

The Waterford Condominium Tree Inventory and Management Plan | 2024



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The Waterford Condominium Tree Inventory and Management Plan 2024

MAKING THE MOST OF YOUR INVENTORY MANAGEMENT PLAN

Those who operate a large business or institution understand how inventory impacts operations and budgeting. One must know what's there, how much or how many, and where it all is. But the task doesn't end there. To obtain the greatest benefit from inventory, owners or their designees must manage it. Are a company's tools, for example, old and defective, in need of repair, in short supply, or useless and taking up space that could be better occupied? A good management plan will address these issues and keep the inventory current, in good condition, and functioning for the benefit and safety of those involved.

Managing trees on a large property can seem like an overwhelming task, but the same principles of inventory management apply. This inventory and management plan should provide managers the data they need to develop realistic budgets for their tree maintenance needs, and it will help make The Waterford Condominium community a safer and more beautiful environment.

The following tips will assist you in making the most of this document:

Who's Who

Those who conducted the inventory and prepared this document are members of the Bartlett Inventory Solutions team. They are also employees of Bartlett Tree Experts. The Bartlett Inventory Solutions team is overseen by Technical Advisors out of the Bartlett Tree Research Laboratories in Charlotte, North Carolina. The advisors are primarily charged with client support, coordination, quality control, and documentation of inventories and the related data. Extensively trained Regional Inventory Arborists from local Bartlett Tree Experts offices are the primary data collectors and authors of the management plans. Readers may interpret the terms "Bartlett Tree Experts," "Bartlett," "the Inventory Team," "the team," "we," and "our" as the Bartlett company and those who conducted the inventory and prepared this management plan. In addition to the primary author(s) listed on the cover page, Team Member(s) involved in this project included:

Technical Advisor

Andrew Mink, Consulting Advisor

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Data Collection

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Subject Trees

In this document, the term "subject trees" refers (depending on context) to some, or all of the 119 trees included in the inventory.

Definitions & Bolded Terms

Some definitions or specifications are detailed within a given section to explain how readers should interpret certain terms or classifications. We have also appended a Glossary for other terms that appear throughout the document. The first reference to each of these terms appears in **bold** for the reader's convenience.

How This Document is Organized

An outline appears below that introduces the order in which the sections of the management plan will appear. The management plan layout is as follows:

- **Table of Contents**
 - Road map for the management plan
- **Making the Most of Your Inventory Management Plan**
 - Explanations for how to efficiently and effectively understand and navigate this management plan document.
- **Executive Summary**
 - Synopsis of the major findings and recommendations
- **Introduction**
 - Brief explanation of the inventory and what was included.
- **Goals & Objectives**
 - Explanation of the specific goals and objectives for this inventory
- **Data Collection & Tree Inspection Methodology**
 - Lists, explanations, and definitions of all data collected during the inventory.
- **Tree Risk Assessment and Mitigation**
 - Summary of *overall tree risk ratings* assigned during the inventory with corresponding table and map displays with figures if applicable.
 - Summary of *Level 3 Advanced assessments* recommended during the inventory (summarized in the *overall tree risk ratings* table) with a map display and figures if applicable.
- **Stand Dynamics Results**
 - Summary information for the entire tree population inventoried.

- **Recommendations**
 - Summary of all recommendations made during the inventory including associated table and map displays, explanations and examples, and figures if applicable.
- **Defects or Observations**
 - List of all trees observed to have defects in the field in a table view with associated descriptive figures and maps if applicable.
- **Entire Inventory**
 - List of all trees collected in a table display.
- **Additional Resources**
 - Listing of all appended items for this management plan

EXECUTIVE SUMMARY

In March 2024, the Bartlett Inventory Solutions (BIS) Team from Bartlett Tree Experts conducted an update of the inventory of trees within The Waterford Condominium community. We identified 119 trees which included 26 species. The attributes that we collected include tree latitude and longitude, size, age and condition class, and a visual assessment of tree structure, health, and **vigor**.

We conducted the attribute collection using a sub-meter accuracy Global Positioning Satellite Receiver (GPSr) device with an error-in-location potential of not greater than three meters. Our recommendations for the subject trees are based on the number of desired management cycles. All tree work activities will comply with current American National Standards Institute (ANSI) Z133.1 requirements for safety.

Tree Risk Assessments and Mitigation

Perform the recommended tree risk mitigation activities for the 3 trees (3%) which we found defects or concerns that prompted the need to use the International Society of Arboriculture's (ISA) risk matrices in the field. Risk mitigation activities will comply with current ANSI A300 standard practices. Please see the Tree Risk Assessments, Limitations & Glossary section for more information.

Level 3 Advanced Assessment

At the time of inventory, no trees were recommended for *Level 3 Advanced assessments* to evaluate the impact of wood decay. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if *Level 3 Advanced assessments* are warranted in the future.

Soil Sampling

Taking soil samples throughout planting beds and actively managed areas. Soil analysis provides information on the presence of soil nutrients, pH, organic matter, and cation exchange capacity.

Bulk Density Sampling

Taking bulk density samples throughout planting beds and actively managed areas to determine the amount of soil compaction.

Soil Rx®

Apply Bartlett's Soil Rx® program to 27 trees (23%) to correct nutrient deficiencies and optimize soil conditions for the designated trees.

Root Invigoration™

Perform Bartlett's patented Root Invigoration™ on 1 tree (1%) to improve aeration and promote more efficient root growth, especially for high-value trees in disturbed areas.

Mulching

Wherever possible, apply 2-4 inches of mulch within the root zone to help moderate soil temperatures, reduce soil moisture loss, reduce soil compaction, provide nutrients, improve soil structure, and keep mowers and string trimmers away from tree trunks. The best mulch materials are wood chips, bark nuggets, composted leaves, or pine needles. To avoid potential disease problems, mulch should not be placed directly against the trunk.

Root Collar Excavations

Perform **root collar** excavations to 47 trees (39%) to lower risk of damaging conditions such as **girdling roots**, basal cankers, masking of root decay and lower-stem decay, and predisposing trees to various insect and disease pests.

Plant Health Care (PHC)

Implement Bartlett's PHC program to monitor pests and diseases on the subject trees. Treatments are therapeutic and preventive, and treatment timing is based on pest life cycle.

Pruning

Prune 85 trees (71%) for safety, health, structure, and appearance. Pruning will comply with current ANSI A300 standard practices for pruning.

Structural Support

There are structural support system recommendations for 2 trees (2%) to reduce risk of branch or whole tree failure. All structural support systems will comply with current ANSI A300 standard practices for supplemental support systems.

Lightning Protection

There are lightning protection system recommendations for 5 trees (4%) to try and intercept lightning strikes and conduct them to the ground. All Lightning protection systems will comply with current ANSI A300 standard practices for lightning protection systems.

Removals

At the time of inventory, no trees were recommended for removal. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if tree removals are warranted in the future.

Vine Removal

Remove vines from 15 trees (13%) to try and prevent them from hiding defects.

INTRODUCTION

In October 2023, The Waterford Condominium in Kensington, Maryland retained Bartlett Tree Experts to perform an update of the inventory of trees within their community. Team member Harry Chojev visited the site on March 4, 2024, to conduct the update.

The inventory update included:

- identifying trees and assigning a Tree ID number (Tree ID numbers ranging from 1 to 126);
- identifying the trees' condition, health, and vigor;
- recommending risk evaluations and removals of appropriate trees;
- recommending tree care, soil care, structural support, and pest management treatments to promote tree safety, health, appearance, and longevity; and
- mapping the trees using GPSr hardware and Geographic Information System (GIS) software, and Bartlett Tree Experts' ArborScope™ web-based management system

The methods and procedures we used to make the above determinations and recommendations are detailed in the following sections.

GOALS & OBJECTIVES

An effective management plan communicates clear goals and the specific objectives designed to carry out those goals. We intend "goal" to mean the overall aim or result we expect to achieve for the client in producing the inventory and management plan. The objectives are the specific actions taken or recommended to support goal completion. The table below describes each goal and its corresponding objective(s).

GOALS & OBJECTIVES

GOAL	OBJECTIVES TO ACCOMPLISH GOAL
Perform an update to the tree inventory (per numbers agreed) within The Waterford Condominium community.	<ul style="list-style-type: none"> • Using Trimble® DA2 GPSr hardware and ArborScope™ Inventory Management Tools, collect data such as tree name, location, size, age class, and condition class. • Assign a Tree ID number to each tree inventoried.
Provide mechanism for managing inventory, recommendations, and related budget planning.	<ul style="list-style-type: none"> • Provide map or maps of the inventoried trees to assist the client in managing property areas. • Submit a comprehensive management plan that documents and organizes findings and provides other resources to assist the client in efficient use of the information.
Maximize client understanding and implementation of management plan.	<ul style="list-style-type: none"> • Include in management plan specific explanations and visuals related to plan recommendations. • Provide appended resources that address health, procedures, and standards related to tree care. • Make periodic contact with client to follow up and answer any questions about the management plan's contents.
Maximize immediate and long-term tree health and aesthetics.	Implement recommended plant-health-care program that uses <ul style="list-style-type: none"> • integrated pest management • soil care • maintenance pruning
Manage immediate and long-term risk associated with trees in high-use areas.	Implement recommended risk-management measures that include <ul style="list-style-type: none"> • risk-reduction pruning • required removals • tree structure evaluations

DATA COLLECTION & TREE INSPECTION METHODOLOGY

In conducting the inventory, we used specialized equipment and software and followed specific procedures to determine tree characteristics, risk evaluations, and recommendations. The following explanation will assist the reader in interpreting the findings of this management plan.

Data Collection Equipment & Attribute Data

The Inventory Team used Trimble® DA2 GPSr hardware units, Trimble TerraFlex® and Trimble Connect Office® GIS software, and Bartlett Tree Experts' ArborScope™ web-based management system to inventory the trees. The attribute data we collected on site are listed below.

- botanical name and regional common name according to local ISA Chapter Tree Species List
- tree location based on GPS coordinate system.
- tree ID number
- diameter at breast height (**DBH**)
- canopy radius
- age class
- height class
- condition class
- root zone infringement, based on **dripline** and estimated **grayscale** (e.g., sidewalks) impact on root zone.
- infrastructure interaction (between trees and grayscale that may cause an undesirable condition)
- documented *Level 2 Basic assessment* for tree risk where defects or concerns were observed that prompted the need to use the ISA risk matrices in the field resulting in an *overall tree risk rating*.
- Tree & Shrub Work phase (based on number of desired management cycles)
- pruning category
- need for and inspection of existing structural support systems.
- need for and inspection of existing lightning protection systems.
- need for *Level 3 Advanced assessment* for tree risk.
- tree removals
- soil care recommendations
- plant health care recommendations
- noted defects/observations.
- observed pests/diseases.

Specifications/Definitions

Age Class

New Planting	Tree not yet established
Young	Established tree but not in the landscape for many years
Semi-mature	Established tree but has not yet reached full growth potential
Mature	Tree within its full growth potential
Over-mature	Tree that is declining or beginning to decline due to its age

Height Class

Small	Less than 15 feet
Medium	15 to 40 feet
Large	Greater than 40 feet

Condition Class

Dead

Poor Most of the canopy displays dieback and undesirable leaf color, inappropriate leaf size or inadequate new growth. Tree or parts of tree are in the process of failure.

Fair Parts of canopy display undesirable leaf color, inappropriate leaf size, and inadequate new growth. Parts of the tree are likely to fail.

Good Tree health and condition are acceptable.

Tree & Shrub Work Phase

Tree & Shrub Work phase takes into consideration tree species, condition, location, age, and proximity to infrastructure. We intend for this rating system to assist decision makers in prioritizing risk mitigation, tree pruning, cabling and bracing, and tree lightning protection recommendations. *Trees with an ASAP and an overall tree risk rating of extreme or high (see definitions in the next section) should be addressed immediately.* Prioritization does not take into account any budgetary or financial considerations.

Phases 1, 2, 3, 4, and 5 are all based on observations by the inventory arborist according to the manager's goals. The following additional information clarifies each priority:

ASAP Trees with recommendations that should be addressed As Soon As Possible.

Phase 1 Typically addressed in the first management cycle. Trees located in high-use sites, have a high aesthetic value, have an elevated *overall tree risk rating*, and/or parts that are currently in conflict with infrastructure.

Phase 2 Typically addressed in the second management cycle. Trees with moderate aesthetic value, don't have an elevated *overall tree risk rating*, and/or parts that are anticipated to be in conflict with infrastructure.

Phase 3 Typically addressed in the third management cycle. Tree parts that are anticipated to be in conflict with infrastructure and/or recommendations based on anticipated growth.

Phase 4 Typically addressed in the fourth management cycle. Recommendations are for future consideration and anticipated growth.

Phase 5 Typically addressed in the fifth management cycle. Recommendations are for future consideration and anticipated growth.

Pruning Category

All trees identified in this management plan that have tree care recommendations are listed within a specific pruning category. Trees within each pruning category can be prioritized by the specific goals of the manager. It is recommended that specific goals be discussed prior to any pruning.

Risk Mitigation	This goal requires pruning of any tree where risk mitigation should take precedence over other pruning goals. Typically aims to reduce the <i>overall tree risk rating</i> by branch removal and/or branch reduction.
Maintenance	This goal typically requires routine pruning of large/mature trees. Includes branch removal and/or branch reduction to help reduce <i>likelihood of failure</i> and/or conflict with infrastructure. Trees with this goal are typically climbed or require the use of aerial lifts and/or other specialized equipment.
Developmental	This goal typically requires routine pruning of small/young trees. Includes structural pruning to develop a strong central stem, establish proper branch spacing, and/or develop branch structure.
Ornamental	This goal typically requires pruning of small trees. Includes reduction and/or shearing to its desired shape, size, and/or structure.
Specialized	Trees with this goal require a unique treatment that may include, but not limited to, targeted pruning cuts, removal of nuisance fruit/parasitic plants, and/or rejuvenation/internodal pruning.

* The listed descriptions of goals, tools, and/or techniques are not limited to these definitions. Specific individual goals and species profiles should guide the pruning recommendations.

Tree Risk Assessments, Limitations & Glossary

In accordance with industry standards, tree risk ratings are derived from a combination of three factors: the *likelihood of failure*, the *likelihood of the failed tree part impacting a target*, and the *consequences* of the target being struck. The guidelines used to classify each of these factors are presented in the *ISA's BMP for Tree Risk Assessment* and guidelines developed by the Bartlett Tree Research Laboratories. *These factors are then used to categorize tree risk as Extreme, High, Moderate or Low.* The factors used to define your risk ratings are identified in this report. An explanation of terms used in this report appears in the glossary located in the appendix. The information provided in this report is based on the conditions identified at the time of inspection. Tree conditions do change over time, so reassessment is recommended annually and after major storm events.

Limitations of Tree Risk Assessments

It is important for the tree owner or manager to know and understand that all trees pose some degree of risk from failure or other conditions. The information and recommendations within this report have been derived from the level of tree risk assessment identified in this report, using the information and practices outlined in the *International Society of Arboriculture's Best Management Practices for Tree Risk Assessment*, as well as the information available at the time of the inspection. However, the *overall tree risk rating*, the mitigation recommendations, or any other conclusions do not preclude the possibility of failure from undetected conditions, weather events, or other acts of man or nature. Trees can unpredictably fail even if no defects or other conditions are present. It is the responsibility of the tree owner or manager to schedule repeat or *Advanced assessments*, determine actions, and implement follow up recommendations, monitoring and/or mitigation.

Bartlett Tree Experts can make no warranty or guarantee whatsoever regarding the safety of any tree, trees, or parts of trees, regardless of the level of tree risk assessment provided, the risk rating, or the residual risk rating after mitigation. The information in this report should not be considered as making safety, legal, architectural, engineering, landscape architectural, land surveying advice or other professional advice. This information is solely for the use of the tree owner and manager to assist in the decision-making process regarding the management of their tree or trees. Tree risk assessments are simply tools which should be used in conjunction with the owner or tree manager's knowledge, other information and observations related to the specific tree or trees discussed, and sound decision making.

Glossary

Tree risk assessment has a unique set of terms with specific meanings. Definitions of all specific terms may be found in the *International Society of Arboriculture's Best Management Practice for Tree Risk Assessment*. Definitions of some of these terms used in this report are as follows:

The *likelihood of failure* may be categorized as imminent meaning that failure has started or could occur at any time; probable meaning that failure may be expected under normal weather conditions within the next 3 years; possible meaning that failure could occur, but is unlikely under normal weather conditions during that time frame; and improbable meaning that failure is not likely under normal weather conditions, and may not occur in severe weather conditions during that time frame.

The *likelihood of the failed tree part impacting a target* may be categorized as high meaning that a failed tree or tree part will most likely impact a target; medium meaning the failed tree or tree part could impact the target, but is not expected to do so; low meaning that the failed tree or tree part is not likely to impact a target; and very low meaning that the chance of a failed tree or tree part impacting the target is remote.

The *likelihood of failure and impact* is defined by the Likelihood Matrix below.

LIKELIHOOD OF FAILURE AND IMPACT

Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very Likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

The *consequences* of a known target being struck may be categorized as severe meaning that impact could involve serious personal injury or death, damage to high value property, or disruption to important activities; significant meaning that the impact may involve personal injury, property damage of moderate to high value, or considerable disruption; minor meaning that impact could cause low to moderate property damage, small disruptions to traffic or a communication utility, or minor injury; and negligible meaning that impact may involve low value property damage, disruption that can be replaced or repaired, and do not involve personal injury.

Targets are people, property, or activities that could be injured, damaged or disrupted by a tree failure.

Levels of assessment 1) *Limited visual assessments* are conducted to identify obvious defects. 2) *Basic assessments* are visual inspections done by walking around the tree looking at the site, buttress roots, trunk and branches. It may include the use of simple tools to gain information about the tree or defects. 3) *Advanced assessments* are performed to provide detailed information about specific tree parts, defects, targets of site conditions. Drilling to detect decay is an advanced assessment technique.

Tree Risk Ratings are terms used to communicate the level of risk rating. They are defined in defined in the Risk Matrix below as a combination of Likelihood and Consequences:

ISA RISK MATRIX

Likelihood of Failure & Impact	Consequences of the Tree Failure			
	Negligible	Minor	Significant	Severe
Very Likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

Overall tree risk rating is the highest individual risk identified for the tree. The *residual risk* is the level of risk the tree should pose after the recommended mitigation.

Bartlett Tree Experts can inventory trees that have ropes courses, zip lines, swings, tree houses, or any other life support system attached for several different attributes; however, Bartlett Tree Experts is unable to provide tree risk assessment information on such trees, nor is Bartlett Tree Experts able to determine whether the correct hardware has been used, the systems are attached to the trees correctly, or whether the trees can withstand the additional forces that are placed on the tree or trees from such systems or structures. Bartlett Tree Experts does not recommend that any hardware or structures, other than those recommended by and installed by qualified arborists to aid the tree in structural support or protections from lightning, be installed in or attached to any tree(s). Bartlett Tree Experts recommends removing, or discontinuing the use of, any such system or recreational structure until the Client hires or consults with an engineer/specialist that deals specifically with ropes courses, zip lines, swings, tree houses, or any other life support systems and how they attach to and impact trees to determine if the trees can handle the forces being placed on them.

In the event that Bartlett Tree Experts observes an immediate safety issue with a tree with any such device attached, such as the presence of a dead, dying, or broken limb that could fall and injure a person or damage property, Bartlett Tree Experts may make a recommendation to remove or prune such a limb or otherwise mitigate the obvious safety issue. However, the Client should not infer that following such a recommendation and mitigating the immediate safety issue makes the tree in question safe for the use of the attached device or feature.

TREE RISK ASSESSMENTS AND MITIGATION



TREE RISK ASSESSMENTS AND MITIGATION

In reviewing the results and recommendations, the reader will find useful the specifications and definitions detailed in the preceding methodology. We used the following categories to organize the results and recommendations, which are displayed in tables:

- **Subject Trees Summarized According to:**
 - Tree Risk Assessment Results and Mitigation Recommendations
 - *Level 3 Advanced Assessment* Recommendations

Tree Risk Assessments and Mitigation

As part of the inventory process, the Inventory Team conducts a *Level 2 Basic assessment* from the ground. While every tree poses a risk, typically low, any trees that were found to have conditions that posed a hazardous situation, prompting the arborists to go through the steps outlined in the Tree Risk Assessments, Limitations, and Glossary section of this plan. *Overall Tree Risk Ratings* are then assigned to these trees.

During the *Level 2 Basic assessment* the Regional Inventory Arborist can determine whether some aspect of tree structure or health indicates that a more comprehensive tree structure evaluation, called a *Level 3 Advanced assessment*, is needed to more thoroughly evaluate tree condition and *likelihood of failure*.

In such cases, we may recommend *Level 3 Advanced assessments* of the roots, stem, or crown. These assessments may include climbing inspections, examination of the root system using a compressed-air tool (that avoids damage to roots and underground utilities), resistance-recording drilling, or sonic tomography that produces a visual representation of internal conditions based on how sound moved through the tree. The goal is to use the appropriate method to evaluate impact of wood decay in stems and buttress roots that show potential for failure and to determine presence and condition of the root system. Once those *Level 3 Advanced assessments* are completed, more specific recommendations can be made, such as remediation, maintenance, or removal.

The Tree Risk Table below summarizes the inventoried trees that were observed posing a hazardous situation during the course of the inventory, including those trees recommended for *Level 3 Advanced assessments*. The table is organized first by *Overall Tree Risk Rating* (highest to lowest), then by Tree & Shrub Work Phase (ascending order), and finally by Tree ID (ascending order).

TREE RISK ASSESSMENTS AND MITIGATION (3 Trees)

Tree ID	Common Name	DBH	Condition	Overall Tree Risk Rating	Primary Target	Tree & Shrub Work Phase	Recommendation	Defect(s) or Observation(s)
8	Dogwood-Flowering	9,9,6,6,5	Fair	Low	Parking	1	<ul style="list-style-type: none"> • Prune: Reduce risk of branch stem and/or root failure • Prune: Reduce spread of crown • Prune: Clearance • RCX 	<ul style="list-style-type: none"> • Buried root collar • Cavity-root flare • Cavity-stem • Co-dominant stems • Dead branches <=2 • Included bark
96	Maple-Sugar	35	Good	Low	Overhead lines	1	<ul style="list-style-type: none"> • Prune: Reduce risk of branch stem and/or root failure • Prune: Reduce spread of crown • Prune: Clearance • Cable: Inspect 	<ul style="list-style-type: none"> • Co-dominant stems • Dead branches >2 • Included bark
98	Maple-Crimson King	23	Good	Low	Overhead lines	1	<ul style="list-style-type: none"> • Prune: Reduce risk of branch stem and/or root failure • Prune: Reduce spread of crown • Prune: Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Included bark

INVENTORIED TREES ASSIGNED *OVERALL TREE RISK RATINGS* AT THE TIME OF DATA COLLECTION



Overall Tree Risk Rating: ● Low

STAND DYNAMICS RESULTS



STAND DYNAMICS RESULTS

In reviewing the results and recommendations, the reader will find useful the specifications and definitions detailed in the preceding methodology above. We used the following categories to organize the stand dynamics results, which are displayed in tables:

- **Subject Trees Summarized According to:**
 - Tree Species Identified
 - Condition Class
 - Age Class
 - Tree Size per DBH
 - Estimated Tree Asset Value
 - Tree Location Value

Where appropriate, we have included explanations, photos, drawings, or other information to illuminate the table contents.

Stand Dynamics

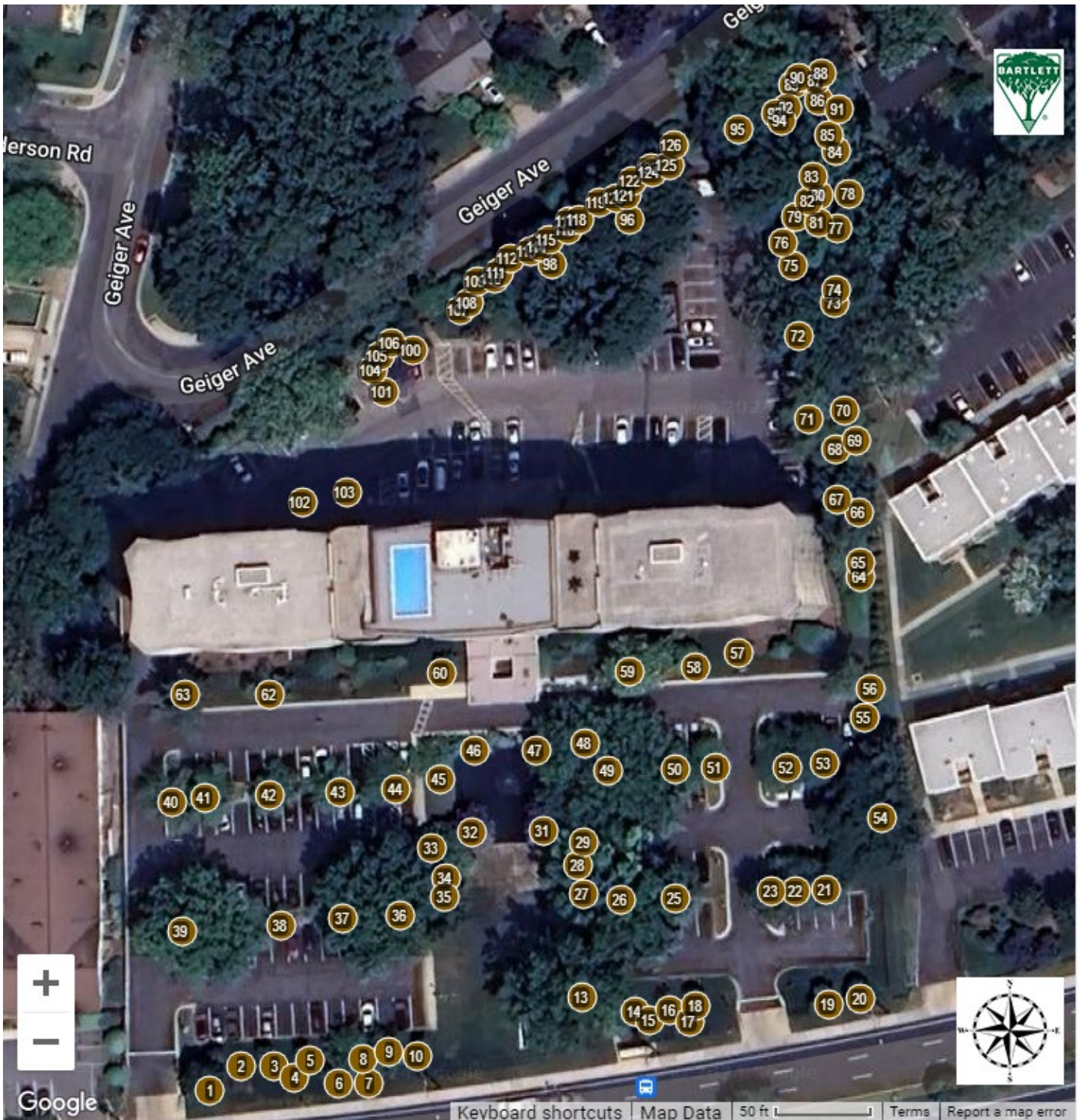
Tree Species Identified

Our inventory revealed 26 species of trees, as detailed in the following table:

TREE SPECIES IDENTIFIED

Genus	Species	Common Name	Count	% Distribution Total
Acer	<i>buergerianum</i>	Maple-Trident	1	1%
	<i>palmatum</i>	Maple-Japanese	4	3%
	<i>platanoides</i>	Maple-Norway	1	1%
	<i>platanoides</i> var. 'Crimson King'	Maple-Crimson King	2	2%
	<i>rubrum</i>	Maple-Red	1	1%
	<i>saccharum</i>	Maple-Sugar	1	1%
Acer Total			10	8%
Cercis	<i>canadensis</i>	Redbud-Eastern	1	1%
Cornus	<i>florida</i>	Dogwood-Flowering	10	8%
	<i>kousa</i>	Dogwood-Kousa	3	3%
Cornus Total			13	11%
Fagus	<i>grandifolia</i>	Beech-American	1	1%
Juniperus	<i>virginiana</i>	Juniper-Eastern Redcedar	1	1%
Lagerstroemia	<i>indica</i>	Crapemyrtle-Common	16	13%
Liriodendron	<i>tulipifera</i>	Tuliptree	3	3%
Magnolia	<i>grandiflora</i>	Magnolia-Southern	1	1%
	<i>x soulangeana</i>	Magnolia-Saucer	5	4%
Magnolia Total			6	5%
Morus	<i>alba</i>	Mulberry-White	5	4%
Pinus	<i>strobus</i>	Pine-Eastern White	8	7%
Prunus	<i>serrulata</i>	Cherry-Flowering	15	13%
	<i>x yedoensis</i>	Cherry-Yoshino	1	1%
Prunus Total			16	13%
Quercus	<i>alba</i>	Oak-White	5	4%
	<i>palustris</i>	Oak-Pin	3	3%
	<i>phellos</i>	Oak-Willow	4	3%
	<i>velutina</i>	Oak-Black	2	2%
Quercus Total			14	12%
Tsuga	<i>canadensis</i>	Hemlock-Canadian	23	19%
Ulmus	<i>americana</i>	Elm-American	1	1%
x Cupressocyparis	<i>leylandii</i>	Leyland Cypress	1	1%
Grand Total			119	100%

2024 TREE INVENTORY

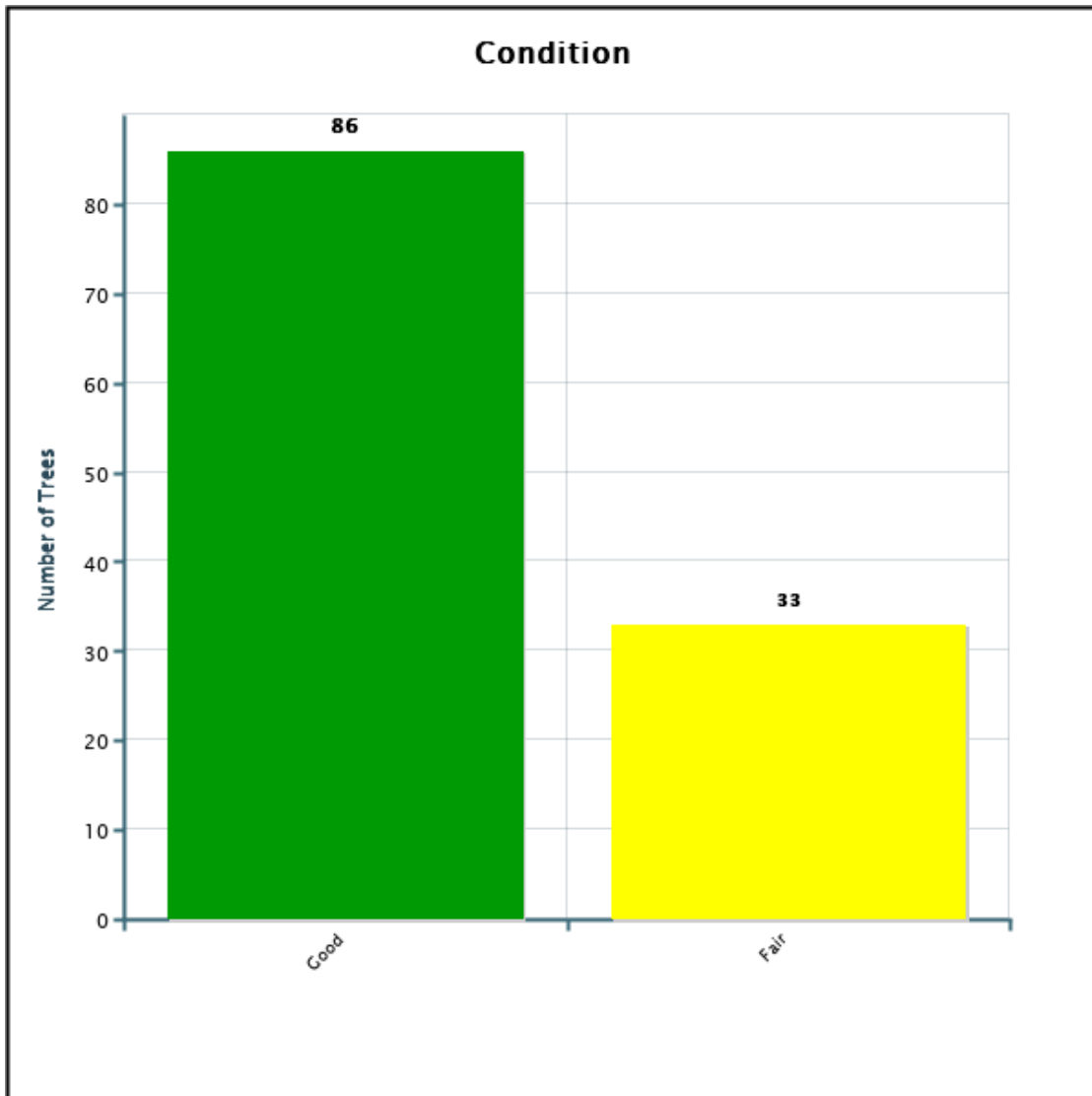


Condition Class

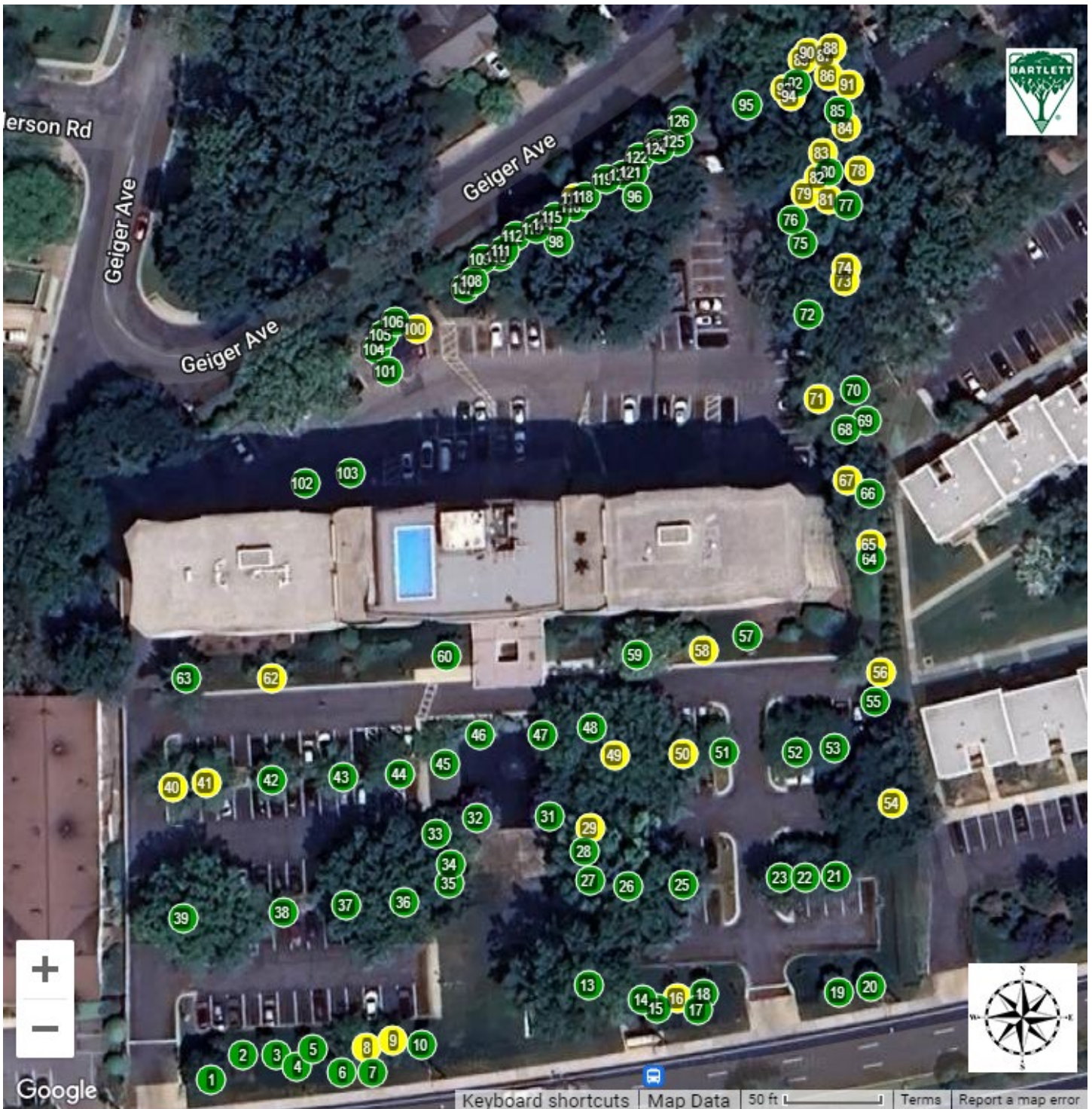
The breakdown of tree condition follows:

CONDITION CLASS BREAKDOWN

Condition Class	Quantity	% of Total
Good	86	72%
Fair	33	28%



INVENTORIED TREES BY CONDITION CLASS

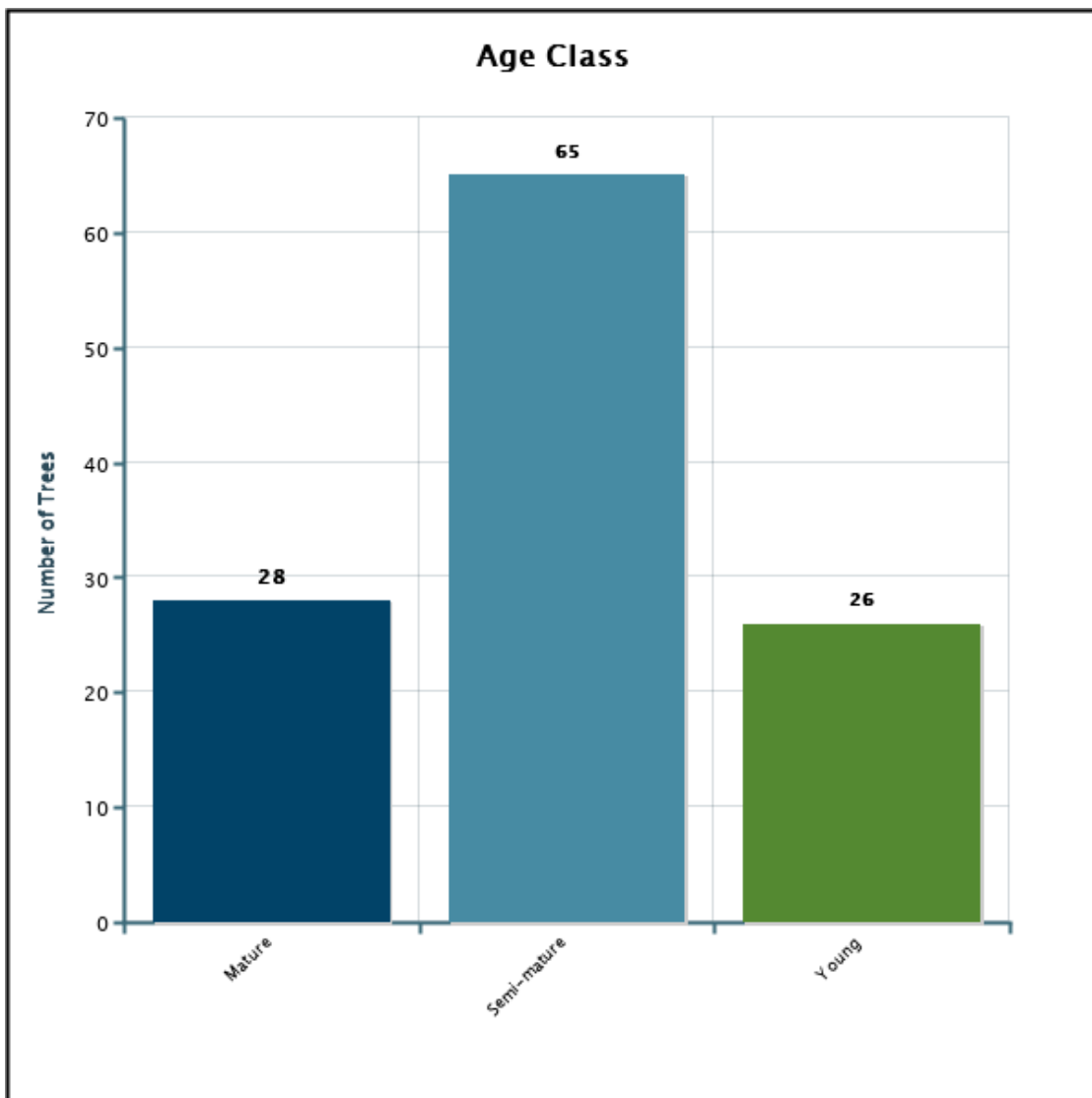


Age Class

The breakdown of tree age class follows:

AGE CLASS BREAKDOWN

Age Class	Quantity	% of Total
Mature	28	24%
Semi-mature	65	55%
Young	26	22%

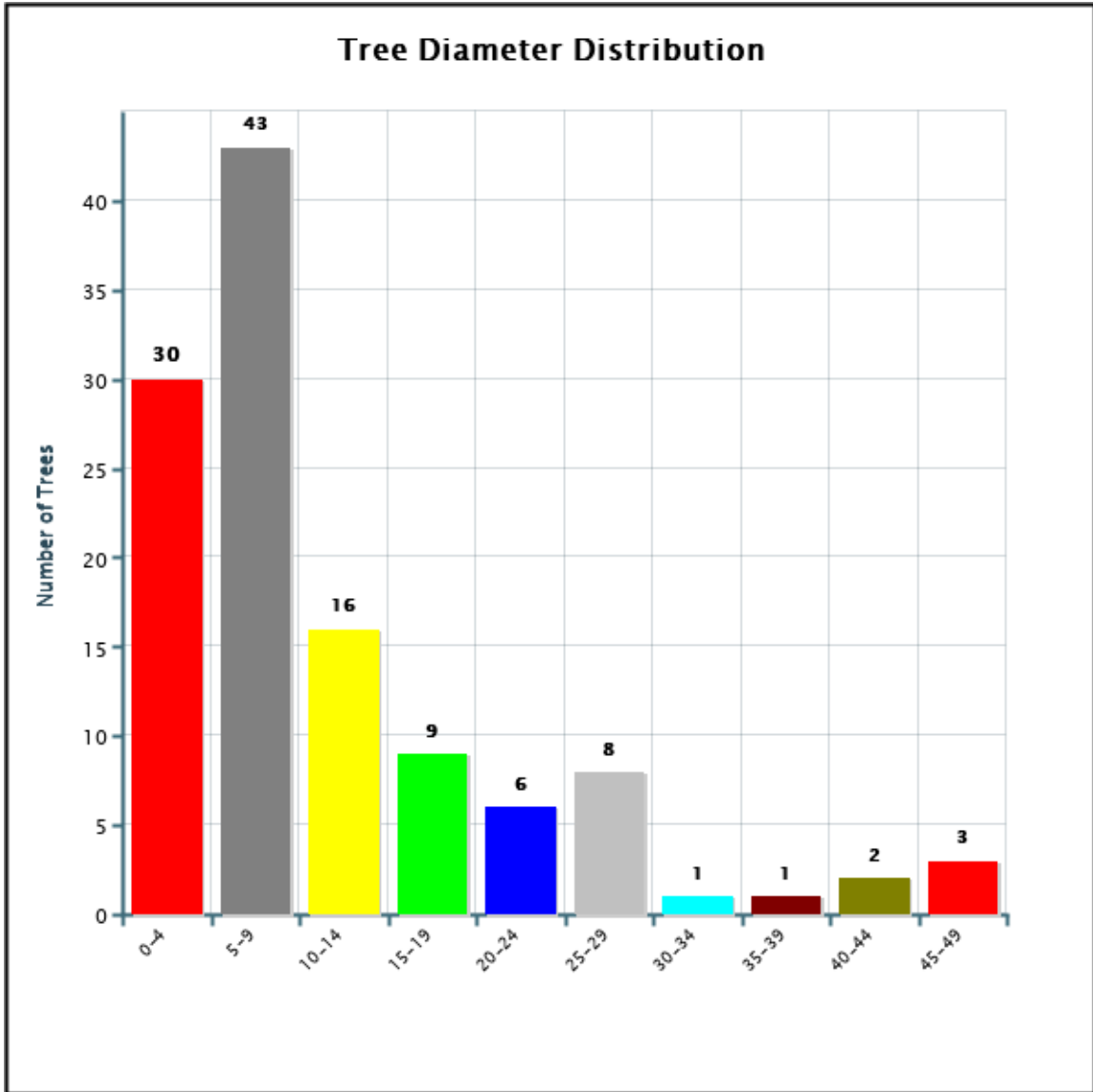


INVENTORIED TREES BY AGE CLASS



Tree Size (DBH)

The following chart illustrates numbers of trees according to size per DBH:



Estimated Tree Asset Value

As part of the Bartlett inventory process, we have included an Estimated Tree Asset Value for each tree and a cumulative total for all trees inventoried. We use an average per square inch nursery price, size (DBH), species factor, condition factor, and location factor to estimate the tree asset value. This is not intended to replace a tree appraisal.

The following data fields are used in this formula:

Data Field	Description
Average Per Square Inch Nursery Price	Based on the average nursery prices for two common tree species and one exotic tree species within a region, then taking the average of those three as the average per square inch price for the region
Size	Based on tree DBH (4.5 feet above grade)
Species Factor	Relative species desirability based on 100% for the tree in that geographical location. In most cases, species desirability ratings, published by the International Society of Arboriculture, are used for adjustment.
Condition Factor	Rating of the tree's structure and health based on 100%
Location Factor	Average rating for the site and the tree's contribution and placement, based on 100%

$$\text{Estimated Tree Asset Value} = (\text{Average Per Square Inch Nursery Price} * \text{Size}) * \text{Species Factor} * \text{Condition Factor} * \text{Location Factor}$$

The estimated cumulative total value for all trees inventoried is **\$349,508.19**. The following table lists the ten trees with the highest Tree Asset Values:

TOP TEN TREES - HIGHEST ESTIMATED TREE ASSET VALUE

Tree ID	Common Name	Genus	Species	DBH	Tree Asset Value
13	Oak-Pin	<i>Quercus</i>	<i>palustris</i>	45	\$32,322.77
96	Maple-Sugar	<i>Acer</i>	<i>saccharum</i>	35	\$25,581.45
70	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	29	\$13,343.99
79	Oak-White	<i>Quercus</i>	<i>alba</i>	27	\$13,219.32
59	Magnolia-Southern	<i>Magnolia</i>	<i>grandiflora</i>	29	\$12,130.90
54	Elm-American	<i>Ulmus</i>	<i>americana</i>	32,22	\$11,602.03
91	Tuliptree	<i>Liriodendron</i>	<i>tulipifera</i>	28	\$11,308.71
69	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	26	\$10,725.97
89	Tuliptree	<i>Liriodendron</i>	<i>tulipifera</i>	27	\$10,515.37
73	Oak-Black	<i>Quercus</i>	<i>velutina</i>	25	\$9,659.18

TOP TEN TREES - HIGHEST TREE ASSET VALUE



Tree Location Value

Each tree at The Waterford Condominium was assigned a location value of good, fair, poor, or unacceptable. Twenty-seven trees (23%) were assigned a location value of fair, poor, or unacceptable due to present or anticipated conflicts with infrastructure or utilities. Trees with conflicts that can easily be mitigated with a one-time raise or reduction prune were not classified as existing in a fair or poor location.

It is recommended that the 27 trees (23%) with fair, poor, or unacceptable location values and not recommended for removal continue to be monitored for intolerable levels of conflict with the surrounding infrastructure. If the level of conflict continues to increase and cannot be easily mitigated, a removal and replacement program should be considered for these trees. If removal and replacement is deemed appropriate, please consult with your local Bartlett Arborist Representative for information on desirable replacement plantings.



Flowering cherry #21 was in a median and had poor location value.

INVENTORIED TREES WITH A FAIR, POOR, OR UNACCEPTABLE LOCATION VALUE (27 Trees)

Tree ID	Common Name	Location Type	Location Value	DBH	Root Zone Infringement
23	Leyland Cypress	Median	Unacceptable	16,13,9	>75%
26	Oak-Willow	Median	Unacceptable	45	>75%
36	Oak-Willow	Median	Unacceptable	46	>75%
39	Oak-Willow	Median	Unacceptable	43	>75%
49	Oak-Willow	Median	Unacceptable	40	>75%
21	Cherry-Flowering	Median	Poor	9,8	51-75%
22	Cherry-Flowering	Median	Poor	9	51-75%
25	Cherry-Flowering	Median	Poor	11	25-50%
37	Cherry-Flowering	Median	Poor	7	25-50%
38	Cherry-Flowering	Median	Poor	6	25-50%
40	Cherry-Flowering	Median	Poor	20	51-75%
41	Cherry-Flowering	Median	Poor	14	51-75%
42	Cherry-Flowering	Median	Poor	14	51-75%
43	Cherry-Flowering	Median	Poor	12	51-75%
44	Cherry-Flowering	Median	Poor	14	51-75%
50	Cherry-Flowering	Median	Poor	8	25-50%
51	Cherry-Flowering	Median	Poor	8	25-50%
52	Cherry-Flowering	Median	Poor	16	25-50%
53	Cherry-Flowering	Median	Poor	15	25-50%
46	Crapemyrtle-Common	Median	Fair	4,3,3,2,2,2	25-50%
47	Crapemyrtle-Common	Median	Fair	5,4,4,3,2,2	25-50%
48	Juniper-Eastern Redcedar	Median	Fair	8	25-50%
54	Elm-American	Median	Fair	32,22	25-50%
57	Dogwood-Flowering	Foundation	Fair	4,2	<25%
59	Magnolia-Southern	Foundation	Fair	29	<25%
60	Dogwood-Flowering	Foundation	Fair	5	<25%
63	Pine-Eastern White	Foundation	Fair	25	<25%

INVENTORIED TREES WITH A FAIR, POOR, OR UNACCEPTABLE LOCATION VALUE



RECOMMENDATIONS



RECOMMENDATIONS

In reviewing the results and recommendations, the reader will find useful the specifications and definitions detailed in the preceding methodology. We used the following categories to organize the results and recommendations, which are displayed in tables:

Recommendations

- Soil Care
- Root Collar Excavation
- Plant Health Care
- Tree Pruning
- Structural Support Systems
- Lightning Protection Systems
- Tree Removal
- Vine Removal

Soil Care

Healthy soil is critical to the health and longevity of trees. Soil provides trees with the essential nutrients required for their growth. Many secondary problems such as reduced vigor, inadequate growth, branch dieback, and pest or disease concerns are related to the primary stress of poor soil conditions. Undisturbed, native forest soils generally contain adequate levels of organic matter, soil microbes, and nutrients. Urban, suburban, and landscape soils (as opposed to forest soils) usually lack these qualities and are often compacted. In many cases, trees in a landscaped environment suffer from inadequate soil fertility, soil compaction, root zone competition with turf grasses, and inadequate total soil volume. Soil Care treatments should be applied as soon as possible, therefore they do not have a Tree & Shrub Work phase.

Bartlett Tree Experts recommends several procedures and treatments that address soil quality. Taking soil samples is perhaps the most important. Proper tree care cannot be initiated unless it is known what type of soil environment the trees are growing in. Soil testing results can help to create a path forward for improved tree health. We address some of these below.

Soil Sampling

Collecting soil samples and having them tested helps determine nutrients that may be lacking, unfavorable soil pH values, and adequacy of soil organic matter. Laboratory tests and analyses can determine the need for soil amendments.

Bulk Density

Compacted soils are regrettably common in the urban setting. A bulk density test, which requires an undisturbed core sample, measures the level of soil compaction. Arborists can use the results to diagnose problems or to determine what size holes to dig for planting. If soil density exceeds a measured threshold for a given soil type and tree species, we recommend Bartlett's Root Invigoration™ program.

Soil Rx®

Bartlett's Soil Rx® program, which is a prescription soil amendment program, aims to correct nutrient deficiencies and optimize soil conditions for designated trees.

Root Invigoration™

The aim of Bartlett's patented Root Invigoration™ Program is to improve soil conditions by addressing soil compaction and promoting efficient root growth, especially for high-value trees in disturbed areas. The process includes taking soil samples to determine what nutrients are deficient, performing a root collar excavation, "air-tilling" a portion of the root zone to find fine roots, incorporating organic matter, applying soil amendments (based on soil sample), and applying mulch. The area of the root system treated can vary by tree. For the Root Invigoration™ Program to be successful, proper watering techniques must be employed after the process is complete.



Pin oak #13 was recommended for Root Invigoration™.

Mulch Application

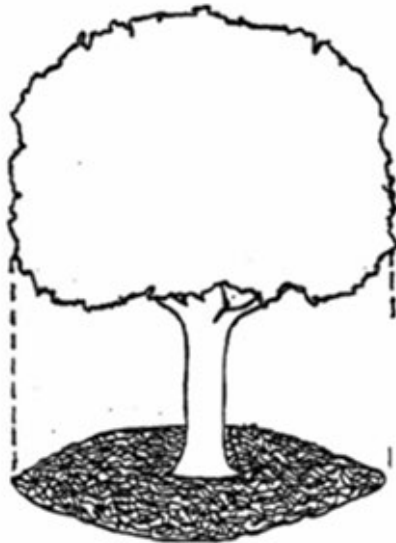
Proper mulching (top left and bottom left) provides many benefits to trees and shrubs. It moderates soil temperatures, reduces soil moisture loss, reduces soil compaction, provides nutrients, and improves soil structure. This practice results in more root growth and healthier plants. The image on the top right illustrates root growth density under grass versus mulch. Mulch is frequently applied incorrectly (bottom right), so we recommend that readers inspect the technical report on mulch application guidelines that appears in the Appendix.



Example of how mulch should be installed, 2-4 inches thick and not against the trunk.



Example of root density under grass versus mulch.



Example of how mulch should be applied from the trunk to the dripline.



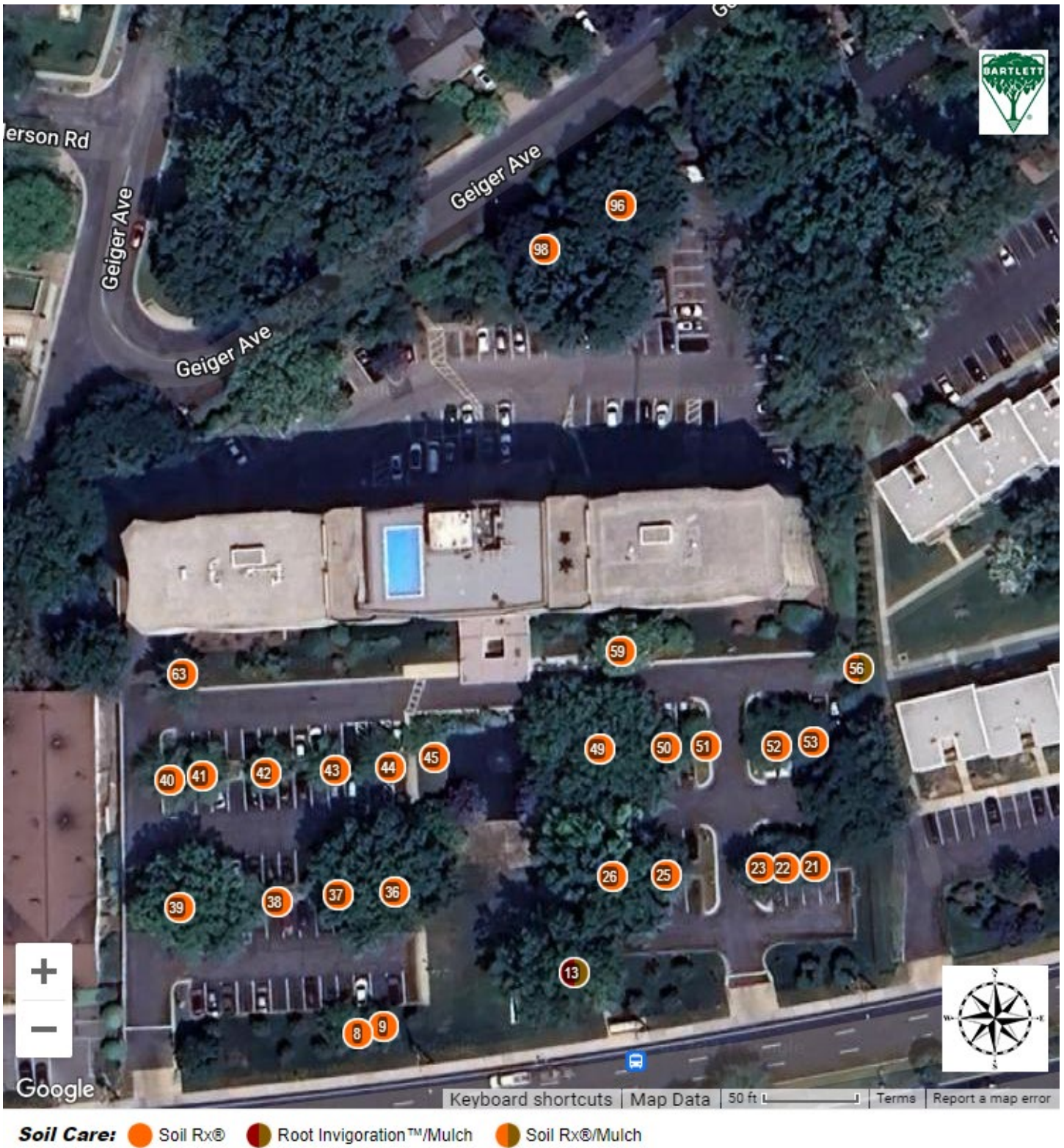
Example of improper mulch application, known as "volcano mulch".

The following inventoried trees are recommended for soil care because of possible nutrient deficiencies, soil compaction, or inadequate soil conditions:

INVENTORIED TREES RECOMMENDED FOR SOIL CARE (28 Trees)

Tree ID	Common Name	DBH	Soil Care	Mulch Recommended
8	Dogwood-Flowering	9,9,6,6,5	• Soil Rx ®	...
9	Dogwood-Flowering	13	• Soil Rx ®	...
13	Oak-Pin	45	• Root Invigoration™	Yes
21	Cherry-Flowering	9,8	• Soil Rx ®	...
22	Cherry-Flowering	9	• Soil Rx ®	...
23	Leyland Cypress	16,13,9	• Soil Rx ®	...
25	Cherry-Flowering	11	• Soil Rx ®	...
26	Oak-Willow	45	• Soil Rx ®	...
36	Oak-Willow	46	• Soil Rx ®	...
37	Cherry-Flowering	7	• Soil Rx ®	...
38	Cherry-Flowering	6	• Soil Rx ®	...
39	Oak-Willow	43	• Soil Rx ®	...
40	Cherry-Flowering	20	• Soil Rx ®	...
41	Cherry-Flowering	14	• Soil Rx ®	...
42	Cherry-Flowering	14	• Soil Rx ®	...
43	Cherry-Flowering	12	• Soil Rx ®	...
44	Cherry-Flowering	14	• Soil Rx ®	...
45	Cherry-Flowering	9	• Soil Rx ®	...
49	Oak-Willow	40	• Soil Rx ®	...
50	Cherry-Flowering	8	• Soil Rx ®	...
51	Cherry-Flowering	8	• Soil Rx ®	...
52	Cherry-Flowering	16	• Soil Rx ®	...
53	Cherry-Flowering	15	• Soil Rx ®	...
56	Pine-Eastern White	16	• Soil Rx ®	Yes
59	Magnolia-Southern	29	• Soil Rx ®	...
63	Pine-Eastern White	25	• Soil Rx ®	...
96	Maple-Sugar	35	• Soil Rx ®	...
98	Maple-Crimson King	23	• Soil Rx ®	...

INVENTORIED TREES RECOMMENDED FOR SOIL CARE



Root Collar Excavation

Excavating the root collar is necessary for trees whose buttress roots are covered by excess soil or mulch. Buried root collars can contribute to tree health problems, including girdling roots, basal cankers, and masking root and lower stem decay. Trees in the root collar excavation table do not have a Tree & Shrub Work phase and should be completed as soon as possible. The top image shows a buried root collar, and the bottom image shows an exposed root collar.



Example of a buried root collar.



Example of an exposed root collar.

Girdling Roots

Girdling roots (top left and right) restrict water and nutrient movement throughout the tree. If left untreated they can cause the tree to decline, fail (bottom), and eventually die in severe cases. Girdling roots should be removed as soon as possible, unless removal of roots will significantly impact the condition or stability of the tree. In some cases, the presence of significant or severe girdling roots may cause the tree to be recommended for removal.



Examples of girdling roots.



Example of tree failure from girdling roots.

The following trees are recommended for a root collar excavation:

INVENTORIED TREES RECOMMENDED FOR A ROOT COLLAR EXCAVATION (47 Trees)

Tree ID	Common Name	DBH	Overall Tree Risk Rating	Root Collar Observation
2	Crapemyrtle-Common	5,4,3,3,3,3	...	• Buried root collar
3	Crapemyrtle-Common	5,5,3,3,2	...	• Buried root collar
4	Crapemyrtle-Common	5,5,4,3,3,2	...	• Buried root collar
5	Crapemyrtle-Common	6,5,4,3,3,2	...	• Buried root collar
6	Crapemyrtle-Common	5,4,4,3,3,3	...	• Buried root collar
7	Crapemyrtle-Common	5,5,4,3,3,3	...	• Buried root collar
8	Dogwood-Flowering	9,9,6,6,5	Low	• Buried root collar
9	Dogwood-Flowering	13	...	• Buried root collar
10	Crapemyrtle-Common	4,3,3,3,2,2	...	• Buried root collar
14	Crapemyrtle-Common	4,4,3,3,2,2	...	• Buried root collar
15	Crapemyrtle-Common	5,5,4,3,3,2	...	• Buried root collar
16	Crapemyrtle-Common	5,5,4,4,3,2	...	• Buried root collar
17	Crapemyrtle-Common	6,5,4,4,4,3	...	• Buried root collar
18	Crapemyrtle-Common	6,5,4,3,3	...	• Buried root collar
19	Crapemyrtle-Common	14	...	• Buried root collar
20	Crapemyrtle-Common	15	...	• Buried root collar
21	Cherry-Flowering	9,8	...	• Girdling roots present
22	Cherry-Flowering	9	...	• Girdling roots present
25	Cherry-Flowering	11	...	• Buried root collar
27	Magnolia-Saucer	4,3,2	...	• Buried root collar
28	Magnolia-Saucer	4,3,2	...	• Buried root collar
29	Cherry-Yoshino	8,7,6	...	• Girdling roots present
31	Maple-Japanese	10	...	• Girdling roots present (moderate)

Tree ID	Common Name	DBH	Overall Tree Risk Rating	Root Collar Observation
32	Maple-Japanese	11	...	• Buried root collar
33	Magnolia-Saucer	9	...	• Buried root collar
34	Magnolia-Saucer	10	...	• Buried root collar
35	Magnolia-Saucer	6,3	...	• Buried root collar
38	Cherry-Flowering	6	...	• Buried root collar
40	Cherry-Flowering	20	...	• Girdling roots present (moderate)
42	Cherry-Flowering	14	...	• Buried root collar
43	Cherry-Flowering	12	...	• Buried root collar
44	Cherry-Flowering	14	...	• Girdling roots present (moderate)
45	Cherry-Flowering	9	...	• Buried root collar
46	Crapemyrtle-Common	4,3,3,2,2,2	...	• Buried root collar
47	Crapemyrtle-Common	5,4,4,3,2,2	...	• Buried root collar
48	Juniper-Eastern Redcedar	8	...	• Buried root collar
50	Cherry-Flowering	8	...	• Buried root collar
52	Cherry-Flowering	16	...	• Girdling roots present (moderate)
53	Cherry-Flowering	15	...	• Girdling roots present (moderate)
55	Pine-Eastern White	6,3	...	• Buried root collar
56	Pine-Eastern White	16	...	• Girdling roots present (moderate)
58	Dogwood-Flowering	6	...	• Buried root collar
59	Magnolia-Southern	29	...	• Girdling roots present (moderate)
60	Dogwood-Flowering	5	...	• Buried root collar
62	Dogwood-Flowering	9,7	...	• Buried root collar
95	Maple-Crimson King	19	...	• Buried root collar
101	Maple-Japanese	4,4	...	• Buried root collar

INVENTORIED TREES RECOMMENDED FOR A ROOT COLLAR EXCAVATION



Plant Health Care

The Inventory Team also recommends Plant Health Care (PHC) programs for trees in the formal landscape. In addition, an Integrated Pest Management (IPM) program monitors for potentially damaging insects, diseases and cultural problems that are often seasonal and may not have been evident during our inventory visit. Plant Health Care treatments should be applied as soon as possible, therefore they do not have a Tree & Shrub Work phase. These pests and diseases include, but are not limited to, the following:

- Anthracnose - on a variety of species
- Aphids - on a variety of species
- Bacterial Leaf Scorch - on trees within red oak group
- Bagworms - on a variety of tree species
- Boring Insects - on a variety of tree species
- Caterpillar Defoliators - on a variety of tree species, especially oak
- Gall Insects - on a variety of species
- Lacebugs - on a variety of species
- Scab and Rust Fungi - on crabapple and apple species.
- Suspected Phytophthora Root Rot and Canker - on a variety of tree species, especially beech species
- Scale Insects - on a variety of tree species, especially oak
- Spider Mites - on a variety of tree species



Canadian hemlock #126 had mites and adelgid pests present.

We identified pests or diseases and/or provided plant health care recommendations on the following inventoried trees at the time of the inventory:

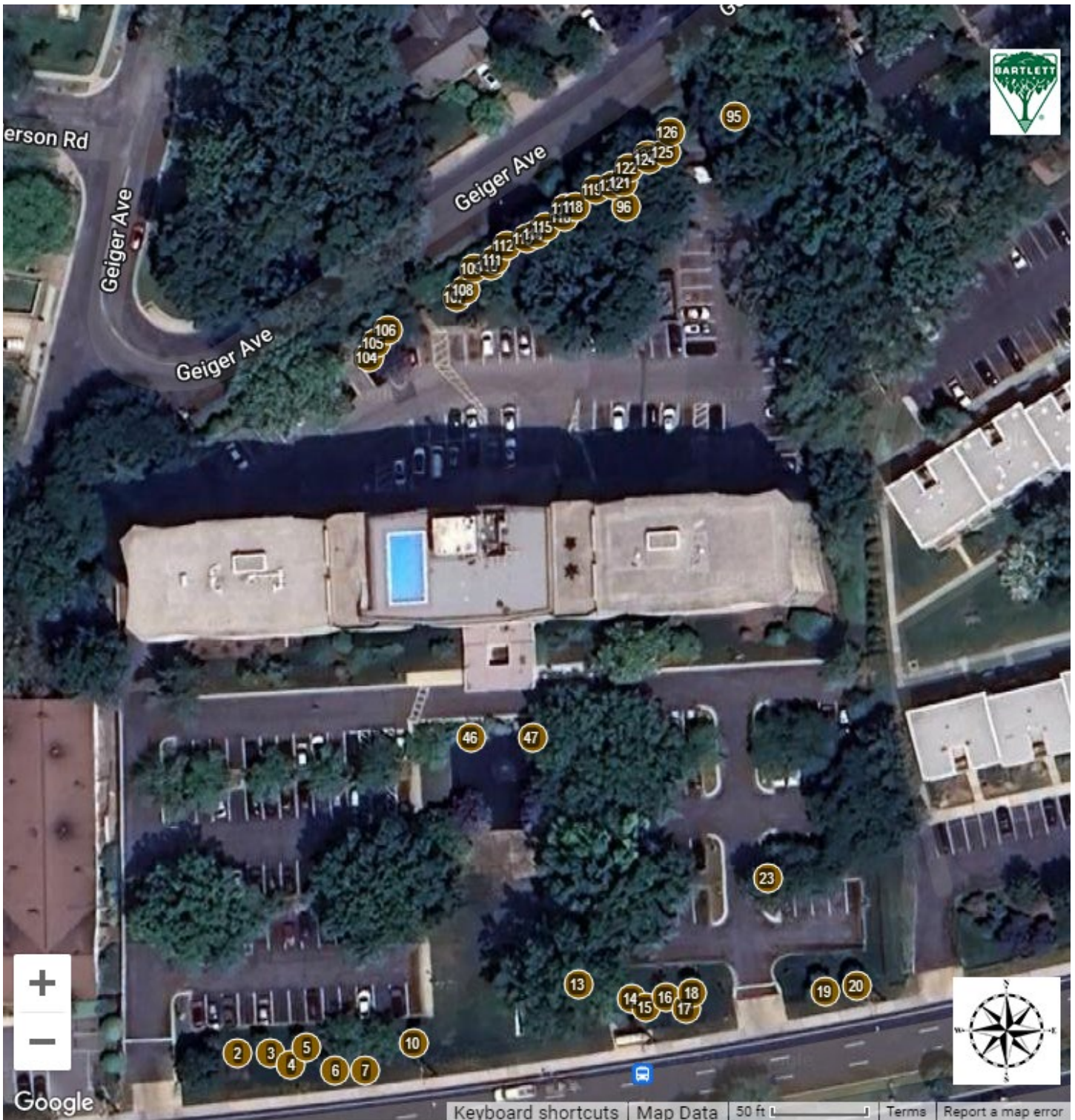
INVENTORIED TREES IDENTIFIED FOR PLANT HEALTH CARE (58 Trees)

Tree ID	Common Name	DBH	Plant Health Care	Pest(s) or Disease(s)
2	Crapemyrtle-Common	5,4,3,3,3,3	• Scale treatment	• Scale
3	Crapemyrtle-Common	5,5,3,3,2	• Scale treatment	• Scale
4	Crapemyrtle-Common	5,5,4,3,3,2	• Scale treatment	• Scale
5	Crapemyrtle-Common	6,5,4,3,3,2	• Scale treatment	• Scale
6	Crapemyrtle-Common	5,4,4,3,3,3	• Scale treatment	• Scale
7	Crapemyrtle-Common	5,5,4,3,3,3	• Scale treatment	• Scale
10	Crapemyrtle-Common	4,3,3,3,2,2	• Scale treatment	• Scale
13	Oak-Pin	45	• Bacterial leaf scorch	• Bacterial leaf scorch (suspected)
14	Crapemyrtle-Common	4,4,3,3,2,2	• Scale treatment	• Scale
15	Crapemyrtle-Common	5,5,4,3,3,2	• Scale treatment	• Scale
16	Crapemyrtle-Common	5,5,4,4,3,2	• Scale treatment	• Scale
17	Crapemyrtle-Common	6,5,4,4,4,3	• Scale treatment	• Scale
18	Crapemyrtle-Common	6,5,4,3,3	• Scale treatment	• Scale
19	Crapemyrtle-Common	14	• Scale treatment	• Scale
20	Crapemyrtle-Common	15	• Scale treatment	• Scale
23	Leyland Cypress	16,13,9	...	• Cankers
46	Crapemyrtle-Common	4,3,3,2,2,2	• Scale treatment	• Scale
47	Crapemyrtle-Common	5,4,4,3,2,2	• Scale treatment	• Scale
54	Elm-American	32,22	...	• Vines
64	Pine-Eastern White	14	...	• Vines
65	Pine-Eastern White	21	...	• Vines
66	Oak-Pin	22	...	• Vines
67	Oak-Pin	15	...	• Vines
68	Pine-Eastern White	15	...	• Vines
69	Pine-Eastern White	26	...	• Vines
70	Pine-Eastern White	29	...	• Vines
73	Oak-Black	25	...	• Poisonous plants
74	Oak-Black	13	...	• Poisonous plants • Vines
77	Oak-White	18	...	• Vines
79	Oak-White	27	...	• Vines
81	Oak-White	20	...	• Vines
89	Tuliptree	27	...	• Vines

Tree ID	Common Name	DBH	Plant Health Care	Pest(s) or Disease(s)
95	Maple-Crimson King	19	• Bleeding canker	• Bleeding • Cankers
96	Maple-Sugar	35	• Bleeding canker	• Bleeding • Cankers
98	Maple-Crimson King	23	...	• Vines
104	Hemlock-Canadian	4,3,3	• Adelgid treatment • Mite treatment	• Adelgid • Mites
105	Hemlock-Canadian	5	• Adelgid treatment • Mite treatment	• Adelgid • Mites
106	Hemlock-Canadian	3	• Adelgid treatment • Mite treatment	• Adelgid • Mites
107	Hemlock-Canadian	6	• Adelgid treatment • Mite treatment	• Adelgid • Mites
108	Hemlock-Canadian	4,3	• Adelgid treatment • Mite treatment	• Adelgid • Mites
109	Hemlock-Canadian	4	• Adelgid treatment • Mite treatment	• Adelgid • Mites
110	Hemlock-Canadian	4	• Adelgid treatment • Mite treatment	• Adelgid • Mites
111	Hemlock-Canadian	4	• Adelgid treatment • Mite treatment	• Adelgid • Mites
112	Hemlock-Canadian	3	• Adelgid treatment • Mite treatment	• Adelgid • Mites
113	Hemlock-Canadian	4	• Adelgid treatment • Mite treatment	• Adelgid • Mites
114	Hemlock-Canadian	4	• Adelgid treatment • Mite treatment	• Adelgid • Mites
115	Hemlock-Canadian	4,3	• Adelgid treatment • Mite treatment	• Adelgid • Mites
116	Hemlock-Canadian	4,4	• Adelgid treatment • Mite treatment	• Adelgid • Mites
117	Hemlock-Canadian	4,2	• Adelgid treatment • Mite treatment	• Adelgid • Mites
118	Hemlock-Canadian	4,3	• Adelgid treatment • Mite treatment	• Adelgid • Mites
119	Hemlock-Canadian	4	• Adelgid treatment • Mite treatment	• Adelgid • Mites
120	Hemlock-Canadian	4	• Adelgid treatment • Mite treatment	• Adelgid • Mites
121	Hemlock-Canadian	4	• Adelgid treatment • Mite treatment	• Adelgid • Mites

Tree ID	Common Name	DBH	Plant Health Care	Pest(s) or Disease(s)
122	Hemlock-Canadian	4,3	<ul style="list-style-type: none"> • Adelgid treatment • Mite treatment 	<ul style="list-style-type: none"> • Adelgid • Mites
123	Hemlock-Canadian	5	<ul style="list-style-type: none"> • Adelgid treatment • Mite treatment 	<ul style="list-style-type: none"> • Adelgid • Mites
124	Hemlock-Canadian	6	<ul style="list-style-type: none"> • Adelgid treatment • Mite treatment 	<ul style="list-style-type: none"> • Adelgid • Mites
125	Hemlock-Canadian	5,3	<ul style="list-style-type: none"> • Adelgid treatment • Mite treatment 	<ul style="list-style-type: none"> • Adelgid • Mites
126	Hemlock-Canadian	5,4	<ul style="list-style-type: none"> • Adelgid treatment • Mite treatment 	<ul style="list-style-type: none"> • Adelgid • Mites

INVENTORIED TREES IDENTIFIED FOR PLANT HEALTH CARE



Tree Pruning

A commonly offered service among tree companies, pruning trees is one of the most poorly executed practices by tree workers who lack training in the basics of tree biology. "Lion's tailing," topping, and flush cuts are a few examples, and these can lead to hazardous conditions over time.

Because this practice is so misunderstood, and because specific standards exist to perform pruning correctly, the Inventory Team decided to include some explanation in the main body of this management plan.

Tree owners and tree-care practitioners should always keep in mind that any pruning cut is a wound. Informed tree-care professionals have learned to manage that wounding to preserve the health, safety, and integrity of the tree.

Improper Pruning Practices

A few of the most common pruning abuses are:

- Lion's Tailing - pruning that removes interior branches along the stem and scaffold branches. This encourages poor branch taper, poor wind load distribution, and risk of branch failure. It also deprives the tree of foliage it needs to produce **photosynthates**. See next page, top left.
- Topping - pruning cuts that reduce a tree's size by using heading cuts that shorten branches to a predetermined size. Topping substantially reduces the functional benefits a tree is capable of providing and predisposes trees to structural defects that can contribute to failures in the future. It also reduces the value of the trees substantially and deprives the tree of adequate foliage. See next page, top right.
- Flush Cuts - pruning cut through the **branch collar**, flush against the trunk or parent stem, causing unnecessary injury. See next page, bottom.
- Using Climbing Spikes Inappropriately - Using climbing spikes on a healthy tree, for example, wounds healthy stem tissues and can lead to infection by fungal pathogens.



Example of Lion's tailing.



Examples of topping.



Examples of flush cuts.

Pruning with a Goal

Below are illustrations of common pruning goals:



Illustration of improving airflow to reduce disease.



Illustration of branch weight reduction.

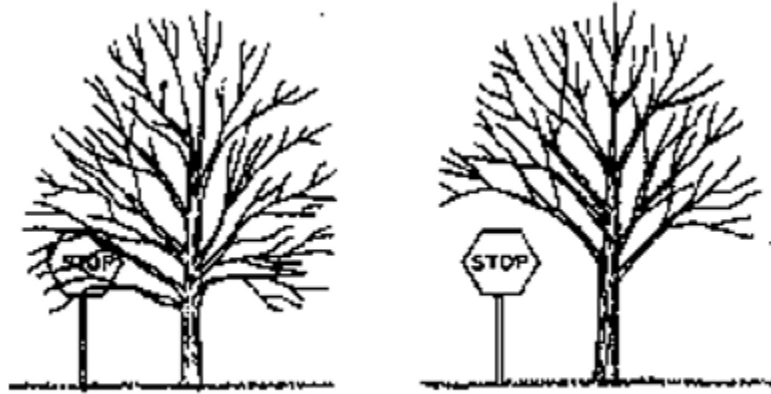


Illustration of raising branch elevation to improve clearance.

Without Development of Central Leader				
	At Planting	2-4 Years	5-7 Years	8-10 Years
With Development of Central Leader				

Illustration of promoting a strong central leader.

Pruning Category

All trees identified in this management plan that have pruning recommendations are listed with a specific pruning category. The listed order of these pruning categories are typical to most managers. Trees within each category are prioritized by the specific goals of most managers. It is recommended that specific goals be discussed with your local Bartlett Arborist Representative. Pruning categories are separated into individual tables below where each table lists specific arboricultural pruning goals and recommendations for each tree.

Risk Mitigation Pruning

Any tree identified with a Risk Mitigation Pruning category to reduce the *Overall Tree Risk Rating*, was previously summarized in the Tree Risk Assessments and Mitigation section earlier in the document.

Maintenance Pruning

This goal typically requires routine pruning of large/mature trees. Includes branch removal and/or branch reduction to help reduce *likelihood of failure* and/or conflict with infrastructure. Trees with these goals are typically climbed or require the use of aerial lifts and/or other specialized equipment.

The trees in this table are recommended for maintenance pruning:

INVENTORIED TREES RECOMMENDED FOR MAINTENANCE PRUNING (46 Trees)

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
21	Cherry-Flowering	9,8	1	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Girdling roots present
22	Cherry-Flowering	9	1	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Girdling roots present • Included bark
23	Leyland Cypress	16,13,9	1	<ul style="list-style-type: none"> • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Included bark

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
25	Cherry-Flowering	11	1	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Included bark • Overextended branch
29	Cherry-Yoshino	8,7,6	1	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Girdling roots present • Included bark • Suppressed
40	Cherry-Flowering	20	1	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Girdling roots present (moderate) • Included bark
41	Cherry-Flowering	14	1	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Co-dominant stems • Included bark
42	Cherry-Flowering	14	1	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Included bark
43	Cherry-Flowering	12	1	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Included bark
44	Cherry-Flowering	14	1	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Co-dominant stems • Girdling roots present (moderate) • Included bark
45	Cherry-Flowering	9	1	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Overextended branch
49	Oak-Willow	40	1	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Dead branches <=2 • Decay-stem • Included bark • Pavement/curbing damage
59	Magnolia-Southern	29	1	<ul style="list-style-type: none"> • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Girdling roots present (moderate)

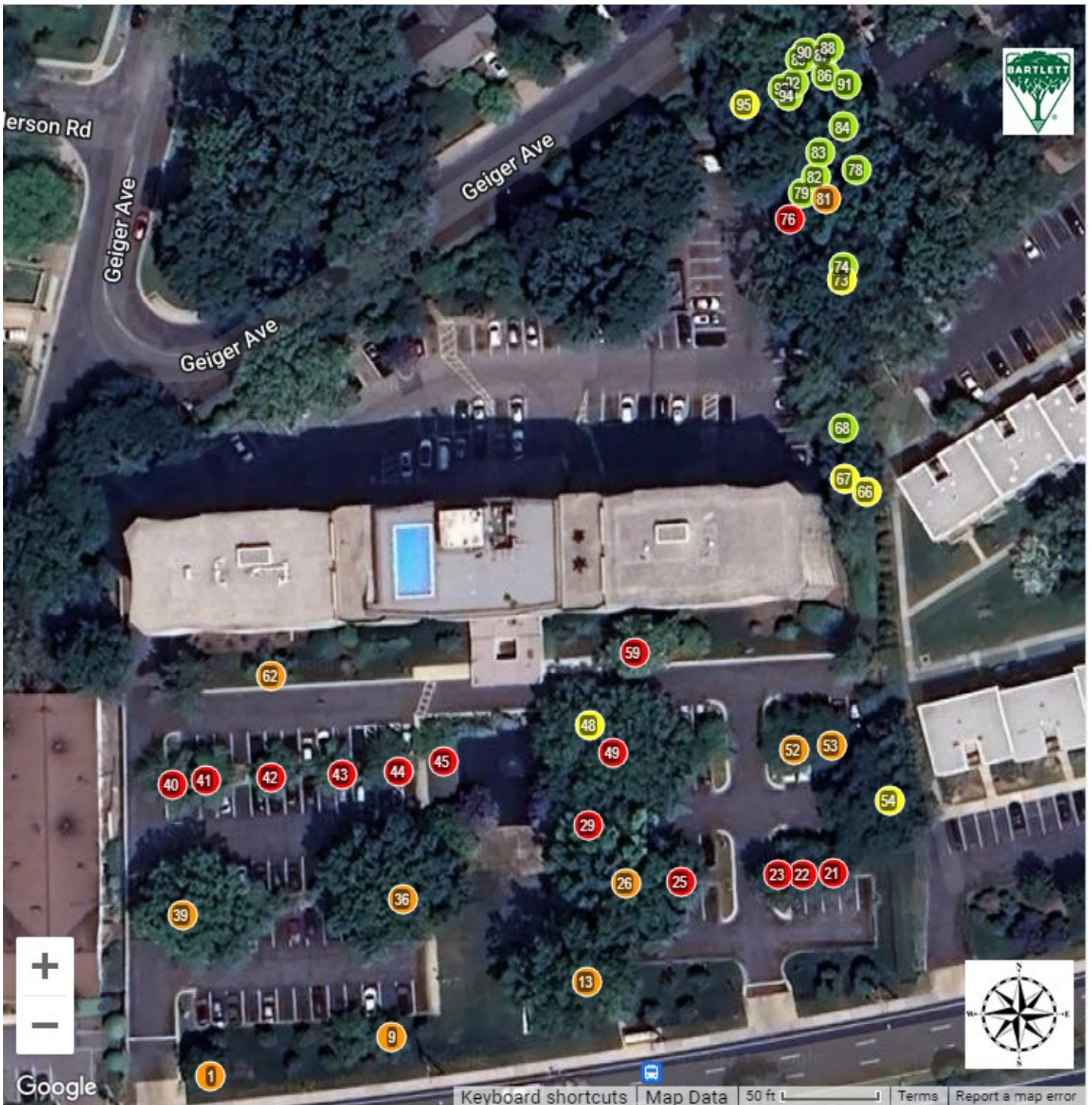
Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
76	Dogwood-Kousa	6,5	1	<ul style="list-style-type: none"> • Clearance • Raise:Parking;0 	<ul style="list-style-type: none"> • Co-dominant stems
1	Maple-Trident	12	2	<ul style="list-style-type: none"> • Reduce density • Improve form and shape • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems
9	Dogwood-Flowering	13	2	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Increase air circulation • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Cavity-stem
13	Oak-Pin	45	2	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Improve light and air penetration through crown • Clearance 	<ul style="list-style-type: none"> • Dead branches >2
26	Oak-Willow	45	2	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Cavity-stem • Co-dominant stems • Dead branches >2 • Included bark • Pavement/curbing damage
36	Oak-Willow	46	2	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Broken branch(s) • Co-dominant stems • Hanger
39	Oak-Willow	43	2	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Dead branches <=2 • Pavement/curbing damage
52	Cherry-Flowering	16	2	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Co-dominant stems • Girdling roots present (moderate) • Included bark
53	Cherry-Flowering	15	2	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Co-dominant stems • Girdling roots present (moderate) • Included bark

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
62	Dogwood-Flowering	9,7	2	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Improve form and shape • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Cavity-stem • Co-dominant stems • Decay-stem • Included bark
81	Oak-White	20	2	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed
48	Juniper-Eastern Redcedar	8	3	<ul style="list-style-type: none"> • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Uneven crown
54	Elm-American	32,22	3	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Growing against object • Included bark • Uneven crown • Wound-root
66	Oak-Pin	22	3	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Uneven crown
67	Oak-Pin	15	3	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Uneven crown
73	Oak-Black	25	3	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Dead branches >2 • Lean • Suppressed
95	Maple-Crimson King	19	3	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Included bark
68	Pine-Eastern White	15	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Suppressed
74	Oak-Black	13	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
78	Dogwood-Flowering	3	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed
79	Oak-White	27	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Cavity-root flare • Dead branches >2 • Lean
82	Beech-American	10	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed
83	Dogwood-Flowering	4	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed
84	Mulberry-White	8	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Included bark • Lean
86	Tuliptree	22	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Lean
87	Mulberry-White	5	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed
88	Maple-Red	7	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Suppressed
89	Tuliptree	27	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed
90	Mulberry-White	6	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean
91	Tuliptree	28	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Included bark
92	Maple-Norway	5	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Suppressed
93	Mulberry-White	4	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
94	Mulberry-White	4	4	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Lean • Suppressed

INVENTORIED TREES RECOMMENDED FOR MAINTENANCE PRUNING



Developmental Pruning

This goal typically requires routine pruning of small/young trees. Includes structural pruning to develop a strong central stem, establish proper branch spacing, and/or develop branch structure.

The trees in this table are recommended for developmental pruning:

INVENTORIED TREES RECOMMENDED FOR DEVELOPMENTAL PRUNING (2 Trees)

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
55	Pine-Eastern White	6,3	2	<ul style="list-style-type: none"> Promote development of strong central stem Develop branch structure Clearance 	<ul style="list-style-type: none"> Buried root collar Co-dominant stems
57	Dogwood-Flowering	4,2	2	<ul style="list-style-type: none"> Promote development of strong central stem Develop branch structure Clearance 	<ul style="list-style-type: none"> Co-dominant stems Included bark

INVENTORIED TREES RECOMMENDED FOR DEVELOPMENTAL PRUNING



Tree & Shrub Work Phase: ● 2

Ornamental Pruning

This goal typically requires pruning of small trees. Includes reduction and/or shearing to its desired shape, size, and/or structure.

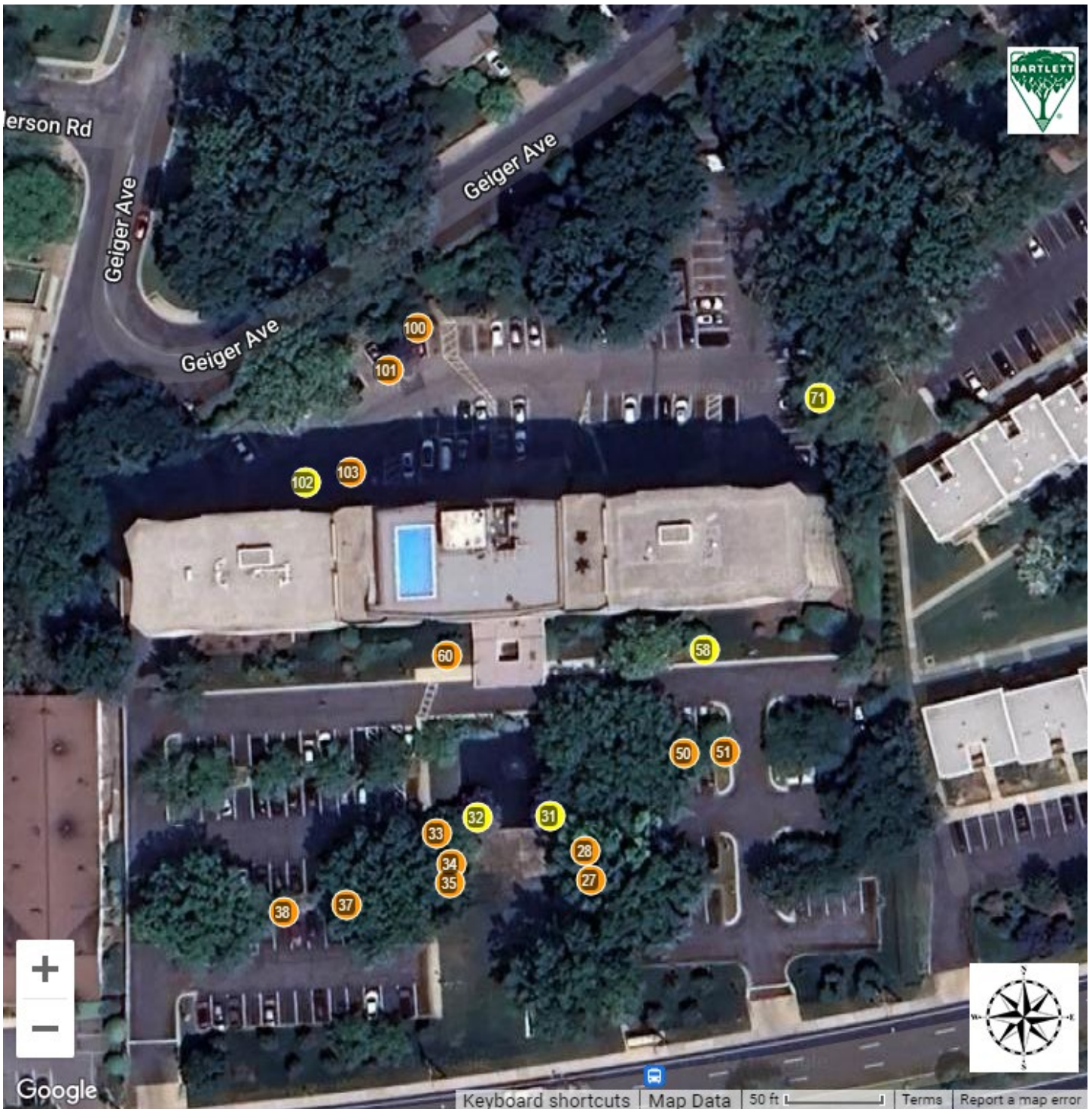
The trees in this table are recommended for ornamental pruning:

INVENTORIED TREES RECOMMENDED FOR ORNAMENTAL PRUNING (18 Trees)

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
27	Magnolia-Saucer	4,3,2	2	<ul style="list-style-type: none"> • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
28	Magnolia-Saucer	4,3,2	2	<ul style="list-style-type: none"> • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
33	Magnolia-Saucer	9	2	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
34	Magnolia-Saucer	10	2	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Included bark
35	Magnolia-Saucer	6,3	2	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Included bark
37	Cherry-Flowering	7	2	<ul style="list-style-type: none"> • Improve form and shape • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Included bark
38	Cherry-Flowering	6	2	<ul style="list-style-type: none"> • Improve form and shape • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Included bark
50	Cherry-Flowering	8	2	<ul style="list-style-type: none"> • Improve appearance • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Included bark
51	Cherry-Flowering	8	2	<ul style="list-style-type: none"> • Improve appearance • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Included bark
60	Dogwood-Flowering	5	2	<ul style="list-style-type: none"> • Improve appearance • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
100	Redbud-Eastern	8	2	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Reduce spread of crown • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Fungi/conks • Included bark • Wound-stem
101	Maple-Japanese	4,4	2	<ul style="list-style-type: none"> • Clearance • Reduce spread of crown 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
103	Dogwood-Flowering	2,2	2	<ul style="list-style-type: none"> • Promote development of strong central stem • Develop branch structure • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems
31	Maple-Japanese	10	3	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems • Girdling roots present (moderate)
32	Maple-Japanese	11	3	<ul style="list-style-type: none"> • Reduce risk of branch stem and/or root failure • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
58	Dogwood-Flowering	6	3	<ul style="list-style-type: none"> • Improve appearance • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Decay-stem • Suppressed • Wound-stem
71	Dogwood-Flowering	7	3	<ul style="list-style-type: none"> • Improve appearance • Clearance 	<ul style="list-style-type: none"> • Cavity-stem • Dead branches >2 • Decay-stem • Dieback (moderate)
102	Maple-Japanese	3	3	<ul style="list-style-type: none"> • Improve appearance • Clearance 	<ul style="list-style-type: none"> • Co-dominant stems

INVENTORIED TREES RECOMMENDED FOR ORNAMENTAL PRUNING



Tree & Shrub Work Phase: ● 2 ● 3

Specialized Pruning

Trees with this goal require a unique treatment that may include, but not limited to, targeted pruning cuts, removal of nuisance fruit/parasitic plants, and/or rejuvenation/internodal pruning.

Crapemyrtle (*Lagerstromia indica*) can tolerate significant heading cuts to force an even display of flowers if performed at the appropriate season. This specialized pruning should be performed by those with the expertise to prevent damage, given the amount of potential loss to photosynthates.

The trees in this table are recommended for specialized pruning:

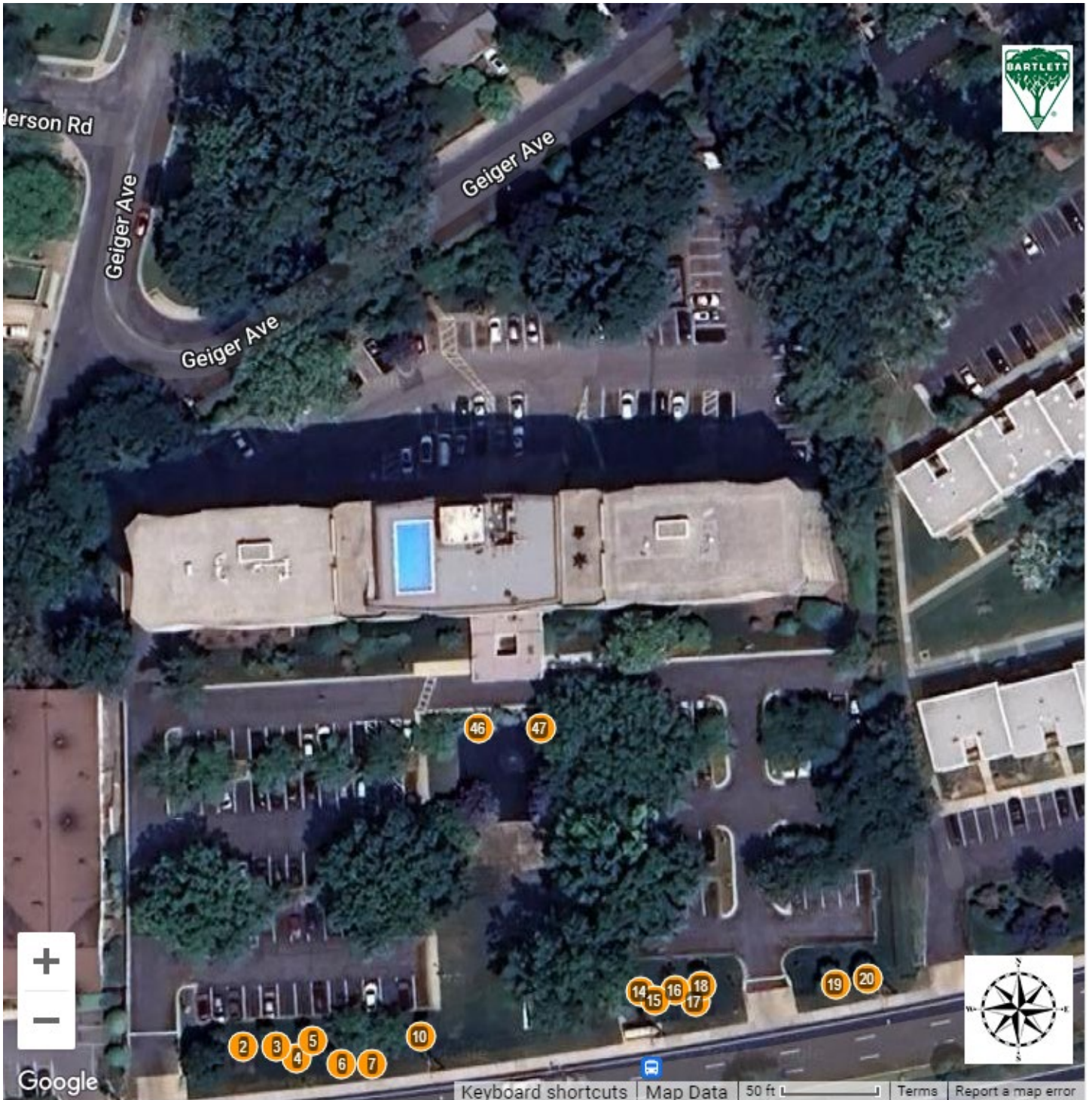
INVENTORIED TREES RECOMMENDED FOR SPECIALIZED PRUNING (16 Trees)

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
2	Crapemyrtle-Common	5,4,3,3,3,3	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
3	Crapemyrtle-Common	5,5,3,3,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
4	Crapemyrtle-Common	5,5,4,3,3,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
5	Crapemyrtle-Common	6,5,4,3,3,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
6	Crapemyrtle-Common	5,4,4,3,3,3	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
7	Crapemyrtle-Common	5,5,4,3,3,3	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
10	Crapemyrtle-Common	4,3,3,3,2,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
14	Crapemyrtle-Common	4,4,3,3,2,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
15	Crapemyrtle-Common	5,5,4,3,3,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Dead branches >2
16	Crapemyrtle-Common	5,5,4,4,3,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Dead branches >2
17	Crapemyrtle-Common	6,5,4,4,4,3	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems • Dead branches >2
18	Crapemyrtle-Common	6,5,4,3,3	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
19	Crapemyrtle-Common	14	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
20	Crapemyrtle-Common	15	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Pruning Goal	Defect(s) or Observation(s)
46	Crapemyrtle-Common	4,3,3,2,2,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems
47	Crapemyrtle-Common	5,4,4,3,2,2	2	<ul style="list-style-type: none"> • Improve form and shape • Reduce size of crown • Clearance 	<ul style="list-style-type: none"> • Buried root collar • Co-dominant stems

INVENTORIED TREES RECOMMENDED FOR SPECIALIZED PRUNING



Tree & Shrub Work Phase: ● 2

Structural Support Systems

Structural support systems can reduce risk of tree or tree part(s) failure by limiting movement of stems or branches in certain situations. Examples include co-dominant stems or overextended branches with heavy foliage loads.

Cabling

Cabling is the process of connecting two or more upright stems to one another to add stability and reduce the *likelihood of failure*. In some instances, a lateral branch may be secured to the central leader using a cabling system to support the weight of the branch.

Bracing

Bracing is the process of securing the union of two co-dominant stems using high strength steel rods to alleviate stresses at the union and reduce the *likelihood of failure*. Bracing may also be used to reinforce trees that have a partial failure and are likely to benefit from bracing.

Guying

Guying is the process of anchoring a tree's stem to the ground or another immovable object to reduce the likelihood of root failure. Guying can be temporary or permanent and is most often used for establishing a tree in the landscape.

Propping

Propping is the process of using rigid structures that are built on or into the ground to help support the trunk or branch(s) that are oriented near the ground in a horizontal position to reduce the *likelihood of failure* from the weight or defect of the tree part being supported.



Willow oak #26 had a cabling system installed and was recommended for routine inspection.

The following table lists all inventoried trees with structural support system recommendations:

INVENTORIED TREES WITH STRUCTURAL SUPPORT SYSTEM RECOMMENDATIONS (2 Trees)

Tree ID	Common Name	DBH	<i>Overall Tree Risk Rating</i>	Tree & Shrub Work Phase	Structural Support
26	Oak-Willow	45	...	2	<ul style="list-style-type: none"> • Cable: Yes
96	Maple-Sugar	35	Low	1	<ul style="list-style-type: none"> • Cable: Yes

INVENTORIED TREES WITH STRUCTURAL SUPPORT SYSTEM RECOMMENDATIONS



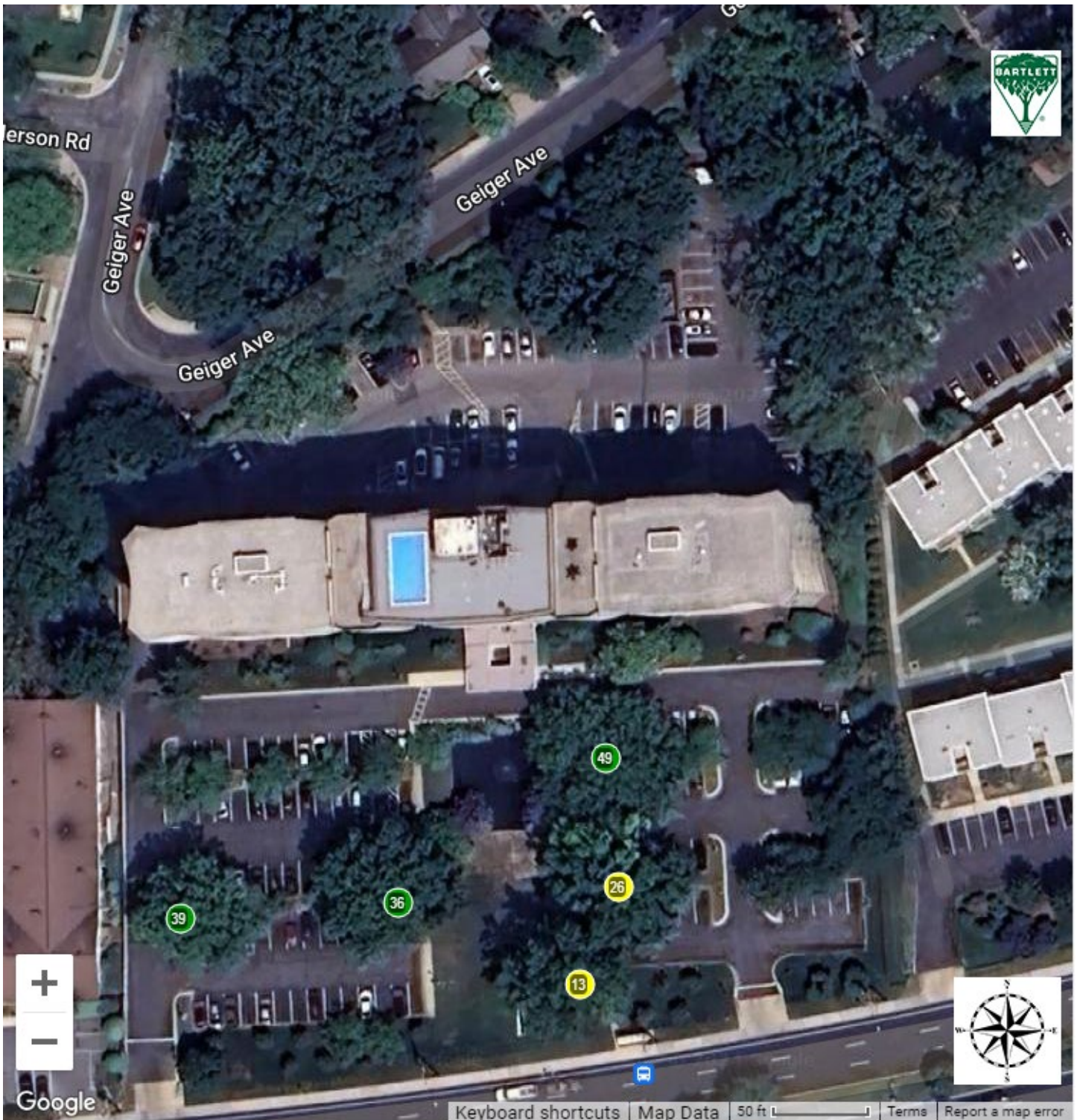
Lightning Protection Systems

Lightning strikes kill many people each year and can cause significant damage to objects on the property. Lightning protection systems are designed to provide a preferred path for lightning to the ground in a manner that minimizes tree damage; adjacent tree damage; and also to buildings, property, animals, and people near the tree. Tree species that are naturally more susceptible to lightning strikes, valuable to the landscape, and trees that are within 10 feet of, taller than, or have limbs that are extending over a structure are recommended for lightning protection systems due to the possibility of damage, "sideflashes", and step voltage.

INVENTORIED TREES WITH LIGHTNING PROTECTION SYSTEM RECOMMENDATIONS(5 Trees)

Tree ID	Common Name	DBH	Tree & Shrub Work Phase	Lightning Protection
13	Oak-Pin	45	2	Inspect
26	Oak-Willow	45	2	Inspect
36	Oak-Willow	46	2	New
39	Oak-Willow	43	2	New
49	Oak-Willow	40	1	New

INVENTORIED TREES WITH LIGHTNING PROTECTION SYSTEM RECOMMENDATIONS



Lightning Protection: ● Inspect ● New

Tree Removal

In some cases, the inspector may determine need for removal while assessing the tree. Trees may be recommended for removal during the inventory for several reasons:

- The tree is dead;
- The tree is in poor condition and thought to be beyond rehabilitation;
- The tree is over-mature and will continue to decline in condition;
- The tree has significant structural weaknesses that cannot be addressed;
- The tree is already or will interfere with infrastructure (overhead lines for example);
- The location value for the tree is poor or unacceptable (for example, large maturing tree growing directly under overhead lines); and/or,
- The tree species has been declared an invasive for the given area or region.

At the time of inventory, no trees were recommended for removal. However, as trees continue to grow and site changes occur, we recommend continual consultation with your local Bartlett Arborist Representative to determine if tree removals are warranted in the future.

Vine Removal

The following trees were recommended for removal of vines. Vines and suckers can cover the trunk of a tree and hide defects that may be present.

INVENTORIED TREES RECOMMENDED FOR VINE REMOVAL (15 Trees)

Tree ID	Common Name	DBH	Poisonous Plants
54	Elm-American	32,22	...
64	Pine-Eastern White	14	...
65	Pine-Eastern White	21	...
66	Oak-Pin	22	...
67	Oak-Pin	15	...
68	Pine-Eastern White	15	...
69	Pine-Eastern White	26	...
70	Pine-Eastern White	29	...
73	Oak-Black	25	Yes
74	Oak-Black	13	Yes
77	Oak-White	18	...
79	Oak-White	27	...
81	Oak-White	20	...
89	Tuliptree	27	...
98	Maple-Crimson King	23	...

INVENTORIED TREES RECOMMENDED FOR VINE REMOVAL



ENTIRE INVENTORY



ENTIRE INVENTORY (119 Trees)

Tree ID	Common Name	Genus	Species	DBH	Height Class	Age Class	Condition Class	Tree & Shrub Work Phase	Tree Asset Value
1	Maple-Trident	<i>Acer</i>	<i>buergerianum</i>	12	Medium	Semi-mature	Good	2	\$2,907.95
2	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	5,4,3,3,3	Medium	Semi-mature	Good	2	\$1,848.17
3	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	5,5,3,3,2	Medium	Semi-mature	Good	2	\$1,728.16
4	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	5,5,4,3,3,2	Medium	Semi-mature	Good	2	\$2,112.19
5	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	6,5,4,3,3,2	Medium	Semi-mature	Good	2	\$2,376.21
6	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	5,4,4,3,3,3	Medium	Semi-mature	Good	2	\$2,016.18
7	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	5,5,4,3,3,3	Medium	Semi-mature	Good	2	\$2,232.20
8	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	9,9,6,6,5	Medium	Mature	Fair	1	\$3,415.69
9	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	13	Medium	Mature	Fair	2	\$2,228.77
10	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	4,3,3,3,2,2	Medium	Semi-mature	Good	2	\$1,224.11
13	Oak-Pin	<i>Quercus</i>	<i>palustris</i>	45	Large	Mature	Good	2	\$32,322.77
14	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	4,4,3,3,2,2	Medium	Semi-mature	Good	2	\$1,392.13
15	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	5,5,4,3,3,2	Medium	Semi-mature	Good	2	\$2,112.19
16	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	5,5,4,4,3,2	Medium	Semi-mature	Fair	2	\$1,628.72
17	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	6,5,4,4,4,3	Medium	Semi-mature	Good	2	\$2,832.25
18	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	6,5,4,3,3	Medium	Semi-mature	Good	2	\$2,280.21
19	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	14	Medium	Mature	Good	2	\$4,410.40
20	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	15	Medium	Mature	Good	2	\$5,062.96
21	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	9,8	Medium	Semi-mature	Good	1	\$1,051.74
22	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	9	Medium	Semi-mature	Good	1	\$587.53
23	Leyland Cypress	<i>x Cupressocyparis</i>	<i>leylandii</i>	16,13,9	Large	Mature	Good	1	\$1,251.21
25	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	11	Medium	Semi-mature	Good	1	\$822.81
26	Oak-Willow	<i>Quercus</i>	<i>phellos</i>	45	Large	Mature	Good	2	\$5,327.93
27	Magnolia-Saucer	<i>Magnolia</i>	<i>x soulangeana</i>	4,3,2	Small	Young	Good	2	\$585.63
28	Magnolia-Saucer	<i>Magnolia</i>	<i>x soulangeana</i>	4,3,2	Small	Young	Good	2	\$585.63
29	Cherry-Yoshino	<i>Prunus</i>	<i>x yedoensis</i>	8,7,6	Small	Semi-mature	Fair	1	\$1,688.68

Tree ID	Common Name	Genus	Species	DBH	Height Class	Age Class	Condition Class	Tree & Shrub Work Phase	Tree Asset Value
31	Maple-Japanese	<i>Acer</i>	<i>palmatum</i>	10	Medium	Semi-mature	Good	3	\$2,461.76
32	Maple-Japanese	<i>Acer</i>	<i>palmatum</i>	11	Medium	Semi-mature	Good	3	\$2,792.56
33	Magnolia-Saucer	<i>Magnolia</i>	x <i>soulangeana</i>	9	Medium	Semi-mature	Good	2	\$1,635.72
34	Magnolia-Saucer	<i>Magnolia</i>	x <i>soulangeana</i>	10	Medium	Semi-mature	Good	2	\$2,019.41
35	Magnolia-Saucer	<i>Magnolia</i>	x <i>soulangeana</i>	6,3	Medium	Semi-mature	Good	2	\$908.74
36	Oak-Willow	<i>Quercus</i>	<i>phellos</i>	46	Large	Mature	Good	2	\$5,480.76
37	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	7	Small	Semi-mature	Good	2	\$355.42
38	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	6	Small	Semi-mature	Good	2	\$261.12
39	Oak-Willow	<i>Quercus</i>	<i>phellos</i>	43	Large	Mature	Good	2	\$5,014.35
40	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	20	Medium	Mature	Fair	1	\$1,942.88
41	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	14	Medium	Semi-mature	Fair	1	\$1,015.48
42	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	14	Medium	Semi-mature	Good	1	\$1,332.81
43	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	12	Medium	Semi-mature	Good	1	\$979.21
44	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	14	Medium	Semi-mature	Good	1	\$1,332.81
45	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	9	Small	Semi-mature	Good	1	\$1,285.21
46	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	4,3,3,2,2,2	Small	Semi-mature	Good	2	\$788.64
47	Crapemyrtle-Common	<i>Lagerstroemia</i>	<i>indica</i>	5,4,4,3,2,2	Small	Semi-mature	Good	2	\$1,189.39
48	Juniper-Eastern Redcedar	<i>Juniperus</i>	<i>virginiana</i>	8	Small	Semi-mature	Good	3	\$1,055.04
49	Oak-Willow	<i>Quercus</i>	<i>phellos</i>	40	Large	Mature	Fair	1	\$3,231.56
50	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	8	Small	Semi-mature	Fair	2	\$331.58
51	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	8	Small	Semi-mature	Good	2	\$435.20
52	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	16	Medium	Semi-mature	Good	2	\$1,740.82
53	Cherry-Flowering	<i>Prunus</i>	<i>serrulata</i>	15	Medium	Semi-mature	Good	2	\$1,530.01
54	Elm-American	<i>Ulmus</i>	<i>americana</i>	32,22	Large	Mature	Fair	3	\$11,602.03
55	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	6,3	Medium	Semi-mature	Good	2	\$714.01
56	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	16	Large	Semi-mature	Fair	...	\$2,901.36
57	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	4,2	Small	Young	Good	2	\$247.28
58	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	6	Medium	Semi-mature	Fair	3	\$474.77

Tree ID	Common Name	Genus	Species	DBH	Height Class	Age Class	Condition Class	Tree & Shrub Work Phase	Tree Asset Value
59	Magnolia-Southern	<i>Magnolia</i>	<i>grandiflora</i>	29	Large	Mature	Good	1	\$12,130.90
60	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	5	Small	Young	Good	2	\$309.09
62	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	9,7	Medium	Mature	Fair	2	\$1,607.29
63	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	25	Large	Mature	Good	...	\$7,083.40
64	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	14	Large	Semi-mature	Good	...	\$3,109.90
65	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	21	Large	Mature	Fair	...	\$4,998.05
66	Oak-Pin	<i>Quercus</i>	<i>palustris</i>	22	Large	Mature	Good	3	\$9,075.82
67	Oak-Pin	<i>Quercus</i>	<i>palustris</i>	15	Large	Semi-mature	Fair	3	\$3,013.66
68	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	15	Large	Semi-mature	Good	4	\$3,808.03
69	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	26	Large	Mature	Good	...	\$10,725.97
70	Pine-Eastern White	<i>Pinus</i>	<i>strobus</i>	29	Large	Mature	Good	...	\$13,343.99
71	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	7	Small	Semi-mature	Fair	3	\$646.21
72	Dogwood-Kousa	<i>Cornus</i>	<i>kousa</i>	5,5	Small	Semi-mature	Good	...	\$1,353.97
73	Oak-Black	<i>Quercus</i>	<i>velutina</i>	25	Large	Mature	Fair	3	\$9,659.18
74	Oak-Black	<i>Quercus</i>	<i>velutina</i>	13	Medium	Semi-mature	Fair	4	\$2,611.84
75	Dogwood-Kousa	<i>Cornus</i>	<i>kousa</i>	5,4,4,3	Medium	Semi-mature	Good	...	\$1,787.24
76	Dogwood-Kousa	<i>Cornus</i>	<i>kousa</i>	6,5	Small	Semi-mature	Good	1	\$1,548.60
77	Oak-White	<i>Quercus</i>	<i>alba</i>	18	Large	Semi-mature	Good	...	\$8,225.36
78	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	3	Small	Young	Fair	4	\$118.69
79	Oak-White	<i>Quercus</i>	<i>alba</i>	27	Large	Mature	Fair	4	\$13,219.32
80	Oak-White	<i>Quercus</i>	<i>alba</i>	11	Medium	Semi-mature	Good	...	\$3,071.81
81	Oak-White	<i>Quercus</i>	<i>alba</i>	20	Large	Mature	Fair	2	\$7,253.40
82	Beech-American	<i>Fagus</i>	<i>grandifolia</i>	10	Medium	Semi-mature	Fair	4	\$1,758.40
83	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	4	Small	Semi-mature	Fair	4	\$211.01
84	Mulberry-White	<i>Morus</i>	<i>alba</i>	8	Medium	Semi-mature	Fair	4	\$633.02
85	Oak-White	<i>Quercus</i>	<i>alba</i>	12	Medium	Semi-mature	Good	...	\$3,899.43
86	Tuliptree	<i>Liriodendron</i>	<i>tulipifera</i>	22	Large	Mature	Fair	4	\$6,981.40
87	Mulberry-White	<i>Morus</i>	<i>alba</i>	5	Medium	Semi-mature	Fair	4	\$247.28
88	Maple-Red	<i>Acer</i>	<i>rubrum</i>	7	Medium	Semi-mature	Fair	4	\$753.91
89	Tuliptree	<i>Liriodendron</i>	<i>tulipifera</i>	27	Large	Mature	Fair	4	\$10,515.37
90	Mulberry-White	<i>Morus</i>	<i>alba</i>	6	Medium	Semi-mature	Fair	4	\$356.08
91	Tuliptree	<i>Liriodendron</i>	<i>tulipifera</i>	28	Large	Mature	Fair	4	\$11,308.71

Tree ID	Common Name	Genus	Species	DBH	Height Class	Age Class	Condition Class	Tree & Shrub Work Phase	Tree Asset Value
92	Maple-Norway	<i>Acer</i>	<i>platanoides</i>	5	Medium	Semi-mature	Good	4	\$423.12
93	Mulberry-White	<i>Morus</i>	<i>alba</i>	4	Medium	Young	Fair	4	\$158.26
94	Mulberry-White	<i>Morus</i>	<i>alba</i>	4	Medium	Young	Fair	4	\$158.26
95	Maple-Crimson King	<i>Acer</i>	<i>platanoides</i> var. 'Crimson King'	19	Large	Mature	Good	3	\$6,248.64
96	Maple-Sugar	<i>Acer</i>	<i>saccharum</i>	35	Large	Mature	Good	1	\$25,581.45
98	Maple-Crimson King	<i>Acer</i>	<i>platanoides</i> var. 'Crimson King'	23	Large	Mature	Good	1	\$9,156.59
100	Redbud-Eastern	<i>Cercis</i>	<i>canadensis</i>	8	Small	Semi-mature	Fair	2	\$962.72
101	Maple-Japanese	<i>Acer</i>	<i>palmatum</i>	4,4	Small	Young	Good	2	\$738.53
102	Maple-Japanese	<i>Acer</i>	<i>palmatum</i>	3	Small	Young	Good	3	\$207.71
103	Dogwood-Flowering	<i>Cornus</i>	<i>florida</i>	2,2	Small	Young	Good	2	\$138.47
104	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4,3,3	Small	Young	Good	...	\$588.51
105	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	5	Medium	Semi-mature	Good	...	\$432.73
106	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	3	Small	Young	Good	...	\$166.17
107	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	6	Medium	Semi-mature	Good	...	\$623.13
108	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4,3	Small	Semi-mature	Good	...	\$432.73
109	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4	Small	Young	Good	...	\$295.41
110	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4	Small	Young	Good	...	\$276.95
111	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4	Medium	Young	Good	...	\$276.95
112	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	3	Small	Young	Good	...	\$166.17
113	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4	Small	Young	Good	...	\$295.41
114	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4	Small	Young	Good	...	\$295.41
115	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4,3	Small	Young	Good	...	\$461.58
116	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4,4	Medium	Young	Good	...	\$553.90
117	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4,2	Small	Young	Fair	...	\$247.28
118	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4,3	Small	Young	Good	...	\$461.58
119	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4	Small	Young	Good	...	\$295.41
120	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4	Small	Young	Good	...	\$295.41
121	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4	Small	Young	Good	...	\$295.41

Tree ID	Common Name	Genus	Species	DBH	Height Class	Age Class	Condition Class	Tree & Shrub Work Phase	Tree Asset Value
122	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	4,3	Small	Young	Good	...	\$461.58
123	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	5	Medium	Semi-mature	Good	...	\$432.73
124	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	6	Medium	Semi-mature	Good	...	\$623.13
125	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	5,3	Medium	Semi-mature	Good	...	\$588.51
126	Hemlock-Canadian	<i>Tsuga</i>	<i>canadensis</i>	5,4	Medium	Semi-mature	Good	...	\$709.68

APPENDIX



ADDITIONAL RESOURCES

Bartlett publishes a variety of tree-resource documents, including technical reports, plant health care recommendations, and service brochures. The following technical reports may be pertinent to your inventory. To access these documents and view the complete Bartlett Resource Library online, please follow this URL:

<https://www.bartlett.com/resourcelist.cfm>

Girdling Roots

Lightning Protection Systems

Maintenance Pruning Program

Monitor IPM Program

Mulch Application Guidelines

Tree Risk Assessments

Tree Structure Evaluation

GLOSSARY OF TERMS

air pollution removal: removal of pollutants from the air by plants through natural processes

arborist: 1. An individual engaged in the profession of arboriculture who, through experience, education and related training, possesses the competence to provide for, or supervise the management of, trees and other woody ornamentals. [ANSI A300 (Part 1, 2, 4, 5, 6)] 2. An individual engaged in the profession of arboriculture. [ANSI Z133.1-2000 Safety Requirements for Arboricultural Operations]

bracing: The installation of lag-thread screw or threaded-steel rods in limbs, leaders, or trunks to provide supplemental support. [ANSI A300 (Part 3)-2000 Support Systems]

branch: An outgrowing shoot, stem or twig that grows from the main stem or trunk. [ANSI Z60.1-2004 Nursery Stock]

buttress roots: Lateral surface roots that aid in stabilizing the tree.

cable: 1) Zinc coated strand per ASTM A-475 for dead-end grip applications. 2) Wire rope or strand for general applications. 3) Synthetic-fiber rope or synthetic-fiber webbing for general applications. [ANSI A300 (Part 3)-2000 Support Systems]

cabbling: The installation of a steel wire rope, steel strand, or synthetic-fiber system within a tree between limbs or leaders to limit movement and provide supplemental support. [ANSI A300 (Part 3)-2000 Support Systems]

canopy: collective branches and foliage of a tree or group of trees' crowns

carbon sequestration: removal of carbon from the air by plants through natural processes

carbon storage: storage of carbon removed from the air in plant tissues

cation exchange capacity (CEC): The ability of soil to absorb nutrients.

cavity: An open wound characterized by the presence of decay and resulting in a hollow.

cleaning: Selective pruning to remove one or more of the following parts: dead, diseased, and/ or broken branches (5.6.1). [ANSI A300 (Part 1)-2001 Pruning]

co-dominant branches: Equal in size and importance, usually associated with either the trunks, stems, or scaffold limbs.

conk: fruiting body or non-fruiting body of a fungus. Often associated with decay.

critical root zone (CRZ): area of soil around a tree trunk where roots are located that provide stability and uptake of water and minerals required for tree survival.

crown: 1. The leaves and branches of a tree measured from the lowest branch on the trunk to the top of the tree. [ANSI A300 (Part 1)-2001 Pruning] [ANSI A300 (Part 6)-2005 Transplanting] 2. The portion of a tree comprising the branches. [ANSI Z60.1-2004 Nursery Stock]

D.B.H. [diameter at breast height]: Measurement of trunk diameter taken at 4.5 feet (1.4 m) off the ground. [ANSI A300 (Part 6)-2005 Transplanting]

decay: The degradation of woody tissue caused by microorganisms. [ANSI A300 (Part 1)-2001 Pruning]

Geographic Information System (GIS): is any system for capturing, storing, analyzing and managing data and associated attributes which are spatially referenced to earth.

girdling root: A root that may impede proper development of other roots, trunk flare, and/or trunk. [ANSI A300 (Part 6)-2005 Transplanting]

Global Positioning System (GPS): A constellation of at least 24 Medium Earth Orbit satellites that transmit precise microwave signals, the system enables a GPS receiver to determine its location, speed, direction, and time.

Global Positioning System receiver (GPSr): A receiver that receives its input from GPS satellites to determine location, speed, direction, and time.

heading: cutting a shoot back to a bud or cutting branches back to buds, stubs, or lateral branches not large enough to assume apical dominance. Cutting an older branch or stem back to meet a structural objective

integrated pest management (IPM): A pest control strategy that uses an array of complementary methods: mechanical devices, physical devices, genetic, biological, legal, cultural management, and chemical management. These methods are done in three stages of prevention, Observation, and finally Intervention. It is an ecological approach that has its main goal is to significantly reduce or eliminate the use of pesticides.

lateral branch: A shoot or stem growing from a parent branch or stem. [ANSI A300 (Part 1)-2001 Pruning]

leader: A dominant or co-dominant, upright stem. [ANSI A300 (Part 1)-2001 Pruning]

lean: Departure from vertical of the stem, beginning at or near the base of the trunk.

limb: A large, prominent branch. [ANSI A300 (Part 1)-2001 Pruning]

lion's tailing: The removal of an excessive number of inner, lateral branches from parent branches. Lion's tailing is not an acceptable pruning practice (5.5.7). [ANSI A300 (Part 1)-2001 Pruning]

macronutrient: Nutrient required in relatively large amounts by plants, such as nitrogen (N), phosphorus (P), potassium (K), and sulfur (S). [ANSI A300 (Part 2)-2004 Fertilization]

micronutrient: Nutrient required in relatively small amounts by plants, such as iron (Fe), manganese (Mn), zinc (Zn), copper (Cu), and boron (B). [ANSI A300 (Part 2)-2004 Fertilization]

noise attenuation: reducing sound levels via materials, structures, plants, etc.

nutrient: Element or compound required for growth, reproduction or development of a plant. [ANSI A300 (Part 2)-2004 Fertilization]

organic matter: material derived from the growth (and death) of living organisms. The organic components of soil.

parent branch or stem: A tree trunk, limb, or prominent branch from which shoots or stems grow. [ANSI A300 (Part 1)-2001 Pruning]

pH: unit of measurement that describes the alkalinity or acidity of a solution. Measured on a scale of 0 to 14. Greater than 7 is alkaline, less than 7 is acid, and 7 is neutral (pure water).

pruning: The selective removal of plant parts to meet specific goals and objectives. [ANSI A300 (Part 1)-2001 Pruning]

qualified arborist: An individual who, by possession of a recognized degree, certification, or professional standing, or through related training and on-the-job experience, is familiar with the equipment and hazards involved in arboricultural operations and who has demonstrated ability in the performance of the special techniques involved. [ANSI Z133.1-2000 Safety Requirements for Arboricultural Operations]

raising: Selective pruning to provide vertical clearance (5.6.3). [ANSI A300 (Part 1)-2001 Pruning]

reduction: Selective pruning to decrease height and/or spread (5.6.4). [ANSI A300 (Part 1)-2001 Pruning]

risk assessment: process of evaluating what unexpected things could happen, how likely it is, and what the likely outcomes are. In tree management, the systematic process to determine the level of risk posed by a tree, tree part, or group of trees.

root collar: 1. The transition zone between the trunk and the root system. [ANSI A300

(Part 6)-2005 Transplanting] 2. See COLLAR. [ANSI Z60.1-2004 Nursery Stock]

root flare or trunk flare: The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk. [ANSI Z60.1-2004 Nursery Stock] [ANSI A300 (Part 6)-2005 Transplanting]

root zone: The volume of soil containing the roots of a plant. [ANSI A300 (Part 5)-2005 Management]

secondary nutrient: Nutrient required in moderate amounts by plants, such as calcium (Ca) and magnesium (Mg). [ANSI A300 (Part 2)-2004 Fertilization]

seam: Vertical line that appears where two edges of wound wood or callus ridge meet.

soil amendment: Any material added to soil to alter its composition and structure, such as sand, fertilizer, or organic matter. [ANSI A300 (Part 6)-2005 Transplanting]

soil pH: A measure of the acidity or alkalinity of the soil.

stormwater runoff: water (generally from rain or snow melt) that flows over the ground after storm events.

structural support system: hardware installed in tree, may be; cables, braces, or guys, to provide supplemental support.

sweep: Departure from vertical of the stem, beginning above the base of the trunk.

thinning: Selective pruning to reduce density of live branches (5.6.2). [ANSI A300 (Part 1)-2001 Pruning]

tree risk assessment: Closer inspection of visibly damaged, dead, defected, diseased, leaning or dying tree to determine management needs.

topping: The reduction of a tree's size using heading cuts that shorten limbs or branches back to a predetermined crown limit. Topping is not acceptable pruning practice. (5.5.7). [ANSI A300 (Part 1)-2001 Pruning]

tree inventory: A comprehensive list of individual trees providing descriptive information on all or a portion of the project area. [ANSI A300 (Part 5)-2005 Management during site planning, site development, and construction]

tree protection zone: A space above and belowground within which trees are to be retained and protected. [ANSI A300 (Part 5)-2005 Management during site planning, site development, and construction]

trunk: That portion of a stem or stems of a tree before branching occurs. [ANSI Z60.1-

2004 Nursery Stock]

vigor: Overall health. Capacity to grow and resist stress. [ISA Municipal Specialist Certification Study Guide 2008]

wound: An opening that is created when the bark of a living branch or stem is penetrated, cut, or removed. [ANSI A300 (Part 1)-2001 Pruning]