

The Regional Municipality of York

Committee of the Whole
Environmental Services
November 5, 2020

Report of the Commissioner of Environmental Services

2020 Street Tree Health and Performance Update

1. Recommendation

The Regional Clerk circulate this report to the Clerks of the local municipalities.

2. Summary

This report updates Council on the status of the street tree program and provides new information on the recent street tree health assessment.

Key Points:

- The Region's street tree population, valued at \$421 million, continues to grow, increasing the environmental, social and economic benefits to residents
- The Region has made a substantial investment in street trees since adoption of the Streetscape Policy in 2001, and implementation of Great Regional Streets and VivaNext programs
- To address poor performance of street trees, significant program improvements have been implemented including regular street tree health assessments
- Street tree health assessments have shown a significant improvement in street tree performance from 29% of trees in healthy condition in 2003 to 87% in 2020
- Urbanization and limited boulevard space will require continued implementation of technologies and practices to ensure survival and long-term tree performance

3. Background

Street trees provide considerable environmental, social and economic benefits to our communities

Street trees, as a component of the urban forest, provide numerous benefits to residents including shade, energy conservation, improved air quality, prevention of soil erosion and stormwater management.

Regional streetscapes with trees help define the character of our communities and contribute to a sense of place. The Region has made a substantial investment in street trees since adoption of the Streetscape Policy in 2001, and implementation of Designing Great Streets and VivaNext programs.

Over 1,500 street trees are planted annually along Regional roads

The Streetscape Policy and subsequent guidelines set objectives and standards for street tree planting along Regional roads. Since 2001, the number of street trees has steadily increased as a result of annual planting efforts. Currently the Region plants an average of 1,900 street trees each year, with over 80% of tree planting occurring within existing urban areas. In recent years, planting projects have required more complex technologies such as engineered soil cells below sidewalks to ensure survival and long-term performance in urban settings including VivaNext corridors. Currently there are 69,000 street trees in the inventory with an estimated value of \$421 million.

Street tree health assessments are completed once every five years to monitor street tree performance

In the early 2000s, it was evident that recently planted street trees were performing poorly. To identify factors contributing to this poor performance, the Region undertook a comprehensive street tree health assessment in 2003. Results of the study identified that only 29% of recently planted trees were in healthy condition. The assessment identified a number of factors that impacted street tree performance including lack of water during the establishment period, poor boulevard soil conditions, low quality nursery stock, and poor planting procedures and post-planting maintenance practices.

To address poor performance of street trees, the Region implemented significant program improvements which have resulted in a dramatic increase in street tree health over the past 20 years. A commitment was made to continue to undertake street tree health assessments every five years and report the findings to Council. Health assessments in 2010 and 2015 showed improvement in street tree performance with respectively 76% and 84% of street trees in good health.

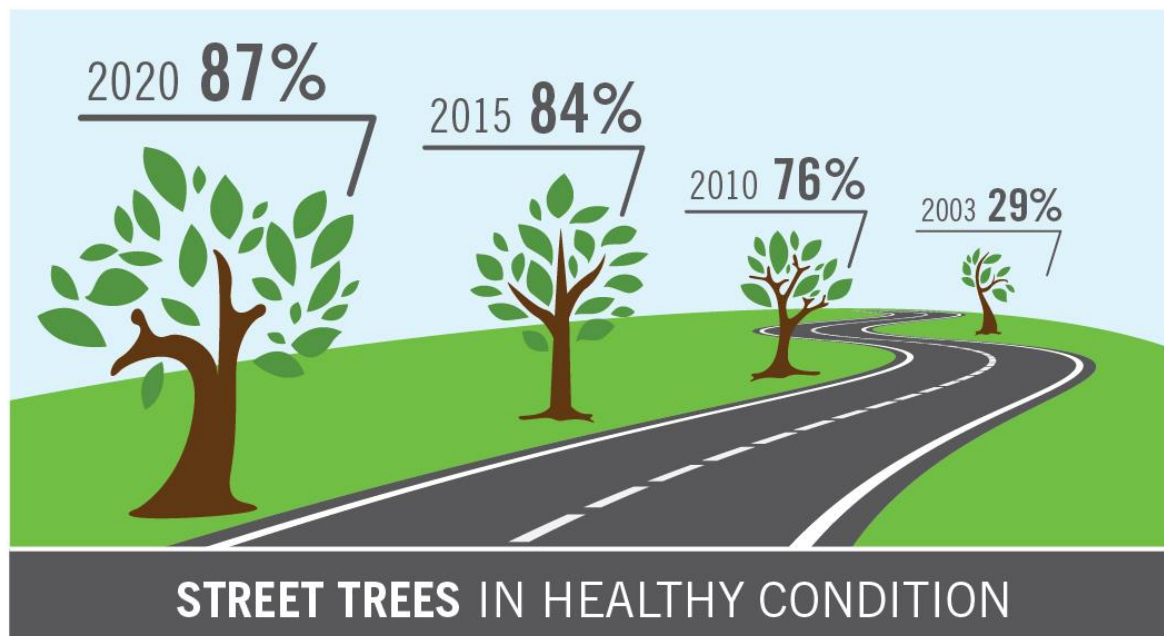
4. Analysis

2020 street tree health assessment confirms investments have resulted in improved performance with 87% of trees in healthy condition

In 2020, a fourth street tree health assessment was completed to measure the effectiveness of program improvements. A detailed health assessment of 3,099 street trees planted over the last 5 - 10 years was completed to determine tree health and further assess factors affecting tree performance (Attachment 1). Results of the assessment show that 87% of recently planted trees were in satisfactory or good condition. This demonstrates continued improvement in tree health since 2003 and confirms investments made in program improvements are having a positive impact on street tree performance (Figure 1). These investments enable the Region to close in on the performance target of 90% of trees in

healthy condition. This target was established in previous health assessments through a review of industry best practices, experience and expectations for the harsh roadway environment.

Figure 1
Improvements in Street Tree Health 2003 to 2020



Improvements to current practices continue with increased focus on key factors including soil quality, soil quantity and planting locations

The 2020 street tree health assessment identified several key factors which continue to influence the performance of street trees along Regional roads including:

- Poor root development and function resulting from boulevard soil conditions
- Negative impact when planting trees near roadway edges
- Drying of trees subject to winter winds on open sites

Construction along and adjacent to Regional roads can disturb natural soils, creating compacted soils that are generally less biologically healthy and having poorer drainage. Tree health increases when soil quality is improved before tree planting using techniques such as installation of a soil trench with drainage. The 2020 street tree health assessment noted that 94% of trees planted within a soil trench are in a healthy condition.

Planting location and species selection are critical to a tree's success. Planting within three metres of the roadway should be avoided, unless measures such as raised planter beds are considered, and top performing tree species selected. Likewise, open windy sites are being avoided as this planting location has been linked to decreased tree health.

Urbanization of Regional corridors presents challenges that are being met through new technologies and practices

Street trees are recognized as a key component for successful urbanization of Regional corridors such as VivaNext rapidways. Urban centres and corridors present challenges for establishing and maintaining healthy trees. To provide adequate soil and water in these hardscaped environments, the Region has invested in new technologies including engineered soil cells, structural soils and water efficient irrigation systems.

The 2020 street tree health assessment examined the rooting behaviour of trees planted in hardscapes where below ground soil cells had been installed (VivaNext) and softscape boulevards where structural soils had been installed under sidewalks. In both cases, extensive rooting was found within the soil cells and under the sidewalks, improving tree health. Street trees perform better when they have access to large volumes of uncompacted, good quality soils, allowing for unrestricted root growth.

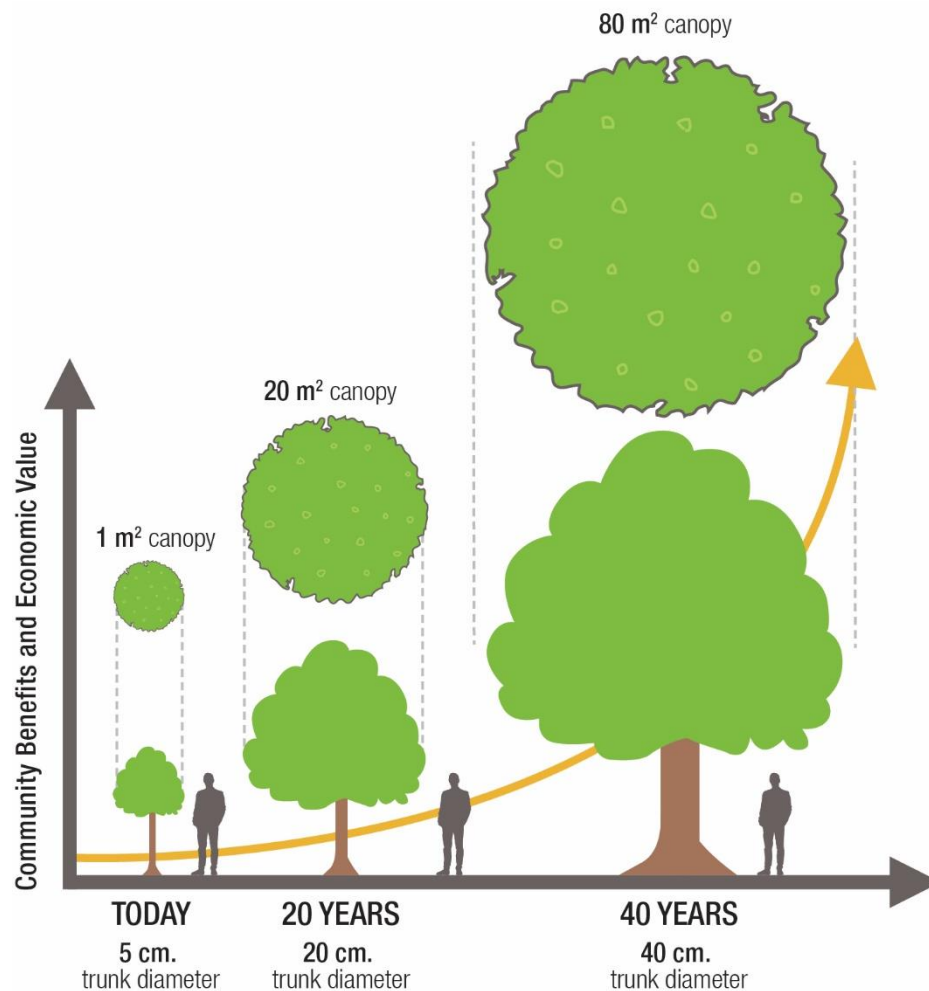
Street tree management and tree maintenance programs are increasing tree health

The Region's street tree population is continuing to grow in both number and tree size. With more trees surviving and performing well, the need to maintain these trees continues to increase. Once established, pruning street trees on a regular basis is required to maintain tree health and minimize hazards. The Region has implemented a proactive program to prune trees on a regular cycle. The 2020 street tree health assessment found a decrease in the number of trees with poor structure, 66% in 2015 compared to 5% in 2020, demonstrating the pruning program's positive impact.

Climate change impacts, particularly the frequency and intensity of storms, are a threat to street trees. Healthy, vigorous trees receiving proactive management including cyclical tree pruning, reduces susceptibility to damage from severe weather, minimizing impacts of storm events such as ice storms and extreme wind events. This has been demonstrated in recent storm events, where fewer reactive work orders have been required for comparable storms.

As healthy street trees grow their economic value and benefits increase significantly (Figure 2). In 2019 state of the infrastructure report the Region's street trees were valued at \$421 million. Through investments in planting and maintenance of street trees we ensure they maximize their growth potential and associated benefits to our residents.

Figure 2
Tree Growth and Associated Increase in Benefits



Street trees and other green infrastructure elements are a significant capital asset

In 2018, the Region updated the Corporate Asset Management Policy, which details principles for a consistent and coordinated approach for managing Regional assets to ensure long-term sustainability and to demonstrate fiscal stewardship. Green infrastructure, including street trees and systems that support them have been identified as an asset. To meet the goals of the Corporate Asset Management Policy, Environmental Services developed a Green Infrastructure Asset Management Plan.

This award-winning plan has provided insights to maximize the assets lifecycle and its benefits through financial modelling, evaluating risk, determining levels of service and identifying opportunities for continuous improvement. The Green Infrastructure Asset Management Plan will be updated in 2021 leading to further improvements in the management of these critical green assets.

Healthy street trees support the Strategic Plan by enhancing and preserving green space

Development and implementation of best practices related to planting and maintenance of street trees are identified as actions in the York Region Forest Management Plan. Improving street tree health contributes to increasing canopy cover and progress towards the 35% Regional canopy cover target. Growing the Region's canopy cover supports the Strategic Plan priority to build sustainable communities and protect the environment, and the objective of enhancing and preserving green space. Progress on achieving canopy and woodland cover targets will be reported to Council in the 2021 State of the Forest report.

5. Financial

Street tree health improvements will be achieved through program optimization

Recommendations from the 2020 street tree health assessment report will be reviewed and advanced on a priority basis. Program changes (e.g. increased watering) and use of new technologies (e.g. soil trenches and engineered soil cells) has already been implemented in previous years. Further street tree health improvements will be achieved through program optimization and implemented as part of ongoing adaptive management (e.g. refinement of soil quality specifications). Any financial impacts will be addressed through the multi-year budget process.

In 2019, the Region was successful in securing \$10.1 million in Federal funding for a natural infrastructure project through the Disaster Mitigation and Adaptation Fund. Included in this project is the planting of 12,500 street trees over nine years to mitigate the impacts of extreme heat.

Growth and urbanization of Regional corridors is presenting additional pressure on operating budgets

Green infrastructure in an urbanized streetscape provides a sense of place and community, and contributes toward achieving the vision of walkable and liveable cities. Maintenance needs associated with these streetscapes increase based on the road typology and landscaping treatment (Table 1). Maintenance requirements along urbanized roads are more complex and intensive, and include activities such as, weeding and pruning planting beds, irrigation of plant material and regular application of mulch. These maintenance activities along with proactive tree maintenance ensure green infrastructure assets remain in a good state of repair and achieve expected levels of service over the long term.

Table 1
Impact to Forestry Landscape Maintenance Budgets by Road Typology

Road Typology	Description of Landscape Treatments	Annual cost per centerline km
4 lane cross section	Trees planted in sod boulevards	\$1,600
6 lane cross section	Raised Centre median with shrub and perennials, trees planted in sod boulevards	\$44,000
Urban Centre - Rapid way	Raised Centre median with shrub and perennials, raised boulevard planter beds with shrubs and perennials	\$136,000

6. Local Impact

The Region's street trees continue to play a significant role in defining the character of our local communities. Healthy trees contribute to healthy communities. Improvements identified in this report will help to ensure street trees provide expected benefits to the environment, communities and residents. Street tree health assessments, continuous improvement measures and new technologies are also of interest to local municipalities and partners. This information will be shared with local municipal staff through the York Region Urban Forestry Forum to assist with program delivery and improvements in street tree health.

7. Conclusion

Street trees are a significant Regional asset providing many benefits to residents. They are an asset that appreciates in value over time. To achieve expected benefits, trees require resources to ensure their growth and long-term performance.

The 2020 street tree health assessment confirms the Region's investment in the street tree program has made a positive impact on the performance of street trees. Evidence-based decision making, and monitoring are key to advancing performance improvements. The assessment identifies opportunities for further improvement to help meet performance targets. By leveraging knowledge gained and continuing to innovate as conditions change, we will be able to meet the challenges of growing street trees on Regional roads, contributing to healthy communities across York Region.

For more information on this report, please contact Laura McDowell, Director, Environmental Promotion and Protection at 1-877-464-9675 ext. 75077. Accessible formats or communication supports are available upon request.

Recommended by: **Erin Mahoney, M. Eng.**
Commissioner of Environmental Services

Approved for Submission: **Bruce Macgregor**
Chief Administrative Officer

October 15, 2020
Attachments (1)
EDocs# 11617674