Lakeside, IA

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2021 Urban Forest Management Plan
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Executive Summary

Overview

This plan was developed to assist the City of Lakeside with managing its urban forest, including budgeting and future planning. Trees can provide a multitude of benefits to the community, and sound management allows a community to best take advantage of these benefits. Management is especially important considering the serious threats posed by forest pests such as the emerald ash borer (EAB). EAB is an invasive insect imported from Eastern Asia on wood shipping crates that kills all species of ash trees (this does not include mountain ash). There is a strong possibility that 31.5% of Lakeside's city owned trees (ash) will die once EAB becomes established in the community, unless preventative treatment is used. With proper planning and management, the costs of removing dead and dying trees can be extended over years, mitigating public safety issues.

Inventory and Results

In 2020, a tree inventory was conducted using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street and park trees. Below are some key findings of the 413 trees inventoried.

- Lakeside's trees provide $77,276 of benefits annually, an average of $187 a tree
- There are over 31 species of trees
- The top four genera are: Ash 31.5%, Cottonwood 29.5%, Maple 10.4%, and Apple 10.4%
- 29.5% of trees are in need of some type of management
- 59 trees are recommended for removal

Recommendations

The core recommendations are detailed in the Recommendations Section. The Emerald Ash Borer Plan includes management recommendations as well. Below are some key recommendations.

- Of the 59 trees needing removal, 26 trees are over 24 inches in diameter at 4.5 ft and must be addressed immediately *City ownership of the trees recommended for removal should be verified prior to any removal*
- 124 of the 129 ash trees should be carefully examined, as they have one or more symptoms that could be related to an EAB infestation
- All trees should be pruned on a routine schedule- one third of the city every other year
- Plant a diverse mix of trees that do not include: ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut
- Check ash trees with a visual survey yearly
- With the current budget it could take 22 years to remove ash – Suggestion: request a budget increase to $10,000 annually and apply for grants to plant replacement trees

Introduction

This plan was developed to assist Lakeside with the management, budgeting and future planning of their urban forest. Across the state, forestry budgets continue to decrease with more and more of that money spent on tree removal. With the anticipated arrival or recovery from Emerald Ash Borer (EAB), an invasive pest that kills native ash trees, it is time to prepare for the increased costs of tree removal or treatment and replacement planting. With proper planning and management of the current canopy in Lakeside, these costs can be extended over years and public safety issues from dead and dying ash trees mitigated.

Trees are an important component of Lakeside's infrastructure and one of the greatest assets to the community. The benefits of trees are immense. Trees provide the community with improved air quality, stormwater runoff interception, energy conservation, lower traffic speeds, increased property values, reduced crime, improved mental health and create a desirable place to live, to name just a few benefits. It is essential that these benefits be maintained for the people of Lakeside and future generations through good urban forestry management.

Good urban forestry management involves setting goals and developing management strategies to achieve these goals. An essential part of developing management strategies is a comprehensive public tree inventory. The inventory supplies information that will be used for maintenance, removal schedules, tree planting and budgeting. Basing actions on this information will help meet Lakeside's urban forestry goals.

Inventory

In 2020, a tree inventory was conducted that included 100% of the city owned trees on both streets and parks. The tree data was collected using a handheld Global Positioning System (GPS) receiver. The data collector gives Geographic Information Systems (GIS) coordinates with an accuracy of 3 meters, which can be used in Arc GIS as an active GIS data layer. Because the inventory is a digital document the data can be updated with new information and become a working document.

The programming used to collect tree information on the data collectors was written to be compatible with a state-of-the-art software suite called i-Tree. i-Tree was developed by the USDA Forest Service to quantify the structure of community trees and the environmental services that trees provide. The i-Tree suite is a public domain which can be accessed for free.

To quantify the urban forest structure and benefits, specific data is collected for each tree. This data includes: location, land use, species, diameter at 4.5 ft, recommended maintenance, priority of that maintenance, leaf health, and wood condition. Additionally, signs and symptoms associated with EAB were noted for all ash trees. The signs and symptoms noted were canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and woodpecker damage.

Inventory Results

The data collected for the 413 city trees was entered into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management as part of the i-Tree suite. The following are results from the i-Tree STREETS analysis.

Annual Benefits

Annual Energy Benefits

Trees conserve energy by shading buildings and blocking winds. Lakeside's trees reduce energy related costs by approximately $21,053 annually (Appendix A, Table 1). These savings are both in Electricity (99.9 MWh) and in Natural Gas (13,743.4 Therms).

Annual Stormwater Benefits

Lakeside's trees intercept about 1,147,477 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $31,097 of benefits to the city.

Annual Air Quality Benefits

Air quality is a persistent public health issue in Iowa. The urban forest improves air quality by removing pollutants, lowering air temperature, and reducing energy consumption, which in turn reduces emissions from power plants, and emitting volatile organic matter (ozone). In Lakeside, it is estimated that trees remove 1,335 lbs of air pollution (ozone (O_3), particulate matter less than 10 microns (PM10), carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2)) per year with a net value of $3,817 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Lakeside, trees sequester about 358,086 lbs of carbon a year with an associated value of $2,686 (Appendix A, Table 5). In addition, the trees store 5,294,451 lbs of carbon, with a yearly benefit of $39,708 (Appendix A, Table 4).

Annual Aesthetics Benefits

Social benefits of trees are hard to capture. The analysis does have a calculation for this area that includes: aesthetic value, property values, lowered rates of mental illness and crime, city livability and much more. Lakeside receives $18,624 in annual social benefits from trees (Appendix A, Table 6).

Financial Summary of all Benefits

According to the USDA Forest Service i-Tree STREETS analysis, Lakeside's trees provide $77,276 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 413 trees in Lakeside provide approximately $187 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

Lakeside has over 31 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Ash	130	31.5%
Cottonwood	122	29.5%
Apple	43	10.4%
Maple(silver, Norway, box elder, red, sugar)	43	10.4%
Spruce	18	4.4%
Mulberry	7	1.7%
Broadleaf Decid. Med.	7	1.7%
Oak (bur and red)	6	1.5%
Broadleaf Decid. Small	6	1.5%

Age Class

Most of Lakeside's trees (35%) are between 6 and 18 inches in diameter at 4.5 ft (Appendix A, Figure 2). For age, it is preferred that the highest amounts of trees are in the smallest size category (a downward slope) to prepare for natural mortality and to maintain canopy cover. Lakeside's size curve is on the smaller side, indicating a younger than average stand.

Condition: Wood and Foliage

Both wood condition and leaf condition are good indicators of the overall health of the urban forest. The foliage condition results for Lakeside indicate that 85% of the trees are in good health, with only 1.5% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 75% of Lakeside's trees are in good health for wood condition (appendix A, Figure 4 & Appendix B, Figure 3). Wood condition that is in poor health, dead or dying is about 11% of the population. This 11% is an estimate of trees that need management follow up.

Management Needs

The following outlines the specific management needs of the street and park trees by number of trees and percent of canopy (Appendix B, Figure 3).

Tree Removal	59	14.3%
Crown Cleaning	58	14%
Crown Reduction	4	1%

Canopy Cover

The total canopy with both private and public trees is 34%, at 38.5 canopy acres. The canopy cover on city-owned properties included in the Lakeside inventory includes approximately 11.7 acres (Appendix A, Figure 4). The City's Canopy goal is to increase canopy by 3%, in 30 years on all lands. To achieve this goal it is estimated that 8 trees need to be planted annually on public and/or private lands.

Land Use and Location

The majority of Lakeside's city and park trees are in front yards in parks or open areas (Appendix A, Figure 6 & Appendix A, Figure7). The following describes the land use and locations for the street and park trees.

Park/vacant/other	61%
Single Family Residential	39%

Location

Front Yard	83%
Planting Strip	17%

Recommendations

Risk Management

Hazardous trees can be a significant threat to both people and property. Trees that are dead or dying, or that have large issues such as trunk cracks longer than 18 inches should be removed. Broken branches and branches that interfere with motorist's vision of pedestrians, vehicles, traffic signs and signals, etc should be removed.

Hazardous trees

Lakeside has 6 critical concern trees and 14 trees labeled needing immediate removal. Both categories need immediate removal. These trees can be seen on the Location of Trees with Recommended Maintenance map (Appendix B, Figure 4). It is recommended to start with the large diameter critical concern trees first. There are 14 trees of the 20 that are over 18 inches in diameter at 4.5 ft that should be addressed immediately. Please refer to the six year maintenance plan at the end of this section. After all of the critical concern trees are addressed, there should be follow up on the trees marked as needing maintenance. There are a total of 102 additional trees with these needs.

Poor tree species

After the removal of the critical concern trees, ash trees in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). Of the 59 removals, 34 are ash trees. There are a total of 129 ash trees, and 124 of those have signs and symptoms that have been associated with EAB. In addition, there are 17 trees that are in poor health. *City ownership of the trees recommended for removal should be verified prior to any removal*

Pruning Cycle

Proper pruning can extend the life and good health of trees, as well as reduce public safety issues. In the Management Needs section of the Findings there are four main maintenance issues to be addressed: routine pruning, crown cleaning, crown raising, and crown reduction. Crown cleaning removes dead, diseased, and damaged limbs. Crown raising is the removal of lower branches that are 2 inches in diameter or larger in the case of providing clearance for pedestrians or vehicles. Crown reduction is removing individual limbs from structures or utility wires. It is recommended that all trees be pruned on a routine schedule every five to seven years. Please refer to the six year maintenance plan for further information.

Planting

Most of the planting over the next 5 years will replace the trees that are removed. It is recommended to plant 1.2 trees for every tree removed, since survival rates will not be 100%. Please refer to the six year maintenance plan at the end of this section. It is not essential that the new trees be planted in the same location of the trees being removed. However, maintaining the same number of trees helps ensure continuation of the benefits of the existing forest in Lakeside.

It is important to plant a diverse mix of species in the urban forest to maintain canopy health, since most insects and diseases target a genus (ash) or species (green ash) of trees. Current diversity recommendations advise that a genus (i.e. maple, oak) not make up more than 20% of the urban forest and a single species (i.e. silver maple, sugar maple, white oak, bur oak) not make up more than 10% of the total urban forest. Presently, the forest is heavily planted with cottonwood (29.5%) (Appendix A, Figure 1). Cottonwoods should not be planted until this percentage can be lowered. Also, ash trees have not been recommended since 2002, due to the threat of EAB. Other species to avoid because they are public nuisances include: cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut. All trees planted must meet the restrictions in city ordinance Chapter 3, Article 4 (Appendix C).

Continual Monitoring

Due to the threat of EAB, it is important to continuously check the health of ash trees. It is recommended that ash trees be checked with a visual survey every year for tree decline and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and woodpecker damage.

Budget and Emerald Ash Borer Plan

Six Year Maintenance Plan with <u>No Additional Funding</u>
Current Budget $8,000/year, Total $48,000 over 6 years

FY 2021
Removal: 6 critical concern trees plus 3 trees labeled for immediate removal , $7,200
    Planting and Replacement: 3 trees to be planted in open locations, $300
    Young Tree Pruning & Maintenance: $500
    Visual Survey for signs and symptoms of EAB

FY 2022
    Removal: 3 more trees labeled for immediate removal $2,400
    Planting and Replacement: 10 trees in open locations from year one removals, $1,000
    Young Tree Pruning & Maintenance: $500
    Routine trimming: Contract to trim 1/3 of the city trees, $4,100
    Visual Survey for signs and symptoms of EAB

FY 2023
    Removal: 8 trees remaining trees labeled for immediate removal plus 1 new critical concern trees and ash in poor health $7,200

Planting and Replacement: 3 locations from previous removals, $300
Young Tree Pruning & Maintenance: $500
Visual Survey for signs and symptoms of EAB

FY 2024
Removal: 3 trees - removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal, $2,400
Planting and Replacement: 10 trees in open locations from previous removals, $1,000
Routine trimming: Contract to trim 1/3 of the city trees, $4,100
Young Tree Pruning & Maintenance: $500
Visual Survey for signs and symptoms of EAB

FY 2025
Removal: 9 trees - removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal, $7,200
Planting and Replacement: 9 trees to be planted in open locations and locations from previous removals, $300
Young Tree Pruning & Maintenance: $500
Visual Survey for signs and symptoms of EAB

FY 2026
Removal: 3 trees - removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal, $2,400
Planting and Replacement: 10 trees in open locations from previous removals, $1,000
Routine trimming: Contract to trim 1/3 of the city trees, $4,100
Young Tree Pruning & Maintenance: $500
Visual Survey for signs and symptoms of EAB

*Reduction of ash over 6 years: Approximately 36 ash trees removed (approximately 28% of ash). It will take approximately 22 years to remove all ash with the current budget. EAB could potentially kill all ash within 4 to 15 years of its arrival.
**To remove all ash trees within 6 years, the budget would need to be increased to $20,400 a year. If the budget were increased to $10,000 a year all ash could be removed in 15 years.

Ash Tree Removal
Tree removal will be prioritized with dead, dying, hazardous trees to be removed first (Appendix B, Figure 4). Next will be all ash in poor condition and displaying signs and symptoms of EAB (Appendix B, Figure 2 & Appendix B, Figure 3). *City ownership of the tree recommended for removal should be verified prior to any removal*

Treatment of Ash Trees
Chemical treatment can be an effective tool for communities to spread removal costs out over several years while allowing trees to continue to provide benefits. However, treatment is not recommended if EAB is more than 15 miles away from the community. For more information on the cost of treatment strategies visit http://extension.entm.purdue.edu/treecomputer/

EAB Quarantines

EAB is an extremely destructive plant pest and it is responsible for the death and decline of millions of ash trees. Ash in both forested and urban settings constitute a significant portion of the canopy cover in the United States. Current tools to detect, control, suppress and eradicate this pest are not as robust as the USDA would desire. In order to stay ahead of this hard to detect beetle, the USDA is attempting to contain the beetle before it spreads beyond its known positions by regulating articles.

A regulated article under the USDA's quarantine includes any of the following items:
- emerald ash borer
- firewood of all hardwood species (for example ash, oak, maple and hickory)
- nursery stock and green lumber of ash
- any other ash material, whether living, dead, cut or fallen, including logs, stumps, roots, branches, as well as composted and not composted chips of the genus ash (Mountain ash is not included)

In addition, any other article, product or means of conveyance not listed above may be designated as a regulated article if a USDA inspector determines that it presents a risk of spreading EAB once a quarantine is in effect for your county.

Wood Disposal

A very important aspect of planning is determining how wood infested with EAB will be handled, keeping in mind that quarantines will restrict its movement. Consider who will cut and haul the dead and dying trees? Is there an accessible, secured site big enough to store and sort the hundreds of trees and the associated brush and chips? How will wood be disposed of or utilized? Do you have equipment capable of handling the amount and size of ash trees your tree inventory has identified? Once your county is under quarantine for EAB, contact USDA-APHIS-PPQ at 515-251-4083 or visit the website http://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/regulatory.shtml. Wood waste can be disposed of as you normally would if your county is not part of a quarantine.

Canopy Replacement

As budget permits, all removed trees will be replaced. All trees will meet the restrictions in city ordinance Chapter 3, Article 4 (Appendix C). The new plantings will be a diverse mix and will not include ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.

Postponed Work

While finances, staffing and equipment are focused on the management of ash, usual services may be delayed. Tree removal requests on genera other than ash will be prioritized by hazardous or emergency situations only.

Monitoring

It is recommended that ash trees be checked with a visual survey every year for tree death and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and woodpecker damage.

Private Ash Trees

It is strongly recommended that private property owners start removing ash trees on their property upon arrival of EAB if preventative treatments are not being used. City Code Chapter 3, Article 4.03 states "The city shall have removed, on the order of the council, any tree on the streets of the city which interferes with the making of improvements or with travel thereon. He shall additionally remove any trees on the street, not on private property, which have become diseased, or which constitute a danger to the public or which may otherwise be declared a nuisance."

Proposed Budget Increase

EAB could potentially kill all ash trees in Lakeside within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $20,400 (total ash + all other removals *removal cost + (planting and maintenance *1.2 of removals) /6) a year. Additionally, it is recommended that Lakeside apply for grants to fund replacement trees. Utility Company grants are usually between $500 and $10,000 for community-based, tree-planting projects that include parks, gateways, cemeteries, nature trails, libraries, nursing homes, and schools.

Another option being considered by many communities is treating a number of selected trees, either to maintain those trees in the landscape or to delay their removal – to spread out the costs and number of trees needing to be removed all at once. Trunk injection is administered every two years for the life of the tree. If treatment is discontinued, the tree dies. For instance, in this treatment scenario, the average ash diameter is 20 inches and at $15 per inch, about 4 trees could be treated per year (every other year treatment) would be $1,200. This would be 8 trees selected for treatment, and Lakeside would still need to find $8,000 (total ash - 8 *removal cost) for removal. Alternatively, if there are 15 treatable trees, it would cost approximately $2,250 a year for treatment and leave $1,800 (total ash- 8 *removal cost) for removal. These are alternatives to straight removal of ash trees. However, whether or not the treatment option is selected, there will be an increased cost of dealing with ash trees if EAB is found in Lakeside. It is suggested to consider increasing the budget to plan for this.

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Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Lakeside

Annual Energy Benefits of Public Trees

3/17/2021

Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	36.0	2,731	4,854.5	4,757	7,488	(N/A)	31.5	35.6	57.60
Cottonwood	43.6	3,308	5,981.5	5,862	9,170	(N/A)	29.5	43.6	75.16
Apple	2.4	183	413.8	406	588	(N/A)	10.4	2.8	13.68
Silver maple	5.3	400	689.3	676	1,075	(N/A)	4.4	5.1	59.73
Norway maple	3.2	245	465.7	456	701	(N/A)	3.9	3.3	43.84
Blue spruce	0.8	57	116.7	114	172	(N/A)	2.9	0.8	14.30
Broadleaf Deciduous Medium	0.2	18	37.7	37	54	(N/A)	1.7	0.3	7.78
Mulberry	0.8	57	120.4	118	175	(N/A)	1.7	0.8	25.03
Broadleaf Deciduous Small	0.5	35	64.5	63	98	(N/A)	1.5	0.5	16.31
Spruce	0.4	28	48.9	48	76	(N/A)	1.2	0.4	15.27
Northern red oak	0.5	36	70.8	69	106	(N/A)	1.2	0.5	21.11
Red maple	0.7	56	93.1	91	147	(N/A)	1.0	0.7	36.76
Northern white cedar	0.2	17	38.0	37	54	(N/A)	1.0	0.3	13.58
Boxelder	0.5	40	75.6	74	114	(N/A)	1.0	0.5	28.53
Honeylocust	1.2	89	157.4	154	243	(N/A)	1.0	1.2	60.82
Littleleaf linden	0.4	27	48.9	48	75	(N/A)	0.7	0.4	25.07
Black walnut	0.4	32	54.4	53	86	(N/A)	0.7	0.4	28.50
Conifer Evergreen Small	0.0	4	7.4	7	11	(N/A)	0.7	0.1	3.62
American elm	0.5	41	69.3	68	109	(N/A)	0.5	0.5	54.28
Lilac	0.0	2	4.4	4	6	(N/A)	0.5	0.0	3.13
Catalpa	0.8	62	110.0	108	170	(N/A)	0.5	0.8	84.77
Conifer Evergreen Medium	0.1	10	20.4	20	30	(N/A)	0.5	0.1	14.80
Bur oak	0.0	2	3.7	4	6	(N/A)	0.2	0.0	5.82
Sugar maple	0.2	18	26.9	26	44	(N/A)	0.2	0.2	44.11
Norway spruce	0.1	4	9.5	9	14	(N/A)	0.2	0.1	13.58
Siberian elm	0.3	20	37.9	37	57	(N/A)	0.2	0.3	57.41
Birch	0.0	3	6.2	6	9	(N/A)	0.2	0.0	8.99
Black cherry	0.0	0	0.6	1	1	(N/A)	0.2	0.0	0.87
Callery pear	0.1	8	16.9	17	24	(N/A)	0.2	0.1	24.47
Northern hackberry	0.4	33	60.8	60	92	(N/A)	0.2	0.4	92.23
Basswood	0.3	20	38.1	37	57	(N/A)	0.2	0.3	57.32
Total	99.9	7,584	13,743.4	13,469	21,053	(N/A)	100.0	100.0	50.98

Table 2: Annual Stormwater Benefits

Lakeside

Annual Stormwater Benefits of Public Trees

3/17/2021

Species	Total rainfall interception (Gal)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	390,946	10,595	(N/A)	31.5	34.1	81.50
Cottonwood	570,419	15,458	(N/A)	29.5	49.7	126.71
Apple	8,892	241	(N/A)	10.4	0.8	5.60
Silver maple	69,797	1,892	(N/A)	4.4	6.1	105.08
Norway maple	26,360	714	(N/A)	3.9	2.3	44.65
Blue spruce	8,856	240	(N/A)	2.9	0.8	20.00
Broadleaf Deciduous Medium	1,233	33	(N/A)	1.7	0.1	4.77
Mulberry	3,163	86	(N/A)	1.7	0.3	12.25
Broadleaf Deciduous Small	1,608	44	(N/A)	1.5	0.1	7.26
Spruce	4,317	117	(N/A)	1.2	0.4	23.40
Northern red oak	2,643	72	(N/A)	1.2	0.2	14.33
Red maple	4,458	121	(N/A)	1.0	0.4	30.21
Northern white cedar	2,382	65	(N/A)	1.0	0.2	16.14
Boxelder	4,393	119	(N/A)	1.0	0.4	29.76
Honeylocust	12,902	350	(N/A)	1.0	1.1	87.41
Littleleaf linden	2,181	59	(N/A)	0.7	0.2	19.70
Black walnut	2,681	73	(N/A)	0.7	0.2	24.22
Conifer Evergreen Small	550	15	(N/A)	0.7	0.0	4.97
American elm	4,170	113	(N/A)	0.5	0.4	56.50
Lilac	76	2	(N/A)	0.5	0.0	1.03
Catalpa	11,182	303	(N/A)	0.5	1.0	151.51
Conifer Evergreen Medium	1,511	41	(N/A)	0.5	0.1	20.47
Bur oak	172	5	(N/A)	0.2	0.0	4.65
Sugar maple	1,367	37	(N/A)	0.2	0.1	37.05
Norway spruce	596	16	(N/A)	0.2	0.1	16.14
Siberian elm	2,290	62	(N/A)	0.2	0.2	62.07
Birch	163	4	(N/A)	0.2	0.0	4.41
Black cherry	7	0	(N/A)	0.2	0.0	0.20
Callery pear	586	16	(N/A)	0.2	0.1	15.88
Northern hackberry	4,984	135	(N/A)	0.2	0.4	135.08
Basswood	2,591	70	(N/A)	0.2	0.2	70.21
Citywide total	1,147,477	31,097	(N/A)	100.0	100.0	75.29

Table 3: Annual Air Quality Benefits

Annual Air Quality Benefits of Public Trees

3/17/2021

Species	Deposition (lb)				Total Depos. ($)	Avoided (lb)				Total Avoided ($)	BVOC Emissions (lb)	BVOC Emissions ($)	Total (lb)	Total ($) Standard Error	% of Total Trees	Avg. $/tree
	O_3	NO_2	PM_{10}	SO_2		NO_2	PM_{10}	VOC	SO_2							
Green ash	50.7	8.1	24.2	2.3	270	171.2	25.0	23.8	163.1	1,068	0.0	0	468.3	1,338 (N/A)	31.5	10.29
Cottonwood	89.9	14.4	40.7	4.0	472	208.3	30.3	28.9	197.5	1,297	0.0	0	613.9	1,769 (N/A)	29.5	14.50
Apple	1.6	0.3	0.9	0.1	9	12.2	1.7	1.6	10.9	74	0.0	0	29.4	83 (N/A)	10.4	1.94
Silver maple	11.4	1.9	5.7	0.5	62	24.8	3.6	3.5	23.8	155	-6.1	-23	69.2	194 (N/A)	4.4	10.79
Norway maple	4.9	0.8	2.5	0.2	26	15.7	2.3	2.2	14.7	97	-1.2	-4	41.9	119 (N/A)	3.9	7.44
Blue spruce	0.8	0.2	0.8	0.1	6	3.7	0.5	0.5	3.4	23	-2.8	-11	7.3	18 (N/A)	2.9	1.52
Broadleaf Deciduous Medium	0.1	0.0	0.1	0.0	1	1.2	0.2	0.2	1.0	7	0.0	0	2.7	8 (N/A)	1.7	1.09
Mulberry	0.9	0.1	0.4	0.0	5	3.8	0.5	0.5	3.4	23	0.0	0	9.7	28 (N/A)	1.7	3.95
Broadleaf Deciduous Small	0.4	0.1	0.2	0.0	2	2.2	0.3	0.3	2.1	14	0.0	0	5.6	16 (N/A)	1.5	2.66
Spruce	0.4	0.1	0.4	0.1	3	1.8	0.3	0.2	1.7	11	-1.4	-5	3.5	9 (N/A)	1.2	1.73
Northern red oak	0.3	0.1	0.2	0.0	2	2.3	0.3	0.3	2.2	14	-0.5	-2	5.3	14 (N/A)	1.2	2.89
Red maple	0.8	0.1	0.4	0.0	4	3.4	0.5	0.5	3.3	22	-0.3	-1	8.8	25 (N/A)	1.0	6.20
Northern white cedar	0.2	0.0	0.2	0.0	1	1.1	0.2	0.2	1.0	7	-0.7	-2	2.3	6 (N/A)	1.0	1.48
Boxelder	0.4	0.1	0.2	0.0	2	2.5	0.4	0.4	2.4	16	-0.2	-1	6.2	17 (N/A)	1.0	4.33
Honeylocust	2.5	0.4	1.1	0.1	13	5.6	0.8	0.8	5.3	35	-1.9	-7	14.7	41 (N/A)	1.0	10.16
Littleleaf linden	0.2	0.0	0.1	0.0	1	1.7	0.3	0.2	1.6	11	-0.1	-1	4.1	12 (N/A)	0.7	3.84
Black walnut	0.2	0.0	0.1	0.0	1	2.0	0.3	0.3	1.9	12	0.0	0	4.8	13 (N/A)	0.7	4.47
Conifer Evergreen Small	0.0	0.0	0.0	0.0	0	0.2	0.0	0.0	0.2	1	-0.3	-1	0.3	1 (N/A)	0.7	0.20
American elm	0.3	0.1	0.2	0.0	2	2.5	0.4	0.4	2.4	16	0.0	0	6.3	18 (N/A)	0.5	8.84
Lilac	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	0.0	0	0.3	1 (N/A)	0.5	0.41
Catalpa	2.1	0.3	0.9	0.1	11	3.9	0.6	0.5	3.7	24	0.0	0	12.1	35 (N/A)	0.5	17.51
Conifer Evergreen Medium	0.1	0.0	0.1	0.0	1	0.6	0.1	0.1	0.6	4	-0.5	-2	1.2	3 (N/A)	0.5	1.53
Bur oak	0.0	0.0	0.0	0.0	0	0.1	0.0	0.0	0.1	1	0.0	0	0.3	1 (N/A)	0.2	0.87
Sugar maple	0.1	0.0	0.1	0.0	1	1.1	0.2	0.2	1.1	7	-0.1	0	2.6	7 (N/A)	0.2	7.08
Norway spruce	0.1	0.0	0.1	0.0	0	0.3	0.0	0.0	0.3	2	-0.2	-1	0.6	1 (N/A)	0.2	1.48
Siberian elm	0.3	0.0	0.1	0.0	1	1.3	0.2	0.2	1.2	8	0.0	0	3.3	9 (N/A)	0.2	9.47
Birch	0.0	0.0	0.0	0.0	0	0.2	0.0	0.0	0.2	1	0.0	0	0.4	1 (N/A)	0.2	1.21
Black cherry	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0	0.0	0 (N/A)	0.2	0.11
Callery pear	0.1	0.0	0.0	0.0	0	0.5	0.1	0.1	0.5	3	0.0	0	1.2	3 (N/A)	0.2	3.47
Northern hackberry	0.9	0.1	0.4	0.0	5	2.1	0.3	0.3	2.0	13	0.0	0	6.1	18 (N/A)	0.2	17.54
Basswood	0.3	0.0	0.1	0.0	1	1.3	0.2	0.2	1.2	8	0.0	0	3.3	9 (N/A)	0.2	9.34
Citywide total	170.1	27.5	80.5	7.8	905	477.6	69.5	66.3	452.8	2,974	-16.4	-61	1,335.7	3,817 (N/A)	100.0	9.24

Table 4: Annual Carbon Stored

Lakeside

Stored CO2 Benefits of Public Trees

3/17/2021

Species	Total Stored CO2 (lbs)	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	1,682,379	12,618	(N/A)	31.5	31.8	97.06
Cottonwood	3,025,076	22,688	(N/A)	29.5	57.1	185.97
Apple	32,299	242	(N/A)	10.4	0.6	5.63
Silver maple	257,597	1,932	(N/A)	4.4	4.9	107.33
Norway maple	80,187	601	(N/A)	3.9	1.5	37.59
Blue spruce	3,762	28	(N/A)	2.9	0.1	2.35
Broadleaf Deciduous	2,286	17	(N/A)	1.7	0.0	2.45
Mulberry	14,319	107	(N/A)	1.7	0.3	15.34
Broadleaf Deciduous	6,785	51	(N/A)	1.5	0.1	8.48
Spruce	2,856	21	(N/A)	1.2	0.1	4.28
Northern red oak	5,123	38	(N/A)	1.2	0.1	7.68
Red maple	9,450	71	(N/A)	1.0	0.2	17.72
Northern white cedar	1,027	8	(N/A)	1.0	0.0	1.93
Boxelder	11,247	84	(N/A)	1.0	0.2	21.09
Honeylocust	32,140	241	(N/A)	1.0	0.6	60.26
Littleleaf linden	5,644	42	(N/A)	0.7	0.1	14.11
Black walnut	5,741	43	(N/A)	0.7	0.1	14.35
Conifer Evergreen Sm	129	1	(N/A)	0.7	0.0	0.32
American elm	9,780	73	(N/A)	0.5	0.2	36.67
Lilac	192	1	(N/A)	0.5	0.0	0.72
Catalpa	71,755	538	(N/A)	0.5	1.4	269.08
Conifer Evergreen Me	568	4	(N/A)	0.5	0.0	2.13
Bur oak	185	1	(N/A)	0.2	0.0	1.39
Sugar maple	3,624	27	(N/A)	0.2	0.1	27.18
Norway spruce	257	2	(N/A)	0.2	0.0	1.93
Siberian elm	6,743	51	(N/A)	0.2	0.1	50.57
Birch	218	2	(N/A)	0.2	0.0	1.64
Black cherry	14	0	(N/A)	0.2	0.0	0.10
Callery pear	1,101	8	(N/A)	0.2	0.0	8.26
Northern hackberry	13,507	101	(N/A)	0.2	0.3	101.30
Basswood	8,458	63	(N/A)	0.2	0.2	63.43
Citywide total	5,294,451	39,708	(N/A)	100.0	100.0	96.15

Table 5: Annual Carbon Sequestered

Lakeside

Annual CO₂ Benefits of Public Trees

3/17/2021

Species	Sequestered (lb)	Sequestered ($)	Decomposition Release (lb)	Maintenance Release (lb)	Total Released ($)	Avoided (lb)	Avoided ($)	Net Total (lb)	Total Standard ($) Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	80,042	600	-8,075	-374	-63	60,348	453	131,941	990 (N/A)	31.5	36.8	7.61
Cottonwood	90,901	682	-14,520	-483	-113	73,103	548	149,001	1,118 (N/A)	29.5	41.6	9.16
Apple	3,463	26	-155	-42	-1	4,039	30	7,304	55 (N/A)	10.4	2.0	1.27
Silver maple	20,179	151	-1,237	-56	-10	8,829	66	27,715	208 (N/A)	4.4	7.7	11.55
Norway maple	5,596	42	-386	-32	-3	5,415	41	10,593	79 (N/A)	3.9	3.0	4.97
Blue spruce	462	3	-18	-14	0	1,265	9	1,696	13 (N/A)	2.9	0.5	1.06
Broadleaf Deciduous Medi	475	4	-11	-3	0	388	3	848	6 (N/A)	1.7	0.2	0.91
Mulberry	837	6	-69	-11	-1	1,264	9	2,021	15 (N/A)	1.7	0.6	2.17
Broadleaf Deciduous Smal	687	5	-33	-6	0	766	6	1,414	11 (N/A)	1.5	0.4	1.77
Spruce	340	3	-14	-6	0	628	5	948	7 (N/A)	1.2	0.3	1.42
Northern red oak	737	6	-25	-6	0	799	6	1,505	11 (N/A)	1.2	0.4	2.26
Red maple	1,297	10	-45	-6	0	1,233	9	2,478	19 (N/A)	1.0	0.7	4.65
Northern white cedar	211	2	-5	-5	0	378	3	579	4 (N/A)	1.0	0.2	1.08
Boxelder	1,236	9	-54	-6	0	885	7	2,061	15 (N/A)	1.0	0.6	3.87
Honeylocust	4,109	31	-154	-9	-1	1,968	15	5,914	44 (N/A)	1.0	1.7	11.09
Littleleaf linden	961	7	-27	-4	0	604	5	1,533	12 (N/A)	0.7	0.4	3.83
Black walnut	863	6	-28	-4	0	710	5	1,541	12 (N/A)	0.7	0.4	3.85
Conifer Evergreen Small	40	0	-1	-2	0	79	1	117	1 (N/A)	0.7	0.0	0.29
American elm	564	4	-47	-5	0	899	7	1,411	11 (N/A)	0.5	0.4	5.29
Lilac	47	0	-1	-1	0	43	0	88	1 (N/A)	0.5	0.0	0.33
Catalpa	1,336	10	-344	-9	-3	1,365	10	2,347	18 (N/A)	0.5	0.7	8.80
Conifer Evergreen Mediun	77	1	-3	-2	0	212	2	285	2 (N/A)	0.5	0.1	1.07
Bur oak	74	1	-1	-1	0	49	0	121	1 (N/A)	0.2	0.0	0.91
Sugar maple	319	2	-17	-2	0	391	3	691	5 (N/A)	0.2	0.2	5.18
Norway spruce	53	0	-1	-1	0	94	1	145	1 (N/A)	0.2	0.0	1.08
Siberian elm	485	4	-32	-3	0	447	3	897	7 (N/A)	0.2	0.3	6.73
Birch	96	1	-2	-1	0	65	0	158	1 (N/A)	0.2	0.0	1.18
Black cherry	9	0	0	0	0	6	0	14	0 (N/A)	0.2	0.0	0.10
Callery pear	224	2	-5	-1	0	176	1	393	3 (N/A)	0.2	0.1	2.95
Northern hackberry	616	5	-65	-4	-1	721	5	1,269	10 (N/A)	0.2	0.4	9.51
Basswood	660	5	-41	-3	0	441	3	1,058	8 (N/A)	0.2	0.3	7.93
Citywide total	216,993	1,627	-25,416	-1,103	-199	167,611	1,257	358,086	2,686 (N/A)	100.0	100.0	6.50

Table 6: Annual Social and Aesthetic Benefits

Lakeside

Annual Aesthetic/Other Benefits of Public Trees

3/17/2021

Species	Total ($)	Standard Error	% of Total Trees	% of Total $	Avg. $/tree
Green ash	6,746	(N/A)	31.5	36.2	51.90
Cottonwood	6,761	(N/A)	29.5	36.3	55.42
Apple	193	(N/A)	10.4	1.0	4.49
Silver maple	1,642	(N/A)	4.4	8.8	91.22
Norway maple	551	(N/A)	3.9	3.0	34.43
Blue spruce	240	(N/A)	2.9	1.3	19.97
Broadleaf Deciduous Medium	66	(N/A)	1.7	0.4	9.45
Mulberry	47	(N/A)	1.7	0.3	6.79
Broadleaf Deciduous Small	39	(N/A)	1.5	0.2	6.53
Spruce	101	(N/A)	1.2	0.5	20.25
Northern red oak	81	(N/A)	1.2	0.4	16.24
Red maple	191	(N/A)	1.0	1.0	47.86
Northern white cedar	62	(N/A)	1.0	0.3	15.42
Boxelder	133	(N/A)	1.0	0.7	33.23
Honeylocust	1,004	(N/A)	1.0	5.4	250.97
Littleleaf linden	117	(N/A)	0.7	0.6	39.16
Black walnut	103	(N/A)	0.7	0.6	34.32
Conifer Evergreen Small	40	(N/A)	0.7	0.2	13.37
American elm	88	(N/A)	0.5	0.5	43.90
Lilac	2	(N/A)	0.5	0.0	1.05
Catalpa	94	(N/A)	0.5	0.5	47.08
Conifer Evergreen Medium	42	(N/A)	0.5	0.2	21.08
Bur oak	15	(N/A)	0.2	0.1	14.73
Sugar maple	40	(N/A)	0.2	0.2	39.54
Norway spruce	15	(N/A)	0.2	0.1	15.42
Siberian elm	40	(N/A)	0.2	0.2	39.94
Birch	13	(N/A)	0.2	0.1	12.89
Black cherry	0	(N/A)	0.2	0.0	0.03
Callery pear	26	(N/A)	0.2	0.1	26.22
Northern hackberry	73	(N/A)	0.2	0.4	72.66
Basswood	58	(N/A)	0.2	0.3	57.69
Citywide total	18,624	(N/A)	100.0	100.0	45.09

Table 7: Summary of Benefits in Dollars

Lakeside

Total Annual Benefits of Public Trees by Species ($)

3/17/2021

| Species	Energy	CO$_2$	Air Quality	Stormwater	Aesthetic/Other	Total ($)	Standard Error	% of Total $
Green ash	7,488	990	1,338	10,595	6,746	27,156	(N/A)	35.1
Cottonwood	9,170	1,118	1,769	15,458	6,761	34,275	(N/A)	44.4
Apple	588	55	83	241	193	1,161	(N/A)	1.5
Silver maple	1,075	208	194	1,892	1,642	5,011	(N/A)	6.5
Norway maple	701	79	119	714	551	2,165	(N/A)	2.8
Blue spruce	172	13	18	240	240	682	(N/A)	0.9
Broadleaf Deciduous M	54	6	8	33	66	168	(N/A)	0.2
Mulberry	175	15	28	86	47	351	(N/A)	0.5
Broadleaf Deciduous Sn	98	11	16	44	39	207	(N/A)	0.3
Spruce	76	7	9	117	101	310	(N/A)	0.4
Northern red oak	106	11	14	72	81	284	(N/A)	0.4
Red maple	147	19	25	121	191	503	(N/A)	0.7
Northern white cedar	54	4	6	65	62	191	(N/A)	0.2
Boxelder	114	15	17	119	133	399	(N/A)	0.5
Honeylocust	243	44	41	350	1,004	1,682	(N/A)	2.2
Littleleaf linden	75	12	12	59	117	275	(N/A)	0.4
Black walnut	86	12	13	73	103	286	(N/A)	0.4
Conifer Evergreen Smal	11	1	1	15	40	67	(N/A)	0.1
American elm	109	11	18	113	88	338	(N/A)	0.4
Lilac	6	1	1	2	2	12	(N/A)	0.0
Catalpa	170	18	35	303	94	619	(N/A)	0.8
Conifer Evergreen Medi	30	2	3	41	42	118	(N/A)	0.2
Bur oak	6	1	1	5	15	27	(N/A)	0.0
Sugar maple	44	5	7	37	40	133	(N/A)	0.2
Norway spruce	14	1	1	16	15	48	(N/A)	0.1
Siberian elm	57	7	9	62	40	176	(N/A)	0.2
Birch	9	1	1	4	13	29	(N/A)	0.0
Black cherry	1	0	0	0	0	1	(N/A)	0.0
Callery pear	24	3	3	16	26	73	(N/A)	0.1
Northern hackberry	92	10	18	135	73	327	(N/A)	0.4
Basswood	57	8	9	70	58	202	(N/A)	0.3
Citywide Total	21,053	2,686	3,817	31,097	18,624	77,276	(N/A)	100.0
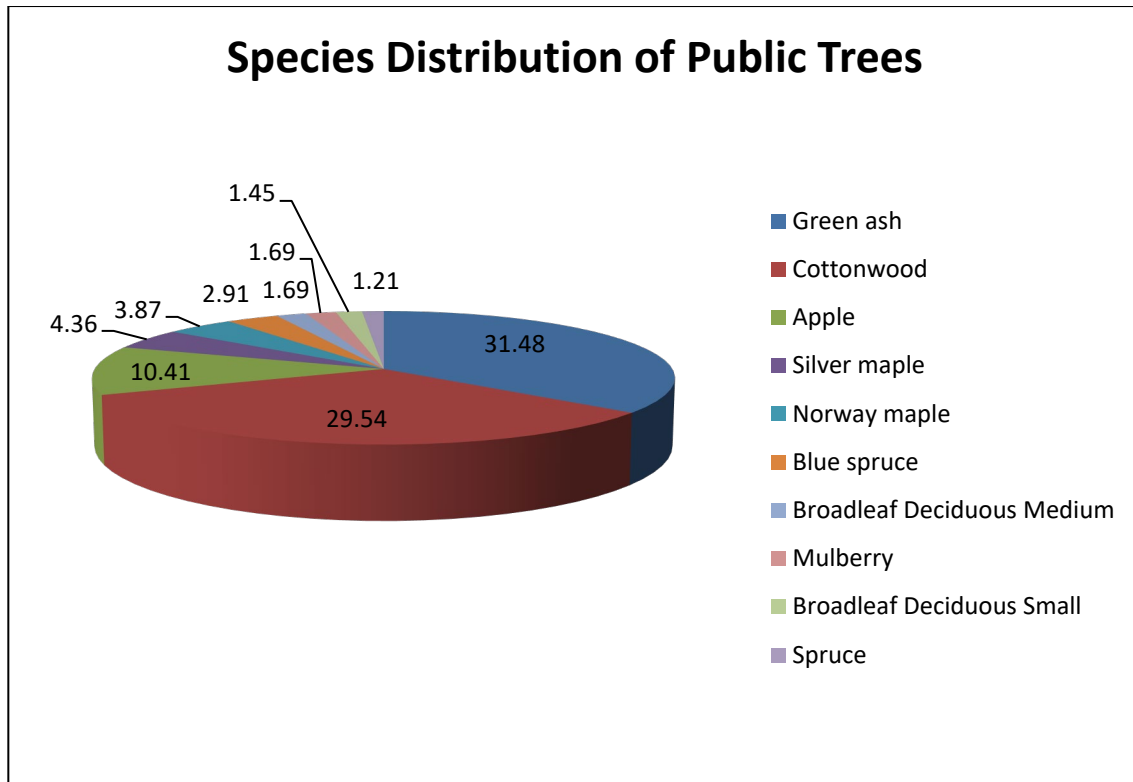
Figure 1: Species Distribution
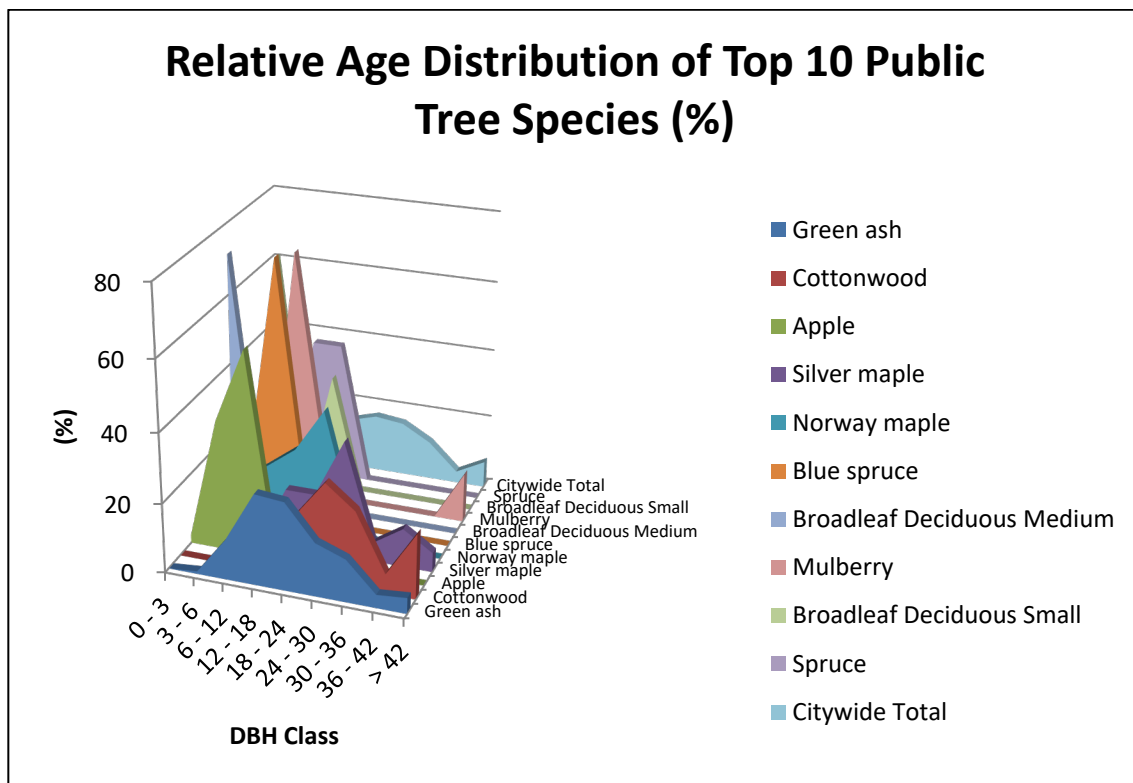
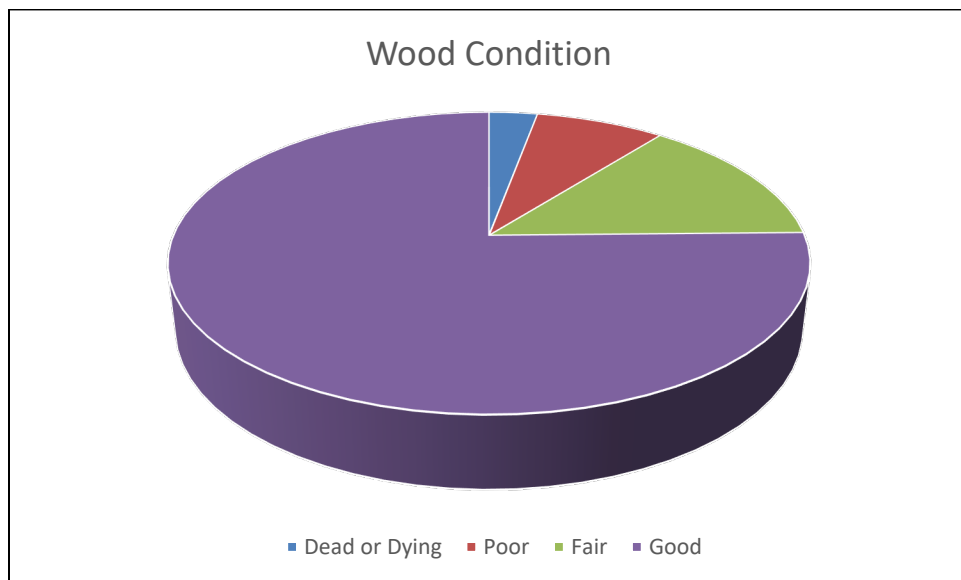**Figure 2: Relative Age Class**
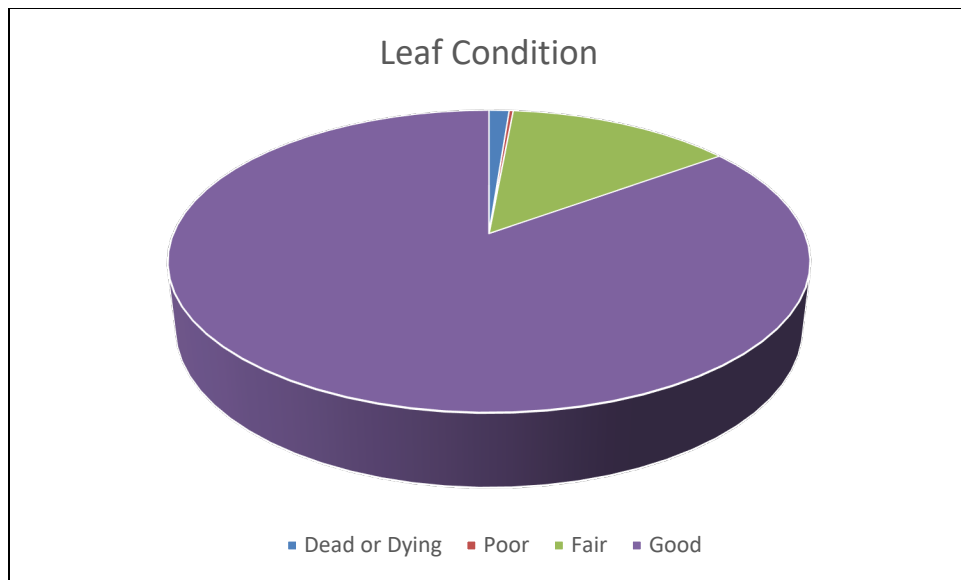
Figure 3: Foliage Condition

Figure 4: Wood Condition

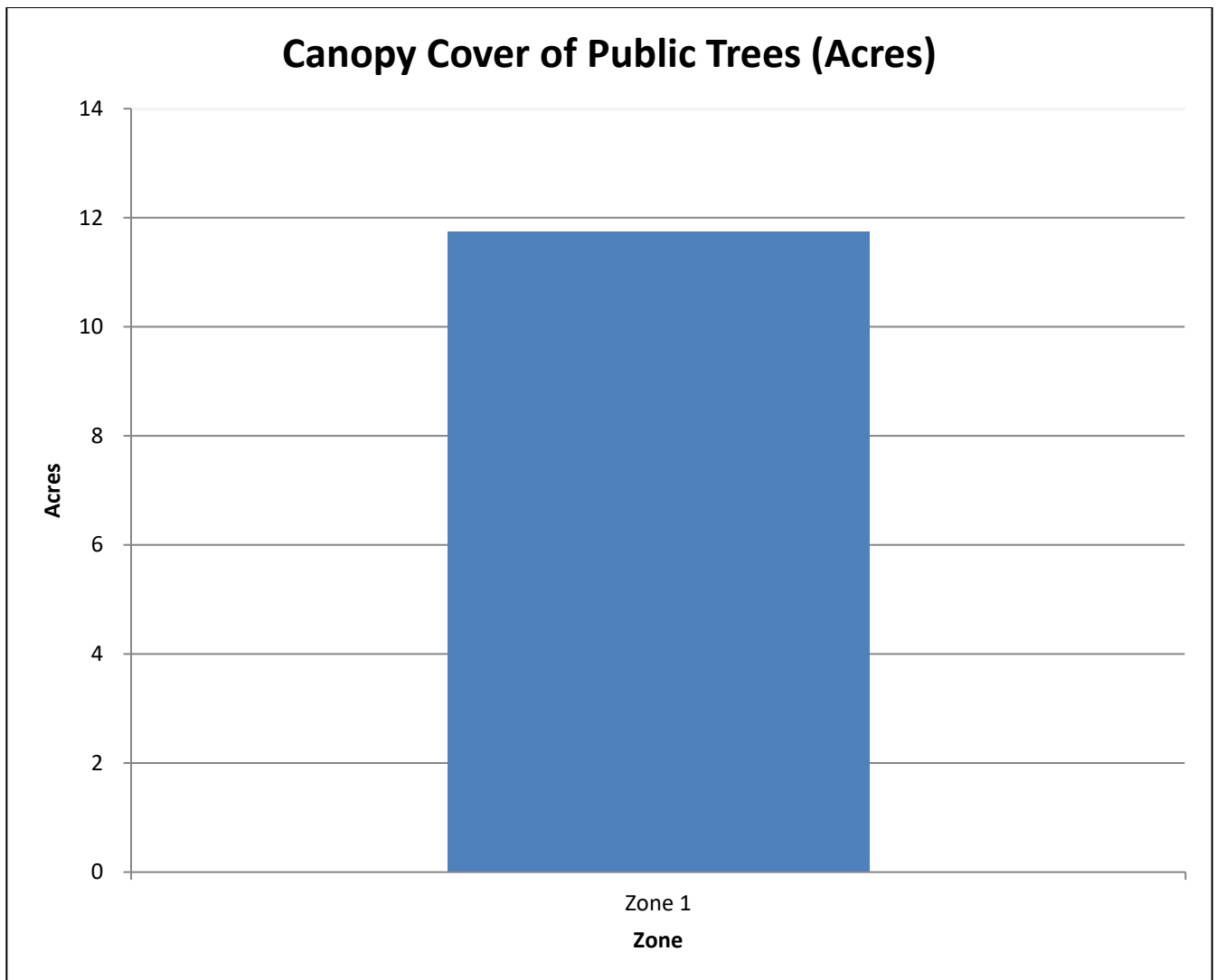**Canopy Cover of Public Trees (Acres)**
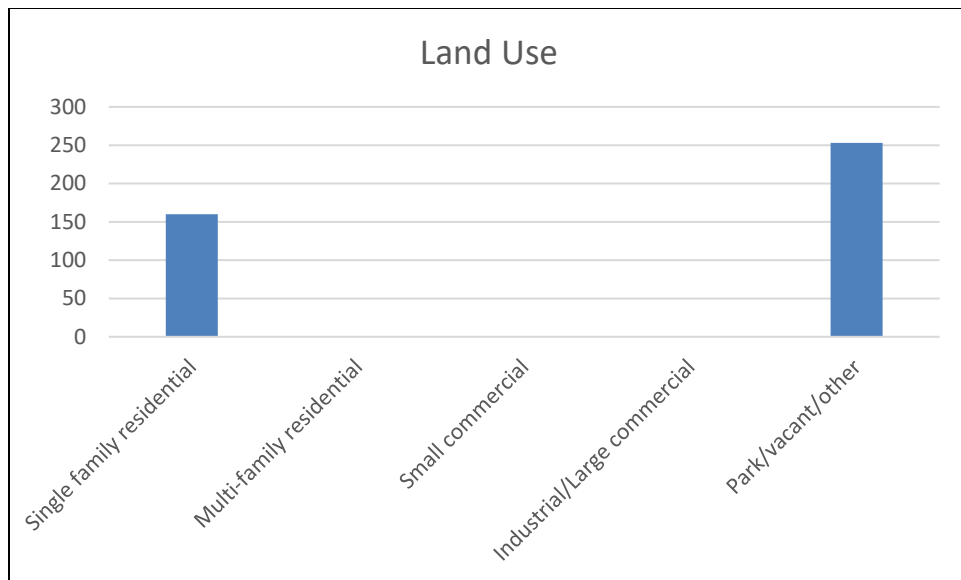
Figure 5: Canopy Cover in Acres

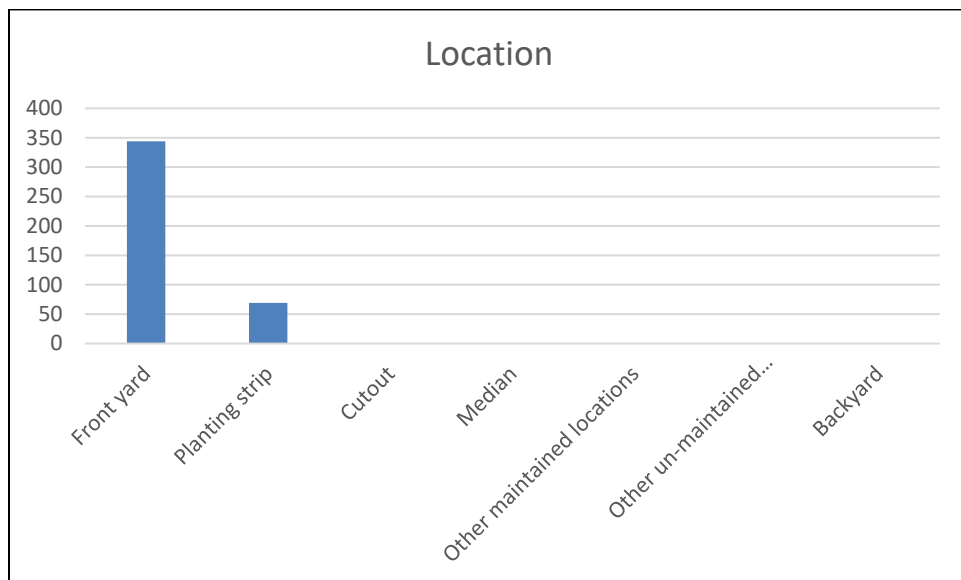**Figure 6: Land Use of city/park trees**

Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

Figure 1: Location of Ash Trees

Figure 2: Location of EAB symptoms

Figure 3: Location of Poor Condition Trees

Figure 4: Location of Trees with Recommended Maintenance

Figure 5: Maintenance Tasks *City ownership of the trees recommended for removal should be verified prior to any removal*

Appendix C: Lakeside Tree Ordinances

Title VI

CHAPTER 3: TREES

ARTICLE 4 - GENERAL PROVISIONS

4.01   <u>DEFINITIONS</u>. For use in this chapter, the following term is defined:

1. "Parking" means that part of the street, avenue or highway in the city not covered by sidewalk and lying between the lot line and the curb line, or, on unpaved streets, that part of the street, avenue or highway lying between the lot line and that portion of the street usually traveled by vehicular traffic.

4.02   <u>ARBORICULTURAL SPECIFICATIONS AND STANDARDS OF PRACTICE</u>.

1. SPACING. All trees hereafter planted shall be planted inside the property lines and not between the sidewalk and the curb. In the event a curb line is not established, trees shall be planted on a line ten (10) feet from the property line.

2. PLANTING. The following regulations shall be followed in the planting of trees within the city.

    a. SIZE. All trees planted on the streets shall be of sufficient size to warrant satisfactory results and stand the abuse common to street trees.

    b. GRADE. Unless otherwise allowed for substantial reasons, all standard sized trees shall have comparatively straight trunks, well-developed leaders, and tip and root characteristics of the species or variety showing evidence of proper nursery pruning. All trees must be free of insect, disease, mechanical injuries and other objectionable features at the time of planting. To compensate for any serious loss of roots, the top of the tree should be reduced by thinning or cutting back as determined by the growth characteristics of the tree species. The leader shall not be cut off in such trimming

    c. PLANTING. Trees shall not be planted on the parking if it is less than nine (9) feet in width, or contains less than eighty-one (81) square feet of exposed soil surface. Trees shall not be planted closer than twenty (20) feet to street intersections (property lines extended) and ten (10) feet to driveways. If it is at all possible, trees should be planted inside the property lines and not between the sidewalk and the curb.

    d. METHOD OF SUPPORT. Trees may be guyed or supported in an upright position according to accepted arboricultural practices. The guys or supports shall be fastened in such a way that they will not girdle or cause serious injury to the trees or endanger public safety.

3.   TRIMMING OR PRUNING. Trees shall be trimmed or pruned according to the following:

a. All cuts are to be made sufficiently close to the parent stem so that healing can readily start under normal conditions.

b. All dead and diseased wood shall be removed.

c. All limbs one inch in diameter or more must be precut to prevent splitting. All branches in danger of injuring the tree in falling shall be lowered by ropes.

d. A crossed or rubbing branch shall be removed where practicable, but removal shall not leave large holes in the general outline of the tree. Crossed or rubbing branches may be cabled apart.

e. All cuts, old or new, one inch in diameter or more, shall be painted with an approved tree wound dressing. On old wounds, care shall be taken to paint exposed wood only.

f. Where there is a known danger of transmitting disease by tools, said tools shall be disinfected with alcohol before use on another tree.

g. Improperly healed scars, where callous growth is not established, are to be traced and painted, unless the city designates other treatment.

h. No topping or dehorning of trees shall be permitted except by special written permission of the city. Trees becoming stag-headed may have the dead portions removed back to sound green wood, with a proper forty-five (45) degree cut only.

i. Elm wood trimmed, pruned or removed shall not be used for any purpose, but shall be disposed of immediately by burning or burying.

4.03   <u>REMOVAL OF TREES</u>. The city shall have removed, on the order of the council, any tree on the streets of the city which interferes with the making of improvements or with travel thereon. He shall additionally remove any trees on the street, not on private property, which have become diseased, or which constitute a danger to the public or which may otherwise be declared a nuisance.
(Code of Iowa, Sec. 364.12(2c))

4.04   <u>DUTY TO TRIM TREES</u>. The owner or agent of the abutting property shall keep the trees on or overhanging the street, trimmed so that all branches will be at least fifteen (15) feet above the surface of the street and eight (8) feet above the sidewalks.
(Code of Iowa, Sec. 364.12(2c))

4.05   <u>TRIMMING TREES TO BE SUPERVISED</u>. It shall be unlawful for any person to trim or cut any tree in a street or public place unless the work is done under the supervision of the city.

4.06   <u>TREE BRANCHES NEAR UTILITY LINES</u>. Trees shall be trimmed so that no branch hangs over, between, or parallel to within a distance of ten (10) feet, any utility, wire, cable,

utility, or appurtenance. For the purpose of this chapter, utility shall include, but not be limited to, power, telephone, cable television, or other public service or facility requiring or utilizing suspended appurtenances for the delivery of the service.

4.07   ASSESSMENT. If the abutting property owner fails to trim the trees as required in this chapter, the city may serve notice on the abutting property owner requiring the person to do so within five (5) days. If the property owner fails to trim the trees within that time, the city may perform the required action and assess the costs against the abutting property for collection in the same manner as a property tax.
(Code of Iowa, Sec. 364.12(2d&e))

Title VI

CHAPTER 3: TREES
ARTICLE 5 - DUTCH ELM DISEASE CONTROL

5.01   TREES SUBJECT TO REMOVAL. The council having determined that the health of the elm trees within the city is threatened by a fatal disease known as the Dutch elm disease hereby declares the following shall be removed:

1. LIVING OR STANDING TREES. Any living or standing elm tree or part thereof infected with the Dutch elm disease fungus or which harbors any of the elm bark beetles, that is scolytus multistriatus (eichb.) or hylurgopinus rufipes (marsh.).

2. DEAD TREES. Any dead elm tree or part thereof including logs, branches, stumps, firewood or other elm material from which the bark has not be removed and burned or sprayed with an effective elm bark beetle destroying insecticide.

5.02   DUTY TO REMOVE. No person, firm or corporation shall permit any tree or material infected with Dutch elm disease to remain on the premises owned, controlled or occupied by the person within the city.
(Code of Iowa, Sec, 364.12(3b))

5.03   INSPECTION. The city shall inspect or cause to be inspected all premises and places within the city to determine whether any condition as defined in Article 7.01 of this ordinance exists thereon, and shall also inspect or cause to be inspected any elm trees reported or suspected to be infected with the Dutch elm disease or any elm bark bearing material reported or suspected to be infected with the elm bark beetles.

5.04   REMOVAL FROM CITY PROPERTY. If the city, upon inspection or examination, in person or by some qualified person acting for the city, shall determine that any condition as herein defined exists in or upon any public street, alley, park or any public place, including the strip between the curb and the lot line of private property within the city, and that the danger of other elm trees within the city is imminent, he/she shall immediately cause it to be removed and burned or otherwise correct the same in such manner as to destroy or prevent as fully as possible the spread of Dutch elm disease or the insect pests or vectors known to carry such disease fungus.

5.05   <u>REMOVAL FROM PRIVATE PROPERTY</u>. If the city upon inspection or examination, in person or by some qualified person acting for the city, shall determine with reasonable certainty that any condition as herein defined exists in or upon private premises, and that the danger to other elm trees within the city is imminent, the person shall immediately notify by certified mail the occupant or person in charge of such property, to correct such condition within 14 days of said notification. If such owner, occupant or person in charge of said property fails to comply within 14 days of receipt thereof, the council may cause the nuisance to be removed and the cost assessed against the property for collection in the same manner as a property tax.
(Code of Iowa, Sec. 364.12(3b&h))

5.06   <u>REASONABLE CERTAINTY</u>. If the city is unable to determine with reasonable certainty whether or not a tree in or upon private premises is infected with Dutch elm disease, a city representative is authorized to remove or cut specimens from said tree, and obtain a diagnosis of such specimens.

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If you need accommodations because of disability to access the services of this Agency, please contact the Director at 515-725-8200.