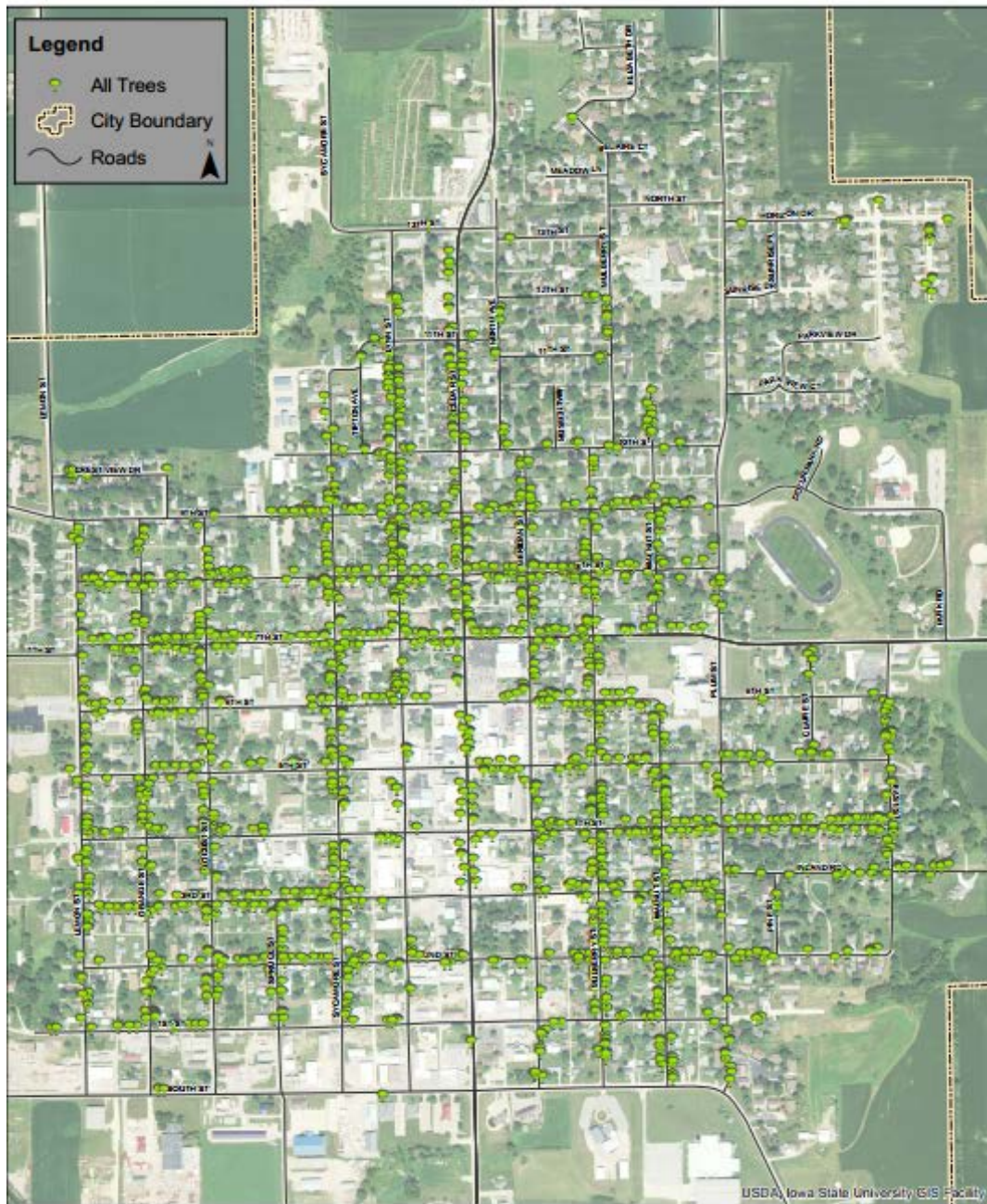


# Tipton, IA



2018 Urban Forest Management Plan  
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# Executive Summary

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## Overview

This plan was developed to assist the City of Tipton 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 6.4% of Tipton'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 1408 trees inventoried.

- Tipton's trees provide \$255,555 of benefits annually, an average of \$181.50 a tree
- There are over 30 species of trees
- The top three genera are: Maple 54%, Ash 6.4%, and Oak 6.4%
- 24% of trees are in need of some type of management
- 95 trees (61 ash) 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 95 trees needing removal, 58 trees are over 24 inches in diameter at 4.5 ft and must be addressed immediately [\\*City ownership of the trees recommended for removal should be verified prior to any removal\\*](#)
- 79 of the 90 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 10 years to remove ash – Suggestion: request a budget increase to \$15,000 annually and apply for grants to plant replacement trees

# Introduction

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

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

# Inventory

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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

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The data collected for the 1408 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

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### **Annual Energy Benefits**

Trees conserve energy by shading buildings and blocking winds. Tipton's trees reduce energy related costs by approximately \$67,711.80 annually (Appendix A, Table 1). These savings are both in Electricity (323.09 MWh) and in Natural Gas (44,070.5 Therms).

### **Annual Stormwater Benefits**

\*CITY\*'s trees intercept about 3,570,475.97 gallons of rainfall or snow melt a year (Appendix A, Table 2). This interception provides \$96,759.90 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 Tipton it is estimated that trees remove 4201.88 lbs of air pollution (ozone (O<sub>3</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and sulfur dioxide (SO<sub>2</sub>)) per year with a net value of \$11,829.55 (Appendix A, Table 3).

### **Annual Carbon Benefits**

Carbon sequestration and storage reduce the amount of carbon in the atmosphere, mitigating climate change. In Tipton trees sequester about 708,625,15 lbs of carbon a year with an associated value of \$5,314.69 (Appendix A, Table 5). In addition, the trees store 13,936,315.71 lbs of carbon, with a yearly benefit of \$104,522.37 (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. Tipton receives \$70,403 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, Tipton's trees provide \$255,555 of benefits annually. Benefits of individual trees vary based on size, species, health and location, but on average each of the 1408 trees in Tipton provide approximately \$181.50 annually (Appendix A, Table 7).

# Forest Structure

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## Species Distribution

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

Maple	762	54%
Ash	90	6.4%
Oak	90	6.4%
Honeylocust	68	4.8%
Apple (Crab)	64	4.5%
Linden/Basswood	45	3.2%
Hackberry	38	2.7%
Elm	28	2%
Spruce	28	2%
Broadleaf Deciduous Lg.	27	1.9%
Broadleaf Deciduous Md	26	1.8%
Cedar	23	1.6%
Others	119	8.5%

## Age Class

Most of Tipton's trees (64%) are less than 24 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. Tipton's size curve is on the smaller side, indicating a younger than average stand.

## Condition: Wood and Foliage

Both wood condition and leaf condition are good indicators of the overall health of the urban forest. The foliage condition results for Tipton 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, 94% of Tipton'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 6% of the population. This 6% 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	169	12%
Crown Raising	28	2%
Tree Staking	13	.9%

Tree Removal	95	6.7%
Crown Reduction	37	2.6%
Treat ash	29	2.0%

### Canopy Cover

The total canopy with both private and public trees is 16%, 210 acres. The canopy cover included in the Tipton inventory includes approximately 37 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 98 trees need to be planted annually.

### Land Use and Location

The majority of Tipton’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	90%
Park/vacant/other	3.5%
Industrial/Large commercial	<1%
Small commercial	5.4%
Multifamily residential	<1%

#### Location

Planting strip	74%
Other maintained locations	0%
Cutout (surrounded by pavement)	2.13%
Front yard	23.15%

## 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 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

Tipton has 8 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 7 trees over 24 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 363 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 95 removals, 61 are ash trees. There are a total of 90 ash trees, and 79 of those have signs and symptoms that have been associated with EAB. In addition, there are 8 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 Tipton.

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 (54%) (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: cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut. All trees planted must meet the restrictions in city ordinances 151.06 and 151.07 (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 No Additional Funding**

#### **Year 1**

- Removal: 8 critical concern trees and 2 ash trees with poor health
- Planting and Replacement: 20 trees to be planted in open locations
- Young Tree Pruning & Maintenance:
- Visual Survey for signs and symptoms of EAB

## Year 2

Removal: 6 ash trees with poor health plus 4 other ash trees  
\*Or saving for ash tree treatment and/or future ash removal  
Planting and Replacement:20 trees in open locations  
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: 10 ash trees  
\*Or saving for ash tree treatment and/or future ash removal  
Planting and Replacement:20 trees in open locations  
Young Tree Pruning & Maintenance:  
Visual Survey for signs and symptoms of EAB

## Year 4

Removal: 10 ash trees  
\*Or saving for ash tree treatment and/or future ash removal  
Planting and Replacement:20 trees in open locations  
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: 10 ash trees  
\*Or saving for ash tree treatment and/or future ash removal  
Planting and Replacement:20 trees in open locations  
Young Tree Pruning & Maintenance:  
Visual Survey for signs and symptoms of EAB

## Year 6

Removal: 10 ash trees  
\*Or saving for ash tree treatment and/or future ash removal  
Planting and Replacement:20 trees in open locations  
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: 52 ash trees removed (approximately 58% of ash). It will take approximately 10 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 approximately \$15,000 a year.

# 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\**

## **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](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 ordinances 151.06 and 151.07. (Appendix C). The new plantings will be a diverse mix and should not include ash, maple, cottonwood, poplar, box elder, Chinese elm, evergreen, willow or black walnut.

## Postponed Work

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

## Monitoring

It is recommended that ash trees be checked with a visual survey every year for tree death and for the following signs and symptoms: canopy dieback, epicormic shoots, bark splitting, D-shaped borer exit holes, and 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 151.09:

**151.09 NUISANCE AND CONDEMNATION.** All street trees planted in violation of, or not maintained in strict compliance with, the provisions of this chapter, or that are dead or dangerous, are declared to constitute a public nuisance. The Urban Forester shall cause written notice to be served on the property owner requiring such nuisances to be corrected within 30 days or the cost of correction will be assessed against the property owner.

# Budget

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## Current Budget

Total \$63,000 over 6 years (\$10,500/year)

## **FY 2019 Budget**

Removal: \$6,750

\*Or saving for ash tree treatment and/or future ash removal

Planting: \$3,500

Watering & Maintenance: \$250

## **FY 2020 Budget**

Removal: \$5,750

\*Or saving for ash tree treatment and/or future ash removal

Planting: \$3,500

Routine trimming: \$1,000

Watering & Maintenance: \$250

## **FY 2021 Budget**

Removal: \$6,750

\*Or saving for ash tree treatment and/or future ash removal

Planting: \$3,500

Watering & Maintenance: \$250

## **FY 2022 Budget**

Removal: \$5,750

\*Or saving for ash tree treatment and/or future ash removal  
Planting: \$3,500  
Routine trimming: \$1,000  
Watering & Maintenance: \$250

#### **FY 2023 Budget**

Removal: \$6,750  
\*Or saving for ash tree treatment and/or future ash removal  
Planting: \$3,500  
Watering & Maintenance: \$250

#### **FY 2024 Budget**

Removal: \$5,750  
\*Or saving for ash tree treatment and/or future ash removal  
Planting: \$3,500  
Routine trimming: \$1,000  
Watering & Maintenance: \$250

**\*Reduction of ash over 6 years: approximately 52 ash trees removed (approximately 58% of ash). It will take approximately 10 years to remove all ash with the current budget.**

#### Purposed Budget Increase

EAB could potentially kill all ash trees in Tipton within 4 years of its arrival. To remove all ash trees within 6 years the budget would need to be increased to \$15,000 a year. If the budget were increased to \$10,000 a year all ash could be removed within 13 years. Additionally, it is recommended that Tipton 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 15 trees could be treated (\$4,500) per year (1/2 treatable ash every other year treatment). This would be 29 total trees selected for treatment, and Tipton would still need to find \$6,750 for removal. Alternatively, if there are 29 treated trees every other year, it would cost approximately \$6,960 every 2 years for treatment and leave \$3,540 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 Tipton. It is suggested to consider increasing the budget to plan for this.

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# Appendix A: i-Tree Data

**Table 1: Annual Energy Benefits**

Annual Energy Benefits of All Trees by Species			12/13/2018						
Species	Total Electricity (MWh)	Electricity (\$)	Total Natural Gas (Therms)	Natural Gas (\$)	Total (\$)	Stand. Error	% of Total Trees	% of Total \$	Avg. \$/tree
Sugar maple	74.96	5,689.53	9,869.36	9,671.97	15,361.50	(N/A)	17.76	22.69	61.45
Norway maple	41.56	3,154.07	6,047.51	5,926.56	9,080.62	(N/A)	11.72	13.41	55.03
Red maple	31.88	2,419.76	4,119.69	4,037.30	6,457.06	(N/A)	10.87	9.54	42.20
Silver maple	37.35	2,835.13	4,980.08	4,880.47	7,715.60	(N/A)	8.59	11.39	63.77
Green ash	27.59	2,093.80	3,767.13	3,691.79	5,785.59	(N/A)	6.39	8.54	64.28
Honeylocust	13.79	1,046.82	1,837.05	1,800.31	2,847.13	(N/A)	4.83	4.20	41.87
Apple	5.69	431.57	866.47	849.14	1,280.71	(N/A)	4.55	1.89	20.01
Maple	7.24	549.29	992.90	973.04	1,522.33	(N/A)	4.40	2.25	24.55
Northern hackberry	16.32	1,238.39	2,260.36	2,215.16	3,453.54	(N/A)	2.70	5.10	90.88
Littleleaf linden	7.13	540.84	968.84	949.47	1,490.31	(N/A)	2.56	2.20	41.40
Northern red oak	4.51	342.30	608.73	596.56	938.86	(N/A)	1.99	1.39	33.53
Northern pin oak	8.03	609.77	1,185.49	1,161.78	1,771.54	(N/A)	1.92	2.62	65.61
Broadleaf Deciduous Small	0.83	63.21	141.09	138.27	201.48	(N/A)	1.92	0.30	7.46
Broadleaf Deciduous Medium	3.65	276.81	535.14	524.44	801.25	(N/A)	1.85	1.18	30.82
Elm	3.89	295.21	523.95	513.48	808.69	(N/A)	1.56	1.19	36.76
Bur oak	6.30	478.40	853.37	836.30	1,314.70	(N/A)	1.49	1.94	62.60
Ginkgo	0.35	26.49	49.19	48.20	74.69	(N/A)	1.28	0.11	4.15
Northern white cedar	1.66	126.08	219.23	214.84	340.93	(N/A)	1.07	0.50	22.73
Blue spruce	1.27	96.29	180.34	176.73	273.02	(N/A)	0.99	0.40	19.50
Kentucky coffeetree	1.40	106.33	188.01	184.25	290.58	(N/A)	0.92	0.43	22.35
Others	27.70	2,102.63	3,876.57	3,799.04	5,901.68		10.65	8.72	36.93
<b>Total</b>	<b>323.09</b>	<b>24,522.71</b>	<b>44,070.50</b>	<b>43,189.09</b>	<b>67,711.80</b>	<b>(N/A)</b>	<b>100.00</b>	<b>100.00</b>	<b>48.09</b>

**Table 2: Annual Stormwater Benefits**

Annual Stormwater Benefits of All Trees by Species			12/13/2018			
Species	Total Rainfall Interception (Gal)	Total (\$)	Stand. Error	% of Total Trees	% of Total \$	Avg. \$/tree
Sugar maple	929,430.69	25,187.57	(N/A)	17.76	26.03	100.75
Norway maple	413,671.01	11,210.48	(N/A)	11.72	11.59	67.94
Red maple	231,779.59	6,281.23	(N/A)	10.87	6.49	41.05
Silver maple	545,191.67	14,774.69	(N/A)	8.59	15.27	122.10
Green ash	324,251.66	8,787.22	(N/A)	6.39	9.08	97.64
Honeylocust	129,598.55	3,512.12	(N/A)	4.83	3.63	51.65
Apple	23,019.40	623.83	(N/A)	4.55	0.64	9.75
Maple	42,736.03	1,158.15	(N/A)	4.40	1.20	18.68
Northern hackberry	192,872.75	5,226.85	(N/A)	2.70	5.40	137.55
Littleleaf linden	60,707.18	1,645.16	(N/A)	2.56	1.70	45.70
Northern red oak	41,664.53	1,129.11	(N/A)	1.99	1.17	40.33
Northern pin oak	90,355.18	2,448.63	(N/A)	1.92	2.53	90.69
Broadleaf Deciduous Small	3,252.80	88.15	(N/A)	1.92	0.09	3.26
Broadleaf Deciduous Medium	28,312.75	767.28	(N/A)	1.85	0.79	29.51
Elm	44,482.71	1,205.48	(N/A)	1.56	1.25	54.79
Bur oak	78,504.22	2,127.46	(N/A)	1.49	2.20	101.31
Ginkgo	2,276.66	61.70	(N/A)	1.28	0.06	3.43
Northern white cedar	25,516.64	691.50	(N/A)	1.07	0.71	46.10
Blue spruce	17,114.49	463.80	(N/A)	0.99	0.48	33.13
Kentucky coffeetree	16,751.34	453.96	(N/A)	0.92	0.47	34.92
Others	328,986.12	8,915.52		10.65	9.21	54.85
<b>Citywide total</b>	<b>3,570,475.97</b>	<b>96,759.90</b>	<b>(N/A)</b>	<b>100.00</b>	<b>100.00</b>	<b>68.72</b>

**Table 3: Annual Air Quality Benefits**

Annual Air Quality Benefits of All Trees by Species					12/13/2018														
Species	Deposition		Deposition		Total Deposition (\$)	Avoided				Total Avoided (\$)	BVOC Emissions (lb)		BVOC Emissions (\$)		Total (lb)	Total (\$)	Stand Error	% of Total Trees	Avg. \$/tree
	O3 (lb)	NO2 (lb)	PM10 (lb)	SO2 (lb)		NO2 (lb)	PM10 (lb)	VOC (lb)	SO2 (lb)		(lb)	(lb)	(lb)	(lb)					
Sugar maple	137.94	23.51	66.68	6.10	741.17	353.99	51.81	49.46	339.50	2,214.28	- 107.32	- 402.46	921.65	2,552.99	(N/A)	17.76	10.21		
Norway maple	87.51	15.09	42.62	3.88	471.75	201.95	29.16	27.75	188.53	1,249.75	- 20.26	- 75.98	576.23	1,645.52	(N/A)	11.72	9.97		
Red maple	49.99	8.52	23.89	2.21	267.83	149.89	21.99	21.00	144.45	939.40	- 17.63	- 66.10	404.32	1,141.14	(N/A)	10.87	7.46		
Silver maple	96.99	16.44	47.45	4.30	522.47	176.69	25.82	24.64	168.98	1,104.01	- 52.07	- 195.27	509.25	1,431.22	(N/A)	8.59	11.83		
Green ash	43.77	7.00	20.48	1.96	231.78	131.64	19.17	18.28	125.02	820.23	0.00	0.00	367.33	1,052.01	(N/A)	6.39	11.69		
Honeylocust	24.13	3.98	11.24	1.10	128.03	65.26	9.54	9.10	62.45	407.85	- 18.15	- 68.08	168.63	467.80	(N/A)	4.83	6.88		
Apple	6.52	1.08	3.15	0.30	34.95	27.92	4.01	3.81	25.77	172.01	- 0.04	- 0.13	72.52	206.83	(N/A)	4.55	3.23		
Maple	6.81	1.16	3.63	0.30	37.55	34.51	5.03	4.79	32.78	215.03	- 2.71	- 10.15	86.30	242.43	(N/A)	4.40	3.91		
Northern hackberry	36.16	6.25	17.59	1.62	194.94	78.27	11.37	10.84	73.98	486.76	0.00	0.00	236.08	681.70	(N/A)	2.70	17.94		
Littleleaf linden	9.23	1.59	4.71	0.41	50.35	34.03	4.96	4.73	32.34	212.10	- 4.67	- 17.52	87.32	244.93	(N/A)	2.56	6.80		
Northern red oak	8.59	1.48	4.21	0.38	46.37	21.42	3.13	2.98	20.43	133.71	- 12.22	- 45.81	50.41	134.26	(N/A)	1.99	4.80		
Northern pin oak	20.32	3.50	9.75	0.90	109.11	39.18	5.65	5.37	36.44	242.12	- 4.61	- 17.27	116.51	333.96	(N/A)	1.92	12.37		
Broadleaf Deciduous Small	0.67	0.11	0.36	0.03	3.71	4.21	0.60	0.56	3.77	25.63	0.00	- 0.02	10.31	29.33	(N/A)	1.92	1.09		
Broadleaf Deciduous Medium	5.00	0.86	2.58	0.22	27.37	17.77	2.56	2.44	16.55	109.86	- 1.25	- 4.67	46.74	132.55	(N/A)	1.85	5.10		
Elm	6.20	0.99	2.90	0.28	32.82	18.49	2.70	2.57	17.63	115.39	0.00	0.00	51.76	148.21	(N/A)	1.56	6.74		
Bur oak	12.06	1.93	5.51	0.54	63.46	30.01	4.38	4.17	28.56	187.16	0.00	0.00	87.16	250.62	(N/A)	1.49	11.93		
Ginkgo	0.56	0.10	0.28	0.02	3.02	1.67	0.24	0.23	1.58	10.40	- 0.17	- 0.66	4.51	12.77	(N/A)	1.28	0.71		
Northern white cedar	2.83	0.56	2.40	0.35	18.84	7.84	1.15	1.10	7.52	49.04	- 10.45	- 39.17	13.29	28.72	(N/A)	1.07	1.91		
Blue spruce	2.12	0.42	1.83	0.26	14.25	6.10	0.88	0.84	5.74	37.86	- 6.04	- 22.65	12.17	29.46	(N/A)	0.99	2.10		
Kentucky coffeetree	2.68	0.43	1.22	0.12	14.12	6.66	0.97	0.93	6.35	41.55	0.00	0.00	19.36	55.66	(N/A)	0.92	4.28		
Others	56.01	9.49	28.80	3.12	306.99	133.03	19.31	18.40	125.56	826.82	- 33.70	- 126.36	360.03	1,007.45	(N/A)	10.65	6.42		
Citywide Total	616.08	104.49	301.29	28.40	3,320.88	1,540.54	224.42	214.00	1,463.94	9,600.98	- 291.28	- 1,092.31	4,201.88	11,829.55	(N/A)	100.00	8.40		

**Table 4: Annual Carbon Stored**

Stored CO2 Benefits of All Trees by Species			12/13/2018			
Species	Total stored CO2 (lbs)	Total (\$)	Stand. Error	% of Total Trees	% of Total \$	Avg. \$/tree
Sugar maple	4,098,445.24	30,738.34	(N/A)	17.76	29.41	122.95
Norway maple	1,444,333.89	10,832.50	(N/A)	11.72	10.36	65.65
Red maple	557,248.91	4,179.37	(N/A)	10.87	4.00	27.32
Silver maple	2,338,476.13	17,538.57	(N/A)	8.59	16.78	144.95
Green ash	1,447,122.20	10,853.42	(N/A)	6.39	10.38	120.59
Honeylocust	308,534.04	2,314.01	(N/A)	4.83	2.21	34.03
Apple	104,819.67	786.15	(N/A)	4.55	0.75	12.28
Maple	85,802.49	643.52	(N/A)	4.40	0.62	10.38
Northern hackberry	589,279.95	4,419.60	(N/A)	2.70	4.23	116.31
Littleleaf linden	199,954.90	1,499.66	(N/A)	2.56	1.43	41.66
Northern red oak	180,931.61	1,356.99	(N/A)	1.99	1.30	48.46
Northern pin oak	335,879.30	2,519.09	(N/A)	1.92	2.41	93.30
Broadleaf Deciduous Small	12,973.69	97.30	(N/A)	1.92	0.09	3.60
Broadleaf Deciduous Medium	84,679.77	635.10	(N/A)	1.85	0.61	24.43
Elm	210,425.96	1,578.19	(N/A)	1.56	1.51	71.74
Bur oak	407,518.73	3,056.39	(N/A)	1.49	2.92	145.54
Ginkgo	8,168.74	61.27	(N/A)	1.28	0.06	3.40
Northern white cedar	23,848.35	178.86	(N/A)	1.07	0.17	11.92
Blue spruce	13,370.54	100.28	(N/A)	0.99	0.10	7.16
Kentucky coffeetree	91,308.82	684.82	(N/A)	0.92	0.66	52.68
Others	1,393,192.77	10,448.95	(N/A)	10.65	10.00	69.22
Citywide total	13,936,315.71	104,522.37	(N/A)	100.00	100.00	74.23



**Table 5: Annual Carbon Sequestered**

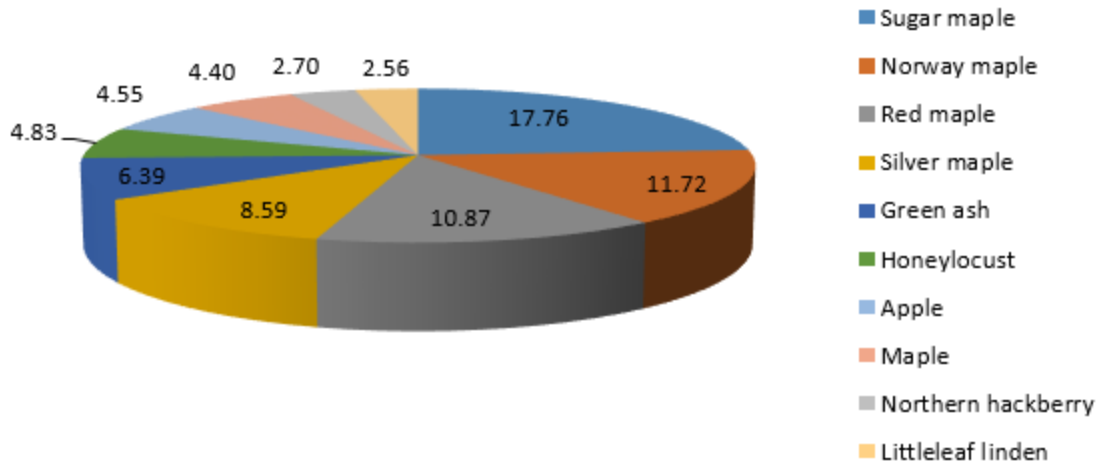
Annual CO2 Benefits of All Trees by Species			12/13/2018											
Species	Sequestered (lb)	Sequestered (\$)	Decomposition Release (lb)	Maintenance Release (lb)	Total Release (\$)	Avoided (lb)	Avoided (\$)	Net Total (lb)	Total (\$)	Stand. Error	% of Total Trees	% of Total \$	Avg. \$/tree	
Sugar maple	185,009.33	1,387.57	- 19,674.69	- 832.66	- 153.81	125,737.08	943.03	290,239.06	2,176.79	(N/A)	17.76	24.59	8.71	
Norway maple	48,043.73	360.33	- 6,939.20	- 458.06	- 55.48	69,704.03	522.78	110,350.49	827.63	(N/A)	11.72	9.35	5.02	
Red maple	65,160.99	488.71	- 2,675.01	- 277.68	- 22.15	53,476.05	401.07	115,684.34	867.63	(N/A)	10.87	9.80	5.67	
Silver maple	164,992.75	1,237.45	- 11,229.04	- 426.86	- 87.42	62,655.52	469.92	215,992.37	1,619.94	(N/A)	8.59	18.30	13.39	
Green ash	62,801.08	471.01	- 6,946.19	- 291.72	- 54.28	46,272.51	347.04	101,835.69	763.77	(N/A)	6.39	8.63	8.49	
Honeylocust	23,115.64	173.37	- 1,490.38	- 112.52	- 12.02	23,134.44	173.51	44,647.19	334.85	(N/A)	4.83	3.78	4.92	
Apple	8,690.67	65.18	- 503.49	- 80.15	- 4.38	9,537.49	71.53	17,644.53	132.33	(N/A)	4.55	1.50	2.07	
Maple	12,087.50	90.66	- 411.96	- 71.76	- 3.63	12,139.12	91.04	23,742.90	178.07	(N/A)	4.40	2.01	2.87	
Northern hackberry	22,695.55	170.22	- 2,828.54	- 165.36	- 22.45	27,368.00	205.26	47,069.64	353.02	(N/A)	2.70	3.99	9.29	
Littleleaf linden	21,841.59	163.81	- 959.78	- 79.56	- 7.80	11,952.50	89.64	32,754.75	245.66	(N/A)	2.56	2.78	6.82	
Northern red oak	5,271.69	39.54	- 868.63	- 56.36	- 6.94	7,564.65	56.73	11,911.35	89.34	(N/A)	1.99	1.01	3.19	
Northern pin oak	4,734.04	35.51	- 1,612.22	- 97.89	- 12.83	13,475.71	101.07	16,499.63	123.75	(N/A)	1.92	1.40	4.58	
Broadleaf Deciduous Small	1,534.56	11.51	- 62.63	- 17.16	- 0.60	1,396.96	10.48	2,851.74	21.39	(N/A)	1.92	0.24	0.79	
Broadleaf Deciduous Medium	5,913.96	44.35	- 411.41	- 39.39	- 3.38	6,117.39	45.88	11,580.55	86.85	(N/A)	1.85	0.98	3.34	
Elm	8,043.29	60.32	- 1,010.28	- 43.29	- 7.90	6,524.14	48.93	13,513.86	101.35	(N/A)	1.56	1.15	4.61	
Bur oak	12,867.85	96.51	- 1,956.13	- 69.03	- 15.19	10,572.50	79.29	21,415.19	160.61	(N/A)	1.49	1.81	7.65	
Ginkgo	93.56	0.70	- 39.40	- 8.39	- 0.36	585.38	4.39	631.15	4.73	(N/A)	1.28	0.05	0.26	
Northern white cedar	1,777.75	13.33	- 114.47	- 29.25	- 1.08	2,786.44	20.90	4,420.46	33.15	(N/A)	1.07	0.37	2.21	
Blue spruce	995.61	7.47	- 64.18	- 22.82	- 0.65	2,128.04	15.96	3,036.65	22.77	(N/A)	0.99	0.26	1.63	
Kentucky coffeetree	2,661.29	19.96	- 438.63	- 16.58	- 3.41	2,349.89	17.62	4,555.97	34.17	(N/A)	0.92	0.39	2.63	
Others	50,292.73	377.20	- 6,691.73	- 347.88	- 52.80	46,467.61	348.51	89,720.73	672.91		10.65	7.60	4.05	
Citywide Total	708,625.15	5,314.69	- 66,927.98	- 3,544.35	- 528.54	541,945.42	4,064.59	1,180,098.24	8,850.74	(N/A)	100.00	100.00	6.29	

**Table 6: Annual Social and Aesthetic Benefits**

Annual Aesthetic/Other Benefit of All Trees by Species				12/13/2018	
Species	Total (\$)	Stand. Error	% of Total Trees	% of Total \$	Avg. \$/tree
Sugar maple	18,352.01	(N/A)	17.76	26.07	73.41
Norway maple	4,546.53	(N/A)	11.72	6.46	27.55
Red maple	8,776.63	(N/A)	10.87	12.47	57.36
Silver maple	12,616.74	(N/A)	8.59	17.92	104.27
Green ash	5,021.54	(N/A)	6.39	7.13	55.79
Honeylocust	5,028.58	(N/A)	4.83	7.14	73.95
Apple	497.54	(N/A)	4.55	0.71	7.77
Maple	1,914.28	(N/A)	4.40	2.72	30.88
Northern hackberry	2,673.72	(N/A)	2.70	3.80	70.36
Littleleaf linden	2,308.79	(N/A)	2.56	3.28	64.13
Northern red oak	416.03	(N/A)	1.99	0.59	14.86
Northern pin oak	429.42	(N/A)	1.92	0.61	15.90
Broadleaf Deciduous Small	83.49	(N/A)	1.92	0.12	3.09
Broadleaf Deciduous Medium	634.60	(N/A)	1.85	0.90	24.41
Elm	733.29	(N/A)	1.56	1.04	33.33
Bur oak	1,014.82	(N/A)	1.49	1.44	48.32
Ginkgo	15.86	(N/A)	1.28	0.02	0.88
Northern white cedar	474.10	(N/A)	1.07	0.67	31.61
Blue spruce	295.50	(N/A)	0.99	0.42	21.11
Kentucky coffeetree	252.97	(N/A)	0.92	0.36	19.46
Others	4,316.88		10.65	6.13	25.26
Citywide Total	70,403.30	(N/A)	100.00	100.00	50.00

**Table 7: Summary of Benefits in Dollars**

Average Annual Benefits of All Tree by Species (\$/tree)					12/13/2018		
Species	Energy	CO2	Air Quality	Stormwater	Aesthetic/Other	Total	Stand.
Sugar maple	61.45	8.71	10.21	100.75	73.41	254.52	(N/A)
Norway maple	55.03	5.02	9.97	67.94	27.55	165.52	(N/A)
Red maple	42.20	5.67	7.46	41.05	57.36	153.75	(N/A)
Silver maple	63.77	13.39	11.83	122.10	104.27	315.36	(N/A)
Green ash	64.28	8.49	11.69	97.64	55.79	237.89	(N/A)
Honeylocust	41.87	4.92	6.88	51.65	73.95	179.27	(N/A)
Apple	20.01	2.07	3.23	9.75	7.77	42.83	(N/A)
Maple	24.55	2.87	3.91	18.68	30.88	80.89	(N/A)
Northern hackberry	90.88	9.29	17.94	137.55	70.36	326.02	(N/A)
Littleleaf linden	41.40	6.82	6.80	45.70	64.13	164.86	(N/A)
Northern red oak	33.53	3.19	4.80	40.33	14.86	96.70	(N/A)
Northern pin oak	65.61	4.58	12.37	90.69	15.90	189.16	(N/A)
Broadleaf Deciduous Small	7.46	0.79	1.09	3.26	3.09	15.70	(N/A)
Broadleaf Deciduous Medium	30.82	3.34	5.10	29.51	24.41	93.17	(N/A)
Elm	36.76	4.61	6.74	54.79	33.33	136.23	(N/A)
Bur oak	62.60	7.65	11.93	101.31	48.32	231.82	(N/A)
Ginkgo	4.15	0.26	0.71	3.43	0.88	9.43	(N/A)
Northern white cedar	22.73	2.21	1.91	46.10	31.61	104.56	(N/A)
Blue spruce	19.50	1.63	2.10	33.13	21.11	77.47	(N/A)
Kentucky coffeetree	22.35	2.63	4.28	34.92	19.46	83.64	(N/A)
Others	36.93	4.05	6.42	54.85	25.26	127.51	
Citywide Total	48.09	6.29	8.40	68.72	50.00	181.50	(N/A)

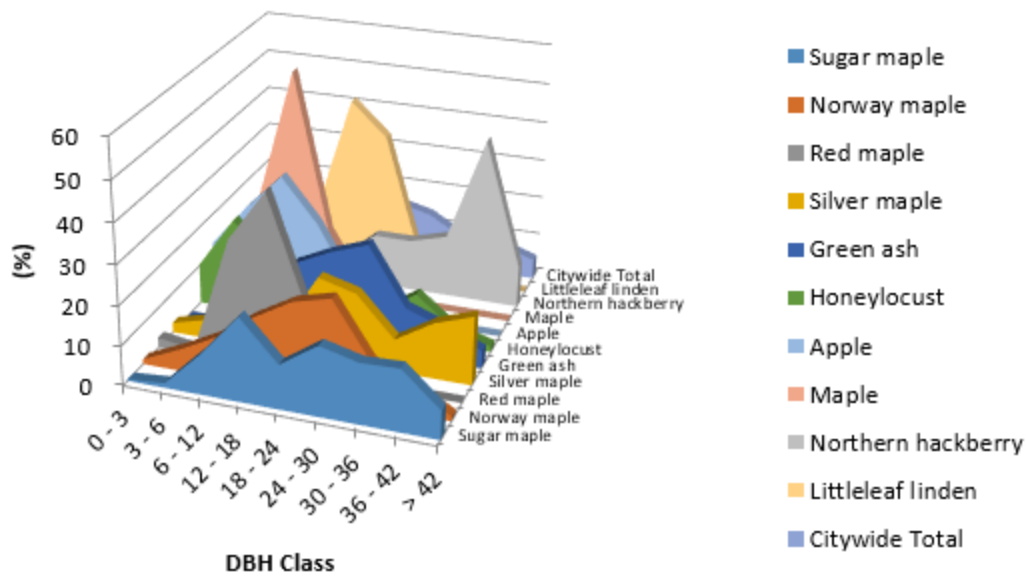


**Species Distribution of All Trees for 1**

<b>12/13/2018</b>	
Species	Percent
Sugar maple	17.76
Norway maple	11.72
Red maple	10.87
Silver maple	8.59
Green ash	6.39
Honeylocust	4.83
Apple	4.55
Maple	4.40
Northern hackberry	2.70
Littleleaf linden	2.56
Other Species	25.64

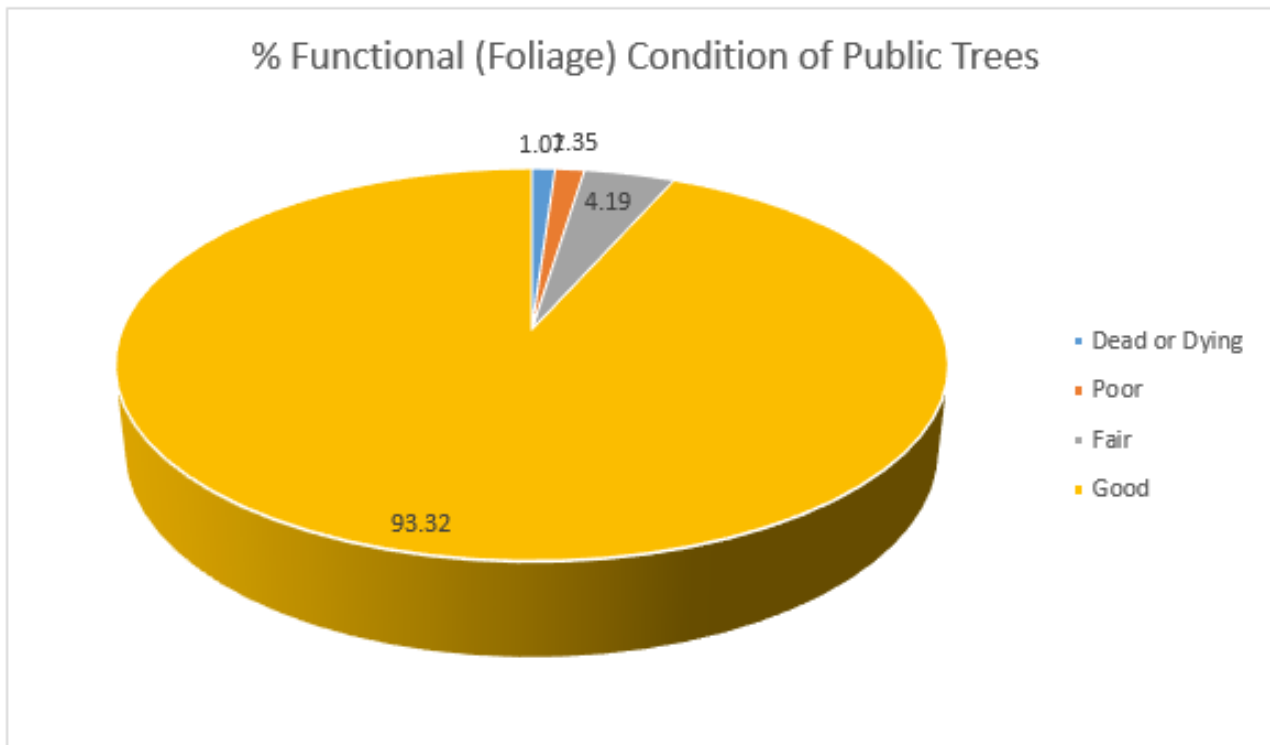
**Figure 1: Species Distribution**

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

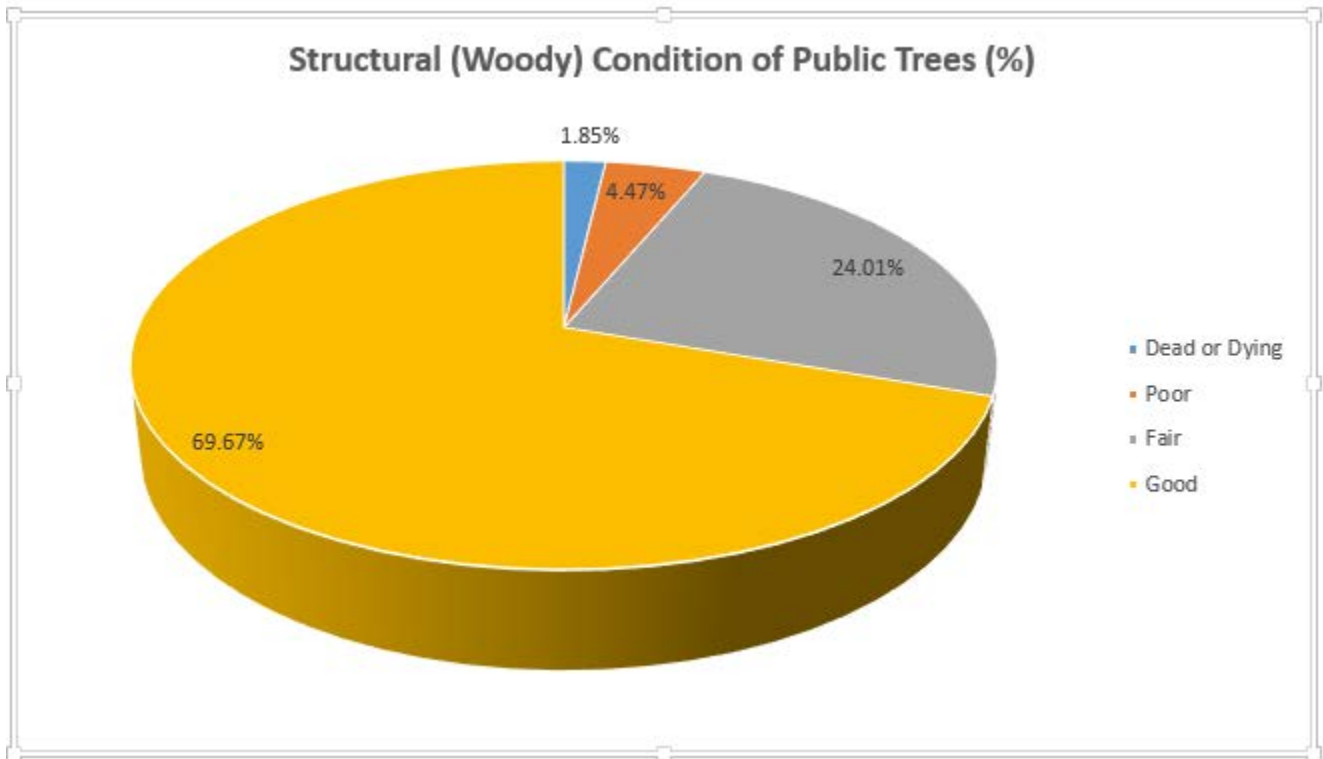


Relative Age Distribution of Top 10 All Tree Species (%)	12/13/2018								
Species	DBH class (in)								
	0 - 3	3 - 6	6 - 12	12 - 18	18 - 24	24 - 30	30 - 36	36 - 42	> 42
Sugar maple	0.40	1.20	10.40	21.20	11.20	17.60	15.20	15.60	7.20
Norway maple	1.21	5.45	10.30	16.97	22.42	24.85	10.91	6.67	1.21
Red maple	2.61	1.31	30.72	43.79	17.65	3.92	0.00	0.00	0.00
Silver maple	2.48	4.96	8.26	5.79	20.66	18.18	8.26	14.05	17.36
Green ash	0.00	0.00	5.56	18.89	23.33	26.67	12.22	8.89	4.44
Honeylocust	10.29	23.53	13.24	13.24	16.18	5.88	11.76	4.41	1.47
Apple	12.50	23.44	32.81	21.88	6.25	1.56	1.56	0.00	0.00
Maple	3.23	22.58	56.45	16.13	1.61	0.00	0.00	0.00	0.00
Northern hackberry	0.00	0.00	0.00	5.26	13.16	13.16	15.79	42.11	10.53
Littleleaf linden	0.00	0.00	13.89	44.44	36.11	5.56	0.00	0.00	0.00
Citywide Total	6.75	7.60	15.98	19.53	15.55	13.35	8.10	8.17	4.97

**Figure 2: Relative Age Class**

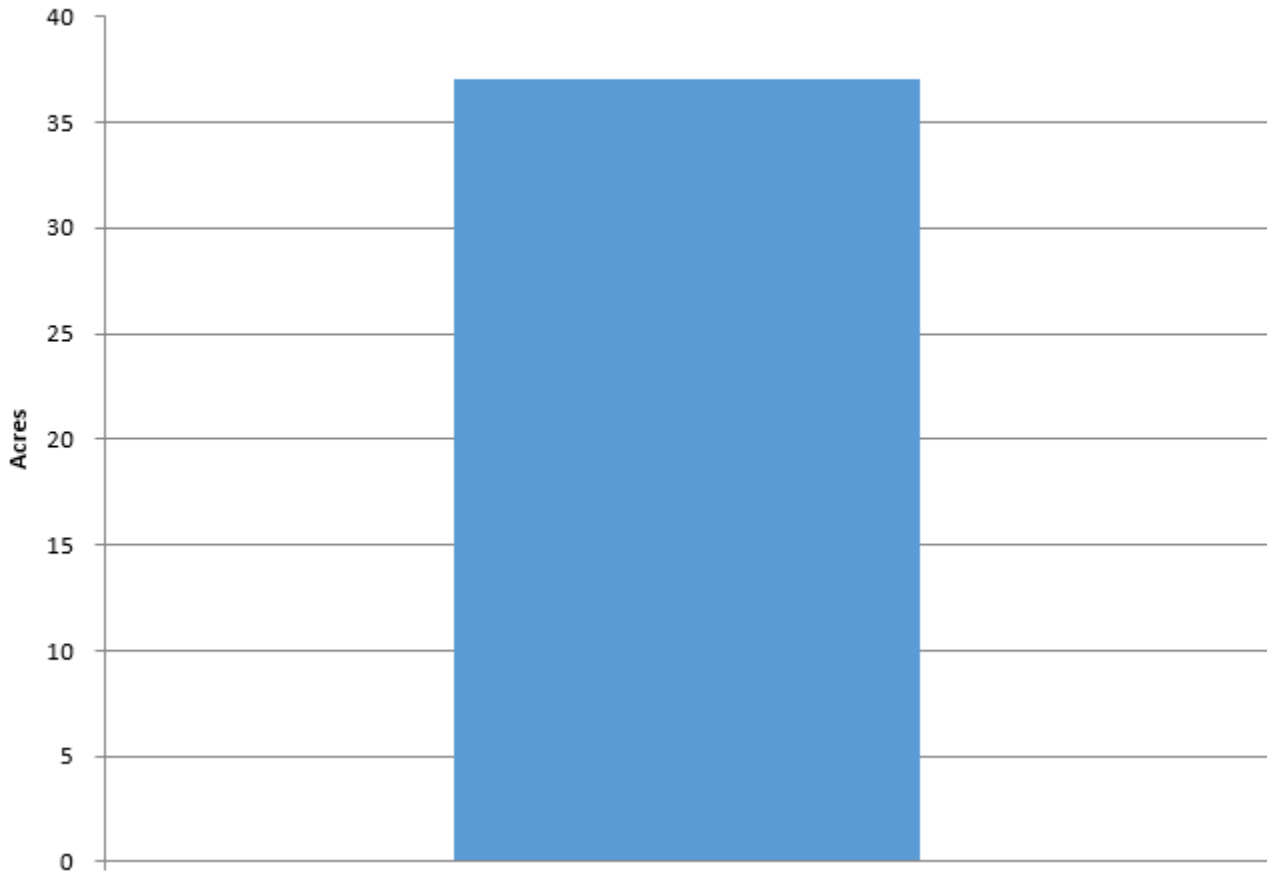


**Figure 3: Foliage Condition**



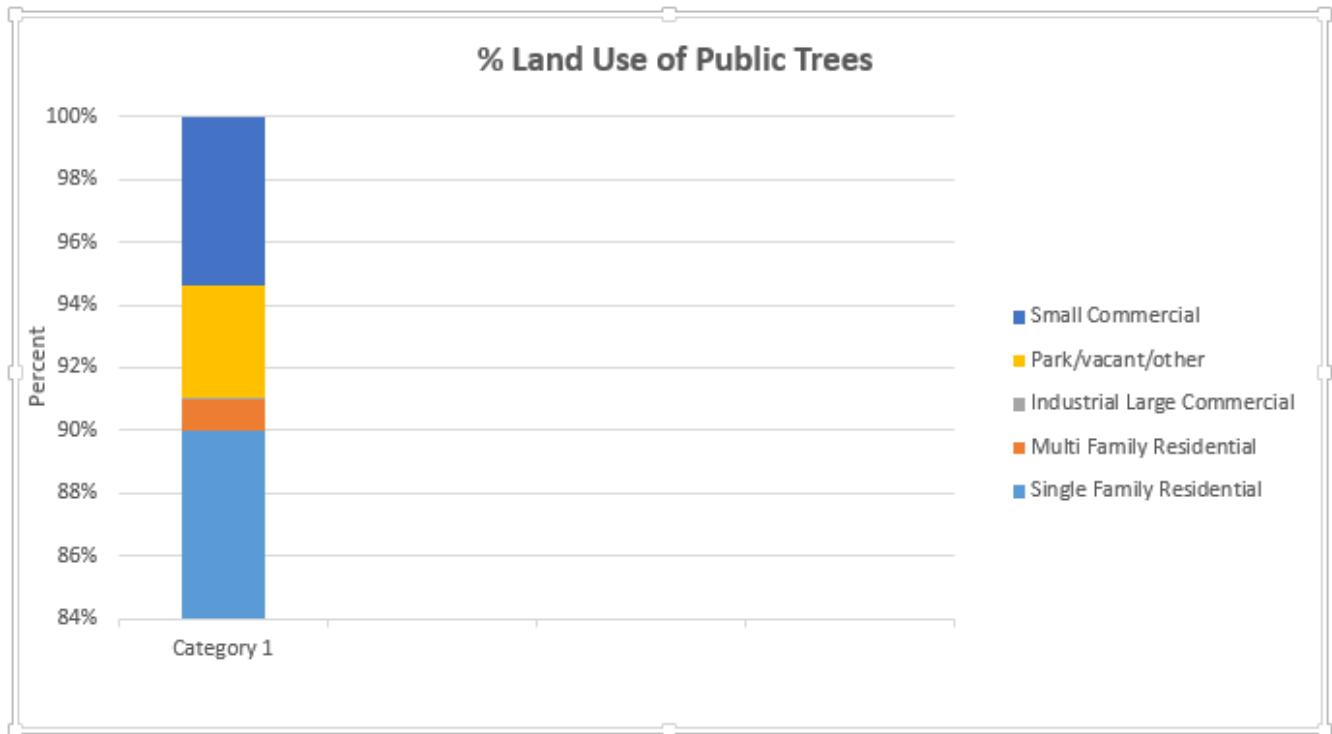
**Figure 4: Wood Condition**

## Canopy Cover of All Trees (Acres)



Canopy Cover of All Trees (Acres)		12/13/2018
Zone	Acres	% of Total Canopy
1	37.04	100.00
<b>Citywide Total</b>	<b>37.04</b>	<b>100.00</b>

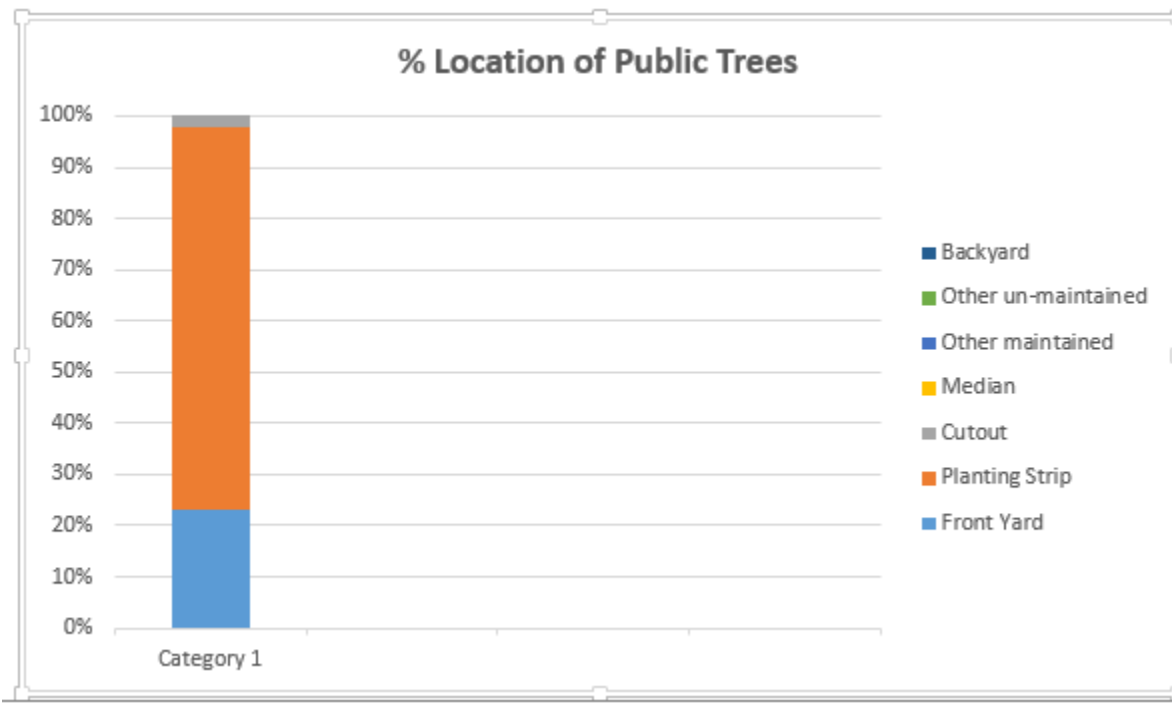
**Figure 5: Canopy Cover in Acres**



Citywide	Single family residential	1267 (N/A)	89.99
	Multi-family residential	14 (N/A)	0.99
	Industrial/Large commercial	1 (N/A)	0.07
	Park/vacant/other	50 (N/A)	3.55
	Small commercial	76 (N/A)	5.40
	<b>Total</b>	<b>1408 (N/A)</b>	<b>100.00</b>

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



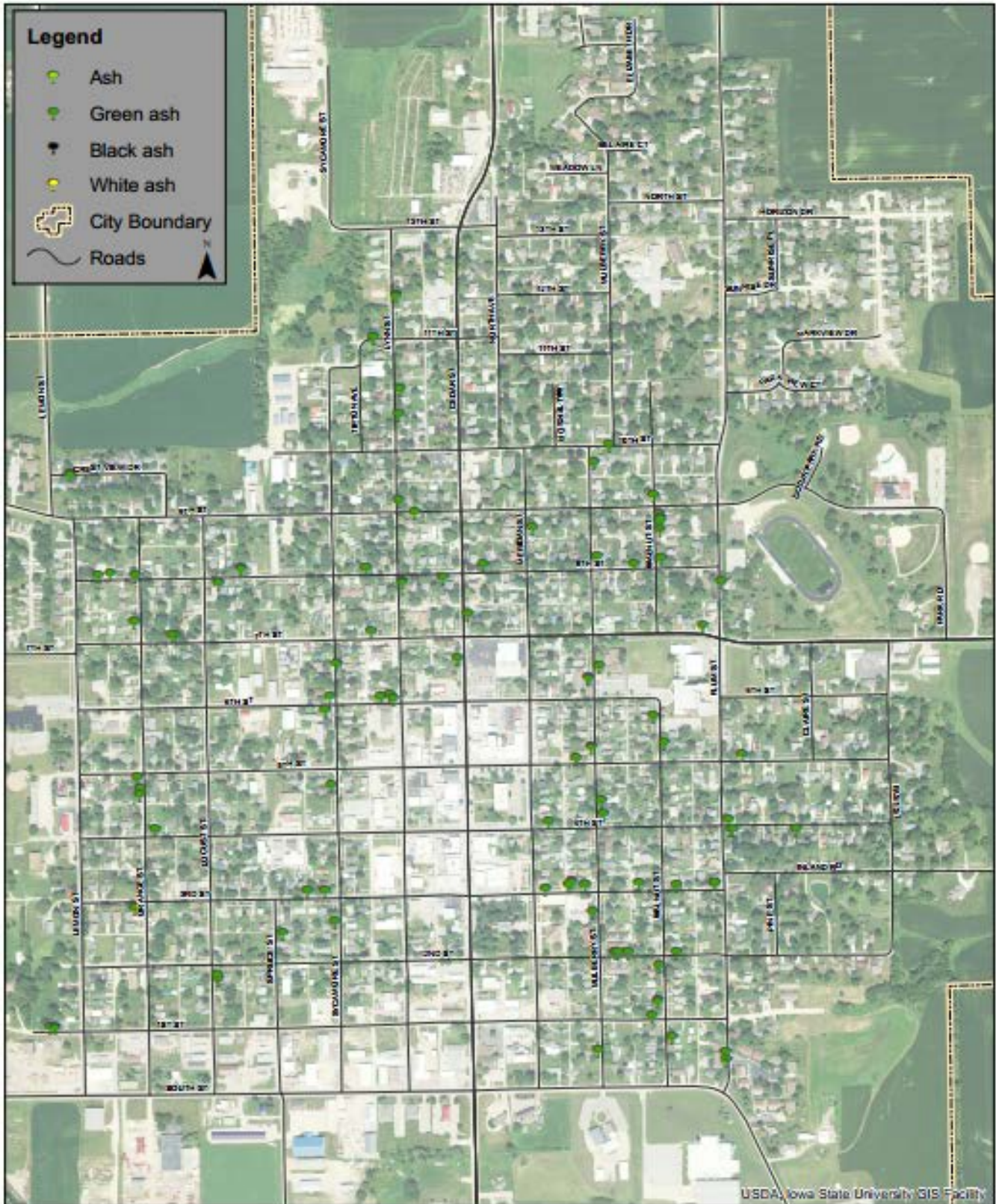


Citywide	Front yard	326 (N/A)	23.15
	Planting strip	1046 (N/A)	74.29
	Cutout	30 (N/A)	2.13
	Median	0 (N/A)	0.00
	Other maintained locations	0 (N/A)	0.00
	Other un-maintained locations	0 (N/A)	0.00
	Backyard	0 (N/A)	0.00
	<b>Total</b>	<b>1402 (N/A)</b>	<b>99.57</b>

**Figure 7: Location of city/park trees**

# Appendix B: ArcGIS Mapping

Location of Ash Trees  
2018 Community Tree Inventory  
Tipton, IA



Location of EAB Symptoms  
 2018 Community Tree Inventory  
 Tipton, IA

Figure 2:

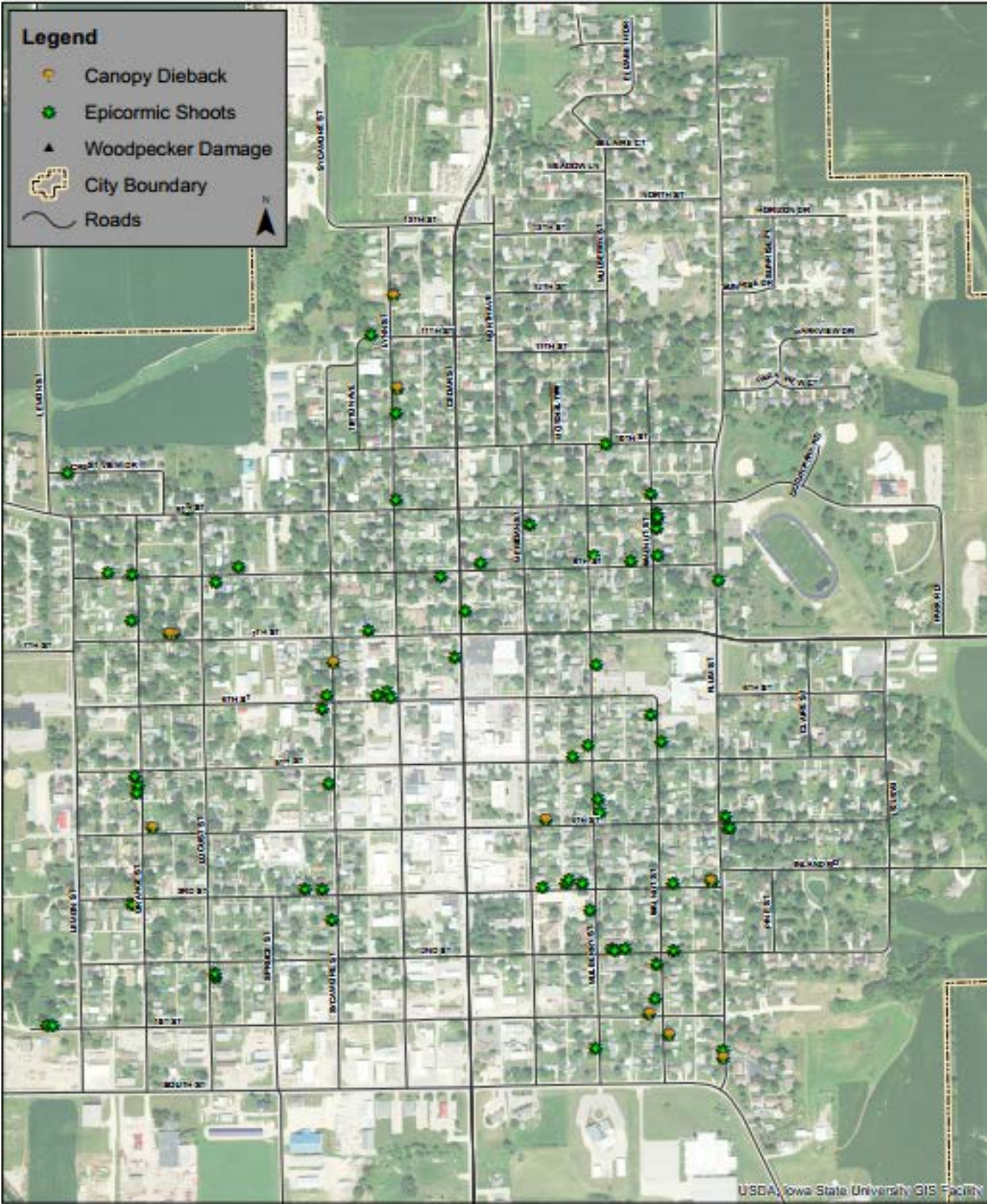


Figure 3a:

Location of Poor Condition Trees  
2018 Community Tree Inventory  
Tipton, IA



**Figure 3b:**

Location of Poor Condition Trees  
2018 Community Tree Inventory  
Tipton, IA



Figure 3c:

Location of Poor Condition Trees  
2018 Community Tree Inventory  
Tipton, IA

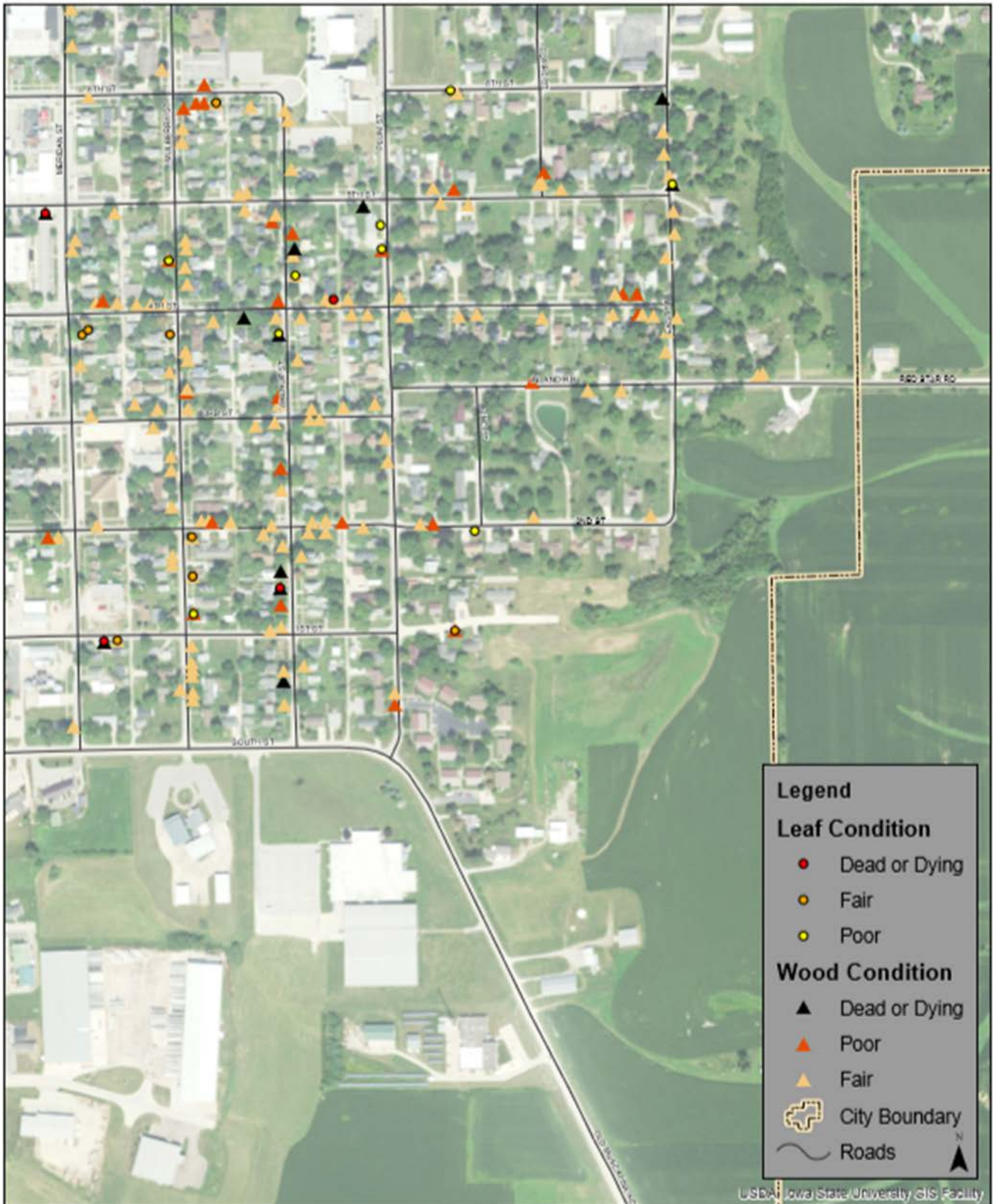
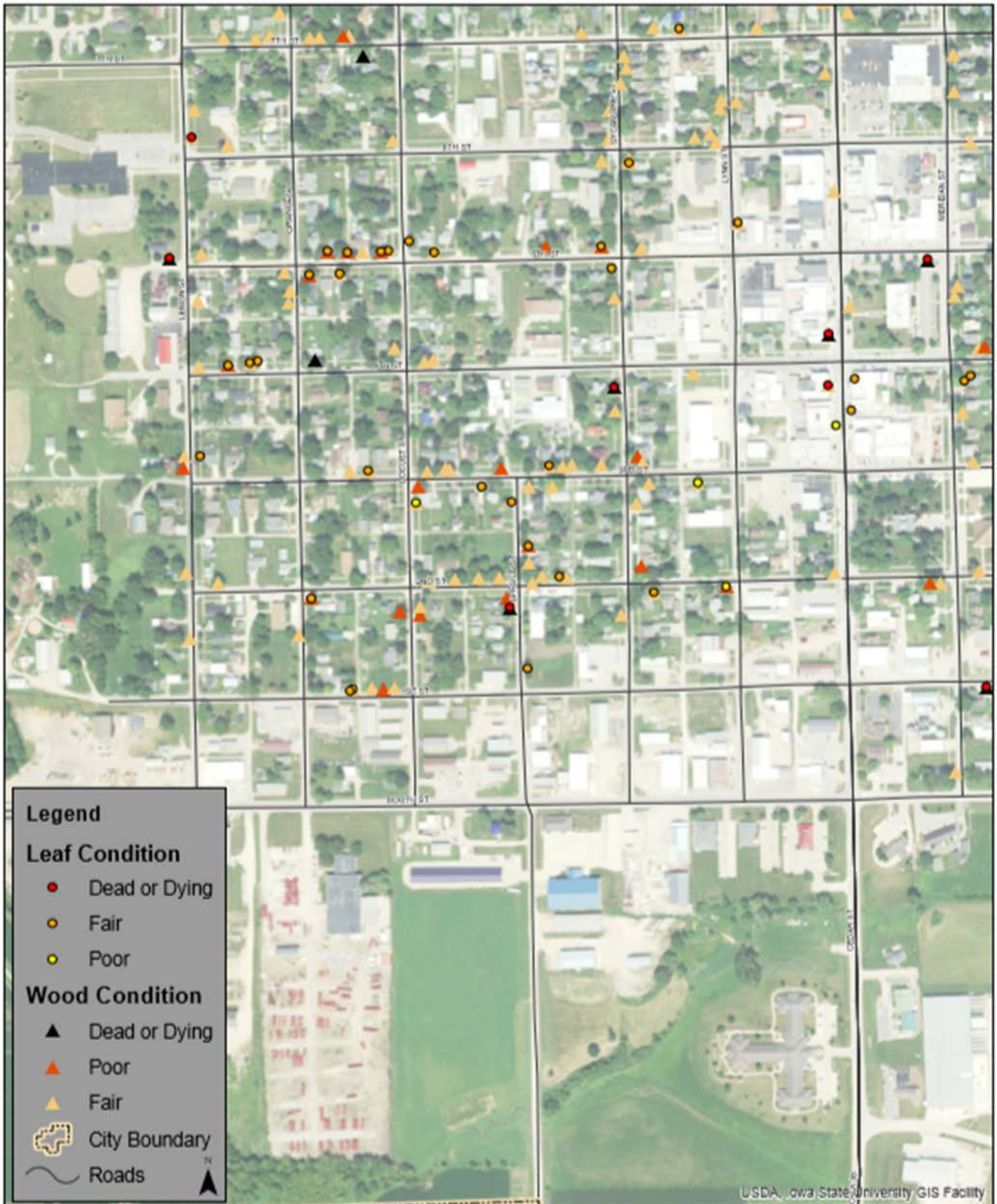


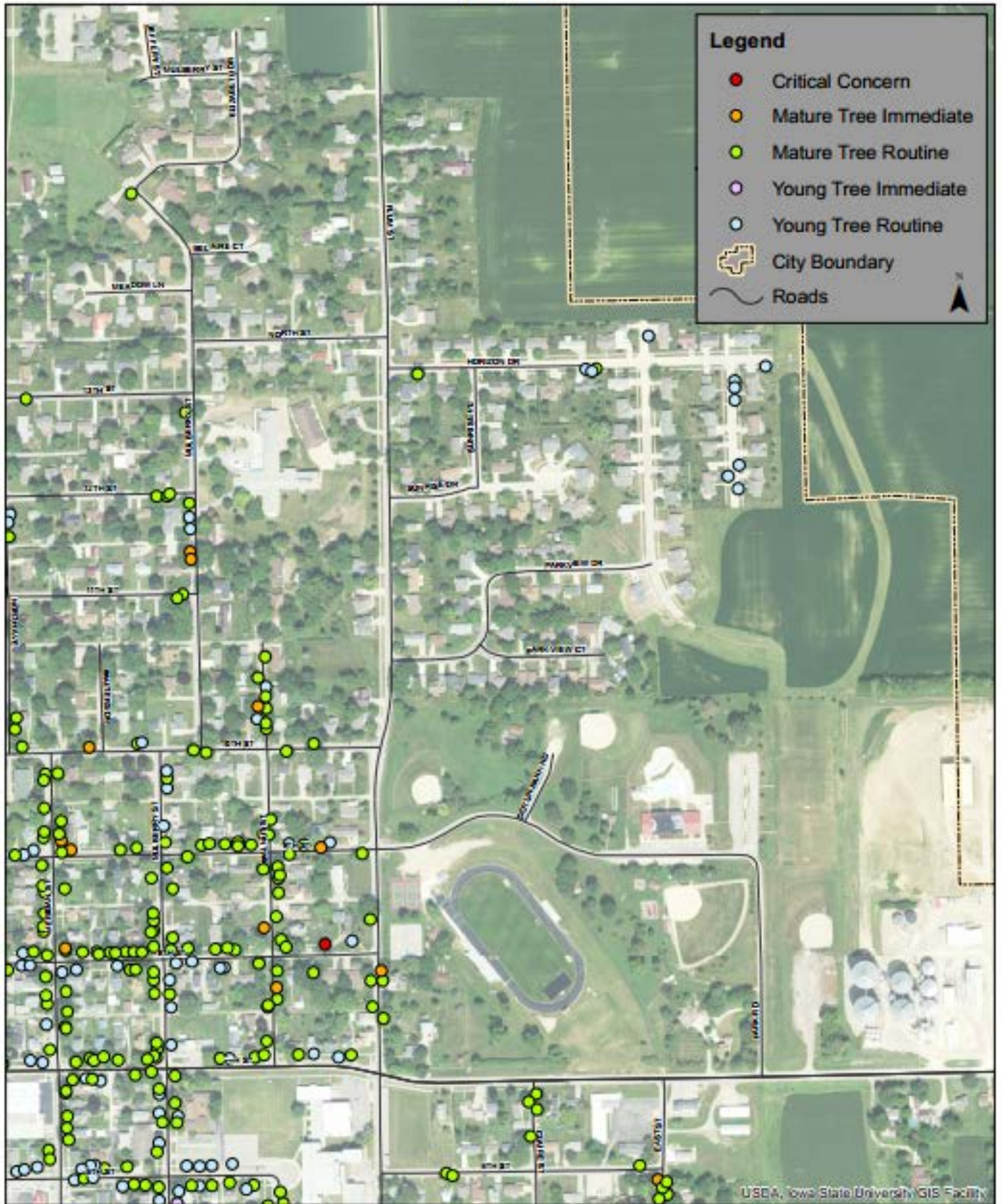
Figure 3d:

### Location of Poor Condition Trees 2018 Community Tree Inventory Tipton, IA



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

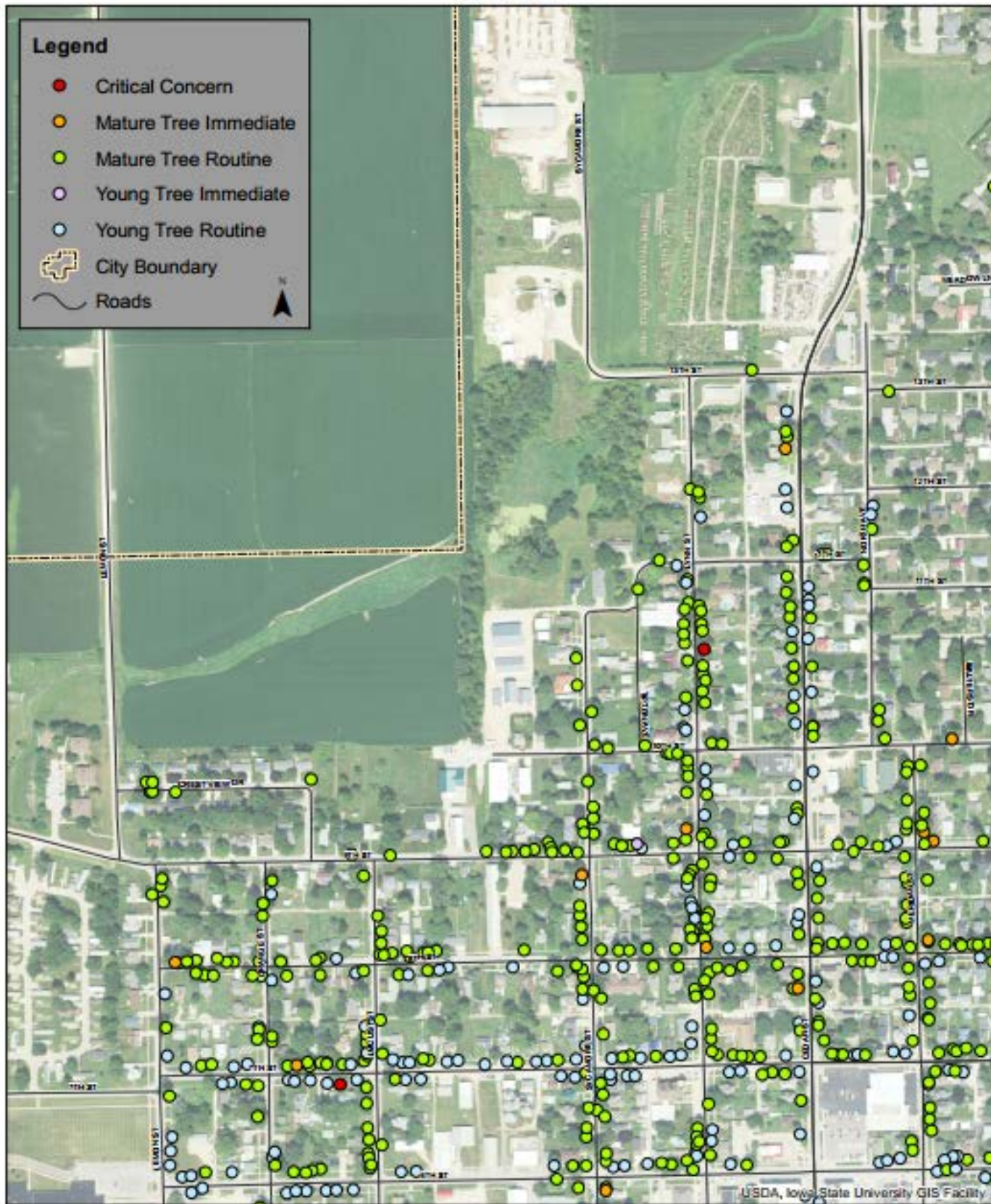
Figure 4a:





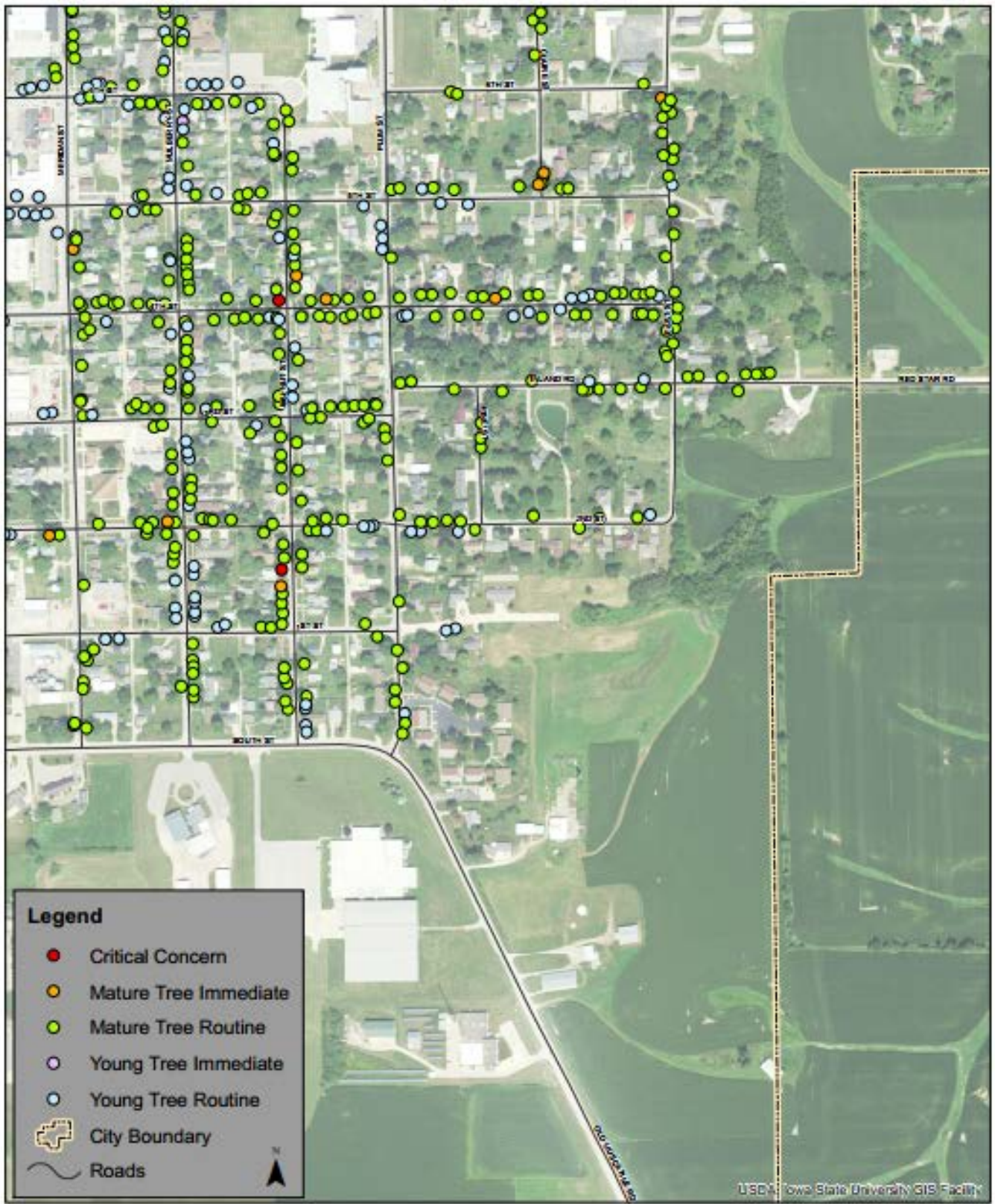
Location of Trees with Recommended Maintenance  
 2018 Community Tree Inventory  
 Tipton, IA

Figure 4b:



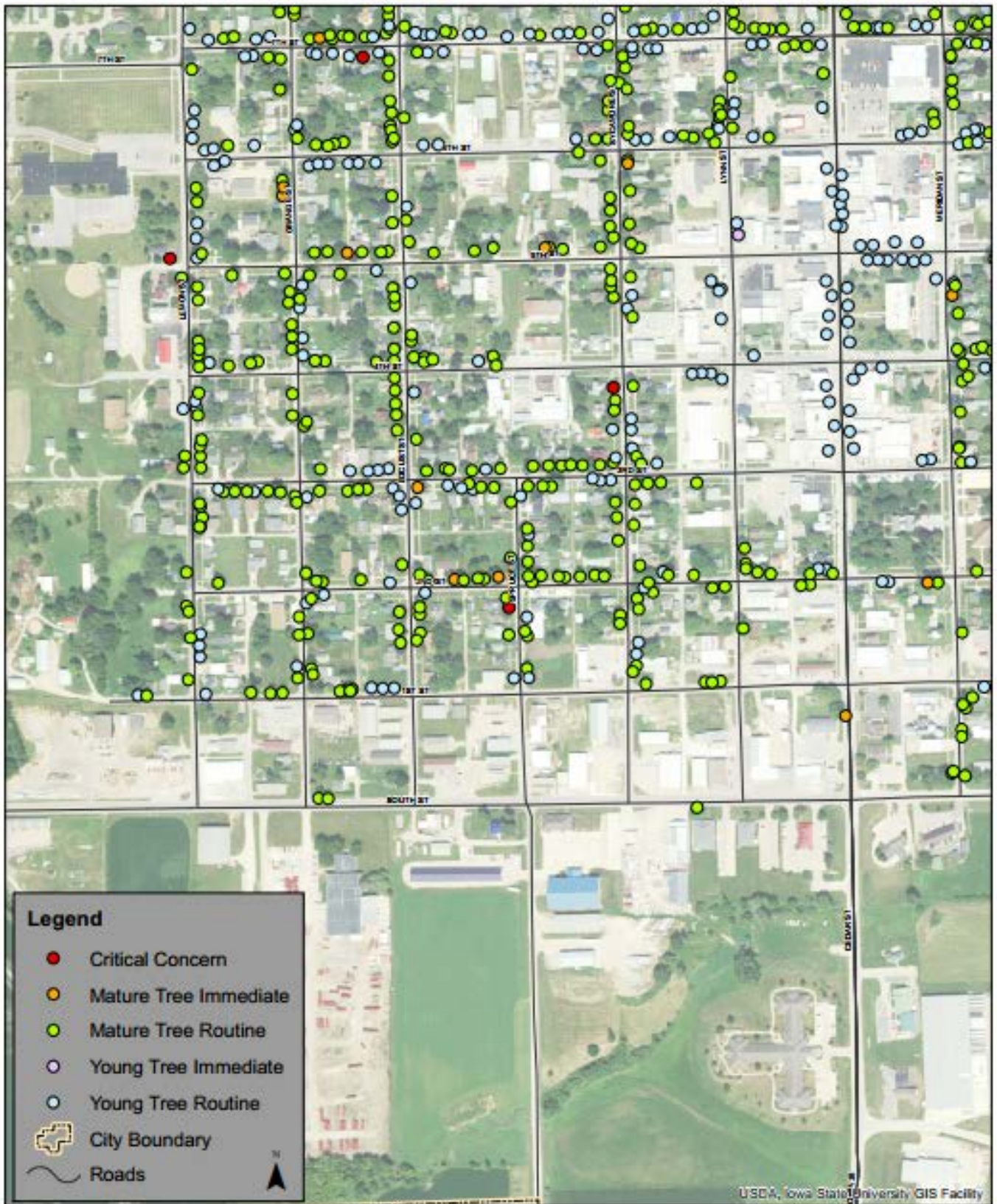
Location of Trees with Recommended Maintenance  
2018 Community Tree Inventory  
Tipton, IA

Figure 4c:



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

Figure 4d:



# Maintenance Tasks 2018 Community Tree Inventory Tipton, IA

Figure 5:

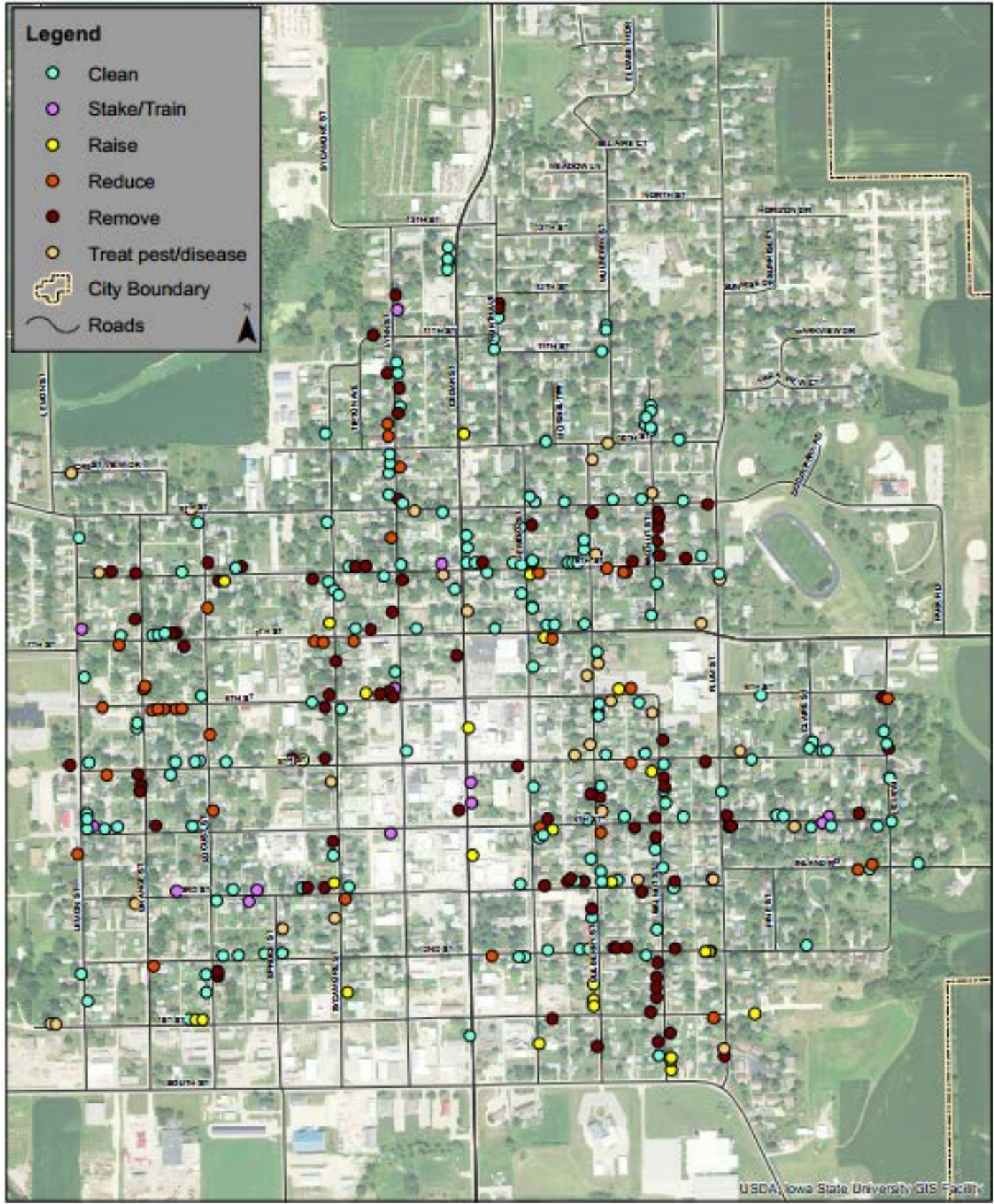
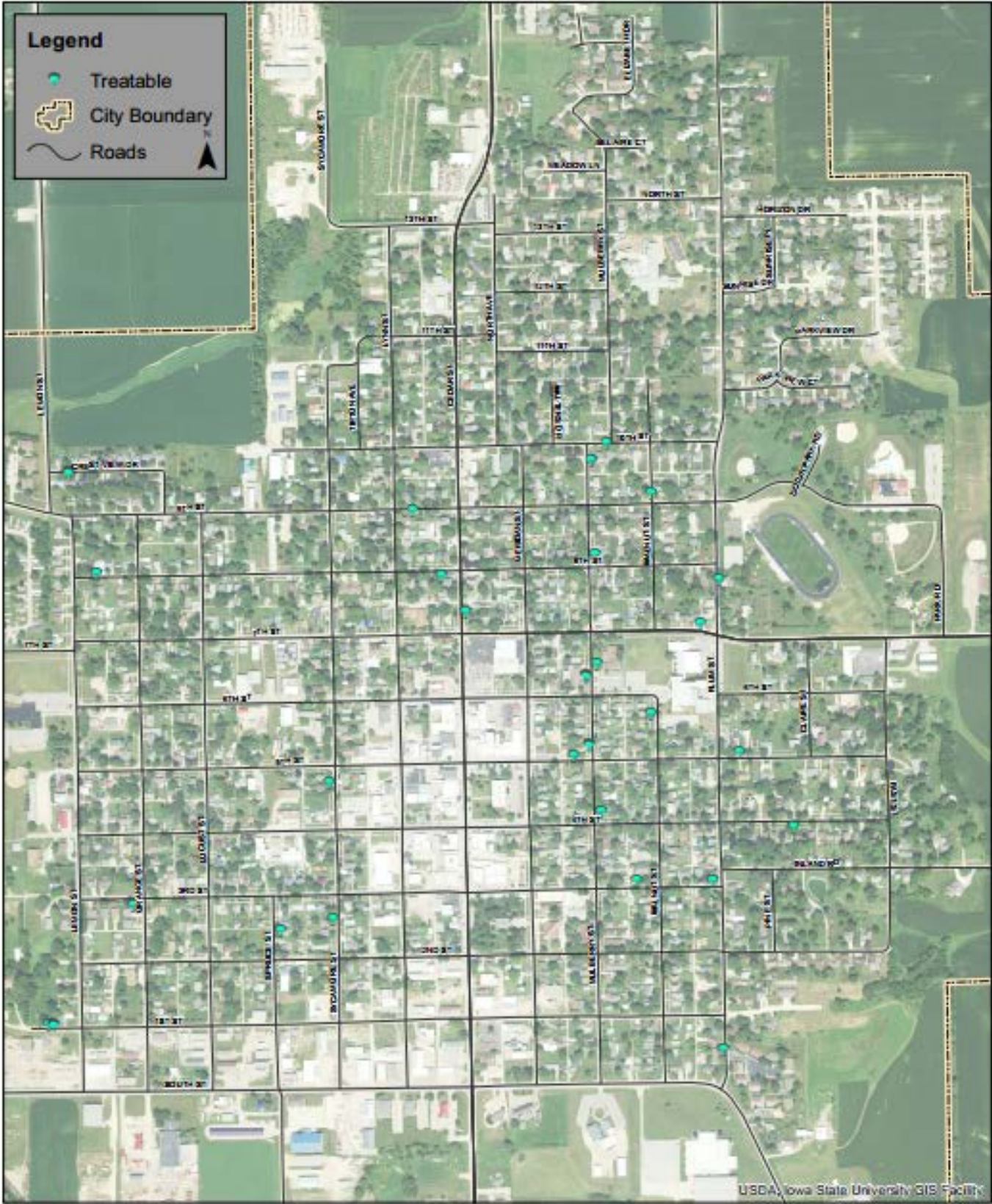


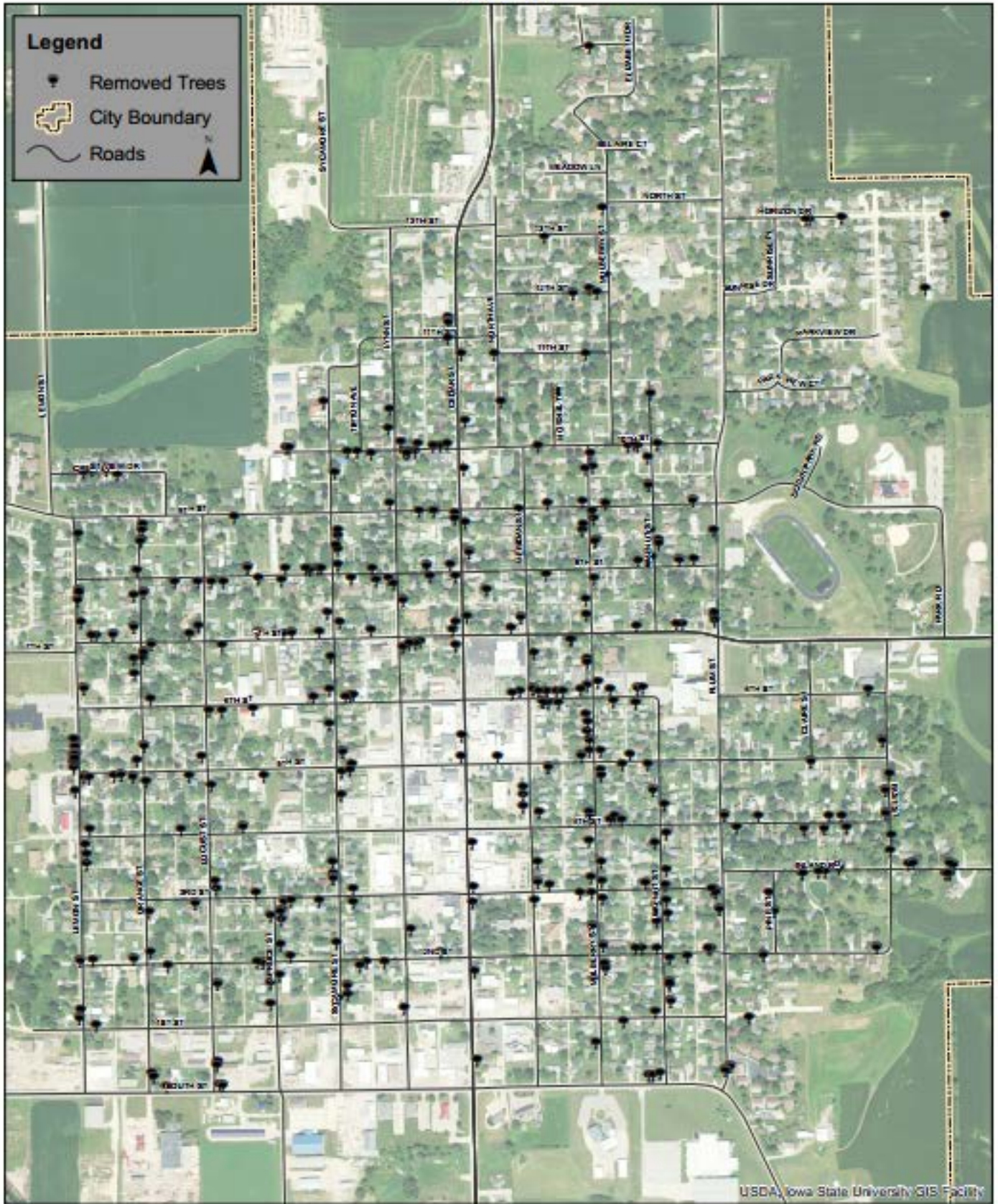
Figure 6:

### Location of Treatable Ash Trees 2018 Community Tree Inventory Tipton, IA



Removed Trees  
2018 Community Tree Inventory  
Tipton, IA

Figure 7:



# Appendix C: Tipton Tree Ordinances

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## CHAPTER 151

### TREES

151.01 Purpose	151.07 Special, Cultivars and Varieties
151.02 Definitions	151.08 Obstruction
151.03 Tree Board	151.09 Nuisance and Condemnation
151.04 Urban Forester	151.10 Protection of Trees
151.05 Permits	151.11 Appeals
151.06 Maintenance	151.12 Interference

**151.01 PURPOSE.** It is the purpose of this chapter to promote and protect the public health, safety, and general welfare by providing for the regulation of the planting, maintenance, and removal of trees, shrubs, and other plants within the City.

#### **151.02 DEFINITIONS.**

1. "Large trees" are those trees attaining a height of 45 feet or more.
2. "Parks" means all public parks having individual names.
3. "Right-of-way" means that part of the street or highway not covered by sidewalk or other paving, lying between a property line and that portion of the street or highway usually used for vehicular traffic.

**151.03 TREE BOARD.** There is hereby created and established a Tree Board for the City, which shall consist of five members, including citizens and residents, who shall be appointed by the Mayor, with the approval of the City Council, for staggered terms of three years. Members of the Board shall serve without compensation. In the event that a vacancy shall occur during the term of any member, his or her successor shall be appointed for the unexpired portion of the term. The City's Urban Forester will serve as an ex-officio member of the Tree Board. The Tree Board will assist the City Urban Forester in the development of a comprehensive plan for the City, including planning, tree planting, and maintenance programs for all public trees. The Board will promote the goals of the tree program.

**151.04 URBAN FORESTER.** The City shall employ a City Forester, Urban Forester or Arborist. This individual shall be employed by the Public Works Department and serve as an ex-officio member of the Tree Board. This individual may also be a current City employee. The Urban Forester shall have the following general powers and duties:

1. To direct, manage, supervise, and control the City street program, to include all planting, removal, maintenance and protection of all trees and shrubs on public areas.
2. To guard all trees and shrubs within the City to prevent the spread of disease or pests and to eliminate dangerous conditions that may affect the life, health, or safety of persons or property.
3. To have such other powers and duties as are provided by the laws of the State of Iowa, by ordinance of the City, and by the Tree Board.

The Urban Forester shall have the authority and jurisdiction of regulating the planting, maintenance, and removal of trees on streets and other publicly owned property to ensure

safety or preserve or enhance the aesthetics of such public sites. The Urban Forester shall have the authority to supervise or inspect all work done under a permit issued in accordance with the terms of this chapter. The Urban Forester shall have the authority to formulate and publish a master tree plan with the advice, hearing, and approval of the Tree Board.

**151.05 PERMITS.** No person shall plant, remove, cut above or below ground or otherwise disturb any tree on any street or City-owned property without first filing an application and procuring a permit from the Urban Forester or specified municipal authority. For the purpose of this chapter, "specified municipal authority" means the Director of Public Works. The person receiving the permit shall abide by the arboriculture specifications and standards of practice adopted by the Urban Forester. All contractors are required to show adequate insurance coverage from potential damages during the execution of the work.

**151.06 MAINTENANCE.** All trees planted shall have trunks not less than ½-inch in diameter at six inches above the ground. No tree shall be planted closer than three feet from the curb line or outer line of the sidewalk. Parking must be at least 25 feet wide for large tree plantings and at least 15 feet wide for medium trees and small trees. All trees shall be planted in line with each other and at a spacing of 40 to 60 feet, depending on the species planted. No street tree shall be planted under or within 10 lateral feet of any overhead utility wire or over or within 5 lateral feet of any underground utility wire. No trees shall be planted within 50 feet from the corners or intersections. All trees and shrubs on public or private property which have branches overhanging a public street or sidewalk shall have said branches trimmed to a clearance height of 14 feet on the street side and 10 feet on the sidewalk side. All public trees designated for removal shall be completely removed from the growing site and disposed of in an authorized manner.

**151.07 SPECIES, CULTIVARS AND VARIETIES.** The Tree Board develops and maintains a list of desirable trees for planting along streets in three size classes: small, medium and large. A list of tree species not suitable for planting as street trees will also be created and enforced by the Tree Board.

**151.08 OBSTRUCTION.** It is the duty of any person owning or operating rental property bordering on any street, upon which property there may be trees, to prune the trees in such a manner that they will not obstruct or shade the street lights, obstruct the passage of pedestrians on sidewalks, obstruct vision of traffic signs, or obstruct the view of any street or alley intersection. The minimum clearance of any overhanging portion thereof shall be 10 feet over sidewalks and 14 feet over all streets. When a person to whom an order is directed shall fail to comply within the specified time, it shall be lawful for the City to prune such trees with the cost assessed to the owner as provided by law in special assessments.

**151.09 NUISANCE AND CONDEMNATION.** All street trees planted in violation of, or not maintained in strict compliance with, the provisions of this chapter, or that are dead or dangerous, are declared to constitute a public nuisance. The Urban Forester shall cause written notice to be served on the property owner requiring such nuisances to be corrected within 30 days or the cost of correction will be assessed against the property owner.

**151.10 PROTECTION OF TREES.** During development, redevelopment, razing, or renovating, no more than 50% of the trees shall be cut, damaged, or removed except by specific permit. No person shall excavate any ditches, tunnels, or trenches or lay any drive within a radius of 20 feet from any tree. No person shall intentionally damage, cut, carve, attach any rope, wire, nails, advertising posters or contrivance to any tree; allow any gaseous,



liquid, chemical, or solid substance that is harmful to such trees to come in contact with them; or set fire or permit fire to burn when such fire or the heat will injure any portion of any tree. Tree topping is not allowed on any tree.

**151.11 APPEALS.** Any person who receives an order from the Urban Forester and objects to all or a part thereof, may, within eight days of receipt thereof, notify the Urban Forester and City Council in writing, of the nature of the objection and request a hearing thereon. The hearing shall be held within eight days of notice to the appellant. Within eight days after such hearing, the Mayor shall notify the appellant and the Urban Forester of the final decision.

**151.12 INTERFERENCE.** No person shall prevent, delay, or interfere with the Urban Forester or Forester's assistants in the execution or enforcement of this chapter.

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 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 the Director at 515-725-8200.