



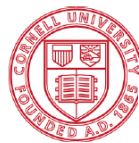
VILLAGE OF MAMARONECK

STREET TREE INVENTORY

Inventory Conducted October 2013

Funding provided by USDA Forest Service

Prepared by Hudson Valley Specialized Weekday Arborist Team (SWAT)
SWAT Coordinator, Brenda Cagle



Cornell University
Cooperative Extension
Dutchess County

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EXECUTIVE SUMMARY

Trees provide important contributions to a community. They offer environmental, economic, social, and aesthetic benefits. It is estimated that the value of a property with trees is 5-7% higher than one without trees. As an invaluable resource, the community forest needs to be properly managed and conserved. A street tree inventory is an essential component of a Community Forestry Management Plan. Only after a community knows the current state of its public trees can it develop a plan for their management. An inventory provides information on species, location, condition, recommended management, and benefits of existing trees as well as potential planting sites. It is a benchmark from which the community can begin the planning process.

The Hudson Valley Specialized Weekday Arborist Team (SWAT) of Cornell Cooperative Extension of Dutchess County conducted an inventory of street trees in the Village of Mamaroneck (the Village) in October 2013. The SWAT project conducts inventories of public trees in grid or village-like settings. Data on 1063 sites – both tree sites and potential planting sites – were recorded.

Summary of Findings

856	Trees
207	Planting sites
267	Maples
646	Good Condition (wood and foliage)
16	>75% deadwood
61	High Priority Prune
75	Consult
\$4,809,502.42	Replacement Value
\$ 157,838.67	Estimated Annual Benefits

METHODOLOGY

SWAT team members input initial data on Apple iPad minis using the integrated mobile web form from the USDA Forest Service i-Tree suite of software. The application, i-Tree Streets v5.1.1, was used to assess the inventory data and calculate structure, function, and ecosystem services of the community forest. The optional pest detection module within Streets was used to gather data to help with early detection of pests and diseases.

GPS coordinates of trees and planting sites were collected using Magellan Meridien Gold GPS receivers with an accuracy of 3 to 7 meters. SWAT team members included Master Gardeners, Bard College students (with experience working in the Bard Arboretum), a state forester and Mamaroneck Tree Committee members.

Hudson Valley SWAT conducts inventories of public trees – up to a maximum of 1000 sites or 12 street miles - in grid or village-like settings. The Village identified the following “Priority 1” streets to be inventoried. Since road right-of-way can vary, for purposes of this study the Village defined *public trees* as trees located within approximately 10 feet of the edge of the road or, where sidewalks exist, between the road and the sidewalk.

Boston Post Rd.
Carroll Ave.
Delancey Ave.
Fenimore Rd.
Halstead Ave.
Hillside Ave.
Jefferson Ave.
Melbourne Ave.
N Barry Ave. & Ext.
Orienta Ave
Palmer Ave.
Plaza Ave.
Prospect Ave.
Raleigh Rd.
Rushmore Ave.
S Barry Ave.
Taylors Ln.
The Parkway
Tompkins Ave.
West St.

DEFINITIONS

Following are the definitions of the data field columns in the inventory.

ID - A unique number was assigned to each tree and planting site.

Street Number, Street Name – This is the property address of the tree or planting site.

Site Type - Location of trees and planting sites were identified as one of the following.

Lawn – lawn area

Plant strip <4 ft – area between road and sidewalk < 4ft

Plant strip >4 ft – area between road and sidewalk > 4ft

Cutout - tree pit in sidewalk or other impervious surface

Other

Loc Site – The location of the tree or planting site from the perspective of facing the front of the property is given. This field is especially important for corner properties.

Front

Side

Rear

Loc Num - Site numbers were assigned to trees and planting spaces from left to right facing the property beginning with 1. For corner properties, numbering begins again with 1 for the side street.

Species - Trees were identified by their common names.

DBH - Trunk diameter at breast height (approximately 4.5 feet above the ground) was measured to the nearest inch. DBH is the most commonly used measure of tree size and age. It is not an absolute measure, however, as relationships between DBH and canopy spread or DBH and tree age vary by species.

Mtnc Rec - Tree maintenance recommendations were assessed by one of four ratings.

None - no maintenance necessary

Train - routine maintenance for a young tree

Routine Prune - routine maintenance of a mature tree

Hi Priority Prune - maintenance recommended, a high priority

Consult - Based on the condition of the tree, further consultation by a certified arborist may be recommended.

Sw Damg – Sidewalk heaving (damage) was noted.

Wires - The presence or absence of single or triple phase overhead utility wires was noted.

DEFINITIONS (cont)

Cond Wood - The condition of a tree's wood was assessed by one of four ratings.

Dead -	extreme problems, wood dead or dying
Poor -	major problems
Fair -	minor problems
Good -	no apparent problems

Cond Lvs - The condition of a tree's leaves was assessed by one of four ratings.

Dead -	extreme problems, leaves dead or dying
Poor -	major problems
Fair -	minor problems
Good -	no apparent problems

% Dead Wood – Dead wood refers to branches over two inches in diameter that are dead, dying, or diseased. The percentage of deadwood in the tree canopy was assessed by one of five ratings.

<10
10-25
25-50
50-75
>75

Latitude, Longitude - Latitude and Longitude of tree sites and planting sites in decimal degrees were collected.

INVENTORY SAMPLE

Tree Id	Species	SiteType	Loc Site	Loc No	DBH	MtnRec	Con sult	Sw Damg	Wires Present	Cond Wood	Cond Lvs	% Dead wood	GPS_Lat	GPS_Lon	St Num	Street
1	Northern red oak	Cutout	Side	1	15	Routine prune	No	None	No	Good	Good	<10	40.94900	-73.73200	144	E Boston Post
2	Cherry	Plant strip >4 ft	Side	2	17	Routine prune	No	None	No	Fair	Good	<10	40.94910	-73.73249	144	E Boston Post
3	Red maple	Cutout	Front	1	4	Train (small tree)	No	None	Yes	Good	Good	<10	40.94963	-73.73154	180	E Boston Post
4	Red maple	Cutout	Front	2	6	Train (small tree)	No	None	Yes	Good	Good	<10	40.94966	-73.73142	180	E Boston Post
5	Red maple	Cutout	Front	3	4	Train (small tree)	No	None	Yes	Good	Good	<10	40.94971	-73.73134	180	E Boston Post
6	Dogwood	Plant strip <4 ft	Front	1	2	Train (small tree)	No	None	Yes	Good	Fair	<10	40.95134	-73.72888	514	E Boston Post
7	Dogwood	Plant strip <4 ft	Front	2	2	Train (small tree)	No	None	Yes	Good	Good	<10	40.95148	-73.72873	514	E Boston Post
8	Plant Site No Wi	Lawn	Front	3	-	-	-	-	-	-	-	-	40.95162	-73.72849	514	E Boston Post
9	Norway maple	Lawn	Front	4	38	Routine prune	Yes	None	Yes	Good	Good	<10	40.95170	-73.72828	514	E Boston Post
10	Norway maple	Lawn	Front	5	28	Routine prune	No	None	Yes	Good	Good	<10	40.95175	-73.72822	514	E Boston Post
11	Ginkgo	Cutout	Front	1	7	Routine prune	No	None	Yes	Good	Good	<10	40.95244	-73.72712	640	E Boston Post
12	Ginkgo	Cutout	Front	2	2	Train (small tree)	No	None	No	Good	Good	<10	40.95249	-73.72702	640	E Boston Post
13	Ginkgo	Cutout	Front	3	6	Routine prune	Yes	None	Yes	Good	Good	<10	40.95255	-73.72683	640	E Boston Post
14	Norway maple	Plant strip <4 ft	Front	1	9	Routine prune	No	None	Yes	Good	Good	<10	40.95379	-73.72106	1100	E Boston Post
15	Norway maple	Plant strip <4 ft	Front	2	10	Routine prune	No	None	Yes	Good	Good	<10	40.95383	-73.72095	1100	E Boston Post
16	Plant Site Wires	Plant strip <4 ft	Front	3	-	-	-	-	-	-	-	-	40.95383	-73.72082	1100	E Boston Post
17	Plant Site Wires	Plant strip <4 ft	Front	4	-	-	-	-	-	-	-	-	40.95383	-73.72065	1100	E Boston Post
18	Plant Site Wires	Plant strip <4 ft	Front	5	-	-	-	-	-	-	-	-	40.95386	-73.72056	1100	E Boston Post
19	Plant Site Wires	Plant strip <4 ft	Front	6	-	-	-	-	-	-	-	-	40.95386	-73.72039	1100	E Boston Post
20	Plant Site Wires	Plant strip <4 ft	Front	1	-	-	-	-	-	-	-	-	40.95433	-73.71852	1258	E Boston Post
21	Plant Site Wires	Plant strip <4 ft	Front	2	-	-	-	-	-	-	-	-	40.95437	-73.71836	1258	E Boston Post
22	Norway maple	Plant strip <4 ft	Front	1	2	Train (small tree)	No	None	No	Good	Good	<10	40.95366	-73.72253	951	E Boston Post
23	Northern red oak	Plant strip <4 ft	Front	2	4	Train (small tree)	No	None	No	Good	Good	<10	40.95368	-73.72263	951	E Boston Post
24	Norway maple	Plant strip <4 ft	Front	3	1	Train (small tree)	No	None	No	Good	Fair	<10	40.95369	-73.72273	951	E Boston Post
25	Norway maple	Plant strip <4 ft	Front	4	2	Train (small tree)	No	None	No	Good	Good	<10	40.95371	-73.72291	951	E Boston Post
26	Northern red oak	Plant strip <4 ft	Front	1	7	Routine prune	No	None	No	Good	Good	<10	40.95100	-73.72902	501	E Boston Post
27	Pin oak	Plant strip <4 ft	Front	2	12	Routine prune	No	None	No	Good	Good	<10	40.95095	-73.72908	501	E Boston Post
28	Dogwood	Plant strip <4 ft	Front	1	3	Train (small tree)	No	None	No	Good	Good	<10	40.96144	-73.73415	811	N Barry Ave
29	Serviceberry	Plant strip <4 ft	Front	1	2	Train (small tree)	No	None	Yes	Good	Good	<10	40.96143	-73.73412	805	N Barry Ave
30	Cherry plum	Plant strip <4 ft	Front	2	3	None	No	None	Yes	Good	Good	<10	40.96139	-73.73408	805	N Barry Ave
31	Apple	Plant strip <4 ft	Front	1	3	None	No	None	Yes	Good	Good	<10	40.96126	-73.73388	795	N Barry Ave
32	Serviceberry	Plant strip <4 ft	Front	1	2	None	No	None	Yes	Good	Good	<10	40.96116	-73.73370	787	N Barry Ave
33	Cherry plum	Plant strip <4 ft	Front	1	3	None	No	None	Yes	Good	Good	<10	40.96109	-73.73357	779	N Barry Ave
34	Apple	Plant strip >4 ft	Front	1	2	Train (small tree)	No	None	Yes	Good	Good	<10	40.96107	-73.73351	771	N Barry Ave
35	Serviceberry	Plant strip >4 ft	Front	1	2	None	No	>3/4 in	Yes	Good	Good	<10	40.96091	-73.73318	755	N Barry Ave
36	Apple	Plant strip >4 ft	Front	1	2	Train (small tree)	No	None	Yes	Good	Good	<10	40.96076	-73.73287	741	N Barry Ave
37	Cherry plum	Plant strip >4 ft	Front	2	3	Routine prune	No	None	Yes	Good	Poor	<10	40.96076	-73.73283	741	N Barry Ave
38	Serviceberry	Plant strip >4 ft	Front	1	2	None	No	>3/4 in	Yes	Good	Good	<10	40.96062	-73.73261	731	N Barry Ave
39	Cherry plum	Plant strip >4 ft	Front	1	3	Train (small tree)	No	None	Yes	Good	Good	<10	40.96052	-73.73244	723	N Barry Ave
40	Cherry plum	Plant strip <4 ft	Front	1	3	Train (small tree)	No	None	Yes	Good	Good	<10	40.96016	-73.73192	655	N Barry Ave
41	Apple	Plant strip <4 ft	Front	1	2	Train (small tree)	No	None	Yes	Good	Good	<10	40.95998	-73.73177	645	N Barry Ave
42	Cherry plum	Plant strip <4 ft	Front	1	2	Train (small tree)	No	None	Yes	Good	-	<10	40.95989	-73.73169	637	N Barry Ave
43	Cherry plum	Plant strip <4 ft	Front	1	3	Train (small tree)	No	None	Yes	Good	Fair	<10	40.95956	-73.73150	621	N Barry Ave
44	Ginkgo	Cutout	Front	1	2	None	No	None	No	Good	Good	<10	40.95272	-73.72663	640	E Boston Post
45	Red maple	Plant strip >4 ft	Front	2	3	Train (small tree)	No	>3/4 in	No	Good	Poor	<10	40.95289	-73.72678	640	E Boston Post
46	Red maple	Cutout	Front	3	3	None	No	None	No	Good	Good	<10	40.95316	-73.72703	640	E Boston Post
47	Pin oak	Plant strip >4 ft	Front	1	32	Hi Priority prune	Yes	>3/4 in	No	Good	Good	<10	40.95347	-73.72729	192	N Barry Ave
48	Hawthorn	Lawn	Front	1	3	None	No	-	-	Good	Good	<10	40.93942	-73.73624	902	sylvan lane
49	Plant Site No Wi	Lawn	Front	2	-	-	-	-	-	-	-	-	40.93944	-73.73615	902	sylvan lane
50	Hawthorn	Lawn	Side	3	2	None	No	-	-	Good	Good	<10	40.93935	-73.73580	902	sylvan lane
51	Hawthorn	Lawn	Side	4	2	None	No	-	-	Good	Good	<10	40.93951	-73.73601	902	sylvan lane
52	Cherry plum	Lawn	Front	5	4	None	No	-	-	Good	Good	<10	40.93927	-73.73640	902	sylvan lane
53	Eastern hemlock	Lawn	Front	6	11	Routine prune	No	-	Yes	Poor	Poor	-	40.93927	-73.73636	902	sylvan lane
54	Dogwood	Lawn	Front	7	19	None	No	-	-	Good	Good	<10	40.93924	-73.73642	902	sylvan lane
55	Norway maple	Lawn	Front	1	4	Hi Priority prune	-	-	Yes	Good	Good	<10	40.93918	-73.73650	912	sylvan lane
56	Plum	Lawn	Front	2	13	Routine prune	-	-	-	Poor	Poor	-	40.93917	-73.73646	912	sylvan lane
57	Maple	Lawn	Front	3	13	None	-	-	Yes	Good	Good	<10	40.93893	-73.73677	912	sylvan lane
58	Maple	Lawn	Front	4	13	None	No	-	-	Good	Good	<10	40.93890	-73.73684	912	sylvan lane
59	Maple	Lawn	Front	1	19	Routine prune	-	-	Yes	Good	Poor	<10	40.93876	-73.73699	918	sylvan lane

SPECIES

The following table lists all inventoried street tree species in order of frequency of occurrence. A species of "Other" represents all species comprised of less than 5 trees each. BDM and BDS indicate Broadleaf Deciduous Medium and Broadleaf Deciduous Small trees respectively whose species were unknown.

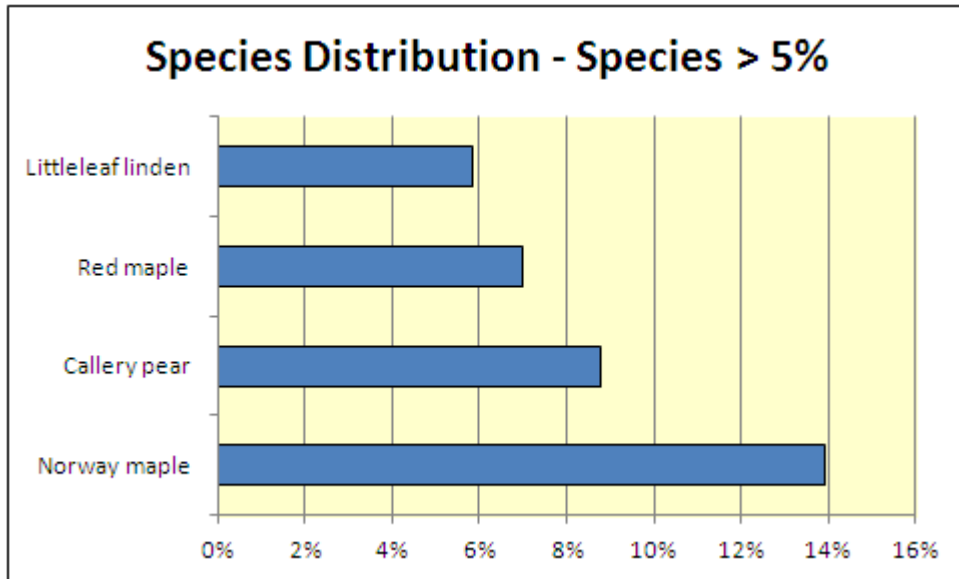
SPECIES LIST BY OCCURRENCE

SPECIES	COUNT	%		SPECIES	COUNT	%
Norway maple	119	14%		BDS OTHER	14	2%
Callery pear	75	9%		Apple	12	1%
Red maple	60	7%		Cherry	11	1%
Littleleaf linden	50	6%		Oak	10	1%
Maple	47	5%		Japanese maple	10	1%
Honeylocust	36	4%		Blue spruce	10	1%
London planetree	30	4%		Silver maple	9	1%
Pin oak	29	3%		Zelkova	9	1%
Plum	28	3%		Eastern redbud	9	1%
Dogwood	27	3%		Ginkgo	8	1%
Sugar maple	22	3%		Eastern white pine	8	1%
Ash	24	2%		Spruce	8	1%
Northern red oak	18	2%		White oak	7	1%
BDM OTHER	16	2%		Eastern red cedar	7	1%
Serviceberry	16	2%		Basswood	6	1%
Norway spruce	16	2%		Hickory	6	1%
Sweetgum	15	2%		Beech	5	1%
American elm	15	2%		Magnolia	5	1%
Elm	14	2%		Other	48	6%
				Total	856	100%

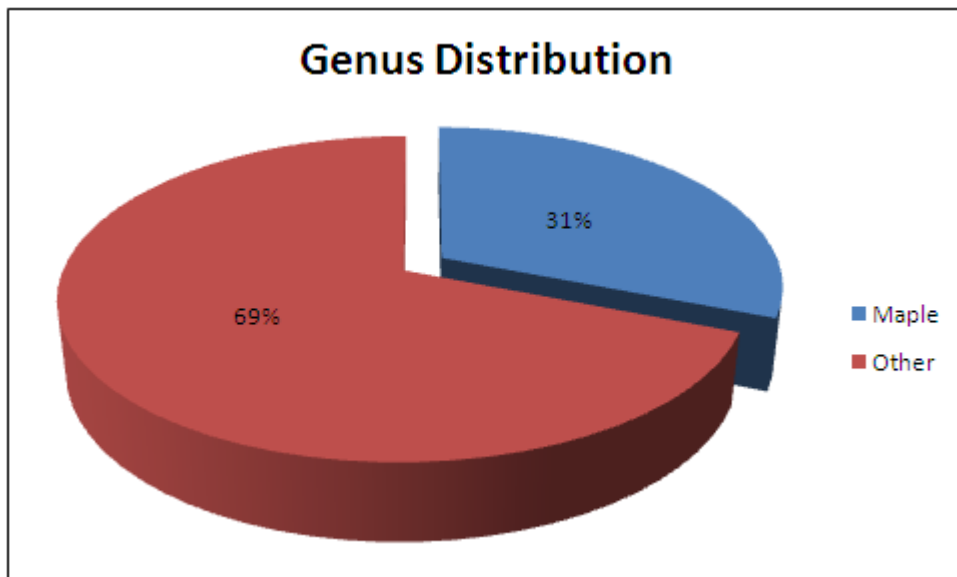
SPECIES DISTRIBUTION

It is recommended that no more than 5%-10% of any one species should comprise the street tree population. (The first word in a botanical name is the genus name; the second word is the species name (properly, specific epithet). For example, *Acer platanoides* is the botanical name for a Norway maple where *Acer* is the genus and *platanoides* is the species.

Only four species of trees each comprise more than 5% of the trees inventoried. Note that 47 maple species were listed as “Maple” with no species epithet.

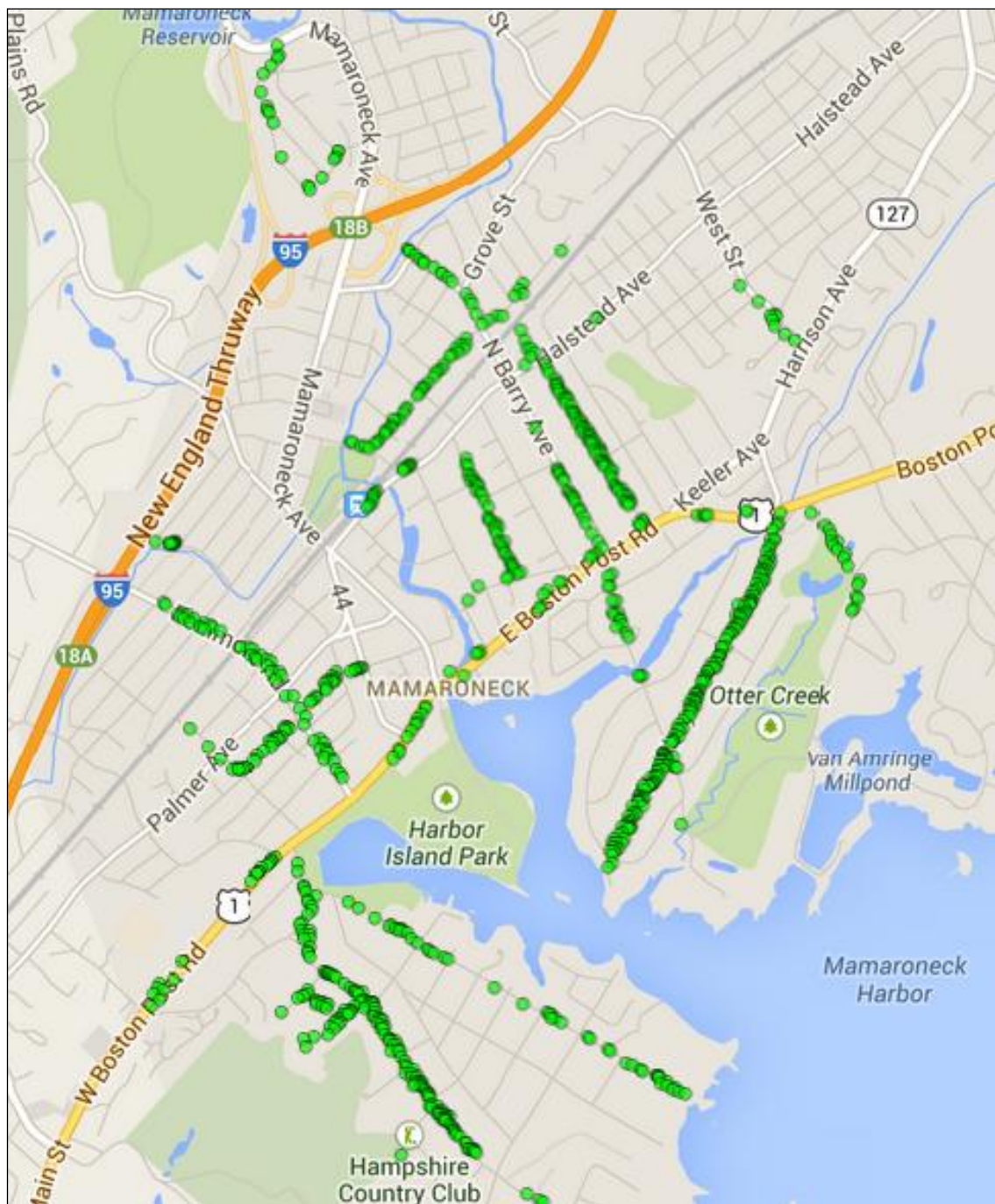


It is also recommended that any one genus should not exceed 20%. Grouping all Maples (genus *Acer*) together – Norway Maple, Sugar Maple, Silver Maple, Japanese Maple, Red Maple – this genus makes up 31% of the community forest (inventoried) as illustrated below. No other genus comprises more than 20% of the total tree population.



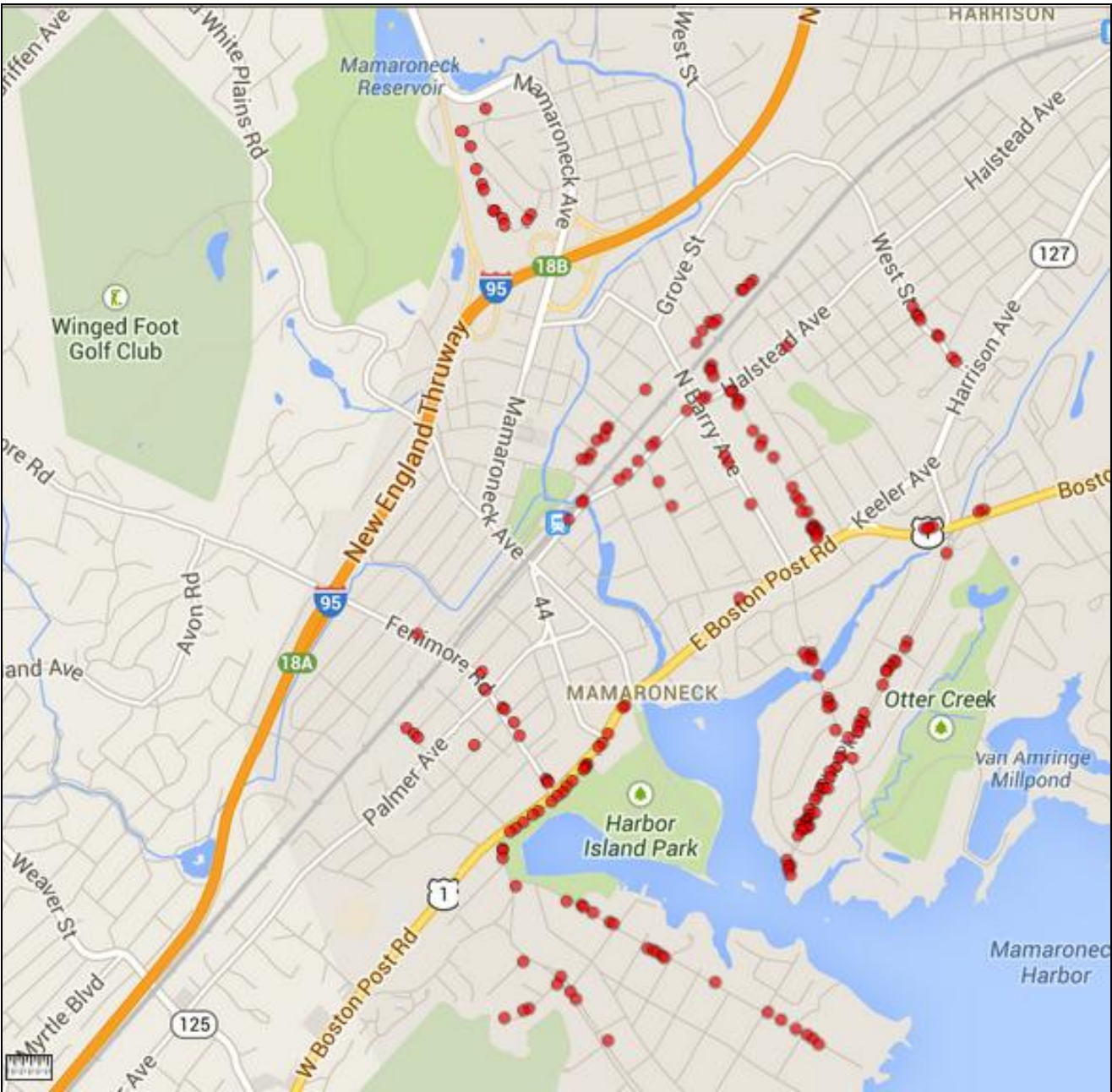
TREE SITES

856 tree sites were inventoried.



PLANTING SITES

207 planting sites were identified.



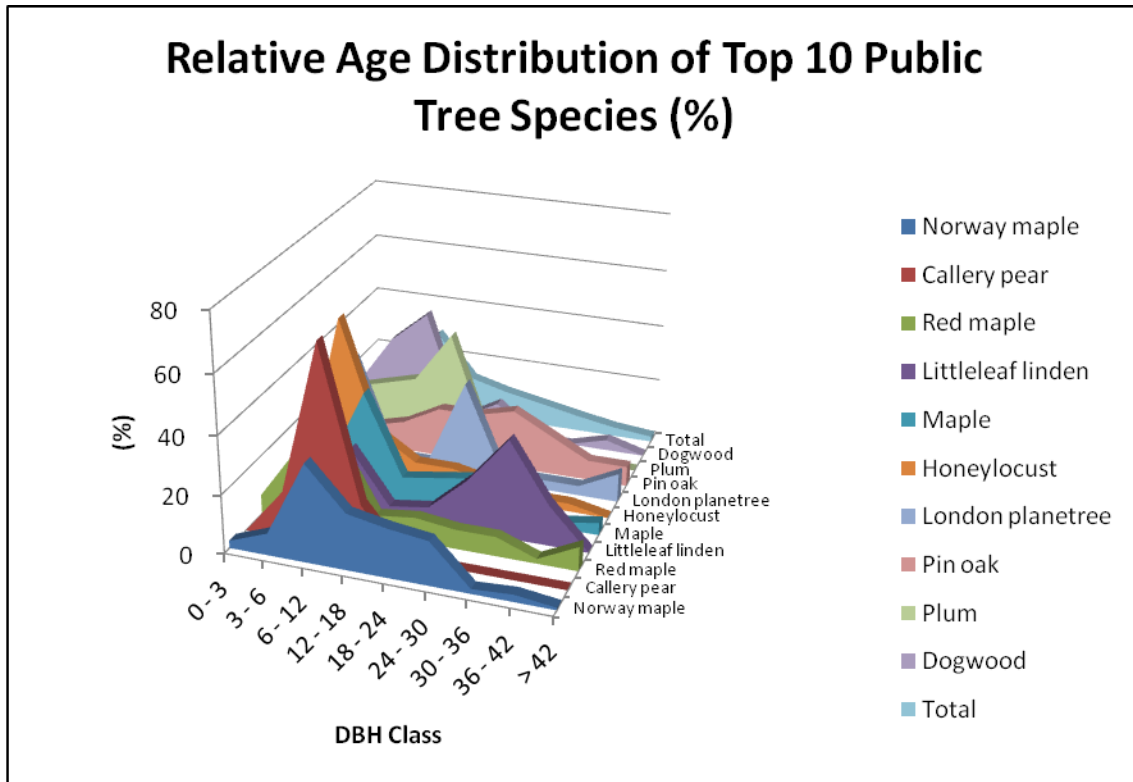
STOCKING LEVEL

Stocking level is the percentage of potential street tree sites that are currently planted with trees. The following chart shows the stocking level within the areas inventoried.

Planted Sites	Total No. Sites	Stocking (%)
856	1063	81

DBH DISTRIBUTION

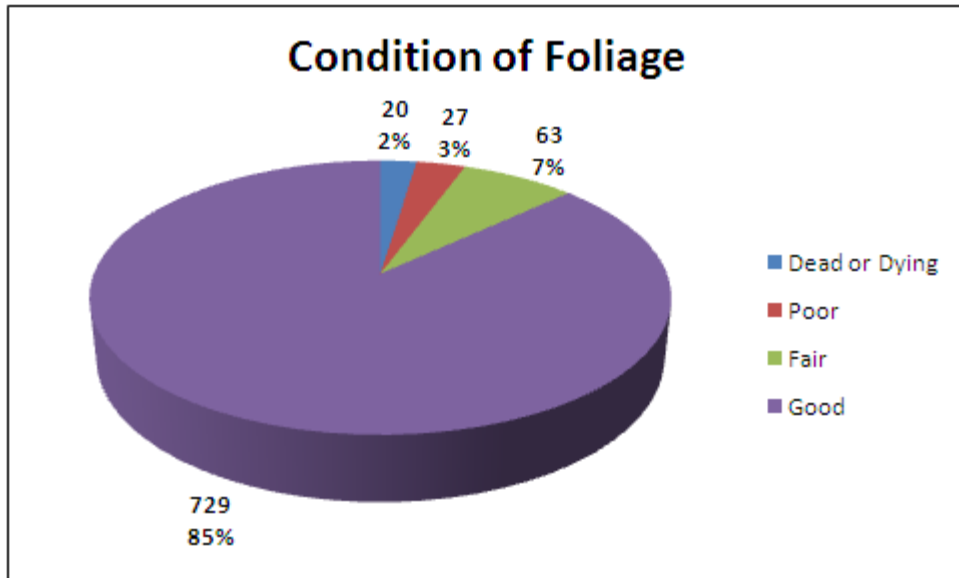
In a diameter distribution, trees are grouped according to diameter at breast height (dbh). Communities can get clues about the age of trees, planting patterns, planting needs, and future forest health from a diameter distribution. In the ideal distribution, the number of trees decreases as the diameter increases so that there are young trees to replace older, dying trees. The chart indicates that the majority of Callery pear and Honeylocust trees (within their own species) are within the 6-12 inch class whereas the majority of Littleleaf lindens are in the larger diameter classes.



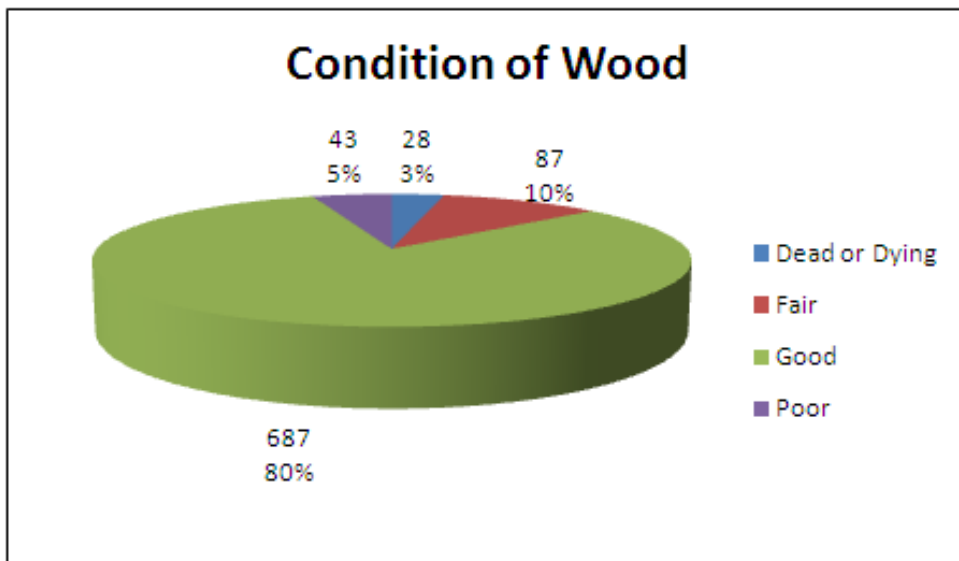
Species	DBH class (in)								
	0 - 3	3 - 6	6 - 12	12 - 18	18 - 24	24 - 30	30 - 36	36 - 42	> 42
Norway maple	2.5	7.6	33.6	19.3	16.8	15.1	1.7	2.5	0.8
Callery pear	0.0	16.0	68.0	16.0	0.0	0.0	0.0	0.0	0.0
Red maple	6.7	25.0	30.0	6.7	8.3	6.7	6.7	1.7	8.3
Littleleaf linden	0.0	2.0	22.0	4.0	6.0	18.0	34.0	14.0	0.0
Maple	8.5	8.5	36.2	8.5	10.6	12.8	8.5	2.1	4.3
Honeylocust	0.0	55.6	16.7	8.3	8.3	5.6	2.8	2.8	0.0
London planetree	3.3	36.7	3.3	3.3	33.3	3.3	3.3	3.3	10.0
Pin oak	0.0	6.9	10.3	17.2	17.2	20.7	13.8	6.9	6.9
Plum	14.3	17.9	21.4	39.3	3.6	3.6	0.0	0.0	0.0
Dogwood	11.1	29.6	40.7	3.7	11.1	0.0	0.0	3.7	0.0

CONDITION

By far, most trees have leaves in good condition. There are 20 trees with dead or dying foliage. Note that 6 ash trees have dead foliage; all of these also have dead wood.

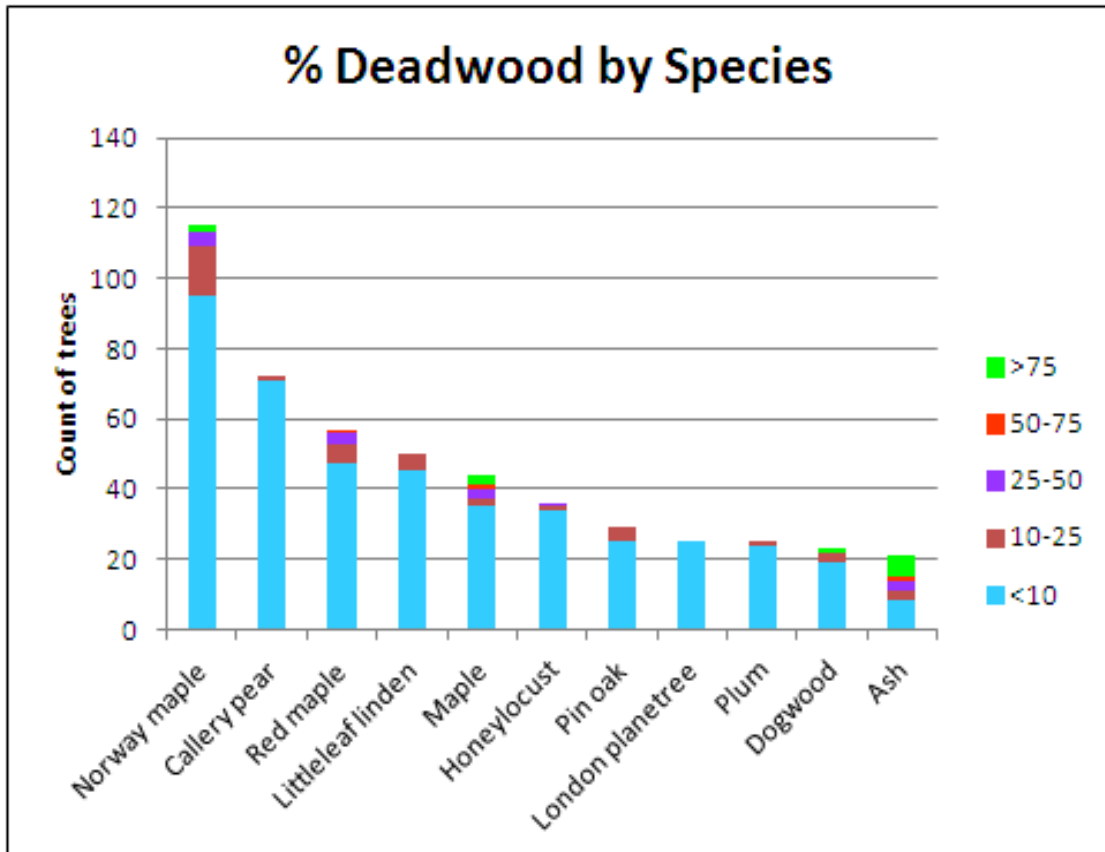


There are 28 trees with dead or dying wood; 13 of these are maples. Of the 43 trees with a wood condition of poor, 19 are maples. Given the high number of maples, this outcome would be expected. Note that 8 ash trees have dead or poor condition wood.



PERCENT DEAD WOOD

The chart depicts percentage of dead wood in the top 10 most populous trees and additionally, ash trees. There is very little deadwood in the Top 10; however, ash trees have a high percentage of deadwood. Total number of ash trees is 24.

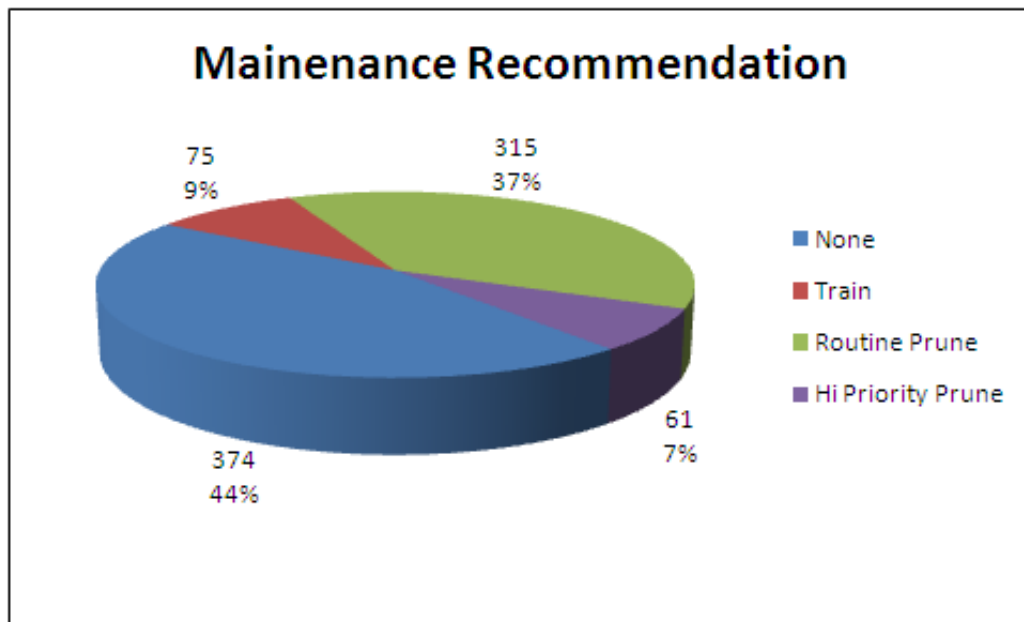


PEST DATA

The SWAT team collected pest data as a trial project. The data is reported in the inventory spread sheet as a separate worksheet. No reports were generated based on this data. Team members were not expected to identify pests or diseases, but rather to observe and note signs and symptoms.

MAINTENANCE

Sixteen percent of the inventoried trees, 61 trees, are categorized as “high priority prune”; 7 are ash trees. Note that “train” is for small or young trees.



CONSULT

75 trees should be further assessed by a certified arborist. Of these, 10 are ash trees. Teams may have detected a large cavity, presence of fungi, a large crack, or other evidence that the tree needs further examination. Below are examples.



RELATIVE PERFORMANCE INDEX

The RPI relates the overall condition of each species in comparison to all the others. Any value higher than 1 indicates species that have proportionately better condition ratings. Likewise, index values lower than 1 are species with below-average condition ratings when compared with other inventoried street trees.

Species	Dead or Dying	Poor	Fair	Good	RPI	# of Trees	% of Public Trees
Norway maple	1.68	1.68	5.88	90.76	1.02	119	13.90
Callery pear	0.00	0.00	2.67	97.33	1.06	75	8.76
Red maple	1.67	3.33	15.00	80.00	0.97	60	7.01
Littleleaf linden	0.00	0.00	4.00	96.00	1.04	50	5.84
Maple	6.38	2.13	19.15	72.34	0.93	47	5.49
Honeylocust	0.00	0.00	2.78	97.22	1.07	36	4.21
London planetree	0.00	0.00	16.67	83.33	0.98	30	3.50
Pin oak	0.00	0.00	0.00	100.00	1.08	29	3.39
Plum	3.57	3.57	10.71	82.14	0.98	28	3.27
Dogwood	3.70	0.00	29.63	66.67	0.94	27	3.15
Sugar maple	4.55	9.09	9.09	77.27	0.94	22	2.57
Ash	28.57	0.00	14.29	57.14	0.73	21	2.45
Northern red oak	0.00	0.00	11.11	88.89	1.04	18	2.10
Serviceberry	0.00	0.00	0.00	100.00	1.07	16	1.87
BDM OTHER	0.00	0.00	18.75	81.25	0.99	16	1.87
Norway spruce	0.00	0.00	12.50	87.50	1.03	16	1.87
Sweetgum	0.00	0.00	0.00	100.00	1.06	15	1.75
American elm	0.00	0.00	20.00	80.00	0.96	15	1.75
BDS OTHER	21.43	0.00	0.00	78.57	0.84	14	1.64
Elm	0.00	0.00	7.14	92.86	1.05	14	1.64
Apple	0.00	8.33	8.33	83.33	0.98	12	1.40
Cherry	0.00	0.00	9.09	90.91	1.03	11	1.29
Japanese maple	0.00	10.00	0.00	90.00	1.00	10	1.17
Oak	0.00	0.00	0.00	100.00	1.07	10	1.17
Blue spruce	0.00	0.00	0.00	100.00	1.08	10	1.17
Zelkova	0.00	0.00	0.00	100.00	1.06	9	1.05
Silver maple	0.00	11.11	22.22	66.67	0.91	9	1.05
Eastern redbud	0.00	0.00	0.00	100.00	1.08	9	1.05
Ginkgo	0.00	0.00	0.00	100.00	1.08	8	0.93
Eastern white pine	0.00	0.00	37.50	62.50	0.90	8	0.93
Spruce	0.00	12.50	0.00	87.50	1.00	8	0.93
Eastern red cedar	14.29	0.00	28.57	57.14	0.79	7	0.82
White oak	0.00	0.00	0.00	100.00	1.06	7	0.82
Hickory	0.00	0.00	16.67	83.33	0.97	6	0.70
Basswood	0.00	0.00	0.00	100.00	1.06	6	0.70
Beech	0.00	0.00	0.00	100.00	1.05	5	0.58

Species	Dead or Dying	Poor	Fair	Good	RPI	# of Trees	% of Public Trees
Southern magnolia	0.00	0.00	20.00	80.00	0.99	5	0.58
BDL OTHER	0.00	25.00	25.00	50.00	0.80	4	0.47
Black walnut	0.00	0.00	0.00	100.00	1.08	4	0.47
Hawthorn	0.00	0.00	0.00	100.00	1.08	3	0.35
Green ash	0.00	0.00	0.00	100.00	1.08	3	0.35
CES OTHER	0.00	33.33	0.00	66.67	0.87	3	0.35
Tulip tree	0.00	0.00	33.33	66.67	0.98	3	0.35
Birch	0.00	33.33	33.33	33.33	0.76	3	0.35
Japanese tree lilac	0.00	0.00	0.00	100.00	1.00	2	0.23
Willow	0.00	0.00	0.00	100.00	1.08	2	0.23
CEL OTHER	0.00	0.00	50.00	50.00	0.92	2	0.23
Common chokecherry	0.00	0.00	0.00	100.00	1.00	2	0.23
Northern catalpa	0.00	0.00	0.00	100.00	1.00	2	0.23
Black locust	0.00	0.00	0.00	100.00	1.08	2	0.23
CEM OTHER	0.00	0.00	0.00	100.00	1.08	2	0.23
European hornbeam	0.00	0.00	0.00	100.00	1.08	2	0.23
Eastern hemlock	0.00	100.00	0.00	0.00	0.45	1	0.12
Dawn redwood	0.00	0.00	0.00	100.00	1.08	1	0.12
Bur oak	0.00	0.00	0.00	100.00	1.08	1	0.12
Horsechestnut	0.00	0.00	0.00	100.00	1.08	1	0.12
Red mulberry	0.00	0.00	0.00	100.00	0.92	1	0.12
American holly	0.00	0.00	0.00	100.00	1.08	1	0.12
Mountain ash	0.00	0.00	0.00	100.00	1.08	1	0.12
Pine	0.00	0.00	0.00	100.00	1.08	1	0.12
Shagbark hickory	0.00	0.00	0.00	100.00	1.08	1	0.12
Total	2.22	1.87	9.00	86.92	1.00	856	100.00

IMPORTANCE VALUE

IVs are displayed in table form for all species that make up more than 1% of the population. The Streets IV is the mean of three relative values (percentage of total trees, percentage of total leaf area, and percentage of canopy cover) and can range from 0 to 100 with an IV of 100 suggesting total reliance on one species

Species	# Trees	% Total Trees	Leaf Area (ft ²)	% Total Leaf Area	Canopy Cover (ft ²)	% Total Canopy Cover	Importance Value
Norway maple	119	13.90	262,185.65	13.93	106,119.11	16.19	14.67
Callery pear	75	8.76	91,207.88	4.85	36,195.67	5.52	6.38
Red maple	60	7.01	161,789.61	8.59	48,053.12	7.33	7.65
Littleleaf linden	50	5.84	118,628.99	6.30	47,250.89	7.21	6.45
Maple	47	5.49	121,769.30	6.47	43,711.54	6.67	6.21
Honeylocust	36	4.21	78,888.26	4.19	29,583.46	4.51	4.30
London planetree	30	3.50	112,132.44	5.96	36,725.70	5.60	5.02
Pin oak	29	3.39	157,944.99	8.39	54,760.19	8.36	6.71
Plum	28	3.27	17,227.84	0.92	9,140.65	1.39	1.86
Dogwood	27	3.15	13,853.08	0.74	7,557.80	1.15	1.68
Sugar maple	22	2.57	111,540.56	5.93	24,985.81	3.81	4.10
Ash	21	2.45	48,770.45	2.59	17,302.30	2.64	2.56
Northern red oak	18	2.10	26,135.71	1.39	10,059.71	1.53	1.68
BDM OTHER	16	1.87	22,002.62	1.17	5,786.59	0.88	1.31
Serviceberry	16	1.87	951.80	0.05	543.66	0.08	0.67
Norway spruce	16	1.87	31,304.82	1.66	13,187.80	2.01	1.85
American elm	15	1.75	34,777.36	1.85	10,052.94	1.53	1.71
Sweetgum	15	1.75	60,118.33	3.19	16,608.45	2.53	2.49
BDS OTHER	14	1.64	1,789.18	0.10	1,125.27	0.17	0.63
Elm	14	1.64	17,365.67	0.92	4,238.09	0.65	1.07
Apple	12	1.40	9,072.89	0.48	3,385.15	0.52	0.80
Cherry	11	1.29	3,322.93	0.18	2,144.66	0.33	0.60
Blue spruce	10	1.17	11,089.12	0.59	4,333.45	0.66	0.81
Japanese maple	10	1.17	7,236.46	0.38	3,967.72	0.61	0.72
Oak	10	1.17	34,121.28	1.81	11,947.65	1.82	1.60
Eastern redbud	9	1.05	1,381.51	0.07	986.99	0.15	0.43
Silver maple	9	1.05	67,029.39	3.56	17,396.11	2.65	2.42
Zelkova	9	1.05	12,386.98	0.66	4,458.25	0.68	0.80
Spruce	8	0.93	12,787.99	0.68	5,207.07	0.79	0.80
Eastern white pine	8	0.93	13,576.58	0.72	5,591.28	0.85	0.84
Ginkgo	8	0.93	1,377.04	0.07	795.69	0.12	0.38
Eastern red cedar	7	0.82	5,564.87	0.30	3,975.22	0.61	0.57
White oak	7	0.82	53,554.01	2.84	18,502.42	2.82	2.16
Basswood	6	0.70	22,604.87	1.20	6,406.40	0.98	0.96

Species	# Trees	% Total Trees	Leaf Area (ft ²)	% Total Leaf Area	Canopy Cover (ft ²)	% Total Canopy Cover	Importance Value
Hickory	6	0.70	24,388.22	1.30	7,235.89	1.10	1.03
Beech	5	0.58	12,165.91	0.65	3,569.45	0.54	0.59
Southern magnolia	5	0.58	1,403.53	0.07	924.68	0.14	0.27
BDL OTHER	4	0.47	14,000.54	0.74	4,483.79	0.68	0.63
Black walnut	4	0.47	5,764.09	0.31	2,220.22	0.34	0.37
Hawthorn	3	0.35	319.48	0.02	215.47	0.03	0.13
Tulip tree	3	0.35	12,746.02	0.68	3,901.98	0.60	0.54
Birch	3	0.35	5,653.33	0.30	1,711.71	0.26	0.30
Green ash	3	0.35	13,279.42	0.71	4,641.58	0.71	0.59
CES OTHER	3	0.35	484.25	0.03	143.44	0.02	0.13
CEM OTHER	2	0.23	169.71	0.01	154.44	0.02	0.09
European hornbeam	2	0.23	1,590.21	0.08	273.49	0.04	0.12
Japanese tree lilac	2	0.23	1,702.07	0.09	767.43	0.12	0.15
CEL OTHER	2	0.23	3,554.15	0.19	1,464.07	0.22	0.22
Common chokecherry	2	0.23	3,003.13	0.16	1,239.85	0.19	0.19
Black locust	2	0.23	2,882.05	0.15	1,110.11	0.17	0.19
Northern catalpa	2	0.23	4,093.74	0.22	1,305.02	0.20	0.22
Willow	2	0.23	5,606.90	0.30	1,697.94	0.26	0.26
Pine	1	0.12	31.82	0.00	8.12	0.00	0.04
Bur oak	1	0.12	170.20	0.01	71.28	0.01	0.05
Dawn redwood	1	0.12	1,441.02	0.08	555.05	0.08	0.09
Shagbark hickory	1	0.12	11,581.55	0.62	2,783.10	0.42	0.39
Red mulberry	1	0.12	1,629.58	0.09	419.32	0.06	0.09
Eastern hemlock	1	0.12	319.99	0.02	221.67	0.03	0.06
Horsechestnut	1	0.12	8,030.80	0.43	1,500.89	0.23	0.26
Mountain ash	1	0.12	200.51	0.01	147.51	0.02	0.05
American holly	1	0.12	728.02	0.04	537.06	0.08	0.08
Total	856	100.00	1,882,430.73	100.00	655,391.35	100.00	100.00

BENEFITS REPORTS

An analysis tool within the iTree software suite, i-Tree Streets, was used to quantify the value of annual environmental and aesthetic benefits of the community trees and also to calculate the replacement value of the trees. Since there are many variables in site conditions, these benefits are a general accounting. The software uses tree growth and benefit models for predominant urban tree species in 16 national climate zones. The Village of Mamaroneck is in the Northeast Zone.

For more information on methods used for benefits calculations, see The Northeast Community Tree Guide. (See resource page.)

Five **ANNUAL BENEFITS** are assessed in i-Tree Streets. Each benefit is quantified in terms of resource units and a dollar value is assigned to the units.

- **Energy** – the sum of energy savings due to reduced natural gas use in winter and reduced electricity use for air conditioning in summer.
- **Stormwater** – a measure of reduced annual stormwater runoff due to trees.
- **Air quality** – the sum of air pollutants (O₃, NO₂, SO₂, PM₁₀) deposited on tree surfaces and reduced emissions from power plants (NO₂, PM₁₀, VOCs, SO₂) due to reduced electricity use.
- **Carbon dioxide** – the sum of decreased atmospheric CO₂ due to sequestration by trees and reduced emissions from power plants due to reduced energy use.
- **Aesthetic/other** – a measure of the tangible and intangible benefits of trees reflected in increases in property values due to trees..

Average Annual Benefits by All Trees

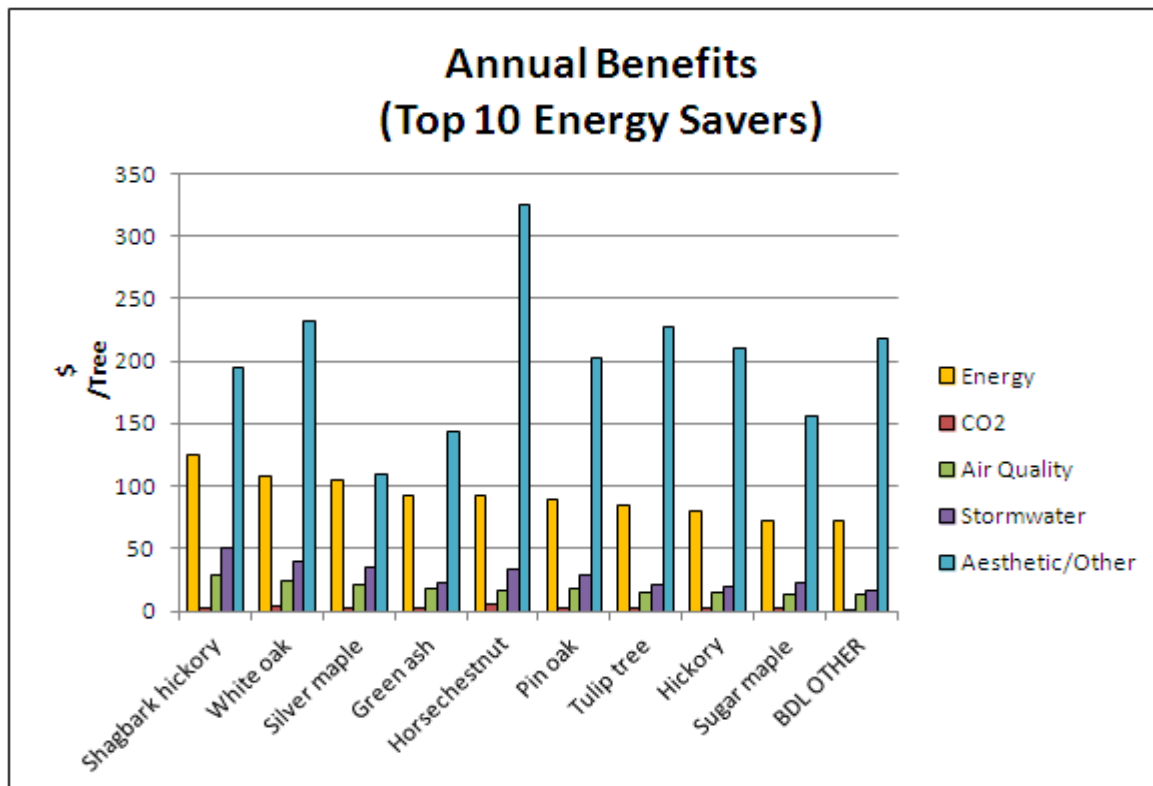
Benefits	Total (\$)	\$/Tree
Energy	41,041	47.95
CO ₂	1,049	1.23
Air Quality	7,403	8.65
Stormwater	10,006	11.69
Aesthetic/Other	98,340	114.88
Total Benefits	157,839	184.39

REPLACEMENT VALUES given in the Benefits Reports are estimates of the costs of replacing trees in their current condition. Species and size are also considered.

AVERAGE ANNUAL BENEFITS BY SPECIES

Species	Energy	CO2	Air Quality	Stormwater	Aesthetic /Other	Total
Shagbark hickory	126	3	29	50	195	402
White oak	107	4	24	40	231	407
Silver maple	105	2	21	35	109	273
Green ash	93	2	18	23	143	278
Horsechestnut	92	5	17	33	325	472
Pin oak	89	3	18	29	202	341
Tulip tree	84	2	16	20	228	350
Hickory	80	2	14	19	211	326
Sugar maple	73	2	13	22	156	265
BDL OTHER	72	2	13	17	218	322
Basswood	69	2	12	18	189	290
London planetree	67	2	12	19	133	232
Oak	64	2	12	18	163	259
Willow	64	1	11	14	110	199
Littleleaf linden	64	1	11	13	30	118
Sweetgum	60	1	7	17	81	167
Black walnut	58	1	8	8	190	265
Black locust	58	1	8	8	190	265
Dawn redwood	58	1	8	8	190	265
Norway maple	58	2	11	13	142	225
Maple	57	2	11	14	154	238
Ash	55	1	10	12	114	191
Norway spruce	53	1	10	15	51	131
Red maple	51	1	9	13	98	172
Beech	50	1	9	11	170	241
Zelkova	50	1	7	7	175	240
Honeylocust	49	1	9	11	126	196
Common chokecherry	48	1	8	9	24	89
CEL OTHER	46	1	9	14	30	99
Eastern white pine	45	1	9	13	54	122
Birch	43	1	7	9	111	172
Northern catalpa	42	1	8	11	109	170
Spruce	42	1	8	12	49	111
American elm	39	1	7	10	174	231
Northern red oak	39	1	6	8	93	147
Eastern red cedar	38	1	9	8	63	119
American holly	36	0	9	7	0	52
Red mulberry	34	1	5	8	113	161
Callery pear	32	1	6	7	206	253
Japanese maple	31	1	5	5	66	108

Species	# Trees	% Total Trees	Leaf Area (ft ²)	% Total Leaf Area	Canopy Cover (ft ²)	% Total Canopy Cover
Japanese tree lilac	30	1	5	5	36	77
Blue spruce	29	1	5	8	53	96
BDM OTHER	29	1	5	6	113	154
Plum	27	1	4	4	31	67
Elm	24	1	4	5	154	187
Apple	23	0	4	4	31	62
Dogwood	23	1	4	3	28	59
Cherry	17	0	3	2	26	48
Eastern hemlock	16	0	3	3	51	74
Southern magnolia	14	0	3	3	78	98
Mountain ash	13	0	2	2	24	40
European hornbeam	12	0	2	3	114	132
Eastern redbud	10	0	1	1	22	35
Ginkgo	8	0	1	1	28	39
BDS OTHER	7	0	1	1	21	30
Bur oak	7	0	1	1	76	85
Hawthorn	7	0	1	1	21	29
CEM OTHER	6	0	1	1	30	39
CES OTHER	4	0	1	1	68	74
Serviceberry	3	0	0	0	19	24
Pine	1	0	0	0	54	56
Total	48	1	9	12	115	184



ANNUAL ENERGY BENEFITS

Species	Total Electricity (MWh)	Electricity (\$)	Total Natural Gas (Therms)	Natural Gas (\$)	Total (\$)	% of Total Tree Numbers	% of Total \$	Avg. \$/tree
Norway maple	10.29	1,441.62	3,856.94	5,430.57	6,872.18	13.90	16.74	57.75
Callery pear	3.73	522.07	1,338.03	1,883.95	2,406.02	8.76	5.86	32.08
Red maple	4.52	632.78	1,703.07	2,397.92	3,030.70	7.01	7.38	50.51
Littleleaf linden	4.63	648.55	1,794.83	2,527.13	3,175.67	5.84	7.74	63.51
Maple	4.04	566.32	1,497.63	2,108.67	2,674.99	5.49	6.52	56.91
Honeylocust	2.73	381.99	992.79	1,397.84	1,779.83	4.21	4.34	49.44
London planetree	3.22	450.52	1,112.93	1,567.01	2,017.53	3.50	4.92	67.25
Pin oak	4.49	628.79	1,392.99	1,961.32	2,590.11	3.39	6.31	89.31
Plum	1.00	140.77	435.98	613.86	754.63	3.27	1.84	26.95
Dogwood	0.77	108.31	365.72	514.93	623.24	3.15	1.52	23.08
Sugar maple	2.38	333.85	898.14	1,264.58	1,598.43	2.57	3.89	72.66
Ash	1.71	239.23	649.45	914.43	1,153.66	2.45	2.81	54.94
Northern red oak	1.04	146.23	391.40	551.10	697.33	2.10	1.70	38.74
BDM OTHER	0.63	87.67	265.24	373.46	461.13	1.87	1.12	28.82
Serviceberry	0.06	8.22	33.45	47.09	55.31	1.87	0.13	3.46
Norway spruce	1.41	197.07	467.51	658.25	855.32	1.87	2.08	53.46
American elm	0.93	129.66	323.10	454.93	584.59	1.75	1.42	38.97
Sweetgum	1.44	202.36	497.76	700.84	903.20	1.75	2.20	60.21
BDS OTHER	0.12	16.29	60.81	85.63	101.92	1.64	0.25	7.28
Elm	0.47	66.25	190.53	268.27	334.52	1.64	0.82	23.89
Apple	0.37	52.02	160.45	225.92	277.94	1.40	0.68	23.16
Cherry	0.23	31.63	107.80	151.78	183.41	1.29	0.45	16.67
Blue spruce	0.46	64.00	159.26	224.24	288.24	1.17	0.70	28.82
Japanese maple	0.43	60.07	175.02	246.43	306.50	1.17	0.75	30.65
Oak	1.05	146.85	350.09	492.93	639.78	1.17	1.56	63.98
Eastern redbud	0.10	14.29	51.99	73.21	87.50	1.05	0.21	9.72
Silver maple	1.52	213.28	521.57	734.37	947.65	1.05	2.31	105.29
Zelkova	0.64	89.64	254.14	357.83	447.47	1.05	1.09	49.72
Spruce	0.52	72.62	184.72	260.09	332.71	0.93	0.81	41.59
Eastern white pine	0.57	80.20	198.18	279.04	359.23	0.93	0.88	44.90
Ginkgo	0.08	11.74	37.44	52.71	64.45	0.93	0.16	8.06
Eastern red cedar	0.44	62.25	145.14	204.36	266.60	0.82	0.65	38.09
White oak	1.37	191.41	396.53	558.31	749.72	0.82	1.83	107.10
Basswood	0.63	87.75	233.00	328.07	415.82	0.70	1.01	69.30
Hickory	0.73	102.65	267.00	375.94	478.59	0.70	1.17	79.77
Beech	0.38	53.36	140.83	198.28	251.64	0.58	0.61	50.33
Southern magnolia	0.09	12.68	39.66	55.84	68.53	0.58	0.17	13.71
BDL OTHER	0.45	62.42	160.86	226.49	288.90	0.47	0.70	72.23

Species	Total Electricity (MWh)	Electricity (\$)	Total Natural Gas (Therms)	Natural Gas (\$)	Total (\$)	% of Total Tree Numbers	% of Total \$	Avg. \$/tree
Black walnut	0.32	45.53	132.44	186.47	232.00	0.47	0.57	58.00
Hawthorn	0.02	3.15	11.80	16.62	19.77	0.35	0.05	6.59
Tulip tree	0.39	54.99	140.05	197.20	252.19	0.35	0.61	84.06
Birch	0.20	28.37	71.12	100.14	128.51	0.35	0.31	42.84
Green ash	0.45	62.99	152.52	214.75	277.73	0.35	0.68	92.58
CES OTHER	0.02	2.17	7.32	10.31	12.48	0.35	0.03	4.16
CEM OTHER	0.02	2.39	6.93	9.75	12.14	0.23	0.03	6.07
European hornbeam	0.03	4.07	14.49	20.41	24.48	0.23	0.06	12.24
Japanese tree lilac	0.08	10.92	35.18	49.53	60.45	0.23	0.15	30.23
CEL OTHER	0.14	19.67	51.50	72.51	92.18	0.23	0.22	46.09
Common chokecherry	0.13	17.60	55.11	77.60	95.20	0.23	0.23	47.60
Black locust	0.16	22.77	66.22	93.24	116.00	0.23	0.28	58.00
Northern catalpa	0.12	17.25	47.82	67.34	84.58	0.23	0.21	42.29
Willow	0.20	28.18	70.31	99.00	127.17	0.23	0.31	63.59
Pine	0.00	0.12	0.49	0.69	0.81	0.12	0.00	0.81
Bur oak	0.01	1.07	3.99	5.62	6.70	0.12	0.02	6.70
Dawn redwood	0.08	11.38	33.11	46.62	58.00	0.12	0.14	58.00
Shagbark hickory	0.21	29.21	68.48	96.42	125.63	0.12	0.31	125.63
Red mulberry	0.04	6.09	19.78	27.85	33.94	0.12	0.08	33.94
Eastern hemlock	0.02	3.12	8.82	12.42	15.54	0.12	0.04	15.54
Horsechestnut	0.14	19.69	51.62	72.68	92.37	0.12	0.23	92.37
American mountain ash	0.02	2.13	7.62	10.73	12.85	0.12	0.03	12.85
American holly	0.05	7.49	19.95	28.08	35.58	0.12	0.09	35.58
Total	62.51	8,757.79	22,928.65	32,283.54	41,041.34	100.00	100.00	47.95

ANNUAL STORMWATER BENEFITS

Species	Total Rainfall Interception (Gal)	Total (\$)	% of Total Tree Numbers	% of Total \$	Avg. \$/tree
Norway maple	189,365.54	1,514.92	13.90	15.14	12.73
Callery pear	68,382.29	547.06	8.76	5.47	7.29
Red maple	100,436.03	803.49	7.01	8.03	13.39
Littleleaf linden	81,642.22	653.14	5.84	6.53	13.06
Maple	83,181.75	665.45	5.49	6.65	14.16
Honeylocust	48,016.47	384.13	4.21	3.84	10.67
London planetree	70,224.57	561.80	3.50	5.61	18.73
Pin oak	103,374.85	827.00	3.39	8.27	28.52
Plum	13,956.44	111.65	3.27	1.12	3.99
Dogwood	11,384.04	91.07	3.15	0.91	3.37
Sugar maple	60,506.85	484.05	2.57	4.84	22.00
Ash	31,326.19	250.61	2.45	2.50	11.93
Northern red oak	18,189.06	145.51	2.10	1.45	8.08
BDM OTHER	12,898.17	103.19	1.87	1.03	6.45
Serviceberry	801.39	6.41	1.87	0.06	0.40
Norway spruce	30,710.20	245.68	1.87	2.46	15.36
American elm	18,988.26	151.91	1.75	1.52	10.13
Sweetgum	32,303.91	258.43	1.75	2.58	17.23
BDS OTHER	1,589.50	12.72	1.64	0.13	0.91
Elm	8,720.16	69.76	1.64	0.70	4.98
Apple	6,304.60	50.44	1.40	0.50	4.20
Cherry	2,994.73	23.96	1.29	0.24	2.18
Blue spruce	10,527.99	84.22	1.17	0.84	8.42
Japanese maple	6,079.97	48.64	1.17	0.49	4.86
Oak	22,395.11	179.16	1.17	1.79	17.92
Eastern redbud	1,319.86	10.56	1.05	0.11	1.17
Silver maple	39,422.71	315.38	1.05	3.15	35.04
Zelkova	7,973.77	63.79	1.05	0.64	7.09
Spruce	12,358.31	98.87	0.93	0.99	12.36
Eastern white pine	13,183.68	105.47	0.93	1.05	13.18
Ginkgo	1,140.48	9.12	0.93	0.09	1.14
Eastern red cedar	6,955.60	55.64	0.82	0.56	7.95
White oak	35,066.20	280.53	0.82	2.80	40.08
Basswood	13,232.54	105.86	0.70	1.06	17.64
Hickory	14,337.81	114.70	0.70	1.15	19.12
Beech	7,128.50	57.03	0.58	0.57	11.41
Southern magnolia	1,662.46	13.30	0.58	0.13	2.66
BDL OTHER	8,556.80	68.45	0.47	0.68	17.11

Species	Total Rainfall Interception (Gal)	Total (\$)	% of Total Tree Numbers	% of Total \$	Avg. \$/tree
Black walnut	3,833.77	30.67	0.47	0.31	7.67
Hawthorn	295.11	2.36	0.35	0.02	0.79
Tulip tree	7,623.37	60.99	0.35	0.61	20.33
Birch	3,546.53	28.37	0.35	0.28	9.46
Green ash	8,486.95	67.90	0.35	0.68	22.63
CES OTHER	408.91	3.27	0.35	0.03	1.09
CEM OTHER	237.54	1.90	0.23	0.02	0.95
European hornbeam	765.62	6.12	0.23	0.06	3.06
Japanese tree lilac	1,269.43	10.16	0.23	0.10	5.08
CEL OTHER	3,454.21	27.63	0.23	0.28	13.82
Common chokecherry	2,148.99	17.19	0.23	0.17	8.60
Black locust	1,916.89	15.34	0.23	0.15	7.67
Northern catalpa	2,632.82	21.06	0.23	0.21	10.53
Willow	3,518.14	28.15	0.23	0.28	14.07
Pine	25.31	0.20	0.12	0.00	0.20
Bur oak	120.54	0.96	0.12	0.01	0.96
Dawn redwood	958.44	7.67	0.12	0.08	7.67
Shagbark hickory	6,212.67	49.70	0.12	0.50	49.70
Red mulberry	947.69	7.58	0.12	0.08	7.58
Eastern hemlock	392.98	3.14	0.12	0.03	3.14
Horsechestnut	4,180.28	33.44	0.12	0.33	33.44
American mountain ash	194.93	1.56	0.12	0.02	1.56
American holly	921.75	7.37	0.12	0.07	7.37
Total	1,250,731.91	10,005.86	100.00	100.00	11.69

ANNUAL AESTHETIC/OTHER BENEFITS

Species	Total (\$)	% of Total Tree Numbers	% of Total \$	Avg. \$/tree
Norway maple	16,899.48	13.90	17.18	142.01
Callery pear	15,466.93	8.76	15.73	206.23
Red maple	5,867.59	7.01	5.97	97.79
Littleleaf linden	1,480.93	5.84	1.51	29.62
Maple	7,246.86	5.49	7.37	154.19
Honeylocust	4,550.11	4.21	4.63	126.39
London planetree	3,994.12	3.50	4.06	133.14
Pin oak	5,868.05	3.39	5.97	202.35
Plum	856.72	3.27	0.87	30.60
Dogwood	762.45	3.15	0.78	28.24
Sugar maple	3,438.00	2.57	3.50	156.27
Ash	2,383.53	2.45	2.42	113.50
Northern red oak	1,668.03	2.10	1.70	92.67
BDM OTHER	1,811.63	1.87	1.84	113.23
Serviceberry	306.30	1.87	0.31	19.14
Norway spruce	818.16	1.87	0.83	51.13
American elm	2,607.95	1.75	2.65	173.86
Sweetgum	1,218.56	1.75	1.24	81.24
BDS OTHER	294.73	1.64	0.30	21.05
Elm	2,157.54	1.64	2.19	154.11
Apple	368.24	1.40	0.37	30.69
Cherry	284.70	1.29	0.29	25.88
Blue spruce	529.31	1.17	0.54	52.93
Japanese maple	663.88	1.17	0.68	66.39
Oak	1,629.68	1.17	1.66	162.97
Eastern redbud	199.52	1.05	0.20	22.17
Silver maple	979.17	1.05	1.00	108.80
Zelkova	1,575.90	1.05	1.60	175.10
Spruce	388.95	0.93	0.40	48.62
Eastern white pine	433.40	0.93	0.44	54.17
Ginkgo	227.03	0.93	0.23	28.38
Eastern red cedar	439.53	0.82	0.45	62.79
White oak	1,618.51	0.82	1.65	231.22
Basswood	1,136.59	0.70	1.16	189.43
Hickory	1,265.55	0.70	1.29	210.93
Beech	849.86	0.58	0.86	169.97
Southern magnolia	392.19	0.58	0.40	78.44
BDL OTHER	870.72	0.47	0.89	217.68

Species	Total (\$)	% of Total Tree Numbers	% of Total \$	Avg. \$/tree
Black walnut	760.16	0.47	0.77	190.04
Hawthorn	61.97	0.35	0.06	20.66
Tulip tree	684.15	0.35	0.70	228.05
Birch	334.17	0.35	0.34	111.39
Green ash	428.62	0.35	0.44	142.87
CES OTHER	204.41	0.35	0.21	68.14
CEM OTHER	60.57	0.23	0.06	30.28
European hornbeam	228.95	0.23	0.23	114.47
Japanese tree lilac	71.56	0.23	0.07	35.78
CEL OTHER	60.14	0.23	0.06	30.07
Common chokecherry	47.90	0.23	0.05	23.95
Black locust	380.08	0.23	0.39	190.04
Northern catalpa	218.34	0.23	0.22	109.17
Willow	219.28	0.23	0.22	109.64
Pine	54.39	0.12	0.06	54.39
Bur oak	76.48	0.12	0.08	76.48
Dawn redwood	190.04	0.12	0.19	190.04
Shagbark hickory	195.03	0.12	0.20	195.03
Red mulberry	113.19	0.12	0.12	113.19
Eastern hemlock	51.27	0.12	0.05	51.27
Horsechestnut	324.84	0.12	0.33	324.84
Mountain ash	23.68	0.12	0.02	23.68
American holly	0.01	0.12	0.00	0.01
Total	98,339.64	100.00	100.00	114.88

STORED CO2 BENEFITS

Species	Total stored CO2 (lbs)	Total (\$)	% of Total Tree #s	% of Total \$	Avg. \$/tree
Norway maple	738,990.61	2,438.67	13.90	19.67	20.49
Callery pear	84,882.63	280.11	8.76	2.26	3.73
Red maple	221,377.97	730.55	7.01	5.89	12.18
Littleleaf linden	231,277.61	763.22	5.84	6.16	15.26
Maple	378,488.35	1,249.01	5.49	10.07	26.57
Honeylocust	87,322.25	288.16	4.21	2.32	8.00
London planetree	198,160.99	653.93	3.50	5.27	21.80
Pin oak	448,542.87	1,480.19	3.39	11.94	51.04
Plum	71,929.55	237.37	3.27	1.91	8.48
Dogwood	56,682.82	187.05	3.15	1.51	6.93
Sugar maple	237,696.13	784.40	2.57	6.33	35.65
Ash	51,430.27	169.72	2.45	1.37	8.08
Northern red oak	34,700.10	114.51	2.10	0.92	6.36
BDM OTHER	12,223.82	40.34	1.87	0.33	2.52
Serviceberry	157.58	0.52	1.87	0.00	0.03
Norway spruce	32,470.51	107.15	1.87	0.86	6.70
American elm	46,530.54	153.55	1.75	1.24	10.24
Sweetgum	65,657.99	216.67	1.75	1.75	14.44
BDS OTHER	2,426.66	8.01	1.64	0.06	0.57
Elm	7,587.06	25.04	1.64	0.20	1.79
Apple	18,080.72	59.67	1.40	0.48	4.97
Cherry	7,457.40	24.61	1.29	0.20	2.24
Blue spruce	8,085.02	26.68	1.17	0.22	2.67
Japanese maple	13,205.23	43.58	1.17	0.35	4.36
Oak	75,851.43	250.31	1.17	2.02	25.03
Eastern redbud	1,077.54	3.56	1.05	0.03	0.40
Silver maple	197,796.02	652.73	1.05	5.26	72.53
Zelkova	6,193.15	20.44	1.05	0.16	2.27
Spruce	12,781.18	42.18	0.93	0.34	5.27
Eastern white pine	13,830.49	45.64	0.93	0.37	5.71
Ginkgo	1,089.25	3.59	0.93	0.03	0.45
Eastern red cedar	15,541.18	51.29	0.82	0.41	7.33
White oak	186,706.94	616.13	0.82	4.97	88.02
Basswood	32,930.32	108.67	0.70	0.88	18.11
Hickory	25,937.20	85.59	0.70	0.69	14.27
Beech	12,279.44	40.52	0.58	0.33	8.10
Southern magnolia	1,047.13	3.46	0.58	0.03	0.69
BDL OTHER	12,554.28	41.43	0.47	0.33	10.36
Black walnut	2,199.59	7.26	0.47	0.06	1.81
Hawthorn	194.36	0.64	0.35	0.01	0.21
Tulip tree	12,738.03	42.04	0.35	0.34	14.01
Birch	4,811.64	15.88	0.35	0.13	5.29
Green ash	19,666.69	64.90	0.35	0.52	21.63
CES OTHER	88.51	0.29	0.35	0.00	0.10
CEM OTHER	143.37	0.47	0.23	0.00	0.24
European hornbeam	342.04	1.13	0.23	0.01	0.56
Japanese tree lilac	10,020.82	33.07	0.23	0.27	16.53
CEL OTHER	3,772.92	12.45	0.23	0.10	6.23
Common chokecherry	19,692.31	64.98	0.23	0.52	32.49
Black locust	1,099.79	3.63	0.23	0.03	1.81
Northern catalpa	5,031.59	16.60	0.23	0.13	8.30

Species	# Trees	% Total Trees	Leaf Area (ft ²)	% Total Leaf Area	Canopy Cover (ft ²)
Willow	4,796.28	15.83	0.23	0.13	7.91
Pine	2.21	0.01	0.12	0.00	0.01
Bur oak	10.83	0.04	0.12	0.00	0.04
Dawn redwood	549.90	1.81	0.12	0.01	1.81
Shagbark hickory	16,940.14	55.90	0.12	0.45	55.90
Red mulberry	782.16	2.58	0.12	0.02	2.58
Eastern hemlock	477.75	1.58	0.12	0.01	1.58
Horsechestnut	0.00	0.00	0.12	0.00	0.00
American mountain ash	174.67	0.58	0.12	0.00	0.58
American holly	3,037.16	10.02	0.12	0.08	10.02
Total	3,757,552.99	12,399.92	100.00	100.00	14.49

ANNUAL CO2 BENEFITS

Species	Sequestered (lb)	Sequestered (\$)	Decomposition Release(lb)	Maintenance Release (lb)	Total Release (\$)	Avoided (lb)	Avoided (\$)	Net Total (lb)	Total (\$)	% of Total Tree #'s	% of Total \$	Avg. \$/ tree
Norway maple	43,934.44	144.98	- 5,678.24	- 1,434.68	- 4.73	30,993.07	102.28	67,814.60	223.79	13.90	21.34	1.88
Callery pear	12,873.15	42.48	- 387.06	- 85.67	- 0.28	11,223.92	37.04	23,624.34	77.96	8.76	7.43	1.04
Red maple	5,491.90	18.12	- 1,926.09	- 688.78	- 2.27	13,604.10	44.89	16,481.13	54.39	7.01	5.19	0.91
Littleleaf linden	2,078.05	6.86	- 1,612.50	- 828.14	- 2.73	13,943.03	46.01	13,580.44	44.82	5.84	4.27	0.90
Maple	20,244.32	66.81	- 2,335.12	- 582.55	- 1.92	12,175.25	40.18	29,501.90	97.36	5.49	9.28	2.07
Honeylocust	3,175.55	10.48	- 1,082.23	- 287.85	- 0.95	8,212.37	27.10	10,017.84	33.06	4.21	3.15	0.92
London planetree	6,568.27	21.68	- 961.97	- 395.22	- 1.30	9,685.56	31.96	14,896.63	49.16	3.50	4.69	1.64
Pin oak	17,872.20	58.98	- 3,155.65	- 516.30	- 1.70	13,518.26	44.61	27,718.50	91.47	3.39	8.72	3.15
Plum	3,970.83	13.10	- 1,259.91	- 220.46	- 0.73	3,026.34	9.99	5,516.80	18.21	3.27	1.74	0.65
Dogwood	2,972.22	9.81	- 567.07	- 181.62	- 0.60	2,328.64	7.68	4,552.17	15.02	3.15	1.43	0.56
Sugar maple	6,821.32	22.51	- 1,321.63	- 346.10	- 1.14	7,177.41	23.69	12,331.00	40.69	2.57	3.88	1.85
Ash	2,556.42	8.44	- 460.30	- 197.61	- 0.65	5,143.09	16.97	7,041.60	23.24	2.45	2.22	1.11
Northern red oak	2,006.70	6.62	- 505.42	- 115.37	- 0.38	3,143.75	10.37	4,529.66	14.95	2.10	1.43	0.83
BDM OTHER	1,144.59	3.78	- 273.81	- 94.81	- 0.31	1,884.78	6.22	2,660.75	8.78	1.87	0.84	0.55
Serviceberry	97.38	0.32	- 3.53	- 18.28	- 0.06	176.70	0.58	252.27	0.83	1.87	0.08	0.05
Norway spruce	1,127.32	3.72	- 361.98	- 205.61	- 0.68	4,236.84	13.98	4,796.57	15.83	1.87	1.51	0.99
American elm	2,605.20	8.60	- 527.42	- 110.80	- 0.37	2,787.58	9.20	4,754.55	15.69	1.75	1.50	1.05
Sweetgum	988.06	3.26	- 310.40	- 183.90	- 0.61	4,350.53	14.36	4,844.28	15.99	1.75	1.52	1.07
BDS OTHER	316.03	1.04	- 54.36	- 29.70	- 0.10	350.31	1.16	582.29	1.92	1.64	0.18	0.14
Elm	1,166.96	3.85	- 169.95	- 70.82	- 0.23	1,424.24	4.70	2,350.42	7.76	1.64	0.74	0.55
Apple	517.69	1.71	- 122.17	- 84.53	- 0.28	1,118.43	3.69	1,429.43	4.72	1.40	0.45	0.39
Cherry	716.72	2.37	- 167.05	- 50.26	- 0.17	680.04	2.24	1,179.46	3.89	1.29	0.37	0.35
Blue spruce	373.00	1.23	- 120.21	- 82.24	- 0.27	1,375.94	4.54	1,546.49	5.10	1.17	0.49	0.51
Japanese maple	1,216.74	4.02	- 295.80	- 65.11	- 0.21	1,291.54	4.26	2,147.37	7.09	1.17	0.68	0.71
Oak	3,868.09	12.76	- 591.58	- 125.65	- 0.41	3,157.17	10.42	6,308.03	20.82	1.17	1.98	2.08
Eastern redbud	233.30	0.77	- 24.14	- 23.99	- 0.08	307.30	1.01	492.48	1.63	1.05	0.15	0.18
Silver maple	3,025.91	9.99	- 986.24	- 203.32	- 0.67	4,585.30	15.13	6,421.65	21.19	1.05	2.02	2.35
Zelkova	815.78	2.69	- 138.73	- 54.83	- 0.18	1,927.23	6.36	2,549.46	8.41	1.05	0.80	0.93
Spruce	390.93	1.29	- 103.62	- 92.52	- 0.31	1,561.20	5.15	1,755.99	5.79	0.93	0.55	0.72
Eastern white pine	513.77	1.70	- 127.12	- 87.95	- 0.29	1,724.14	5.69	2,022.83	6.68	0.93	0.64	0.83
Ginkgo	151.69	0.50	- 24.40	- 22.85	- 0.08	252.42	0.83	356.87	1.18	0.93	0.11	0.15
Eastern red cedar	1,403.60	4.63	- 348.12	- 79.96	- 0.26	1,338.23	4.42	2,313.75	7.64	0.82	0.73	1.09
White oak	6,019.82	19.87	- 869.06	- 151.92	- 0.50	4,115.00	13.58	9,113.83	30.08	0.82	2.87	4.30

Species	Sequestered (lb)	Sequestered (\$)	Decomposition Release(lb)	Maintenance Release (lb)	Total Release (\$)	Avoided (lb)	Avoided (\$)	Net Total (lb)	Total (\$)	% of Total Tree #'s	% of Total \$	Avg. \$/ tree
Basswood	1,621.24	5.35	- 533.29	- 86.81	- 0.29	1,886.61	6.23	2,887.75	9.53	0.70	0.91	1.59
Hickory	1,126.14	3.72	- 278.78	- 73.10	- 0.24	2,206.86	7.28	2,981.11	9.84	0.70	0.94	1.64
Beech	610.11	2.01	- 275.06	- 37.69	- 0.12	1,147.15	3.79	1,444.51	4.77	0.58	0.45	0.95
Southern magnolia	196.43	0.65	- 23.46	- 19.42	- 0.06	272.67	0.90	426.22	1.41	0.58	0.13	0.28
BDL OTHER	816.17	2.69	- 281.22	- 44.55	- 0.15	1,341.85	4.43	1,832.25	6.05	0.47	0.58	1.51
Black walnut	401.82	1.33	- 49.27	- 27.41	- 0.09	978.87	3.23	1,304.01	4.30	0.47	0.41	1.08
Hawthorn	48.01	0.16	- 4.35	- 5.71	- 0.02	67.78	0.22	105.73	0.35	0.35	0.03	0.12
Tulip tree	663.56	2.19	- 285.33	- 38.84	- 0.13	1,182.22	3.90	1,521.61	5.02	0.35	0.48	1.67
Birch	292.30	0.96	- 107.78	- 23.99	- 0.08	610.01	2.01	770.54	2.54	0.35	0.24	0.85
Green ash	795.16	2.62	- 157.41	- 47.97	- 0.16	1,354.13	4.47	1,943.91	6.41	0.35	0.61	2.14
CES OTHER	35.73	0.12	- 0.40	- 3.43	- 0.01	46.71	0.15	78.61	0.26	0.35	0.02	0.09
CEM OTHER	54.44	0.18	- 3.21	- 6.85	- 0.02	51.29	0.17	95.66	0.32	0.23	0.03	0.16
European hornbeam	82.56	0.27	- 7.66	- 6.85	- 0.02	87.59	0.29	155.63	0.51	0.23	0.05	0.26
Japanese tree lilac	451.81	1.49	- 48.81	- 19.42	- 0.06	234.87	0.78	618.45	2.04	0.23	0.19	1.02
CEL OTHER	41.09	0.14	- 23.62	- 36.55	- 0.12	422.90	1.40	403.82	1.33	0.23	0.13	0.67
Common chokecherry	415.97	1.37	- 89.80	- 31.98	- 0.11	378.35	1.25	672.54	2.22	0.23	0.21	1.11
Black locust	200.91	0.66	- 24.64	- 13.71	- 0.05	489.44	1.62	652.00	2.15	0.23	0.21	1.08
Northern catalpa	200.30	0.66	- 112.71	- 17.13	- 0.06	370.77	1.22	441.22	1.46	0.23	0.14	0.73
Willow	283.09	0.93	- 107.44	- 22.85	- 0.08	605.82	2.00	758.63	2.50	0.23	0.24	1.25
Pine	2.30	0.01	- 0.05	- 1.14	0.00	2.64	0.01	3.75	0.01	0.12	0.00	0.01
Bur oak	7.09	0.02	- 0.24	- 1.14	0.00	23.09	0.08	28.80	0.10	0.12	0.01	0.10
Dawn redwood	100.46	0.33	- 12.32	- 6.85	- 0.02	244.72	0.81	326.00	1.08	0.12	0.10	1.08
Shagbark hickory	318.30	1.05	- 77.25	- 25.13	- 0.08	627.91	2.07	843.83	2.78	0.12	0.27	2.78
Red mulberry	83.48	0.28	- 17.52	- 6.85	- 0.02	130.98	0.43	190.08	0.63	0.12	0.06	0.63
Eastern hemlock	82.26	0.27	- 10.70	- 6.85	- 0.02	67.11	0.22	131.81	0.43	0.12	0.04	0.43
Horsechestnut	1,131.93	3.74	0.00	- 29.70	- 0.10	423.41	1.40	1,525.65	5.03	0.12	0.48	5.03
Mountain ash	35.84	0.12	- 3.91	- 3.43	- 0.01	45.70	0.15	74.20	0.24	0.12	0.02	0.24
American holly	0.00	0.00	- 13.85	- 1.14	0.00	161.05	0.53	146.06	0.48	0.12	0.05	0.48
Total	167,356.48	552.28	- 29,422.96	- 8,365.91	- 27.61	188,282.17	621.33	317,849.77	1,048.90	100.00	100.00	1.23

ANNUAL AIR QUALITY BENEFITS

Species	Deposit'n O3 (lb)	Deposit'n NO2 (lb)	Deposit'n PM10 (lb)	Deposit'n SO2 (lb)	Avoided NO2 (lb)	Avoided PM10 (lb)	Avoided VOC (lb)	Avoided SO2 (lb)	BVOC Emissions (lb)	BVOC Emissions (\$)	Total (lb)	Total (\$)	% of Total Tree #s	Avg. \$/tree
Norway maple	59.08	25.54	29.01	9.69	88.99	5.77	3.43	45.17	- 9.61	- 22.20	257.06	1,262.46	13.90	10.61
Callery pear	21.75	9.50	10.61	3.71	31.63	2.05	1.21	16.35	0.00	0.00	96.80	466.36	8.76	6.22
Red maple	25.71	11.10	12.82	4.29	39.16	2.54	1.51	19.83	- 6.80	- 15.72	110.16	548.10	7.01	9.13
Littleleaf linden	25.39	10.67	12.24	3.90	40.64	2.64	1.58	20.32	- 12.81	- 29.59	104.58	534.09	5.84	10.68
Maple	24.33	10.52	11.95	3.99	34.78	2.25	1.34	17.74	- 4.46	- 10.31	102.44	506.05	5.49	10.77
Honeylocust	15.09	6.11	7.16	2.31	23.28	1.51	0.89	11.97	- 7.20	- 16.63	61.13	311.38	4.21	8.65
London planetree	19.74	8.30	9.51	3.03	26.87	1.73	1.02	14.11	- 24.06	- 55.59	60.25	351.88	3.50	11.73
Pin oak	29.30	12.65	14.61	4.89	35.86	2.30	1.34	19.68	- 26.16	- 60.43	94.48	525.90	3.39	18.13
Plum	5.09	2.20	2.50	0.83	9.29	0.61	0.37	4.41	- 0.04	- 0.08	25.27	120.96	3.27	4.32
Dogwood	4.21	1.82	2.07	0.69	7.46	0.49	0.30	3.40	- 0.03	- 0.07	20.40	97.99	3.15	3.63
Sugar maple	13.91	6.01	6.83	2.28	20.66	1.34	0.80	10.46	- 8.93	- 20.63	53.36	279.70	2.57	12.71
Ash	9.30	3.91	4.48	1.43	14.86	0.96	0.57	7.50	0.00	0.00	43.01	206.48	2.45	9.83
Northern red oak	5.38	2.32	2.68	0.90	9.03	0.59	0.35	4.58	- 4.75	- 10.98	21.08	112.88	2.10	6.27
BDM OTHER	3.10	1.34	1.54	0.52	5.72	0.37	0.23	2.75	- 0.93	- 2.14	14.64	72.31	1.87	4.52
Serviceberry	0.30	0.13	0.15	0.05	0.62	0.04	0.03	0.26	0.00	0.00	1.58	7.56	1.87	0.47
Norway spruce	10.02	4.79	6.35	2.71	11.56	0.74	0.44	6.17	- 19.75	- 45.63	23.02	166.21	1.87	10.39
American elm	5.13	2.08	2.43	0.79	7.76	0.50	0.30	4.06	0.00	0.00	23.04	110.64	1.75	7.38
Sweetgum	8.47	3.43	4.02	1.30	12.05	0.78	0.46	6.34	- 31.63	- 73.06	5.22	104.39	1.75	6.96
BDS OTHER	0.63	0.27	0.31	0.10	1.18	0.08	0.05	0.51	0.00	- 0.01	3.12	14.99	1.64	1.07
Elm	2.16	0.88	1.03	0.33	4.22	0.28	0.16	2.08	0.00	0.00	11.14	52.91	1.64	3.78
Apple	2.03	0.89	0.99	0.35	3.43	0.22	0.14	1.63	- 0.02	- 0.05	9.66	46.40	1.40	3.87
Cherry	1.19	0.52	0.59	0.20	2.19	0.14	0.09	0.99	- 0.01	- 0.02	5.90	28.28	1.29	2.57
Blue spruce	3.29	1.57	2.09	0.89	3.83	0.25	0.15	2.00	- 7.00	- 16.16	7.07	53.54	1.17	5.35
Japanese maple	2.21	0.95	1.08	0.36	3.85	0.25	0.15	1.88	- 0.27	- 0.61	10.48	50.86	1.17	5.09
Oak	6.39	2.76	3.19	1.07	8.63	0.56	0.33	4.60	- 5.65	- 13.06	21.87	120.14	1.17	12.01
Eastern redbud	0.55	0.24	0.27	0.09	1.02	0.07	0.04	0.45	0.00	- 0.01	2.72	13.07	1.05	1.45
Silver maple	9.68	4.19	4.75	1.59	12.67	0.82	0.48	6.68	- 3.56	- 8.22	37.30	189.77	1.05	21.09
Zelkova	2.40	1.01	1.15	0.37	5.68	0.37	0.22	2.81	0.00	0.00	14.01	65.92	1.05	7.32
Spruce	3.95	1.89	2.51	1.07	4.39	0.28	0.17	2.27	- 8.07	- 18.64	8.46	63.53	0.93	7.94
Eastern white pine	4.25	2.03	2.69	1.15	4.78	0.31	0.18	2.51	- 8.57	- 19.79	9.34	69.07	0.93	8.63
Ginkgo	0.43	0.18	0.21	0.07	0.79	0.05	0.03	0.37	- 0.11	- 0.25	2.01	9.86	0.93	1.23
Eastern red cedar	3.02	1.44	1.91	0.82	3.62	0.23	0.14	1.95	- 0.47	- 1.08	12.67	63.81	0.82	9.12
White oak	9.90	4.27	4.94	1.65	10.64	0.68	0.39	5.99	- 8.87	- 20.49	29.59	167.57	0.82	23.94
Basswood	3.44	1.45	1.66	0.53	5.40	0.35	0.21	2.75	- 1.27	- 2.94	14.51	72.87	0.70	12.15

Species	Deposit'n O3 (lb)	Deposit'n NO2 (lb)	Deposit'n PM10 (lb)	Deposit'n SO2 (lb)	Avoided NO2 (lb)	Avoided PM10 (lb)	Avoided VOC (lb)	Avoided SO2 (lb)	BVOC Emissions (lb)	BVOC Emissions (\$)	Total (lb)	Total (\$)	% of Total Tree #s	Avg. \$/tree
Hickory	3.89	1.63	1.87	0.60	6.26	0.41	0.24	3.22	0.00	0.00	18.11	86.84	0.70	14.47
Beech	1.92	0.81	0.92	0.29	3.27	0.21	0.13	1.67	0.00	0.00	9.23	44.11	0.58	8.82
Southern magnolia	0.70	0.34	0.45	0.19	0.84	0.06	0.03	0.40	- 0.34	- 0.79	2.66	14.11	0.58	2.82
BDL OTHER	2.41	1.01	1.16	0.37	3.79	0.25	0.15	1.96	0.00	0.00	11.09	53.22	0.47	13.31
Black walnut	1.19	0.50	0.58	0.18	2.92	0.19	0.11	1.43	0.00	0.00	7.10	33.40	0.47	8.35
Hawthorn	0.12	0.05	0.06	0.02	0.23	0.02	0.01	0.10	0.00	0.00	0.60	2.89	0.35	0.96
Tulip tree	2.10	0.88	1.01	0.32	3.32	0.21	0.13	1.72	0.00	0.00	9.70	46.51	0.35	15.50
Birch	0.92	0.40	0.46	0.15	1.70	0.11	0.06	0.89	- 0.24	- 0.55	4.45	21.77	0.35	7.26
Green ash	2.49	1.05	1.20	0.38	3.72	0.24	0.14	1.97	0.00	0.00	11.21	53.87	0.35	17.96
CES OTHER	0.11	0.05	0.07	0.03	0.15	0.01	0.01	0.07	- 0.18	- 0.40	0.32	2.03	0.35	0.68
CEM OTHER	0.12	0.06	0.07	0.03	0.15	0.01	0.01	0.07	- 0.01	- 0.03	0.51	2.55	0.23	1.27
Eur hornbeam	0.15	0.06	0.07	0.02	0.29	0.02	0.01	0.13	- 0.07	- 0.15	0.69	3.45	0.23	1.73
Japanese tree lilac	0.43	0.18	0.21	0.07	0.74	0.05	0.03	0.34	0.00	- 0.01	2.04	9.82	0.23	4.91
CEL OTHER	1.11	0.53	0.70	0.30	1.20	0.08	0.05	0.62	- 2.24	- 5.18	2.35	17.69	0.23	8.84
Chokecherry	0.69	0.30	0.34	0.11	1.17	0.08	0.05	0.55	- 0.01	- 0.01	3.28	15.76	0.23	7.88
Black locust	0.60	0.25	0.29	0.09	1.46	0.10	0.06	0.71	0.00	0.00	3.55	16.70	0.23	8.35
Northern catalpa	0.70	0.30	0.35	0.12	1.08	0.07	0.04	0.54	- 0.17	- 0.40	3.03	15.02	0.23	7.51
Willow	0.91	0.39	0.45	0.15	1.69	0.11	0.06	0.88	- 0.24	- 0.54	4.41	21.59	0.23	10.80
Pine	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	- 0.02	- 0.05	0.01	0.10	0.12	0.10
Bur oak	0.04	0.02	0.02	0.01	0.08	0.01	0.00	0.03	- 0.03	- 0.07	0.17	0.89	0.12	0.89
Dawn redwood	0.30	0.13	0.14	0.05	0.73	0.05	0.03	0.36	0.00	0.00	1.78	8.35	0.12	8.35
Shagbark hickory	1.50	0.63	0.72	0.23	1.70	0.11	0.06	0.91	0.00	0.00	5.87	28.61	0.12	28.61
Red mulberry	0.22	0.10	0.11	0.04	0.41	0.03	0.02	0.19	- 0.07	- 0.16	1.05	5.19	0.12	5.19
Eastern hemlock	0.17	0.08	0.11	0.05	0.20	0.01	0.01	0.10	- 0.03	- 0.06	0.69	3.50	0.12	3.50
Horsechestnut	0.84	0.36	0.41	0.14	1.20	0.08	0.05	0.62	- 0.54	- 1.24	3.15	16.57	0.12	16.57
Mountain ash	0.08	0.04	0.04	0.01	0.15	0.01	0.01	0.07	0.00	0.00	0.40	1.94	0.12	1.94
American holly	0.41	0.20	0.26	0.11	0.46	0.03	0.02	0.23	0.00	0.00	1.72	8.52	0.12	8.52
Total	364.91	157.30	182.42	62.01	535.49	34.68	20.57	274.36	- 205.21	- 474.03	1,426.52	7,402.94	100.00	8.65

REPLACEMENT VALUE

REPLACEMENT VALUES are estimates of the costs of replacing trees in their current condition. Species and size are also considered.

Species	DBH Class (in)										
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	> 42	Total	% of Total
Littleleaf linden	0.00	593.05	23,011.95	11,290.12	32,923.98	157,409.25	428,224.11	217,266.80	0.00	870,719.26	18.10
Norway maple	543.55	4,635.59	63,247.75	85,745.30	156,420.38	233,474.98	39,650.31	67,072.76	29,289.72	680,080.35	14.14
Red maple	512.43	8,677.83	38,590.62	19,676.33	50,676.19	66,278.34	105,270.22	33,401.89	193,133.42	516,217.26	10.73
London planetree	105.11	5,337.41	2,092.00	5,645.06	106,518.76	15,421.85	26,328.43	34,844.68	116,843.54	313,136.84	6.51
Maple	650.02	1,405.86	24,862.91	17,250.53	35,438.99	77,824.99	53,061.45	22,357.59	45,657.51	278,509.84	5.79
Pin oak	0.00	841.60	3,611.02	14,901.03	28,225.03	55,188.43	53,287.55	35,160.03	39,263.20	230,477.87	4.79
White oak	107.30	0.00	2,536.16	0.00	0.00	0.00	60,835.20	86,954.01	48,605.97	199,038.64	4.14
Sweetgum	470.99	1,883.27	2,314.08	0.00	12,307.07	40,602.94	88,740.18	39,160.84	0.00	185,479.38	3.86
Honeylocust	0.00	11,084.57	11,219.49	14,936.54	28,926.74	31,720.22	23,076.79	17,060.05	0.00	138,024.41	2.87
Sugar maple	464.26	387.40	2,407.35	8,940.62	22,580.02	40,038.66	24,684.68	0.00	19,631.60	119,134.58	2.48
Norway spruce	0.00	0.00	3,568.70	44,330.34	51,645.46	18,080.79	0.00	0.00	0.00	117,625.29	2.45
Callery pear	0.00	5,183.20	60,325.25	35,236.55	0.00	0.00	0.00	0.00	0.00	100,745.00	2.09
Oak	275.93	0.00	4,183.99	5,645.06	10,974.66	72,323.17	0.00	0.00	0.00	93,402.81	1.94
Silver maple	0.00	0.00	495.63	2,980.21	5,645.01	6,492.76	11,362.79	44,984.15	19,631.60	91,592.13	1.90
Dogwood	365.48	4,837.43	22,051.79	742.50	31,491.63	0.00	0.00	27,642.95	0.00	87,131.78	1.81
Northern red oak	356.35	3,312.35	10,144.63	27,909.96	0.00	22,522.15	0.00	0.00	0.00	64,245.44	1.34
Basswood	0.00	0.00	2,092.00	5,645.06	32,923.98	15,421.85	0.00	0.00	0.00	56,082.89	1.17
Spruce	0.00	593.05	6,275.99	5,645.06	15,493.64	0.00	26,328.43	0.00	0.00	54,336.16	1.13
Plum	928.53	2,270.99	6,513.99	28,837.87	5,645.01	1,082.13	0.00	0.00	0.00	45,278.51	0.94
Ash	464.26	454.20	5,841.35	7,976.43	16,104.87	0.00	0.00	12,409.42	0.00	43,250.53	0.90
American elm	696.39	2,190.84	1,699.30	2,980.21	11,290.01	0.00	0.00	17,580.01	0.00	36,436.76	0.76
Hickory	0.00	0.00	4,216.52	3,551.58	8,309.83	0.00	19,825.16	0.00	0.00	35,903.09	0.75
Apple	678.87	1,116.67	3,739.83	9,811.26	0.00	0.00	19,683.15	0.00	0.00	35,029.77	0.73
BDM OTHER	365.48	1,255.52	18,444.55	11,694.42	0.00	0.00	0.00	0.00	0.00	31,759.97	0.66
Eastern white pine	0.00	476.23	3,739.83	9,957.69	17,582.92	0.00	0.00	0.00	0.00	31,756.67	0.66
Blue spruce	190.52	523.62	8,239.17	8,625.27	0.00	13,639.43	0.00	0.00	0.00	31,218.01	0.65
Green ash	0.00	0.00	0.00	8,625.27	0.00	0.00	19,825.16	0.00	0.00	28,450.42	0.59
Eastern red cedar	0.00	0.00	2,568.68	9,132.64	11,731.53	0.00	0.00	0.00	0.00	23,432.85	0.49
CEL OTHER	0.00	0.00	1,869.91	0.00	0.00	0.00	0.00	21,549.54	0.00	23,419.45	0.49
BDL OTHER	128.11	0.00	0.00	1,670.63	20,994.42	0.00	0.00	0.00	0.00	22,793.16	0.47
Beech	314.48	558.33	0.00	4,978.85	0.00	15,860.11	0.00	0.00	0.00	21,711.77	0.45
Zelkova	128.11	1,883.27	6,533.86	12,622.55	0.00	0.00	0.00	0.00	0.00	21,167.79	0.44

Species	DBH Class (in)										
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	> 42	Total	% of Total
Tulip tree	0.00	0.00	1,869.91	4,978.85	0.00	11,195.37	0.00	0.00	0.00	18,044.14	0.38
Horsechestnut	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17,580.01	0.00	17,580.01	0.37
Elm	190.52	3,434.34	8,239.17	4,312.63	0.00	0.00	0.00	0.00	0.00	16,176.67	0.34
Common chokecherry	0.00	0.00	0.00	0.00	5,645.01	7,845.41	0.00	0.00	0.00	13,490.42	0.28
American holly	0.00	0.00	0.00	0.00	10,974.66	0.00	0.00	0.00	0.00	10,974.66	0.23
Japanese tree lilac	0.00	523.62	0.00	0.00	7,087.80	0.00	0.00	0.00	0.00	7,611.42	0.16
Black walnut	0.00	0.00	6,591.34	0.00	0.00	0.00	0.00	0.00	0.00	6,591.34	0.14
Willow	0.00	0.00	0.00	5,960.41	0.00	0.00	0.00	0.00	0.00	5,960.41	0.12
Ginkgo	640.54	627.76	4,628.15	0.00	0.00	0.00	0.00	0.00	0.00	5,896.45	0.12
Cherry	273.74	2,523.66	1,519.02	1,405.46	0.00	0.00	0.00	0.00	0.00	5,721.89	0.12
Northern catalpa	232.13	0.00	0.00	0.00	4,814.86	0.00	0.00	0.00	0.00	5,046.99	0.10
Southern magnolia	232.13	593.05	4,183.99	0.00	0.00	0.00	0.00	0.00	0.00	5,009.17	0.10
BDS OTHER	2,118.77	454.20	1,345.28	0.00	0.00	0.00	0.00	0.00	0.00	3,918.25	0.08
Birch	232.13	0.00	0.00	3,330.82	0.00	0.00	0.00	0.00	0.00	3,562.95	0.07
Eastern redbud	696.39	2,725.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,421.58	0.07
Black locust	0.00	0.00	3,295.67	0.00	0.00	0.00	0.00	0.00	0.00	3,295.67	0.07
Serviceberry	2,356.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,356.32	0.05
Dawn redwood	0.00	0.00	2,314.08	0.00	0.00	0.00	0.00	0.00	0.00	2,314.08	0.05
European hornbeam	0.00	1,186.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,186.09	0.02
CEM OTHER	0.00	1,047.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,047.24	0.02
Hawthorn	381.04	523.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	904.67	0.02
CES OTHER	112.72	769.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	882.26	0.02
Eastern hemlock	0.00	0.00	678.52	0.00	0.00	0.00	0.00	0.00	0.00	678.52	0.01
Red mulberry	0.00	0.00	647.82	0.00	0.00	0.00	0.00	0.00	0.00	647.82	0.01
Mountain ash	0.00	454.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	454.20	0.01
Pine	232.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	232.13	0.00
Bur oak	148.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	148.91	0.00
Total	15,742.57	75,550.89	392,211.21	454,112.45	742,372.44	902,422.84	1,020,008.75	695,024.73	512,056.54	4,809,502.42	100.00

RECOMMENDATIONS and CONCLUSIONS

- It is important to maintain an up-to-date inventory in order to direct future maintenance and planting. Record any pruning, removal, or planting activities. Try to designate this responsibility to someone early in the tree management process. Some communities decide to re-inventory 20% of their street trees every year so that every five years a total reassessment has been performed.
- A community forestry management plan is an essential component to a public tree management program. The Village of Mamaroneck can use this inventory to set maintenance and planting priorities. The Northeast Center for Urban and Community Forestry and the Arbor Day Foundation have information on the development and importance of creating a management plan. (See resource page.)
- The stocking level is 81%. It is up to a community to set stocking level goals. The national average is about 60%.
- Maple trees make up about 31% of total tree population inventoried (Norway maples alone comprise about 14%), so greater diversity is one recommended goal for a management plan. A diverse tree population helps prevent the loss of large numbers of trees when pest or disease outbreaks occur.
- When selecting tree species for new plantings, using the “right tree in the right place” promotes a healthier, more sustainable forest. Choose species that are disease and pest resistant and suitable for street plantings. Consider available planting space. Many tree failures occur because of restricted or compacted soil. Choosing the proper size tree for the site also helps prevent damage by roots to impervious surfaces. According to the National Arbor Day Foundation, tree lawns less than 4-feet wide are generally too narrow for tree planting. The Urban Horticulture Institute at Cornell University offers information on many aspects of street tree planning. (See resource page.)
- Looking at the condition of the trees and the maintenance recommendations, a community can set priorities for maintenance needs. Public safety should be a top priority. There are 75 trees that are recommended for further examination by a certified arborist. Pruning priorities should be established which take into consideration the 61 “high priority prune” trees.
- The Village’s street trees provide significant benefits to residents. With a replacement value of almost \$5 million and a total annual environmental benefits value of about \$158,000, the importance of proper management of this valuable resource is clear. The Northeast Community Tree Guide gives placement guidelines to maximize the benefits provided by public trees. (See resource page.) According to the Tree Guide and as evidenced in the inventory, larger public trees produce greater average annual net benefits.

RECOMMENDATIONS and CONCLUSIONS (cont)

- Becoming a Tree City USA can provide many benefits to a community – the Tree City designation increases public awareness about the value of trees, provides leverage when applying for grants, and indicates local commitment to a healthy community forest. The Village is to be congratulated on its 33 years as a Tree City!
- Be aware of current threats to the trees in your area; private citizens are often the early detectors of invasive species. The emerald ash borer was first found in Michigan in 2002 and has destroyed more than 50 million ash trees since that time. With 24 ash trees identified in the inventory, it is important to be aware of this threat. The emerald ash borer has now been found in 13 counties in New York, including Dutchess and Ulster. Ash trees are not currently recommended for planting.

The Asian longhorned beetle continues to threaten Brooklyn, Queens, and parts of Long Island. ALB is known to develop in and destroy as many as 23 species of deciduous trees, including maples, ash, elm, and London planetree. The NY Department of Environmental Conservation, U.S. Forest Service, USDA APHIS, and Cornell Cooperative Extension are good sources of information on invasive species.

- Planting on private property has become a new way of thinking for many communities. Some towns are considering changes to their ordinances to allow planting on homeowners' lawns especially since the loss of hundreds of thousands of trees in the wake of Superstorm Sandy. Although a shady canopy makes for a charming street, planting on the right of way is an idea that has been phased out in some towns. And by planting on the homeowner's lawn rather than on the narrow right of way, the roots have more room to spread out instead of being scrunched under the sidewalk. The New York Urban Forestry Council is studying ways in which a municipality can use public monies for this effort.

WEBSITE RESOURCES

- ARBOR DAY FOUNDATION
<http://www.arboday.org/>
- CORNELL COOPERATIVE EXTENSION
<http://www.cce.cornell.edu/dutchess/>
- CORNELL ENTOMOLOGY – pest updates
<http://www.entomology.cornell.edu/Extension/Woodys/>
- INTERNATIONAL SOCIETY OF ARBORICULTURE
<http://www.isa-arbor.com/>
- i-TREE – software suite for assessing and managing community forests
<http://www.itreetools.org/>
- NEW YORK DEC URBAN AND COMMUNITY FORESTRY
<http://www.dec.ny.gov/lands/4957.html>
- NEW YORK INVASIVE SPECIES INFORMATION WEBSITE
<http://www.nyis.info/>
- NEW YORK RELEAF
<http://www.dec.ny.gov/lands/5307.html>
- NEW YORK STATE ARBORISTS – locate certified arborists
<http://www.newyorkstatearborists.com/>
- NEW YORK STATE URBAN AND COMMUNITY FORESTRY COUNCIL
<http://www.nysurbanforestrycouncil.com/>
- NORTHEAST CENTER FOR URBAN & COMMUNITY FORESTRY – management plan guide
<http://www.umass.edu/urbantree/mgtplanguide.pdf>
- SOCIETY OF MUNICIPAL ARBORISTS
<http://www.urban-forestry.com/>
- TREE CITY – learn how to become a Tree City USA
<http://www.arboday.org/programs/treeCityUSA.cfm>
- TREELINK
<http://www.treelink.org/>
- URBAN HORTICULTURE INSTITUTE – free downloadable resources
<http://www.hort.cornell.edu/UHI/>
- US FOREST SERVICE NORTHEASTERN AREA
<http://www.na.fs.fed.us/>
- US FOREST SERVICE PACIFIC SOUTHWEST RESEARCH STATION
<http://treesearch.fs.fed.us/pubs/28759> Northeast Community Tree Guide
- URBAN NATURAL RESOURCES INSTITUTE
<http://www.unri.org/>