



Staff Report for Committee of the Whole Meeting

Date of Meeting: October 4, 2023

Report Number: SRPBS.23.008

Department: Planning and Building Services

Division: Policy Planning

Subject: SRPBS.23.008 – Urban Forest Management Plan
Progress Update, 2020 to 2022

Purpose:

To provide an update on the progress of the Urban Forest Management Plan actions implemented since Council approval in June 2020 to end of year 2022.

Report Highlights:

- Richmond Hill's urban forest plays a vital role in providing ecosystem services, such as improving air quality, carbon storage and sequestration, and flood attenuation. These services are influenced by the urban forest's structural elements, such as canopy cover distribution, species composition, size and overall health of the trees.
- The Urban Forest Management Plan (UFMP) was approved by Council in June 2020 and is a strategic approach to protect and enhance the City's urban forest. Since its approval, several actions have been completed or initiated by the City's Urban Forest Working Group.
- The City's Urban Forest Study (UFS) was completed in partnership with York Region to assess the condition of our urban forest, identify opportunities for improvement and track the City's progress towards its canopy cover targets.
- The City has made progress toward growing our urban canopy, however, there are areas we need to continue to address such as diversifying the urban forest, protecting and enabling trees to mature, managing invasive species and conserving our natural assets to help combat the impacts of climate change.
- Staff will continue to implement the UFMP and use the updated findings from the UFS to enhance the City's practices for ensuring the continued overall health of Richmond Hill's urban forest.

Recommendation(s):

- a) That staff report SRPBS.23.008, including the attached Urban Forest Management Plan Progress Tracker (2020-2022) and Urban Forest Study Fact Sheets be received for information.

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Contact Person:

Maria Flores, Director of Policy Planning, phone number 905-771-5438

Ruth Rendon, Manager of Sustainability, phone number 905-771-2420

Diana Shermet, Natural Environment Coordinator, phone number 905-771-5521

Report Approval:

Submitted by: Kelvin Kwan, Commissioner of Planning and Business Services

Approved by: Darlene Joslin, City Manager

All reports are electronically reviewed and/or approved by the Division Director, Treasurer (as required), City Solicitor (as required), Commissioner, and City Manager. Details of the reports approval are attached.

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Background:

Trees and woodlands throughout the community are an essential component of our urban infrastructure, contributing to a high quality of life in Richmond Hill. All trees and woodlands, whether on public or private land, represent the urban forest. Collectively, they make our community healthy and resilient by cleaning the air and water, reducing flood risk, conserving energy, counteracting urban heat stress, increasing property values, and building stronger and healthier communities.

In June 2020, the City of Richmond Hill's Urban Forest Management Plan (UFMP) was approved by Council ([SRCS.20.19](#)). The UFMP builds on a strong foundation of urban forest management in Richmond Hill and provides a comprehensive approach for managing our urban forest. It assists the City in prioritizing and identifying opportunities for improvement by streamlining workflows, leveraging technology and innovation, and optimizing resources.

This staff report showcases the progress in implementing the UFMP actions between June 2020 and end of year 2022, and provides an overview of the findings and recommendations from the recent Urban Forest Study (2022). Many actions have been initiated or completed since Council approval, while other actions have a longer term trajectory for initiation. To view each of the UFMPs actions, their status and implementation progress, see **Attachment 1, Urban Forest Management Plan Progress Tracker (2020-2022)**.

Urban Forest Management Plan Progress between 2020 and 2022

The management of the urban forest is a shared responsibility by all property owners, community members and the City. Many departments within the City have a role in ensuring a healthy and resilient urban forest, and assist in the implementation of the UFMP. For this reason, the City has an Urban Forest Working Group (UFWG) comprised of staff from Sustainability; Urban Forestry, Natural Environment, and Horticulture; Park and Natural Heritage Planning; Strategic Communications; and Infrastructure Delivery Services. The UFWG works together to implement the actions within the UFMP.

The following section recognizes some of the accomplishments made since June 2020 and is organized by each of the four goals of the UFMP.

Goal 1: Build knowledge to make wise decisions

Current and reliable information on the urban forest allows staff to make informed and strategic decisions that directs daily operations and informs long term planning.

To assist in this approach, the City worked in partnership with York Region to complete the 2022 Urban Forest Study (UFS) which included a woodland and canopy cover (2020) assessment. The final UFS report quantified and assessed the existing distribution and condition of the urban forest; the report also identifies opportunities for improvement and tracks the City's progress towards its canopy cover targets. A more

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thorough overview of the key findings and recommendations from the 2022 UFS is provided below.

In addition, the City's tree inventory and natural area data were used and incorporated into the City's Enterprise Asset Management (EAM) inventory in 2022 to ensure the urban forest is managed in accordance with required asset management principles. This provides the City with the ability to report on the State of Infrastructure including condition, value, and age for natural assets. The City will continue working towards incorporating natural assets into the EAM database, defining levels of service and risk assessments to forecast for future urban forest management.

Goal 2: Plan and protect to preserve canopy cover

Trees, and the environments in which they grow, face many threats and stressors such as climate change impacts, urban development pressures, land use changes, altered soils and invasive species. This goal is focused on ensuring the City strategically plans for all aspects of trees and their growing environments to maintain a suitable level of canopy cover and protect the City's investment in the urban forest.

As part of the Official Plan Update project, several policy updates have been approved by Council. In June of 2022, Official Plan Amendment (OPA) 18.3 updated the urban forest canopy cover targets and woodland cover targets as well as the City's commitment to measuring and reporting on the state of the urban forest. Through OPA 18.3 the City committed to increase the tree canopy cover target to a minimum of 30%, a woodland cover target of 15%, and completing a comprehensive study every 10 years with an interim canopy cover assessment every five years.

City staff recently undertook research to inform a phased increase to the Tariff of Fees By-Law to achieve full cost recovery. Once complete, this change will allow the City to fund the canopy cover enhancements to mitigate losses occurring from infill development.

In addition, as part of the Standards and Specifications Manual update, the City has incorporated the Urban Forest Planting Guidelines within the manual, as well as a section (Division K) dedicated to planting standards; this became available on the City's website in late 2022.

Goal 3: Strengthen the urban forest to increase resilience

As part of on-going City operations, staff strive to maximize the levels of service of the urban forest by establishing new trees where needed, increasing species diversity and supporting growth of mature healthy trees.

From June 2020 to the end of 2022, the City initiated several woodlot management and maintenance projects, including Beaver Woodland, Elgin Mills Greenway, Phyllis Rawlinson Park and David Dunlap Observatory (DDO) Park (Phase 1 and 2). Additionally, restoration work to address the impacts of Emerald Ash Borer (EAB) at

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Saigeon Trail began in 2022 and implementation of the DDO Phase 3 restoration plan began in the summer of 2023.

While a formalized city-wide Invasive Species Management Strategy is not proposed until 2027, staff still take measures to address and mitigate the impacts of invasive species. Internally, in 2022, staff established and launched an Invasive Species Interim Response Procedure to guide the City's response to priority invasive species on public property that negatively impact residents' health and safety, capital infrastructure, or ecological restoration investments. In 2020, southern Ontario experienced a spongy moth outbreak that lasted until early 2022. During this time, Public Works Operations staff took measures to address spongy moth by vacuuming egg masses from priority street and park trees, removing over 200,000 egg masses, and treating over 90 high value park trees.

Goal 4: Grow partnerships to strengthen challenges

Richmond Hill's urban forest is a shared resource, and it takes a community to care for and manage it. Education is a key role in stewarding the City's urban forest and natural areas. City staff continued to work collaboratively with residents, businesses, organizations, and other levels of government to sustain the canopy cover for future generations.

Between 2020 and 2022, City staff continued to provide urban forest education and outreach through the City's Healthy Yards and Community Stewardship Programs (CSP), the Greening the Hill booth at public events, as well as through corporate communications such as public service announcements, councilor and corporate newsletters, social media and the waste calendar.

The CSP continued to engage residents and volunteers in natural area stewardship on public and private lands. Over the last 3 years, the CSP planted almost 28,000 trees with over 2000 volunteers. This was completed with over 240 partner led events and 18 workshops with over 1800 participants.

To encourage naturalization of private lands, the City's Healthy Yards program has provided residents with native plants at a subsidized rate. Since 2020, Healthy Yards has sold over 3500 trees and shrubs, more than 9000 wildflowers and over 870 backyard composters and 950 rain barrels.

The City continues to partner with organizations such as York Region, Ontario Streams, Toronto and Region Conservation Authority (TRCA), Local Enhancement and Appreciation of Forests (LEAF), local schools, businesses and community groups.

Key Findings and Recommendations from the Urban Forest Study

In 2022, the City partnered with York Region to retain TRCA to conduct the 10 year Urban Forest Study (UFS). The last UFS was completed in 2012, and this 2022 report provides an update and explores changes since the last assessment. It also identifies

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key recommendations that support and align with actions in the UFMP. The UFS offers an overview of the ecosystem services provided by the urban forest, and examines the state of the urban forest by looking at the distribution of canopy cover by land use type, size and species composition, and overall condition. The 2022 UFS also includes a vulnerability assessment, which looks at the urban forest's susceptibility to invasive species and climate vulnerability. The section below provides an overview of the UFS findings and, where applicable, includes a few of the UFS recommendations that complement the actions within the UFMP.

1. Ecosystem Services

The urban forest plays a vital role in providing ecosystem services, such as improving air quality, carbon storage and sequestration, flood attenuation and many more services. Refer to **Attachment 2a - The Benefits of Trees in Richmond Hill**. As the urban forest continues to grow and expand, so will the services it provides. The urban forest study quantified the services of the urban forest using the i-Tree Eco model, an industry standard methodology developed by the U.S. Forest Services (USFS), using data parameters specific to Ontario and, where available, the Greater Toronto and Hamilton Area (GTHA). Below is a summary of the ecosystem services provided by Richmond Hill's urban forest:

- **Carbon storage and sequestration** - Richmond Hill's urban forest sequesters approximately 7,646 tonnes of carbon per year, an annual value of \$1.44 million, and stores 239,267 tonnes of carbon, valued at \$45.2 million. Annual carbon sequestration and storage rates have increased since 2012, which is in line with the increase observed in canopy cover, tree population size and leaf area.

Recommendations:

- Follow the goals identified in the Community Energy & Emissions Plan (CEEP), Richmond Hill's Path to a low-carbon future to increase carbon sequestration by implementing the UFMP and developing a Natural Heritage Strategy to increase the quality, connectivity, integrity and diversity of the natural heritage system.
- **Air pollution removal** - Richmond Hill's urban forest improves local air quality by absorbing and intercepting airborne pollutants, by removing 107 tonnes of air pollution, and producing 11,611 tonnes of oxygen. This is a service valued at \$2.4 million annually.

Recommendations:

- Select long lived, low maintenance tree species, and bolster evergreen tree populations (aside from eastern white cedar, due to its high vulnerability to climate change) to improve year-round pollution removal services.

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- **Residential energy savings** - Trees that are adjacent to buildings can reduce the demand for heating and air conditioning through their temperature moderating influence. This reduction in demand for heating and cooling reduces the emissions associated with fossil fuel combustion. Based on modeling, the annual demand for heating and cooling for residential buildings with adjacent trees in Richmond Hill was reduced providing an estimated financial savings of \$1.6 million. This is a sharp increase from 2012, which saw an approximate savings of \$567,000 annually. The difference is likely due to the maturation of the urban forest between 2012 and 2022.

Recommendations:

- Assess the City's tree species selection tool on the potential of each species to provide energy savings.
- **Hydrological benefits** - Trees absorb and filter rainwater, which helps improve water quality and reduces flash flooding. The urban forest provides great hydrological services with stormwater offset estimated at 537,553m³ across the City, which is equivalent to 215 Olympic sized pools. This service is valued at \$1.25 million annually.

Recommendations:

- Explore the opportunity to use the Sustainable Technology Evaluation Program Treatment Trail Tool to further evaluate and quantify the Stormwater benefits of plantings trees.

2. State of the Urban Forest

Many services provided by the urban forest are influenced by its structural elements, including canopy cover distribution, species composition, size and overall health of the trees. Refer to **Attachment 2b - The Health of Richmond Hill's Urban Forest**. Below is a summary of the state of Richmond Hill's urban forest:

- **Canopy cover** - Since 2012, Richmond Hill's canopy cover across the city has increased from 25% to 30%, including both public and private lands. This range is within the recommended threshold target of 26% to 35% for Richmond Hill suggested in the York Region Forest Management Plan.

In terms of distribution, residential areas contribute the greatest proportion of canopy cover with 27.5%, while natural cover contributes the second most at 23.3% cover. These two land uses also provide the greatest amount of potential plantable area for increasing the City's canopy cover. On the other hand, institutional, industrial, commercial, high density residential, and utility transportation areas contribute the least to canopy cover in the City, with a combined total providing 5.6% of the total canopy cover.

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Recommendations:

- Develop and implement land-use based tree canopy cover targets.
- Utilize York Region's Tree Planting Prioritization Tool to improve equitable canopy cover distribution.
- Develop mechanisms and incentive opportunities to support private landowners, including commercial and industrial landowners, to undertake tree planting and improved tree health maintenance practices.

This will help to facilitate a more equitable distribution of urban forest services across the City.

- **Species composition** - Species composition is relatively homogeneous in Richmond Hill, leaving it susceptible to pest outbreaks. The top three most abundant tree species make up 39.4% of the total population; this is a decrease of 4% from 43.4% in 2012, meaning Richmond Hill has made progress towards a more diverse urban forest.

The top three tree species by percent of population are Eastern white cedar, European buckthorn and Eastern white pine. Within residential land use areas, eastern white cedar represents 43% of total trees, partly due to its extensive use in hedgerows. European buckthorn is a highly invasive species in Ontario, and its abundance is partly due to its fast growing and adaptable nature, smaller growth form and its tendency to grow in high densities.

Recommendations:

- Establish a diverse tree population, in which no species represents more than 5% of the total population; no genus represents more than 10% of the total population; and no family presents more than 20% of the urban forest.
- Use native and appropriate non-native stock in planting activities.
- Formalize an education campaign that highlights the importance of diversity in a resilient urban forest.

Frequency and severity of pest outbreaks is increasing and it is essential to encourage a more diverse urban forest to enhance its resiliency and mitigate potential future impacts.

- **Tree size** - As tree size increases so do their environmental, social and economic services. In Richmond Hill, 71% of trees are considered small (less than 15.2cm diameter at breast height (dbh)) and fewer than 2% of trees are considered large (greater than 45.7cm dbh). Tree size has increased since 2012. In 2022, 8% of trees fell within the 30.6cm to 45.7cm size class, this is a two-fold increase from 4% in 2012.

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Many factors affect size distribution, including the age of the tree and land use influences. Many trees in Richmond Hill are newly planted as the City continues to develop and intensify. In time, with proper management and care, these trees can mature and, in return, increase their environmental, social and economic benefits.

Recommendations:

- Evaluate and develop strategic steps to increase the proportion of large, mature trees.
- Apply tree preservation requirements to the City's design specifications and standards.
- Explore the possibility of amending the existing Private Tree Preservation By-law to decrease the minimum regulated dbh and review replanting conditions associated with removal of privately owned trees.

These strategies will help to improve and increase the size and age of the urban forest. Increasing the proportion of large mature trees within the City will increase their environmental, social and economic services, and support increasing canopy cover within the City.

- **Condition** - Approximately 75% of trees in Richmond Hill are estimated to be in either excellent or good condition; this is an increase from 64% in 2012. Tree health assessments provide a useful overview of the general condition of trees across Richmond Hill. The existing scoring suggests that trees should be delivering services within an expected capacity, however, they need to be managed to promote future health. Engaging private landowners on tree planting maintenance complements the City's own practices and efforts to ensure a healthy urban forest overall.

Recommendations:

- Engage and potentially incentivize industrial and commercial landowners to undertake tree planting, and educate landowners on best maintenance and tree care practices.

The City needs to continue managing trees to promote future tree health as urban stressors, compounded by the effects of a changing climate, can affect the benefits and services trees provide in the future.

3. Invasive Species

Invasive species continue to be a threat to the urban forest. Invasive plants have the capacity to outcompete and colonize natural areas, making it inhabitable for other vegetation to survive and prosper. Pests and diseases often target specific host species and can have devastating consequences, such as EAB on ash species. Refer to **Attachment 2c - Invasive Species in Richmond Hill**. Below is a summary of the status of invasive species across Richmond Hill's urban forest:

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- **Invasive Plants** - The most commonly found invasive plants include European buckthorn, Norway maple, garlic mustard, Manitoba maple and non-native honey suckles. In natural areas, three-quarters of the study area plots had at least one invasive species present, while in residential land uses two thirds of the study area plots had an invasive species present.
- **Pests and diseases** - The presence of EAB and spongy moth were observed in Richmond Hill, however the City has been managing these populations since 2012 and 2019 respectively. Asian long-horned beetle, hemlock woolly adelgid and oak wilt were not found in the City. Confirmed sightings of oak wilt and hemlock woolly adelgid have been found in Ontario recently, and City staff are taking proactive measures to prevent their introduction.

Recommendations:

- Continue targeted removal of high priority invasive species.
- Develop and implement municipal-led invasive species education and volunteer program to enhance awareness of invasive species, citizen science monitoring and proper removal practices.
- Implement natural buffers along the edges of woodlands and apply edge enhancement plans as part of the development process to protect against encroachment of invasive species into woodlands.
- Develop a monitoring and action plan for invasive species, including pests and diseases.

The UFMP and the updated Environment Strategy (2022) identifies an Invasive Species Management Strategy and Action Plan as a priority and is proposed to be completed between 2025 and 2030. This will be an important component in addressing the issue of invasive species in the City.

4. Climate Vulnerability

Changes in climate conditions are expected to alter environmental conditions, limiting the capacity of many trees to cope as their optimal climatic ranges shift. Twelve of the City's most abundant tree species were rated as highly or extremely vulnerable to climate change, including the top five species: eastern white cedar, European buckthorn, eastern white pine, green ash and white spruce. These twelve species make up 66% of the total population of trees across the City. The limited diversity of the urban forest makes it more vulnerable to the impacts of climate change.

Recommendations:

- Assess the tree species selection tool to incorporate climate vulnerability scores, to encourage the planting of less vulnerable species.
- In alignment with Richmond Hill's UFMP and the City's Climate Change Framework, investigate a formal approach and program to test plants

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and trees from warmer ecozones (such as Carolinian) for viability in the City (eg. Assisted range expansion and assisted migration).

As the climate continues to change, maintaining a resilient and healthy urban forest will aid in mitigating the effects of climate change on the City and its residents.

5. Urban Forest Study Conclusion

The UFS identified 38 recommendations that align and complement the actions of the UFMP and will help the City establish a more resilient urban forest. While Richmond Hill has made good progress growing our urban canopy, there are areas we need to improve on or continue to address. These opportunities include improving the equitable distribution of canopy cover throughout the City, establishing a more diverse urban forest by planting a range of species resilient to changing climate conditions, protecting and enabling trees to mature, managing invasive species and conserving our natural assets to help combat the impacts of climate change.

In partnership with York Region and TRCA, staff will continue to report on the state of the urban forest every ten years through the UFS and provide updates on how the City has met the recommendations. In the interim five years, staff will conduct a canopy cover assessment, which will be used to evaluate our progress on the implementation of the UFMP and OP goals of achieving a canopy cover target of 30% and woodland cover target of 15%.

Next Steps

The actions of the UFMP have been given specific timing that ranges from ongoing, specific cycles (every 5 or 10 years) and short (2020 to 2025), medium (2025 to 2030) or long term (2030 to 2040) time frames. Over the next decade and a half, staff will continue to deliver on the commitments of the UFMP (2020 – 2040), focusing on the high and medium priority actions within the specific timeframes and the UFS recommendations that support these actions. As part of the implementation of the UFMP, the various departments involved in the management and protection of Richmond Hill's urban forest meet regularly as members of the UFWG to provide updates and address urban forest related issues as they arise. Staff will continue to track progress on an annual basis and provide regular updates to Council as necessary.

Financial/Staffing/Other Implications:

There are no financial implications resulting from this staff report.

Relationship to Council's Strategic Priorities 2020-2022:

Continued implementation of the UFMP strongly aligns with three of the four Council strategic priorities. The UFMP complements and supports the Balancing Growth and Green and the City's commitment to stewardship of green spaces and longer-term sustainability planning. The management of the City's urban forest also helps to create

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a Strong Sense of Belonging by creating opportunities for people to experience and immerse themselves within the City's natural environment and take part in stewardship programming. Lastly, the UFMP also demonstrates Fiscal Responsibility, by prioritizing and identifying opportunities to optimize resources, and ensure the long-term maintenance of the city's investment toward the urban forest.

Climate Change Considerations:

The continued investment in the City's urban forest through the implementation of the UFMP contributes to climate change mitigation. The protection, enhancement and management of the urban forest helps to mitigate climate change by reducing urban heat island effect and capturing and storing atmospheric carbon emissions.

Conclusion:

Richmond Hill has a strong legacy of protecting and managing the urban forest. The UFMP is the City's commitment to long-term, strategic protection and innovative management strategies moving forward. This staff report and its attachments highlight how the UFMP actions have been implemented since Council approval in June of 2020. Based on the findings and recommendations of the Urban Forest Study, this staff report also identifies how staff intend to use updated information and enhance our practices to ensure the continued overall health of Richmond Hill's urban forest.

Attachments:

The following attached documents may include scanned images of appendixes, maps and photographs. All attachments have been reviewed and made accessible. If you require an alternative format please call the contact person listed in this document.

- Attachment 1 – Urban Forest Management Plan Progress Tracker (2020-2022)
- Attachment 2 – Urban Forest Study Fact Sheets
 - 2.a The Benefits of Trees in Richmond Hill
 - 2.b The Health of Richmond Hill's Urban Forest
 - 2.c Invasive Species in Richmond Hill

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Report Approval Details

Document Title:	SRPBS.23.008 - Urban Forest Management Plan Progress Update 2020 to 2022.docx
Attachments:	- SRPBS.23.008-Att1-Urban Forest Management Plan Progress Tracker (2020-2022) - AODA.pdf - SRPBS.23.008-Att2a - The Benefits of Trees in Richmond Hill - AODA.pdf - SRPBS.23.008-Att2b - The Health of Richmond Hill's Urban Forest - AODA.pdf - SRPBS.23.008-Att2c - Invasive Species in Richmond Hill - AODA.pdf
Final Approval Date:	Sep 9, 2023

This report and all of its attachments were approved and signed as outlined below:

Maria Flores - Sep 8, 2023 - 9:16 AM

Kelvin Kwan - Sep 8, 2023 - 10:23 AM

Darlene Joslin - Sep 9, 2023 - 8:44 AM