City of Kingston
Information Report to Environment, Infrastructure & Transportation Policies Committee
Report Number EITP-24-015

To:	**Chair and Members of the Environment, Infrastructure & Transportation Policies Committee**
From:	**Brad Joyce, Commissioner, Infrastructure, Transportation & Emergency Services**
Resource Staff:	**Karen Santucci, Director, Public Works & Solid Waste**
Date of Meeting:	**April 9, 2024**
Subject:	**Tree Canopy**

Council Strategic Plan Alignment:

Theme: 2. Lead Environmental Stewardship and Climate Action

Goal: 2.3 Maintain the City's natural heritage and environmental assets.

Executive Summary:

The City of Kingston recently purchased spatial Artificial Intelligence (AI) vegetation analysis deliverables derived from the City's high resolution vertical imagery. Previously, tree canopy reports were based on manual calculations to derive the percentage of tree coverage in the City of Kingston.

Staff conducted the analysis of the tree canopy coverage for 2022 and 2023 using AI technology to allow for a more direct comparison of the canopy from the previous year. The total canopy coverage for the city was 35.72% for 2022 and 36.83% for 2023. This total was then broken down further to show the canopy coverage for the urban area and the rural area. The urban tree canopy coverage for the city was 20.2% in 2022 and 20.93% in 2023. The rural tree canopy coverage for the city was 39.18% in 2022 and 40.37% in 2023.

Staff continue to focus on providing proper pruning and maintenance activities to improve tree health, in addition to planting more trees and developing programs to support tree planting on private lands.

Recommendation:

This report is for information only.

Authorizing Signatures:

ORIGINAL SIGNED BY COMMISSIONER

Brad Joyce, Commissioner, Infrastructure, Transportation & Emergency Services

p.p.
ORIGINAL SIGNED BY CHIEF ADMINISTRATIVE OFFICER

Lanie Hurdle, Chief Administrative Officer

Consultation with the following Members of the Corporate Management Team:

Paige Agnew, Commissioner, Growth & Development Services	Not required
Jennifer Campbell, Commissioner, Community Services	Not required
Neil Carbone, Commissioner, Corporate Services	☑
David Fell, President & CEO, Utilities Kingston	Not required
Peter Huigenbos, Commissioner, Major Projects & Strategic Initiatives	Not required
Desirée Kennedy, Chief Financial Officer & City Treasurer	Not required

Options/Discussion:

Background

In 2010, the forest canopy coverage for the City was determined to be 20% in the urban area and 28% for the rural area. In 2014, fully 30% of the City's trees were Ash trees, and tree removals were initiated that year in response to the devastating emerald ash borer that invaded our area around 2010. This work still continues today, and the impact on the tree canopy cannot be understated as this invasive pest has reduced the tree canopy considerably. Staff estimate that reduction to be in the range of 4%-5%, which means had the City not invested in tree plantings over the last decade, that 20% urban canopy coverage would have dropped to around 15% or 16%.

As it was, in 2021, a new urban tree canopy study was completed by Davey Tree Expert which found that the total Urban Tree Canopy was 21.5% in the urban growth area (UGA) and 28.8% for the entire city.

In 2022, the City completed an internal Tree Canopy study using the latest aerial photography. This method was very manual in the process that was undertaken, with some estimations of larger wooded areas. The Urban Tree Canopy coverage found during this assessment was 21.48%.

Tree canopy statistics were derived from an AI deliverable purchased through the City's current aerial imagery provider, NearMap. NearMap imagery is captured bi-annually, once in the spring (leaf off) and again in late summer/early fall (leaf on). The imagery used for the 2023 report was captured on August 9, 2023. The late summer acquisition provides the best option for City tree canopy analysis as vegetation is at its peak foliage.

This report uses NearMaps's Medium-High Vegetation Class (vegetation greater than 2 metres in height). For increased accuracy in Tree Canopy Coverage to Total Land Area comparisons, the area totals for large water bodies were removed to establish total land area statistics applied to Electoral Districts, Urban and Rural Areas, as well as the City Boundary. This is more aligned with how tree canopy coverages are typically calculated.

**Analysis**

NearMap AI will continue to be utilized with a new tree canopy report being provided to EITP on an annual basis. Utilizing the AI deliverable and NearMap imagery, tree canopy coverage (as displayed in Figure A) was found to be the following:

- Entire City tree canopy coverage for 2022 was 35.72%
- Entire City tree canopy coverage for 2023 was 36.83%
- Rural canopy coverage for 2022 was 39.18%
- Rural canopy coverage for 2023 was 40.37%
- Urban canopy coverage for 2022 was 20.20%
- Urban canopy coverage for 2023 was 20.93%

Figure A
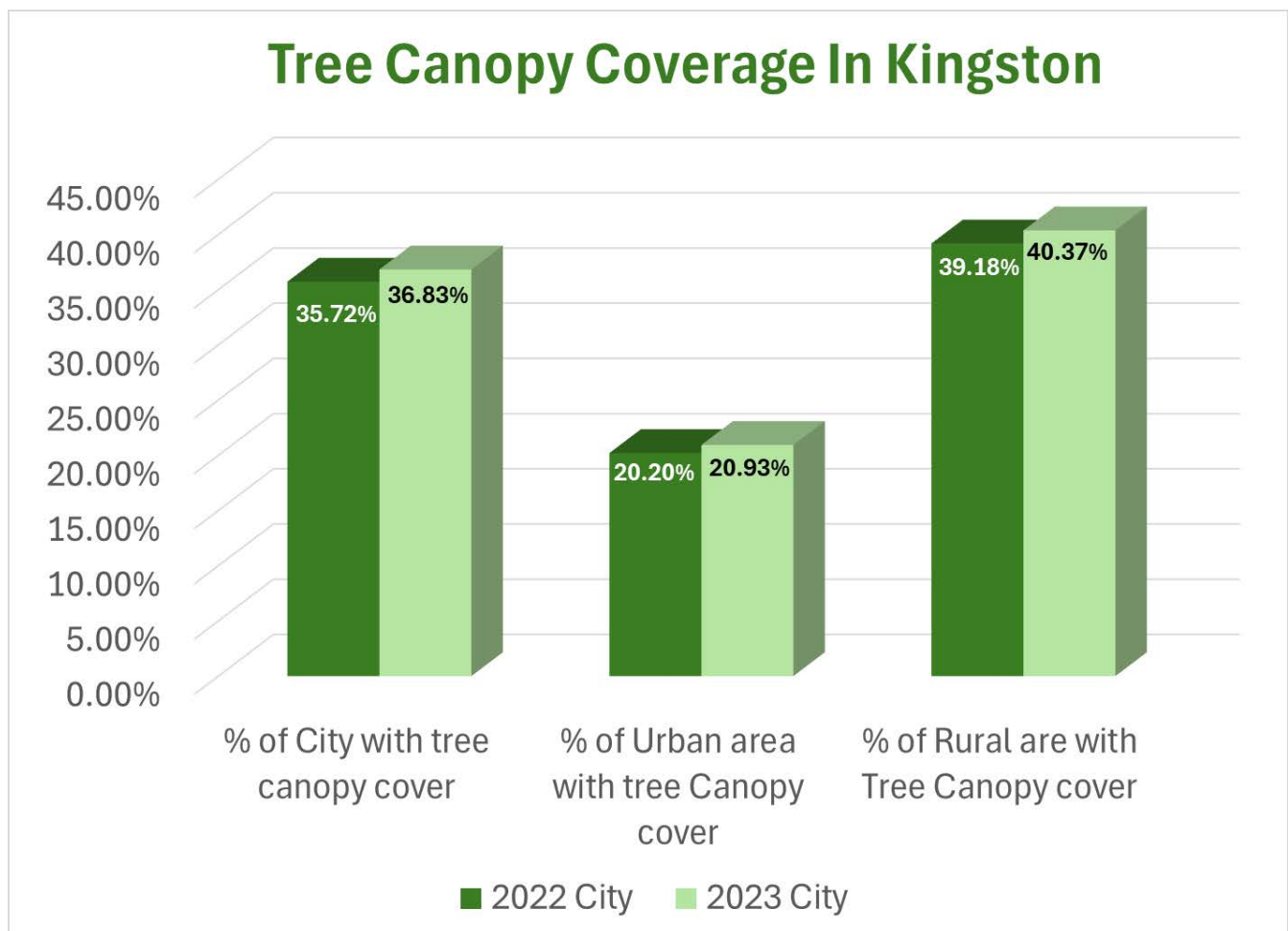
There was an increase in the percentage of the total tree canopy, the urban tree canopy and the rural tree canopy. Figure B, shows the following total increase in tree canopy for 2023,

- Total increase in tree canopy for the entire city was 1.1%
- Total increase in the rural tree canopy was 1.18%
- Total increase in the urban tree canopy was 0.73%
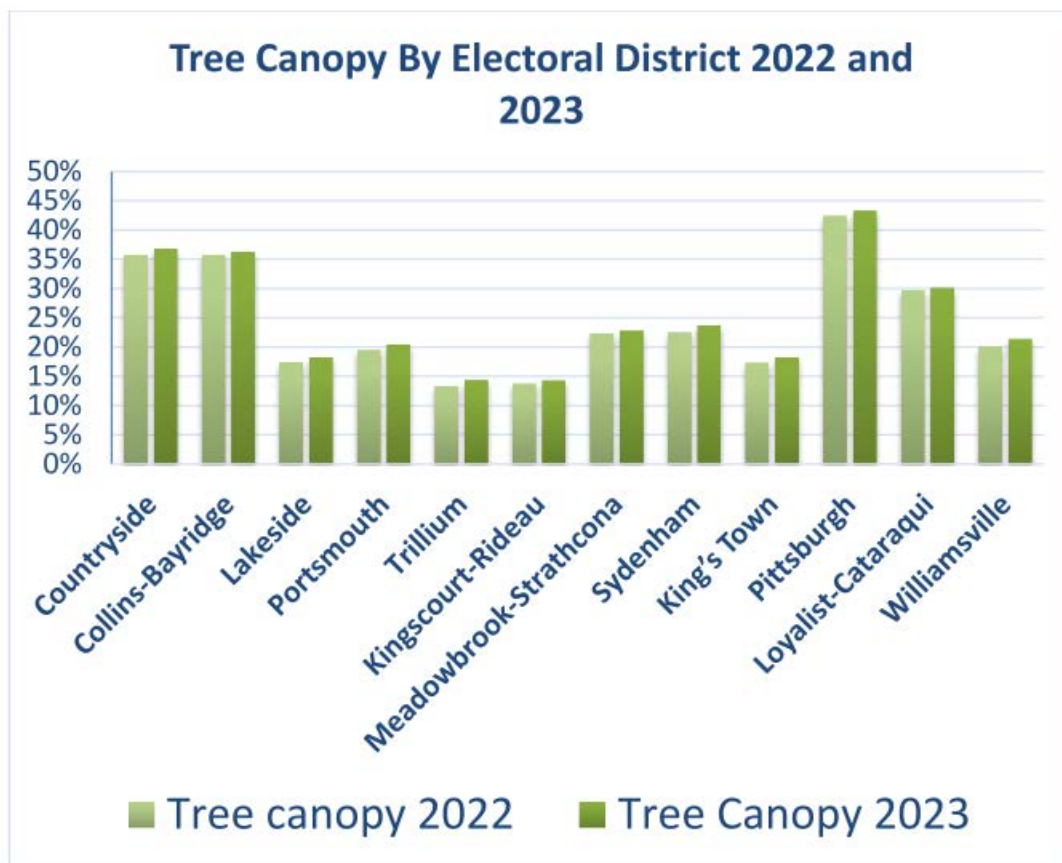
Figure B
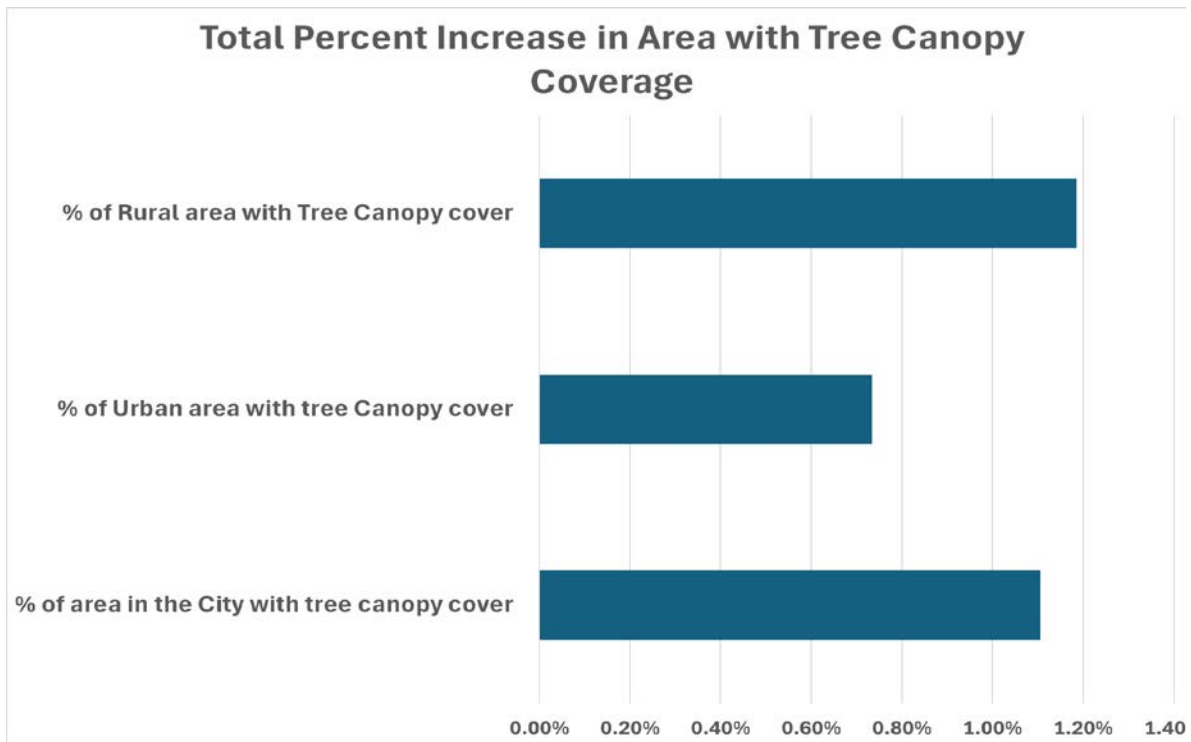
This information was also broken down into the tree canopy coverage for each electoral district for both 2022 and 2023 all of the electoral districts seeing an increase. Results shown in Figure C and tabled below are:

- Kingscourt-Rideau: Increase of 0.53 to 14.31%
- Trillium: Increase of 0.94 to 14.38%
- Lakeside Increase of 0.84 to 18.33%
- King's Town: Increase of 0.98 to 18.34%
- Portsmouth: Increase of 0.98 to 20.51%
- Williamsville: Increase of 1.25 to 21.40%
- Meadowbrook-Strathcona: Increase of 0.47 to 22.83%
- Sydenham: Increase of 1.18 to 23.72%
- Loyalist-Cataraqui: Increase of 0.38 to 30.15%
- Collins-Bayridge: Increase of 0.44 to 36.28%
- Countryside: Increase of 1.03 to 36.86%
- Pittsburgh: Increase of 0.87 to 43.35%

Figure C

Tree Canopy By Electoral District 2022 and 2023

Figure D outlines a number of plantings and removals by type by year from 2016–2023. Over the 8-year period, a total of 95,792 new trees have been added to the city from City-run or sponsored programs. It is expected that these trees are just beginning to have an impact on the tree canopy, and we will see a larger positive impact from these trees over the next 20 years as newer trees begin to be counted within the greater than 2m height limit used by the NearMap AI method.

Figure D

Planting Description	2016	2017	2018	2019	2020	2021	2022	2023	Total
New Tree Planting	1,537	1,019	2,011	1,260	855	1,017	1273	2,016	10,988
CRCA Tree Planting	0	0	0	0	16,000	12,000	10,000	42,000	80,000
Neighborhood Tree Program	0	0	0	0	0	1,800	4,000	3,600	9,400
Other Departments	529	300	0	0	0	237	0	100	1,166
Tree Removal	-775	-715	-1204	-948	-867	-403	-400	-450	-5,762
Total Net Planting	**1,291**	**604**	**807**	**312**	**15,988**	**14,651**	**14,873**	**47,266**	**95,792**

Planting trees on public lands is one way to further increase the tree canopy, however this alone will not increase the tree canopy enough for the City to get to its 30% target by 2030. To reach that, continued focus will be required on both tree planting and maintenance, and continued work on bringing programs to support plantings on private lands will be instrumental.

Climate Risk Considerations

As trees grow, they help to reduce net climate change emissions by removing carbon dioxide from the air, storing carbon in the trees and soil, and releasing oxygen into the atmosphere. Trees also provide shade that mitigates the impacts of extreme summer temperatures, particularly in urban areas.

Existing Policy/By-Law

None

Notice Provisions

None

Financial Considerations

None

Contacts:

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Other City of Kingston Staff Consulted:

Paul MacLatchy, Environment Director, Business, Real Estate & Environment

Jordan Rogers, Manager, Enterprise GIS, Information Systems & Technology

Jeff Bumstead, Chief Information Officer, Information Systems & Technology

Exhibits Attached:

None