TORONTO

REPORT FOR ACTION

Strengthening Toronto's Tree Canopy: Report on Climate Resilience and Tree Equity

Date: February 12, 2025
To: Infrastructure and Environment Committee
From: Executive Director, Environment, Climate and Forestry
Wards: All

SUMMARY

Toronto's urban forest consists of over 11.5 million trees, which spans streetscapes, parks and ravines, commercial and industrial lands, and residential properties and provides fundamental ecosystem services. These ecosystem services include creating oxygen and removing pollutants from the air, reducing energy costs, improving water quality, mitigating extreme heat, and providing food and habitat for the many birds, insects, amphibians, and mammals which contribute to the city's biodiversity.

Like many major urban centres around the world, Toronto is experiencing the impacts of climate change. These changes include more extreme heat and extended heat waves that can disproportionately affect the health and wellness of equity-deserving groups. A healthy urban forest is fundamental to climate resilience and provides access to the numerous benefits which is central to Toronto's tree equity approach to canopy expansion.

The purpose of this report is to describe Toronto's multi-pronged approach to ensure the expansion, protection and maintenance of trees across Toronto's urban forest as climate change intensifies. City Council has reaffirmed its commitment to achieving a 40 per cent canopy cover by 2050. Urban Forestry is using a tree equity approach to grow the tree canopy where it is needed most, ensuring that all Torontonians, including equity-deserving groups such as children and seniors, realize the co-benefits of a healthy and resilient urban forest.

RECOMMENDATIONS

The Executive Director of Environment, Climate and Forestry, recommends that:

1. The Infrastructure and Environment Committee receive this report for information.

FINANCIAL IMPACT

There are no financial implications resulting from the adoption of this report.

DECISION HISTORY

At its May 28, 2024, meeting, the Infrastructure and Environment Committee requested the General Manager, Parks, Forestry and Recreation to report back to Infrastructure and Environment Committee by the first quarter of 2025 with a plan to protect and enhance Toronto’s tree canopy in all parts of the city as climate change intensifies, with particular attention to the importance of trees in reducing the adverse effects of extreme heat on children, seniors and other vulnerable populations.

Agenda Item History - 2024.IE14.11

At its meeting on December 15, 2021, City Council reaffirmed Toronto's target of 40 per cent tree canopy cover by 2050 to align with the City of Toronto's TransformTO NetZero Strategy. In this report to Council, Urban Forestry introduced the tree equity approach to planning and service delivery at the neighbourhood scale to help address the inequitable distribution of the urban forest.

Agenda Item History - 2021.IE26.6

At its meeting on January 29, 2020, City Council adopted the key next steps to implement the Ravine Strategy over the next ten years and directed the General Manager, Parks, Forestry and Recreation, in consultation with the Chief Planner and Executive Director, City Planning, the General Manager, Toronto Water and the Toronto and Region Conservation Authority to report every three years on the advancement of the Ravine Strategy's actions. City Council also directed the General Manager, Parks, Forestry and Recreation, the Executive Director, Municipal Licensing and Standards and the City Solicitor, in consultation with applicable agencies and divisions, to report on the opportunity and actions necessary to seek increased fines related to all offences pertaining to littering and dumping of refuse in ravines.

Agenda Item History - 2020.EX12.1

At its meeting on February 20, 2013, City Council adopted item PE18.4, Toronto's Strategic Forest Management Plan, that continues to guide Urban Forestry's planning and decision making and includes the adoption of a city-wide target of 40 per cent canopy cover.

Agenda Item History - 2013.PE18.4

COMMENTS

The Importance of Toronto's Urban Forest

Toronto's urban forest has an estimated canopy cover of 28.4 to 31 per cent and 11.5 million trees across private and public property. Its structural value exceeds $7 billion. The urban forest enhances city streetscapes, private properties and open spaces, while also providing habitat in parks, ravines, and natural areas. It provides a range of environmental, ecological, physical and mental health, social, cultural, and economic benefits, including cooling benefits and resulting mitigation of extreme heat through shade and evapotranspiration.

Green infrastructure, in particular tree canopies, are nature-based solutions which play a key role in the mitigation of climate change. Maintaining and expanding Toronto's urban forest is a key component of mitigating the urban heat island (UHI) effect and protecting equity-deserving groups from extreme heat. Toronto's trees are essential to the city's green infrastructure and provide cooling benefits, through evapotranspiration and shade provision, as well as carbon sequestration, air pollution mitigation, wildlife habitat, and stormwater management. The urban forest contributes over $55 million annually in ecosystem services, including $8.3 million in energy savings, $4.0 million in gross carbon sequestration, $37.9 million in pollution removal, and $4.8 million in avoided runoff. A joint study by the Canadian Institute for Climate Choices and Smart Prosperity Institute noted that from 1990-2018, urban trees removed an average of 2.4 million tons of greenhouse gases (GHG) annually and contributed to GHG emission reductions by reducing heating and cooling needs in adjacent buildings. They also filter particulate matter and absorb pollutants like ground-level ozone. Urban trees offer health benefits by reducing heat-related illnesses, as trees can lower temperatures by up to 12 degrees Celsius while providing shade and reducing exposure to harmful ultraviolet rays.

Street trees are an important part of Toronto's urban forest, helping to mitigate UHI effects. According to the most recent Tree Canopy Study, street trees make a significant contribution to the overall benefits of the urban forest, comprising almost 19.4 per cent of the structural value while making up only 5.4 per cent of the total population. The temperature difference between city streets with and without trees can vary greatly in a densely populated urban setting during the hot summer season. In addition to providing benefits described above, research shows that people in neighbourhoods with more trees on their streets report better health and fewer heart-related or metabolic issues (like hypertension, heart disease, high cholesterol), even after considering factors like income and age. These trees also provide shade and cooling to the pedestrians walking to school and work, and those shopping in their communities; as well as the transit riders waiting at transit stops in the heat.

Urban parks, especially ravines and natural areas, act as cooling centres during hot weather, offering spaces for outdoor recreation that benefit both physical and mental health. According to the Canadian Psychological Association, time spent in nature reduces anxiety, depression, and mental fatigue; and promotes physical activity,

relaxation, and socialization, which all help to lower stress and improve mental well-being.

Climate Change and Extreme Heat

Climate change is increasing heat risks, with rising temperatures and more frequent heat events and extreme weather, especially in cities. Urban areas are particularly affected by the UHI effect, where heat is trapped by buildings and paved surfaces, making cities hotter than surrounding rural areas. Concrete and pavement absorb and radiate more heat, while tall buildings block wind, intensifying the heat.

More frequent and intense heat events will increase the risk of heat-related illnesses and deaths, such as heat stress, stroke, and cardiovascular disease. According to Toronto's Heat Relief Strategy equity-deserving groups, including seniors, children, people with pre-existing conditions, and those with limited access to cooling, are at higher risk.

In 2024, the City released Toronto's Current and Future Climate Report, which highlights the city's changing climate including warmer, wetter, more unpredictable weather, and increased extreme weather events. Some key impacts include rising average annual temperatures; more extreme heat days above 30 degrees Celsius; and fewer cold days below -20 degrees Celsius.

Toronto's Plan to Protect and Enhance the Urban Forest

The role of trees and urban forests as critical green infrastructure is well recognized globally. Many cities invest in greening plans, strategies and actions which promote urban forests as nature-based solutions for thermal regulation, such as New York, Seattle, Paris, Melbourne and London, to name a few.

Toronto is a recognized leader in urban forest management and biodiversity conservation. This is evidenced by Toronto's recognition as a Role Model City in the United Nations Environment Programme's Generation Restoration and the City of Toronto being designated as a Tree City of the World for the last five consecutive years. This designation, awarded in partnership with the Arbor Day Foundation and the Food and Agriculture Organization of the United Nations, recognizes the City's commitment to ensuring sustainable and healthy urban forests, protecting local ecosystems and enhancing its resilience to climate change.

Urban Forest Management Planning Framework

Urban Forestry's mandate is to maintain, protect, plant and plan for Toronto's urban forest. These actions are a critical component of the city's green infrastructure and its climate resilience efforts. Toronto's Strategic Forest Management Plan, adopted by City Council in 2013, outlines the actions needed to ensure a healthy and resilient urban forest for future generations and sets goals and objectives for urban forest growth and management. It also sets out the planning and service delivery for Urban Forestry organized around four service pillars: maintain, protect, plant and plan. The Strategic Forest Management Plan continues to be the guiding document for urban forestry

management across the city. It has more recently been strengthened by additional studies, strategies and initiatives that ensure data-driven decisions informed by equity and evidence-based management approaches.

Urban Forestry conducts tree canopy assessments to collect and analyze information about changes and trends in the urban forest over time, including the size, composition, condition, extent, and trends across the city's land use areas. These canopy assessments also map changes in the tree canopy, analyzing factors like development and storm damage, and assess ecosystem services provided by trees. The most recent Tree Canopy Study was conducted in 2018 and continues to inform strategies, planting programs, biodiversity policies, and operational procedures.

The 2018 Tree Canopy Study determined that the greatest amount of potential space for canopy growth exists on private land. To respond to this need, the Tree Planting Strategy was created, to serve as a blueprint for actions and investments to grow the urban forest on private land through tree planting, stewardship, education, leadership and innovation. As part of the development and implementation of the Tree Planting Strategy, the Urban Forestry Grants and Incentives Program was created to expand the tree canopy on private land through subsidized grants or tree giveaways. Between 2017 and 2024 Urban Forestry invested over $6.4 million and leveraged over $14 million in matching funding from external sources in support of tree planting and stewardship on private land through the Urban Forestry Grants and Incentives Program. This resulted in the planting of over 118,000 trees and shrubs and the engagement of over 314,000 people. In total, 226 projects have been funded across all 25 Wards in Toronto, including 29 of 31 Neighbourhood Improvement Areas.

One of the strategic goals of the Strategic Forest Management Plan is to ensure an equitable distribution of the urban forest, focusing on areas with the greatest need. In 2021, Urban Forestry adopted a tree equity approach to address uneven tree distribution of the urban forest. The tree equity approach prioritizes areas for canopy expansion and helps to ensure all residents benefit from the environmental, health and economic advantages of trees and green spaces, including the cooling effects of the urban forest.

In 2024, the Toronto Tree Equity Score Analyzer (TESA), a free online tool, was launched in partnership with American Forests, LEAF (Local Enhancement and Appreciation of Forests), and local stakeholders. A tree equity score, expressed as a number from 0 to 100, is calculated at the census tract and parcel level across the city using tree canopy and heat mapping, and socio-economic data. The socio-economic factors include Canada census data for seniors and children, as well as census data for race, income, and employment. This tool helps to prioritize planting in areas where trees will provide the most significant benefits to residents, including equity-deserving communities facing extreme heat. TESA allows residents, community organizations and City staff to explore planting scenarios, track progress, and generate reports on the benefits of tree planting.

Ravine Strategy

Toronto's Ravine Strategy supports a ravine system that is a natural, connected sanctuary essential for the health and well-being of the city. Large natural areas, like ravines, are essential for mitigating heat stress by providing shade and cooling effects in urban areas. They offer residents from adjacent neighbourhoods a cool and shaded opportunity for recreation or active transportation. The Strategy recognizes the increasing pressure from climate change while highlighting the role of ravines in mitigating its impacts.

The Ravine Strategy includes actions to enhance climate resilience and support equity-deserving groups. Adopted by City Council in January 2020, the implementation report identified ten Priority Investment Areas (PIAs). Criteria for selecting these priority areas included several equity considerations, such as lack of nearby cultural or recreation facilities, low-income neighbourhoods, and the heat vulnerability of adjacent neighbourhoods. Investments in these PIAs include capital improvements to trails and access points for more people to enjoy the benefits that ravines can provide.

Through the implementation of the Strategy, community engagement and targeted outreach is carried out to communities who may face barriers in accessing them. Through the Ravine Strategy, the InTO the Ravines program, in partnership with Park People, empowers residents, particularly those from historically marginalized communities, to become local ravine champions. Participants receive training, resources, and funding to host events that promote awareness of ecological, social and health benefits of ravines while fostering stronger connections between their communities and these important natural spaces.

Ravine Strategy progress is reported back to City Council every three years. The next update report is planned for 2025.

Toronto's Tree Protection By-Laws

Protecting trees, ravines and natural features is a critical component of ensuring climate resilience and reaching the City's target of 40 per cent tree canopy cover by 2050. Urban Forestry regulates tree removal and injury on City and private property, and natural features in the city's designated ravine areas through several Municipal Codes; namely *Chapter 658* (Ravine and Natural Features Protection By-law); *Chapter 813* (City Street and Private Tree By-law); and *Chapter 608* (Parks). These three bylaws are known collectively as the City's Tree Protection By-laws.

The intent of the City's tree bylaws is to regulate tree injury and removal, protecting trees from unnecessary harm, while promoting maximum tree protection and compensation, including replacement planting.

Trees of all sizes are protected by the following bylaws:

- City Street Tree By-law, *City of Toronto Municipal Code, Chapter 813, Trees, Article II*
- Ravine and Natural Feature Protection By-law, *City of Toronto Municipal Code, Chapter 658, Ravine and Natural Feature Protection*
- Parks By-Law *City of Toronto Municipal Code, Chapter 608, Parks.*

Trees with a diameter-at-breast-height of 30 cm or greater on private property (outside ravine-regulated areas) are protected by the Private Tree By-Law, *City of Toronto Municipal Code, Chapter 813, Trees, Article III.*

In 2015, the City's Tree By-law, Municipal Code 813 - Trees and Municipal Code 658 Ravine and Natural Feature Protection, were amended to improve customer service and response times, and enhance enforcement and transparency. In 2022, City Council delegated the authority to make final decisions on tree permit appeals to Community Councils. Environment, Climate and Forestry is currently reviewing the City's tree bylaws for potential subject matter amendments. Public engagement and a report-back on the tree bylaws review is anticipated in 2025.

Urban Forestry Key Programs and Actions

A strong, healthy, and resilient urban forest is critical to mitigating the negative impacts of climate change. Urban Forestry undertakes key programs and actions to increase urban forest resilience through planting, stewardship, maintenance of newly planted trees, survival studies, education and engagement. This report highlights recent achievements and action in a few key program areas:

- In 2024, Urban Forestry planted over 130,000 trees through staff, contractors, and volunteers on public land, and through Grants and Incentives programs on private land. This represents more than 8 per cent above the annual target.
- The Tree Seed Diversity Program secures source-identified native plant material for Urban Forestry's natural area planting programs and Environmentally Significant Areas. Planting source-identified trees and shrubs will improve genetic diversity and support an ecosystem that is more resilient to climate change impacts. This is the fourth year of a 10-year partnership with Forests Canada to deliver approximately 25,000 trees and shrubs annually for the planting programs.
- To maximize existing tree health and survival in the face of climate pressures, the tree maintenance program focuses on quality service with the newly-planted tree maintenance program targeting young trees for pruning, watering and fertilizing annually, helping to avoid future maintenance costs.
- Toronto was the first Canadian municipality to launch a complex prescribed grazing program to tackle invasive species. Using a specialized ‘eco-herd’ of goats at Don Valley Brick Works Park, 3000 square metres of meadow habitat was grazed to manage invasive species and provide a quality home for native species of flora and fauna.
- Through existing monitoring, newly planted street tree survival is estimated at 93 per cent. Urban Forestry has engaged a consultant to perform a large-scale

survival study sampling program inclusive of park trees, street trees and hard-surface tree planting programs. Data collection will be completed in fall 2025.
- In 2024, Urban Forestry's volunteer and engagement programs engaged over 43,000 participants in over 690 events and provided employment and training for over 100 youth. Of these events, 52 per cent were located in Neighbourhood Improvement Areas and/or low tree equity neighbourhoods.

Corporate Initiatives Contributing to Tree Canopy and Climate-Resilient Outcomes

While the Environment, Climate and Forestry Division leads efforts to expand, protect and maintain the urban forest and management of ravines and natural areas, other City Divisions play an essential role in supporting these efforts to realize common goals, targets, and outcomes. Key initiatives that will directly support healthy trees and urban forests, and climate resilient efforts include:

- Toronto Green Standard (TGS) Version 4: Provides sustainability guidelines for new developments, emphasizing energy efficiency, green infrastructure, and climate resilience. TGS V4 highlights the role of trees in mitigating the urban heat island effect and improving air quality. Environment, Climate and Forestry are contributing to discussions of TGS Version 5, anticipated later in 2025.
- Thermal Comfort Guidelines: New guidelines, recently adopted by City Council, address thermal comfort in the public realm and shared outdoor amenity spaces, taking into consideration future climate projections and the impacts of surrounding built form. Ensuring thermal comfort in the public realm is essential to protect the physical and mental well-being of the city's residents and visitors, particularly in the wake of climate change. The design of the public realm is key in designing a resilient city.
- Growing Green Streets (GGS): An interdivisional initiative aimed at expanding green infrastructure and tree canopy on city streets. GGS is developing focus areas incorporating tree equity data and other socio-economic equity factors to prioritize street tree planting and other green infrastructure. The project is scheduled to be completed in 2026.

Next Steps

Toronto's comprehensive efforts to enhance its urban forest and address climate resilience underscore the importance of an equitable approach in building a sustainable and healthy urban environment. Through the implementation of a tree equity approach, strategies such as the Ravine Strategy, and multiple interdivisional-led initiatives, the City is working to mitigate the effects of extreme heat, particularly for equity-deserving groups that are disproportionately affected by climate change. The City's commitment to increasing its tree canopy and prioritizing areas with the greatest need ensures that equity-deserving neighbourhoods can benefit from the advantages that trees provide. Tools like the TESA and community-focused programs further promote engagement and action, build climate resilience by helping to identify and address tree equity gaps. Targeted planting and stewardship in underserved neighbourhoods such as those with low tree equity and in Ravine Strategy's Priority Investment Areas ensures that these communities receive the cooling benefits of trees, reducing their exposure to extreme heat. With a goal of 40 per cent canopy cover by 2050, Toronto is strengthening its

resilience to extreme heat. The continued use of monitoring and tree canopy studies to inform the success and efficacy of Toronto's collective actions is critical.

With Urban Forestry's recent merge into the newly established Environment, Climate and Forestry (ECF) Division, the ongoing commitment to expanding, protecting and maintaining the urban forest is strengthened and is central to the City's TransformTO and net zero targets, fostering a sustainable, equitable, and healthy environment for all Toronto residents.

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ATTACHMENTS

No attachments