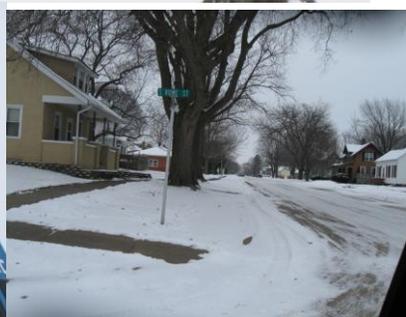


# Walcott, IA



2011 Community Street & Park Tree Management Plan  
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# Executive Summary

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## Overview

This plan was developed to assist the City of Walcott 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) and gypsy moth. 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). This pest was found in Iowa in the spring of 2010. There is a strong possibility that ~12 % of Walcott's city owned trees (ash-22) will die once EAB becomes established in the community. With proper planning and management, the costs of removing dead and dying trees can be extended over years, mitigating public safety issues. Another concern is that 49% of Walcott's city owned trees are some type of (maple-90), so if any type of insect or disease starts to threaten the health of maples in the community this could have a significant impact on the community tree population. Basically, 61% (112) of Walcott's city owned trees are either a maple or an ash.

## Inventory and Results

In the summer of 2010 and the winter of 2011, a tree inventory was conducted using Global Positioning System (GPS) data collectors. The inventory was a complete inventory of street and park trees in the community. Below are some key findings of the 178 trees inventoried.

- Walcott's trees provide \$31,039 of benefits annually, an average of \$174 a tree
- There are ~30 species of trees
- The top four genus are: Maple 49%, Ash 12%, Oak 9%, and Hackberry 5%
- 28% of trees are in need of some type of management
- 9 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 9 trees needing removal, 8 trees are over 18 inches in diameter at 4.5 ft and must be evaluated immediately to decide if they need to be removed and when [\\*City ownership of the trees recommended for removal should be verified prior to any removal\\*](#)
- 5 of the 22 ash trees are in need of follow up because they are displaying signs and symptoms associated with EAB
- 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, willow, black walnut, or evergreen species as street trees. Evergreen species such as Norway spruce, Serbian spruce, white spruce, black hills spruce, Eastern white pine, Eastern redcedar, concolor fir, or arborvitae can be considered for park plantings.
- Check ash trees with a visual survey yearly
- With the current budget it could take 3.5 years to remove the existing ash if they were to die

## Introduction

This plan was developed to assist Walcott 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 and replacement planting. With proper planning and management of the current canopy in Walcott, these costs can be extended over years and public safety issues from dead and dying ash trees mitigated.

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

## Inventory

In the summer of 2010 and in the winter of 2011, 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 of 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**

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The data collected for the 178 city trees was entered into the USDA Forest service program Street Tree Resource Analysis Tool for Urban forestry Management (STRATUM), part of the I-Tree suite. The following are results from the I-Tree STRATUM analysis.

### **Annual Benefits**

#### **Annual Energy Benefits**

Trees conserve energy by shading buildings and blocking winds. Walcott's trees reduce energy related costs by approximately \$8,110 annually (Appendix A, Table 1). These savings are both in Electricity (38.3 MWh) and in Natural Gas (5,307 Therms).

#### **Annual Stormwater Benefits**

Walcott's trees intercept about 406,331 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides \$11,012 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 Walcott, it is estimated that trees remove 484.8 lbs of air pollution (ozone (O<sub>3</sub>), particulate matter less than 10 microns (PM10), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and sulfur dioxide (SO<sub>2</sub>)) per year with a net value of \$1,358 (Appendix A, Table 3).

#### **Annual Carbon Benefits**

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Walcott, trees sequester about 94,066 lbs of carbon a year with an associated value of \$1,133 (Appendix A, Table 4). In addition, the trees store 1,499,278 lbs of carbon, with a yearly benefit of \$11,245 (Appendix A, Table 5).

## 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. Walcott receives \$9,425 in annual social benefits from trees (Appendix A, Table 6).

## Financial Summary of all Benefits

According to the USDA Forest Service i-Tree STRATUM analysis, Walcott's trees provide \$31,039 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 178 trees in Walcott provide approximately \$174 annually (Appendix A, Table 7).

## **Forest Structure**

### Species Distribution

Walcott has 30 different tree species along city streets and parks (Appendix A, Figure 1). The distribution of trees by genus is as follows:

|                 |    |  |
|-----------------|----|--|
| Maple           | 90 | 49% (Norway, Amur, Red, Silver, and Sugar) |
| Ash             | 22 | 12% (White and Green)                      |
| Oak             | 16 | 9% (Pin, Red, Bur, and White)              |
| Hackberry       | 9  | 5%   |
| Apple (Crab)    | 7  | 3%   |
| Pear (Callery)  | 7  | 3%   |
| Honeylocust     | 6  | 3%   |
| Spruce          | 6  | 3%   |
| Linden/Basswood | 3  | 2%   |
| Eastern Redbud  | 3  | 2%   |
| Birch           | 2  | 1%   |
| Pine            | 2  | 1%   |
| Sycamore        | 2  | 1%   |
| Mountain Ash    | 1  | <1%  |
| Amur Corktree   | 1  | <1%  |
| Other           | 1  | <1%  |

### Size Class

A little over half of Walcott's public trees (54.5%) are between 3 and 18 inches in diameter at 4.5 ft (Appendix A, Figure 2). The remaining portion of the trees (45.5%) are 18 inches in diameter and greater. It should be noted that (28.5%) of the trees are 24 inches in diameter or greater.

## 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 Walcott indicate that 83% of the trees are in good health, with only 2% of the foliage in poor health, dead or dying (Appendix A, Figure 3 & Appendix B, Figure 3). It should be noted that all of the trees in the 3 main parks were evaluated in the winter of 2011 and there was no leaf evaluation. Similarly, 65% of Walcott'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 5% of the population. This 5% is an estimate of trees that need management follow up.

## Management Needs

In (Appendix B, Figure 4) the specific management needs of the inventoried trees are identified. Management practices needed include crown cleaning, crown raising, crown reduction, and removal. The most common practice needed is crown raising above the street and sidewalks for safety clearance. City ordinance [151.03 DUTY TO TRIM TREES](#) assigns that responsibility to adjacent property owners. There are 2 trees on the map that have been identified as critical concerns, and these trees need to be evaluated immediately to determine needed management. There are 47 trees identified on the map that need work done within the next year including 9 trees identified for removal. Below I would like to highlight a few trees in the parks that have some concerns that should be evaluated as soon as possible:

### Victory Park

- Large pin oak next to woman's bathroom has significant crack in trunk of the tree. This tree has been temporarily cabled but the current system could cause long-term trunk damage. Re-evaluate this tree.
- There is a hackberry tree next to the concession stand and one next to the adjacent shelter that have some dead branches 3 to 5 inches in diameter that should be removed before activity in the park increasing this spring (2011).

### Wescott Park

- There is an 18 to 24 inch green ash tree next to the bleachers on the first base side of the ball field that needs to be evaluated for removal. This tree has significant decay along the stem.

## Pruning Practices

There are some trees in Victory and Watertower Park that have been pruned in a way that will make it difficult for these trees to respond correctly to the wounding. When a few of the trees were pruned in these parks too much of a stub was left. The good news is that this pruning can be easily corrected to allow for proper tree response.



**Ash tree in Watertower Park**



**Too Much Stub**

**Linden/Basswood in Victory Park**

### Consider the guidelines when pruning:

1. To avoid concerns related to the fungus that causes the disease oak wilt, all oak species should only be pruned between October 1 and February 28<sup>th</sup>.
2. All final cuts should be outside the branch collar.
3. Unless pruning broken oak branches between March 1 and September 30<sup>th</sup> pruning paints are not needed.



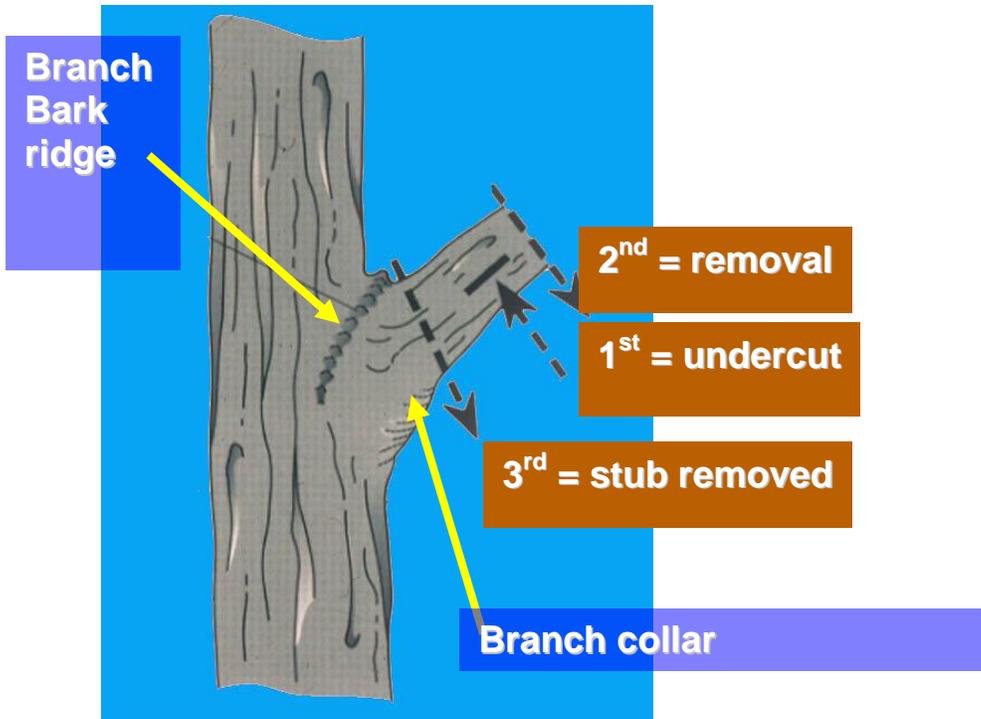
**Branch collar**



**Proper Pruning**



**Improper Pruning**



**Proper Pruning Cut**

**Canopy Cover**

The canopy cover of Walcott is approximately 4 acres (Appendix A, Figure 4). According to the 2000 census, Walcott occupies ~1,856 acres. Thus the canopy cover on city land is less than 1%.

**Land Use and Location**

The majority of Walcott’s city trees are in planting strips in single family residential neighborhoods (61.8%), and the remaining trees (38.2%) are in the parks (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 | 61.8% |
| Park/vacant/other         | 38.2% |

Location

|                            |       |
|----------------------------|-------|
| Planting strip             | 61.2% |
| Other maintained locations | 38.2% |
| Backyard                   | .6%   |

## Recommendations

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### 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 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

Walcott has 2 critical concern trees that need immediate attention to remove dead branches. These trees can be seen on the Location of Trees with Recommended Maintenance map (Appendix B, Figure 4). There are also trees listed in the Management Needs Section that need to be evaluated now to determine needed work.

#### Poor tree species

There are 9 trees that have been identified for removal or at least evaluation for removal. Once these trees are removed, ash trees in poor health should be assessed for removal (Appendix B, Figure 3 & Appendix B, Figure 4). Of the 9 removals, 3 are ash trees. There are a total of 22 ash trees, and 5 of those have signs and symptoms that have been associated with EAB. In addition, there are 7 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 2 years will replace the trees that are removed. It is recommended to plant 1 to 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 Walcott.

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 (49%) (Appendix A, Figure 1). Maples should not be planted on public property 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, boxelder, Chinese elm, evergreens as street trees, willow or black walnut, as outlined in section 151.02 of the city ordinance (Appendix C). All trees planted must meet the restrictions in city ordinance 151.02 (Appendix C). **Please see suggested modifications to current Tree Ordinance Chapter 151 (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 death and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and wood pecker damage. With many new potential tree health threats on the horizon attempt to monitor the health of all city owned trees on a regular basis.

### Six Year Maintenance Plan with No Additional Funding

#### Year 1

Removal: 6 trees (@ estimate \$500/tree) with the highest concern that have been identified  
Planting and Replacement: 10 to 30 trees (@ \$50 to \$150/tree) planted in open locations  
Visual Survey for signs and symptoms of EAB

#### Year 2

Removal: 3 trees with the highest concern that have been identified, plus 1 dying tree and 1 ash tree in poor health  
Planting and Replacement: 10 to 30 trees planted in open locations  
Visual Survey for signs and symptoms of EAB

#### Year 3

Removal: 3 trees - removal of any new critical concern trees and ash in poor health  
Planting and Replacement: 10 to 30 trees planted in open locations  
Routine trimming: Contract to trim a portion of city trees  
Visual Survey for signs and symptoms of EAB

#### Year 4

Removal: 3 trees - removal of any new critical concern trees and ash in poor health  
Planting and Replacement: 10 to 30 trees planted in open locations  
Routine trimming: Contract to trim a portion of city trees  
Visual Survey for signs and symptoms of EAB

## Year 5

Removal: 3 trees - removal of any new critical concern trees and ash in poor health

Planting and Replacement: 10 to 30 trees planted in open locations

Routine trimming: Contract to trim a portion of city trees

Visual Survey for signs and symptoms of EAB

## Year 6

Removal: 3 trees - removal of any new critical concern trees and ash in poor health

Planting and Replacement: 10 to 30 trees planted in open locations

Routine trimming: Contract to trim a portion of city trees

Visual Survey for signs and symptoms of EAB

EAB could potentially kill all ash within 4 years of its arrival. It would take approximately 3.5 years to remove all ash (22) at \$500/tree with the current budget (\$3,000 pruning and removal).

## Emerald Ash Borer Plan

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### 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\\*](#)

### EAB Quarantines

EAB is an extremely destructive plant pest and it is responsible for the death and decline of over 25 million 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 ash 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](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 ash trees should be replaced. All trees will meet the restrictions in city ordinance 151.02 (Appendix C). The new plantings will be a diverse mix and will not include ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreens along the streets, 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 genus 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. City Code 151.05 and 151.06 states “**151.05 DISEASE CONTROL.** Any dead, diseased or damaged tree or shrub which may harbor serious insect or disease pests or disease injurious to other trees is hereby declared to be a nuisance.

### **151.06 INSPECTION AND REMOVAL.**

The Council shall inspect or cause to be inspected any trees or shrubs in the City reported or suspected to be dead, diseased or damaged, and such trees and shrubs shall be subject to the following:

2. Private Property. If it is determined with reasonable certainty that any such condition exists on private property and that danger to other trees or to adjoining property or passing motorists or pedestrians is imminent, the Council shall notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within fourteen (14) days of said notification. If such owner, occupant or person in charge of said property fails to comply within fourteen (14) days of receipt of notice, the Council may cause the condition to be corrected and the cost assessed against the property. ”

## Budget

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### Current Budget

**Total \$27,000 over 6 years (\$4,500/year)**

### **FY 2011 Budget**

Removal & Pruning: \$3,000

Planting: \$1,000

Watering & Maintenance: \$500

EAB could potentially kill all ash within 4 years of its arrival. It would take approximately 3.5 years to remove all ash (22) at \$500/tree with the current budget.

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## Appendix A: I-Tree Data

Table 1: Annual Energy Benefits

### Annual Energy Benefits of Public Trees by Species

1/18/2011

| Species            | Total Electricity<br>(MWh) | Electricity<br>(\$) | Total Natural<br>Gas (Therms) | Natural<br>Gas (\$) | Total Standar<br>(\$) | d Error | % of Total<br>Trees | % of<br>Total \$ | Avg.<br>\$/tree |
|--------------------|----------------------------|---------------------|-------------------------------|---------------------|-----------------------|---------|---------------------|------------------|-----------------|
| Norway maple       | 7.6                        | 577                 | 1,099.2                       | 1,077               | 1,654                 | (N/A)   | 20.2                | 20.4             | 45.95           |
| Silver maple       | 6.7                        | 506                 | 875.9                         | 858                 | 1,364                 | (N/A)   | 11.8                | 16.8             | 64.95           |
| Red maple          | 1.3                        | 100                 | 196.4                         | 193                 | 293                   | (N/A)   | 9.0                 | 3.6              | 18.30           |
| Sugar maple        | 3.4                        | 260                 | 471.8                         | 462                 | 723                   | (N/A)   | 7.9                 | 8.9              | 51.61           |
| White ash          | 2.4                        | 185                 | 314.7                         | 308                 | 494                   | (N/A)   | 6.7                 | 6.1              | 41.15           |
| Northern hackberry | 3.2                        | 244                 | 464.8                         | 456                 | 700                   | (N/A)   | 5.1                 | 8.6              | 77.76           |
| Green ash          | 2.2                        | 166                 | 300.5                         | 294                 | 460                   | (N/A)   | 5.1                 | 5.7              | 51.13           |
| Pin oak            | 3.0                        | 230                 | 397.7                         | 390                 | 620                   | (N/A)   | 5.1                 | 7.6              | 68.85           |
| Apple              | 0.3                        | 24                  | 53.7                          | 53                  | 76                    | (N/A)   | 3.9                 | 0.9              | 10.88           |
| Honeylocust        | 2.0                        | 151                 | 260.2                         | 255                 | 406                   | (N/A)   | 3.4                 | 5.0              | 67.70           |
| Callery pear       | 0.4                        | 28                  | 58.5                          | 57                  | 85                    | (N/A)   | 3.4                 | 1.1              | 14.15           |
| Northern red oak   | 0.9                        | 68                  | 124.5                         | 122                 | 190                   | (N/A)   | 2.8                 | 2.4              | 38.08           |
| Blue spruce        | 0.3                        | 19                  | 40.8                          | 40                  | 59                    | (N/A)   | 2.3                 | 0.7              | 14.80           |
| Eastern redbud     | 0.3                        | 25                  | 50.3                          | 49                  | 75                    | (N/A)   | 1.7                 | 0.9              | 24.84           |
| American basswood  | 0.8                        | 58                  | 107.2                         | 105                 | 163                   | (N/A)   | 1.7                 | 2.0              | 54.18           |
| Birch              | 0.4                        | 32                  | 64.3                          | 63                  | 95                    | (N/A)   | 1.1                 | 1.2              | 47.66           |
| Spruce             | 0.2                        | 14                  | 24.1                          | 24                  | 38                    | (N/A)   | 1.1                 | 0.5              | 18.86           |
| American sycamore  | 0.7                        | 54                  | 100.5                         | 99                  | 153                   | (N/A)   | 1.1                 | 1.9              | 76.46           |
| Other street trees | 2.2                        | 167                 | 301.9                         | 296                 | 463                   | (N/A)   | 6.7                 | 5.7              | 38.59           |
| Citywide total     | 38.3                       | 2,909               | 5,307.0                       | 5,201               | 8,110                 | (N/A)   | 100.0               | 100.0            | 45.56           |

Table 2: Annual Stormwater Benefits

### Annual Stormwater Benefits of Public Trees by Species

1/18/2011

| Species            | Total rainfall<br>interception (Gal) | Total<br>(\$) | Standard<br>Error | % of Total<br>Trees | % of Total<br>\$ | Avg.<br>\$/tree |
|--------------------|--------------------------------------|---------------|-------------------|---------------------|------------------|-----------------|
| Norway maple       | 67,841                               | 1,839         | (N/A)             | 20.2                | 16.7             | 51.07           |
| Silver maple       | 95,703                               | 2,594         | (N/A)             | 11.8                | 23.6             | 123.51          |
| Red maple          | 7,076                                | 192           | (N/A)             | 9.0                 | 1.7              | 11.99           |
| Sugar maple        | 37,011                               | 1,003         | (N/A)             | 7.9                 | 9.1              | 71.65           |
| White ash          | 20,505                               | 556           | (N/A)             | 6.7                 | 5.1              | 46.31           |
| Northern hackberry | 32,380                               | 878           | (N/A)             | 5.1                 | 8.0              | 97.51           |
| Green ash          | 25,537                               | 692           | (N/A)             | 5.1                 | 6.3              | 76.90           |
| Pin oak            | 37,839                               | 1,026         | (N/A)             | 5.1                 | 9.3              | 113.95          |
| Apple              | 1,068                                | 29            | (N/A)             | 3.9                 | 0.3              | 4.14            |
| Honeylocust        | 21,420                               | 581           | (N/A)             | 3.4                 | 5.3              | 96.75           |
| Callery pear       | 1,823                                | 49            | (N/A)             | 3.4                 | 0.5              | 8.23            |
| Northern red oak   | 8,311                                | 225           | (N/A)             | 2.8                 | 2.1              | 45.05           |
| Blue spruce        | 3,021                                | 82            | (N/A)             | 2.3                 | 0.7              | 20.47           |
| Eastern redbud     | 1,195                                | 32            | (N/A)             | 1.7                 | 0.3              | 10.80           |
| American basswood  | 6,606                                | 179           | (N/A)             | 1.7                 | 1.6              | 59.68           |
| Birch              | 4,350                                | 118           | (N/A)             | 1.1                 | 1.1              | 58.95           |
| Spruce             | 2,134                                | 58            | (N/A)             | 1.1                 | 0.5              | 28.92           |
| American sycamore  | 9,433                                | 256           | (N/A)             | 1.1                 | 2.3              | 127.82          |
| Other street trees | 23,078                               | 625           | (N/A)             | 6.7                 | 5.7              | 52.12           |
| Citywide total     | 406,331                              | 11,012        | (N/A)             | 100.0               | 100.0            | 61.87           |

**Table 3: Annual Air Quality Benefits**

**Annual Air Quality Benefits of Public Trees by Species**

1/18/2011

| 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 <sub>3</sub>  | NO <sub>2</sub> | PM <sub>10</sub> | SO <sub>2</sub> |                   | NO <sub>2</sub> | PM <sub>10</sub> | VOC  | SO <sub>2</sub> |                    |                     |                     |            |             |                |                  |              |
| Norway maple       | 13.4            | 2.3             | 6.7              | 0.6             | 73                | 36.9            | 5.3              | 5.1  | 34.5            | 228                | -3.2                | -12                 | 101.6      | 289 (N/A)   | 20.2           | 8.04             |              |
| Silver maple       | 16.7            | 2.8             | 8.2              | 0.7             | 90                | 31.4            | 4.6              | 4.4  | 30.1            | 196                | -9.0                | -34                 | 90.1       | 253 (N/A)   | 11.8           | 12.05            |              |
| Red maple          | 0.8             | 0.1             | 0.5              | 0.0             | 5                 | 6.4             | 0.9              | 0.9  | 6.0             | 40                 | -0.4                | -1                  | 15.4       | 43 (N/A)    | 9.0            | 2.70             |              |
| Sugar maple        | 4.8             | 0.8             | 2.4              | 0.2             | 26                | 16.4            | 2.4              | 2.3  | 15.5            | 102                | -3.8                | -14                 | 41.0       | 114 (N/A)   | 7.9            | 8.12             |              |
| White ash          | 1.9             | 0.3             | 1.0              | 0.1             | 10                | 11.5            | 1.7              | 1.6  | 11.1            | 72                 | 0.0                 | 0                   | 29.1       | 82 (N/A)    | 6.7            | 6.86             |              |
| Northern hackberry | 5.1             | 0.9             | 2.6              | 0.2             | 28                | 15.6            | 2.3              | 2.1  | 14.6            | 97                 | 0.0                 | 0                   | 43.5       | 125 (N/A)   | 5.1            | 13.85            |              |
| Green ash          | 3.3             | 0.5             | 1.6              | 0.1             | 18                | 10.4            | 1.5              | 1.4  | 9.9             | 65                 | 0.0                 | 0                   | 28.8       | 82 (N/A)    | 5.1            | 9.17             |              |
| Pin oak            | 7.2             | 1.3             | 3.6              | 0.3             | 39                | 14.3            | 2.1              | 2.0  | 13.7            | 89                 | -13.2               | -50                 | 31.3       | 79 (N/A)    | 5.1            | 8.79             |              |
| Apple              | 0.2             | 0.0             | 0.1              | 0.0             | 1                 | 1.6             | 0.2              | 0.2  | 1.4             | 10                 | 0.0                 | 0                   | 3.7        | 10 (N/A)    | 3.9            | 1.50             |              |
| Honeylocust        | 4.2             | 0.7             | 1.9              | 0.2             | 22                | 9.4             | 1.4              | 1.3  | 9.0             | 59                 | -3.2                | -12                 | 24.8       | 69 (N/A)    | 3.4            | 11.46            |              |
| Callery pear       | 0.1             | 0.0             | 0.1              | 0.0             | 1                 | 1.8             | 0.3              | 0.2  | 1.7             | 11                 | -0.1                | 0                   | 4.2        | 12 (N/A)    | 3.4            | 1.96             |              |
| Northern red oak   | 1.7             | 0.3             | 0.8              | 0.1             | 9                 | 4.3             | 0.6              | 0.6  | 4.1             | 27                 | -2.4                | -9                  | 10.1       | 27 (N/A)    | 2.8            | 5.37             |              |
| Blue spruce        | 0.3             | 0.1             | 0.3              | 0.0             | 2                 | 1.3             | 0.2              | 0.2  | 1.1             | 8                  | -0.9                | -4                  | 2.5        | 6 (N/A)     | 2.2            | 1.53             |              |
| Eastern redbud     | 0.3             | 0.0             | 0.2              | 0.0             | 2                 | 1.6             | 0.2              | 0.2  | 1.5             | 10                 | 0.0                 | 0                   | 4.1        | 12 (N/A)    | 1.7            | 3.88             |              |
| American basswood  | 0.8             | 0.1             | 0.4              | 0.0             | 4                 | 3.7             | 0.5              | 0.5  | 3.4             | 23                 | -0.7                | -3                  | 8.8        | 24 (N/A)    | 1.7            | 8.09             |              |
| Birch              | 0.9             | 0.2             | 0.5              | 0.0             | 5                 | 2.1             | 0.3              | 0.3  | 1.9             | 13                 | -0.2                | -1                  | 6.0        | 17 (N/A)    | 1.1            | 8.52             |              |
| Spruce             | 0.2             | 0.0             | 0.2              | 0.0             | 2                 | 0.9             | 0.1              | 0.1  | 0.8             | 5                  | -0.7                | -3                  | 1.7        | 4 (N/A)     | 1.1            | 2.15             |              |
| American sycamore  | 1.3             | 0.2             | 0.6              | 0.1             | 7                 | 3.4             | 0.5              | 0.5  | 3.2             | 21                 | 0.0                 | 0                   | 9.8        | 28 (N/A)    | 1.1            | 14.09            |              |
| Other street trees | 3.3             | 0.5             | 1.6              | 0.2             | 18                | 10.5            | 1.5              | 1.5  | 10.0            | 66                 | -0.7                | -3                  | 28.5       | 81 (N/A)    | 6.7            | 6.74             |              |
| Citywide total     | 66.5            | 11.3            | 33.3             | 3.0             | 361               | 183.5           | 26.7             | 25.4 | 173.7           | 1,142              | -38.5               | -144                | 484.8      | 1,358 (N/A) | 100.0          | 7.63             |              |

**Table 4: Annual Carbon Stored**

**Stored CO2 Benefits of Public Trees by Species**

1/18/2011

| Species            | Total Stored CO2 (lbs) | Total (\$) | Standard Error | % of Total Trees | % of Total \$ | Avg. \$/tree |
|--------------------|------------------------|------------|----------------|------------------|---------------|--------------|
| Norway maple       | 222,811                | 1,671      | (N/A)          | 20.2             | 14.9          | 46.42        |
| Silver maple       | 401,848                | 3,014      | (N/A)          | 11.8             | 26.8          | 143.52       |
| Red maple          | 12,317                 | 92         | (N/A)          | 9.0              | 0.8           | 5.77         |
| Sugar maple        | 136,938                | 1,027      | (N/A)          | 7.9              | 9.1           | 73.36        |
| White ash          | 49,170                 | 369        | (N/A)          | 6.7              | 3.3           | 30.73        |
| Northern           | 77,830                 | 584        | (N/A)          | 5.1              | 5.2           | 64.86        |
| Green ash          | 110,666                | 830        | (N/A)          | 5.1              | 7.4           | 92.22        |
| Pin oak            | 197,011                | 1,478      | (N/A)          | 5.1              | 13.1          | 164.18       |
| Apple              | 3,435                  | 26         | (N/A)          | 3.9              | 0.2           | 3.68         |
| Honeylocust        | 53,257                 | 399        | (N/A)          | 3.4              | 3.6           | 66.57        |
| Callery pear       | 3,075                  | 23         | (N/A)          | 3.4              | 0.2           | 3.84         |
| Northern red oak   | 36,122                 | 271        | (N/A)          | 2.8              | 2.4           | 54.18        |
| Blue spruce        | 1,137                  | 9          | (N/A)          | 2.3              | 0.1           | 2.13         |
| Eastern redbud     | 4,853                  | 36         | (N/A)          | 1.7              | 0.3           | 12.13        |
| American           | 27,052                 | 203        | (N/A)          | 1.7              | 1.8           | 67.63        |
| Birch              | 15,381                 | 115        | (N/A)          | 1.1              | 1.0           | 57.68        |
| Spruce             | 1,427                  | 11         | (N/A)          | 1.1              | 0.1           | 5.35         |
| American           | 41,716                 | 313        | (N/A)          | 1.1              | 2.8           | 156.43       |
| Other street trees | 46,826                 | 774        | (N/A)          | 6.7              | 6.9           | 64.52        |
| Citywide total     | 1,499,278              | 11,245     | (N/A)          | 100.0            | 100.0         | 63.17        |

**Table 5: Annual Carbon Sequestered****Annual CO<sub>2</sub> Benefits of Public Trees by Species**

1/18/2011

| Species            | Sequestered (lb) | Sequestered (\$) | Decomposition Release (lb) | Maintenance Release (lb) | Total Released (\$) | Avoided (lb) | Avoided (\$) | Net Total (lb) | Total Standar d Error (\$) | % of Total Trees | % of Total \$ | Avg. \$/tree |
|--------------------|------------------|------------------|----------------------------|--------------------------|---------------------|--------------|--------------|----------------|----------------------------|------------------|---------------|--------------|
| Norway maple       | 9,661            | 72               | -1,069                     | -7                       | -8                  | 12,752       | 96           | 21,337         | 160 (N/A)                  | 20.2             | 14.1          | 4.45         |
| Silver maple       | 28,688           | 215              | -1,929                     | -4                       | -14                 | 11,172       | 84           | 37,927         | 284 (N/A)                  | 11.8             | 25.1          | 13.55        |
| Red maple          | 1,885            | 14               | -59                        | -3                       | 0                   | 2,218        | 17           | 4,041          | 30 (N/A)                   | 9.0              | 2.7           | 1.89         |
| Sugar maple        | 7,556            | 57               | -657                       | -3                       | -5                  | 5,750        | 43           | 12,647         | 95 (N/A)                   | 7.9              | 8.4           | 6.77         |
| White ash          | 5,654            | 42               | -236                       | -2                       | -2                  | 4,097        | 31           | 9,513          | 71 (N/A)                   | 6.7              | 6.3           | 5.95         |
| Northern hackberry | 4,188            | 31               | -374                       | -2                       | -3                  | 5,399        | 40           | 9,212          | 69 (N/A)                   | 5.1              | 6.1           | 7.68         |
| Green ash          | 4,875            | 37               | -531                       | -2                       | -4                  | 3,662        | 27           | 8,004          | 60 (N/A)                   | 5.1              | 5.3           | 6.67         |
| Pin oak            | 13,723           | 103              | -946                       | -2                       | -7                  | 5,082        | 38           | 17,857         | 134 (N/A)                  | 5.1              | 11.8          | 14.88        |
| Apple              | 493              | 4                | -16                        | -1                       | 0                   | 521          | 4            | 997            | 7 (N/A)                    | 3.9              | 0.7           | 1.07         |
| Honeylocust        | 5,319            | 40               | -256                       | -1                       | -2                  | 3,341        | 25           | 8,402          | 63 (N/A)                   | 3.4              | 5.6           | 10.50        |
| Callery pear       | 830              | 6                | -15                        | -1                       | 0                   | 610          | 5            | 1,424          | 11 (N/A)                   | 3.4              | 0.9           | 1.78         |
| Northern red oak   | 946              | 7                | -173                       | -1                       | -1                  | 1,512        | 11           | 2,284          | 17 (N/A)                   | 2.8              | 1.5           | 3.43         |
| Blue spruce        | 154              | 1                | -5                         | -1                       | 0                   | 425          | 3            | 573            | 4 (N/A)                    | 2.3              | 0.4           | 1.07         |
| Eastern redbud     | 495              | 4                | -23                        | -1                       | 0                   | 557          | 4            | 1,028          | 8 (N/A)                    | 1.7              | 0.7           | 2.57         |
| American basswood  | 1,838            | 14               | -130                       | -1                       | -1                  | 1,271        | 10           | 2,978          | 22 (N/A)                   | 1.7              | 2.0           | 7.45         |
| Birch              | 224              | 2                | -74                        | 0                        | -1                  | 714          | 5            | 864            | 6 (N/A)                    | 1.1              | 0.6           | 3.24         |
| Spruce             | 168              | 1                | -7                         | 0                        | 0                   | 311          | 2            | 472            | 4 (N/A)                    | 1.1              | 0.3           | 1.77         |
| American sycamore  | 1,816            | 14               | -200                       | 0                        | -2                  | 1,202        | 9            | 2,818          | 21 (N/A)                   | 1.1              | 1.9           | 10.57        |
| Other street trees | 5,551            | 42               | -496                       | -2                       | -4                  | 3,695        | 28           | 8,748          | 66 (N/A)                   | 6.7              | 5.8           | 5.47         |
| Citywide total     | 94,066           | 705              | -7,197                     | -35                      | -54                 | 64,292       | 482          | 151,126        | 1,133 (N/A)                | 100.0            | 100.0         | 6.37         |

**Table 6: Annual Social and Aesthetic Benefits****Annual Aesthetic/Other Benefits of Public Trees by Species**

1/18/2011

| Species            | Total (\$) | Standar d Error | % of Total Trees | % of Total \$ | Avg. \$/tree |
|--------------------|------------|-----------------|------------------|---------------|--------------|
| Norway maple       | 970        | (N/A)           | 20.2             | 10.3          | 26.95        |
| Silver maple       | 2,202      | (N/A)           | 11.8             | 23.4          | 104.84       |
| Red maple          | 342        | (N/A)           | 9.0              | 3.6           | 21.38        |
| Sugar maple        | 799        | (N/A)           | 7.9              | 8.5           | 57.07        |
| White ash          | 743        | (N/A)           | 6.7              | 7.9           | 61.92        |
| Northern hackberry | 545        | (N/A)           | 5.1              | 5.8           | 60.58        |
| Green ash          | 421        | (N/A)           | 5.1              | 4.5           | 46.81        |
| Pin oak            | 1,014      | (N/A)           | 5.1              | 10.8          | 112.64       |
| Apple              | 27         | (N/A)           | 3.9              | 0.3           | 3.92         |
| Honeylocust        | 1,270      | (N/A)           | 3.4              | 13.5          | 211.62       |
| Callery pear       | 104        | (N/A)           | 3.4              | 1.1           | 17.33        |
| Northern red oak   | 80         | (N/A)           | 2.8              | 0.9           | 16.08        |
| Blue spruce        | 84         | (N/A)           | 2.3              | 0.9           | 21.08        |
| Eastern redbud     | 28         | (N/A)           | 1.7              | 0.3           | 9.43         |
| American basswood  | 146        | (N/A)           | 1.7              | 1.6           | 48.65        |
| Birch              | 26         | (N/A)           | 1.1              | 0.3           | 13.11        |
| Spruce             | 48         | (N/A)           | 1.1              | 0.5           | 23.87        |
| American sycamore  | 132        | (N/A)           | 1.1              | 1.4           | 66.10        |
| Other street trees | 442        | (N/A)           | 6.7              | 4.7           | 36.84        |
| Citywide total     | 9,425      | (N/A)           | 100.0            | 100.0         | 52.95        |

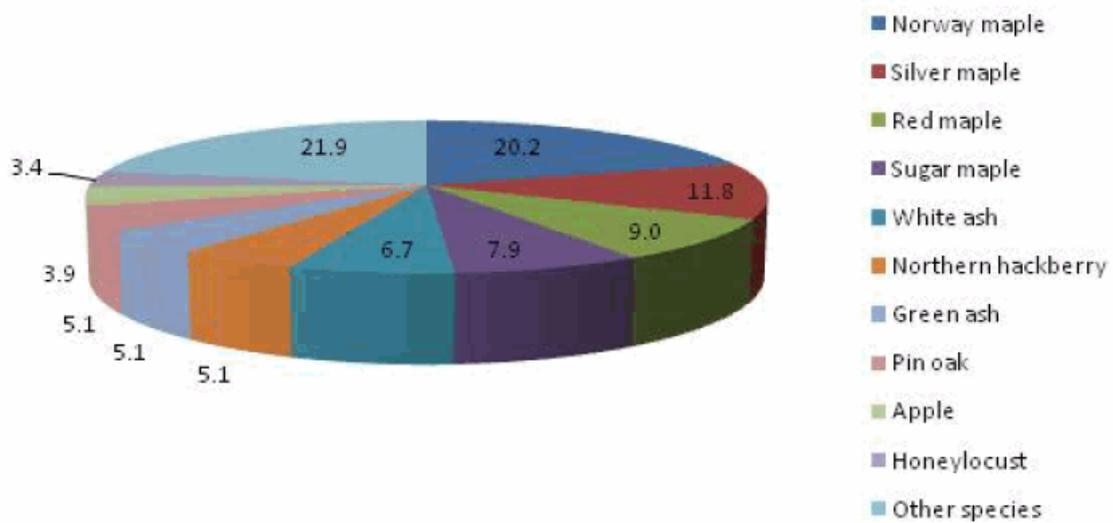
**Table 7: Summary of Benefits in Dollars****Total Annual Benefits of Public Trees by Species (\$)**

1/18/201

| Species               | Energy       | CO <sub>2</sub> | Air Quality  | Stormwater    | Aesthetic/Other | Total (\$)    | Standard Error | % of Total \$ |
|-----------------------|--------------|-----------------|--------------|---------------|-----------------|---------------|----------------|---------------|
| Norway maple          | 1,654        | 160             | 289          | 1,839         | 970             | 4,913         | (±0)           | 15.8          |
| Silver maple          | 1,364        | 284             | 253          | 2,594         | 2,202           | 6,697         | (±0)           | 21.6          |
| Red maple             | 293          | 30              | 43           | 192           | 342             | 900           | (±0)           | 2.9           |
| Sugar maple           | 723          | 95              | 114          | 1,003         | 799             | 2,733         | (±0)           | 8.8           |
| White ash             | 494          | 71              | 82           | 556           | 743             | 1,946         | (±0)           | 6.3           |
| Northern hackberry    | 700          | 69              | 125          | 878           | 545             | 2,316         | (±0)           | 7.5           |
| Green ash             | 460          | 60              | 82           | 692           | 421             | 1,716         | (±0)           | 5.5           |
| Pin oak               | 620          | 134             | 79           | 1,026         | 1,014           | 2,872         | (±0)           | 9.3           |
| Apple                 | 76           | 7               | 10           | 29            | 27              | 151           | (±0)           | 0.5           |
| Honeylocust           | 406          | 63              | 69           | 581           | 1,270           | 2,388         | (±0)           | 7.7           |
| Callery pear          | 85           | 11              | 12           | 49            | 104             | 261           | (±0)           | 0.8           |
| Northern red oak      | 190          | 17              | 27           | 225           | 80              | 540           | (±0)           | 1.7           |
| Blue spruce           | 59           | 4               | 6            | 82            | 84              | 236           | (±0)           | 0.8           |
| Eastern redbud        | 75           | 8               | 12           | 32            | 28              | 155           | (±0)           | 0.5           |
| American basswood     | 163          | 22              | 24           | 179           | 146             | 534           | (±0)           | 1.7           |
| Birch                 | 95           | 6               | 17           | 118           | 26              | 263           | (±0)           | 0.8           |
| Spruce                | 38           | 4               | 4            | 58            | 48              | 151           | (±0)           | 0.5           |
| American sycamore     | 153          | 21              | 28           | 256           | 132             | 590           | (±0)           | 1.9           |
| Other street trees    | 463          | 66              | 81           | 625           | 442             | 1,677         | (±0)           | 5.4           |
| <b>Citywide Total</b> | <b>8,110</b> | <b>1,133</b>    | <b>1,358</b> | <b>11,012</b> | <b>9,425</b>    | <b>31,039</b> | <b>(±0)</b>    | <b>100.0</b>  |

## Species Distribution of Public Trees (%)

1/18/2011

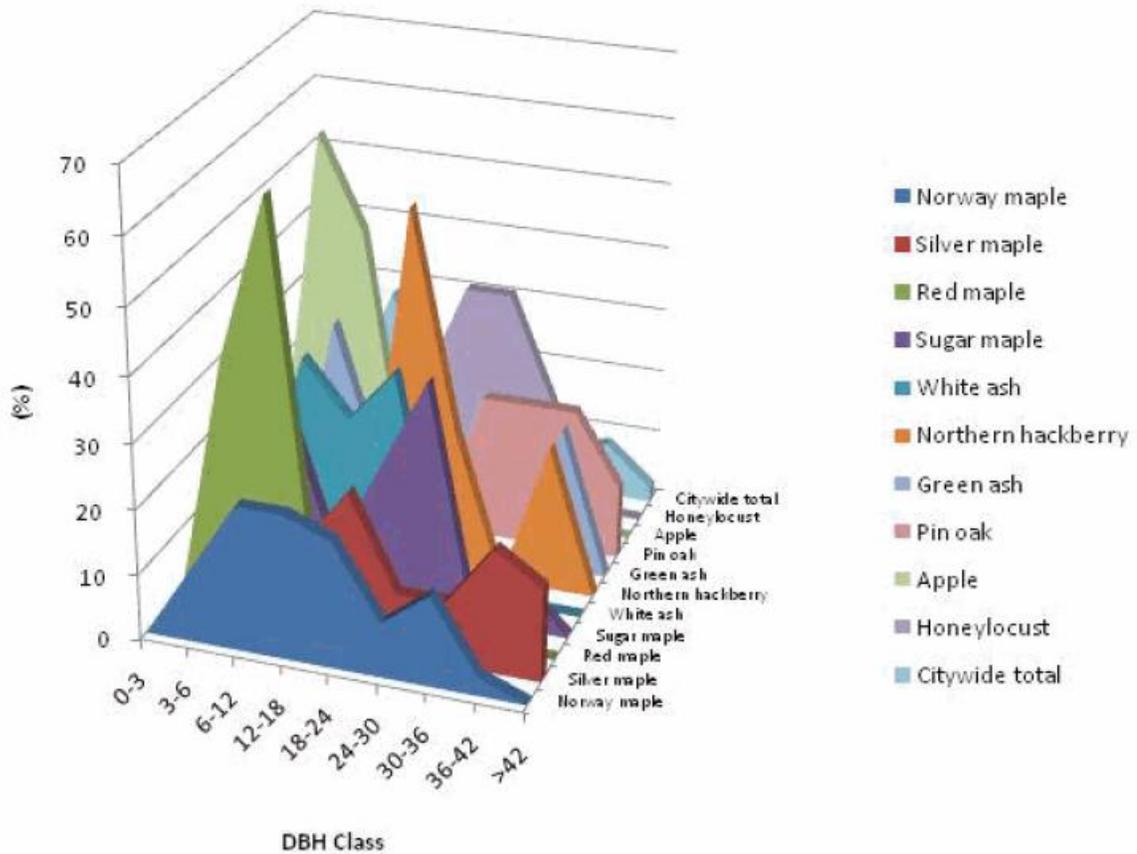


| Species            | Percent      |
|--------------------|--------------|
| Norway maple       | 20.2         |
| Silver maple       | 11.8         |
| Red maple          | 9.0          |
| Sugar maple        | 7.9          |
| White ash          | 6.7          |
| Northern hackberry | 5.1          |
| Green ash          | 5.1          |
| Pin oak            | 5.1          |
| Apple              | 3.9          |
| Honeylocust        | 3.4          |
| Other species      | 21.9         |
| <b>Total</b>       | <b>100.0</b> |

**Figure 1: Species Distribution**

# Relative Age Distribution of Top 10 Public Tree Species (%)

1/18/2011



| Species            | DBH class (in) |      |      |       |       |       |       |       |      |
|--------------------|----------------|------|------|-------|-------|-------|-------|-------|------|
|                    | 0-3            | 3-6  | 6-12 | 12-18 | 18-24 | 24-30 | 30-36 | 36-42 | >42  |
| Norway maple       | 0.0            | 11.1 | 22.2 | 22.2  | 19.4  | 8.3   | 13.9  | 2.8   | 0.0  |
| Silver maple       | 0.0            | 4.8  | 4.8  | 14.3  | 23.8  | 9.5   | 9.5   | 19.0  | 14.3 |
| Red maple          | 0.0            | 37.5 | 62.5 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0  |
| Sugar maple        | 0.0            | 0.0  | 28.6 | 7.1   | 21.4  | 35.7  | 0.0   | 7.1   | 0.0  |
| White ash          | 0.0            | 8.3  | 33.3 | 25.0  | 33.3  | 0.0   | 0.0   | 0.0   | 0.0  |
| Northern hackberry | 0.0            | 0.0  | 0.0  | 0.0   | 55.6  | 22.2  | 0.0   | 22.2  | 0.0  |
| Green ash          | 0.0            | 0.0  | 33.3 | 11.1  | 33.3  | 0.0   | 0.0   | 22.2  | 0.0  |
| Pin oak            | 0.0            | 11.1 | 0.0  | 11.1  | 0.0   | 22.2  | 22.2  | 22.2  | 11.1 |
| Apple              | 0.0            | 57.1 | 42.9 | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0  |
| Honeylocust        | 0.0            | 0.0  | 0.0  | 16.7  | 33.3  | 33.3  | 16.7  | 0.0   | 0.0  |
| Citywide total     | 0.0            | 12.4 | 28.1 | 14.0  | 16.9  | 11.2  | 6.7   | 8.4   | 2.2  |

Figure 2: Relative Age Class

## Functional (Foliage) Condition of Public Trees by Species (%)

1/18/2011

### Citywide total

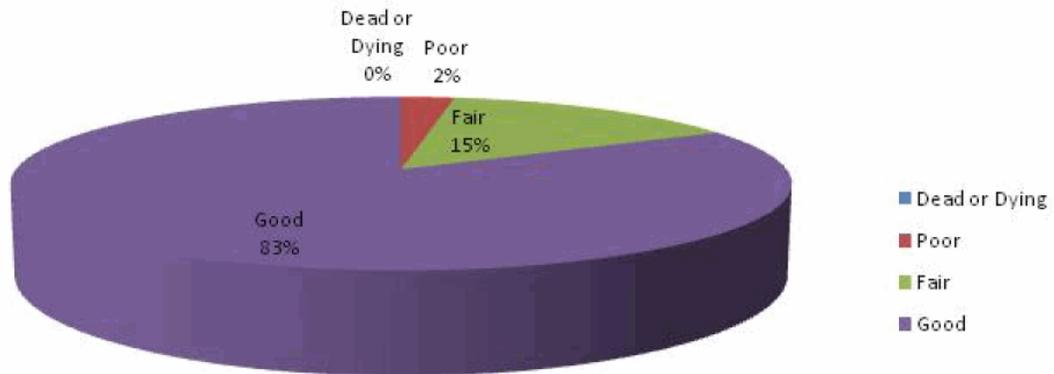


Figure 3: Foliage Condition

## Structural (Woody) Condition of Public Trees by Species (%)

1/18/2011

### Citywide total

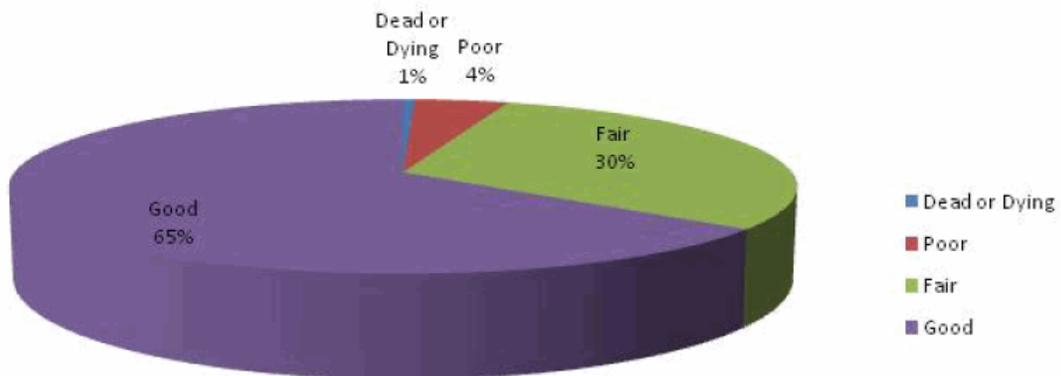
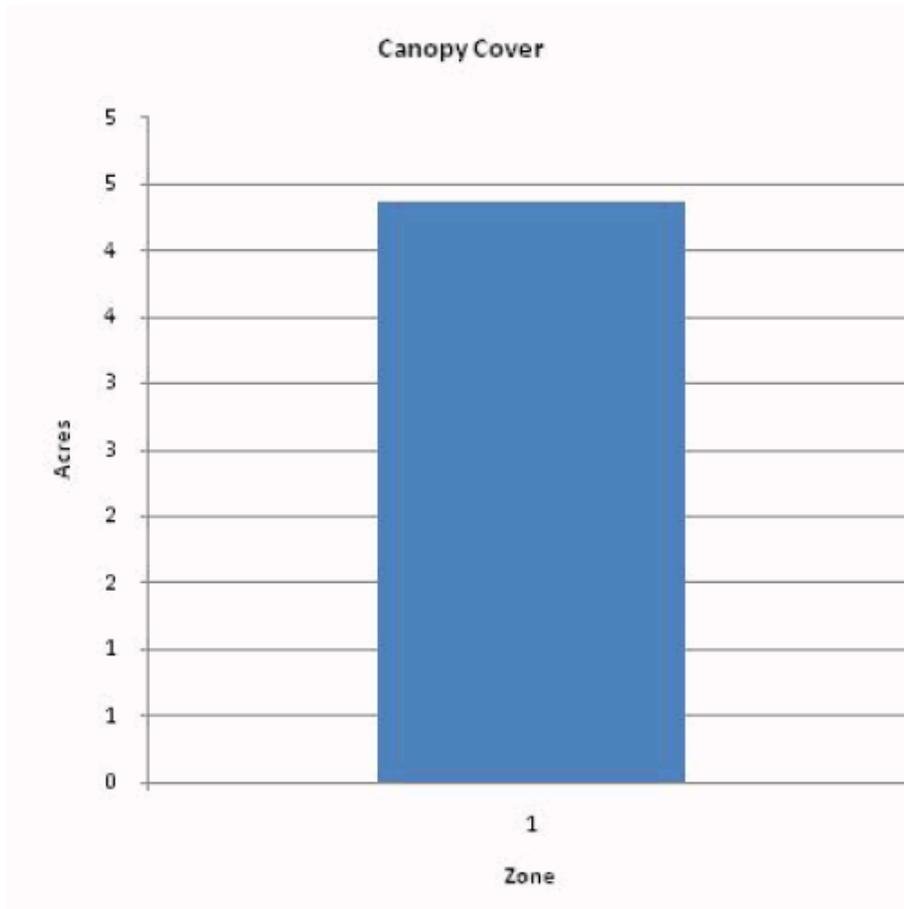


Figure 4: Wood Condition

# Canopy Cover of Public Trees (Acres)

1/18/2011



| Zone           | Acres | % of Total Canopy Cover |
|----------------|-------|-------------------------|
| 1              | 4     | 100.0                   |
| Citywide total | 4     | 100.0                   |

|          | Total Land Area | Total Street and Sidewalk Area | Total Canopy Cover | Canopy Cover as % of Total Land Area | Canopy Cover as % of Total Streets and Sidewalks |
|----------|-----------------|--------------------------------|--------------------|--------------------------------------|--|
| Citywide | 0               | 0                              | 4                  |                                      |  |

Figure 5: Canopy Cover in Acres

## Land Use of Public Trees by Zone (%)

1/18/2011

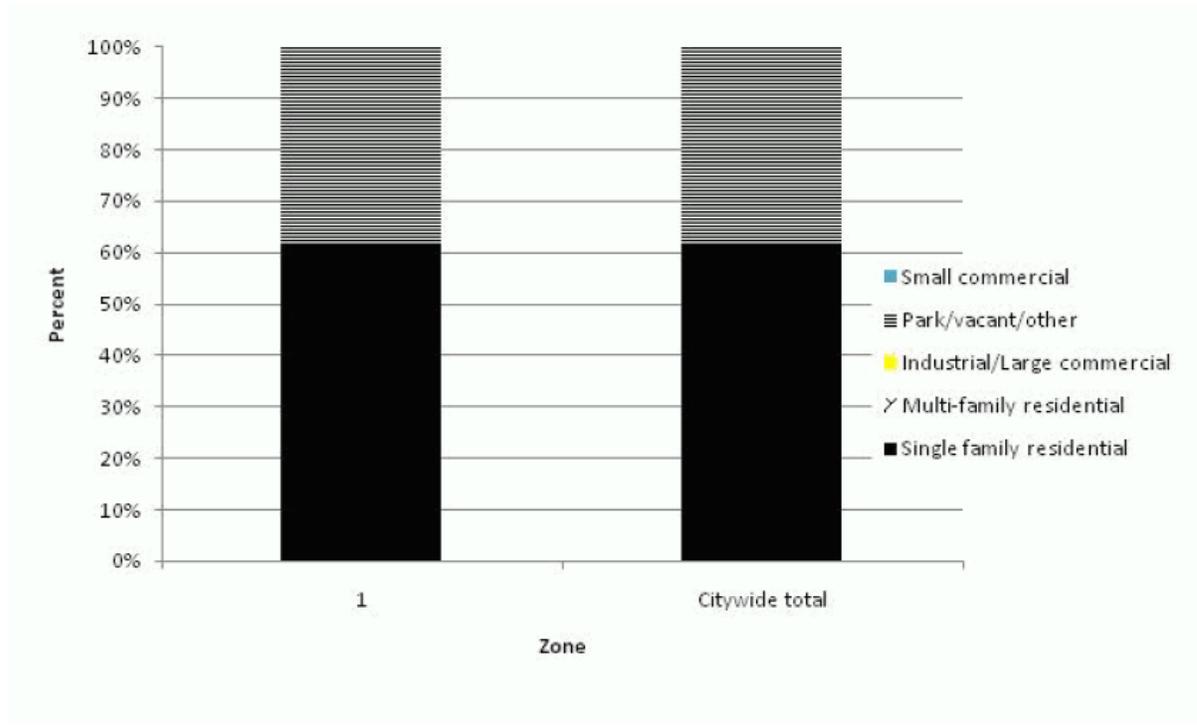


Figure 6: Land Use of city/park trees

## Location of Public Trees by Zone (%)

1/18/2011

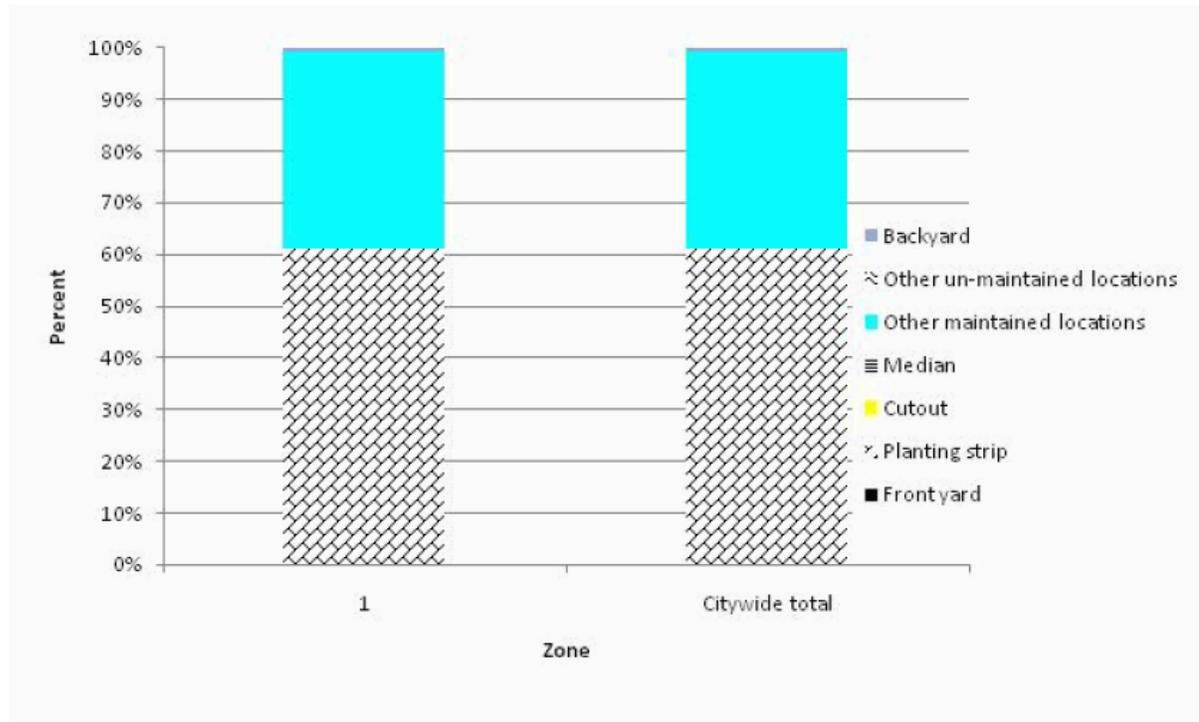


Figure 7: Location of city/park trees

## Appendix B: ArcGIS Mapping



**Figure 1: Location of Ash Trees**



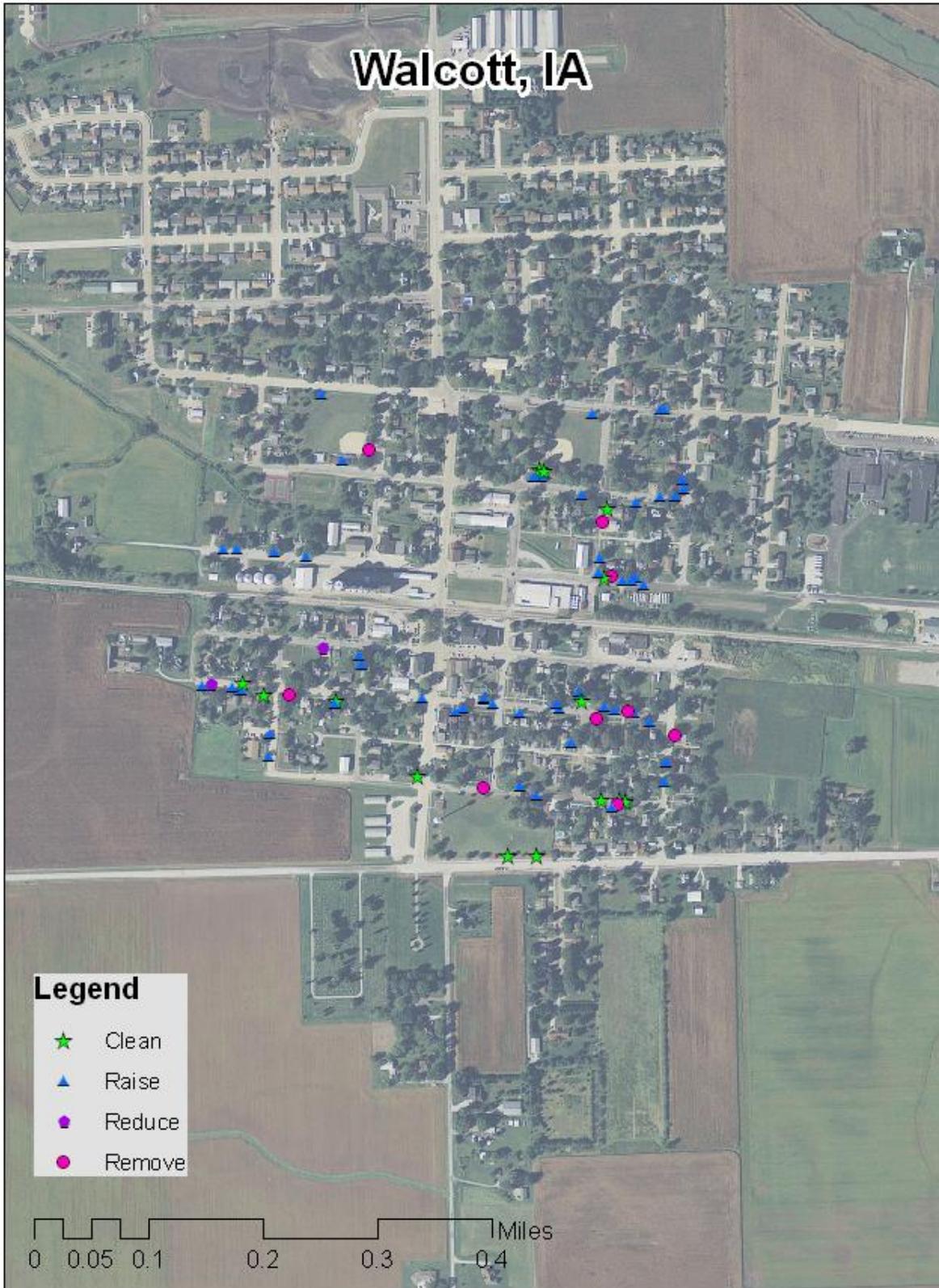
**Figure 2: Location of EAB symptoms**



**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\*

Recommended changes will be highlighted in red.

## Chapter 151

### TREES

**151.01 DEFINITION.** For use in this chapter, "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.

#### 151.02 ARBORICULTURAL SPECIFICATIONS AND STANDARDS OF PRACTICE.

1. Spacing. All trees hereafter planted in any street shall be planted midway between the outer line of 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

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 size trees shall have comparatively straight trunks, well-developed leaders, and top 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. \*Not a recommended practice consider removal of this section.**

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. **\*Consider requiring a permit to plant trees between the street and sidewalk. This will allow the city to control species diversity planted on public property.**

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.

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 pre-cut 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. \*Not a recommended practice consider removing this statement.

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 Public Works Department designates other treatment. \*Not a regular recommended practice consider removing this statement.

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

4. Prohibited Trees. No person shall plant in any street any fruit-bearing tree or any tree of the kinds commonly known as cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut. All trees pretty much produce a fruit, seed, or nut so consider a permit system to control species planted.

#### 151.03 DUTY TO TRIM TREES.

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 thirteen (13) feet above the surface of the street and nine (9) feet above the sidewalks. If the abutting property owner fails to trim the trees, the City may serve notice on the abutting property owner requiring that such action be taken within five (5) days. If such action is not taken 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[2c, d & e])

**151.04 TRIMMING TREES TO BE SUPERVISED.**

Except as allowed in Section [151.03](#), it is 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.

**151.05 DISEASE CONTROL.**

Any dead, diseased or damaged tree or shrub which may harbor serious insect or disease pests or disease injurious to other trees is hereby declared to be a nuisance.

**151.06 INSPECTION AND REMOVAL.**

The Council shall inspect or cause to be inspected any trees or shrubs in the City reported or suspected to be dead, diseased or damaged, and such trees and shrubs shall be subject to the following:

1. City Property. If it is determined that any such condition exists on any public property, including the strip between the curb and the lot line of private property, the Council may cause such condition to be corrected by treatment or removal. The Council may also order the removal of any trees on the streets of the City which interfere with the making of improvements or with travel thereon.
2. Private Property. If it is determined with reasonable certainty that any such condition exists on private property and that danger to other trees or to adjoining property or passing motorists or pedestrians is imminent, the Council shall notify by certified mail the owner, occupant or person in charge of such property to correct such condition by treatment or removal within fourteen (14) days of said notification. If such owner, occupant or person in charge of said property fails to comply within fourteen (14) days of receipt of notice, the Council may cause the condition to be corrected and the cost assessed against the property.

(Code of Iowa, Sec. 364.12[3b & h])



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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. 9<sup>th</sup> St., Des Moines, IA 50319.

If you need accommodations because of disability to access the services of this Agency, please contact Director Richard Leopold at 515-281-5918.