City of York

2025 Tree Management Plan

Prepared for:

Downtown Inc.

Your 2025 City of York Tree Management Plan is broken down into easy-to-comprehend sections (see the diagram on the right). Each section is color-coded throughout the plan.

This plan summarizes the significant site and urban forest results along with management recommendations.

Project Team

- **Dylan Kleine**, Field Consulting Arborist
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- **Eric Hinzman**, Bartlett Consulting Advisor
- **Vincent Rozette**, Division Manager
- **Christian Fitzpatrick**, Arborist Representative

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MANAGEMENT PLAN TOOLKIT

While your 2025 City of York Tree Management Plan summarizes all the significant results and recommendations, we know that sometimes more detailed information is desired. Bartlett provides this additional information via three primary sources:

- ArborScope™: Access detailed and summarized tree data via a read-only account. Contact arborscope@bartlett.com for setup.
- Bartlett.com - Expert Knowledge Hub: Discover technical reports, plant care information, FAQs, and practical advice.
- YouTube (Bartlett Tree Experts): Watch educational videos on tree species, management techniques, services, and ongoing research.

BARTLETT TREE EXPERTS

SCIENTIFIC TREE CARE SINCE 1907

City of York SNAPSHOT

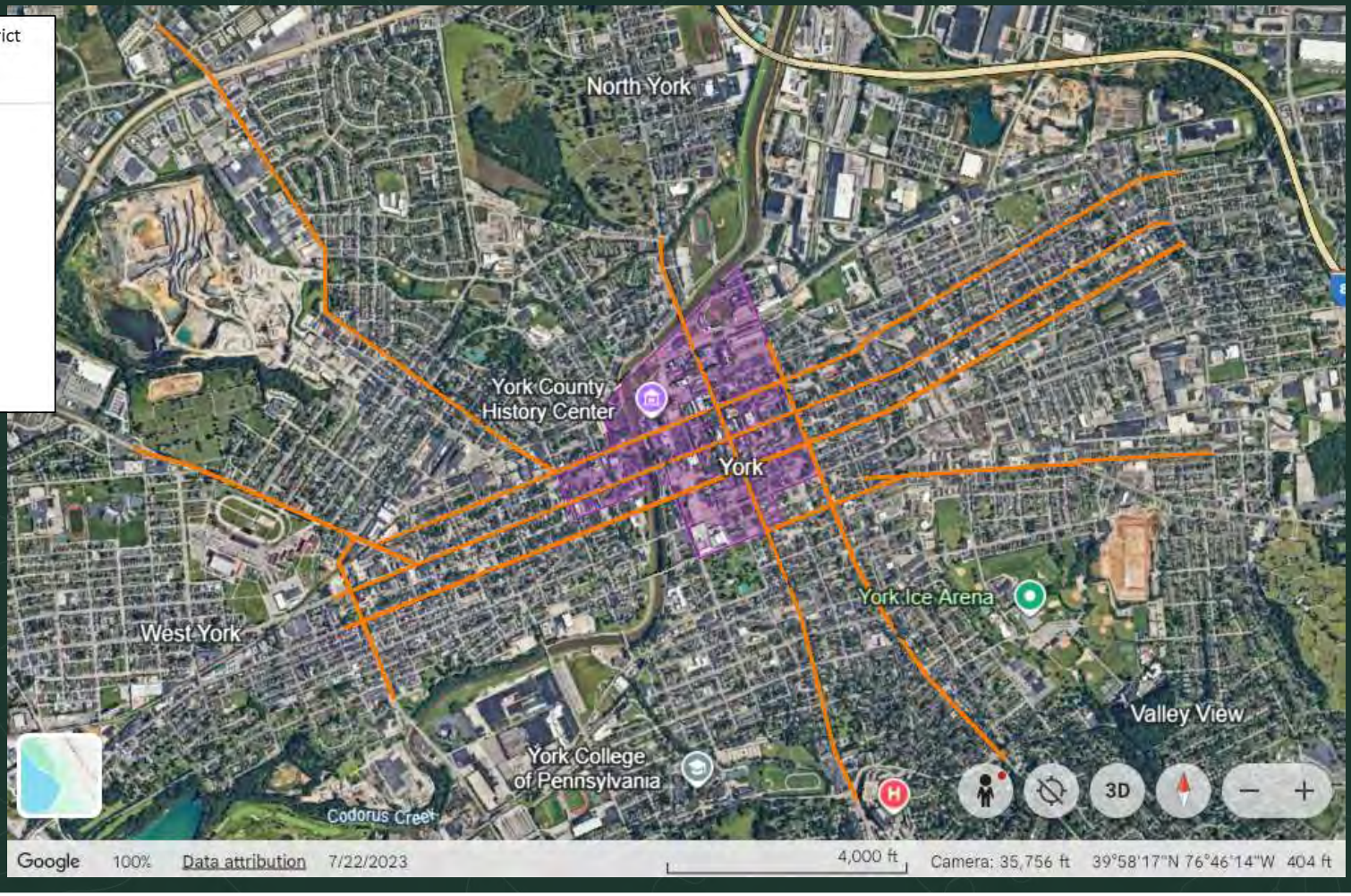
Community Overview | At A Glance | Tree Risk Assessment Recommendations| Five-year Comprehensive Tree Care Schedule

CITY OF YORK - MAJOR ARTERIAL STREETS AND BUSINESS IMPROVEMENT DISTRICT

Business Improvement District

Arterial Streets

- Market St
- Philadelphia St
- King St
- George St
- Queen St
- Prospect St
- College Ave
- Richard Ave
- Carlisle Ave
- Roosevelt Ave



OVERVIEW

The 2025 inventory project focused on 820 street trees located along approximately 17 miles of major arterial streets within the City of York. The site included residential and commercial streets, within and beyond the downtown business improvement district.

The inventoried trees were generally in fair condition and predominantly semi-mature. Site conditions were poor, limiting healthy, sustained growth due to restricted rooting space. Tree canopies frequently conflicted with overhead lines and nearby structures. Species diversity was good overall, aside from a high concentration of Callery pears. Few pests and disease issues were observed. Cultural conditions could become problematic, as most of the subject trees had buried root collars and root systems that had completely filled their tree pits.

The community had a growing urban forest. The City of York will be well-positioned to improve it by addressing the subject trees' cultural needs, establishing a cyclic pruning program focused on structural development, and caring for the soil. Planting trees in understocked areas and replacing removed trees with species better suited to site conditions can improve species diversity and enhance the overall health of the urban forest. Note that less than one percent of identified planting sites were appropriate for large tree species.

The following plan outlines Bartlett's current recommendations for the community. The recommendations prioritize maintaining current plant health care programs, combined with recommended additional soil and plant health care treatments, and tree pruning and removal where necessary. Planting recommendations include seeking opportunities for larger-maturing species and reducing the predominance of Callery pears.

AT A GLANCE

Overall Urban Forest Results:

- **820** trees were inventoried
- **42%** of trees were in fair condition
- **73%** of trees were young to semi-mature in age
- **Callery pear** (*Pyrus calleryana*) was the most common species (20%)

Value of the Urban Forest:

- Estimated cumulative asset value of over **$1 million**
- London planetree (*Platanus x hispanica*) #639 had the highest estimated value at **$23,167**
- Average estimated asset value of **$1,371/tree**

Tree Care Recommendations:

- **299** trees were recommended for plant health care
- **420** trees were recommended for soil care
- **70%** of trees were recommended for pruning
- **240** trees were recommended for removal
- **3** trees were recommended for advanced risk assessment

Tree-related Sustainability Estimates:

- **361 tons** of stored carbon
- Carbon sequestration rate of **4.5 tons/year**
- Air pollution removal rate of **200.2 pounds/year**
- Reduction in runoff by **48.8 thousand gallons/year**

More information can be found in ArborScope™ (Reports > Executive Reports)

TREE RISK

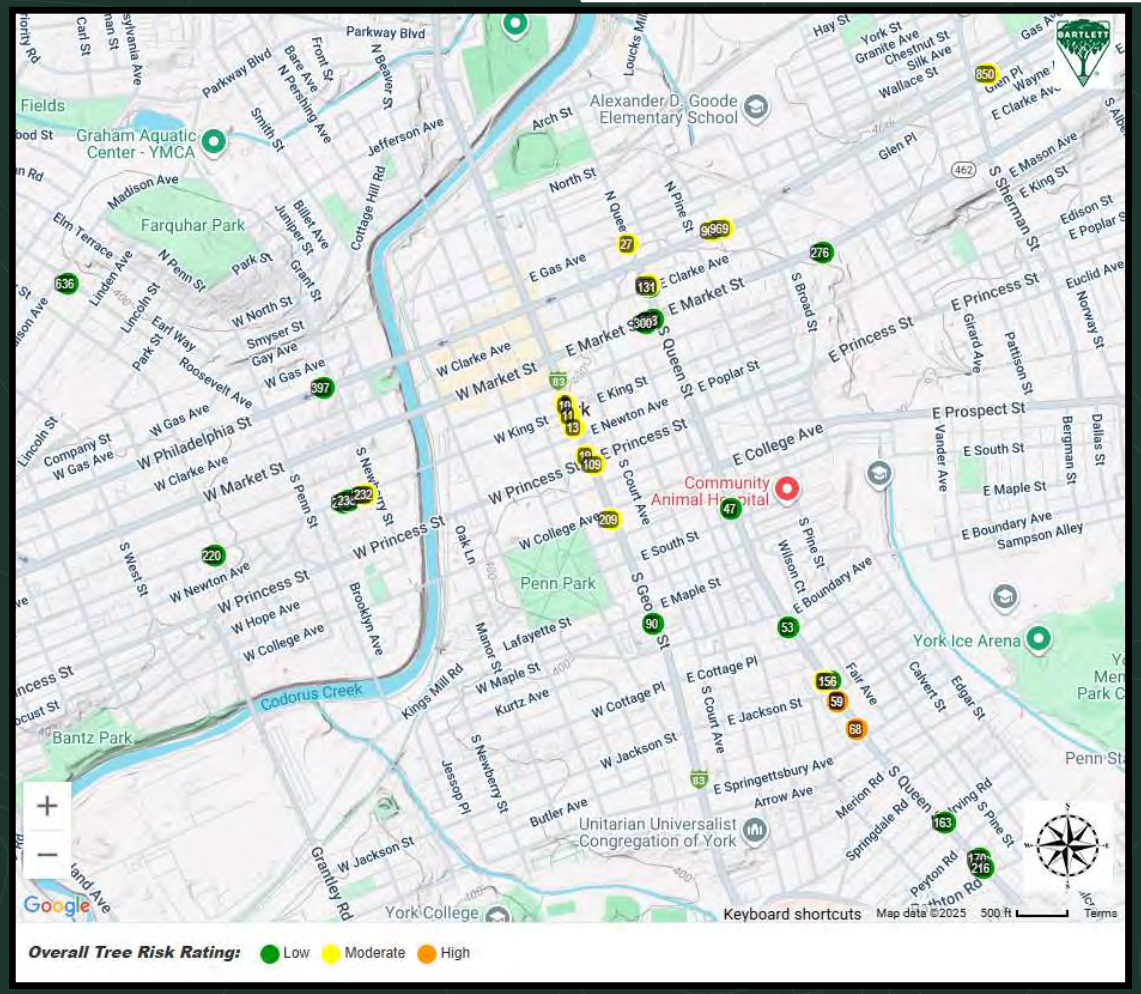
During the Level 1 limited visual assessment, 37 trees met the criteria to perform a Level 2 basic assessment during the inventory:

- High-risk trees
  - Remove Trees #59, and 68
- Moderate-risk trees
  - Remove Trees #209, 232, 850, 966, and 969
  - Prune Trees #8, 9, 10, 11, 13, 19, 27, 55, 109, 130, and 231
- Low-risk trees
  - Remove Trees #58, 78, 90, 131, 156, 170, 228, 230, 297, 298, 300, and 397
  - Prune Trees #47, 53, 163, 216, 220, 276, and 636
  - Install Supplemental Support Cable in Trees #53, and 220

Recommended for Advanced Assessment*

- Root and Stem assessments for Trees #109, 163, and 636

*Advanced assessments should be conducted prior to determining and performing any tree work. The results of the advanced assessments will guide the future management of the tree.



More information can be found in ArborScope™ (Reports > Custom Tree Report > Custom Fields > TRA)

FIVE-YEAR COMPREHENSIVE TREE CARE SCHEDULE

	ASAP	1	2	3	4	5
Risk Assessment	☐ Advanced assessment: 3 Trees	☐ Annual inspections	☐ Annual inspections	☐ Annual inspections	☐ Annual inspections	☐ Annual inspections
Root Collar Excavation	☐ 330 Trees					
Soil Care	☐ Prescription fertilization: 420 Trees	☐ Prescription fertilization: 420 Trees ☐ Soil sampling	☐ Prescription fertilization: 420 Trees ☐ Soil sampling	☐ Prescription fertilization: 420 Trees ☐ Soil sampling	☐ Prescription fertilization: 420 Trees ☐ Soil sampling	☐ Prescription fertilization: 420 Trees ☐ Soil sampling
Plant Health Care (Total)		☐ 299 Trees	☐ 3 Trees	☐ 7 Trees	☐ 3 Trees	☐ 7 Trees
Growth Regulator		☐ 296 Trees				
Emerald Ash Borer		☐ 4 Trees		☐ 4 Trees		☐ 4 Trees
Scale Insects		☐ 1 Tree				
Monitor		☐ 3 Trees	☐ 3 Trees	☐ 3 Trees	☐ 3 Trees	☐ 3 Trees
Cable Support		☐ Install: 4 Trees	☐ Install: 15 Trees ☐ Inspections	☐ Install: 1 Tree ☐ Inspections	☐ Inspections	☐ Inspections
Brace Rod Support		☐ Install: 1 Tree	☐ Install : 2 Trees			
Guy Anchoring	☐ Install: 3 Trees					
Pruning	☐ 1 Tree	☐ 98 Trees	☐ 109 Trees	☐ 158 Trees	☐ 92 Trees	☐ 117 Trees
Removal	☐ 4 Trees	☐ 190 Trees	☐ 46 Trees			

BARTLETT TREE EXPERTS

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ASSIGNMENT

Project Objectives | Project Roadmap

PROJECT OBJECTIVES

In 2025, Downtown Inc. awarded Bartlett Tree Experts a contract to:

- Conduct a comprehensive inventory of the Major Arterial Streets within the corporate limits of the City of York, and
- Create an Urban Forest Management Plan based on the data collected in the inventory.

The main project objectives were:

Longterm Planning

Identify tree care priorities throughout the community and organize their execution by need.

Improve Health

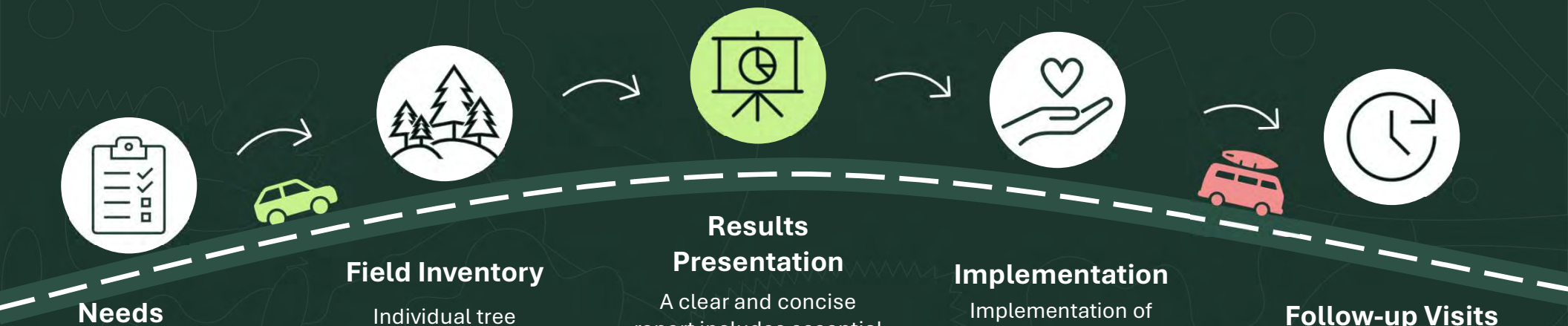
Develop a five-year holistic management plan which will address all aspects of the landscape including soil care, plant health care, pruning needs, and future tree plantings.

Identify Safety Concerns

Identify and provide recommendations for trees which pose an immediate risk to people or infrastructure in the landscape.

PROJECT ROADMAP

A tree management plan involves a process from the initial needs assessment to re-performing the project over time. The needs assessment with the City of York began in 2024 in discussions with Arborist Representative Christian Fitzpatrick. This management plan is the conclusion of the field inventory and part of the results presentation phase.



Needs Assessment

Client objectives define the management planning pathway.

Field Inventory

Individual tree evaluations plus soil and foliar samples provide the data to drive the management plan forward.

Results Presentation

A clear and concise report includes essential information and an action plan that is easy to follow.

Implementation

Implementation of endorsed suggestions from the management plan.

Follow-up Visits

Periodic check-ins help ensure client objectives are met with satisfaction.

BARTLETT TREE EXPERTS

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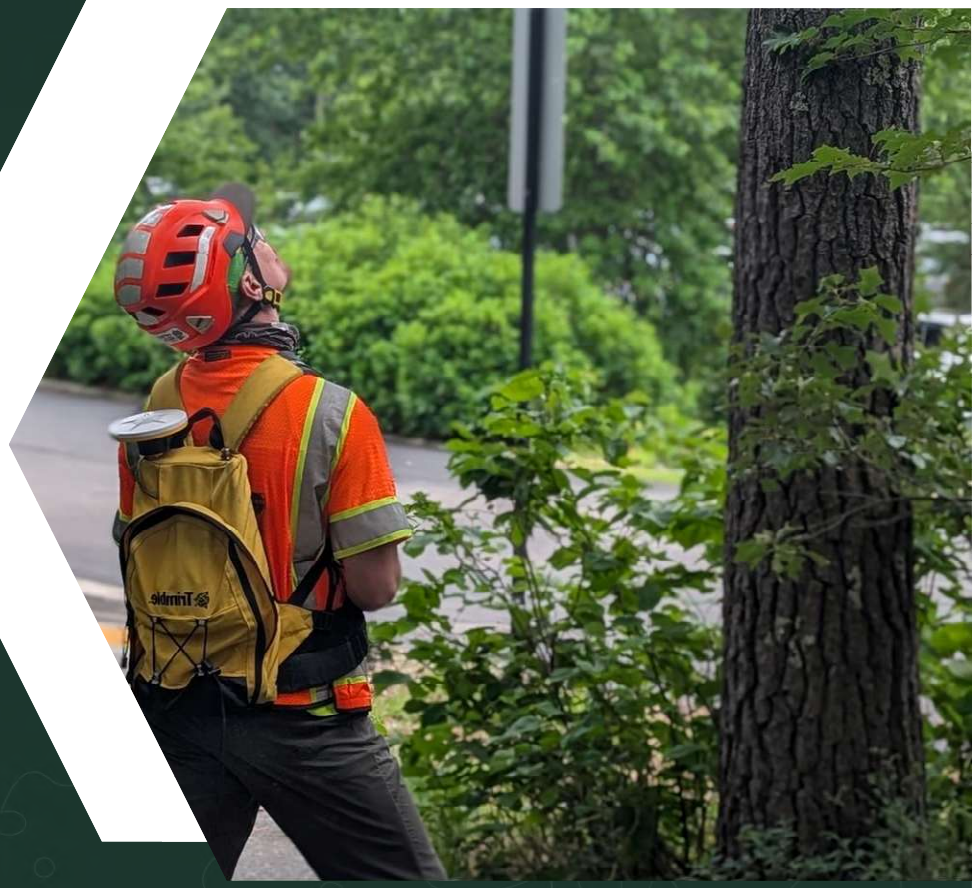
METHODOLOGY

Equipment | Data Collected | Tree Risk Assessment

EQUIPMENT

The Inventory Team used the following hardware and software to inventory the :

- Trimble Catalyst DA2 GNSS receiver
- Trimble Catalyst 60
- Trimble TerraFlex
- Trimble Connect
- Bartlett Tree Experts' ArborScope™ web-based management system to inventory the trees



DATA COLLECTED

Data attributes collected for each tree included:

- botanical name
- tree location
- tree ID number
- trunk diameter measured at 54 inches above grade (DBH)
- age class
- condition class
- tree & shrub work phase
- pruning recommendation
- need for and inspection of existing structural support systems
- need for and inspection of existing lightning protection systems
- removal recommendation
- soil care recommendations
- plant health care recommendations
- noted defects/observations
- observed pests/diseases
- level 2 basic tree risk assessments
- land use category

Species, condition class, and trunk diameter were used with location datasets to generate i-Tree Eco data.

More Information and definitions can be found in Appendix A and Appendix B

TREE RISK ASSESSMENT

The Inventory Team conducted a Level 1 limited visual assessment of the inventoried trees. Any tree (or tree part) observed to have a probable or imminent likelihood of failure, and a medium or high likelihood of impacting a target, received a Level 2 basic assessment in the field.

People, buildings, vehicles, and overhead utility lines were the targets considered during the assessments. The occupancy rates used were:

- Occasional to frequent for people and vehicles
- Constant for building and overhead utility lines

The consequences used were:

- Significant to severe for people
- Negligible to severe for buildings
- Significant to severe for overhead utility lines
- Negligible to minor for vehicles

The tree risk assessment attributes collected included:

- Likelihood of failure
- Likelihood of impact
- Consequences of failure
- Overall tree risk rating
- Risk mitigation options
- Recommendations for Level 3 advanced assessment (if warranted)
- Estimated residual risk after mitigation

A timeframe of three years was used for the likelihood of failure.

BARTLETT TREE EXPERTS

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SITE OVERVIEW

Site-wide Soils | Tree Root Zones |
Invasive & Undesirable Species

CITY SOILS

Results
According to the USDA NRCS Web Soil Survey, the soil in the inventoried locations is classified as Urban, which can contain a combination of any or all of:

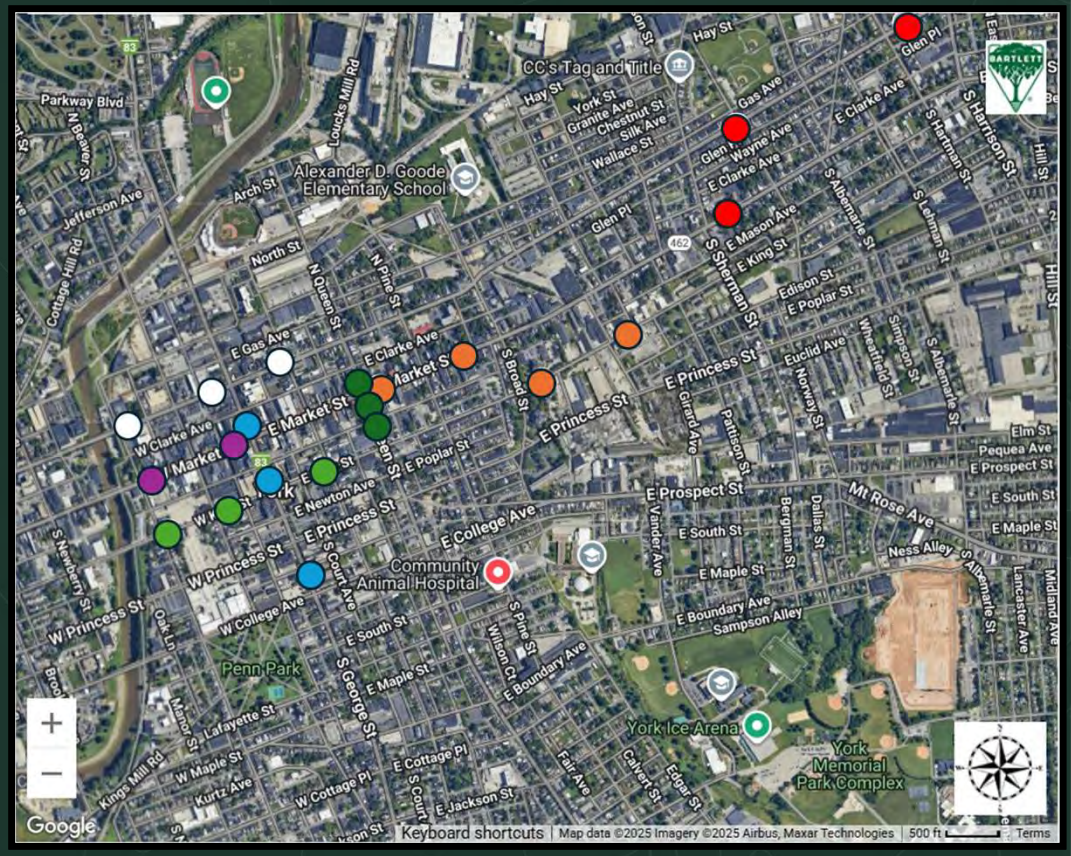
- Natural soil materials
- Construction debris
- Materials dredged from waterways
- Coal ash
- Municipal solid waste

(*NRCS Urban Soil Primer, 2005*)

Seven (7) aggregate soil samples were taken at representative locations throughout the maintained landscape to identify the general soil pH and level of organic matter:

1. 8.0 pH with optimal organic matter
2. 7.8 pH with optimal organic matter
3. 7.8 pH with optimal organic matter
4. 7.6 pH with high organic matter
5. 7.9 pH with high organic matter
6. 7.8 pH with high organic matter
7. 7.8 pH with optimal organic matter

Why is this important?
Tree health, stability, and long-term viability depend heavily on the soil. A healthy soil environment can help support a tree's growth and natural defenses to pests and diseases.



More information can be found in ArborScope™ (Inventory > Files)

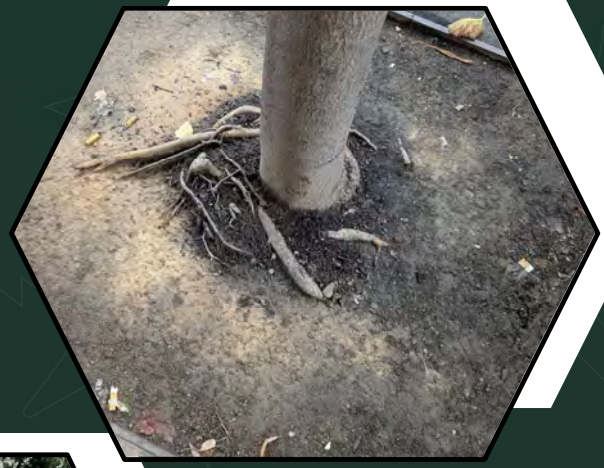
TREE ROOT ZONES

Observations
While most trees in the City of York had individual mulch rings or were within landscape beds, many did not have fresh mulch, or had too much mulch/soil around the root collar of the tree (upper right image). Some trees had surface roots which had filled the rooting space and even grown around hardscape (lower left image).

Why is this important?
Limited root space forces tree roots to exploit any space available. This growth can develop into serious safety concerns for the tree and the surrounding hardscape.

Additionally, buried root collars can make the tree more susceptible to pests, diseases, and girdling roots, which can cause tree decline and failure or death over time.

Recommendations
- Perform the recommended 330 root collar excavations.
- Implement/continue prescription fertilization on 420 trees.
- Take soil samples for any specimen that is underperforming.
- Prepare all new planting sites with Root Invigoration™: Incorporate biochar with soil amendments, organic matter, and mulch in all new planting pits or tree lawns. Biochar is a beneficial soil amendment that also stores carbon.



More information can be found in ArborScope™ (Reports > Soil Care)

INVASIVE & UNDESIRABLE SPECIES

Inventory Observations
Several species of subject trees observed on the site were on the PA DCNR invasive species list:

- Callery pear (*Pyrus calleryana*) (photo 1) (168 trees),
- Norway maple (*Acer platanoides*) (photo 2) (18 trees), and
- White mulberry (*Morus alba*) (photo 3) (1 tree)

Why is this important?
Invasive species damage native ecosystems and displace and prevent desirable species from growing. Without control, seeds can escape the urban environment and devastate local natural areas.

Recommendations
- Add Callery pear, Norway maple, and white mulberry to the "not recommended" section of the community tree list.
- These species should be selectively removed where appropriate.


1


2


3

Photo attribution: 2 and 3: John Seiler, Edward Jensen, Alex Niemiera, and John Peterson

BARTLETT TREE EXPERTS

SCIENTIFIC TREE CARE SINCE 1907

URBAN FOREST OVERVIEW

Top Species | Condition | Age | Size | Sustainability Quantification | Canopy Cover | Pests and Diseases | Species-Specific Programs

TOP SPECIES BREAKDOWN

Results
Callery pear (*Pryus calleryana*) was the most common species (20%) in the inventory (see table). Pear (*Pyrus*) at 20%, and linden (*Tilia*) at 12% were the most common genera. Trees were most commonly in the Rosaceae family at 39%.

The species highlighted in the table had a Relative Performance Index (RPI) of 1.0 or greater. In general, this means that *based on the observed condition ratings*, tree species with a rating of 1.0 or greater will generally provide more benefits to the community and may be good selections for new plantings. Two of the most common species, Ginkgo (*Ginkgo biloba*), and serviceberry (*Amelanchier* sp.) with the highest RPI were almost entirely new plantings.

Why is this important?
Prioritizing management of the most common species found on site is an efficient and effective management strategy. Also, to maintain a diverse and more sustainable urban forest, it is recommended that a site not have more than 10% of its trees represented by a specific tree species and not more than 20% represented by a single genus, when feasible.

Recommendations
- Review the existing tree species breakdown when prioritizing tree care and when selecting the species for new plantings (distribution % and RPI rating).

Common Name	Scientific Name	Distribution	Relative Performance Index*
Callery Pear	*Pyrus calleryana*	20%	0.02
Japanese Tree Lilac	*Syringa reticula*	10%	2.00
Littleleaf Linden	*Tilia cordata*	9%	1.35
Flowering Cherry	*Prunus serrulata*	7%	0.86
Ginkgo	*Ginkgo biloba*	7%	3.31
Honeylocust	*Gleditsia triacanthos*	6%	0.79
Washington Hawthorne	*Crataegus phaenopyrum*	5%	0.23
Red Maple	*Acer rubrum*	4%	0.23
Serviceberry	*Amelanchier sp.*	3%	2.95
Freeman's Maple	*Acer x freemanii*	3%	0.46
American Hornbeam	*Carpinus caroliniana*	2%	2.19
Norway Maple	*Acer platanoides*	2%	0.19
Pin Oak	*Quercus palustris*	2%	0.22

*This protocol was adopted from the Vibrant Cities Labs

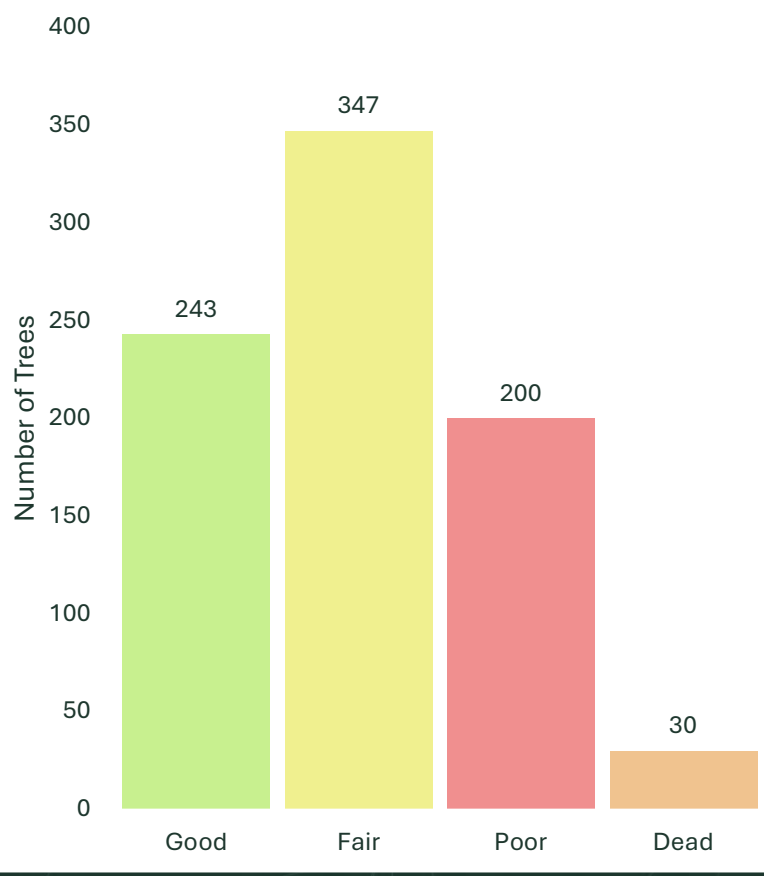
More information can be found in ArborScope™ (Reports > Stand Dynamics Reports)

CONDITION DISTRIBUTION

Results
Overall, the inventoried trees in the City of York tended to be in fair condition (42%) (see graph). York's condition distribution was not following the desired pattern, which places the majority of trees in good condition, followed by fair, poor, and the fewest trees being dead.

Why is this important?
In general, trees in good condition are better suited to live longer and require less maintenance over time. Trees in fair condition can generally increase to good with proper maintenance. Tree care cannot typically improve trees in poor condition to good without significant investment.

Recommendations
- Review trees in fair condition to determine desirable specimens for additional care.
- Plan for larger planting pits where possible, and place greater focus on developmental pruning with young trees.



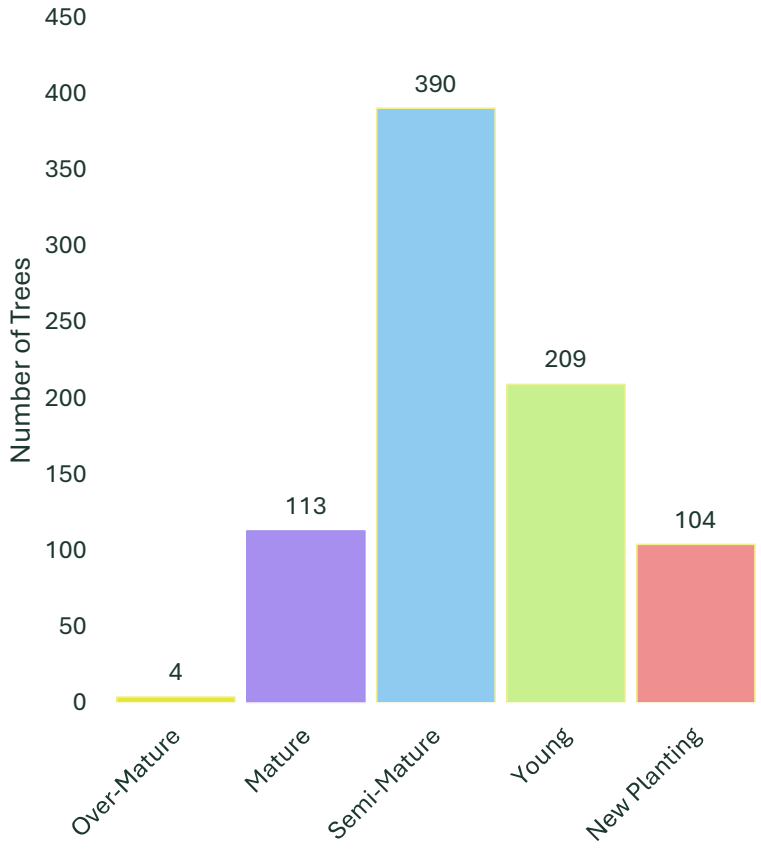
More information can be found in ArborScope™ (Reports > Stand Dynamics Reports)

AGE DISTRIBUTION

Results
The stage of development of the inventoried trees could be described as young (25%) to semi-mature (48%) (see graph). Based on the species recorded, approximately half were approaching maturity and approximately one third were early in their development and will take many years to mature.

Why is this important?
The tree population is closer to mature than young. A large cohort of trees in the same stage of development can cause logistical challenges. Larger more mature trees provide more benefits and services to the community, but will experience higher mortality, so it is important to maintain a high proportion of new plantings and young trees to sustain the overall tree population.

Recommendations
- Annual tree plantings should occur to both replace trees that are removed and to maintain enough younger trees to replace mature trees that are lost over time.
- Ensure that plantings are carried out with a feasible post-installation care plan in place. It is more economical to plant fewer trees with a lower mortality rate than the reverse.
- Avoid “stop-and-go” plantings of larger numbers of trees followed by periods with no planting; prefer continuous planting of fewer trees to encourage an uneven-aged tree population.
- To maintain canopy coverage, emphasis should be placed on planting medium and large-maturing trees in locations that will support them.



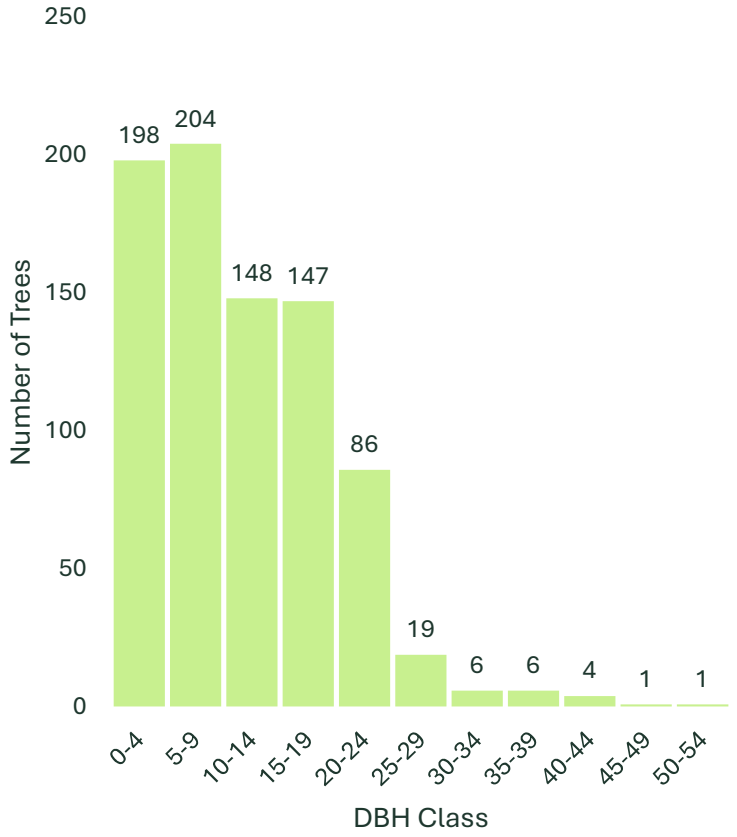
More information can be found in ArborScope™ (Reports > Stand Dynamics Reports)

SIZE DISTRIBUTION

Results
Most inventoried trees (67%) had a trunk diameter of less than 15 inches (see graph). The graph describes a decreasing curve with the number of trees falling dramatically from 19 to 30 inches in diameter.

Why is this important?
Healthy tree populations have a broad range of tree diameters. Smaller trunk diameters generally equate to younger trees. A population of older trees may require more intensive care, while younger trees may need assistance during development. Knowing the size distribution of your trees may help in forecasting decisions and future costs.

Recommendations
- The recommendations made in the age class section directly correlate to size distribution. York should continue planting new trees and replacing removed trees to maintain a healthy DBH distribution over time as the existing trees mature.



More information can be found in ArborScope™ (Reports > Stand Dynamics Reports)

SUSTAINABILITY QUANTIFICATION

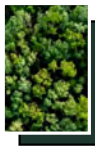
Results
The i-Tree Eco application and procedures were used to provide the City of York with tree-related sustainability information (ecosystem services). The estimates for key ecosystem services are provided on this page. The net annual benefit for all inventoried trees was **$4,054**.

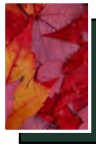
Why is this important?
I-Tree results can assist the City of York in:
- **sustainability goalsetting**
- acting as a catalyst for future projects, providing community engagement in the value of the urban forest, and
- providing data for potential use with carbon and biodiversity markets.

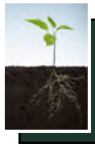
Recommendations
- Continue including i-Tree Eco with re-inventory efforts in the community, but no sooner than every five (5) years.
- Given the small average size and relative youth of the tree population, keeping the trees healthy and well-pruned will result in a rapid increase in ecosystem services.

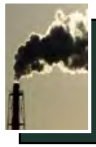
Inventoried Trees

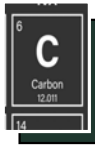

• Number of trees: 820


Tree Cover: 5.724 acres


Most common species of trees: Callery pear, Japanese tree lilac, Littleleaf linden

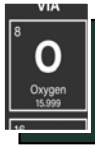

Percentage of trees less than 6" (15.2 cm) diameter: 32.8%


Pollution Removal: 200.2 pounds/year ($1,680/year)



Carbon Storage: 361.2 tons ($156,000)


Carbon Sequestration: 4.5 tons/year ($1,940/year)



Oxygen Production: 11.94 tons/year


Avoided Runoff: 48,770 gallon/year ($436/year)


Replacement values: $842,000

More information can be found in ArborScope™ (Inventory > Files)

CANOPY COVER

Results
Canopy cover was determined for the City of York using i-Tree Canopy. This tool uses arial imagery to sample across a defined area. The City of York had tree or shrub canopy across an estimated 561 acres (16.4%) of the total area of 3422 acres.

Why is this important?
These results can assist the City of York in:

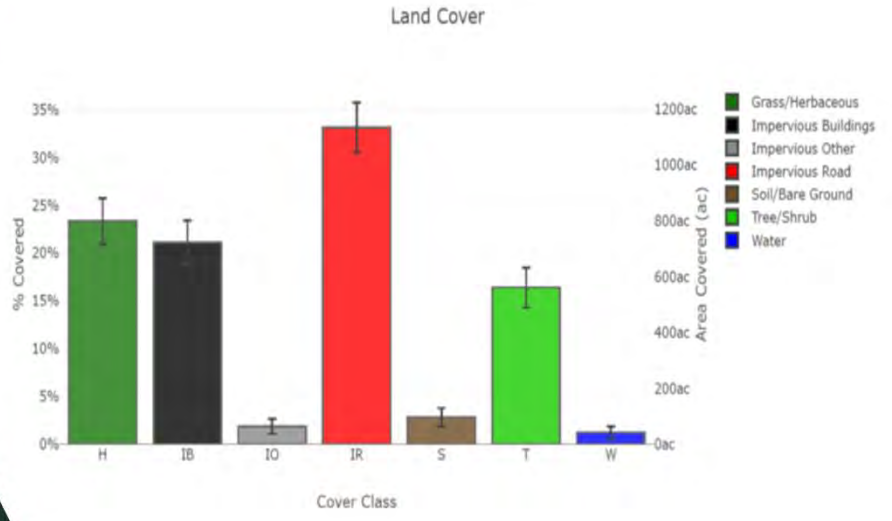
- **canopy coverage goalsetting**
- acting as a catalyst for future projects, providing community engagement in the value of the urban forest, and
- providing data for potential use with carbon and biodiversity markets.

Recommendations

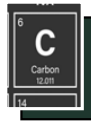
- Increase canopy coverage to 25% by 2040,
- Replace removed trees quickly,
- Maintain the health of semi-mature and mature trees, and
- Identify more planting opportunities for medium- to large-maturing species.

More information can be found in ArborScope™ (Inventory > Files)

Entire City



Carbon Sequestration: 651 tons/year ($281,774/year)



Carbon Storage: 19,246 tons ($8.3 million)

PESTS AND DISEASES

Results
The inventoried trees were almost entirely free from observable pests and diseases. Those that were observed included:

- Emerald ash borer exit holes on ash trees (photo 1)
- Scale on several trees (photo 2)
- Spotted lanternfly on several trees, especially maples (photo 3)

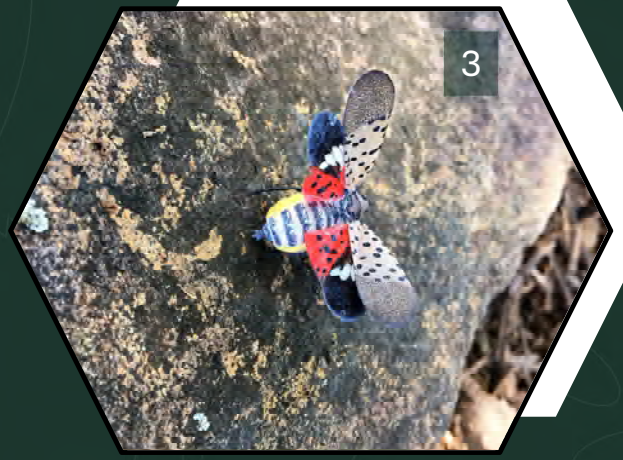
Why is this important?
Pests and diseases pose significant challenges to the health of an urban forest. Understanding these challenges involves not only identifying their causes but also recognizing their impacts and implementing effective management strategies.

Recommendations

- Maintain any current plant health care treatments.
- Treat all retained ash trees for emerald ash borer
- Review all trees with observed pests or diseases and determine if treatment programs are warranted.


1


2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More information can be found in ArborScope™ (Inventory > Reports > Tree Observations)

Photo attribution: 1: Thomas Smiley, Ph.D. , via Lorraine Graney; 3: Brian Duvall , via Lorraine Graney

CULTURAL CONDITIONS

Results
Many trees were observed with buried root collars, girdling roots (photo 1), and water stress (photo 2). Others suffered from heading cuts and other poor pruning practices (photo 3). Trees were observed outgrowing their tree grates in several locations as well (photo 4).

Why is this important?
Cultural conditions are perhaps the most important factor influencing tree health and mortality. Good cultural conditions maximize tree and root growth. Trees affected by environmental or cultural stressors are predisposed to pest and disease problems, potentially initiating a decline spiral. Pest and disease symptoms can be masked or imitated by cultural or abiotic symptoms. Finally, the effectiveness of soil care and plant healthcare treatments are maximized in good cultural conditions.

Recommendations

- Review the tree planting list to ensure tolerance to climate zone 7a and to shade, salt, and pollution conditions at the planting site.
- Match mature tree size to the soil volume and obstructions present at the planting site.
- Track existing trees and new plantings with tree grates so they can be adjusted or removed in the appropriate timeframe.
- Initiate an irrigation program for water-stressed trees after root collar investigation and proper mulching. This is especially important with new plantings, which should be irrigated for three growing seasons post-installation. Use drip irrigation in contact with the soil when possible.

More information can be found in ArborScope™ (Inventory > Reports > Root Collar Excavations)

SPECIES-SPECIFIC PROGRAMS

Why is this important?
While many tree species share similar cultural, pest, and disease concerns, they do have unique concerns and timing considerations. Understanding species specifics can help you make more informed management decisions to protect important specimens. A species can be important for numerous reasons, but the percentage of the total population, location, client-specified, and uniqueness are all good reasons to implement species-specific programs.

Recommendations
- Implement systematic soil and plant health care programs.
- Review the following species-specific programs and consider implementing them to improve and maintain the condition of these important trees.

Five species-specific programs are highlighted on the next pages.

Bartlett Tree Research Laboratories

PLANT HEALTH CARE REPORT

BARTLETT TREE EXPERTS

Linden

Lindens are notable shade trees, widely used as street trees and ornamentals. They are renowned for highly fragrant, white flowers and a dense crown of heart-shaped leaves. Lindens are grouped in the genus *Tilia* with the following species commonly used in the landscape:

American linden or basswood (*Tilia americana*): tall (60–100 feet), stately tree best used in parks, golf courses and large properties. It is native to North America.

Littleleaf linden (*Tilia cordata*): medium-sized, depending on cultivar. 'Greenspire', the most commonly planted linden, reaches a height of 40 feet. Considered tolerant of harsh conditions, littleleaf lindens are native to Europe where they have been planted since ancient times.

Silver linden (*Tilia tomentosa*): medium to large-sized tree, depending on cultivar. Maximum height is 60 feet. Considered an excellent shade tree, tolerating heat and drought better than other lindens. It is native to southeastern Europe and western Asia.

Continued on page 2

Littleleaf linden

Silver lindens

Silver linden foliage

More information can be found in ArborScope™ (Reports > Stand Dynamics Reports)

SPECIES-SPECIFIC PROGRAM

Callery pear (*Pyrus calleryana*)
Callery pear was the most common species in the inventoried tree population (20% with 168 trees).
Cyclical pruning cycle: Every 3-5 years

- Reduction/clearance pruning
- Structural support installation/inspection
- Removal

- Growth regulator
- Monitor and treat for pear trellis rust
- Replacement planting (consider alternates)

- Developmental pruning
- Structural inspection

- Root collar investigation
- Replacement planting (consider alternates)

SPECIES-SPECIFIC PROGRAM

Japanese tree lilac (*Syringa reticulata*)
Japanese tree lilac was the next most common species in the inventoried tree population (10% with 86 trees).
Cyclical pruning cycle: Every 3 – 5 years

- Developmental/clearance pruning

- Prescription fertilization
- Growth regulator
- Monitor and treat for Japanese maple scale insects
- Monitor and treat for bark beetles

- Developmental pruning to promote strong central stem and develop branch structure
- Stress reducer

- Root collar excavation
- Root Invigoration™
- Replacement planting

Photo attribution: 1: Jim Robbins at NCSU

SPECIES-SPECIFIC PROGRAM

Linden (*Tilia* spp.)
Littleleaf linden (*T. cordata*) comprised 10% (80 trees) of the inventoried tree population. Other *Tilia* species accounted for another 2% (18 trees) of the population.
Cyclical pruning cycle: Every 2 – 3 years

- Maintenance/clearance pruning
- Structural support installation/inspection
- Removal

- Prescription fertilizer
- Beneficial release - Ladybird beetle

- Developmental pruning
- Beneficial release – Ladybird beetle
- Monitor and treat for Japanese beetle
- Stress reducer

- Pruning - after leaf drop
- Replacement planting

SPECIES-SPECIFIC PROGRAM

Maples (*Acer* spp.)
Maples were the fourth most numerous genus. Red maple (*A. rubrum*) and Freeman's maple (*A. x freemanii*) represented 7% (51 trees) of the inventoried tree population. All maple species combined comprised 10% (85 trees) of the population.
Cyclical pruning cycle: Every 2 – 3 years

- Maintenance/clearance pruning
- Structural support installation/inspection
- Removal

- Prescription fertilization
- Growth regulator

- Developmental pruning to reduce codominant stems and included bark
- Monitor and treat for spotted lanternfly

- Root collar excavation

SPECIES-SPECIFIC PROGRAM

Cherry (*Prunus* spp.)
Flowering cherry (*Prunus serrulata*) was the fourth most numerous species and represented 7% (59 trees) of the inventoried tree population. Other species in the *Prunus* genus included Tibetan cherry (*P. serrula*), Yoshino cherry (*P. x yedoensis*), and purple leaf plum (*P. cerasifera*).
Cyclical pruning cycle: Every 3 – 5 years

- Maintenance/clearance pruning
- Structural support installation/inspection
- Removal

- Prescription fertilizer
- Growth regulator
- Monitor and treat for foliar disease

- Developmental pruning
- Stress reducer

- Root collar investigation
- Replacement plantings

BARTLETT TREE EXPERTS

SCIENTIFIC TREE CARE SINCE 1907

MANAGEMENT ZONES

Arterial Streets within Business District
Arterial Streets outside of Business District

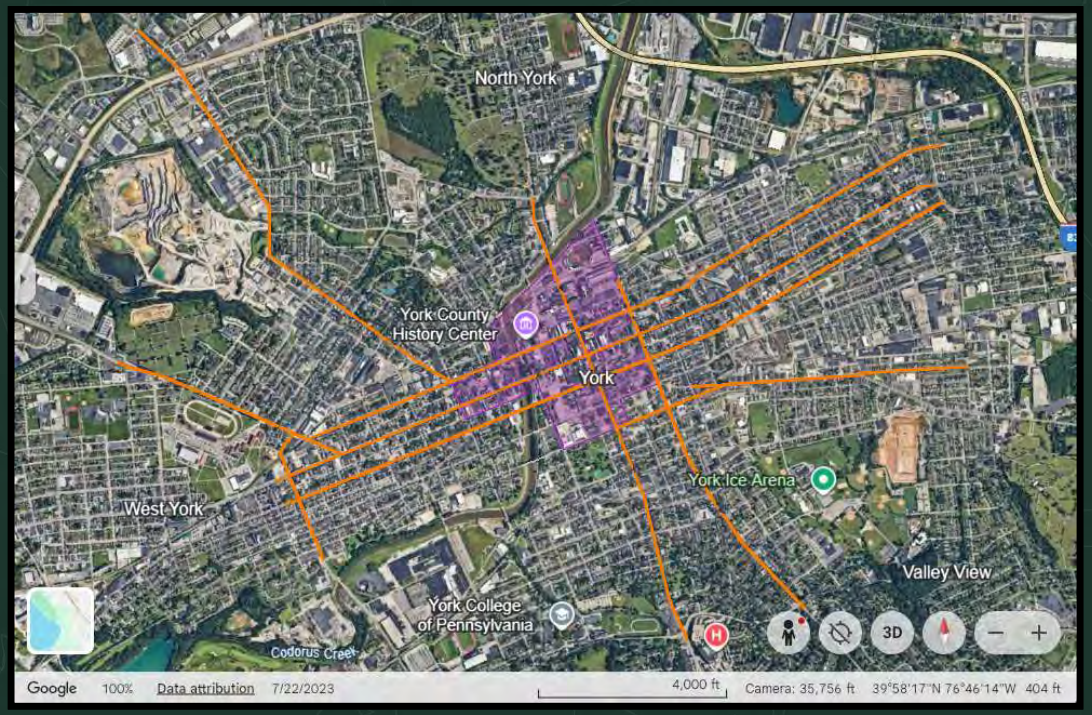
OVERVIEW

The City of York was divided into two management zones: arterial streets within the downtown business district, and arterial streets beyond the business district.

Utilizing these zone boundaries for tree management can help further prioritize tree care recommendations and build consistency with related aspects of facilities management.

The following pages are grouped by management zone. The first page in each group summarizes the tree locations, and tree condition, and the second page summarizes the prioritized tree care recommendations.

Planting recommendations and information can be found in **Additional Considerations & Future Actions**.



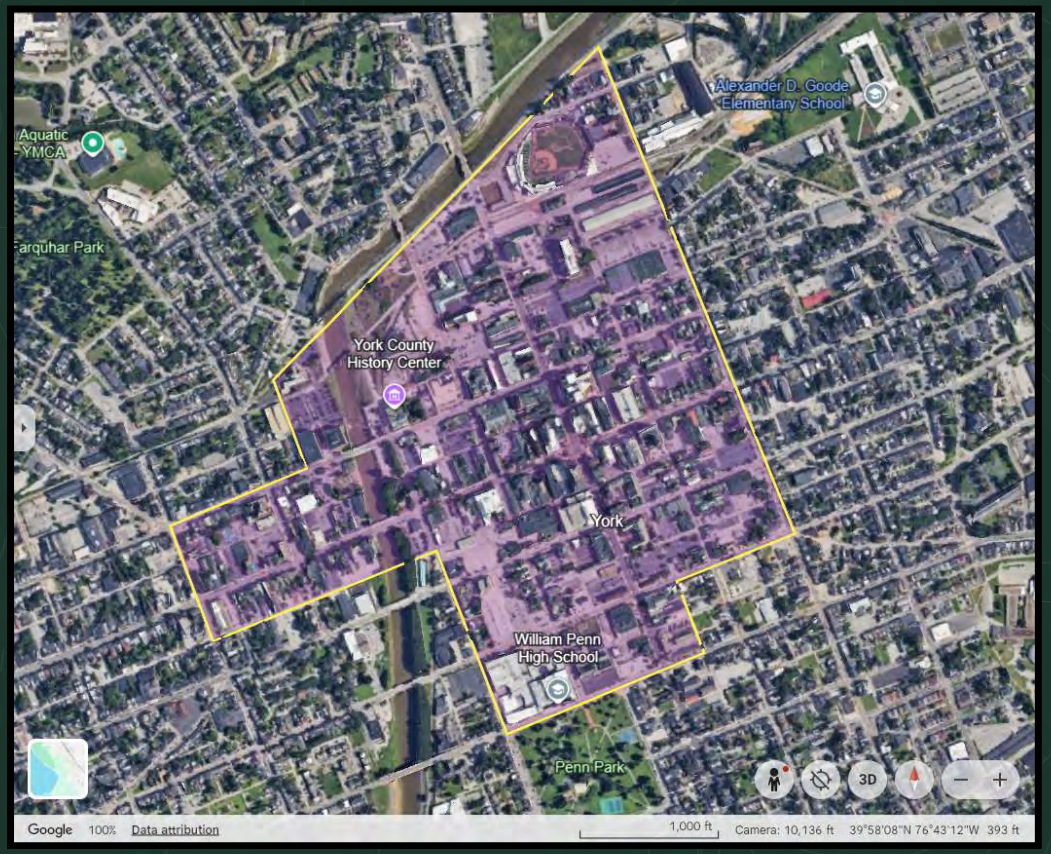
More information can be found in ArborScope™ (Reports > Tree Work Recommendation Reports)

BUSINESS IMPROVEMENT DISTRICT

Results
The business district contained 37% (304 trees) of the inventoried trees.

The condition class breakdown was:

- Good: 127
- Fair: 106
- Poor: 57
- Dead: 14

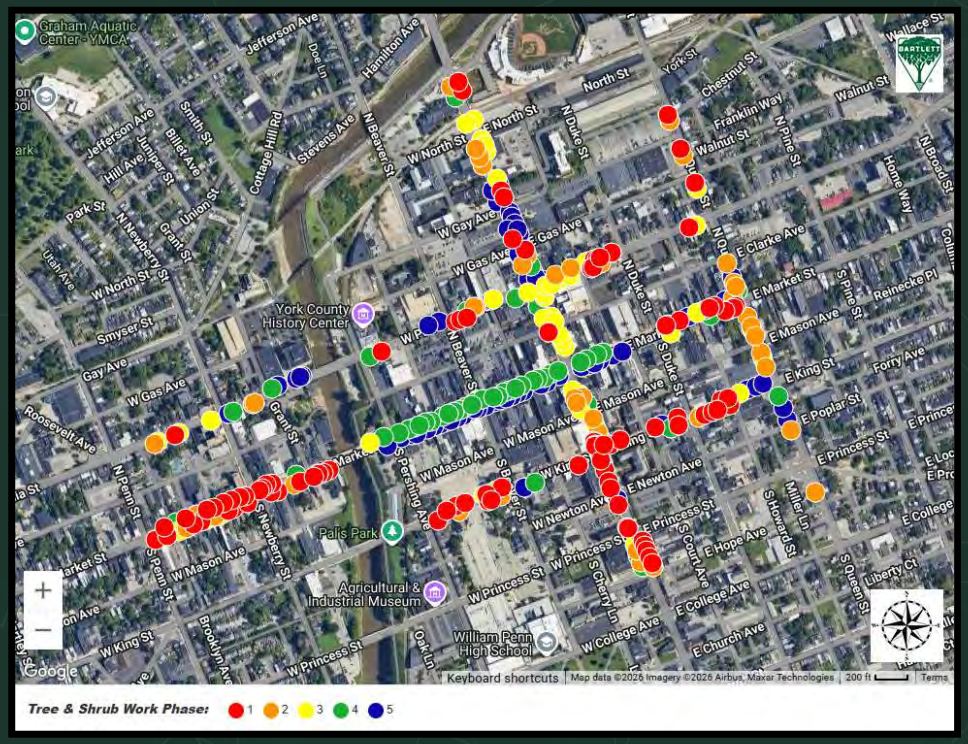


BUSINESS IMPROVEMENT DISTRICT

Recommendations

- Tree Risk Assessment
  - Advanced assessment of 1 tree
- Soil Care
  - Apply prescription fertilization to 210 trees
  - Perform root collar investigations on 154 trees
  - Apply mulch to 6 trees
- Species Programs
  - Begin removal of Priority 1 pear trees
  - Prune and provide growth regulator treatments to retained pears
  - Provide establishment care to all newly planted trees
  - Monitor cherries for foliar disease
- Tree Care:

Phase	Prune	Bracing	Cables	Guying	Removal
ASAP	-	-	-	-	-
Priority 1 (2026)	33 trees	-	1 tree	-	60 trees
Priority 2 (2027)	41 trees	-	2 trees	-	5 trees
Priority 3 (2028)	46 trees	-	-	1 tree	-
Priority 4 (2029)	50 trees	-	-	-	-
Priority 5 (2030)	68 trees	-	-	-	-



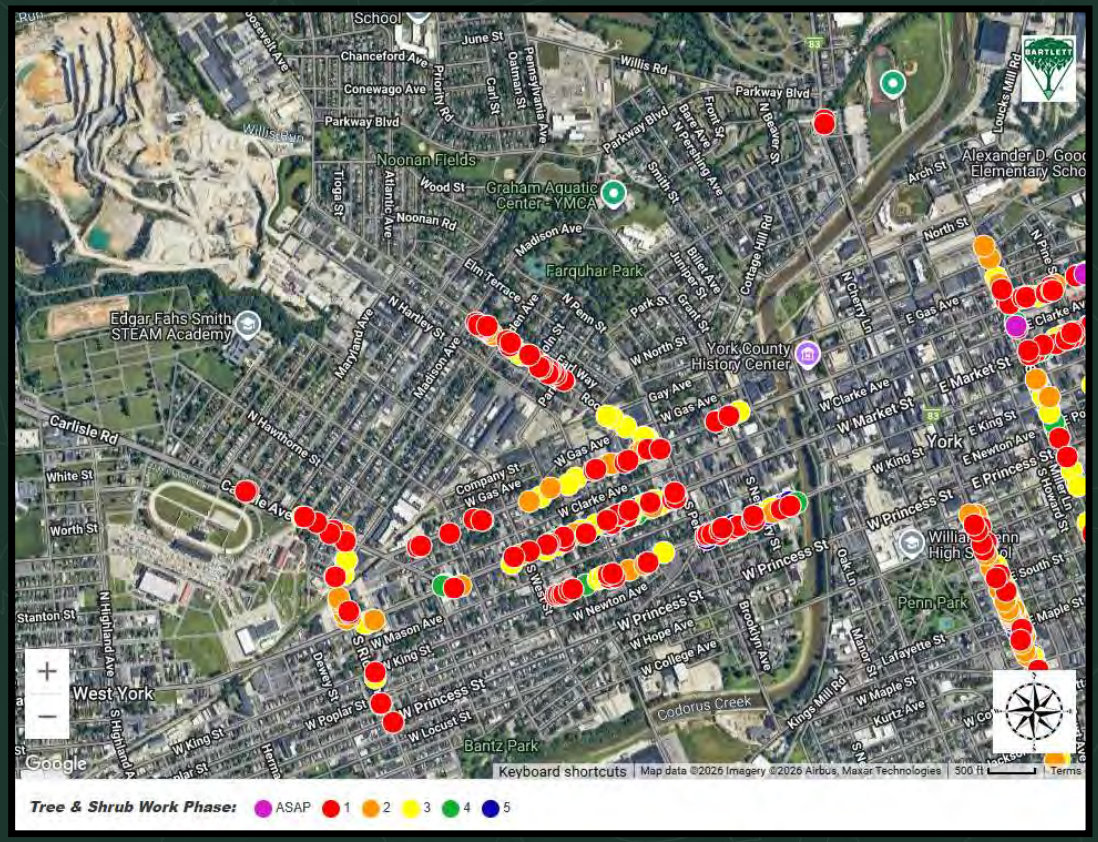
ARTERIAL STREETS
BEYOND THE BUSINESS DISTRICT

Results
The remaining arterial streets represented 63% (516 trees) of the inventoried street trees.

The condition class breakdown was:

- Good: 116
- Fair: 241
- Poor: 143
- Dead:16

West Arterial Streets



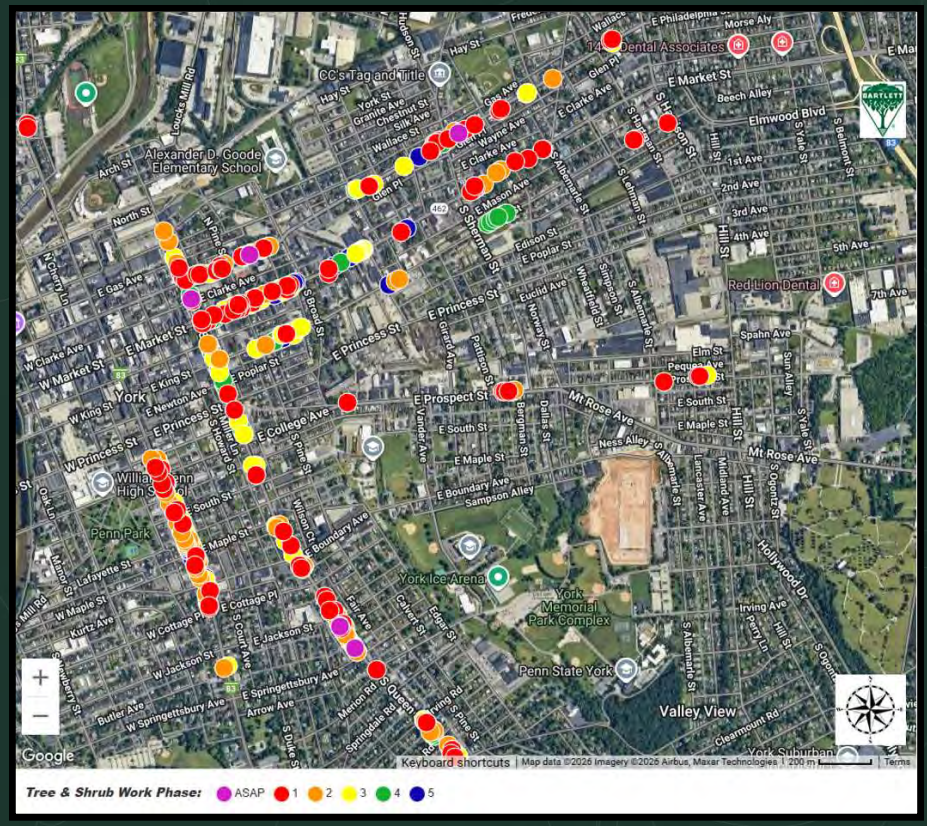
ARTERIAL STREETS
BEYOND THE BUSINESS DISTRICT

Recommendations

- Tree Risk Assessment
  - Advanced assessment of 2 trees
- Soil Care
  - Apply prescription fertilization to 210 trees
  - Perform root collar investigations on 176 trees
- Species Programs
  - Begin planting recommended species
  - Begin removal of Priority 1 pear trees
  - Monitor cherries for foliar disease
- Tree Care:

Phase	Prune	Bracing	Cables	Guying	Removal
ASAP	1	-	-	-	4 trees
Priority 1 (2026)	65 trees	1 tree	3 trees	1 tree	130 trees
Priority 2 (2027)	68 trees	1 tree	13 trees	-	41 trees
Priority 3 (2028)	112 trees	-	1 tree	-	-
Priority 4 (2029)	42 trees	-	-	-	-
Priority 5 (2030)	49 trees	-	-	1 tree	-

South and East Arterial Streets



BARTLETT TREE EXPERTS

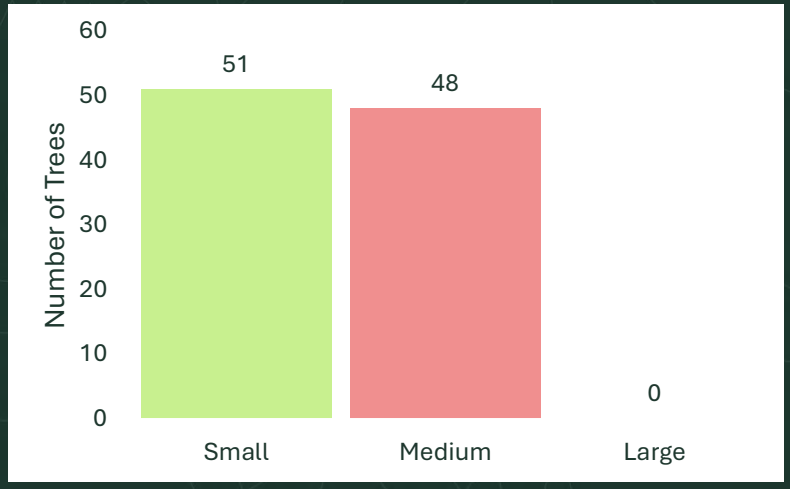
SCIENTIFIC TREE CARE SINCE 1907

ADDITIONAL CONSIDERATIONS & FUTURE ACTIONS

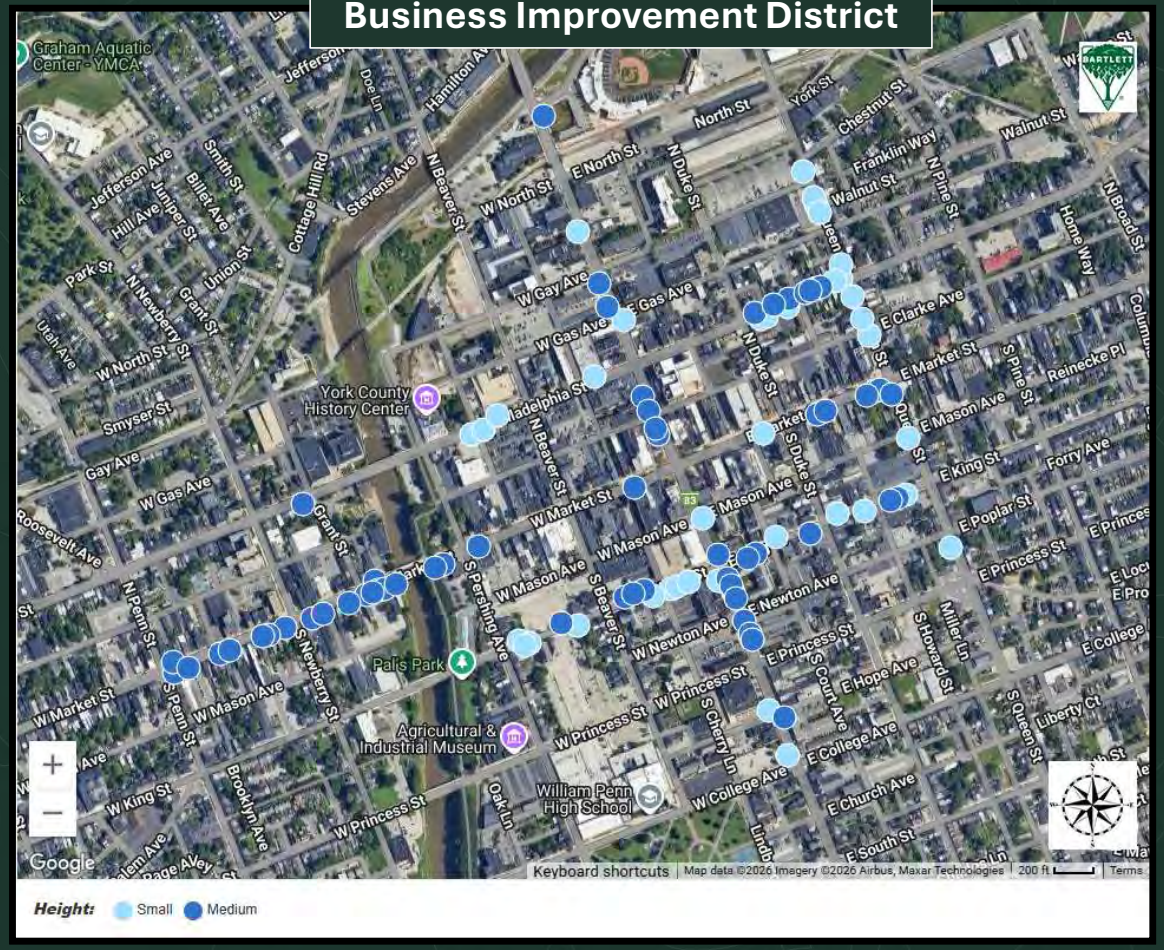
Potential Planting Sites | Recommended Species | Additional Considerations | Future Actions

POTENTIAL PLANTING SITES

- Total Sites Identified: **98**
- Sites for small trees: **40** (52%)
- Sites for medium trees: **58** (48%)
- Sites for large trees: **0**

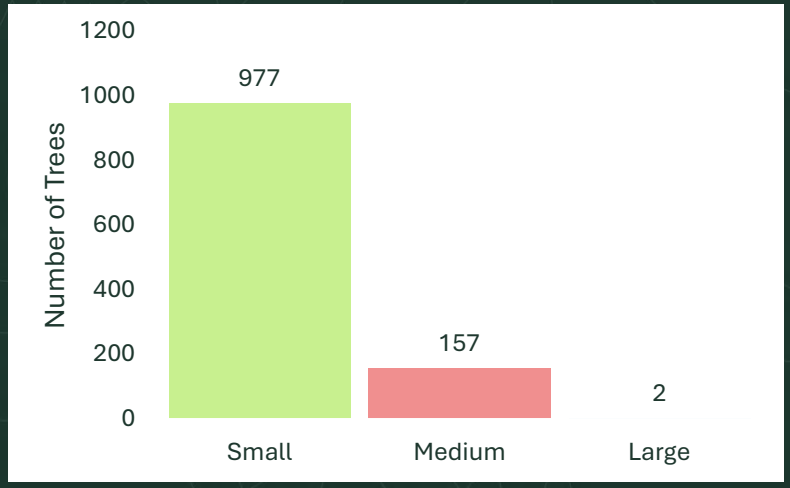


Business Improvement District

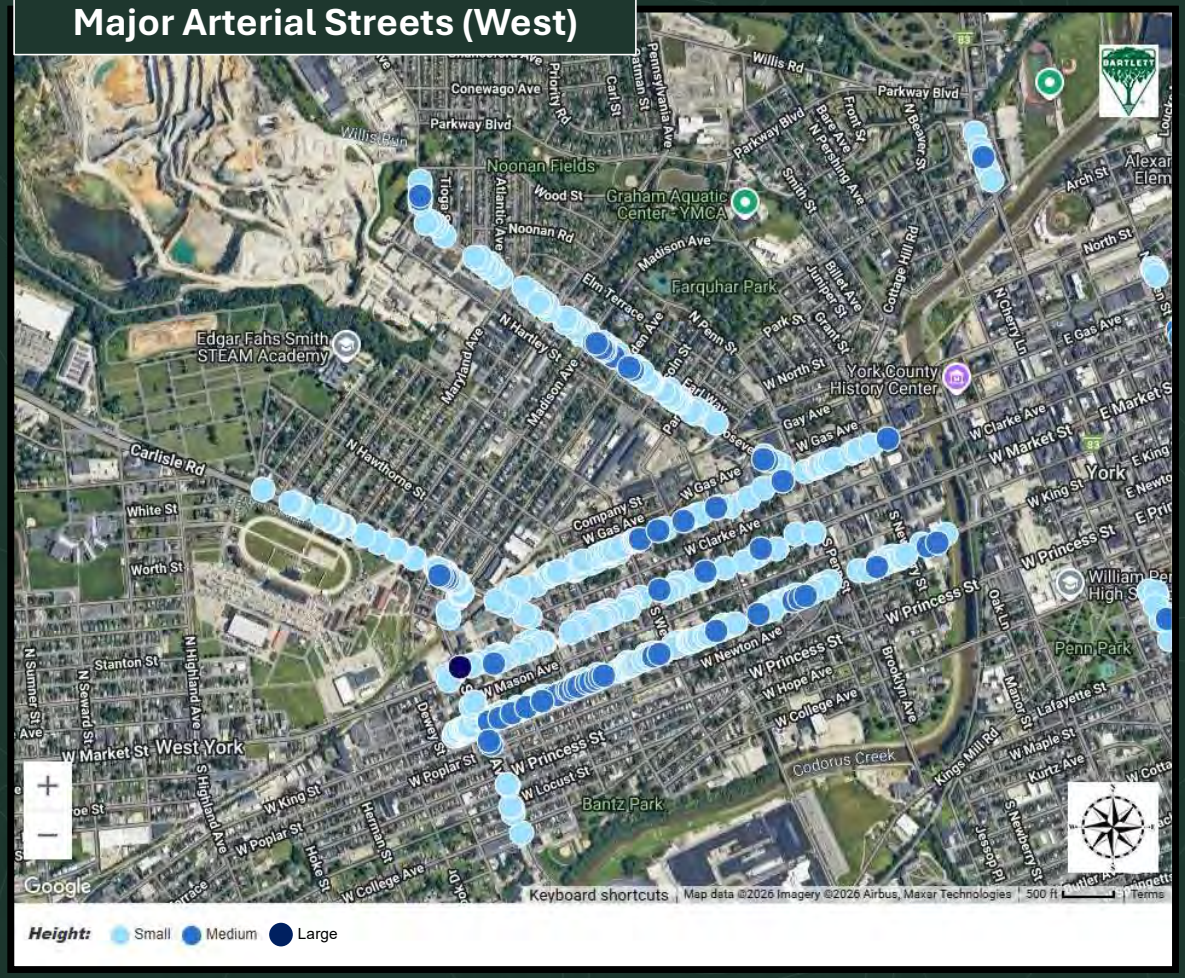


POTENTIAL PLANTING SITES

- Total Sites Identified: **1138**
- Sites for small trees: **986** (87%)
- Sites for medium trees: **150** (13%)
- Sites for large trees: **2** (<1%)



Major Arterial Streets (West)



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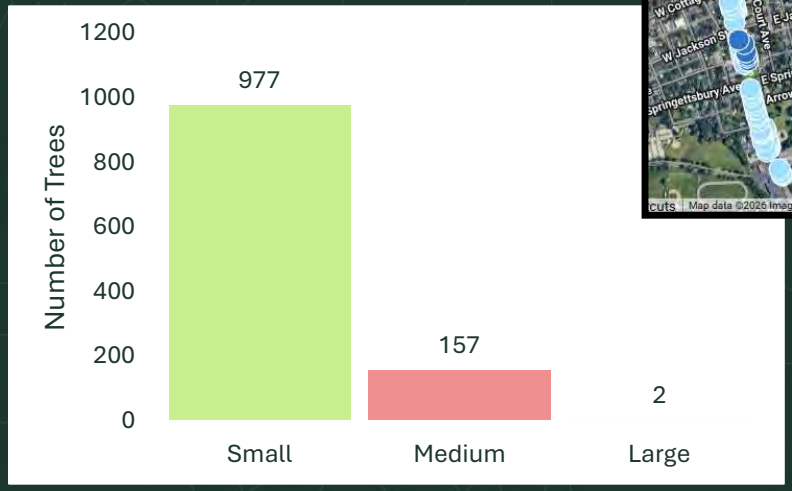
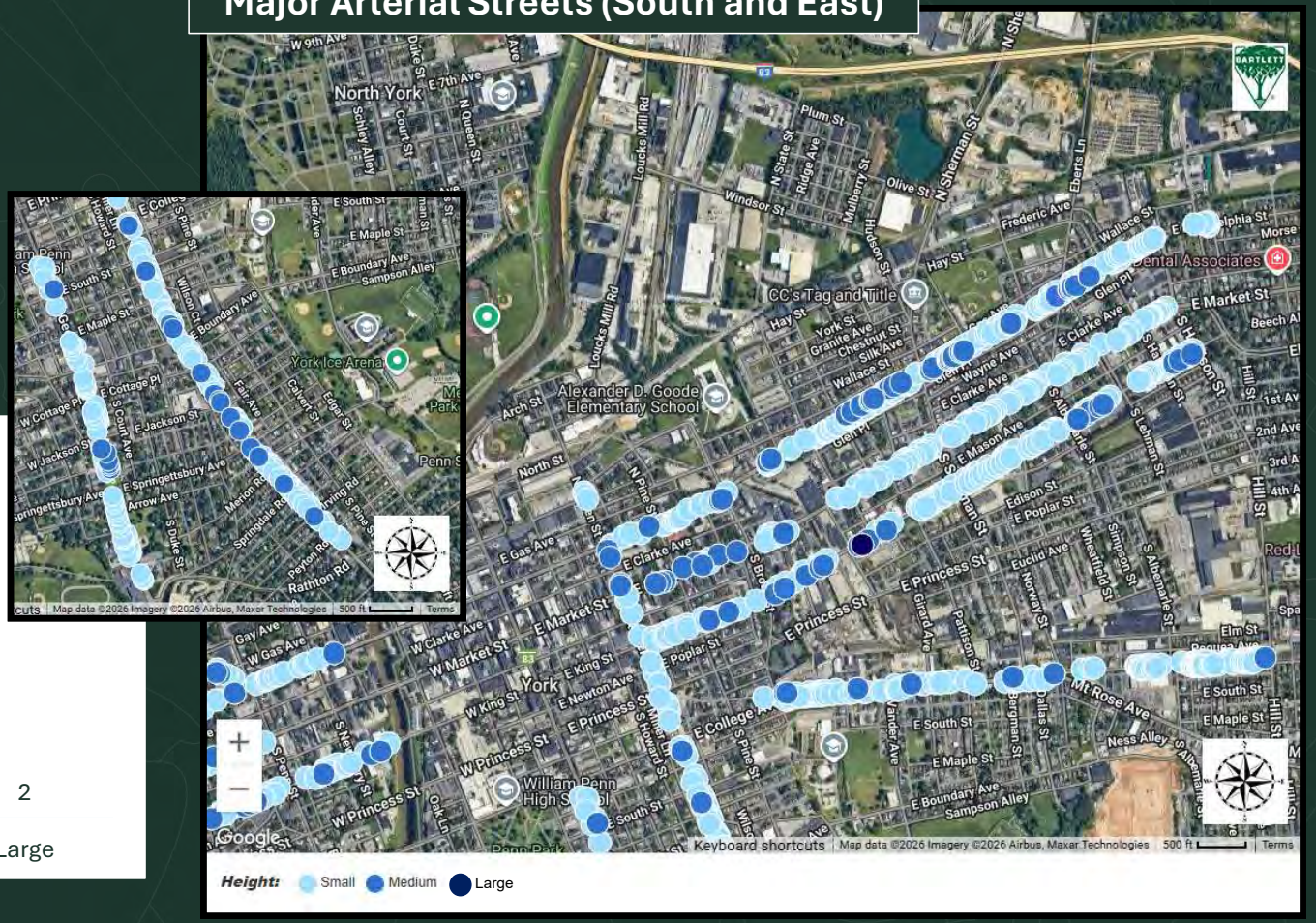


Major Arterial Streets (South and East)



RECOMMENDED SPECIES FOR PLANTING

Small		Small/Medium	Medium/Large
Trident maple (*Acer buergerianum*)	Kousa dogwood (*Cornus kousa*)	Freeman's maple (*Acer x freemanii*)	Yellowwood (*Cladrastis kentukea*)
Hedge maple (*Acer campestre*)	Cornelian cherry (*Cornus mas*)	Miyabe maple (*Acer miyabei*)	Bitternut (*Carya cordiformis*)
Paperbark maple (*Acer griseum*)	Red osier dogwood (*Cornus sericea*)	Red horse-chestnut (*Aesculus x carnea*)	Ginkgo (*Ginkgo biloba*)
Fullmoon maple (*Acer japonicum*)	American hazelnut (*Corylus americana*)	Yellow birch (*Betula allegheniensis*)	Thornless honeylocust (*Gleditsia triacanthos var. inermis*)
Japanese maple (*Acer palmatum*)	American smoketree (*Cotinus obovatus*)	European hornbeam (*Carpinus betulus*)	Kentucky coffeetree (*Gymnocladus dioicus*)
Three-flowered maple (*Acer triflorum*)	Crape myrtle (*Lagerstromea indica*)	American hornbeam (*Carpinus caroliniana*)	Chinkapin oak (*Quercus muehlenbergii*)
Eastern redbud (*Cercis canadensis*)	Amur maackia (*Maackia amurensis*)	Turkish hazelnut (*Corylus colurna*)	American basswood (*Tilia americana*)
Chinese redbud (*Cercis chinensis*)	Crabapple (*Malus sp.*)	Foster's Number 2 holly (*Ilex x attenuata 'Fosteri #2'*)	Littleleaf linden (*Tilia cordata*)
Chinese fringetree (*Chionanthus retusus*)	Sourwood (*Oxydendrum arboreum*)	American hophornbeam (*Ostrya virginiana*)	Silver linden (*Tilia tomentosa*)
White fringetree (*Chionanthus virginicus*)	Common hoptree (*Ptelea trifoliata*)	Persian ironwood (*Parrotia persica*)	Lacebark elm (*Ulmus parvifolia*)
Alternate leaf dogwood (*Cornus alternifolia*)		Japanese stewartia (*Stewartia pseudocamellia*)	
Flowering dogwood (*Cornus florida*)		Japanese zelkova (*Zelkova serrata*)	

NEW PLANTING RESOURCES

Successful tree planting starts with evaluating the site, choosing the right species, and planning for adequate soil volume and irrigation.

Ensure the tree is planted at the proper height, with the root flare visible at the soil surface.

From the first year, implement a comprehensive soil and plant health care program. Once trees are established, prune them with future structure and size in mind.

Bartlett Research Laboratory Technical Reports:

- Soil for Urban Tree Planting
- Irrigation
- Drought and Landscape Plants
- Mulch Application Guidelines
- Structural Pruning of Young Trees

If you would like additional information about these future considerations, please contact Christian Fitzpatrick.

ADDITIONAL CONSIDERATIONS

This management plan has described the current City of York site and urban forest, along with recommendations for what was observed. Additional situations may arise in the future, and a few examples include:

Deer, Ticks, and Mosquitoes
York is in an area where deer, ticks, and mosquitoes can be nuisance pests. There are management options available for all three pests which can be implemented if levels become an issue.

Irrigation
Any existing irrigation system should continue to be maintained. The spray patterns should be evaluated to ensure they aren't consistently spraying . Soil moisture should be measured around key . Also, additional irrigation may be required during droughts and for new plantings.

Biological Controls and Organic Solutions
Arboricultural research continues to provide new options for tree, soil, pest, and disease management. Implementing biological controls and organic solutions in the community may be a viable option to increase management options without introducing additional chemical controls.

Wildfire Prevention
Wildfires can occur anywhere when the right conditions are present. A Fire-resistant Landscape Evaluation can be performed to identify the locations and characteristics of trees and other plants that may increase the risk of fire to structures.

If you would like additional information about these future considerations, please contact Christian Fitzpatrick.

TREE PRESERVATION RESOURCES

Preservation During Construction
Community needs can change, and these changes can impact the . When construction occurs within the community, tree preservation evaluations and procedures should be implemented by a qualified arborist.

Bartlett Research Laboratory Technical Reports:

- Preventing Construction Damage to Trees
- Sidewalk Repair Near Trees

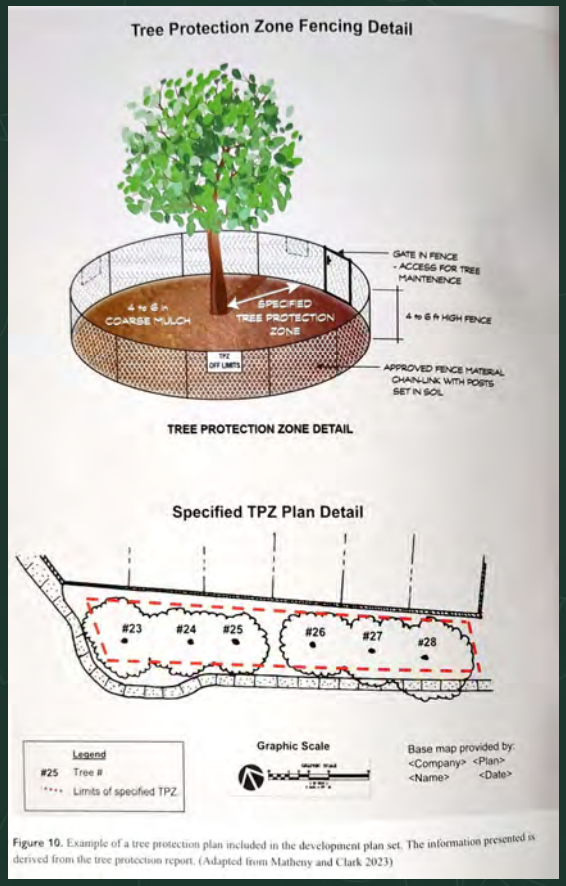


Figure 10. Example of a tree protection plan included in the development plan set. The information presented is derived from the tree protection report. (Adapted from Matheny and Clark 2023)

If you would like additional information about these future considerations, please contact Christian Fitzpatrick.

Photo attribution: Managing Trees During Site Development and Construction Third Ed. ISA

CONTRACTOR QUALIFICATIONS

All contractors engaged to perform work under the Urban Forest Management Plan (UFMP) should ensure that their production arborists possess documented training, qualifications, competencies, and credentials that meet or exceed current industry standards. These records should be maintained by the contractor and made available upon request prior to the commencement of any assigned work.

Qualification/Certification/ Training	Crew Leader	Cimber	Groundperson	Plant Health Care Specialist
Crew Leader competency/training	X			
Crane qualification/training	X	X		
Climber competency/training	X	X		
Aerial lift qualification	X	X	X	
Groundperson competency/training	X	X	X	X
Chipper/winch qualification/training	X	X	X	X
First Aid and CPR certification (biannual)	X	X	X	X
Aerial Rescue training (annual)	X	X	X	X
Electrical Hazard Awareness (annual)	X	X	X	X
Back injury prevention (annual)	X	X	X	X
Heat related illness training (annual)	X	X	X	X
Blood borne pathogen training (annual)	X	X	X	X
Work zone training (annual)	X	X	X	X
Drop zone training (annual)	X	X	X	X
Aerial Rescue qualification (annual)	X	X	X	X
PA Pesticide applicator license				X

FUTURE ACTIONS

The annual programs and recommended tree care activities in this plan should be implemented when and where feasible. In addition, the following future actions should be discussed and planned to maintain and enhance the tree care program in the City of York:

- ❑ **Perform Regular Tree Inspections:** Your trees should be visually inspected at least annually, or after any major weather event, to identify new safety concerns.
- ❑ **Conduct a Re-inventory, Management Plan, and i-Tree Eco Analysis:** Bartlett generally recommends a five-year re-inventory, management plan, and i-Tree Eco analysis cycle. The next cycle should be planned for 2030.

If you would like to discuss the specifics or timing of these future actions, please contact Christian Fitzpatrick.

BARTLETT TREE EXPERTS

SCIENTIFIC TREE CARE SINCE 1907

LIMITATIONS & CONCLUSIONS

Limitations | Conclusions

LIMITATIONS

The inspection of the designated tree(s) on the owner/client's property was conducted in November 2025. All photographs were taken, and observations were made during the inspection.

All information provided by Bartlett Tree Experts was based on the conditions and characteristics of the tree(s), shrub(s), vegetation, or other criteria observed at the time of the inspection. Bartlett Tree Experts can make no guarantees or warranties of any kind that all conditions or defects will be observed, detected, or factored into the overall report or recommendations, nor does it accept any liability in any manner whatsoever for any damage caused by any tree on this property, whether the tree was inventoried, inspected, or present during the fulfillment of the assigned work; or not.

CONCLUSIONS

The inspection included 820 trees. We provided specific tree care recommendations based on our visual inspection.

Please understand that trees and shrubs are biological organisms that are exposed to numerous conditions that can have a negative impact to health and structural safety, and that any tree or shrub's health or safety can change over time. These conditions include but are not limited to: age, climate, wind, weather, drought, insect, disease, fungus, soil conditions, and animal and human activity. To help manage the effects of such conditions, Bartlett Tree Experts recommends that you have a qualified arborist inspect your trees periodically, or after any major weather event, to reassess tree conditions, and identify any safety concerns or other issues that may be present. It is also important for you to understand that all trees pose some degree of risk, and just because a tree was not listed as having immediate needs, intermediate recommendations, or future recommendations, you should not infer that the tree is "safe" or will not fail in any manner.

Recommendations that are made by Bartlett Tree Experts are intended to provide you with a better understanding of your existing landscape and help you make informed decisions about your trees and shrubs. Separate proposals can be provided for any recommendations that you would like to see implemented.

We look forward to working with you in the care of your trees and shrubs.

BARTLETT TREE EXPERTS

SCIENTIFIC TREE CARE SINCE 1907

APPENDICES

Appendix A: Explanation of Management Recommendations | Appendix B: Vocabulary | Appendix C: Explanation of Tree Risk Levels | Appendix D: Explanation of Estimated Tree Asset Value

EXPLANATION OF MANAGEMENT RECOMMENDATIONS

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 .

Soil Care (cont.)

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.

Mulch Application
Proper mulching 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. Mulch is frequently applied incorrectly so we recommend that readers inspect the technical report on mulch application guidelines.

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. Root collar excavation recommendations do not have a Tree & Shrub Work phase and should be completed as soon as possible.

Girdling Roots
Girdling roots restrict water and nutrient movement throughout the tree. If left untreated they can cause the tree to decline, fail, 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.

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.

Tree Pruning
Pruning is a common service offered by tree companies, yet it can be one of the most poorly executed practices from those workers who lack knowledge of basic tree biology. "Lion's tailing," topping, and flush cuts are a few examples that can lead to hazardous conditions over time.

Because this practice can be misunderstood and specific standards are in place for correct pruning, the Inventory Team would like to clarify their recommendations.

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

Tree Removal
In some cases, the arborist may determine the need for removal while inspecting the tree. Trees may be recommended for removal 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.

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.

Supplemental Support Systems

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

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 trees' 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 built on or into the ground to support the trunk or branch(s) that are oriented near the ground in a horizontal position. The prop can reduce the likelihood of failure from excessive weight or defect of the tree part being supported.

VOCABULARY

Age Class

Term	Description
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

Condition Class

Term	Description
Dead	The tree or shrub no longer has living tissue to sustain growth. Alternatively, the current decline is so severe the tree or shrub looks visually dead although there may be some living tissue left; however, there are no mitigation options that would be able to improve health and condition to an acceptable level.
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 and Shrub Work Phase takes into consideration tree species, condition, location, age, and proximity to infrastructure. We intended for this rating system to assist decision-makers in prioritizing their tree care needs. Prioritization does not take into account any budgetary or financial considerations.

The phase is based on observations by the consulting arborist according to the manager's goals. The following additional information clarifies each priority:

Term	Description
ASAP	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, and/or parts that are currently in conflict with infrastructure.
Phase 2	Typically addressed in the second management cycle. Trees with moderate aesthetic value 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.

* 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.

Term	Description
Maintenance	This goal typically requires routine pruning of large/mature . Includes branch removal and/or branch reduction to help reduce likelihood of failure 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 . 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 . Includes reduction and/or shearing to its desired shape, size, and/or structure.
Specialized	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.

Tree Risk Assessment

Tree risk assessment has a unique set of terminology with specific meanings. A complete list of tree risk vocabulary and procedures may be found in the International Society of Arboriculture's (ISA) Best Management Practice (BMP) for Tree Risk Assessment or the American National Standards Institute (ANSI) A300 Tree Risk Assessment Standard. The following information is provided to assist the owner/client with understanding some of the common industry phrases or language, and some of the procedures and methodologies associated with the industry language used in the proposal and/or report.

Tree Risk Assessment Vocabulary

Reevaluation interval is the recommended amount of time between inspections.

Reassessment interval is the recommended amount of time between assessments.

Occupancy rates categorize the estimated time a target is physically within a target zone. Occupancy rate is classified as rare, occasional, frequent, or constant.

Overall risk rating is the highest individual risk identified for the tree.

Time frame is the period the assessor uses in which to estimate the likelihood of failure in all categories except the "imminent" category. The use of a time frame is meant solely to help the assessor better determine the portions of the risk analysis which are time dependent. The owner/client should never consider the time frame a "guarantee period" for the risk assessment or that the tree will not fail or is safe within the stated time frame.

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

Target occupancy rates are typically identified based on information obtained from the owner/client prior to conducting the assessment, as well as information gained during the limited time the assessor evaluates the tree and site. Targets, target zones, and occupancy rates may be adjusted based on observations during the assessment.

Target zones are the areas where a tree or tree part is likely to land if it were to fail. The target zone(s) is determined in the field at the time of the assessment.

Risk is the likelihood of an event and its consequences.

Risk rating for a tree or tree part is the combination of the likelihood of failure, the likelihood of impact, and the consequences.

Tree Risk Assessment (cont.)

Trees can generally be defined as a woody perennial plant with a single trunk, defined crown, and will reach a minimum height of 15 feet at maturity.

Tree parts include branches, fruit, and trunks.

Tree risk is the likelihood of a tree failure impacting a target and the severity of the consequences.

Tree risk assessment is the systematic process used to identify, analyze, and evaluate tree risk. Tree risk assessments are conducted to assist the tree owner or client in better understanding the risk their trees pose so they can make management decisions to reduce or minimize those risks. Tree risk assessments focus on evaluating the structural integrity of the tree crown, branches, trunks, and roots and root collar.

Tree risk assessors are trained arborists or qualified professionals with experience in performing tree risk assessments.

Constant occupancy indicates a target is present in the target zone at nearly all times, 24 hours a day, seven days a week.

Frequent occupancy indicates a target is present in the target zone for a large portion of the day or week.

Occasional occupancy indicates a target is present in the target zone infrequently or irregularly.

Rare occupancy indicates a target zone that is not commonly used by people or other mobile/movable targets.

Imminent likelihood of failure indicates that failure has started or is most likely to occur in the near future, even if there is no significant wind or increased load.

Probable likelihood of failure indicates that failure may be expected under normal weather conditions within the specified time frame.

Possible likelihood of failure indicates that failure could occur, but is unlikely under normal weather conditions within the specified time frame.

Improbable likelihood of failure indicates that failure is not likely during normal weather conditions, and it may not fail in extreme weather conditions within the specified time frame.

Tree Risk Assessment (cont.)

High likelihood of impact indicates that a failed tree or tree part will most likely impact a target.

Medium likelihood of impact indicates the failed tree or tree part could impact the target but is not expected to do so.

Low likelihood of impact indicates that the failed tree or tree part is not likely to impact a target.

Very low likelihood of impact indicates that the likelihood of a failed tree or tree part impacting the specified target is remote.

Very likely likelihood of failure and impact to target is reached by an imminent likelihood of failure and high likelihood of impact.

Likely likelihood of failure and impact to target can be reached by an imminent likelihood of failure and medium likelihood of impact; or probable likelihood of failure and high likelihood of impact.

Somewhat likely likelihood of failure and impact to target can be reached by one of the following combinations; an imminent likelihood of failure and low likelihood of impact; probable likelihood of failure and medium likelihood of impact; or possible likelihood of failure and high likelihood of impact.

Unlikely likelihood of failure and impact to target can be reached by one of the following combinations; a possible or probable likelihood of failure and low likelihood of impact; possible likelihood of failure and medium likelihood of impact; improbable likelihood of failure with any likelihood of impact rating; or any likelihood of failure rating with very low likelihood of impact.

Severe consequences could involve serious personal injury or death, high-value property damage, or major disruption to important activities.

Significant consequences are those that could involve substantial personal injury, property damage of moderate to high value, or considerable disruption of activities.

Minor consequences are those that are believed will only cause minor personal injury, low-to-moderate-value property damage, or small disruption of activities.

Negligible consequences are those that are believed will not result in personal injury, will only involve low-value property damage, or disruptions that can be replaced or repaired.

Extreme risk applies in situations in which failure is imminent, there is a high likelihood of impacting the target, and the consequences of the failure are severe.

High risk situations are those for which consequences are significant and likelihood is very likely or likely; or consequences are severe and likelihood is likely.

Moderate risk situations are those for which consequences are minor and likelihood is very likely or likely; or likelihood is somewhat likely and consequences are significant or severe.

Low risk situations are those for which consequences are negligible and likelihood is unlikely; or consequences are minor and likelihood is somewhat likely.

EXPLANATION OF TREE RISK LEVELS

The three levels of tree risk assessment defined in the *ANSI A300 Tree Risk Assessment Standard* are:

Level 1: Limited Visual Assessment

This level of assessment provides a visual assessment from a defined perspective (e.g., from the sidewalk, street, or aerial view) of an individual tree or population of trees to assess risk to specified targets from obvious defects or specified conditions. Level 1 assessments are typically performed to quickly assess large populations of trees or conduct a rapid assessment of an individual tree. The assessor views only one side of the tree while walking on a sidewalk, being unable to access a neighboring property, looking from a slow-moving car, or from above with a drone, helicopter, or airplane. A Level 1 assessment requires the client to identify the location and/or selection criteria of trees to be assessed. The assessor may:

1. Determine the most efficient route and document the route taken.
2. Assess the tree(s) within the area from the defined perspective (e.g., walk-by or drive-by).
3. Record the location of trees that meet the defined criteria (e.g., significant defects or other conditions of concern).
4. Evaluate the risk (risk rating is optional).
5. Identify trees requiring a higher level of assessment (Level 2 or Level 3) and/or prompt action.
6. Submit risk mitigation recommendations and/or a report.

Limitations: Level 1 assessments are the least thorough means of assessment. They are typically from one perspective, such as a walk-by, a drive-by, or aerial view. This level of assessment is most commonly used to prioritize higher-risk trees within larger groups of trees when there are budgetary, time, or other management constraints. Some defects or conditions will not be visible to the tree risk assessor, nor will all conditions visible at all times of the year; therefore, not all higher-risk trees will be accurately identified. In addition, the assessment may not provide enough information to assign a risk rating, make a risk mitigation recommendation, or determine residual risk.

Explanation of Tree Risk Levels (cont.)

Level 2: Basic Assessment

A Level 2 assessment is a detailed visual inspection of a tree and its surrounding site and a synthesis of the information collected. It requires a 360° ground-based inspection around a tree, including the site conditions, visible buttress roots, trunk, branches, and crown. The Level 2 assessment may include using tools such as binoculars, mallet, or probe at the discretion of the assessor or at the request of the owner/client. At this level, the assessor may:

1. Locate and identify the tree or trees to be assessed.
2. Determine the targets and target zone for the tree or tree part(s) of concern.
3. Review the site history and conditions, and species failure profile.
4. Assess potential load on the tree and its parts.
5. Assess general tree health.
6. Inspect the tree visually which may include the use of common tools such as binoculars, mallet, probes, and/or shovels, as specified in the Scope of Work.
7. Record observations of site conditions, defects, indicators of internal defects, and response growth.
8. If necessary, recommend a Level 3 advanced assessment.
9. Analyze data to determine the likelihood of failure, likelihood of impact, and consequences of failure to evaluate the degree of risk.
10. Develop mitigation options and estimate residual risk for each option.
11. Recommend a re-assessment interval.
12. Prepare and submit a report.

Limitations: Level 2 assessments only include conditions and defects that can be detected from a ground-based visual observation on the day of the assessment. Below-ground, internal, or upper-crown conditions, decay, and defects may not be detected.

Explanation of Tree Risk Levels (cont.)

Level 3: Advanced Assessment

A Level 3 assessment is performed to provide detailed information about specific tree parts, defects, targets, or site conditions. These are usually conducted in conjunction with or after a Level 2 assessment with owner/client approval. Specialized equipment, data collection and analysis, and/or expertise are usually required for Level 3 assessments. At this level, the assessor may:

1. Locate and identify the tree or trees to be assessed.
2. Determine the targets and target zone for the tree or tree part(s) of concern.
3. Review the site history and conditions, and species failure profile.
4. Assess potential load on the tree and its parts.
5. Assess general tree health.
6. Inspect the tree and/or site using advanced techniques as specified in the Scope of Work.
7. Record results from advanced techniques.
8. Analyze data to determine the likelihood of failure, likelihood of impact, and consequences of failure to evaluate the degree of risk.
9. Develop mitigation options and estimate residual risk for each option.
10. Recommend a re-assessment interval.
11. Recommend other advanced assessments, if necessary.
12. Prepare and submit a report.

*Items 1-5 may be included in the associated Level 2 assessment.

Explanation of Tree Risk Levels (cont.)

Level 3: Advanced Assessment (continued)
Procedures and Methodologies (technologies) Often Used for Level 3 Assessments

- Aerial assessment and evaluation of structural defects in upper stems and branches
  - visual observation from the crown or from a lift
  - unmanned aerial vehicle (UAV) photographic inspection
  - decay testing of branches
- Detailed target analysis
  - property value of anything potentially impacted by tree failure
  - use and occupancy statistics
  - potential disruption of activities such as road blockage or an electrical outage
- Detailed site evaluation
  - history evaluation
  - soil profile review to determine root depth
  - soil mineral and structural testing
- Root observation and evaluation
  - root and root collar excavation
  - root decay evaluation
  - ground-penetrating radar
- Decay and wood analysis
  - increment boring
  - drilling with small-diameter bit
  - resistance-recording drilling
  - single path sonic (stress) wave
  - sonic tomography
  - electrical impedance tomography
  - radiation (radar, X-ray)
  - advanced analysis for pathogen identification
- Health evaluation
  - • tree ring analysis (in temperate zone)
  - • shoot length measurement
  - • detailed health/vigor analysis
  - • starch assessment
- Storm/wind load analysis
  - detailed assessment of tree exposure and protection
  - computer-based estimations according to engineering models
  - wind reaction monitoring over a defined interval
- Measuring and assessing the change in trunk lean
  - visual documentation
  - digital level
- Load testing
  - hand pull
  - measured static pull
  - measured tree dynamics

Limitations: Level 3 assessments that include specialized technologies may have uncertainty and require qualified estimations. Exact measures may not be feasible.

Conclusion

Regardless of the level of assessment conducted, every assessment is limited to the trees identified in the scope of work, conditions detectable at the time of the assessment, the level of communication with the owner/client, and other conditions that affect the assessor's ability to collect information. Not all defects and conditions are detectable, and not all tree failures can be predictable. Trees are living organisms, and as such, every tree's structural conditions change over time.

EXPLANATION OF ESTIMATED TREE ASSET VALUE

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 table to the right contains the data fields used in this formula.

Estimated Tree Asset Value =
(Average Per Square Inch Nursery Price*Size)*Species Factor*Condition Factor*Location Factor

Term	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%

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