CITY OF VAUGHAN
COMMITTEE OF THE WHOLE (WORKING SESSION)
AGENDA

This is an Electronic Meeting. The Council Chamber will not be open to the public. Public comments can be submitted by email to clerks@vaughan.ca. If you wish to speak to an item listed on the Agenda, please pre-register by contacting Access Vaughan at 905-832-2281 or clerks@vaughan.ca by noon on the last business day before the meeting.

Wednesday, September 15, 2021
1:00 p.m.
Council Chamber
2nd Floor, Vaughan City Hall
2141 Major Mackenzie Drive
Vaughan, Ontario

Pages

1. CONFIRMATION OF AGENDA

2. DISCLOSURE OF INTEREST

3. COMMUNICATIONS

4. PRESENTATIONS

5. DETERMINATION OF ITEMS REQUIRING SEPARATE DISCUSSION INCLUDING MEMBERS RESOLUTION(S)

    Public Works

    1. HORTICULTURE OPERATION'S BEAUTIFICATION STRATEGY 2.0   3
        Report of the Deputy City Manager, Public Works with respect to the above.

Infrastructure Development

Planning and Growth Management

6. ADOPTION OF ITEMS NOT REQUIRING SEPARATE DISCUSSION

7. CONSIDERATION OF ITEMS REQUIRING SEPARATE DISCUSSION

8. CONSIDERATION OF STATUTORY / AD HOC COMMITTEE REPORTS

9. STAFF COMMUNICATIONS

10. NEW BUSINESS

11. ADJOURNMENT

ALL APPENDICES ARE AVAILABLE FROM THE CITY CLERK'S OFFICE
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AND VIDEO BROADCAST

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Committee of the Whole (Working Session) Report

DATE: Wednesday, September 15, 2021   **WARD(S):** ALL

TITLE: HORTICULTURE OPERATION'S BEAUTIFICATION STRATEGY 2.0

FROM:
Zoran Postic, Deputy City Manager, Public Works

ACTION: DECISION

Purpose

To seek Council endorsement of the Horticulture Operation's Beautification Strategy 2.0 highlighting Council's commitment to citizens to provide beautification across the City that is coherent, efficient, and sustainable in support of the 2018-2022 Term of Council Service Excellence Strategic Plan and beyond.

Report Highlights

- The original beautification strategy Council endorsed in 2016, has met its objective, and operations have advanced through several improvement initiatives, including:
  - Complete inventory mapping,
  - Implementation of "smart" standardized planters and hanging baskets, with a cost avoidance of $110,000 annually; and
  - Implementation of a sponsorship program, that created an additional revenue stream of $75,000.
- The renewed beautification strategy addresses citizen expectations and will deliver:
  - Increased maintenance levels,
  - Clarity on horticulture display classifications, and
  - A standard of work for the Horticulture program.
- The renewed strategy will be implemented in a phased approach; status updates will be provided to Council annually, each spring.
- This renewed strategy will require an $822,500 investment cash flowed over the next three (3) years
- A municipal scan comparing Vaughan's service levels to other comparable municipalities shows that Vaughan is providing a lower level of service.

Recommendations

1. That Council endorse the renewed Beautification 2.0 Strategy as substantially presented in this report and Attachment 1; and
2. That the required operational budget for the recommendation be considered in future budget cycles.

Background

The 2016 Beautification Strategy set out two main objectives, which have been fulfilled by horticulture operations.

The first objective was to outline a general strategy for the beautification of the City of Vaughan. The strategy addressed shortcomings and outlined a general beautification framework that features four (4) classifications (Basic, Standard, Enhanced and Premium); these classifications are associated with a specific composition of plant materials, as well as a specific level of service.

The second objective was surrounding beautification plans for Canada's 150th Anniversary celebration. There was six (6) proposed sites that have received enhanced beautification. Staff have outlined efforts with service groups and other City of Vaughan departments to foster community ownership of these 150th Anniversary sites.

Significant improvements have been made to streamline service delivery, sustain service levels, and provide communities with dedicated gardeners.

A major inventory initiative, consisting of 2,200 horticulture displays have been collected and catalogued. This inventory has provided an opportunity to create dedicated maintenance zones that balanced resources across the City. This resulted in an equal distribution of horticulture resources and staff, and a 43% reduction in assets per zones which provided a foundation in moving towards a more proactive model. Dedicated maintenance zones foster a sense of ownership amongst staff and provides communities with dedicated gardeners that are familiar with the sites and cultural needs of the areas.

The implementation of reservoir planters in 2020 provides an on-going cost benefit of $110,000 annually, by cutting watering efforts in half.

In 2020, reservoirs planters were adopted and paired with 750 reservoir hanging baskets to reduce total watering efforts by 50%. This initiative is expected to realize perpetual cost avoidance of $110,000 annually. Beyond operational benefits, these planters also provide standardization and improve plant health by mitigating against overwatering.

The 2021 launch of the horticulture sponsorship program, Grow with Vaughan, stands to off-set approximately $75,000 in operational costs annually, while providing businesses with partnership opportunities.

The Municipal Partnership Office (MPO) in collaboration with Parks Forestry Horticulture Operations (PFHO) developed a program to offer support, targeted engagement, and community investment opportunities at a low-cost for local businesses through a horticulture sponsorship program. The program provides the opportunity to build brand awareness in a targeted community, along with positive brand association, by contributing to the quality of life and beautification of the neighborhood's businesses operate. The program also created a revenue stream for horticulture operations to help offset maintenance costs. This funding helps support the growing operations that, historically, had difficulties finding funding. During the first year of implementation, sponsorship, 21 out of a possible 50 sites have been sold, generating over $38,000 in sponsorships; this has helped offset seasonal labour.

As a result of the success within the first year, the Municipal Partnership Office will continue to collaborate with Parks, Forestry and Horticulture Operations to expand this program to other opportunities to continue to build brand recognition for Vaughan's business community and help offset operational costs.

Transitioning to a perennial based garden has created efficiencies in maintenance efforts along with an annual $10,000 cost saving, while achieving beautification across the City.

Moving to a more resilient and robust perennial based garden will help sustain costs, reduce maintenance, increase the overall flower inventory, and promote a sustainable operation year over year.

Transitioning from annual flower displays to a perennial base flower bed will show a return on investment of double the plant material after the third (3rd) year through dividing, splitting, budding, and propagating, thus increasing the number of flowers for beautification. Horticulture has been able to achieve a cost avoidance of $10,000 per year with overwintering planter centre piece materials.

Another benefit was a realization last year, when Covid-19 handcuffed beautification efforts associated with annual plantings. A perennial based garden would relieve constraints in the event of future work disruption or planting failures, minimizing risk, and ensuring beautification year over year.

The advancements realized assist in both quantifying maintenance cost as well as partially offsetting recent growth pressures.

The continuing growth in assets – imminently in the Vaughan Metropolitan Centre, the Hospital Precinct, and various subdivisions entrance features – requires continuing investment in operations to achieve service delivery targets. As horticulture displays are designed and built, horticulture operations can provide robust assessment of

maintenance resource requirements. Moreover, the effort made to advance operational efficiency and finding alternative funding sources have helped to lessen these requirements.

The successes achieved presents an opportune time to review and refresh this strategy to ensure that it continues to align with Terms of Council priorities and the needs of our citizens.

Previous Reports/Authority
2016 –"Vaughan – A Beautiful Experience"
2020 – "Horticulture Beds Sponsorship Program"

Analysis and Options
The proposed strategy was developed out of a comprehensive analysis of performance data, citizen call-in data, municipal benchmarking, and public engagement.

Staff have completed a comprehensive analysis with citizen engagement as a fundamental input to the renewed beautification strategy. The review also included a comprehensive review of horticulture work orders, service levels, and a peer assessment.

In addition to the analysis, the proposed beautification strategy has taken items like the sponsorship program and the monarch pledge into consideration to better inform beautification efforts.

Operational improvements have contributed to achieving and surpassing service levels despite growth pressures; however, citizen expectations continue to exceed current service levels.

Horticulture has generated significant benefits from reconfiguring maintenance zones, implementing reservoir planters, and implementing the Sponsorship Program; yet expectations continue to exceed current service levels.

Historical work orders identified gaps in service levels particularly for entry features, annual plantings, and weeding maintenance.

Feedback from public engagement revealed that citizens regard the City of Vaughan as a beautiful city, but entrances to neighbourhood communities via major or regional roads require more beautification efforts. Citizens want to see an increase of perennials, pollinators and tree plantings and there was a definite need to increase maintenance and service levels as most citizens indicated being "very unsatisfied" with current maintenance standards. Finally, the paradox of increasing service levels is met with a clear desire not to increase taxes as well.

Compared to our peers Vaughan horticulture operations provides a lower level of service with a comparable number of assets in peer municipalities.

While compared to our peers, Vaughan horticulture operations provides a lower level of service in several classifications. Results from a municipal scan indicate that the city is severely lagging behind in that several of Vaughan's service levels receive approximately 50% less maintenance than those surveyed.

Table 1: Weeding Service Levels

Classification	Weeding Service Levels (occurances per season)			
	Vaughan	Markham	Brampton	Richmond Hill
Premium	6	↑ 18	↑ 44	↑ 44
Enhanced	3	↑ 18	↑ 22	↑ 10
Standard	2	↑ 3	↑ 11	↑ 5
Basic	1	1	↑ 12	On Request

Table 2: Pruning and Mulching Service Levels

Classification	Pruning and Mulching Service Levels (occurances per annum)			
	Vaughan	Markham	Brampton	Richmond Hill
Premium	1	1	As Required	As Required
Enhanced	1/2	↑ 1	As Required	As Required
Standard	1/2	1/2	As Required	As Required
Basic	1/3	1/3	As Required	As Required

The proposed service levels reflect an equitable and standardized approach that is transparent and responsive to Council, our Citizens, and the increased demands due to continued growth.

The proposed classifications ensure equity and transparency while providing a greater service level that meet citizens' expectations. The following four (4) classification are proposed.

1. **Significant City Sites:** applies to locations of civic importance and village centers. These sites will receive improved maintenance compared to existing service levels.
2. **Neighbourhood Entrances and Community Hubs:** applies to the existing entrances to neighbourhood communities on main roads, community centres, and libraries. These locations have high visibility; they welcome citizens and visitors to the community. These sites will have heightened maintenance compared to current existing service levels.

3. **Boulevards and Side Streets:** applies to sites located on streets adjacent to major roads that border a community but are not an entry point. This classification also applies to secondary roads inside communities. These sites with existing vegetation will have greater weeding and pruning service levels.
4. **Medians and Roundabouts:** these sites are located on both major and secondary roads and will be created into pollinator gardens. Pollinator gardens include plants that support birds, butterflies, bees, and beetles by providing both food and shelter. Supporting these species is important as they are responsible for pollinating our crops and, in turn, growing the food we eat. These types of planting require minimal maintenance, which also keep our crews safe by reducing the amount of time they need to work roadside. Less maintenance also means fewer lane shutdowns, lessening the roadway and traffic interruptions.

Table 3: Proposed Weeding Service Levels

Classification	Weeding Service Levels			
	Current		Proposed	
	Service Delivery (visits/ season)	Meeting Citizen Expectation	Change in Service Level	Service Level (visits/ season)
Significant City Sites	6	✓	↑ Increase x2	12
Neighbourhood Entrances and Community Hubs	3	✗	↑ Increase x2	6
Boulevards and Side Street	1	✗	↑ Increase x3	3
Medians and Roundabouts	N/A	N/A	Establish Service Level	1

Table 4: Proposed Pruning and Mulching Service Levels

Classification	Pruning and Mulching Service Levels			
	Current State		Proposed	
	Service Delivery (visits/ year)	Meeting Citizen Expectation	Change in service level	Service Level (visits/ year)
Significant City Sites	1	✓	No change	1
Neighbourhood Entrances and Community Hubs	1 Every 2 Years	✓	No change	1 Every 2 Years
Boulevards and Side Street	1 Every 2 Years	✗	No change	1 Every 2 Years
Medians and Roundabouts	N/A	N/A	Establish Service Level	1 Every 3 Years

In collaboration with Municipal Partnership Office, staff see value in continuing the Grow with Vaughan Sponsorship program as presented to Council in June 2020.

In collaboration Municipal Partnership Office staff see value in continuing the Grow with Vaughan Sponsorship program as presented to Council in June 2020. The sponsorship program has achieved over $38,000 with 21 beds being sponsored by local businesses. This revenue will help offset operational costs associated to horticultural displays across the City, while contributing to beautification efforts.

Staff recommends that implementation of the proposed beautification strategy be completed with service level increase and bed renewals in a phased approach.

The implementation of increase service levels will be done according to approved budget increases. Each year, service levels will be reviewed against performance and citizen expectations.

The implementation for renewals will follow a two-phased approach. Phase 1 will include enhancing neighborhood entrances and community hubs, medians, and roundabouts to ensure that they are realigned with the new proposed classifications from 2022 to 2025. Phase 2 will include boulevards and side streets for realignment from 2025 to 2028.

This phased approach will allow horticulture operations to monitor each phase and allow room to pivot if needed to address unforeseen shortfalls, adjust operational needs and financial impact.

Financial Impact

Annual operating costs to address increase of service levels will be evaluated as part of the budget process.

While there is no impact toward approving this report at this time, the program will require an operating and capital investment which will be brought forward during the 2022 budget process.

The total operational funding impact is estimated at $622,500, implemented over the next three (3) years.

The capital impact cost to develop and to implement the strategy is estimated at $260,000 in capital over the next three (3) years.

The total financial Impact of project is summarized in Table 5.

Table 5: Total Financial Impact

Item	Financial Impact 2022	Financial Impact 2023	Financial Impact 2024
Net New Capital; Materials and Equipment (Vehicles and Perennial Plant Material)	$140,000	$60,000	$60,000
Net New Operating; Labour (on going)	$207,500	$207,500	$207,500
Total Operating / Year	$207,500	$415,000	$622,500

Requests for capital and operating funding to implement the Beautification 2.0 Strategy will be considered as part of the annual budgeting process and evaluated against other City priorities.

Broader Regional Impacts/Considerations

York region property is out of scope of this project. Items within the current jurisdiction of York Region that is currently maintained by the City of Vaughan will be consolidated.

Conclusion

Horticulture Operations are committed to providing service excellence. Over the past few years, operational efficiencies have increased performance, and created new revenue streams.

To continue to with growth of city building, expectations from our citizens and promote beautification across the City of Vaughan, the renewed Beautification 2.0 is proposed.

For more information, please contact Nadia Paladino – Director of Parks, Forestry and Horticulture Operations. (ext. 6146)

Attachments*:*

1. *"A Beautiful Experience" (Horticulture Beautification Strategy 2.0)*

Prepared by

Nadia Paladino, Director of Parks Forestry and Horticulture Operations
Colin Johnston, Manager of Business and Contract Services, Public Works

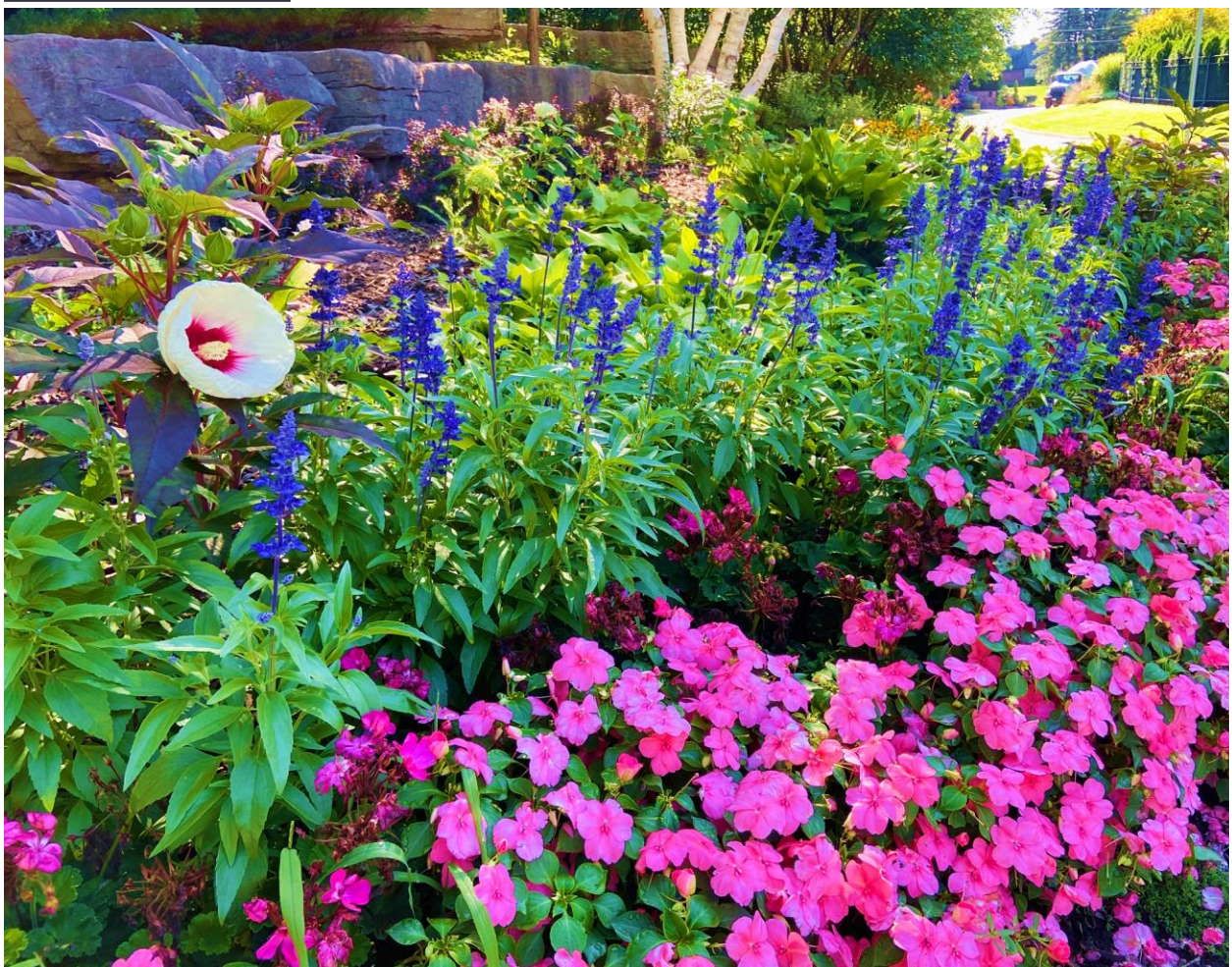| **Approved by**	**Reviewed by**
Zoran Postic, Deputy City Manager, Public Works	Nick Spensieri, City Manager

Beautification 2.0

A Beautiful Experience; continued.

SEPTEMBER 15TH 2021

CITY OF VAUGHAN

Beautification 2.0

A Beautiful Experience; continued.

Contents

Introduction

The City defines beautification as the process of making visual improvements to Vaughan through the placement of flowers, ornamental grasses, trees and shrubs in beds, planters and hanging baskets.

The City of Vaughan's current Beautification Strategy was created and approved in 2016 and implemented in 2017. The strategy provides guidance on where and how the City should focus its beautification efforts. The strategy includes a classification system with four service levels – Premium, Enhanced, Standard and Basic – and describes how these service levels are applied to flower beds, planters and hanging baskets throughout the city. The strategy also provides guidance on which plants the City should use and standards for how often plantings will be maintained.

The City undertook a comprehensive review of its Beautification Strategy to be certain it continues to meet the community's needs. This review and reassessment contributed to a renewed the strategy from 2016 by gathering feedback on service levels across the city.

A comprehensive review of the operation and strategy has been ongoing since the collection of inventories started in 2019, with a more granular lens with the revamping of this strategy. The review identified several opportunities for improvement.

The objective of this report is to refresh the original plan that was created and approved in 2016 and address opportunities for clarification, address needs of citizens and to plan for the future of the more than 550 flower planters, 750 hanging baskets 800 shrub beds and over 400 planting beds maintained by the City.

Background

The 2017 Beautification Strategy set out two main objectives, which have been fulfilled by horticulture operations.

1. To outline a general strategy for the beautification of the City of Vaughan

    The strategy addressed shortcomings and outlined a general beautification framework that features four (4) classifications (Basic, Standard, Enhanced and Premium). These classifications are associated with a specific composition of plant materials, as well as a specific level of service.

2. To outline beautification plans for the Canada 150th Anniversary celebration

    There was six (6) proposed sites that have received enhanced beautification. Staff have outlined efforts with service groups and other City of Vaughan departments to foster community ownership of these 150th Anniversary sites.

Since the initial implementation, significant improvements have been made to streamline service delivery and help sustain service levels.

Advancements Achieved

The following sections detail the significant advancements made to improve operational efficiency, create cost savings, improve quality all in the effort and contribution to service excellence.

Data-Informed Decisions

Data collection efforts made significant strides toward evidence-based service delivery improvements. Over 2,200 horticulture assets have been captured detailing GPS locations, measurements of the planting and shrub beds, asset type, classifications, and condition assessment. Figure 1 translates this data into a visual inventory of horticultural displays across the City.
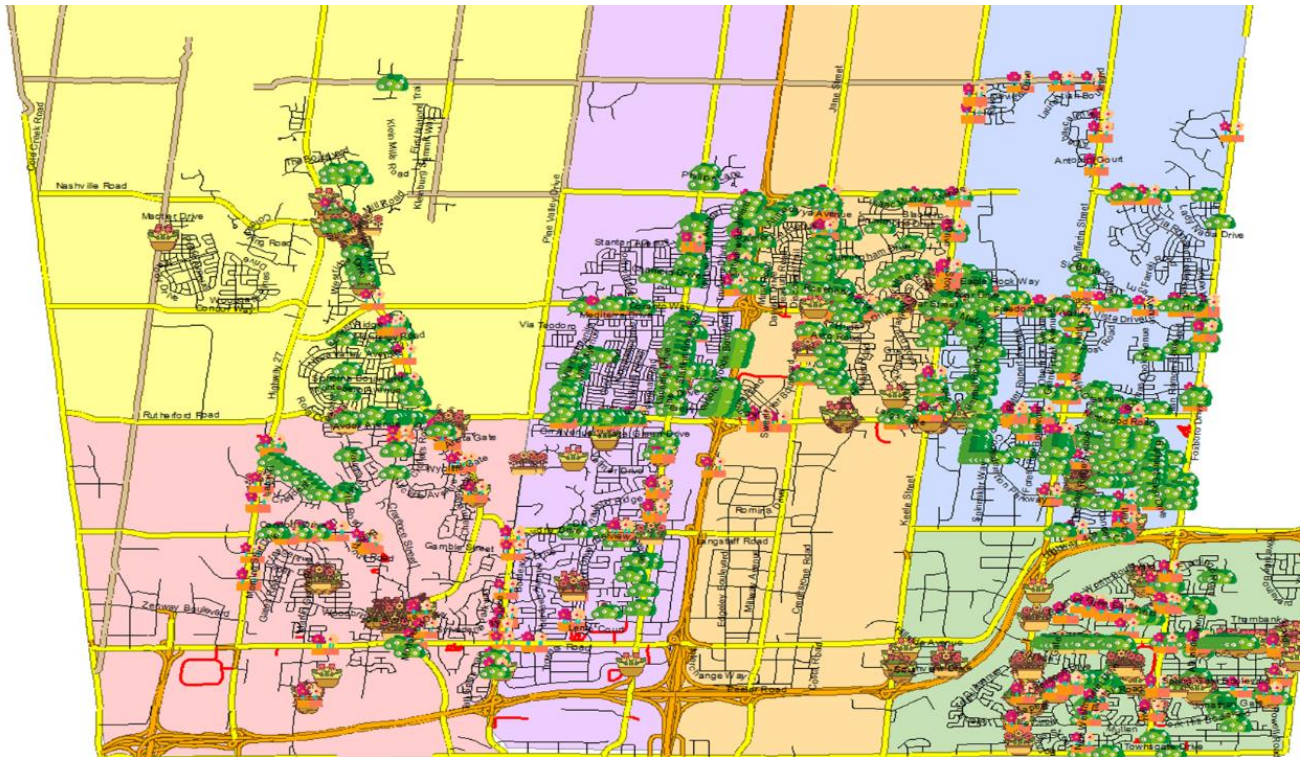
Figure 1: GIS map of Horticulture Assets

This activity was instrumental in equalizing the distribution of maintenance, moving from a 4-zone to 6-zone model (see Figure 2 and Figure 3). This resulted in an equal distribution of horticulture resources and staff, and a 43% reduction in assets per zones moving from 571 assets per area to 325.
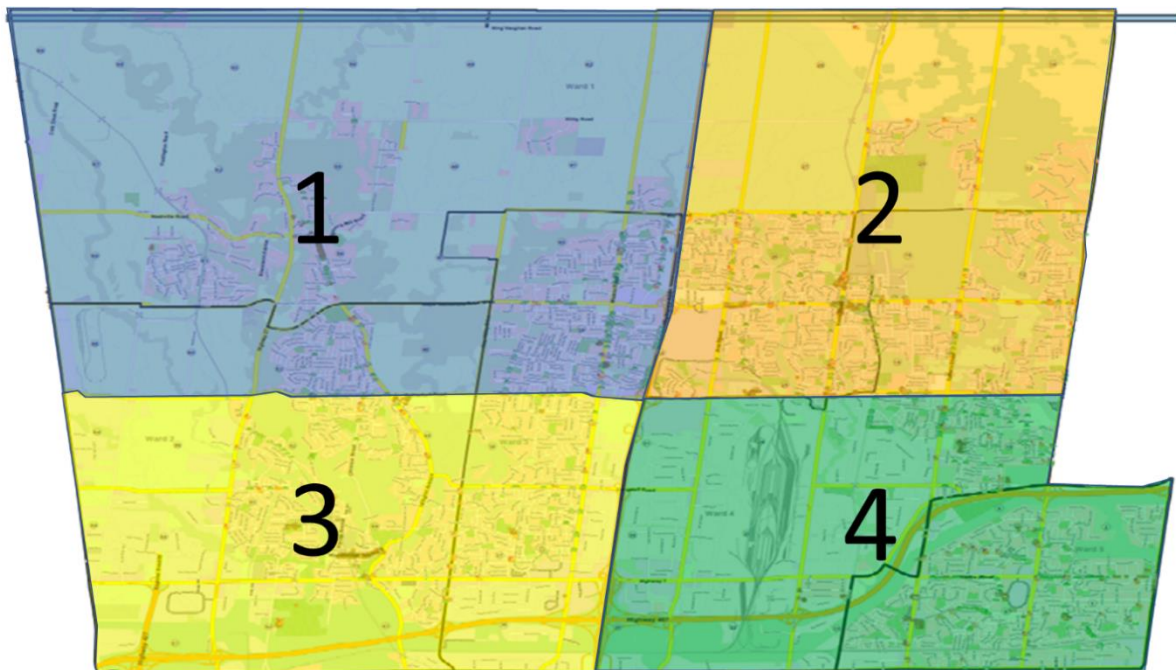

Figure 2: Old 4 Area Maintenance Zones

This assignment allowed for improvements in cultural practices which will promote health and longevity to horticultural material. All this was done with existing horticulture resources and staffing levels. Furthermore, the process involved team members in this decision-making; dedicated maintenance zones provided staff with opportunities to familiarize with the needs of the area and foster a sense of ownership.
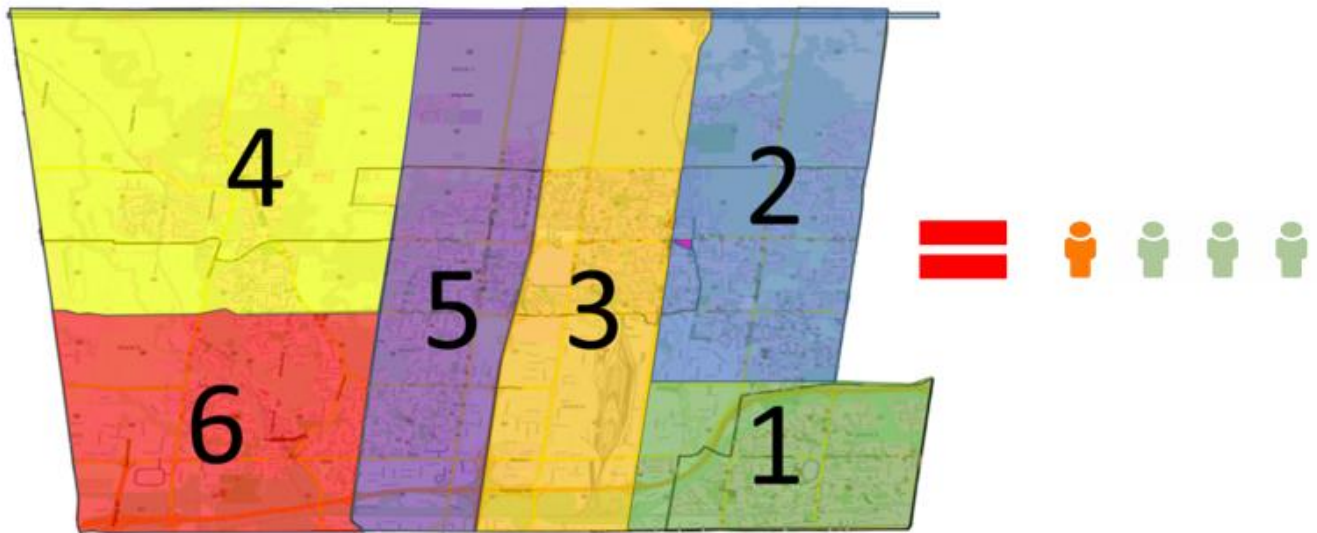

Figure 2: New 2020 Maintenance Zones

Perennial Cultural Practices

Horticulture has benefited from the use of perennials in planter centerpieces by overwintering in the greenhouse. Through dividing, splitting, budding, and propagating, these materials are doubled over three (3) years, realizing a cost avoidance of $10,000 of material per year. Transforming annual flower displays to a perennial-based flower bed will provide a significant return on investment.

Reservoir Planters

The implementation of reservoir planters in 2020 created significant operational efficiencies, by cutting watering efforts in half, while standardizing horticulture assets across the City.

In 2017, the horticulture department invested into 750 reservoir hanging baskets which provided several benefits - a standardized hanging basket across the city, a significant reduction in operational cost associated with water, and a mitigation against overwatering which promoted healthier plant material. Unfortunately, because staff still needed to attend the planters these baskets are typically paired with, the expected savings were not realized.

In 2020, reservoirs planters were adopted and paired with our 750 hanging baskets; this cut watering efforts in half. The savings realized in 2020 were clouded by the reduced operation due to COVID-19 but is expected to show on-going cost avoidance of approximately $110,000. This effort was then redirected into our operations to address growth and short falls in maintenance and cultural practices.

These planters also created the standardization and equity across the City. Feedback from residents supported the change towards these standardized planters.

Grow with Vaughan Sponsorship Program

In 2020, the Municipal Partnership Office (MPO) in collaboration with Parks Forestry Horticulture Operations (PFHO) developed a program to offer support, targeted engagement, and community investment opportunities at a low-cost for local businesses through a horticulture sponsorship program.

The program provides the opportunity for local businesses to build brand awareness in a targeted community, along with positive

brand association, by contributing to the quality of life and beautification of Vaughan neighbourhoods.

The program also created a revenue stream for horticulture operations to help offset maintenance costs. This funding helps support the growing operations which has historically had difficulties finding funding.

Analysis

Given the successes of the initial beautification strategy and ongoing improvements; timing was opportune for a thorough review/ refresh of this strategy to ensure that it continues to align with Terms of Council and meets the needs of our citizens.

The renewed strategy was informed by learnings from the Grow with Vaughan Sponsorship program, operational analysis of horticulture operations, historical call data from residents, and a municipal scan of our neighboring colleagues.

Traffic Count

To understand where sponsorship is best suited, daily traffic counts were collected. This identified that outer blocks along major arteries see a daily average traffic count of ~15,000 to over 40,000 per day, while those assets inside City block see significantly less. Knowing this allows us to better understand where beautification will make the most impact.

Performance Against Service Levels

Operational improvements have contributed to achieving and surpassing service levels despite growth pressures; however, resident expectations continue to exceed current service levels.

Classification	Weeding			Pruning and Mulching		
	Service Level		Performance	Service Level		Performance
Premium	6/ season	✓	Exceed	Every Year	✓	Meet
Enhanced	3/ season	✓	Exceed	Every 2 years	✓	Meet
Standard	2/ season	✓	Exceed	Every 2 years	✓	Meet
Basic	1/ season	✗	Below: On request	Every 3 years	✗	Below: On request

Resident Inquiries

In the spring and summer, residents will call in to inquire about the horticulture program and ask for additional service; most common requests are surrounding increase maintenance or materials.

To help provide a better understanding of the service timelines related to horticulture, Figure 4 below, was developed and will be advertised to help communicate expectations of when work is to take place. An example is the number of calls received after the Victoria Day weekend regarding the schedule of planting of summer annuals. The timeline provided shows the 4-week planting effort required to get 750 Hanging Baskets hung, 550 Annual Planters planted and over 65,000 annuals planted in beds.

Figure 5 illustrates complaint data over the past 3 years (2018 to 2020).
Overall, the data suggests that there is a discrepancy on service expectation, particularly on entry features annual plantings and weeding maintenance service levels and mirrors that of the results in the Public Engagement Survey
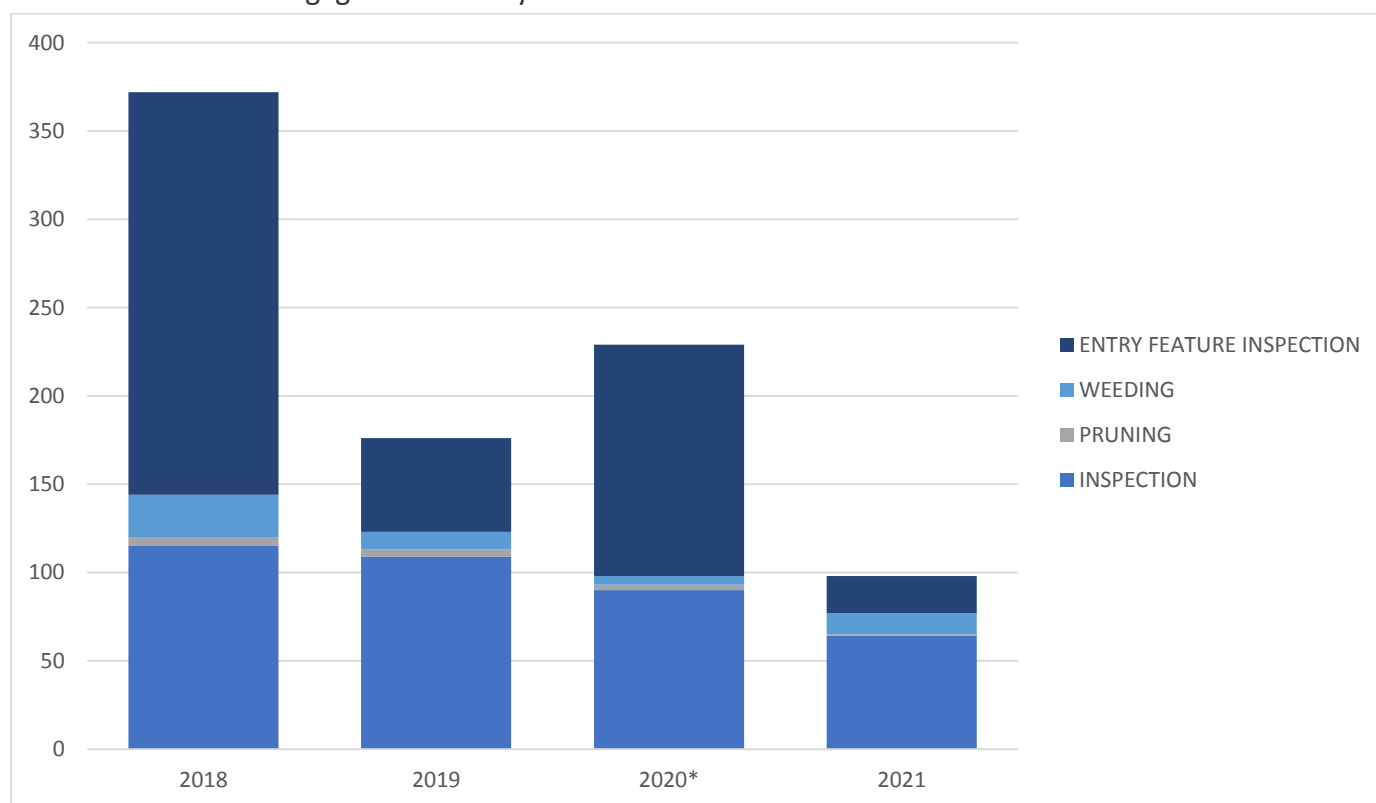

Figure 5: Complaint Data 2018 to 2020

Call volume over the last 3 years, reveals a positive impact of the implementation of improved operational performance and a decline in call volume. While the total 2020 call volumes increase over 2019, the volume was primarily associated with COVID-19 inquires and reduced horticulture operation.

Citizen Engagement

To supplement historical data, public input provided additional insight on perceptions and expectations on Horticulture services.

The beautification survey was out to the public between April 3rd, 2021 to April 18th, 2021; advertised through various platforms of social media, local newspapers, radio, and billboards placed strategically across the City. In all, over 500 citizens visited the project page, and 381 citizens participated in the survey

From this survey, notable results included:
- There was a definite need to increase maintenance and service levels as only 10% of residents indicated being satisfied with current maintenance standards.
- Residents believed that the City should focus more beautification efforts at Entrances to neighbourhood, boulevards parallel to roadways
- Citizens want to see an increase of perennial plantings, with inclusion of pollinators
- Finally, 71% of citizens noted that they thought Grow with Vaughan is a great opportunity for small businesses and a great way to offset costs and contribute to beautification for increase service levels.

Municipal Scan

A municipal scan was completed to understand service levels and delivery. The scan, although informative, provided some challenges as planting bed sizes and materials could not be quantified, which complicated some comparisons. Overall, while compared to our peers, Vaughan horticulture operations provides a lower level of service in several classifications. Results from a municipal scan indicate that several of Vaughan's service levels receive approximately 50% less maintenance than those surveyed.

Maintenance Service Levels

Table: Weeding Service Levels

Classification	Weeding Service Levels (per season)			
	Vaughan	Markham	Brampton	Richmond Hill
Premium	6	↑ 18	↑ 44	↑ 44
Enhanced	3	↑ 18	↑ 22	↑ 10
Standard	2	↑ 3	↑ 11	↑ 5
Basic	1	1	↑ 12	On Request

Table: Pruning and Mulching Service Levels

Classification	Pruning and Mulching Service Levels (per annum)			
	Vaughan	Markham	Brampton	Richmond Hill
Premium	1	1	As Required	As Required
Enhanced	1/2	↑ 1	As Required	As Required
Standard	1/2	1/2	As Required	As Required
Basic	1/3	1/3	As Required	As Required

Classification	Assets			
	Vaughan	Markham	Brampton	Richmond Hill
Total Assets	2515	↑ 2992	↓ 1806	↓ 948

Recommendations

The proposed classification for the beautification of the City of Vaughan has been determined through the following guiding principles

- To honour historically significant areas as determined through council
- To ensure all communities are treated in a transparent and equitable manner
- To adopt best cultural practices

- To ensure maintenance efforts meet service expectations and remain sustainable
- To continue to grow a perennial base garden

The proposal identified will allow horticulture operations to continue providing service excellence through an equitable and standardized approach that is transparent for our Council and our Citizens, which will allow horticulture operations to meet expectations.

Proposed Classifications

The proposed service levels are driven by data, staff knowledge and expertise, municipal benchmarking, and public engagement to provide service excellence through an equitable and standardized approach that is transparent for our Council and our Citizens.

Table: Weeding Service Levels

Classification	Weeding Service Levels			
	Current		Proposed	
	Service Delivery (visits/ season)	Meeting Citizen Expectation	Change in Service Level	Service Level (visits/ season)
Significant City Sites	6	✓	↑ **Increase x2**	12
Neighbourhood Entrances and Community Hubs	3	X	↑ **Increase x2**	6
Boulevards and Side Street	1	X	↑ **Increase x3**	3
Medians and Roundabouts	N/A	N/A	**Establish Service Level**	1

Classification	Pruning and Mulching Service Levels			
	Current State		Proposed	
	Service Delivery (visits/ year)	Meeting Citizen Expectation	Change in service level	Service Level (visits/ year)
Significant City Sites	1	✓	**No Change**	1
Neighbourhood Entrances and Community Hubs	**1 Every 2 Years**	✓	**No Change**	**1 Every 2 Years**
Boulevards and Side Street	**1 Every 2 Years**	✗	**No change**	**1 Every 2 Years**
Medians and Roundabouts	**N/A**	**N/A**	**Establish Service Level**	**1 Every 3 Years**

By increasing the number of maintenance visits, residents can expect reduced weed growth between each visit. Other long-term benefits of more frequent weeding's are removing the roots each time which reduces the rejuvenation of the weeds which results in less effort of each visit.

Perennial Based Gardens

Transitioning to a perennial base garden will continue to save money, staffing resources and maintenance time while still achieving beautification across the City.

The proposed new material allotment are as follows:

Classification	Renewed Strategy	Previous Beautification Strategy
Significant City Sites	Native Trees (80mm Caliper) 20% Perennials and Grasses 70% Annuals 10% Shrubs	Native Trees (80mm Caliper) 10% Perennials and Grasses 90% Annuals Shrubs
Neighbourhood Entrances and Community Hubs	Native Trees (60mm Caliper) 60% Perennials / Grasses 20% Annuals 20% Shrubs	Native Trees (50mm Caliper) 50% Perennials and Grasses 30% Annuals 20% Shrubs
Boulevard and Side Streets	Native Trees Turf	Street Trees Sod
Medians and Round abouts	100% Perennial Pollinators	N/A

Moving to a more resilient and robust perennial based garden will help sustain costs, reduce maintenance, increase the overall flower inventory, and promote a sustainable operation year over year.

Another benefit of perennial-based gardens was, realized in Spring/summer of 2020. Covid-19, and restriction to essential work, handcuffed beautification efforts of putting out annual flowers. A perennial based garden would relieve constraints in the event of pandemics and other failures of annual's yield; this will minimize risk and sustain beautification year over year.

Continuation of the Grow with Vaughan Sponsorship Program

In collaboration with Municipal Partnership Office, staff see value in continuing the Grow with Vaughan Sponsorship program as presented to Council in June 2020. The sponsorship program has achieved over $38,000 with 21 beds being sponsored by local businesses. This revenue will help offset operational costs associated to horticultural displays across the City, while contributing to beautification efforts.

As a result of the success within the first year, the Municipal Partnership Office will continue to collaborate with Parks, Forestry and Horticulture Operations to expand this program to other opportunities that present good opportunities to continue to build brand recognition for Vaughan's business community and help Parks offset operational costs.

Implementation

While proposed service levels are proposed to begin year 1 of the strategy, several sites require rejuvenation to meet classification. Staff recommend rejuvenations are completed in the following phased approach:

Phase 1: 2022- 2025
>   Neighborhood Entrances and Community Hubs
>   Median and Roundabouts

Phase 2: 2025 - 2028
>   Boulevards and Side Streets

Phase 1 will include neighborhood entrances and community hubs to ensure that they are realigned with the new proposed classifications from 2022 to 2025. Additionally, median and roundabouts will begin implementation with pollinator plantings in 2022.
Phase 2 will include boulevards and side streets for realignment from 2025 to 2028.

This phased approach will allow horticulture operations to monitor each phase and allow room to pivot if needed to address unforeseen shortfalls, adjust operational needs and financial impact.

Conclusion

Horticulture Operations are committed to providing service excellence. Over the past few years, operational efficiencies have increased performance, and created new revenue streams.

To continue to with growth of city building, expectations from our citizens and promote beautification across the City of Vaughan, the renewed Beautification 2.0 is proposed.

VAUGHAN

Committee of the Whole (Working Session) Report

DATE: Wednesday, September 15, 2021   **WARD(S):** ALL

TITLE: ASSET MANAGEMENT PLAN – URBAN FORESTRY

FROM:
Zoran Postic, Deputy City Manager, Public Works
Vince Musacchio, Acting Deputy City Manager, Infrastructure Development

ACTION: DECISION

Purpose
Seek Council endorsement of the Urban Forestry Asset Management Plan and
proactive Tree Maintenance Program.

Report Highlights
- The *Infrastructure for Jobs and Prosperity Act, 2015* under O. Reg. 588/17 specifies that Asset Management Plans be prepared and posted to a website that is available to the public.
- The Urban Forestry Asset Management Plan has been developed and includes a proactive Tree Maintenance Program to improve the resiliency of tree assets and will contribute to sustainable tree asset lifecycle management.
- The City currently utilizes a highly reactive maintenance strategy to manage its inventory of over 200,000 trees, a number which is also growing at a rate of more than 5,000 additional trees per year as seen so far during the current Term of Council.
- The proactive Tree Maintenance Program proposes increased inspection and pruning activities for the City's growing inventory of tree assets targeting a 7 year inspection and pruning cycle that is consistent with industry standards and practices in leading peer municipalities.
- A phased in approach over 4 years, beginning in 2022, is being recommended to fully implement the proactive Tree Maintenance Program with a one-time capital cost of $35,000 and operating cost of $1,162,000 over the 4 years.

Recommendations

1. That Council endorse the Urban Forestry Asset Management Plan and approve making it accessible to the public on the City's website (as specified by the *Infrastructure for Jobs and Prosperity Act, 2015* under O. Reg. 588/17) from the Infrastructure Planning and Corporate Asset Management webpage; and

2. That the proactive Tree Maintenance Program funding requirements be considered during the 2022 budget process.

Background

The City is responsible for over 200,000 trees along roadways and in City-owned parks, woodlots, and open spaces.

Vaughan is a rapidly growing City. As subdivisions and parks are built, new trees are planted and assumed at a current rate of more than 5,000 trees per year. The current maintenance strategy for the City's growing inventory of tree assets is largely reactive, responding to requests for service to rectify sightline concerns, tree-health or safety concerns, and emergency issues such as storm damage. The current maintenance program does not allow for more frequent lifecycle inspections or proactive pruning for the majority of the City's established tree inventory.

Trees provide a myriad of social, cultural, environmental, economic, health and aesthetic benefits, and unlike most infrastructure assets, they appreciate in value over time.

Trees contribute both directly and indirectly to the communities and citizens of Vaughan. They offer shelter and shade from the elements, whether they are moderating the urban heat island effect on streets, adjacent to homes or sheltering exposed residences from winter winds. Furthermore, trees such as those in City plazas and urban parks provide much needed natural features in our urban communities.

The City's streetscape tree assets have an estimated value of about $110 million. Proactively managing the City's streetscape tree assets comes with significant benefits. Toronto Dominion Bank published a Special Economics Report in 2014 outlining measurable benefits from maintaining urban trees such as water transportation abatement, carbon sequestration, air pollution reduction, energy emission abatement, and energy savings through temperature moderation. The report demonstrated cost savings to residents and municipal governments between $1.35 and $3.20 for every dollar spent on tree maintenance.

The Forestry Operations Report on the 2013 Ice Storm identified the opportunity to reduce tree failure during future storms through proactive tree maintenance.

The December 2013 Ice Storm created extensive damage to the City's urban forest – impacting over 21,000 trees, included a loss of 8,181 trees, at a direct cost of $9.6 million. There have been further annual losses due to the impacts of the Emerald Ash Borer and Asian Long Horned Beetle. However, following substantive tree planting activities over the previous Term of Council, the City is well-positioned to create a proactive program to mitigate against future storm-related or infestation-relation losses to the City's tree canopy.

The integration of Asset Management into Urban Forestry provides the opportunity to better manage tree assets comprehensively.

Preparation of the City's Asset Management Plans is currently underway to ensure compliance with O. Reg. 588/17. This regulation came into effect to address the issue that in many Ontario municipalities, existing infrastructure is degrading faster than it is being repaired or replaced, putting infrastructure services at risk.

The Urban Forestry Asset Management Plan consists of four sections as follows:
1. State of the Infrastructure (details asset quantities and replacement valuations).
2. Levels of Service (identifies qualitative and technical performance indicators measuring the level of services that are provided by the asset quantities identified).
3. Lifecycle Management Strategy (describes the operations and capital activities undertaken to maintain and manage Urban Forestry assets to ensure they are in a condition to provide the level of services identified).
4. Financial Strategy (forecasts operating, and capital outlays needed to fund the lifecycle activities identified).

A proactive Tree Maintenance Program is a key component of lifecycle management. It aligns with the Term of Council Strategic Priority of Environmental Stewardship and supports the 2019 Community Sustainability Plan – Green Directions Vaughan.

Proactive tree maintenance is aligned with the Strategic Priority theme of "Proactive Environmental Management". It is also aligned with the following sections of the City's community sustainability plan, Green Directions Vaughan 2019, specifically in the following sections:
(2.1.2) Promote green infrastructure (e.g., street trees, …) to build resilience and mitigate the effects of climate change.

(2.2.1) Manage and improve the urban forest, including increasing overall canopy cover, as an important element of green infrastructure and a critical asset of the City that is a community amenity, improves the health of residents, and provides ecosystem services.

A proactive tree pruning strategy prioritizes service excellence.

The systematic pruning of trees is not only the most effective method to address the high volumes of active service requests in neighbourhoods scheduled for pruning, it also has a limiting effect on future citizen requests for service. With historically high request volumes and a growing tree inventory, it will become continually more important to deploy the most efficient maintenance strategies available.

Previous Reports/Authority

For reference, the Report of the Finance, Administration and Audit Committee presented to Council on March 19, 2019 pertaining to the approval of Asset Management Policy may be found at the following address:
https://pub-vaughan.escribemeetings.com/filestream.ashx?DocumentId=15771

The Council approved Asset Management Policy may be found at the following address:
https://www.vaughan.ca/cityhall/departments/IPCAM/policies/Pages/default.aspx

The Report of the Finance, Administration and Audit Committee presented to Council on June 19, 2018 pertaining to the Internal Audit Report – Forestry and Horticulture Operations Audit can be found at the following address:
https://pub-vaughan.escribemeetings.com/filestream.ashx?DocumentId=72266

Analysis and Options

The City retained the consulting services of AECOM Canada to complete the development and review of the Urban Forestry Asset Management Plan and Tree Maintenance Program.

The Urban Forest Asset Management Plan provides evidence-based decision-making towards responsible and sustainable tree asset lifecycle management that is financially sustainable.

As an asset class, City trees are subjected to stresses that are unique to the urban environment and exist in areas where they have the potential to represent a safety and liability issue for the City. Trees that are not maintained can develop an irregular structure, which is susceptible to wind load and shearing during severe weather events.

Additionally, tree branches growing over roadways or sidewalks can impede traffic. Managing and caring for trees via a lifecycle approach will improve operational capacity and performance.

A 7 year proactive Tree Maintenance Program can eliminate hazards before they become a safety concern thereby reducing potential liability and exposure of the City.

A proactive inspection and pruning program promotes healthy and structurally sound growth and consists of the removal of dead, dying, diseased, interfering, and weak branches as well as selective pruning to lighten branches and reduce wind resistance. The preventative work will result in:

- Reduced tree failures, thereby reducing the potential liability exposure of the City.
- Improved public safety through the elimination of branches that block traffic signals, signs, and streetlights.
- Increased performance and condition of the tree assets through greater tree vitality, extending its overall life span.

About 6,000 trees are pruned reactively each year which, based on the City's inventory of street trees (not including trees in parks, woodlots, and open spaces), represents pruning activity in line with a 22 year cycle. However, as the tree inventory increases and based on existing operational resources, it is expected that the current reactive pruning (level of service) activities will decrease to a 25 year cycle by 2024.

A 5 to 7 year inspection and pruning cycle is consistent with arboriculture best practices and established proactive programs in peer and leading municipalities.

During the early years of newly planted trees, routine inspections and pruning on a proactive basis is the ideal lifecycle management approach toward promoting tree health into maturity and minimizing long-term maintenance costs. Adopting the proactive Tree Maintenance Program as detailed in the Urban Forestry Asset Management Plan requires increased inspection and pruning activities based on the recommended 7 year frequency cycle.

The City conducted a municipal scan across comparable cities to gauge established maintenance practices. The scan identified that the majority operate with an established tree maintenance strategy of 7 to 10 years. A notable exception is Mississauga which pursues a reactive-only program. The summary of the peer review is listed in Table 1.

Table 1: Municipal Comparison – Tree Maintenance Rotation

Municipality	Maintenance Rotation (Years)
York Region	
Vaughan	22 years
Richmond Hill	10 years
Markham	7-10 years
Ontario	
Toronto	7 years (starting 3 years after assumption)
Ottawa	7 years (starting 3 years after assumption)
Oshawa	7 years
Oakville	10 years
London	10 years
Mississauga	Reactive
Canada	
Surrey	5 years
Calgary	7 years
Fredericton	7 years

These increased maintenance activities need to be supported by appropriate operational budgets that keep pace with the growing inventory of tree assets.

Financial Impact

An annual operating investment of $1,162,000 (phased in over 4 years), plus a one-time capital investment of $35,000 is required to implement a 7 year proactive tree maintenance program.

While there is no impact toward approving this report at this time, the program will require an operating and capital investment which will be brought forward during the 2022 budget process.

Table 2: Net New Proactive Tree Maintenance Program Costs

Requirement	2022	2023	2024	2025
Net New Operating	$148,000	$338,000	$338,000	$338,000
Net New Capital	$35,000	-	-	-
Total Operating	$148,000	$486,000	$824,000	$1,162,000
Tree Pruning Cycle	18 year	14 year	10 year	7 year

The costs outlined are based on the recommended 7 year pruning cycle, which requires pruning approximately 21,000 trees annually. Based on budget availability and the considerable investment, a phased strategy is presented to achieve the 7 year cycle.

Broader Regional Impacts/Considerations

There are no Regional impacts anticipated as a result of the report recommendations.

Conclusion

Council endorsement of the Urban Forestry Asset Management Plan and approval to make it accessible to the public on the City's website from the Corporate Asset Management webpage is required to ensure compliance with O. Reg. 588/17. The Urban Forestry Asset Management Plan recommends a proactive Tree Maintenance Program, which is to be considered in the 2023 operating and capital budget process.

For more information, please contact:
Nadia Paladino, Director, Parks, Forestry, and Horticulture Operations, Ext. 6146
Michael Frieri, Acting Director, Infrastructure Planning & Corp. Asset Mgt, Ext. 8311.

Attachments

1. Urban Forestry Asset Management Plan, Infrastructure Planning & Corporate Asset Management, AECOM (consultant), April 2021.
2. Urban Forests: The Value of Trees in the City of Toronto, TD Economics, June 9, 2014.

Prepared by

Justin Wong, Project Manager, Corporate Asset Management, Ext. 8725.

Consulted with

Miles Peart, Manager, Urban Forestry, Ext. 6140.
Colin Johnston, Manager, Business & Contract Services, Ext. 6308.
Nadia Paladino, Director, Parks, Forestry & Horticulture Operations, Ext. 6146.
Michael Frieri, Acting Director, Infrastructure Planning & Corp. Asset Mgt, Ext. 8729.

Approved by

Vince Musacchio, Acting DCM
Infrastructure Development

Approved by

Zoran Postic, DCM
Public Works

Reviewed by

Nick Spensieri, City Manager

City of Vaughan
Asset Management Plans

(Urban Forestry)

City of Vaughan

Project number: 60641721

May 2021

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Figures

Tables

1. Introduction

The City of Vaughan ("the City") appointed AECOM Canada Ltd. ("AECOM") to assist in the renewal of the City's Asset Management (AM) Plans for its core infrastructure assets.

1.1 Overview

The City is one of nine area municipalities, located within the Regional Municipality of York. As a lower tier municipality, the City is responsible for providing such services as fire protection, public works, water distribution and wastewater collection, parks and recreation, building and planning and development control.

In 2018, by City Council approval, the Corporate AM Policy for the City came into effect; and, in 2013, the City's first Corporate AM Strategy was published. As identified in the Corporate AM Strategy, the City's first set of AM Plans (AMPs) were developed in 2014.

The purpose of this AMP is to capture new core infrastructure assets and any updates in the City's asset data, so as to provide the City with a comprehensive AMP. The objective is to deliver a financial and technical roadmap for the management of the City's core infrastructure assets, and to provide the means for the City to maximize value from its assets, at the lowest overall expense while, at the same time, providing enhanced service levels for its residents and promoting green initiatives.

Organizations that implement good AM practices will benefit from improved business and financial performance, effective investment decisions, and better risk management. Stakeholders can expect lower total asset life cycle costs, higher asset performance, and confidence in sustained future performance.

1.2 Asset Management Planning Provincial Requirements

The O. Reg. 588 / 17 came into effect in 2018 and stipulates specific AM requirements to be in place within Ontario municipalities by certain key dates (Table 1-1). The renewal of this AM Plan for the City is one of the steps towards meeting the July 1st, 2022 deadline.

Table 1-1: O. Reg. 588 / 17: AM Planning for Municipal Infrastructure

Description: A regulation made under the Infrastructure for Jobs and Prosperity Act, 2015, stating that every municipality shall prepare and update a Strategic AM Policy, and that every municipality shall prepare an AM Plan for its core infrastructure assets by July 1, 2022, and an AM Plan for all other infrastructure assets by July 1, 2024. The regulation outlines several requirements that each AM Plan must follow, such as including current and proposed level of service. Core municipal infrastructure assets include water, wastewater, stormwater, road, and bridge assets.	
Deadline Date	**Regulatory Requirement**
July 1st, 2019	All municipalities are required to prepare their first Strategic AM Policy.
July 1st, 2022	All municipalities are required to have an AM Plan for its entire core municipal infrastructure (i.e., water, sanitary, stormwater, and transportation).
July 1st, 2024	All municipalities are required to have an AM Plan for infrastructure assets not included under their core assets.
July 1st, 2025	All AM Plans must include information about the LoS that the municipality proposes to provide, the activities required to meet those level of service, and a strategy to fund activities.

1.3 Asset Management Plan Scope

This AMP has been developed for the City's four core asset categories, owned and maintained by the City, as shown in Table 1-1. The renewal of the City's AM Plans is consistent with the guidelines laid out in the City's Corporate AM Policy and Section 5 of O. Reg. 588 / 17.

Table 1-2: In-Scope Assets

Asset Category	Sub-Assets
Water Distribution System	Water mains, service connections, valves, hydrants, chambers, water meters, pump stations, and water filling stations.
Wastewater Collection System	Wastewater mains, laterals, manholes, flowmeters, pump stations, and generator stations.
Stormwater Management System	Stormwater mains, laterals, manholes, catch basins, stormwater culverts, inout structures, devices, pump stations, ditches, stormwater management ponds, lakes, rivers, and waterways.
Transportation	Roads, bridges, and culverts.

The following elements are included within the scope of this AM Plan for each of the asset categories shown in **Table 1-2**.

- A summary of the asset inventory, including the replacement cost of the assets, the average age of the assets, the condition of the assets, and the City's approach to assessing the condition of the assets (**Section 3.1, 3.2** & **3.3**);
- Current levels of service (LoS) based on data from 2018 to 2020 determined in accordance with the qualitative descriptions and technical metrics outlined in O. Reg 588 / 17 (**Section 3.4**); and
- Asset lifecycle management activities to maintain identified current LoS, minimize associated asset risks, and to optimize costs over the whole lifecycle of the asset (**Section 3.5**).

1.4   Growth Planning

The City is one of Canada's fastest growing cities, with a population of over 300,000. It is projected that the number of residents will increase to 430,000 by 2031. In addition to its rapidly growing population, the City is home to a well-diversified and expanding employment sector with over 8,000 businesses and 150,000 employees. The City has the largest supply of new employment lands in the Greater Toronto Area (GTA) and it is projected that the number of employees will increase to 278,000 by 2031. As shown in **Figure 1-1**, presented is the development of the City's water network over multiple decades, which is one of the most essential and critical assets and illustrates the City's development over time.

The next 25 years will see the City transition from a growing suburban municipality to a fully urban space. This type of transition will require long-term thinking about how best to accommodate and make the most of new opportunities. Planning for the future through strategic planning will position the City to deal with the many pressing issues impacting the organization such as community safety, access to health facilities, environment, traffic congestion and issues related to growth and the quality of municipal services.
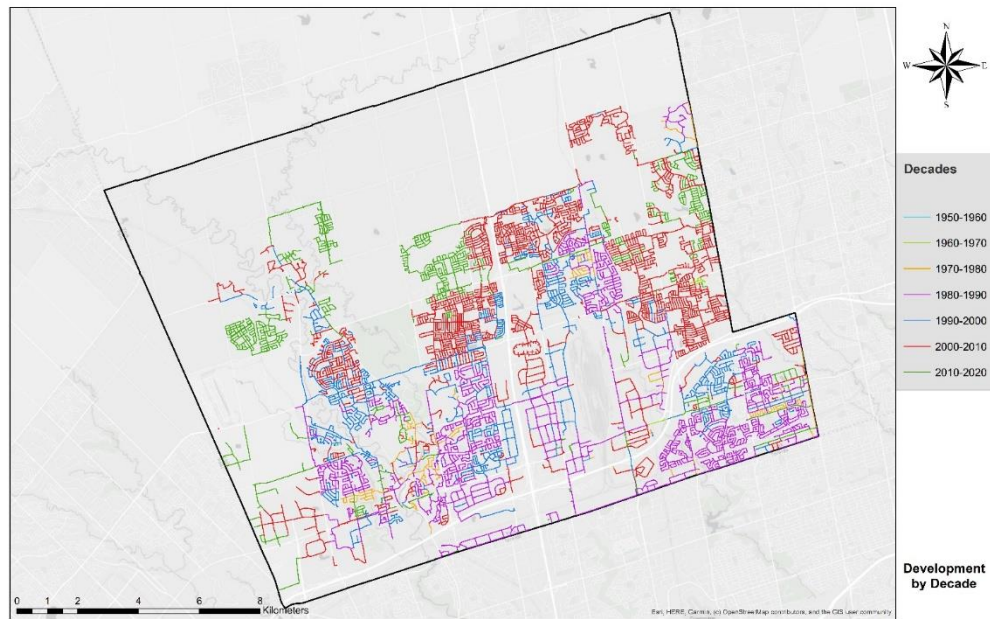
Figure 1-1: City of Vaughan Development Map

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2.   Approach for Asset Management Plan

The approach used in the renewal of this AM Plan is presented in **Figure 2-1**, and has been selected to ensure that the City can have the confidence to make fact-based and defensible business decisions from reliable and robust information.
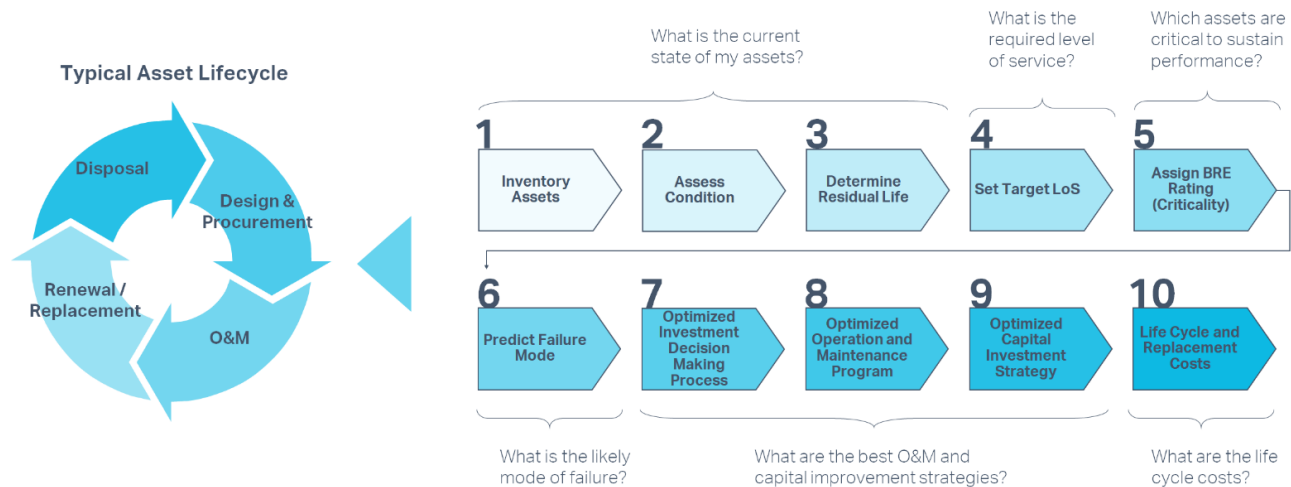

Figure 2-1: AM Plan Approach

2.1   State of Infrastructure

Defining the state of the infrastructure involves quantifying the assets owned, examining their age, replacement value, and condition. AECOM's approach to each of these asset characteristics is summarized below.

2.1.1   Expected Service Life & Remaining Service Life

The expected service life (ESL) is defined as the period over which an asset is available for use and able to provide the required level of service at an acceptable risk (i.e., without unforeseen costs of disruption for maintenance and repair). The ESL for this assignment will be based on discussions with City staff, information from previous studies, and any additional information that might inform the ESL. In terms of determining the Remaining Service Life (RSL), AECOM used the installation date together with the ESL.

In reality, different assets will deteriorate at different rates and not necessarily linearly over time, however, it is important to keep in mind the level of effort required to predict failure compared with the asset value. More sophisticated deterioration modelling may be warranted for very high value assets, whilst the cost of deterioration modeling for low-value assets may very well exceed the replacement cost of the asset. The actual service life can vary significantly from the ESL. In some instances, a variation in expected vs. actual service life is evident due to the following factors:

- **Operating conditions and demands:** Some equipment is operated intermittently or even infrequently, or is being operated a lower demand than its design capacity, thus the actual operating "age" of the asset is reduced.

- **Environment:** Some equipment is exposed to very aggressive environmental conditions (e.g., corrosive chemicals), while other assets are in relatively benign conditions, thus the deterioration of assets is affected differently.

- **Maintenance:** Equipment is maintained through refurbishment or replacement of components, which prolongs the service life of the asset.

- **Technological Obsolescence:** Some assets can theoretically be maintained indefinitely, although considerations such as maintenance cost, energy inefficiency and new technologies are likely to render this approach uneconomical.

2.1.2   Asset Replacement Cost

The estimated replacement value is the cost of replacing an existing asset in today's dollars, considering an inflation rate. These costs were developed based on the records used in the 2016 AECOM project titled "Integration of Underground Utilities with Pavement Management System", previous tenders and quotes, other municipalities similar in size to the City, and consultation with the City's staff. Where applicable, a 2% annual inflation rate was used to adjust the historical costs to 2021 values; this rate is representative of the average inflation rate in Canada for the past 5 to 10 years.

In the reinvestment need analysis for water, wastewater, and stormwater assets, the replacement costs are calculated considering the equation [1] and [2]:

$$Unit\ Cost\ (all-inclusive)\ =\ \{pipe\ unit\ rate, appurtenances/accessories\} \qquad [1]$$

$$Total\ Replacement\ Value\ of\ Service\ Type\ (water, wastewater, storm) \qquad [2]$$
$$=\ \sum Unit\ Cost\ (all-inclusive) * Length\ +\ \sum Others$$

Where $Others$ refers to asset types that are not measured in the all-inclusive unit rate and can vary depending on the service type.

For example, in water, $Unit\ Cost\ (all-inclusive)$ is calculated by considering the total replacement values of pipes, hydrants, chambers, service connections, and valves. The total replacement value was proportionally distributed based on the total length of each pipe size in the network. $Others$ included meters, pressure reducing valves, and water facilities. Upon calculating the replacement costs, the values were rounded to the nearest thousand.

2.1.3   Asset Condition

All assets are expected to deteriorate over their lifetime, and their assigned condition reflects the physical state of the asset. No on-site condition assessments were carried out for this project; therefore, physical condition of the assets is based on consultations with City staff who have experience in managing the assets, combined with any existing condition data, and information from past studies.

Where empirical data is not available (i.e., previous condition assessments, inspections, and observations), Weibull three-parameter distribution was used to assess the current condition and project the future condition of the City's assets. The Weibull distribution has been used extensively in reliability studies and lifetime prediction models in industries ranging from the automotive to the oil and gas industries and provides a suitable distribution for this type of analysis.

The Weibull probability distribution provides a left-skewed distribution that rises slowly and diminishes quickly as the population is consumed. The underlying premise of the Weibull-shaped deterioration is that while some assets fail prematurely due to severe conditions or improper installation, other assets are very long-lived and function well beyond their theoretical expected service life. In order to perform a high order network-level analysis, it was assumed that assets would fail (and require replacement) within a deterioration envelope / curve approximated by a Weibull probability distribution. The Weibull probability distribution has three parameters for location, scale and shape, as set out in equation [3]:

$$f(x)\ =\ \frac{\beta}{\alpha}\left(\frac{x-\gamma}{\alpha}\right)^{\beta-1} e^{-\left(\frac{x-\gamma}{\alpha}\right)^{\beta}} \qquad [3]$$

Where: α = scale parameter
β = shape parameter (or slope)
γ = location parameter

A set of Weibull cumulative distributions were created to depict a set of deterioration curves for assets with different expected service lives (ESLs).

Table 2-1 presents the condition score ranges and the corresponding range of ESL and total life consumed.

Table 2-1: Age-Based Physical Condition Scale

Condition Score (minimum)	Condition Score (maximum)	Condition Rating	Range % of ESL Consumed	Range of % Operational Life Consumed *
1	1.5	Very Good	0% – 71%	0% – 47%
1.5	2.2	Good	72% – 84%	48% – 56%
2.2	2.8	Fair	85% – 92%	57% – 60%
2.8	>=3.5	Poor	93% – >100%	61% – 100%

* NOTE: WERF uses the term "operational life" to define the time period over which an asset remains operational irrespective of performance, risk or cost considerations.

2.2 Levels of Service

In AECOM's experience, documenting LoS is a proven practice that will enable the City to:

- Link corporate strategic objectives to customer expectations and technical operations.

- Balance customer needs and expectations while evaluating the effectiveness of operations and whether the right LoS is being provided at the right cost.

- Transition from an "Asset Stewardship" approach that focuses on making decisions based on maintaining assets in an acceptable condition to a "Serviceability" approach that is geared towards making decisions based on balancing the costs, risks, and goals for the LoS being provided by the City's assets.

- Communicate the physical nature of infrastructure that the City owns and is financially responsible for while promoting the use of LoS to enable effective consultation with stakeholders regarding alternative funding options according to desired LoS outcomes.

- Make recommendations on strategies that the City can take now to minimize future renewal costs while ensuring that adequate LoS can be delivered without burdening future generations.

- Assess internal (e.g., program changes) and external (e.g., climate change) factors that have the potential to impact the City's ability to deliver services and how these factors may impact the LoS being provided.

- Implement a corporate continuous improvement program to further optimize asset management (AM) across all service areas.

The O. Reg. 588 / 17 requires all AM Plans to include information about LoS that the municipality proposes to provide, the activities required to meet those measures, and a strategy to fund activities. The deadline of the requirements for formalized LoS is July 1, 2025.

Successful AM programs aim to achieve targeted service levels through customer-based decision making. To achieve this, AECOM considered a customer-centric approach, where the customer is at the heart of every decision from development to implementation, consultation, and roll-out of the LoS Framework (**Figure 2-2**).

There are two types of LoS measures: Customer LoS (also called "Community" LoS) and Technical LoS. Customer LoS are recorded in a manner that attempts to describe the LoS in terms of what is actually being provided to the customer (i.e., the public) and how the customers experience the service. It is important to note that customers are not concerned with the specific operating requirements of the assets that provide the service, but rather the value they obtain from the operation of the assets. To achieve Customer LoS there needs to be line of sight between the value delivered and how that value is realized. This is the purpose of Technical LoS which attempts to describe how the City will provide and meet the expected Customer LoS.
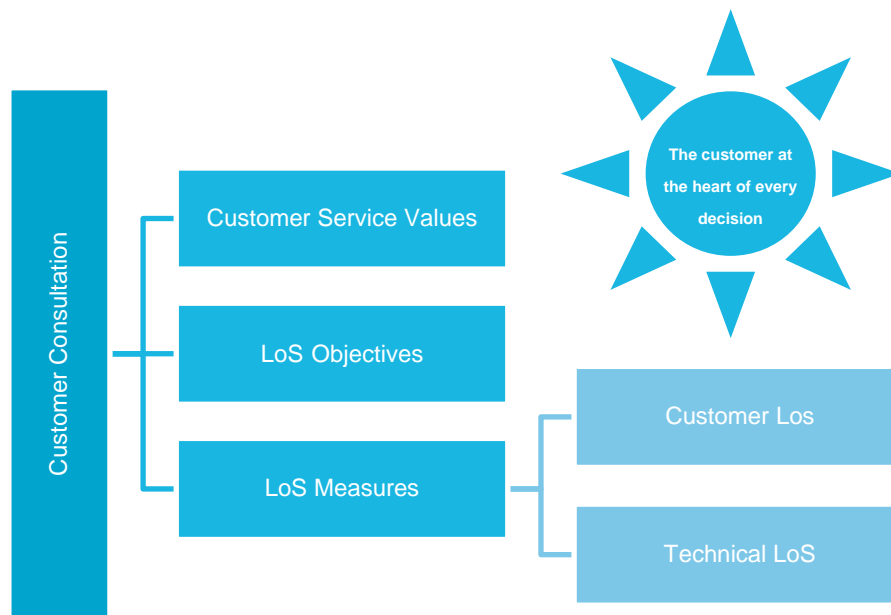
Figure 2-2: The LoS Framework Customer-Centric Approach

The LoS Framework was primarily conceived through a collaborative workshop process. In 2020, AECOM facilitated four workshops with City staff across each of the fourteen service areas. The following outcomes were achieved during each service area workshop:

- Staff were oriented as to the purpose and importance of establishing a consistent LoS Framework;
- Stakeholders were identified, including their expectations, interests, and any regulatory requirements;
- Customer service values were established and reviewed;
- LoS objectives were established for each customer service value;
- Staff provided several performance measures that are currently being tracked as well as those that the City would like to track in the future;
- Where information was available, current performance, targets, and data sources were documented; and
- Growth and shifts in future demand were discussed across the City's service areas.

2.3   Lifecycle Management Strategies

Life cycle management focuses on the specific activities we must undertake during all phases of the asset life cycle. Considering entire asset life cycles can ensure we make sound decisions that take into account present and future service delivery needs.

The overarching goal of life cycle management is to maximize the long-term benefits and services our assets deliver while minimizing the associated costs and risks in the long run. Every asset has a life cycle cost, which is the total cost of all the activities undertaken throughout its service life. The following sections describe activities across the life cycle of assets.

2.3.1   Life Cycle Activities

Any responsible owner of assets such as the City has a desire to preserve the condition of their existing assets for as long as possible, by maintaining or even extending their design lives through routine activities such as maintenance and active intervention. The City is continually acquiring infrastructure assets, but these assets require increased funding for operation and maintenance as they age. The City is also responsible for the replacement of deteriorated assets as long as the service is required. While individual assets may have a useful life that can be predicted in years or decades, the service that the asset provides could be for a substantially longer duration (perhaps in perpetuity). Part of the purpose of the AM planning process is to fully understand and predict the long-range financial

requirements for the City's infrastructure to facilitate planning and resource management in the most cost-effective manner possible. **Figure 2-3** illustrates how costs typically accumulate over an asset's life. It is worth noting that the accumulation of the ongoing operations and maintenance, refurbishment and disposal / replacement costs is many multiples of the initial acquisition costs. A key and important take-away from **Figure 2-3** is therefore for the City to fully understand the entire life cycle costs before proceeding with asset acquisition.
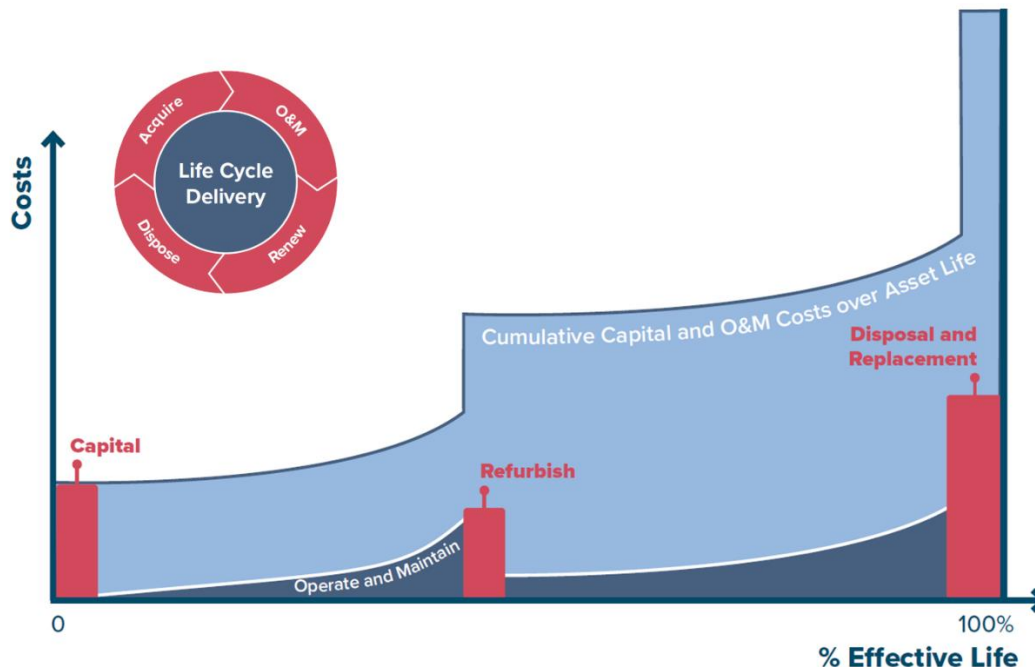

Figure 2-3: Life Cycle Cost Accumulation Over Asset Life

Expressed simply, full lifecycle cost of infrastructure can be accumulated under the following broad headings:

- **Asset Acquisition / Procurement / Construction**: The City has made significant investments in the design and acquisition of its municipal infrastructure assets. Added to City-purchased inventory is infrastructure that the City accepts (and takes immediate financial responsibility for) from developers as new neighborhoods are constructed. For example, as developers build new neighborhoods, the new local infrastructure (including local roads, water mains, sewer mains and storm mains) is paid for by the developer and then transferred to the City for operation, maintenance and ultimately replacement. The City's infrastructure inventory was therefore created over many decades through infrastructure paid for by the City or by developers Looking towards the future, when acquiring new assets, the City should evaluate credible alternative design solutions that consider how the asset is to be managed at each of its life cycle stages. Asset management and full life cycle considerations for the acquisition of new assets include, but are not limited to the following:

  – The asset's operability and maintainability;

  – Availability and management of spares;

  – Staff skill and availability to manage the asset;

  – The manner of the asset's eventual disposal.
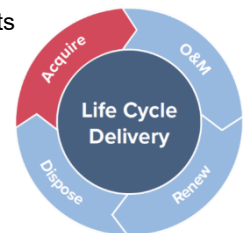
- **Asset Operations and Maintenance (O&M)**: As new infrastructure is commissioned, the City accepts the responsibility of operating and maintaining the infrastructure according to O&M standards to ensure that the infrastructure is safe and reliable. Operations staff provide the day-to-day support required to operate infrastructure. In few cases, operation costs are minor, but for most there are significant increases. For example, underground pipes require almost no operational support while a facility such as a pump station requires full-time staff to operate the facility safely and efficiently. Maintenance expenses include periodic preventive maintenance to ensure that the infrastructure can provide reliable service throughout the life of the asset and corrective maintenance that is required to repair defective assets as and when needed. Inadequate funding for O&M will have an adverse impact on the lifespan of assets. The amount of O&M resources required in any period is a function of the current inventory of infrastructure and total O&M needs required for each asset. As the inventory of infrastructure grows, total O&M requirements will also grow.

- **Renewal and Replacement:** The third portion of full life cycle costing relates to the renewal and replacement of infrastructure that has deteriorated to the point where it no longer provides the required service. Renewal cost is sometimes incurred during the life of an asset where an investment is made to improve the condition and / or functionality of the asset e.g., re-lining of a pipe or resurfacing of a road. Disposal and replacement costs are incurred at the end of an asset's life when it is disposed of and replaced by a fully new asset. Canadian municipalities, including City of Vaughan, have not traditionally factored renewal or replacement costs into future budget projections, except for assets that have a relatively short life such as computer equipment and vehicles. The main reason behind this is the fact that large portions of this infrastructure inventory can have a very long life e.g., from 75 to 100 years for underground pipes. For growing communities like the City, there has not been a historical need to forecast expenses that are not anticipated for decades. However, based on the experiences of more established Canadian cities (where vast inventories of old assets are now in dire need of renewal or replacement), it is vital that communities fully understand the looming obligations of infrastructure renewal or replacement and develop a strategy to respond in a manner that is fair and affordable. The general life cycle activities of asset renewal, and replacement will be explored in more detail as these activities are to be reflected in the Deighton's Total Infrastructure Management System (dTIMs) analysis to determine when City assets are to be intervened upon, what type of intervention is needed and the associated cost (refer to **Section** Error! Reference source not found.).

- **Decommissioning and Disposal:** There will inevitably come a point in time when an asset must be removed from service and, depending on the type of asset, there may be significant costs associated with its decommissioning and disposal. Factors that may influence the decision to remove an asset from service include: changes to legislation that cause the asset to be in non-compliance, the inability of the asset to cope with increased service levels, technology advances that render the asset obsolete, the cost of retaining the asset is greater than the benefit gained, or the current risk associated with the asset's failure is not tolerable. Normally, major costs that may be incurred during disposal and decommissioning derive from the environmental impact of the disposal and, if required, the rehabilitation and decontamination of land. In some cases, there will be residual liabilities and risks to consider if a decision is made to partially abandon the asset as oppose to fully disposing of its components (e.g., leaving a non-functioning pipe in the ground, or an inactive building standing). However, some cost savings may be achieved through the residual value of the asset or by exploring alternative uses for the asset. In all cases, it is important to consider disposal and decommissioning as the strategy employed has the potential to attract significant stakeholder attention. For that reason, the costs and risks associated with disposal and decommissioning should be equally considered in the City's capital investment decision-making process.
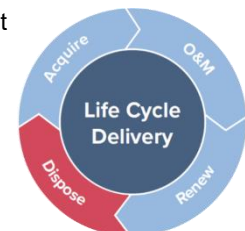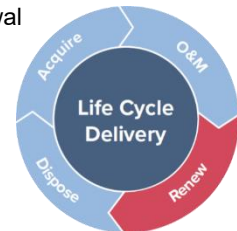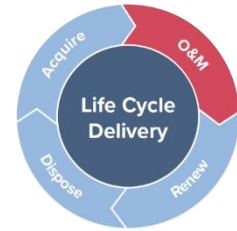
The infrastructure AMPs present the City's strategy for responding to the full lifecycle costs of all its infrastructure assets. Long-range estimates were prepared together with the AMPs, based on industry best practices to ensure the financial sustainability of the City's infrastructure assets over their full life cycle, as discussed in the next Chapters.

2.4   Financial Planning

2.4.1   Financial Policies

The City has taken the initiative to establish financial asset management policies in 2018, which provides directions on how financial principles apply to assets to ensure that service goals are met. The policy aligns the business model of AM with the City's financial planning, financial reporting, cost management, treasury and taxation functions. The City will integrate findings from the AM Plans into its long-term financial planning and budgeting processes. Sound financial analysis will be encompassed in AM planning in order for the AM Plan to be a sought-after guide for employees in budgeting and financial planning.

2.4.2   Financial Analysis

Financial analysis activities for asset management is centered on two essential quantities: revenues and expenditures. Revenues can come from many sources. Through asset operations, the City generate its own source revenues from taxes, development charges, etc. Expenditures are all the direct and indirect costs associated with capital, operating and maintaining, and disposing of assets.

Assessing the financial implications supports in the decision-making when there are competing priorities and trade-offs between projects. Financial analysis provides a better picture of how to fund the capital plan and make critical decisions about service delivery while providing the greatest benefit for the community at the lowest cost.

2.4.3   Aligning the Financial and Non-Financial Functions of AM

ISO 55010[1] identifies the that the financial and non-financial functions of AM within organizations are generally inadequately aligned, as follows:

- **Financial Accounting Functions:** Focused on retrospective reporting of accounting / regulatory financial activities. However, there is a growing awareness in organizations of the need to focus on providing a managerial costing approach in order to support decision-making for the future.

- **Non-Financial Functions:** Have a limited understanding of financial accounting functions but are recognizing the need to improve their understanding of the financial implications of their activities.

The lack of alignment between financial and non-financial functions can be attributed to silos in an organization, including reporting structures, functional / operational business processes, and related technical data. Silos generally bring forth the necessary level of specialization. However, with a lack a communication between the silos, organizations are at risk of inefficiencies and errors in AM results, or AM failures due to a lack of alignment between AM staff and senior management. Financial and non-financial alignment needs to work both "vertically" and "horizontally", as follows:

- **Vertical Alignment:** Financial and non-financial asset-related directives by management are informed by accurate upward information flows, effectively implemented across the appropriate levels of the organization.

- **Horizontal alignment:** Financial and non-financial information that flows between departments (conducting functions such as operations, engineering, maintenance, financial accounting and management) uses the same terminology and refers to the assets identified in the same way.

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[1]   International Organization for Standardization (2019): ISO 55010 - Asset management — Guidance on the alignment of financial and non-financial functions in asset management

Figure 2-4 presents the key elements in a framework to address the need to achieve the alignment.
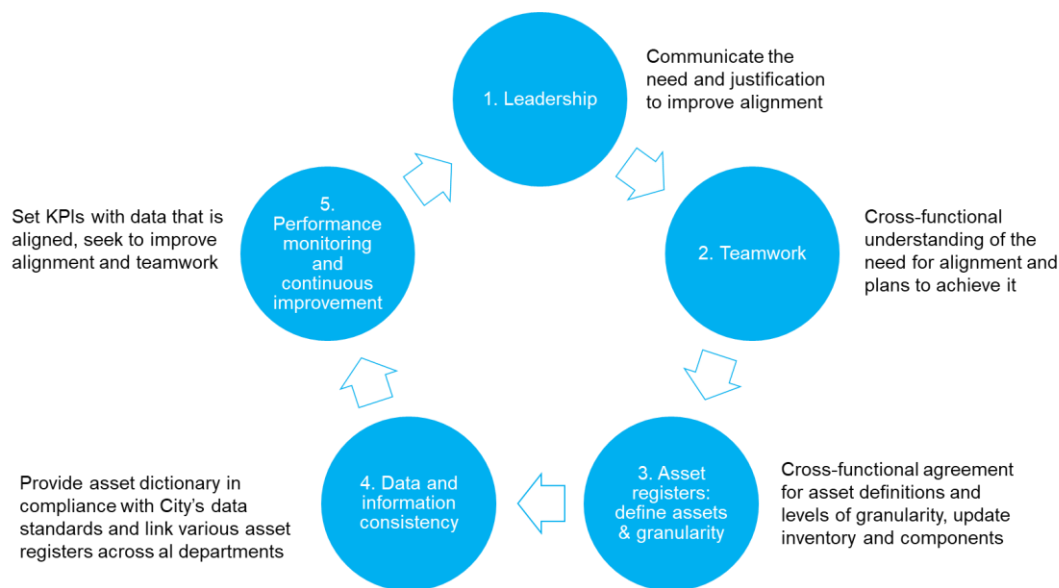

Figure 2-4: Key Elements of a Framework to Achieve Financial and Non-Financial Alignment

2.4.4 Long-Term Financial Planning

Strengthening the City's AM planning according to the recommendations in **Asset Management Strategy** will improve the City's long-term financial planning, by accounting for whole life cycle costs as presented in **Section 2.3.1**. This includes all capital, annual operation and maintenance, and disposal costs over the planning timeframe, thereby aligning financial requirements with long-term level of service objectives.

The challenge is often one of agreeing on a timeframe for such planning, recognizing that the AM perspective is ideally focused on the asset life cycle, versus the political / election cycle that could be as short as a three to four-year Council term. Accordingly, financial and non-financial staff, as well as top management and politicians, should agree on a long enough timeframe to provide useful forward planning information that aligns the financial and non-financial perspectives, as presented in **Figure 2-5**.

Figure 2-5: AM Planning Alignment Across the Organization

The City should have an appropriate long-term financial planning process that achieves the following:

- Stimulates long-term strategic thinking and perspective for stakeholders and decision-makers.

- Can be used as a tool to prevent or predict future financial shocks and demonstrate financial sustainability.

- Demonstrates to internal and external stakeholders that the organization has a financial strategy in place to meet their demands, now and in the future.

The long-term financial planning process needs to involve financial and non-financial staff working together to combine the important elements of strategy development, asset management planning and financial forecasting (**Figure 2-4** and **Figure 2-5**).

3.   Urban Forestry

Urban forests turn the City green, and transform water, nutrients and carbon dioxide into clean air, oxygen, shade, and habitat. The City's Forestry Operations division is responsible for maintaining approximately 126,541 street trees and 4,377 hectares of open spaces across the community. Unlike other assets, trees are living natural assets and increase in value with age for most of their lifecycle. The City recognizes the significant role that the urban tree canopy plays in providing an improved quality of life. Preserving and protecting the health of trees will help the City achieve its commitment to maintaining and enhancing the urban forest and the environment.

Urban forests at the City bring many benefits including:

- Helping soils absorb stormwater which can substantially reduce stormwater runoff and flooding.

- Providing shade that keeps buildings cooler leading to less energy consumption in summer.

- Absorbing greenhouse gas emissions resulting in climate change mitigation.

- Reducing air temperatures through both shade and evapotranspiration combating the urban heat island effect and helping address extreme heat events.

- Offering a critical form of habitat to species living in urban areas.

- Preventing runoff and erosion, resulting in higher water quality and stable slopes.

- Sequestering pollutants and improves air quality by removing carbon dioxide.

- Improving public health in terms of psychological well-being and mental health, and physical health.

- Reducing noise by providing sound buffering from traffic, construction and other City noises.

- Other values such as benefits to community and add value to land.

Urban forests are always at risk from insects, disease, weather damage and development issues. The development of asset management practices is important to sustain a healthy urban forest asset.

3.1   Asset Inventory and Replacement Value

The City owned urban forests system has a value of approximately $473M. The urban forestry inventory is categorized into four types of trees: street trees, park trees, woodlots, and open spaces. The most common species of trees at the City are the Norway Maple, Honeylocust, and Basswood species. Woodlot are open spaces that has designated City's crew to operate and maintain, where open spaces are City owned but they do not need to take care of or there are less maintenance involved. Tree density of woodlots and open spaces are also different. For some open spaces (naturalized areas), the City shares responsibility with Toronto Region and Conservation Authority (TRCA).

The asset inventory and its valuation were determined by using the data from the City' GIS database and from consultant reports. Table 3-1 presents the urban forestry inventory and replacement values. The i-Tree Eco method was adopted from the consultant report for studying the total tree species across the City[2]. The replacement values were estimated based on the cost of having to replace a tree with a similar tree and converted to inflated dollar value to represent current value.

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[2] Vaughan Street Tree Inventory Phase 1 Urban Forest Effects and Values Vaughan Open Space Trees Inventory Phase 2 Urban Forest Effects and Values June 2019

Table 3-1 Asset Inventory & Valuation (Urban Forestry)

Asset Category	Asset Type	No.	Unit of Measure	Average DBH (cm)	New tree Unit Replacement Cost**	Mature tree Replacement Cost per DBH class per Species***	Total Replacement Cost****
Urban Forestry	Street* Trees	126,541	Ea.	18	$435 - $510	$1,100 - $12,484,000	$ 114,825,000
	Park Trees	-	Ea.	-	$435 - $510	-	-
	Woodlots	-	Ha.	-	-	-	-
	Open***** Spaces	4,377	Ha.	43	-	-	$ 357,723,000
Total							**$ 472,548,000**

* The number and diameter at breast height (DBH) of live street trees were sourced from City of Vaughan Parks & Urban Forestry 2019 inventory report.
** New tree unit replacement cost include supply, delivery, set up of the site, and two-year warranty period.
*** Mature tree replacement cost per DBH class was sourced from the City's 2019 iTree replacement cost report and inflated to current value; mature trees cost for various DBH groups is available for various tree species; the range of costs is for minimum and maximum cost for DBH groups of 6 to 12 in, which is considered to be approximately the size of mature trees.
**** Total replacement cost was sourced from the 2016 iTree Analysis reports, inflated to current value.
***** The number and DBH of open spaces was estimated based on three major assumptions: (1) trees<10cm DBH excluded; (2) Only groups of trees within City boundaries that >¼ ha on City managed lands or >1 ha on lands not managed by the City were included; (3) Only groups of trees where canopy cover was = or > than 20% were included; the average DBH of open space trees are weighted by canopy cover.

It should be noted that there can be different approaches for tree valuation. Similar to other municipal physical infrastructure assets, one tree can be replaced by another new tree. On the other hand, replacement values for trees can be treated differently than for typical City assets because trees continuously grow and increase in value. Another approach is to value trees based on the service the trees provided, meaning that one large tree should be replaced by many new trees to recover its service level. The determination of tree valuation approach is a decision that can be made differently at different municipalities.

The environmental and other benefits of trees increase exponentially with size, age and health. **Table 3-2** shows the functional values and benefits of the City's urban forestry assets by using i-Tree modeling approach. The analysis is based on several assumptions including trees<10cm DBH excluded; only groups of trees within City boundaries that >¼ ha on City managed lands or >1 ha on lands not managed by the City were included; only groups of trees where canopy cover was = or > than 20% were included. Please refer to the City's 2016 i-Tree report for more detail.

Table 3-2: Functional Values and Benefits of The City's Urban Forestry Assets

Asset Type	Benefit Type	Amount	Unit of Measure	Value	Unit of Measure
Street trees	Pollution removal	13.73	Tons/year	$70,000	Per year
	Carbon Storage	15.63	Thousand tons	$1,799,660	Per year
	Carbon Sequestration	459.6	Tons	$52,890	Per year
	Oxygen production	1.226	Thousand tons/year	-	-
	Avoided runoff	1.408	Million cubic feet/year	$102,350	Per year
Open spaces	Pollution removal	28.3	Tons/year	$146,850	Per year
	Carbon Storage	43.4	Thousand tons	$4,692,350	Per year
	Carbon Sequestration	982	Tons	$112,620	Per year
	Oxygen production	2.619	Thousand tons/year	-	-
	Avoided runoff	2.907	Million cubic feet/year	$210,880	Per year
Total				**$7,187,600**	Per year

3.2 Age Summary

There are a variety of tree species that are planted and maintained at the City with differing lifespans. The trees are also grown under different environmental conditions. Therefore, estimating expected service life (ESL) for urban forestry assets is complicated. Based on workshop discussion with the City staff and information from similar municipalities, the average expected service life for street trees, park trees, and open street trees are determined to be 40, 40, and 100 years on average, respectively. Street trees often do not last as long as open space trees because of inadequate moisture, nutrition, more exposure to salt conditions, and other environmental factors. It should be noted that trees can achieve ages greater than 100 years if they are planted in the right place, monitored regularly, maintained proactively, and protected from development.

As the City's tree age information is not documented comprehensively, the age was estimated based on the DBH and tree growth factor for different species. When there is no adequate data for the estimation, the group median was used as shown below.

$$Age\ of\ Tree = DBH\ (in) \times Growth\ Factor$$

Figure 3-1 illustrates the average tree ages and remaining service life for street trees. The street trees are on average 80% through their expected service life.
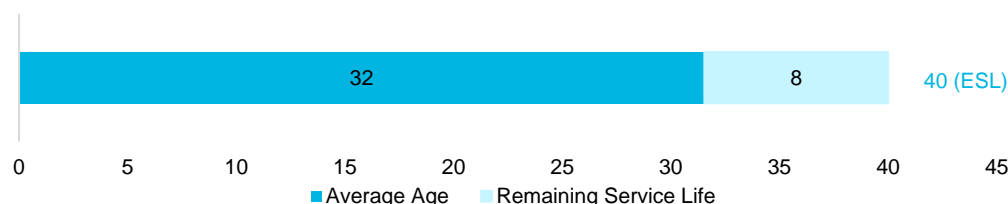

Figure 3-1: Average Asset Age as a Proportion of Average Expected Service Life (Street Trees)

For park trees, woodlots, and open space trees, age information has not been systematically documented or the information is not readily available.

3.3 Asset Condition

As the City's tree condition information is not available, an age and expected service life-based condition rating approach was applied as presented in **Section 2.1.3** and **Table 2-1**.

Figure 3-2 presents the condition profile for street trees based on the assumption of 40 years life expectancy. The City has 64% of street trees in Very Good to Good condition. There are approximately more than a quarter of trees in Poor condition meaning that they are approaching the end of their expected service lives, indicating a need for investment in the short to medium term. The remaining 8% of assets are in Fair condition indicating that the trees meet the current need. Attention may be required as these assets continue to age in future years.
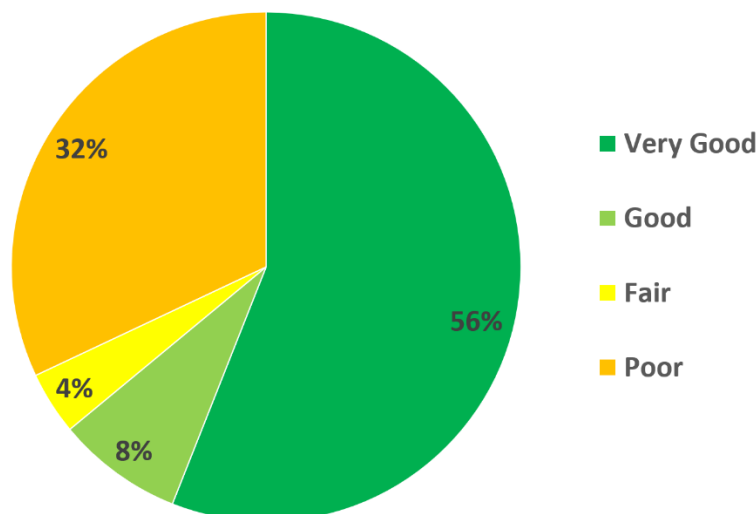
Figure 3-2: Asset Condition Summary (Street Trees)

For park trees, woodlots, and open space trees, age information has not been systematically documented or the information is not readily available, thus the condition profiles are not presented.

3.4   Levels of Service

While urban forestry Level of Service (LoS) is not required by Ontario regulation, the City has developed an urban forestry LoS metrics related to Quality & Reliability, Customer Service & Responsiveness, and Health & Safety. The City's urban forestry LoS performance measure metrics are presented in **Table 3-3.**

Table 3-3: Levels of Service Metrics (Urban Forestry)

Customer levels of service	Technical levels of service
• 5,771 new trees per year (2020).	• 11,252 trees inspected per year (2020).
• 21.9% canopy coverage (2020).	• 10,083 trees pruned per year (2020).

3.5   Life Cycle Strategies

3.5.1   Asset Acquisition / Procurement / Construction Strategies

The City is committed to planting trees for the enhancement of City parks, facilities, and streets. The City is taking a proactive approach to the identification of tree planting opportunities on a citywide basis.

The City acquires trees from developers as new neighborhoods are constructed. When planning trees in new subdivisions, the City's Forestry Operations division is involved in approving the locations of trees. The City will also determine which species to plant in the location to increase the health of the ecosystem by using City established criteria. If the trees are planted properly and in a healthy state, the City will assume the trees as new assets.

Considering tree protection in the initial stages of planning will result in the enhanced protection of trees and where trees are removed will provide for a clear replacement strategy. The City has a Tree Protection Protocol with procedures to maintain and enhance the public's tree canopy through the development approval process.

3.5.2   Asset Operations and Maintenance (O&M) Strategies

Urban Forestry asset O&M activities consists of two major components: pure urban forestry activities and other urban forestry O&M Activities. **Figure 3-4** presents the breakdown activities and five-year average cost for the City's Urban Forestry assets.

The five-year average annual pure urban forestry cost is approximately $1,029,000 and the average annual other activity cost is on average approximately $690,000 in the last five years. The City's pure tree O&M costs include forest maintenance (74%), forest enhancement (17.3%), tree mulching (0.1%), forest management (1.6%), tree fertilizing (0.2%), storm clean-up (1.8%), and invasive species management (5%).

Table 3-4: Urban Forestry O&M Activities and Five-Year Average Costs

O&M Activities	Description	Five-year Average Cost
Pure Urban Forestry O&M Activities	Include forest maintenance, forest enhancement, tree mulching, forest management, tree fertilizing, storm clean-up, and invasive species management.	$1,029,000
Other Urban Forestry O&M Activities	Include overhead cost and other activities such as Baker's Woods, Community Tree Planting Events, Uplands Golf Course etc.	$690,000
Total		**$1,719,000**

The following sections present the details of tree inspections and tree pruning that are the major urban forestry O&M activity at the City.

3.5.2.1   Street Trees and Park Trees

The City's O&M activities for urban forestry assets is largely comprised of tree inspections and tree pruning. Tree health and structure can be greatly increased by regular pruning, especially when the trees are young.

Generally, tree pruning brings many benefits to the City's trees including:

• Promoting tree health.

• Preventing insects and disease.

• Removing potential safety hazards.

• Making vehicle and pedestrian clearances.

• Reducing storm damage from high winds, snow, and freezing rain.

• Accommodating streetlights, buildings, and utilities.

The City prunes trees routinely according to species, age and, in some cases, location and uses different types of pruning:

• Crown cleaning consists of the removal of dead, dying, diseased, crowded, weakly attached and unhealthy branches from the crown of a tree.

• Crown thinning consists of the selective removal of branches to increase light penetration and air movement through the crown. Thinning opens the foliage of a tree, reduces weight on heavy limbs, reduces water intake, and helps retain the tree's natural shape.

• Crown clearance consists of the selective removal of the branches from the tree to provide clearance for buildings, vehicles, pedestrians, streetlights, traffic signals, road, regulatory signage and sight lines. Specification 2.4 metres (8 feet) over a sidewalk and 4.26 metres over a road.

- Crown reduction reduces the size of a tree, to make room for utility lines. Reducing the height or spread of a tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles. This method maintains the form and structural integrity of the tree.

- Crown restoration removes damaged limbs to restore an appropriate stable form to the tree. This is often necessary following storm damage.

- Crown complete is the holistic pruning of a tree that encompasses, cleaning and clearance.

- Crown establishment is the selective pruning of the crown of newly planted trees to promote an aesthetically and structurally sound branching system.

After being pruned, a tree might look rather bare. It will begin to look normal during the next growing season, with a healthier and more attractive form and structure. The City's current tree pruning activities include:

- Proactive tree pruning activities.

  – Rotational tree pruning. City staff examines the urban forest in a block pattern for possible hazards and tree health problems. The rotational pruning cycle was a 20- or 22-year cycle, and now the City is aiming to reduce the cycle of proactive pruning for all street trees to a seven-year cycle. These activities would result in a reduction in emergency pruning calls. Additionally, the City staff can find problems that would not have been reported by residents, such as an insect that needs to be controlled. The block pruning method can also focus on certain tree species that may require more attention.

  – Structural pruning for early age trees. Structural pruning is a type of pruning that aims to develop long-lived, low-risk, stable trees. The City believes that structural pruning for new assets is very critical which could effectively lessen the overall maintenance as trees growing. Immature trees that are left unpruned can develop many structural problems such as weak branch structure, crossing branches, and co-dominant leaders. As growth defects usually begin to develop at an early age and tend to become worse as trees mature. Prioritizing strategic structural pruning while a tree is young is important because it can help correct any problems before they progress far. Structural pruning can help promote proper trunk development, encourage good branching structure and establish permanent branches. Other pruning strategies can include removing branches that cross and correcting double leader. Most urban trees should only have one leader but can develop more if not managed properly.

- Reactive tree pruning activities. The City performs tree pruning to keep sidewalks safe and keep streets open. The tree cleaning work is performed on as per request basis including cleaning for stop signs, elevation of trees, sidelines, streetlights clearance, etc. Parks operations performs very limited pruning to allow winter operation vehicles on sidewalks. Parks will perform an assessment and then either pair with urban forestry or put a request to take care of the pruning that is required.

3.5.2.2 Woodlots

There are very limited O&M activities at the woodlots. It should be noted that the Baker's Woods (maple sugar bush), jointly own by the City, TRCA and the Region, is a woodlot where the City is responsible for maintenance work.

3.5.2.3 Open Spaces

The City generally do not maintain the trees in open spaces.

3.5.3 Asset Renewal and Replacement Strategies

The majority of tree planting activities is related to replacing trees. The City's renewal and replacement activities include tree removals and plantings. The trees are monitored, and problems addressed when triggered by staff observations and public feedback.

Most of the City's tree purchasing is for replacing existing trees. When the City purchases trees, the trees should meet the City's criteria related to species, structure of the tree, DBH size, etc. in the contract. For street trees and park trees, there is a process of tree purchasing from contractors. The process starts from inspection work order as requested from the residents. Then, the City inspects and determines if the trees can be replaced. After that, the City compiles a list and contacts the contractors. Currently, tree purchase cost will include a two-year warranty period.

During the warranty period, contactors are responsible for mulching, pruning, and regular watering. The purchased trees are actively patrolled by one of the City's forestry inspectors. The period between tree cutting down and planting in place is up to nine months including 30 days threshold of site inspection and eight months threshold of tree removal and planting or maintenance.

The City typically do not have planned tree planting at open spaces and woodlots.

3.5.4   Decommissioning and Disposal Activities

For street trees and park trees, when tree removal is considered necessary, disposal activities include tree brush and wood removal, stump removal, site restoration to prepare for replacement.

For woodlots and open spaces, trees are typically left in situ (original location) when they are deceased to decompose naturally. However, trees should be moved if the tree is deemed a hazard to a managed and well-used path, trail, or a house, etc. Disposal costs includes cutting logs and safety-related activities.

3.5.5   Risk Assessment

Risk assessment and prioritization approach can be an effective approach to develop prioritization plans. The City is a young, as time goes and tree growing, the urban forests management will become a greater component. The City needs to prioritize proactive maintenance activities when the trees are young to effectively reduce future damages.

As presented in **Section** Error! Reference source not found., risk scores can be calculated for each street tree by using its Probability of Failure (PoF) and Consequence of Failure (CoF) score. PoF can be estimated using the health condition and a condition rating system. The CoF or criticality rating considers evaluation of the relative importance of assets based on select criteria. With a comprehensive criticality rating, the following factors could be incorporated:

- Economic: Impact of the asset's failure on monetary resources e.g., replacement cost.

- Operational: Impact of the asset's failure on operational ability e.g., street location, AADT.

- Social: Impact of the asset's failure on society e.g., residential areas and commercial areas.

- Environmental: Impact of the asset's failure on the environment e.g., environmental sensitive areas.

It is recommended that the City perform a risk assessment to prioritize resources if there are budget constrains given prioritization under limited resources is very important for urban forestry at the City.

3.6   Urban Forestry 20-Year Funding Need Analysis

The average annual reinvestment rate for the City's urban forestry service is $3.5M over the next 20 years in inflated dollar values. This is equivalent to a total of approximately $70M over the next 20 year period, as presented in **Figure 3-3**. Looking ahead to the decade between 2031 and 2040, the City should prepare for more reinvestment funding as street trees continue to age and be exposed to the adverse urban environment.
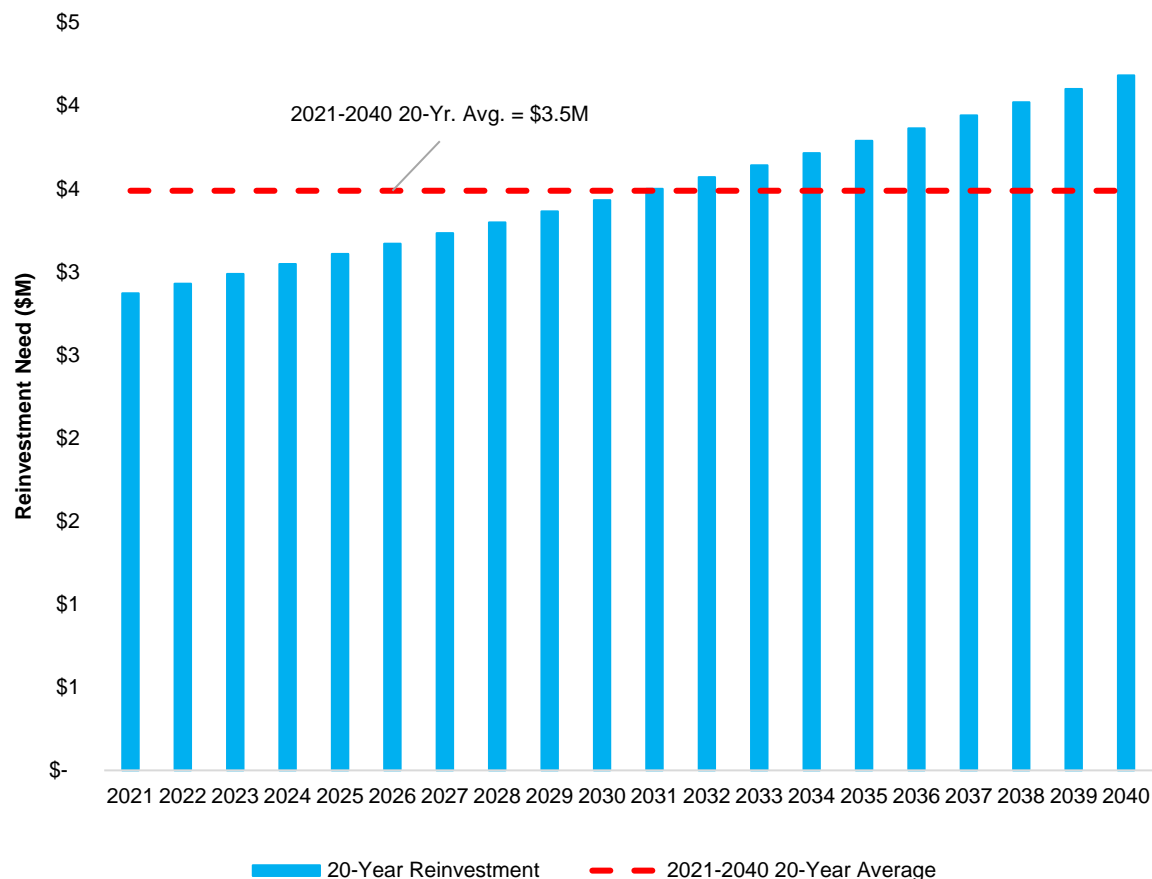
Figure 3-3: Urban Forestry 20-Year Total Reinvestment Need

Figure 3-4 shows a full picture of the City's Urban Forestry funding need forecast over the next 20 years, which provides the City the full funding requirements in order to perform effective financial planning activities.

Urban Forestry assets requires approximately $78M O&M cost over the next 20 years, equivalent to approximately $3.9M per year in inflated dollar value. It is important to note that the City is taking the initiative to reduce the pruning cycle from 20 to 22 year to seven years, which indicates more funding need for O&M cost in the next 20 years. The annual O&M was estimated by adding the extra cost for maintenance activities to the City's last five-year annual average O&M cost.

Unlike other service areas, urban forestry development costs in the last five years were close o zero as the new development trees were mostly acquired from developers. As such, with the additional of O&M, the total average annual reinvestment rate for the City's urban forestry assets increases to approximately $7.4M annually, for a total of $148M over the next 20-year period, as presented in **Figure 3-4**.

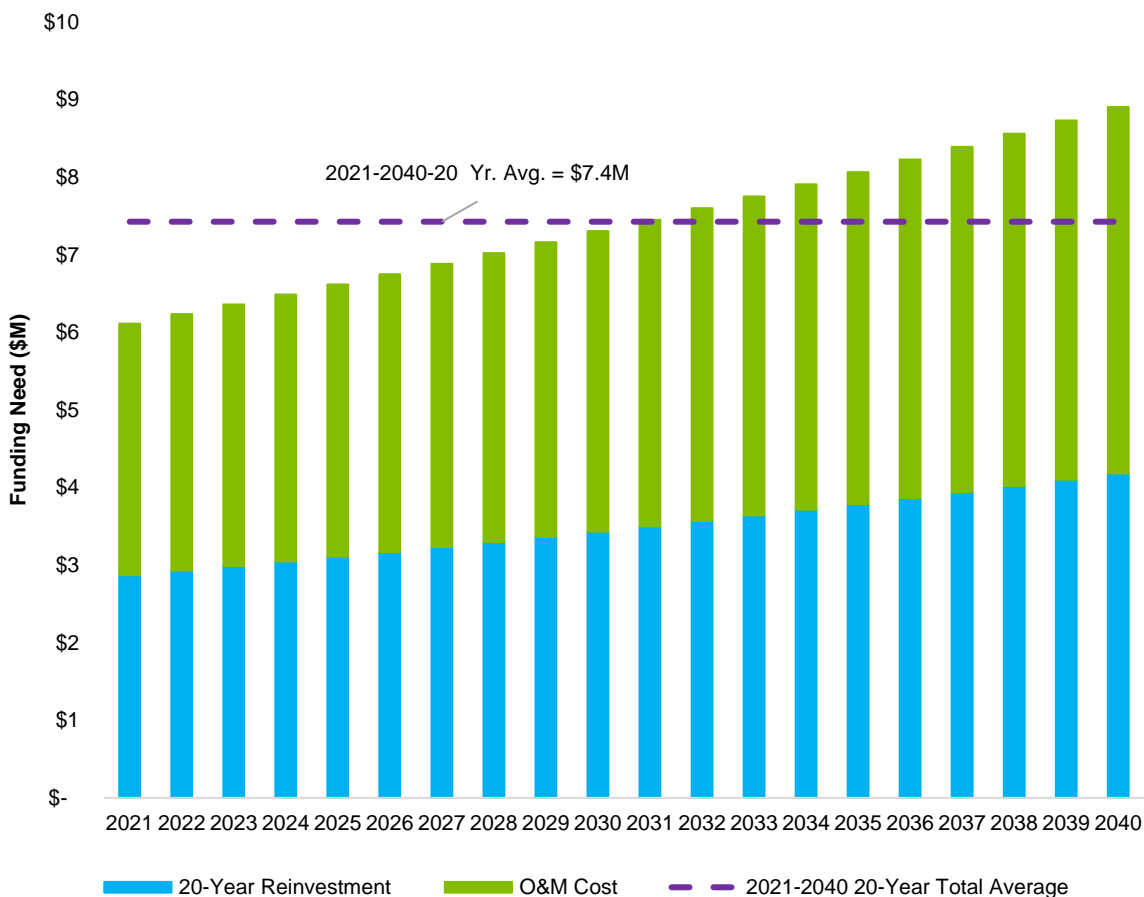**Figure 3-4: Urban Forestry 20-Year Reinvestment and O&M Cost Forecast**

3.7 Recommendations for Urban Forestry AMP Continuous Improvement

Continuous improvement is an important component of any AM program and is achieved through the implementation of recommended improvement initiatives which support sustainable service delivery. While the City's urban forestry assets are young, there are current and future challenges that must be contended with. It is important to address these challenges thoroughly and promptly to leave a positive legacy for future generations.

AECOM has identified a set of activities that represents the next stage of AM planning and implementation within the City.

- **Continue to refine the asset inventory and close existing data gaps, so as to have a more accurate representation of the current state of the urban forestry assets; and, ultimately, to make more informed and defensible decisions**.

  – The City has made great efforts in establishing the street tree inventory. AECOM recommends the City to establish separate inventories for all urban forestry asset categories by developing park trees, woodlots, and open spaces inventories. Consideration should also be given to vegetation and other natural assets occurring within woodlots and open spaces.

  – The more robust asset data for Forestry assets along streets, parks, woodlots and open spaces would be leveraged in the development of the City's first Forestry Management Plan, which would be wider in scope than the accompanying Asset Management Plan for Urban Forestry.

  – Continue to collect missing asset information (or correct those that are known to be erroneous) through geospatial analysis, review of paper records, and verification by O&M personnel. The tree planting dates

are not available in GIS records and will require inputting this information into the GIS database to enhance the completeness of the asset age data. In addition, there are a number of trees with DBH of 0 in the GIS record.

– The City should ensure that out-of-service tree assets are accurately represented in the inventory. Old legacy asset ID's from the GIS inventory should be removed or properly labeled. Assign a unique ID for a new asset and link the ID across data sources so that assets can be tracked throughout their whole lifecycle.

– Develop a Data Governance Framework to define clear roles on data ownership and accountability, improve confidence in decision-making, improve asset data integrity and streamline information workflows.

- **Develop a consistent and structured health condition assessment process across all urban forestry assets.** This process will allow the City to:

  – Better forecast urban forestry assets replacement needs.

  – Avoid tree failures and the resulting economic, social, and environmental costs.

- **Continue the City's proactive tree maintenance approach including rotational tree pruning and early age structural pruning.**

  – Develop a rotational tree maintenance program to manage the change of tree pruning cycle. With the rotational tree pruning cycle reduced from 20- or 22-year to seven years, the City will need more staff resources and funding to implement the tree maintenance activities. The annual O&M cost is predicted to increase from $1.7M to $3.9M in inflated dollar values (**Figure 3-4).**

  – Continue the early age structural pruning activities. Early age strategic structural pruning for tree assets is very important as this proactive activity can effectively lessen the overall maintenance as trees grow. One of the leading practices is scheduling 3 pruning events for all trees within their first 10 years of life.

- **Continue to improve the living environment of street trees to extend their service life.** Salts are used at the City for winter control to keep roads and sidewalks clear of winter snow and ice, but it brings with it some side effects such as the damage (and even death) of trees and shrubs. The City has taken the initiative to reduce the usage of salts from an average of 1,000 tons / event to 700 tons / event using information supplied from the MDSS system. It is recommended that the City continues the initiative to achieve a balance between effectiveness of winter maintenance and extended service life of street trees.

- **Refine the Levels of Service Framework.**

  – Collect current asset performance data for key performance indicators (KPIs) that are not currently being tracked, including associated costs.

  – Analyze asset performance data to determine trends and to establish annual performance benchmarks.

  – Engage in a discussion with key stakeholders (see the **AM Strategy**) to establish service level targets and identify associated costs to meet those targets.

  – Once LoS targets have been decided upon, the City should develop strategies on how to meet service level targets considering its existing operating environment (i.e., staff availability, current funding, resources, etc.).

  – Develop a Customer Consultation Plan to engage the public and other stakeholders on the LoS framework and to better understand customers' willingness to pay for enhanced service levels.

- **Establish Urban Forestry risk assessment for future iterations of the AM plan, and use the risk assessment results to drive future condition assessments and financial needs forecasting.**

  – Calculate a risk score for each tree by using its Probability of Failure (PoF) and Consequence of Failure (CoF) score, to assess the ability of the assets to meet current and future operational requirements including capacity, regulatory, resilience and other LoS needs.

  – Continuing from previous bullet, incorporate more accurate expected service life information based on City's experience to better predict when trees need to be replaced.

- Assess criticality and risk comprehensively for urban forestry assets in the inventory.

- Frequently revisit and revise probability of failure and criticality model as needed.

- Review risk attribute values periodically to ensure alignment with business objective and appetite.

- Overlay the risk models with the current state of the assets (i.e., condition), and the 20-year financial forecast. Using this approach, the City could focus its monitoring, maintenance, and renewal and replacement budget and activities on high risk assets. Medium risk infrastructure could be addressed through the mitigation of failure through regular monitoring, and the low risk assets could be accepted with caution.

- **Establish a sustainable urban forestry funding model that fits the needs of the community.**

  - In light of the annual capital investment reinvestments outlined in **Figure 3-4**, the City should budget for urban forestry expenditures on asset replacement and O&M, to an average of $7.4M estimated per year over the next 20 years.

  - Review financial modeling assumptions on ESL and replacement values and update the financial model with new information as it becomes available. The financial model is based on a number of key assumptions that could have a significant impact on the outcomes of the model.

- **Continue to find ways to improve AM initiatives across the City by maintaining a high level of AM awareness through training, communication, and knowledge sharing.**

  - Conduct an AM Software Assessment to identify future system requirements that may include enhancing existing software, adding-on, or replacing.

  - Develop a Knowledge Retention Strategy & Internal Communications Plan to document staff AM knowledge and experience for reporting and succession planning purposes. Communicate AM improvement initiatives and enhance AM awareness internally through internal communication.

  - Aligning the Financial and Non-Financial Functions of Urban Forestry AM. Refer to **Section 2.4.3** for the framework to address the need to achieve the alignment.

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SPECIAL REPORT

TD Economics

June 9, 2014

URBAN FORESTS: THE VALUE OF TREES IN THE CITY OF TORONTO

Highlights

- Urban forests are made up of the trees, shrubs and other flora and fauna that line the streets, parks and ravines of our cities.

- Urban forests do more than beautify the scenery. They represent an important investment in environmental condition, human health and the overall quality of life.

- The trees in the City of Toronto's urban forest are worth an estimated $7 billion, or about $700 per-tree.

- Toronto's urban forest provides residents with over $80 million, or about $8 per-tree, worth of environmental benefits and cost savings each year. For the average single family household, this works out to $125 of savings per annum.

- For every dollar spent on annual maintenance, Toronto's urban forest returns anywhere from $1.35 – $3.20 worth of benefits and cost savings each year.

- Maintaining the health of our urban forests is the best way to protect the value of our green investment.
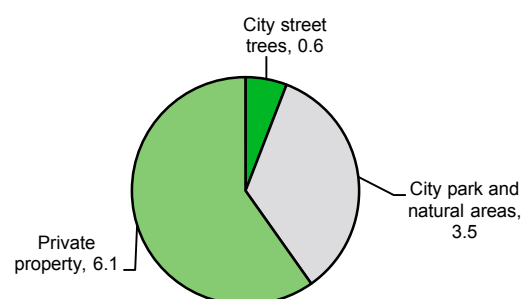
Urban forests are made up of the trees, shrubs and other flora and fauna that line the streets, parks and ravines of our cities. Urban forests play a much greater role than just beautifying the scenery. The green space provided by Toronto's urban forest is a critical factor in environmental condition, human health and the overall quality of life. Using the City of Toronto's urban forest as an example, we demonstrate how an investment in urban forests is an investment in the overall economic and environmental well-being of urban society.

Toronto's urban forest

"Forest" might not be the first word that comes to mind when we think of a bustling urban centre like Toronto – the most populous city in Canada. However, beyond the business and condo towers lie 10 million trees comprised of at least 116 different species that make up Toronto's urban forest. From a bird's-eye view, these trees appear as a lush green canopy that covers nearly 30% (190 km^2) of the City of Toronto. The density of Toronto's urban forest is on average 16,000 trees per square kilometre or about four trees per person in the city. The majority of Toronto's urban forest is located in its ravines and river valleys, such as the Don Valley, Highland Creek and Rouge River watersheds (see Chart 1), which have been largely undisturbed by the city's expansion.

There has been increasing recognition of the environmental

CHART 1 - DISTRIBUTION OF TORONTO'S URBAN FOREST (MILLIONS OF TREES)

City street trees, 0.6
City park and natural areas, 3.5
Private property, 6.1

Source: Toronto Parks, Forestry and Recreation; TD Economics.

Craig Alexander, SVP and Chief Economist, 416-982-8064
Connor McDonald, Economist

Table 1 - Annual benefits provided by Toronto's urban forest				
Benefit	**Description**	**Tangible benefit**	**$ value (millions)**	**$/tree**
Wet-weather flow	Reduced strain on water transportation and processing infrastructure from rain and wet-weather flow intercepted.	25,112,500 cubic metres	$53.95	$5.28
Air quality	Air pollutants absorbed removed and avoided by street trees.	1,905 tonnes	$19.09	$1.87
Energy savings	Energy saved through shading and climate moderation.	749,900 MBTU of natural gas 41,200 MWH of electricity	$6.42	$0.63
Carbon sequestration	Carbon sequestered from the atmosphere and emissions avoided through energy savings.*	36,500 tonnes	$1.24	$0.12
Energy emission abatement	Carbon emissions from fossil fuel power generation avoided through climate moderation.	17,000 tonnes	$0.58	$0.06
Total benefit	Sum of economic benefits provided by urban forests.	-	$81.29	$7.95
Cost benefit ratio	Benefits to citizens for every $ spent on maintenance.	-	-	$1.35 - $3.20
* Carbon avoided and sequestered is net of the emissions from the decomposition and maintenance of trees.				
Source: Toronto Parks, Forestry & Recreation, TD Economics.				

and economic benefits urban forests provide in recent years. As a result, Toronto's urban forest is viewed as an investment in the economic and environmental wellbeing of the city. In the following, we describe the dollar value of some of the benefits provided by Toronto's urban forest. It's important to keep in mind that these values only quantify a portion of the overall value provided by urban forests. Many of the benefits that are important to communities – aesthetic values, recreational spaces, community importance – are difficult to quantify and are not included in our valuation.

Valuing Toronto's urban forest

With urban forests abundantly lining city streets, parks and ravines all around us, it's easy to forget that these trees have a monetary value. The replacement value (what it would cost to remove a tree and replant a similar one) of the 10 million trees that make up Toronto's urban forest is valued at over $7 billion, or about $700 per tree.

Beyond their value as a commodity, our urban forests provide a range of important environmental benefits that improve living standards, while also providing major cost savings to households.

Wet-weather flow reduction

Urban forests help ease the burden of managing snow, rain and other wet-weather flow by intercepting falling precipitation in their canopy, increasing the amount of water absorbed into the ground, and reducing soil erosion. Wet-weather runoff carries pollutants into the city's water supply and, in situations of heavy rainfall, can overburden processing infrastructure, which strains equipment and

shortens its lifespan. This is ultimately very costly.

Each year, Toronto's urban forest intercepts an estimated 25 million cubic metres of wet-weather flow. The annual cost savings this provides through reducing burdens on processing infrastructure and mitigating property damage is valued at over $50 million (see Table 1) – although differences in land use and the distribution of trees in Toronto mean that the benefits of slowing wet-weather flow are more pronounced in some areas than others.

Air quality

Urban forests produce oxygen, absorb air pollutants, and capture particulate matter like dust, ash, dirt and pollen in their canopy. Toronto's urban forest removes about one-quarter of the annual emissions produced by industry within the city – that's about 1,900 metric tons of air pollution removed from the atmosphere annually. Comparatively speaking, the amount of particulate matter removed by Toronto's urban forest each year is equivalent to the amount released by over one million automobiles or 100,000 single family homes (See Table 2).

It is possible to place a monetary value on the indirect benefits provided by pollution removal provided by urban forests. The value of pollution removal is based on the externality costs of pollution, which are the avoided economic damages that air pollution would place on society through its impact on the population. Moreover, we can place a price on the pollution captured by urban forests relative to what it would cost to remove the same amount using technology. By using these techniques, we can estimate that the amount of air pollution abated by Toronto's urban forest generates

Table 2 - Air pollution removed by Toronto's urban forest			
Pollutant removed	Tonnes per-year	Equivalent annual automobile emissions	Equivalent annual single family home emissions
Carbon stored	1.1 million*	733,000	367,900
Carbon sequestered	10	30,900	15,500
Carbon monoxide	10	44	180
Nitrogen oxides	297	20,700	13,800
Sulfur dioxide	62	99,900	1,700
Particulate matter	357	1,047,000	101,100
* Refers to the total amount carbon stored in woody tissues of Toronto's urban forest - not an annual value.			
Source: Toronto Parks, Forestry & Recreation; TD Economics.			

an annual savings of $19 million – just under $2 per tree (see Table 1).

Climate moderation and energy savings

Depending on where they are planted, trees can reduce the energy consumption of buildings by providing shade, evaporative cooling and blocking winter winds. Properly situating trees around a structure can reduce air-conditioning needs in warm seasons by one third and heating requirements in cooler seasons by one quarter. In fact, the annual net cooling effect of a young healthy tree is equivalent to ten room-sized air conditioners operating twenty hours a day. Climate moderation provided by urban forests lowers energy demand for cooling and heating, which can translate into a cost savings for households and businesses. Energy savings provided by climate moderation can also improve air quality by reducing reliance on some emission intensive energy sources.

Every year, Toronto's urban forest abates 750,000 MBTU of natural gas consumption and over 40,000 MWH of electricity. That works out to a $6.5 million/year energy savings for businesses and households (see Table 1). Reduced energy consumption also avoids 17,000 tonnes of greenhouse gas emissions from emission intensive energy sources each year, providing an additional annual savings of $400,000 to $600,000. On their own, these effects might seem small, but over the long term, these benefits make a significant contribution to environmental wellbeing.

Carbon storage and sequestration

Urban forests play an important role in mitigating the effects of climate change through the storage and sequestration of carbon. As trees grow, they naturally remove carbon from the atmosphere and store it within their woody tissues. The total amount of carbon currently stored in Toronto's urban forest is estimated at 1.1 million tonnes. To put this in perspective, this is equivalent to the amount of carbon emitted by 700,000 automobiles each year (see Table 2). In addition to carbon storage within woody tissue, urban forests also sequester carbon from the atmosphere through the photosynthesis process. Every year, the City of Toronto's urban forest sequesters over 46,000 tonnes of carbon, which is equivalent to the annual carbon emissions from 31,000 automobiles or 16,000 single family homes (see Table 2).

The value of carbon stored within the woody tissues of Toronto's urban forest is estimated to be between $27 and $37 million – to put this in perspective, that's about $160,000 – $230,000 per square kilometre. In addition, the total amount of carbon sequestered by Toronto's urban forest through photosynthesis is valued at $1 to $1.5 million per annum.

Property values

An additional benefit of urban forests is that they increase the property values of land, support higher rents and generate more property tax revenue. In some locations, rental rates of commercial office properties are about 7% higher on sites having a high quality landscape that includes trees. A study of New York City also reported that having trees on, or near, property generates an additional US$90 in property taxes. While it's hard to pin down the exact amount our urban forests contribute to property values in Toronto, there is a clear correlation between residential property values and proximity to trees and green space.
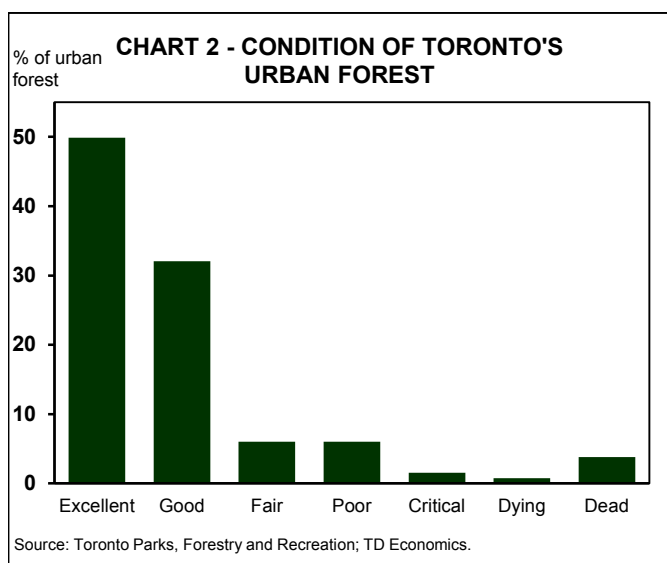
Maintaining our urban forests

Not all trees are created equal, and the benefits they provide vary, depending on size and species. But, as a general rule of thumb, we can say bigger is better. Large, healthy

Table 3 - Air effects of average tree in Toronto by size			
Diameter of tree	Carbon stored (kg)	Carbon sequestered (kg/yr)	Pollutants removed (kg/yr)
0cm - 15cm	9	1	0.1
15cm - 30cm	89	6	0.3
30cm - 45 cm	283	12	0.5
45cm - 60 cm	655	19	0.7
60cm - 75cm	1176	29	1.0
> 75 cm	2709	52	1.8
Source: United States Department of Agriculture, TD Economics.			

CHART 2 - CONDITION OF TORONTO'S URBAN FOREST

% of urban forest

Excellent, Good, Fair, Poor, Critical, Dying, Dead

Source: Toronto Parks, Forestry and Recreation; TD Economics.

trees absorb up to 10 times more air pollutants, 90 times more carbon, and contribute up to 100 times more leaf area to our urban forest canopy relative to smaller trees (see Table 3). That's not to say smaller plants don't do their fair share. The shrubs in Toronto's urban forest contribute about a quarter of the air quality benefits that trees do.

Maintaining the health of our existing urban forests is the best way to secure larger trees, grow the value of our natural capital and ensure they continue to provide environmental benefits. Maintenance is important, as there are serious threats to the health of our urban forests. Invasive species, such as the European Gypsy Moth and the Emerald Ash Borer, pose a significant threat to almost 10% ($570 million) of Toronto's urban tree population. The Asian Long Horned Beetle – which poses a threat to $4 billion worth of Canadian urban forests – was previously thought to be eradicated in Canada. However, it was re-discovered in western Toronto in October 2013. Efforts to maintain our urban forests make a world of difference, and the vast majority of Toronto's urban forest is in good or excellent condition (see Chart 2).

It's only natural to question if the benefits of maintaining an urban forest outweigh the costs, especially in heavily urbanized environments, where plant life has difficulty thriving naturally. Using the 2011 City of Toronto parks and forestry budget proposal as a reference point, we can say that the annual maintenance cost of a tree is roughly $4.20. For every dollar spent on maintenance in Toronto's urban parks, trees return $3.20 to the community, but this number can vary based on the type of land on which the trees are located. For example, trees located in areas where it is difficult for them to grow – such as street trees – return about $1.35 of benefits for every dollar spent. Despite this variation it's clear that the benefits provided by Toronto's urban forest outweigh the cost of maintaining them.

Bottom line

Urban forests are made up of the trees, shrubs and plants that grow in our yards and parks and that line our streets. Torontonians recognize that their urban forest represents an important investment in the city's environmental condition, human health and societal wellbeing. Indeed, the 10 million trees that make up the City of Toronto's urban forest are valued at over $7 billion and provide an additional $80 million of environmental benefits and cost savings each year. Although it's important to keep in mind that the true value of our urban forests is much larger than is reflected in these figures, as they do not include some important benefits such as aesthetic and cultural value, and recreational. Maintaining our urban forests makes sense, as every dollar spent on maintenance returns $1.35 – $3.20 worth of benefits to residents of the City of Toronto. The cost savings produced by our urban forests make it clear that keeping the green on our streets, keeps the green in our wallets.

Craig Alexander, SVP & Chief Economist
416-982-8064

Connor McDonald, Economist

Committee of the Whole (Working Session) Report

DATE: Wednesday, September 15, 2021   **WARD(S):** 1

TITLE: KLEINBURG-NASHVILLE HERITAGE CONSERVATION
DISTRICT PLAN UPDATE – PRESENTATION OF THE DRAFT
PLAN UPDATE

FROM:
Haiqing Xu, Deputy City Manager, Planning and Growth Management

ACTION: DECISION

Purpose
To present the Kleinburg-Nashville Heritage Conservation District Plan Update for adoption, implementation, and subsequent By-law amendment.

Report Highlights
- The current Kleinburg-Nashville Heritage Conservation District Plan was adopted and implemented in 2003
- The current Kleinburg-Nashville Heritage Conservation District Plan is being updated to respond to policy and legislative changes since its original adoption
- The Kleinburg-Nashville Heritage Conservation District Plan Update project updates both sections of the Heritage Conservation District: the Study and the Plan

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Recommendations
1. That the proposed draft Plan Update of the Kleinburg-Nashville Heritage Conservation District Plan, set out in Attachment 1, be RECEIVED;
2. That the current Kleinburg-Nashville Heritage Conservation District Plan (2003) be updated to the Heritage Conservation District Plan Update (2021); and
3. That current Kleinburg-Nashville Heritage Conservation District By-laws 183-2003, 184-2003, and 268-2003 be amended to reflect the adoption and

implementation of the Kleinburg-Nashville Heritage Conservation District Plan Update (2021), as presented.

Background

A Heritage Conservation District Study and Plan for Kleinburg-Nashville were prepared in 2003 by Philip Carter and Paul Oberst. Since that time there have been a number of policy and legislative changes which have and continue to have influence on planning decisions.

In November 2019, the City of Vaughan commenced a comprehensive update to the 2003 Kleinburg-Nashville Conservation District ('KNHCD') Plan. The initiative was undertaken in two phases. The first phase was an update to the KNHCD Study, and the second phase was an update to the 2003 KNHCD Plan, including the design guidelines. This presentation provides a comprehensive update of both documents and will form the KNHCD Plan Update (2021).

Previous Reports/Authority

Previous reports relating to this initiative can be found at the following links:
Item 1, Heritage Vaughan Committee (Report No. 5), July 22, 2020
Item 3, Heritage Vaughan Committee (Report No. 4), April 21, 2021

Analysis and Options

The 2003 KNHCD Plan has provided high-level guidance for development activity in the KNHD Plan area for the last 18 years to protect and conserve the KNHCD's heritage and character, amidst the many regulatory and policy changes introduced by the Province of Ontario.

The first phase of the KNHCD Plan Update was an update to the Study. The KNHCD Study process commenced in Q4 2019. It included the review and mapping of the heritage resources inventory, site walks, Townscape survey, background study and policy review, and the Strengths, Weaknesses, Opportunities and Threats ('SWOT') analysis of the 2003 KNHCD Plan.

Two public and stakeholder meetings were hosted in February 2020. The input received, along with the evaluation and gap analysis of the 2003 KNHCD Plan, guided the updated KNHCD Study. The updated Study draft was made available online for digital engagement with the community. The comments received from all stakeholders contributed to the compilation of the final "draft" of the KNHCD Plan Study document, which was presented to the Heritage Vaughan Committee in November 2020.

The second phase of the project was the update to the Plan. The purpose of the KHCD Plan Update is to build upon the existing KHCD Plan's past successes and respond to a changing legislative environment, strengthen the heritage policies and conservation

tools based on the community's long-term vision. Key objectives of the KHCD Study update included the following:

- updated the maps of existing cultural heritage resources
- addressed the findings of the SWOT analysis of the 2003 KHCD Plan
- updated the list of heritage attributes
- integrated new and updated context for the Plan, including policy frameworks, performance-based design guidelines and policies

The updated Plan draft was made available online for digital engagement with the community. A subsequent public and stakeholder meeting was hosted in February 2021. The input received, along with feedback from City staff, guided the final "draft" of the KNHCD Plan Update. The final "draft" of the KNHCD Plan Update document was presented to the Heritage Vaughan Committee in April 2021.

Financial Impact

There are no requirements for new funding associated with this report.

Broader Regional Impacts/Considerations

There are no broader Regional impacts or considerations.

Conclusion

The KNHCD Plan Update (2021) builds upon the existing KNHCD Plan's past successes and responds to a changing legislative environment, strengthens the heritage policies and conservation tools based on the community's long-term vision. Cultural Heritage staff recommends the final "draft" of the KNHCD Plan Update (Study and Plan) documents and presentation regarding the KNHCD Plan update be received, and the KNHCD Plan Update (2021) be adopted and implemented.

For more information, please contact: Nick Borcescu, Senior Heritage Planner, Development Planning, ext. 8191

Attachments

1. Final "Draft" KNHCD Plan Update (2021) (linked)

Prepared by

Nick R. Borcescu, Senior Heritage Planner, Development Planning, ext. 8191

Approved by

Haiqing Xu, Deputy City Manager,
Planning and Growth Management

Reviewed by

Nick Spensieri, City Manager