distribution by Replacement Value – Vehicle Bridge.....	31
Figure 3-17: Asset Distribution (%) by Replacement Value (\$M) – Roads .....	32
Figure 3-18: % Remaining Useful Life by Component and Condition Rating – Roads .....	33
Figure 3-19: Average Asset Condition Distribution by Replacement Value – Roadway Classes .....	34
Figure 3-20: Asset Distribution (%) by Replacement Value (\$M) – Facilities.....	35
Figure 3-21: Average Asset Condition Distribution by Replacement Value – Facilities.....	36
Figure 3-22: Asset Distribution (%) by Replacement Value (\$M) – Parks .....	39
Figure 3-23: % Useful Life by Component – Parks .....	40
Figure 3-24: Average Asset Condition Distribution by Replacement Value – Parks .....	41
Figure 3-25: Asset Distribution (%) by Replacement Value (\$M) – Fleet .....	42
Figure 3-26: % Useful Life by Component and Condition Rating by Age – Fleet.....	43
Figure 3-27: Average Asset Condition Distribution by Replacement Value – Fleet.....	43
Figure 3-28: Asset Distribution (%) by Replacement Value (\$000s) – IT .....	44
Figure 3-29: % Useful Life by Component and Condition Rating by Age – IT .....	45
Figure 3-30: Average Asset Condition Distribution by Replacement Value – IT .....	45
Figure 4-1: Properties connected to Municipal Water System and Fire Flow Availability (2019).....	49
Figure 4-2: Properties connected to the Municipal Wastewater System (2019) .....	51
Figure 4-3: Properties Resilient to 5-year and 100-year storm (2019).....	53
Figure 4-4: Images of Condition of Bridges and Culverts.....	55
Figure 4-5: City of Markham Road Network and Connectivity .....	58
Figure 4-6: Pavement Condition Index of Arterial Roads.....	59
Figure 4-7: Pavement Condition Index of Major/Minor Roads .....	59
Figure 4-8: Pavement Condition Index of Local/Laneway Roads .....	60