Kew Gardens Priority Tree Planting Plan
i-Tree Eco, i-Tree Landscape & NYC Parks Street Tree Map

Justin Magliochetti

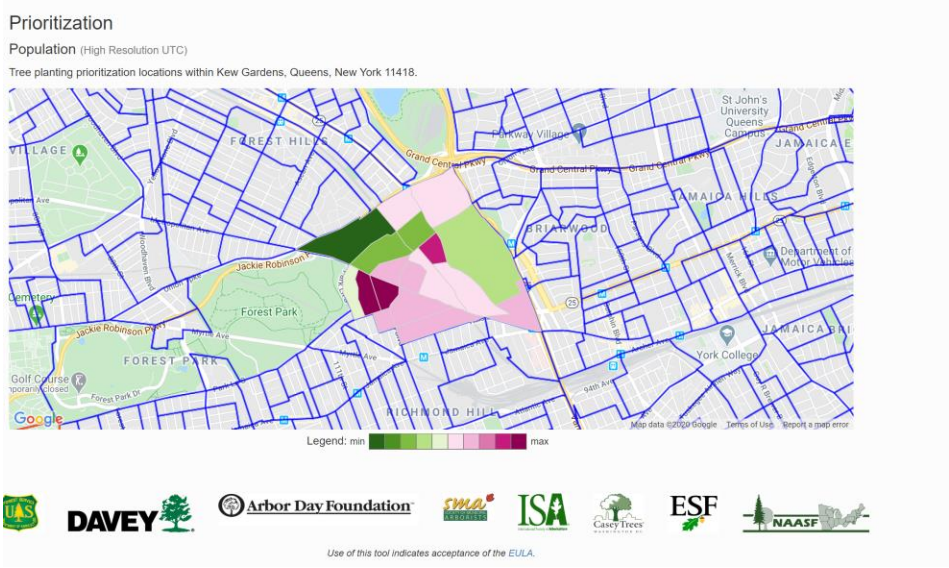
i-Tree Academy 2020

Introduction

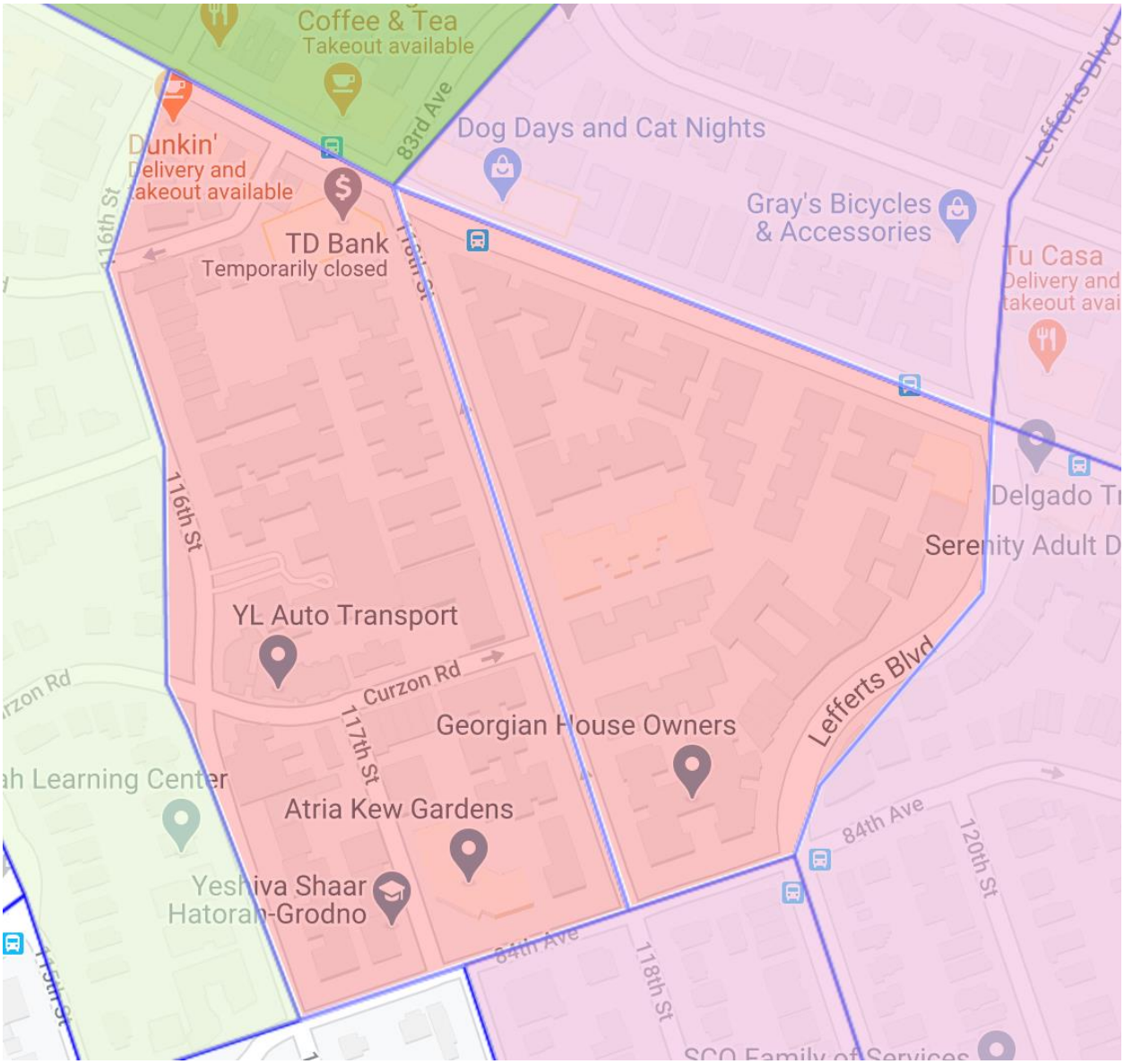
The goal of this study was to determine which areas within Kew Gardens, NY require more trees and which trees would be most suitable. First, i-Tree Landscape was used to isolate which areas within Kew Gardens have the highest need for additional trees. Once the top areas were distinguished, data for each tree point within the priority zones were extracted from the NYC Parks Street Tree Map (https://tree-map.nycgovparks.org/). The recorded trees were then inputted into the i-Tree Eco tool to analyze their benefits. A conclusion on these findings has been outlined, as well as a plan for additional trees to be planted moving forward. Tree inventory, weather and pollution data was used from 2015 collections.

i-Tree Landscape

The i-Tree Landscape tool was used to first select census blocks within Kew Gardens, NY 11415. Next, the prioritize tree planting feature was used to display which areas lack trees the most. These locations were determined based on the tree cover per capita, tree stocking level, and population density. Tree cover per capita had an importance (weight value) as 30%, tree stocking level as 30%, and population density as 40%. The results isolated two blocks, both having a priority index as 100 based on the previous criteria. These 2 blocks were between 116th Street and Lefferts Blvd, within 84th Avenue & Metropolitan Avenue. The results are shown below, additionally, the results can be viewed online (https://landscape.itreetools.org/report/9be211f9-9469-4425-9a06-91a8c421db14/kew-gardens-tree-planting-priority/). A PDF has also been produced and submitted.



The highlighted orange areas below have a priority index as 100:



NYC Parks Street Tree Map

The individual street trees that fell within these two priority areas were collected from the NYC Parks survey of 2015 (https://tree-map.nycgovparks.org/). The data contained each individual tree's scientific name and DBH. This data was stored as an excel sheet with one column for the species and one column for the DBH. The results contained 74 street trees in total. This data was then inputted within i-Tree Eco to analyze the tree benefits. The next page details these results.

i-Tree Eco

A complete inventory project was completed within i-Tree Eco for this given area. 2015 weather and pollution data were used to compare it to the 2015 NYC Parks street tree inventory results. The JFK International Airport Weather Station (744860-94789) was used. Crown health of individual trees was not measured, as a result, the default 13 percent crown dieback was applied to all trees. Below distinguishes the species variation and value differences.

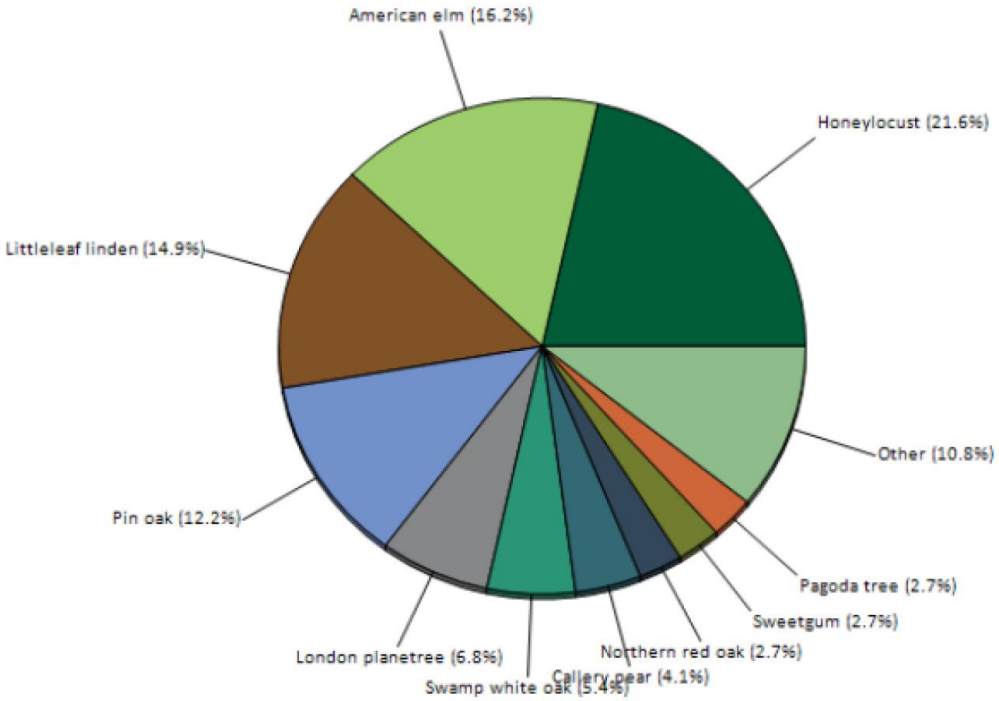


Figure 1. Tree species composition in Kew Gardens Street Tree Priority Location

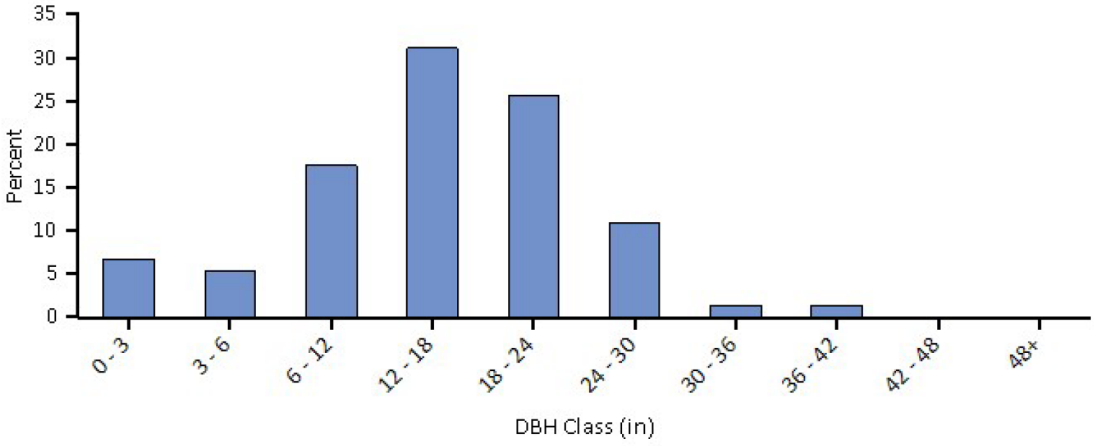


Figure 3. Percent of tree population by diameter class (DBH - stem diameter at 4.5 feet)

Table 1. Most important species in Kew Gardens Street Tree Priority Location

Species Name	*Percent Population*	*Percent Leaf Area*	*IV*
American elm	16.2	27.1	43.3
Honeylocust	21.6	10.7	32.3
Littleleaf linden	14.9	17.1	32.0
Pin oak	12.2	13.9	26.1
London planetree	6.8	12.0	18.8
Northern red oak	2.7	3.9	6.6
Swamp white oak	5.4	0.4	5.8
Pagoda tree	2.7	2.1	4.8
Silver maple	1.4	3.3	4.7
Callery pear	4.1	0.6	4.6

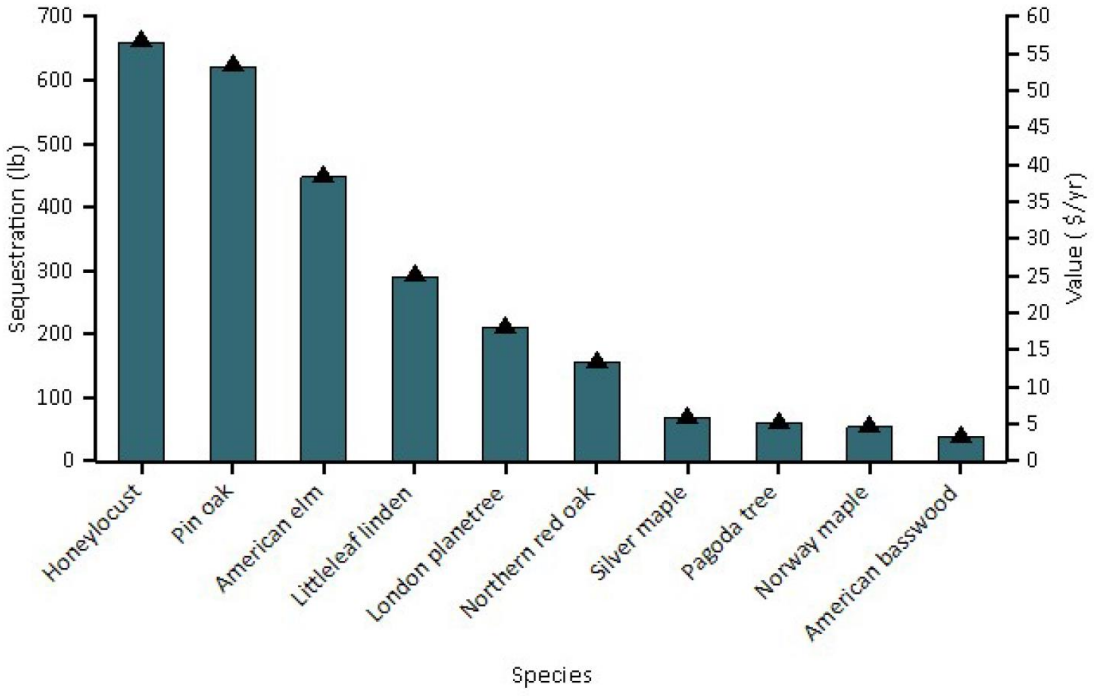


Figure 8. Estimated annual gross carbon sequestration (points) and value (bars) for urban tree species with the greatest sequestration, Kew Gardens Street Tree Priority Location

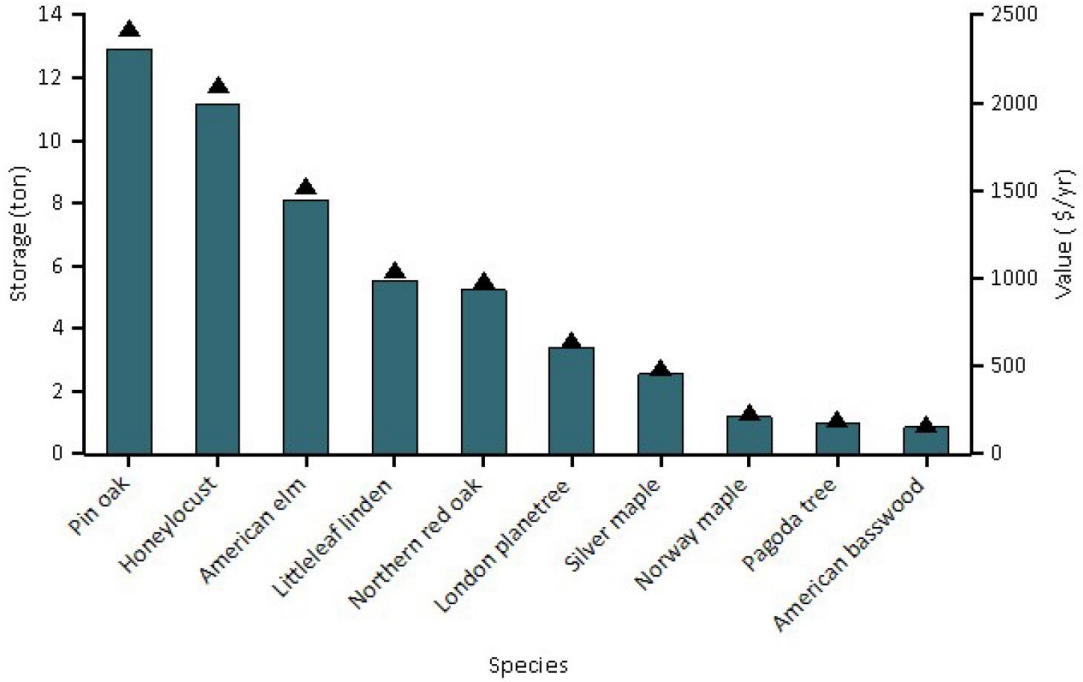


Figure 9. Estimated carbon storage (points) and values (bars) for urban tree species with the greatest storage, Kew Gardens Street Tree Priority Location

Table 2. The top 20 oxygen production species.

Species	*Oxygen (pound)*	*Gross Carbon Sequestration (pound/yr)*	*Number of Trees*	*Leaf Area (acre)*
Honeylocust	1,765.67	662.13	16	0.56
Pin oak	1,665.03	624.38	9	0.72
American elm	1,198.90	449.59	12	1.40
Littleleaf linden	779.75	292.41	11	0.89
London planetree	562.32	210.87	5	0.62
Northern red oak	419.05	157.14	2	0.20
Silver maple	185.75	69.66	1	0.17
Pagoda tree	163.07	61.15	2	0.11
Norway maple	143.64	53.86	1	0.12
American basswood	103.76	38.91	1	0.12
Callery pear	71.63	26.86	3	0.03
Sugar maple	68.65	25.74	1	0.07
Black locust	65.13	24.42	1	0.05
Sweetgum	60.58	22.72	2	0.06
American yellowwood	54.08	20.28	2	0.04
Swamp white oak	38.20	14.33	4	0.02
Tulip tree	7.79	2.92	1	0.01

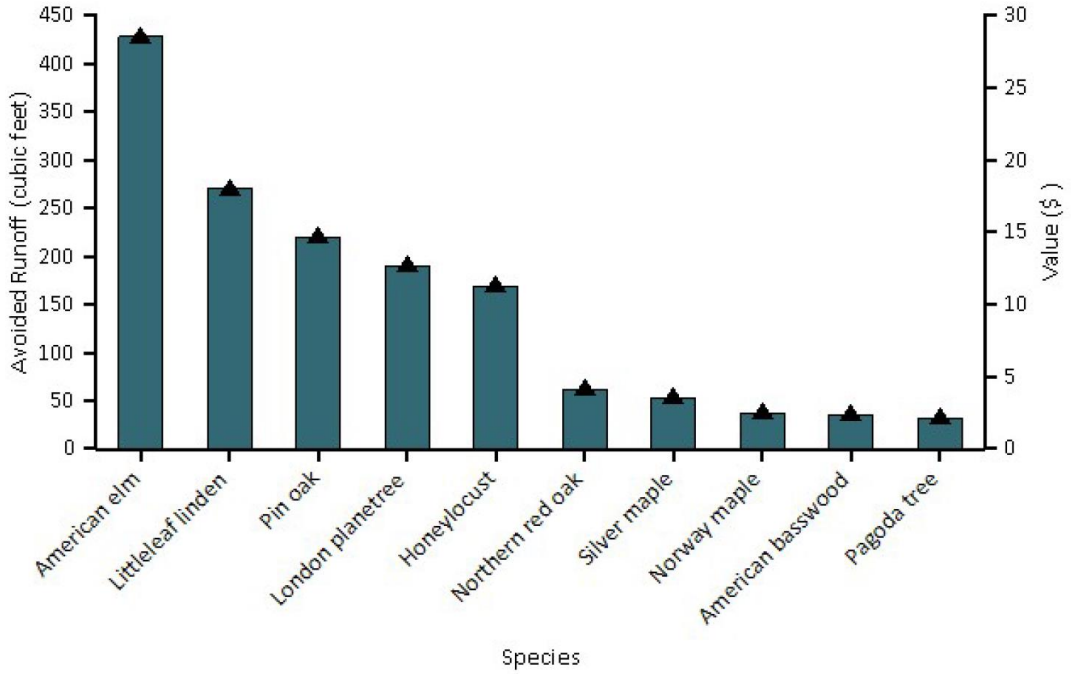


Figure 10. Avoided runoff (points) and value (bars) for species with greatest overall impact on runoff, Kew Gardens Street Tree Priority Location

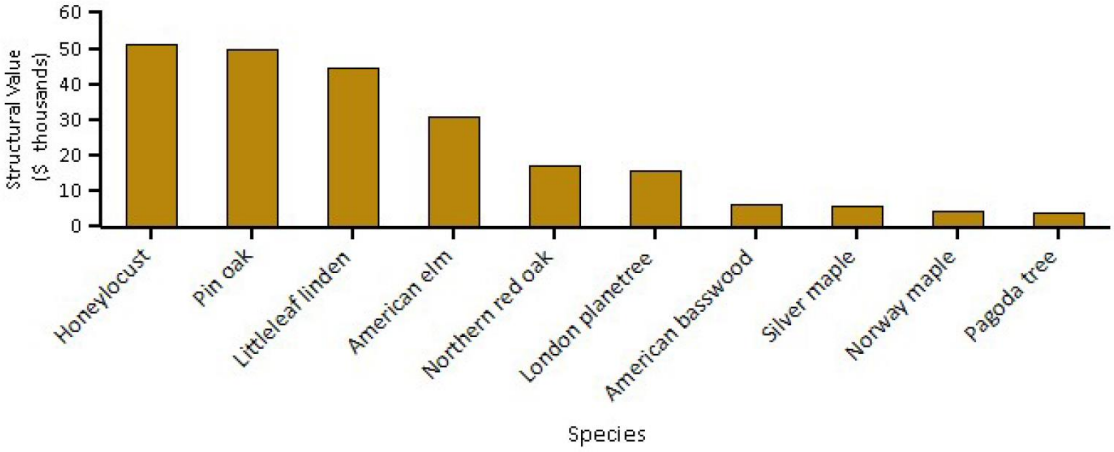


Figure 11. Tree species with the greatest structural value, Kew Gardens Street Tree Priority Location

Conclusion

While the most popular species dominate the highest benefit results, the individual tree results reveal how particular trees can serve individual needs for the area. When considering water runoff and leaf area coverage, the American Elm, Pin Oak, Littleleaf Linden and the London Planetree prove to be effective. When comparing the most common tree, the Honeylocust

(21.6% of trees) to the American elm (16.2% of trees), the American Elms provide higher avoided runoff benefits. Pin Oaks, London Planetrees and Northern Red Oaks also prove to provide high levels of oxygen production. Pin Oaks are efficient when storing carbon, as well as ranking similar to the overall structural value of the most common tree, the Honeylocust. London planetrees also score highly efficient overall values considering their low tree count. Kew Gardens should consider planting more American Elms, Pin Oaks, Northern Red Oaks and London Planetrees. Honeylocusts appear to be effective, however, they do not seem ideal as the most common tree. Maples may require additional testing to reveal their efficiency, however, the threat of the Asian Long Horned beetle still looms within the state and should be considered with caution. Other less common trees such as the Pagoda and American Basswood could be analyzed in similar areas with higher tree counts to reveal their effectiveness. A full PDF of the i-Tree Eco report is also available and has been submitted for review.

Thank you,
Justin Magliochetti
Davey Resource Group
i-Tree Academy Final Project
4-25-2020

Resources Used:
i-Tree Eco
i-Tree Landscape
NYC Street Tree Map
Microsoft Office

This report was intended for the sole purpose of review by the i-Tree Academy instruction staff. All references for tools used are included within the i-Tree Eco and i-Tree Landscape reports.