URBAN GREENING EXPLORER

An Interactive Dashboard for Exploring Vancouver's Public Trees

Progress Report 2

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Course: CSIS 4495 – Applied Research Project

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Work Logs

Date	Hours	Description of Work Done
Sept 28, 2025	2.0	Set up the Streamlit app structure in app.py, created data loaders, and standardized columns in the tree dataset for consistency.
Sept 30, 2025	2.5	Added parsing of the Public Trees dataset, extracting latitude/longitude and converting planting dates and diameters into usable formats.
Oct 2, 2025	3.0	Loaded Local Area Boundaries, prepared attributes, calculated neighbourhood areas, and linked trees to their respective neighbourhoods.
Oct 4, 2025	2.5	Implemented neighbourhood-level summary metrics including total trees, unique species, average diameter, planting year ranges, and density.
Oct 7, 2025	2.0	Developed visualizations to explore the data: top tree species and planting year histogram. Improved layout and organization in Streamlit.
Oct 10, 2025	1.5	Finalized and tested the app with summary tables and charts. Verified results and added a requirements.txt file for reproducibility.

Description of Work Done

Between September 28 and October 10, steady progress was made on the implementation of the Urban Greening Explorer. The development began with setting up the application structure and loaders to parse the Public Trees dataset. Robust CSV parsing was implemented to extract geographic coordinates and clean date and numeric fields.

GeoPandas was used to read the Local Area Boundaries, normalize polygon attributes, and project them into a metric CRS for area calculation. A spatial join linked trees with their neighbourhood polygons, enabling computation of neighbourhood-level indicators such as total trees, unique species, average diameter, earliest and latest planting year, and tree density per square kilometer.

Exploratory data visualizations were added with Altair, including a bar chart of the most common tree species and a histogram of planting years. The final app version as of October 10 displays a neighbourhood summary table alongside the visualizations. This phase achieved the planned scope of robust parsing, spatial joins, and exploratory analysis.
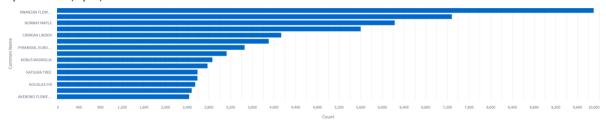
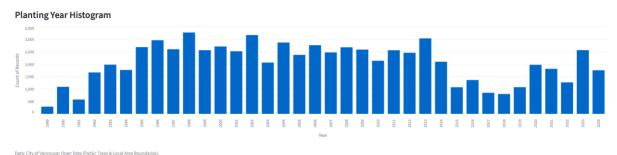Current state of the web application is as follows:

🌳 Urban Greening Explorer – Vancouver

Neighbourhood Summary (Exploratory Analysis)

	LOCAL_AREA	trees	unique_species	avg_diameter	oldest_year	newest_year	AREA_KM2	trees_per_km2
0	Arbutus Ridge	6206	149	12.4208	1989	2024	3.7006	1677.0161
1	Downtown	7133	140	8.937	1989	2024	4.6742	1526.0278
2	Dunbar-Southlands	9589	176	15.0705	1989	2024	9.0798	1056.0749
3	Fairview	4702	143	11.7349	1990	2023	3.6354	1293.4068
4	Grandview-Woodland	6921	169	12.6765	1989	2024	4.7541	1455.7854
5	Hastings-Sunrise	13343	206	11.9512	1990	2024	8.3323	1601.3642
6	Kensington-Cedar Cottage	12689	191	12.3862	1989	2024	7.2525	1749.6038
7	Kerrisdale	9707	173	15.0456	1989	2024	6.6089	1468.7753
8	Killarney	8401	165	11.1823	1989	2024	6.934	1211.5682
9	Kitsilano	9531	204	15.7408	1990	2024	6.3629	1497.9125
10	Marpole	7681	168	11.7238	1989	2024	6.0031	1279.5111

Species Counts (Top 15)

Planting Year Histogram

Data: City of Vancouver Open Data (Public Trees & Local Area Boundaries).

Repo Check-in of Implementation Completed

The GitHub repository has been updated to include the following files under **Implementation** folder:

1. **app.py** – Streamlit application developed so far with neighbourhood summary, species counts and planting year histogram visualizations.
2. **requirements.txt** – Include needed dependencies to ensure reproducibility.