West Burlington, IA

2018 Urban Forest Management Plan
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Table of Contents

Executive Summary

Overview

This plan was developed to assist the City of West Burlington 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 5.2% of West Burlington'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 2018, 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 483 trees inventoried.

- West Burlington's trees provide $95,902 of benefits annually, an average of $199 a tree
- There are over 35 species of trees
- The top three genera are: Maple 55.7%, Oak 8.1%, and Ash 5.2%
- 37.5% of trees are in need of some type of management
- 25 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 25 trees needing removal, 18 trees are over 18 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*
- 18 of the 25 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 15 years to remove ash – Suggestion: request a budget increase to $3,500 annually and apply for grants to plant replacement trees

Introduction

This plan was developed to assist West Burlington 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 of 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 West Burlington these costs can be extended over years and public safety issues from dead and dying ash trees mitigated.

Trees are an important component of West Burlington'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 West Burlington 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 West Burlington's urban forestry goals.

Inventory

In 2018, 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 wood pecker damage.

Inventory Results

The data collected for the 483 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. West Burlington's trees reduce energy related costs by approximately $24,957.91 annually (Appendix A, Table 1). These savings are both in Electricity (118.94 MWh) and in Natural Gas (16,255.33 Therms).

Annual Stormwater Benefits

West Burlington's trees intercept about 1,351.92 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides $36,623.15 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 West Burlington it is estimated that trees remove 1,537.91 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 $4,327.57 (Appendix A, Table 3).

Annual Carbon Benefits

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In West Burlington trees sequester about 454,602.68 lbs of carbon a year with an associated value of $3,409.52 (Appendix A, Table 5). In addition, the trees store 5,070.31 lbs of carbon, with a yearly benefit of $38,029.20 (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. West Burlington receives $26,584.11 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, West Burlington's trees provide $95,902 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 483 trees in West Burlington provide approximately $198 annually (Appendix A, Table 7).

Forest Structure

Species Distribution

West Burlington has over 35 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genera is as follows:

Maple	269	55.7%
Oak	39	8.1%
Ash	25	5.2%
Apple	19	3.9%
Spruce	18	3.7%
Elm	17	3.5%
Walnut	14	2.9%
Hackberry	12	2.5%
Honeylocust	12	2.5%
Eastern Redbud	9	1.9%
Others	49	10.1%

Age Class

Most of West Burlington's trees (59%) are greater than 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. West Burlington's size curve is on the larger side, indicating an older 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 West Burlington indicate that 97% of the trees are in fair to good health, with only 3% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). Similarly, 93% of West Burlington's trees are in fair to 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 7% of the population. This7% 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).

Crown Cleaning	129	26.71%
Crown Raising	21	4.35%
Tree Staking	2	.41%
Tree Removal	25	5.18%
Crown Reduction	4	.83%

Canopy Cover

The total canopy with both private and public trees is 12%, 376.46 acres. The canopy cover included in the West Burlington inventory includes approximately 13.85 acres (Appendix A, Figure 4). The City's Canopy goal is to increase canopy by 3%, in 30 years. To achieve this goal it is estimated that 231 trees need to be planted annually.

Land Use and Location

The majority of West Burlington's city and park trees are in planting strips in single family residential neighborhoods (Appendix A, Figure 6 & Appendix A, Figure7). The following describes the land use and locations for the street and park trees.

Land Use	
Single family residential	79.5%
Park/vacant/other	19.88%
Industrial/Large commercial	.21%
Small commercial	.41%
Multifamily residential	0.0%

Location	
Planting strip	73.91%
Other maintained locations	0.0%
Cutout (surrounded by pavement)	0.0%
Front yard	26.09%

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

West Burlington has 5 critical concern trees that 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 18 trees 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 176 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 25 removals, 16 are ash trees. There is a total of 25 ash trees, and 18 of those have signs and symptoms that have been associated with EAB. In

addition, there are 15 ash 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 West Burlington.

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 maple (55.7%) (Appendix A, Figure 1). Maples 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: poplar, box elder, elm varieties, willow, silver maple, and sycamore as outlined in section 150.10 of the city ordinance (Appendix C). All trees planted must meet the restrictions in city ordinance 150.09 (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 wood pecker damage.

Six Year Maintenance Plan with <u>No Additional Funding</u>

Year 1

- Removal: 2 largest critical concern trees
- Planting and Replacement: 2 trees to be planted in open locations
- Young Tree Pruning & Maintenance:
- Visual Survey for signs and symptoms of EAB

Year 2

- Removal: 2 critical concern trees

*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 0 trees in open locations from year one removals
Young Tree Pruning & Maintenance:
Routine trimming: Contract to trim 1/3 of the city trees
Visual Survey for signs and symptoms of EAB

Year 3
Removal: 1 critical concern tree and 1 ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 2 trees to be planted in open locations and locations from previous removals
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 4
Removal: 2 trees - removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 0 trees in open locations from previous removals
Routine trimming: Contract to trim 1/3 of the city trees
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 5
Removal: 2 trees - removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 2 trees to be planted in open locations and locations from previous removals
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

Year 6
Removal: 2 trees - removal of any new critical concern trees and ash in poor health
*Or saving for ash tree treatment and/or future ash removal
Planting and Replacement: 0 trees in open locations from previous removals
Routine trimming: Contract to trim 1/3 of the city trees
Young Tree Pruning & Maintenance:
Visual Survey for signs and symptoms of EAB

*Reduction of ash over 6 years: Approximately 7 ash trees removed (approximately 28% of ash). It will take approximately 15 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 $3,500 a year. If the budget were increased to $10,000 a year all ash could be removed in 4 years.

Emerald Ash Borer Plan

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 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 150.09 and 150.10 (Appendix C). The new plantings will be a diverse mix and will not include ash, poplar, box elder, elm varieties, willow, silver maple, and sycamore.

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 wood pecker 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 150.08 states:

150.08 FAILURE TO COMPLY WITH NOTICE. Should the adjoining property owner, agent, or occupant refuse to prune, maintain, and care for trees, shrubs, and bushes, or to remove dead, decayed, diseased or dying trees, shrubs, or bushes within a reasonable time after receiving notice from the Council to do so, which reasonable time shall in no event be more than twenty (20) days following the receipt of such notice, then the Council may order the removal, pruning, and maintenance or destruction of said trees, shrubs, and bushes and assess the costs thereof against the adjoining property by resolution of the Council.

Budget

Current Budget

Total $9,000 over 6 years ($1,500/year)

FY 2019 Budget

Removal: $1,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $100

FY 2020 Budget

Removal: $1,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $00
Routine trimming: $200
Watering & Maintenance: $100

FY 2021 Budget

Removal: $1,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $100

FY 2022 Budget

Removal: $1,200

*Or saving for ash tree treatment and/or future ash removal
Planting: $00
Routine trimming: $200
Watering & Maintenance: $100

FY 2023 Budget
Removal: $1,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $200
Watering & Maintenance: $100

FY 2024 Budget
Removal: $1,200
*Or saving for ash tree treatment and/or future ash removal
Planting: $00
Routine trimming: $200
Watering & Maintenance: $100

*Reduction of ash over 6 years: approximately 7 ash trees removed (approximately 28% of ash). **It will take approximately 15 years to remove all ash with the current budget.**

Purposed Budget Increase

EAB could potentially kill all ash trees in West Burlington within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to $3,500 a year. If the budget were increased to $10,000 a year all ash could be removed within 4 years. Additionally, it is recommended that West Burlington 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 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 $12 per inch, about 5 trees could be treated ($1,200) per year (1/2 treatable ash every other year treatment). This would be 9 total trees selected for treatment, and West Burlington would still need to find $1,200 for removal. Alternatively, if there are 9 treated trees every other year, it would cost approximately $2,160 every 2 years for treatment and leave $0 for removal and $0 for planting. 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 when EAB is found in West Burlington. It is suggested to consider increasing the budget to plan for this.

Works Cited

Census Bureau. 2010. http://censtats.census.gov/data/IA/1601964290.pdf (April, 2013)

USDA Forest Service, et al. 2006. i-Tree Software Suite v1.0 User's Manual. Pp. 27-40.

McPherson EG, Simpson JR, Peper PJ, Gardner SL, Vargas KE, Ho J, Maco S, Xiao Q. 2005b. City of Charleston, South Carolina, municipal forest resource analysis. Internal Tech Rep. Davis, CA: U.S. Department of Agriculture, Center for Urban Forest Research. p. 57

Nowak, DJ and JF Dwyer. 2007. Understanding the benefits and costs of urban forest ecosystems. In: Kuser, J. (ed.) Urban and Community Forestry in the Northeast. New York: Springer. Pp. 25-46.

Peper, Paula J; McPherson, E Gregory; Simpson, James R; Vargas, Kelaine E; Xiao, Qingfu 2009. Lower Midwest community tree guide: benefits, costs, and strategic planting. Gen. Tech. Rep. PSW-GTR-219. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. p.115

Appendix A: i-Tree Data

Table 1: Annual Energy Benefits

Annual Energy Benefits of All Trees by Species				12/20/2018					
Species	Total Electricity (MWh)	Electricity ($)	Total Natural Gas (Therms)	Natural Gas ($)	Total ($)	Stand. Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	28.69	2,177.57	3,865.93	3,788.61	5,966.18	(N/A)	21.33	23.90	57.92
Silver maple	26.61	2,019.79	3,520.79	3,450.38	5,470.17	(N/A)	19.46	21.92	58.19
Red maple	6.72	509.90	882.36	864.71	1,374.61	(N/A)	7.25	5.51	39.27
Norway maple	8.70	660.68	1,258.93	1,233.75	1,894.43	(N/A)	7.25	7.59	54.13
Northern pin oak	6.51	494.25	949.31	930.32	1,424.58	(N/A)	4.76	5.71	61.94
Green ash	5.80	440.06	785.56	769.85	1,209.91	(N/A)	4.55	4.85	55.00
Apple	1.70	129.00	255.35	250.24	379.24	(N/A)	3.93	1.52	19.96
Chinese elm	5.93	450.05	812.66	796.40	1,246.45	(N/A)	3.31	4.99	77.90
Black walnut	3.70	280.83	519.72	509.32	790.15	(N/A)	2.90	3.17	56.44
Norway spruce	0.99	75.17	148.39	145.42	220.60	(N/A)	2.69	0.88	16.97
Northern hackberry	4.90	371.88	685.12	671.41	1,043.29	(N/A)	2.48	4.18	86.94
Honeylocust	3.35	254.60	446.92	437.99	692.58	(N/A)	2.48	2.78	57.72
Eastern redbud	1.23	93.46	181.62	177.98	271.44	(N/A)	1.86	1.09	30.16
Northern red oak	1.46	110.80	206.79	202.66	313.45	(N/A)	1.24	1.26	52.24
Northern white cedar	0.32	24.32	47.10	46.15	70.48	(N/A)	1.04	0.28	14.10
River birch	1.28	97.48	189.66	185.87	283.35	(N/A)	0.83	1.14	70.84
Broadleaf Deciduous Sma	0.12	9.24	21.05	20.63	29.87	(N/A)	0.83	0.12	7.47
Swamp white oak	0.22	16.72	35.42	34.71	51.43	(N/A)	0.83	0.21	12.86
Cottonwood	1.79	136.21	238.87	234.09	370.30	(N/A)	0.83	1.48	92.58
American basswood	1.16	88.41	165.26	161.95	250.36	(N/A)	0.83	1.00	62.59
Others	7.74	587.27	1,038.55	1,017.77	1,605.04		9.32	6.43	30.34
Total	118.94	9,027.68	16,255.33	15,930.23	24,957.91	(N/A)	100.00	100.00	51.67

Table 2: Annual Stormwater Benefits

Annual Stormwater Benefits of All Trees by Species				12/20/2018		
Species	Total Rainfall Interception (Gal)	Total ($)	Stand. Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	307,956.62	8,345.62	(N/A)	21.33	22.79	81.03
Silver maple	384,489.02	10,419.65	(N/A)	19.46	28.45	110.85
Red maple	49,609.55	1,344.42	(N/A)	7.25	3.67	38.41
Norway maple	80,381.33	2,178.33	(N/A)	7.25	5.95	62.24
Northern pin oak	70,164.04	1,901.45	(N/A)	4.76	5.19	82.67
Green ash	60,152.74	1,630.14	(N/A)	4.55	4.45	74.10
Apple	6,513.03	176.50	(N/A)	3.93	0.48	9.29
Chinese elm	84,762.11	2,297.05	(N/A)	3.31	6.27	143.57
Black walnut	41,515.09	1,125.06	(N/A)	2.90	3.07	80.36
Norway spruce	14,684.93	397.96	(N/A)	2.69	1.09	30.61
Northern hackberry	54,133.24	1,467.01	(N/A)	2.48	4.01	122.25
Honeylocust	37,812.95	1,024.73	(N/A)	2.48	2.80	85.39
Eastern redbud	4,898.12	132.74	(N/A)	1.86	0.36	14.75
Northern red oak	16,198.98	438.99	(N/A)	1.24	1.20	73.17
Northern white cedar	3,537.95	95.88	(N/A)	1.04	0.26	19.18
River birch	15,057.38	408.06	(N/A)	0.83	1.11	102.01
Broadleaf Deciduous Small	409.26	11.09	(N/A)	0.83	0.03	2.77
Swamp white oak	1,074.07	29.11	(N/A)	0.83	0.08	7.28
Cottonwood	27,207.29	737.32	(N/A)	0.83	2.01	184.33
American basswood	12,539.22	339.81	(N/A)	0.83	0.93	84.95
Others	78,311.00	2,122.23		9.32	5.79	37.84
Citywide total	1,351,407.92	36,623.15	(N/A)	100.00	100.00	75.82

Table 3: Annual Air Quality Benefits

Annual Air Quality Benefits of All Trees by Species					12/20/2018												
Species	Deposition O3 (lb)	Deposition NO2 (lb)	Deposition PM10 (lb)	Deposition SO2 (lb)	Total Deposition ($)	Avoided NO2 (lb)	Avoided PM10 (lb)	Avoided VOC (lb)	Avoided SO2 (lb)	Total Avoided ($)	BVOC Emissions (lb)	BVOC Emissions ($)	Total (lb)	Total ($)	Stand. Error	% of Total Trees	Avg. $/tree
Sugar maple	39.87	6.79	20.09	1.76	216.55	136.27	19.89	18.97	129.95	850.48	- 31.47	- 118.00	342.14	949.03	(N/A)	21.33	9.21
Silver maple	65.49	11.10	32.21	2.90	353.27	125.60	18.38	17.54	120.38	785.44	- 34.31	- 128.65	359.29	1,010.06	(N/A)	19.46	10.75
Red maple	10.75	1.83	5.14	0.48	57.61	31.70	4.64	4.43	30.44	198.40	- 3.77	- 14.12	85.65	241.88	(N/A)	7.25	6.91
Norway maple	16.20	2.80	7.97	0.72	87.58	42.24	6.10	5.81	39.49	261.54	- 3.81	- 14.29	117.52	334.83	(N/A)	7.25	9.57
Northern pin oak	15.52	2.68	7.48	0.69	83.44	31.66	4.57	4.35	29.54	195.88	- 3.54	- 13.27	92.94	266.05	(N/A)	4.76	11.57
Green ash	7.05	1.13	3.44	0.32	37.73	27.61	4.03	3.84	26.28	172.18	0.00	0.00	73.69	209.91	(N/A)	4.55	9.54
Apple	1.77	0.29	0.87	0.08	9.50	8.31	1.20	1.14	7.70	51.30	- 0.01	- 0.04	21.35	60.77	(N/A)	3.93	3.20
Chinese elm	13.38	2.14	6.00	0.60	70.12	28.32	4.12	3.93	26.87	176.39	0.00	0.00	85.37	246.52	(N/A)	3.31	15.41
Black walnut	5.01	0.80	2.41	0.22	26.71	17.78	2.58	2.46	16.77	110.48	0.00	0.00	48.03	137.19	(N/A)	2.90	9.80
Norway spruce	1.55	0.31	1.37	0.19	10.49	4.83	0.70	0.66	4.49	29.84	- 6.34	- 23.78	7.75	16.55	(N/A)	2.69	1.27
Northern hackberry	9.69	1.68	4.77	0.43	52.41	23.56	3.42	3.26	22.22	146.39	0.00	0.00	69.03	198.80	(N/A)	2.48	16.57
Honeylocust	7.37	1.21	3.36	0.34	38.90	15.87	2.32	2.21	15.18	99.16	- 5.75	- 21.58	42.11	116.48	(N/A)	2.48	9.71
Eastern redbud	1.45	0.24	0.69	0.07	7.72	6.00	0.86	0.82	5.58	37.06	- 0.01	- 0.03	15.70	44.75	(N/A)	1.86	4.97
Northern red oak	3.53	0.61	1.69	0.16	18.94	7.02	1.02	0.97	6.61	43.60	- 5.05	- 18.95	16.55	43.60	(N/A)	1.24	7.27
Northern white cedar	0.33	0.07	0.32	0.04	2.31	1.56	0.22	0.21	1.45	9.63	- 1.10	- 4.13	3.10	7.81	(N/A)	1.04	1.56
River birch	3.46	0.60	1.65	0.15	18.53	6.27	0.90	0.86	5.83	38.71	- 0.78	- 2.92	18.93	54.33	(N/A)	0.83	13.58
Broadleaf Deciduous Small	0.05	0.01	0.04	0.00	0.31	0.62	0.09	0.08	0.55	3.76	0.00	0.00	1.44	4.07	(N/A)	0.83	1.02
Swamp white oak	0.08	0.01	0.06	0.00	0.48	1.10	0.16	0.15	1.00	6.74	- 0.03	- 0.12	2.53	7.10	(N/A)	0.83	1.78
Cottonwood	5.12	0.82	2.24	0.23	26.69	8.51	1.24	1.19	8.13	53.15	0.00	0.00	27.49	79.85	(N/A)	0.83	19.96
American basswood	1.68	0.29	0.83	0.07	9.10	5.62	0.81	0.78	5.29	34.89	- 1.44	- 5.40	13.94	38.59	(N/A)	0.83	9.65
Others	10.66	1.80	5.92	0.64	59.73	36.73	5.36	5.12	35.05	229.31	- 7.90	- 29.64	93.37	259.40		9.32	4.66
Citywide Total	220.01	37.18	108.57	10.09	1,188.14	567.19	82.61	78.77	538.79	3,534.34	- 105.31	- 394.91	1,537.91	4,327.57	(N/A)	100.00	8.96

Table 4: Annual Carbon Stored

Stored CO2 Benefits of All Trees by Species				12/20/2018		
Species	Total stored CO2 (lbs)	Total ($)	Stand. Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	1,140,626.44	8,554.70	(N/A)	21.33	22.50	83.06
Silver maple	1,491,666.39	11,187.50	(N/A)	19.46	29.42	119.02
Red maple	120,033.43	900.25	(N/A)	7.25	2.37	25.72
Norway maple	265,158.52	1,988.69	(N/A)	7.25	5.23	56.82
Northern pin oak	256,564.54	1,924.23	(N/A)	4.76	5.06	83.66
Green ash	230,116.55	1,725.87	(N/A)	4.55	4.54	78.45
Apple	28,456.47	213.42	(N/A)	3.93	0.56	11.23
Chinese elm	451,354.20	3,385.16	(N/A)	3.31	8.90	211.57
Black walnut	161,308.51	1,209.81	(N/A)	2.90	3.18	86.42
Norway spruce	14,351.68	107.64	(N/A)	2.69	0.28	8.28
Northern hackberry	153,949.99	1,154.62	(N/A)	2.48	3.04	96.22
Honeylocust	94,960.68	712.21	(N/A)	2.48	1.87	59.35
Eastern redbud	22,522.97	168.92	(N/A)	1.86	0.44	18.77
Northern red oak	77,391.74	580.44	(N/A)	1.24	1.53	96.74
Northern white cedar	1,978.48	14.84	(N/A)	1.04	0.04	2.97
River birch	57,120.59	428.40	(N/A)	0.83	1.13	107.10
Broadleaf Deciduous Small	1,277.27	9.58	(N/A)	0.83	0.03	2.39
Swamp white oak	1,756.07	13.17	(N/A)	0.83	0.03	3.29
Cottonwood	177,165.64	1,328.74	(N/A)	0.83	3.49	332.19
American basswood	61,716.40	462.87	(N/A)	0.83	1.22	115.72
Others	261,083.74	1,958.13		9.32	5.15	30.14
Citywide total	5,070,560.31	38,029.20	(N/A)	100.00	100.00	78.74

Table 5: Annual Carbon Sequestered

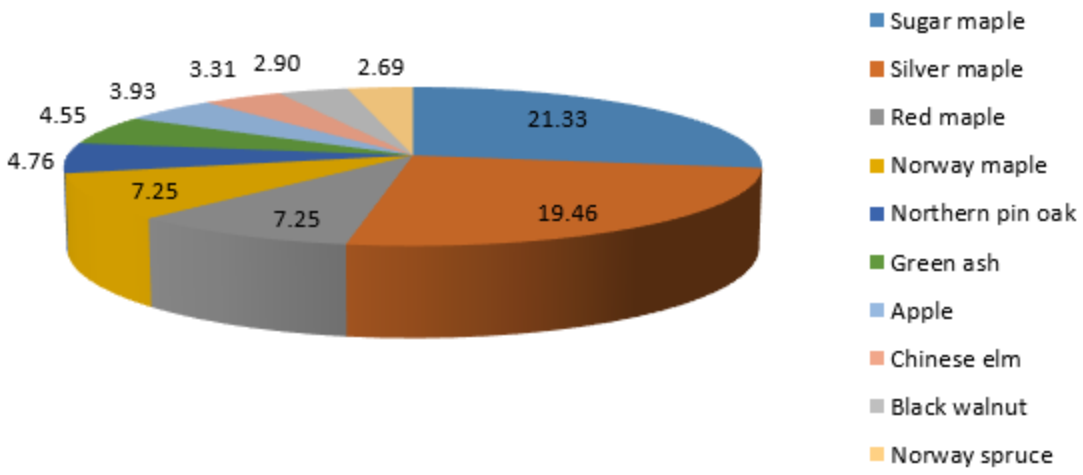
Annual CO2 Benefits of All Trees by Species				12/20/2018									
Species	Sequestered (lb)	Sequestered ($)	Decomposition Release(lb)	Maintenance Release (lb)	Total Release ($)	Avoided (lb)	Avoided ($)	Net Total (lb)	Total ($)	Stand. Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	62,336.10	467.52	- 5,475.71	- 304.01	- 43.35	48,123.71	360.93	104,680.10	785.10	(N/A)	21.33	23.03	7.62
Silver maple	110,676.17	830.07	- 7,164.41	- 298.35	- 55.97	44,636.87	334.78	147,850.28	1,108.88	(N/A)	19.46	32.52	11.80
Red maple	11,464.64	85.98	- 576.16	- 60.45	- 4.77	11,268.61	84.51	22,096.64	165.72	(N/A)	7.25	4.86	4.73
Norway maple	13,531.18	101.48	- 1,272.87	- 88.92	- 10.21	14,600.79	109.51	26,770.19	200.78	(N/A)	7.25	5.89	5.74
Northern pin oak	4,267.47	32.01	- 1,232.21	- 77.81	- 9.83	10,922.86	81.92	13,880.31	104.10	(N/A)	4.76	3.05	4.53
Green ash	13,515.35	101.37	- 1,104.56	- 59.28	- 8.73	9,725.19	72.94	22,076.70	165.58	(N/A)	4.55	4.86	7.53
Apple	2,736.21	20.52	- 136.64	- 23.21	- 1.20	2,850.90	21.38	5,427.27	40.70	(N/A)	3.93	1.19	2.14
Chinese elm	12,495.89	93.72	- 2,166.50	- 67.08	- 16.75	9,945.91	74.59	20,208.22	151.56	(N/A)	3.31	4.45	9.47
Black walnut	9,238.83	69.29	- 774.28	- 39.39	- 6.10	6,206.16	46.55	14,631.32	109.73	(N/A)	2.90	3.22	7.84
Norway spruce	1,050.60	7.88	- 68.89	- 19.31	- 0.66	1,661.33	12.46	2,623.73	19.68	(N/A)	2.69	0.58	1.51
Northern hackberry	6,680.84	50.11	- 738.96	- 48.36	- 5.90	8,218.49	61.64	14,112.01	105.84	(N/A)	2.48	3.10	8.82
Honeylocust	6,071.73	45.54	- 456.95	- 26.91	- 3.63	5,626.54	42.20	11,214.42	84.11	(N/A)	2.48	2.47	7.01
Eastern redbud	2,004.51	15.03	- 108.11	- 15.21	- 0.92	2,065.35	15.49	3,946.53	29.60	(N/A)	1.86	0.87	3.29
Northern red oak	1,503.60	11.28	- 371.48	- 19.50	- 2.93	2,448.56	18.36	3,561.18	26.71	(N/A)	1.24	0.78	4.45
Northern white cedar	291.42	2.19	- 9.50	- 6.05	- 0.12	537.53	4.03	813.41	6.10	(N/A)	1.04	0.18	1.22
River birch	1,480.18	11.10	- 274.18	- 14.04	- 2.16	2,154.35	16.16	3,346.32	25.10	(N/A)	0.83	0.74	6.27
Broadleaf Deciduous Small	198.44	1.49	- 6.18	- 2.54	- 0.07	204.15	1.53	393.87	2.95	(N/A)	0.83	0.09	0.74
Swamp white oak	510.79	3.83	- 10.53	- 2.93	- 0.10	369.42	2.77	866.76	6.50	(N/A)	0.83	0.19	1.63
Cottonwood	2,829.44	21.22	- 850.40	- 21.06	- 6.54	3,010.23	22.58	4,968.22	37.26	(N/A)	0.83	1.09	9.32
American basswood	3,642.81	27.32	- 296.24	- 13.26	- 2.32	1,953.91	14.65	5,287.22	39.65	(N/A)	0.83	1.16	9.91
Others	14,214.78	106.61	- 1,253.20	- 92.04	- 10.09	12,978.46	97.34	25,847.99	193.86		9.32	5.69	3.74
Citywide Total	280,740.97	2,105.56	- 24,347.93	- 1,299.69	- 192.36	199,509.33	1,496.32	454,602.68	3,409.52	(N/A)	100.00	100.00	7.06

Table 6: Annual Social and Aesthetic Benefits

Annual Aesthetic/Other Benefit of All Trees by Species				12/20/2018	
Species	Total ($)	Stand. Error	% of Total Trees	% of Total $	Avg. $/tree
Sugar maple	6,569.24	(N/A)	21.33	24.71	63.78
Silver maple	8,821.84	(N/A)	19.46	33.18	93.85
Red maple	1,584.31	(N/A)	7.25	5.96	45.27
Norway maple	1,265.62	(N/A)	7.25	4.76	36.16
Northern pin oak	400.01	(N/A)	4.76	1.50	17.39
Green ash	1,160.83	(N/A)	4.55	4.37	52.77
Apple	157.01	(N/A)	3.93	0.59	8.26
Chinese elm	889.34	(N/A)	3.31	3.35	55.58
Black walnut	759.32	(N/A)	2.90	2.86	54.24
Norway spruce	251.28	(N/A)	2.69	0.95	19.33
Northern hackberry	811.23	(N/A)	2.48	3.05	67.60
Honeylocust	1,408.34	(N/A)	2.48	5.30	117.36
Eastern redbud	116.34	(N/A)	1.86	0.44	12.93
Northern red oak	102.62	(N/A)	1.24	0.39	17.10
Northern white cedar	85.42	(N/A)	1.04	0.32	17.08
River birch	125.84	(N/A)	0.83	0.47	31.46
Broadleaf Deciduous Small	10.55	(N/A)	0.83	0.04	2.64
Swamp white oak	64.88	(N/A)	0.83	0.24	16.22
Cottonwood	182.08	(N/A)	0.83	0.68	45.52
American basswood	264.49	(N/A)	0.83	0.99	66.12
Others	1,553.52		9.32	5.84	32.66
Citywide Total	26,584.11	(N/A)	100.00	100.00	55.04

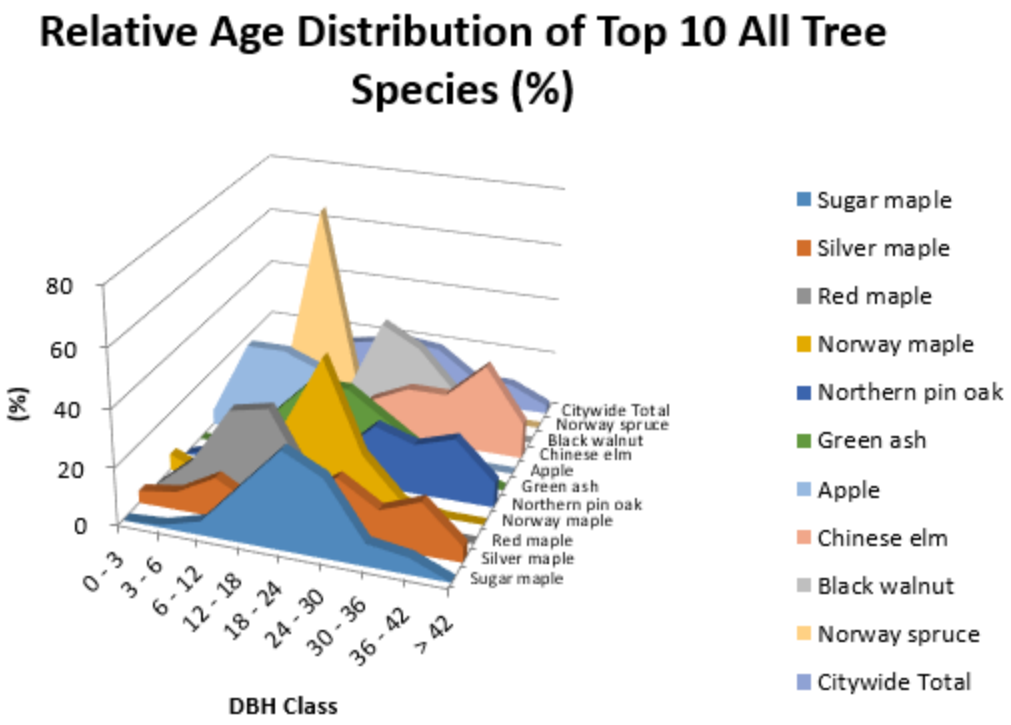
Table 7: Summary of Benefits in Dollars

Average Annual Benefits of All Tree by Species ($/tree)					12/20/2018		
Species	Energy	CO2	Air Quality	Stormwater	Aesthetic/Other	Total	Stand.
Sugar maple	57.92	7.62	9.21	81.03	63.78	219.56	(N/A)
Silver maple	58.19	11.80	10.75	110.85	93.85	285.43	(N/A)
Red maple	39.27	4.73	6.91	38.41	45.27	134.60	(N/A)
Norway maple	54.13	5.74	9.57	62.24	36.16	167.83	(N/A)
Northern pin oak	61.94	4.53	11.57	82.67	17.39	178.10	(N/A)
Green ash	55.00	7.53	9.54	74.10	52.77	198.93	(N/A)
Apple	19.96	2.14	3.20	9.29	8.26	42.85	(N/A)
Chinese elm	77.90	9.47	15.41	143.57	55.58	301.93	(N/A)
Black walnut	56.44	7.84	9.80	80.36	54.24	208.68	(N/A)
Norway spruce	16.97	1.51	1.27	30.61	19.33	69.70	(N/A)
Northern hackberry	86.94	8.82	16.57	122.25	67.60	302.18	(N/A)
Honeylocust	57.72	7.01	9.71	85.39	117.36	277.19	(N/A)
Eastern redbud	30.16	3.29	4.97	14.75	12.93	66.10	(N/A)
Northern red oak	52.24	4.45	7.27	73.17	17.10	154.23	(N/A)
Northern white cedar	14.10	1.22	1.56	19.18	17.08	53.14	(N/A)
River birch	70.84	6.27	13.58	102.01	31.46	224.17	(N/A)
Broadleaf Deciduous Small	7.47	0.74	1.02	2.77	2.64	14.63	(N/A)
Swamp white oak	12.86	1.63	1.78	7.28	16.22	39.75	(N/A)
Cottonwood	92.58	9.32	19.96	184.33	45.52	351.70	(N/A)
American basswood	62.59	9.91	9.65	84.95	66.12	233.23	(N/A)
Others	788.72	97.25	121.28	983.73	849.27	2,840.25	
Citywide Total	51.67	7.06	8.96	75.82	55.04	198.56	(N/A)



Species Distribution of All Trees for :	
12/20/2018	
Species	Percent
Sugar maple	21.33
Silver maple	19.46
Red maple	7.25
Norway maple	7.25
Northern pin oak	4.76
Green ash	4.55
Apple	3.93
Chinese elm	3.31
Black walnut	2.90
Norway spruce	2.69
Other Species	22.57

Figure 1: Species Distribution



Relative Age Distribution of Top 10 All Tree Species (%)	12/20/2018					DBH class (in)			
Species	0 - 3	3 - 6	6 - 12	12 - 18	18 - 24	24 - 30	30 - 36	36 - 42	> 42
Sugar maple	0.00	0.97	4.85	19.42	33.98	27.18	7.77	5.83	0.00
Silver maple	4.26	6.38	13.83	6.38	11.70	21.28	12.77	18.09	5.32
Red maple	0.00	11.43	31.43	34.29	11.43	11.43	0.00	0.00	0.00
Norway maple	5.71	0.00	2.86	22.86	48.57	17.14	2.86	0.00	0.00
Northern pin oak	0.00	4.35	4.35	13.04	8.70	21.74	17.39	21.74	8.70
Green ash	0.00	0.00	13.64	27.27	27.27	18.18	9.09	4.55	0.00
Apple	5.26	31.58	31.58	26.32	5.26	0.00	0.00	0.00	0.00
Chinese elm	0.00	0.00	6.25	0.00	12.50	18.75	18.75	31.25	12.50
Black walnut	0.00	14.29	0.00	7.14	35.71	28.57	14.29	0.00	0.00
Norway spruce	0.00	7.69	69.23	7.69	7.69	7.69	0.00	0.00	0.00
Citywide Total	1.66	6.83	14.91	17.39	19.88	18.43	9.11	8.90	2.90

Figure 2: Relative Age Class

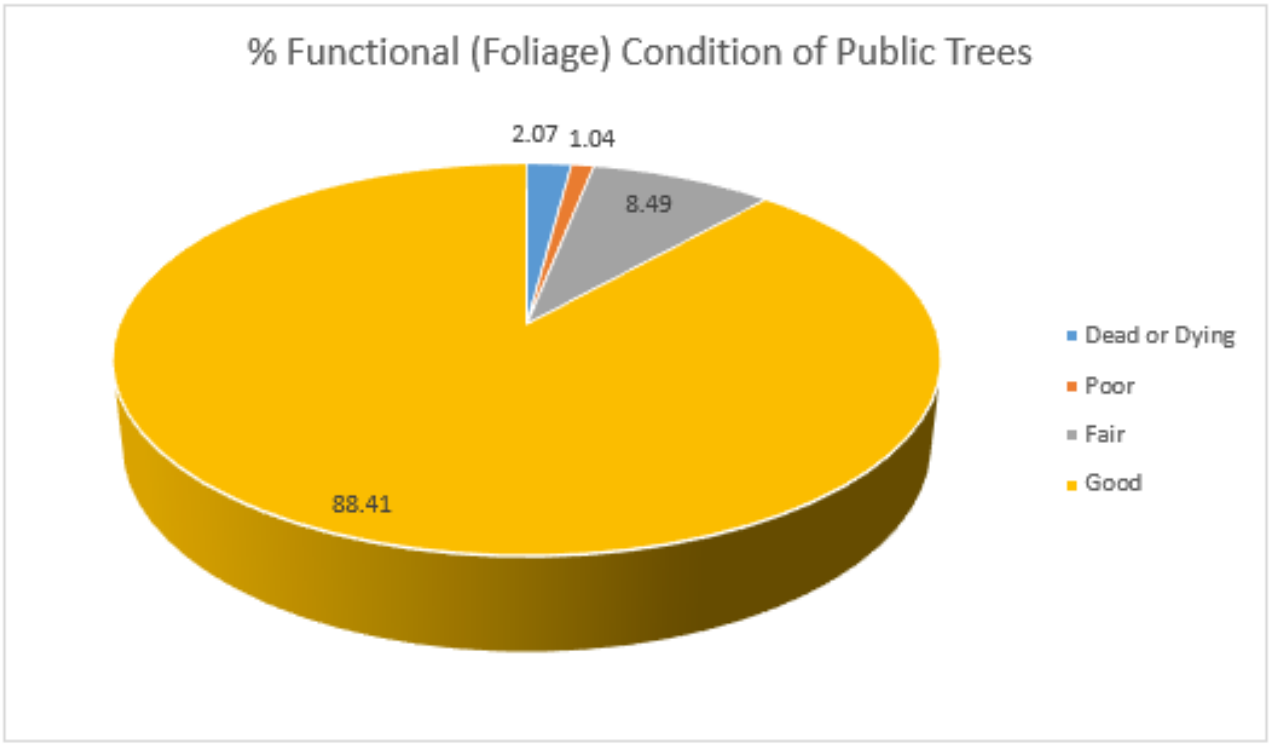


Figure 3: Foliage Condition

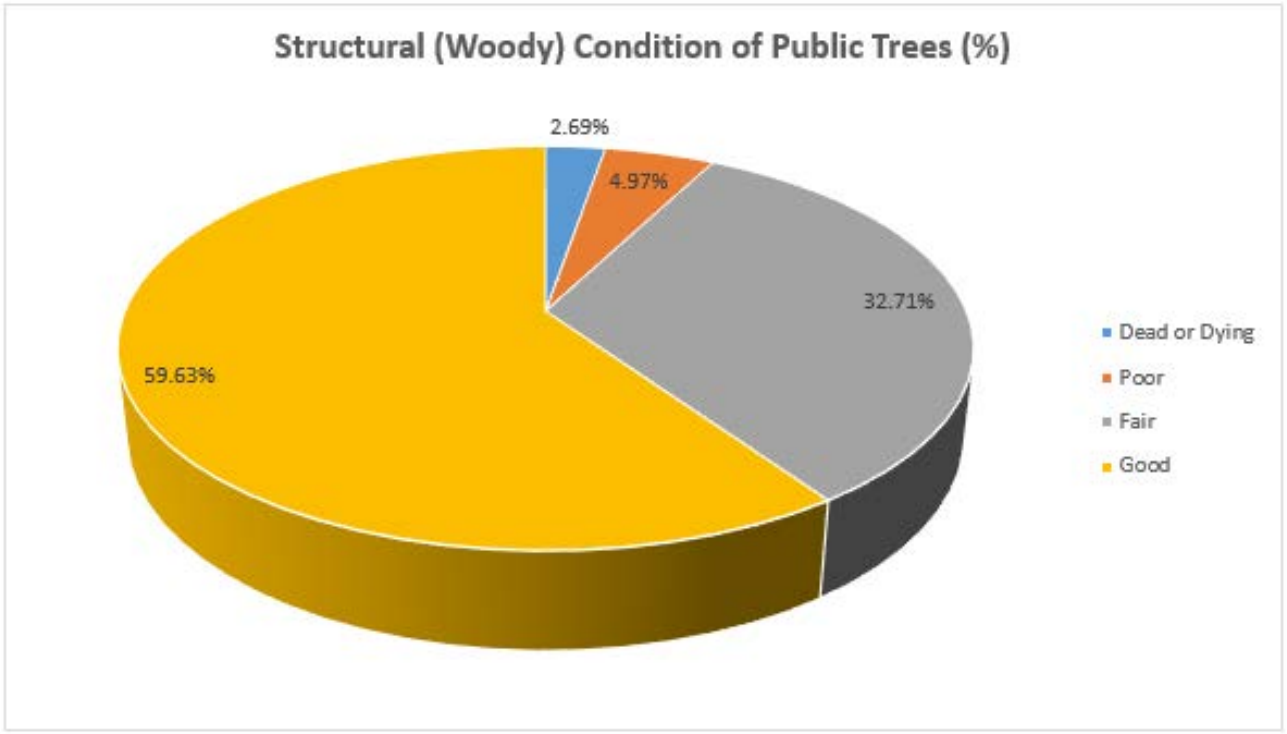
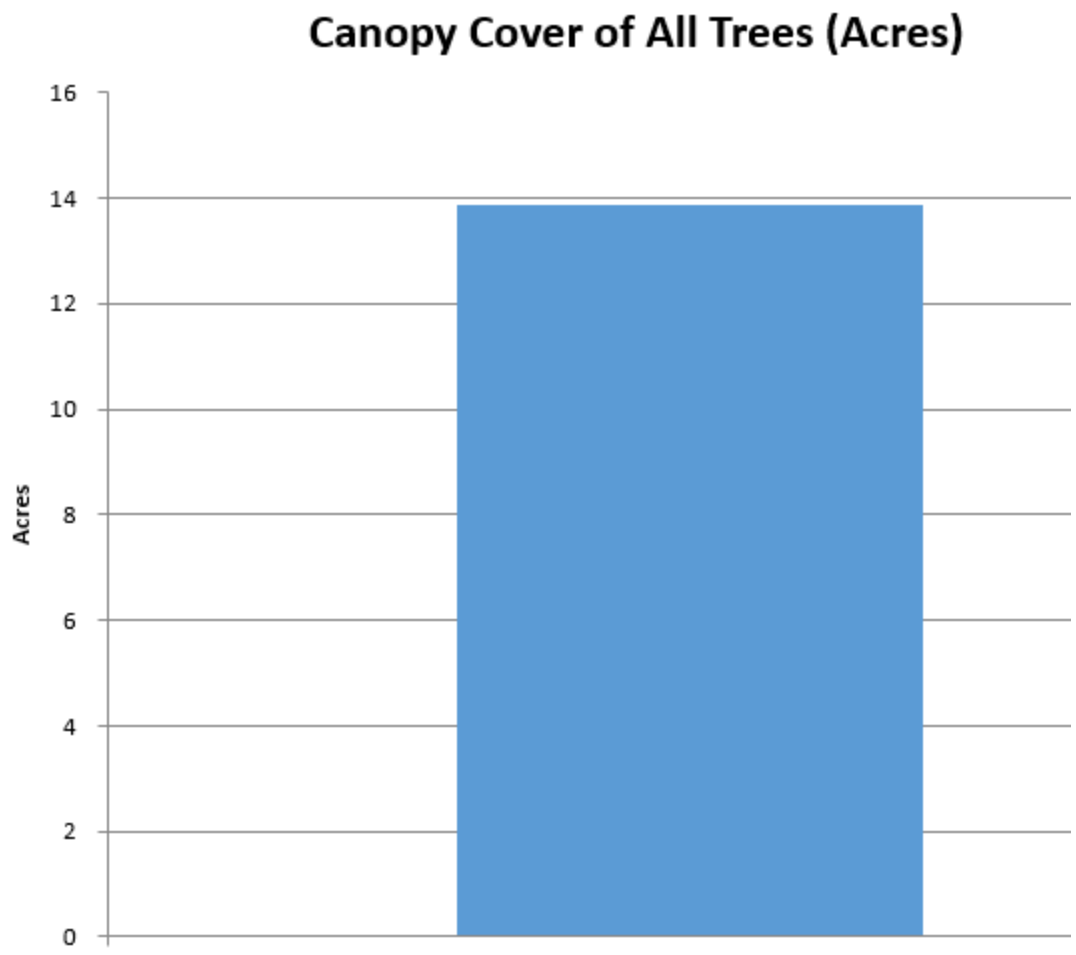


Figure 4: Wood Condition



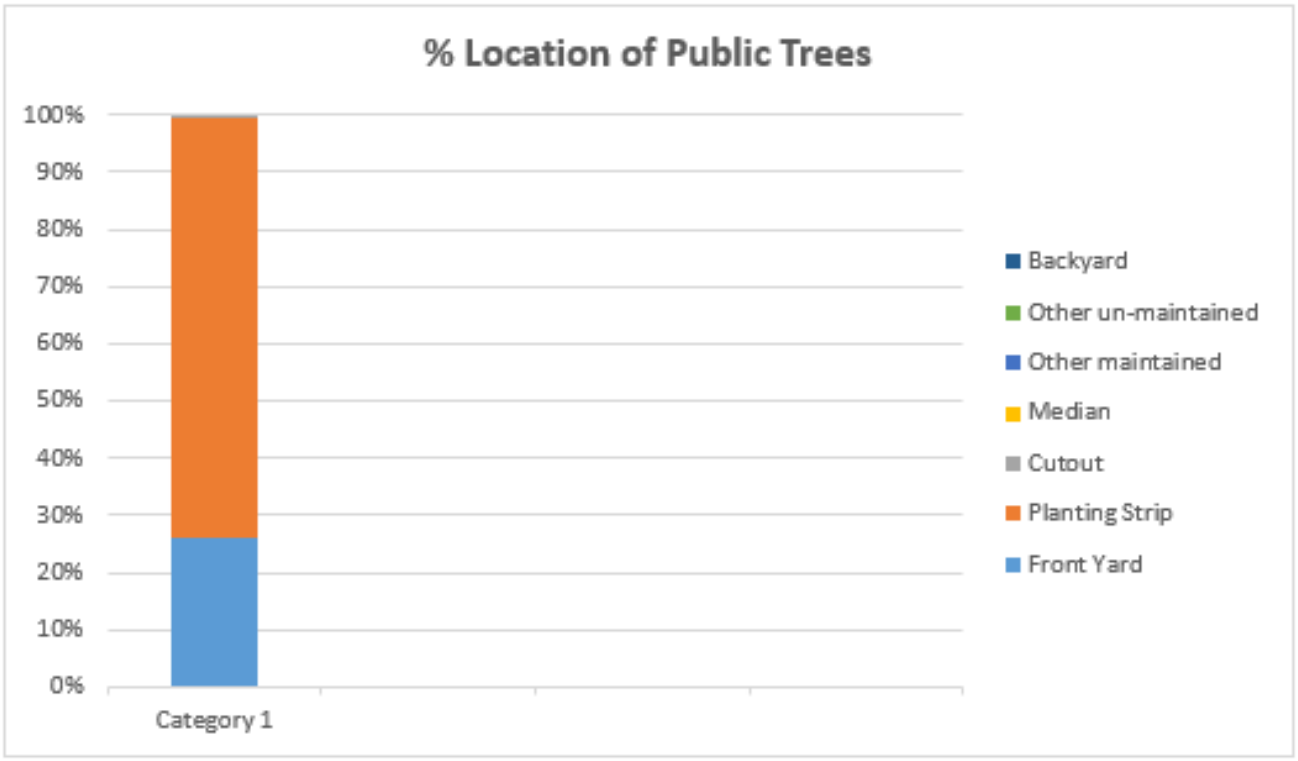
Canopy Cover of All Trees (Acres)		12/20/2018
Zone	Acres	% of Total Canopy
1	13.85	3.70
Citywide Total	376.46	100.00

Figure 5: Canopy Cover in Acres

Land Use of All Trees by Zone

Citywide	Single family residential	384	(N/A)	79.50	79.50
	Multi-family residential	0	(N/A)	0.00	0.00
	Industrial/Large commercial	1	(N/A)	0.21	0.21
	Park/vacant/other	96	(N/A)	19.88	19.88
	Small commercial	2	(N/A)	0.41	0.41
	Total	483	(N/A)	100.00	100.00

Figure 6: Land Use of city/park trees



Front Yard	Planting Strip	Cutout	Median	Other maintained	Other un-maintained	Backyard
26%	73.91%	0%	0.00%	0%	0	0

Figure 7: Location of city/park trees

Appendix B: ArcGIS Mapping

Figure 1:

Location of Ash Trees
2018 Community Tree Inventory
West Burlington, IA

Figure 2:

Location of EAB Symptoms
2018 Community Tree Inventory
West Burlington, IA

Figure 3:

Location of Poor Condition Trees
2018 Community Tree Inventory
West Burlington, IA

Figure 4:

Location of Trees with Recommended Maintenance
2018 Community Tree Inventory
West Burlington, IA

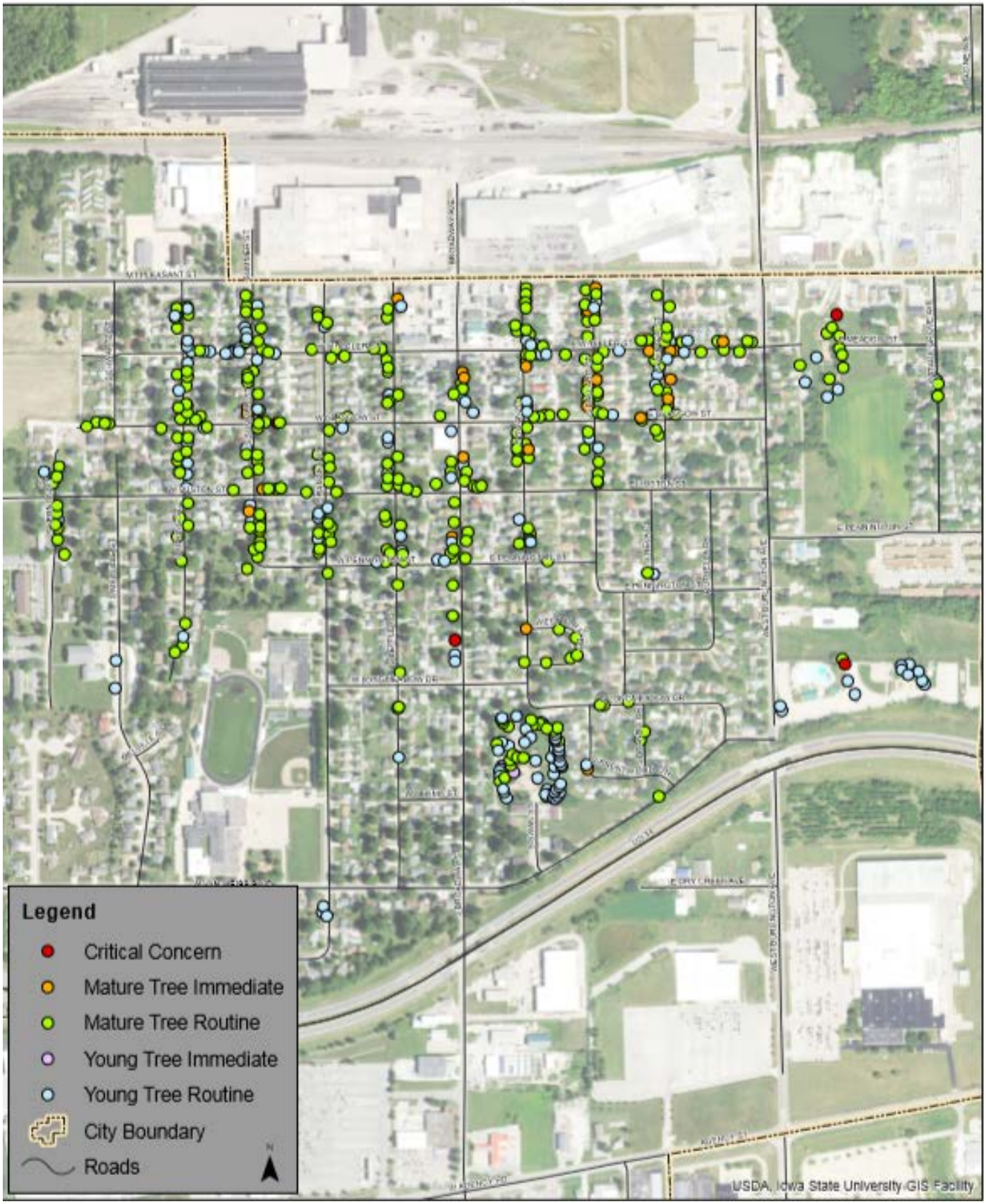


Figure 5:

Maintenance Tasks
2018 Community Tree Inventory
West Burlington, IA

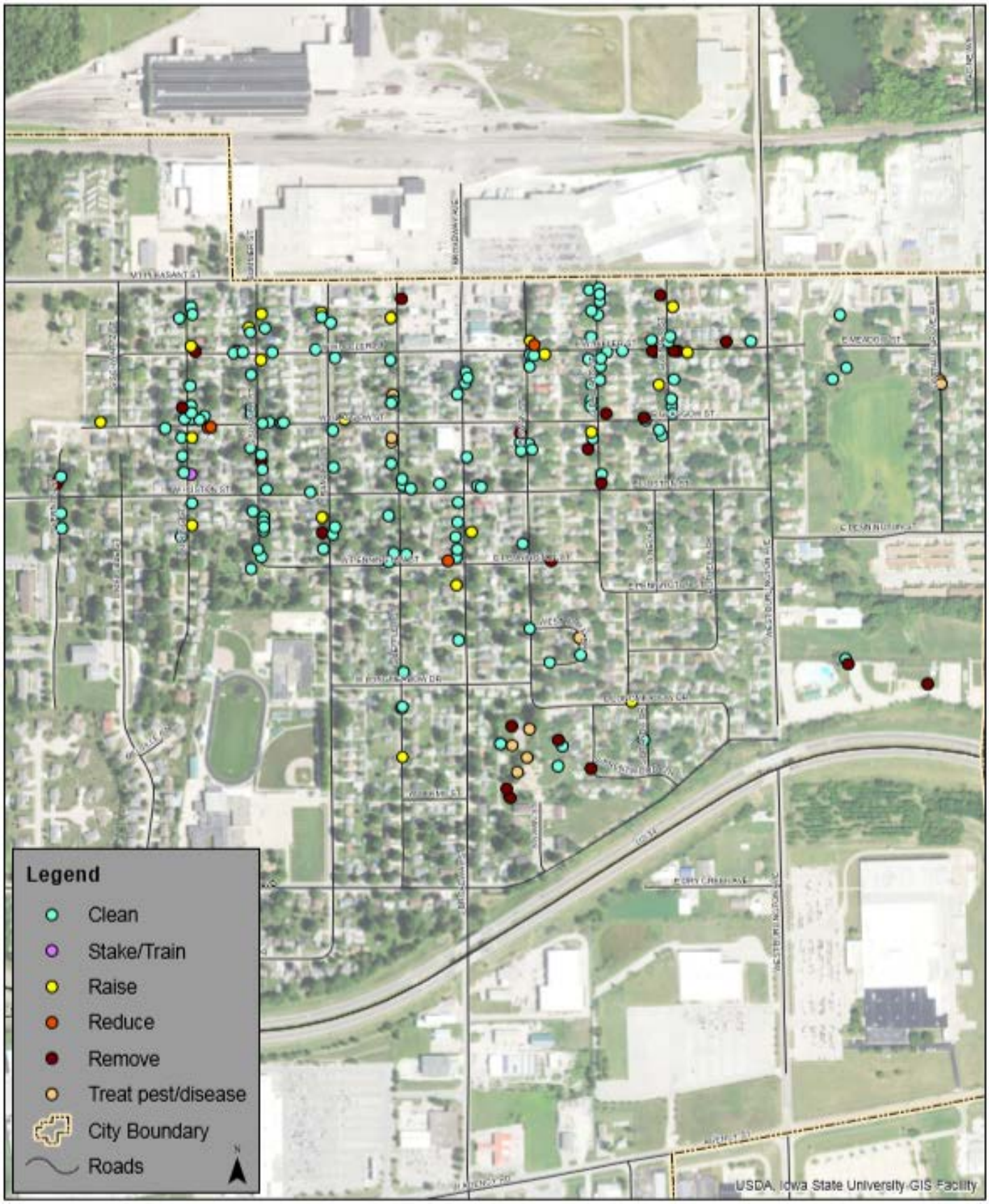


Figure 6:

Location of Treatable Ash Trees
2018 Community Tree Inventory
West Burlington, IA

Figure 7:

Removed Trees
2018 Community Tree Inventory
West Burlington, IA

CHAPTER 150

TREES

150.01 PURPOSE. The purpose of this chapter is to regulate the planting and caring of trees, shrubs, and bushes in the City for the protection of public health, safety and welfare.

150.02 DEFINITIONS. For the purpose of this chapter, the following definitions shall apply:

1. "Owner" includes the terms "agent," "occupant," "tenant," and "person in control" of property.

2. "Parking" includes 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.

3. "Private property" means all property not owned by the City.

4. "Public property" includes any and all property located within the confines of the City and owned by the City or held in the name of the City by any departments, commissions, or agencies within the City government.

5. "Public right-of-way" means all of the land lying between property lines on either side of all public streets, avenues, highways, and alleys including public easements and grants to the City.

6. "Streets" includes the entire width between the property lines of the streets, avenues, highways, or public alleys, and shall include the entire street or alley right-of-way.

150.03 TREE, SHRUB, AND BUSH MAINTENANCE ON PUBLIC PROPERTY. No trees, shrubs, or bushes shall be maintained in such a manner as to interfere with the moving of traffic upon the streets in a safe and orderly manner.

150.04 TREE, SHRUB, AND BUSH REMOVAL ON PRIVATE PROPERTY. No trees, shrubs, bushes, or parts thereof on private property which are dead, decayed, diseased or dying, or have become dangerous to the public, shall be allowed to remain in said dead, decayed, diseased, or dying condition.

150.05 DUTY TO TRIM. All property owners, agents, or occupants of property adjoining the streets in the City shall prune, maintain, and care for all trees, shrubs and bushes located upon the public street right-of-way or parking of the City. All trees, shrubs, and bushes which overhang onto the streets, alleys, or other roadways of the City must be trimmed to a height of

thirteen (13) feet, six (6) inches immediately above such streets alleys or roadways. Furthermore, all trees, shrubs, and bushes which overhang onto the sidewalks of the City must be trimmed to a height of eight (8) feet immediately above such sidewalks. Finally, all trees, shrubs and bushes located upon the public street right-of-way or parking of the City shall be trimmed so that there are no branches within two (2) feet of the sidewalk and of the curb line for snow removal purposes.

150.06 AUTHORITY OF CITY COUNCIL. The City Council shall have the authority to order the property owner, agent or occupant of property adjoining the streets to prune, maintain and care for all trees, shrubs and bushes located on the street, public right-of-way or parking, which has become dangerous to the public or which interfere with the moving of traffic upon the streets in a safe manner, by serving of notice upon such owner to comply with said order. This authority is in addition to the requirements that all trees, shrubs and bushes be trimmed as above described.

150.07 FORM AND SERVICE OF NOTICE. The notice required in Section 150.06 shall be served personally on the owner or occupant of the property by the police department, or sent by registered mail to their last known address.

150.08 FAILURE TO COMPLY WITH NOTICE. Should the adjoining property owner, agent, or occupant refuse to prune, maintain, and care for trees, shrubs, and bushes, or to remove dead, decayed, diseased or dying trees, shrubs, or bushes within a reasonable time after receiving notice from the Council to do so, which reasonable time shall in no event be more than twenty (20) days following the receipt of such notice, then the Council may order the removal, pruning, and maintenance or destruction of said trees, shrubs, and bushes and assess the costs thereof against the adjoining property by resolution of the Council.

150.09 TREES, SHRUBS OR BUSHES IN PUBLIC RIGHT-OF-WAY. No person shall plant any tree, shrub, or bush in any public right-of-way or parking. Any tree, shrub, or bush in the public right-of-way or parking is hereby declared a public danger and nuisance, except an abutting property owner may make application to the City Clerk as provided in Section 150.11, to plant the following trees in the parking:

Minimum Parking Width	Tree Species
4 – 6 feet	American Hornbeam
4 – 6 feet	Amur Maple (treeform)
4 – 6 feet	Flowering Crabapple
4 – 6 feet	Flowering Dogwood
4 – 6 feet	Hedge Maple (treeform)
4 – 6 feet	Golden Chain Tree
4 – 6 feet	Japanese Tree Lilac
4 – 6 feet	Eastern Redbud
4 – 6 feet	Sourwood
4 – 6 feet	Japanese Maple
	Persian Parrotia

Above trees should be placed if power lines are present regardless of parking width.

Minimum Parking Width	Tree Species
6 – 8 feet	Golden Rain Tree
6 – 8 feet	Callery Pear
8 – 10 feet	Katsura Tree (treeform)
8 – 10 feet	Yellow Wood
10 – 12 feet	Ginkgo (male)
10 – 12 feet	Hardy Rubber Tree
10 – 12 feet	Japanese Zelkova
12 – 14 feet	Hackberry
12 – 14 feet	Little Leaf Linden
12 – 14 feet	Norway Maple
14 – 16 feet	Red Maple
14 – 16 feet	Sugar Maple
16 feet or greater	Chinkapin Oak
16 feet or greater	Pin Oak
16 feet or greater	Red Oak
16 feet or greater	Tulip Tree

150.10 PROHIBITED TREES. No person shall plant any of the following species either in the public right-of-way or parking:

Box-Elder
Silver Maple
Sycamore
Elm Varieties
Willow Varieties
Poplar Varieties
Catalpa Varieties

It is recommended the property owner refrain from planting the above mentioned trees on private properties.

150.11 PERMIT AND REGULATION.

1. No person shall plant a tree pursuant to Section 150.09 until said person has obtained a permit which shall show the type of tree to be planted and the placement of said tree. The placement of said tree must be approved by the Public Works Director. No permit shall be issued until the Public Works Director has actually viewed the site of said placement. There will be no fee for said permit.

2. No tree may be planted where there is less than two (2) feet of soil on all sides of said tree; and no tree may be planted closer than five (5) feet from any fire hydrant nor closer than forty (40) feet to another tree on the parking.

3. The City Clerk may refuse the issuance of a permit if the same would cause damage to the public right-of-way and parking, or create a safety hazard or fails to conform to the scheme of planting of trees upon that particular public right-of-way or parking area.

150.12 REMOVAL OF TREES. The City may remove any live tree standing on the public right-of-way or parking thereof for construction of walks, drives, buildings, or any other structures or for public safety. No compensation shall be paid to the abutting property owner whether the City or the abutting property owner placed said tree on the public right-of-way or parking. Any person desiring to remove a live tree standing on the public right-of-way or parking thereof for construction of walks, drives, buildings, or any other reason shall first obtain a permit from the Clerk. If a permit is issued the permittee must remove the tree at the permittee's own expense. No fee shall be charged for the permit to remove said tree.

The State of Iowa is an Equal Opportunity Employer and provider of ADA services.

Federal law prohibits employment discrimination on the basis of race, color, age, religion, national origin, sex or disability. State law prohibits employment discrimination on the basis of race, color, creed, age, sex, sexual orientation, gender identity, national origin, religion, pregnancy, or disability. State law also prohibits public accommodation (such as access to services or physical facilities) discrimination on the basis of race, color, creed, religion, sex, sexual orientation, gender identity, religion, national origin, or disability. If you believe you have been discriminated against in any program, activity or facility as described above, or if you desire further information, please contact the Iowa Civil Rights Commission, 1-800-457-4416, or write to the Iowa Department of Natural Resources, Wallace State Office Bldg., 502 E 9th St, Des Moines IA 50319.

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