Tree Inventory Summary Report

City of Oxford, Mississippi

November 2017

Prepared for:
City of Oxford
107 Courthouse Square
Oxford, Mississippi 38655

Prepared by:
Davey Resource Group
A Division of The Davey Tree Expert Company
1500 North Mantua Street
Kent, Ohio 44240
800-828-8312

DAVEY RESOURCE GROUP
A Division of The Davey Tree Expert Company

Acknowledgments

The City of Oxford's vision to promote and preserve the urban forest and improve the management of public trees was a fundamental inspiration for this project. This vision will ensure canopy continuity, which will reduce stormwater runoff and improve air quality, public health, and aesthetic values.

The City of Oxford is thankful for the grant funding it received from the Mississippi Forestry Commission in cooperation with U.S. Forest Service and the Department of Agriculture through its Urban and Community Forestry (U&CF) Grant Program. The U&CF Grant Program is designed to encourage communities to create and support long-term and sustained urban and community forestry programs throughout Mississippi.

THE CITY OF
OXFORD

Executive Summary

The City of Oxford commissioned an inventory and assessment of trees and stumps located within public street rights-of-way (ROW), as well as two city parks and the cemetery. Understanding an urban forest's structure, function, and value can promote management decisions that will improve public health and environmental quality. Davey Resource Group collected and analyzed the inventory data to understand species composition and tree condition and to generate maintenance recommendations. Tree values and benefits have been quantified using the i-Tree Streets benefits model (developed by the United States Department of Agriculture Forest Service in partnership with The Davey Tree Expert Company). This report will discuss the health and benefits of the inventoried street tree population throughout the City of Oxford.

Key Findings

- The overall condition of the tree population is Good.
- The most common species are: *Lagerstroemia indica* (crapemyrtle), 23%; *Pinus taeda* (loblolly pine), 6%; *Juniperus virginiana* (eastern redcedar), 5%; *Quercus phellos* (willow oak), 4%; and *Pinus elliottii* (slash pine), 4%.
- The vast majority (63%) of the urban forest is in the young, 0–8 inches DBH class.
- Approximately 83% of the population is recommended for a Tree Clean, 12% is recommended for a Young Tree Training Prune, and 5% is recommended for Removal.
- Oxford's tree population provides approximately $318,570 in the following annual benefits:
    - *Aesthetic and Other Tangible Benefits*: valued at $158,800 per year.
    - *Air Quality*: valued at $15,840 per year.
    - *Net Total Carbon Sequestered and Avoided*: 607.5 tons valued at $8,740 per year.
    - *Energy*: 334.3 megawatt-hours (MWh) and 11,700 therms valued at $37,630 per year.
    - *Stormwater:* 9,852,900 gallons valued at $97,540 per year.

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Section 1: Tree Inventory Assessment

Project Area

In October 2017, Davey Resource Group arborists assessed and inventoried trees and stumps along the street ROW in the City of Oxford. Lamar Park, Avent Park, and the cemetery were also chosen to be a part of the inventory. See Appendix A for an overview of the site location methodology used in the inventory and assessment.

Species Diversity

Throughout Oxford's City, 7,106 sites were inventoried, including 6,992 trees and 114 stumps. Figure 1 shows the composition of the most populous species compared to all inventoried species. The composition of a tree population should follow the 10-20-30 Rule for species diversity: a single species should represent no more than 10% of the urban forest, a single genus no more than 20%, and a single family no more than 30%.

Of the species found within the inventory in Oxford, crapemyrtle is the only species that exceeds the 10% threshold (comprising 23% of the inventoried population). Loblolly pine was the next largest, comprising only 6% of the total inventoried population.

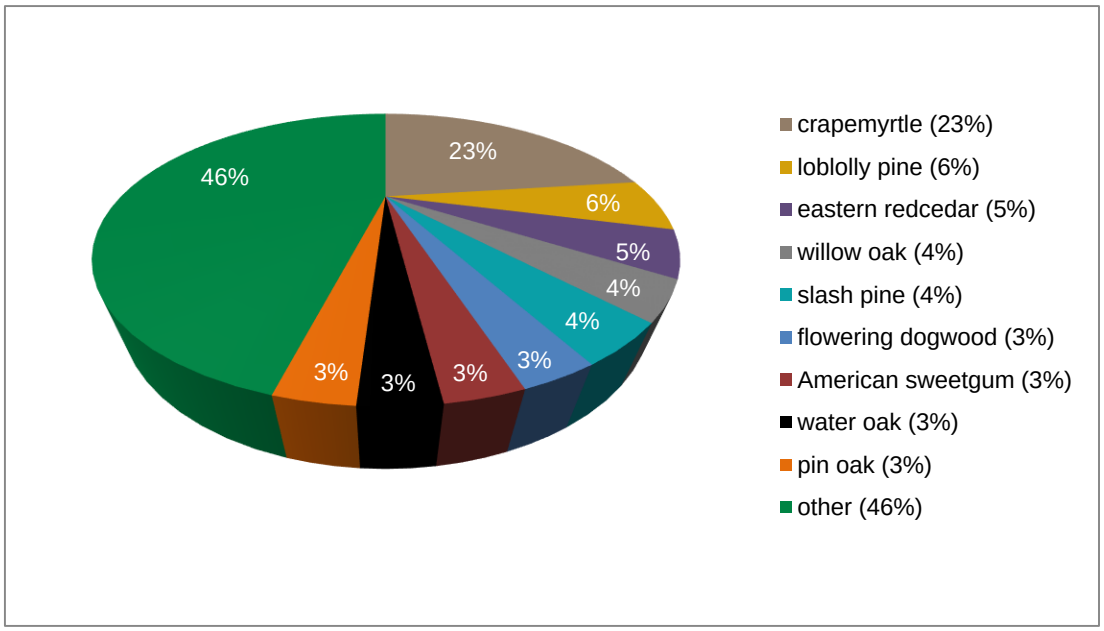
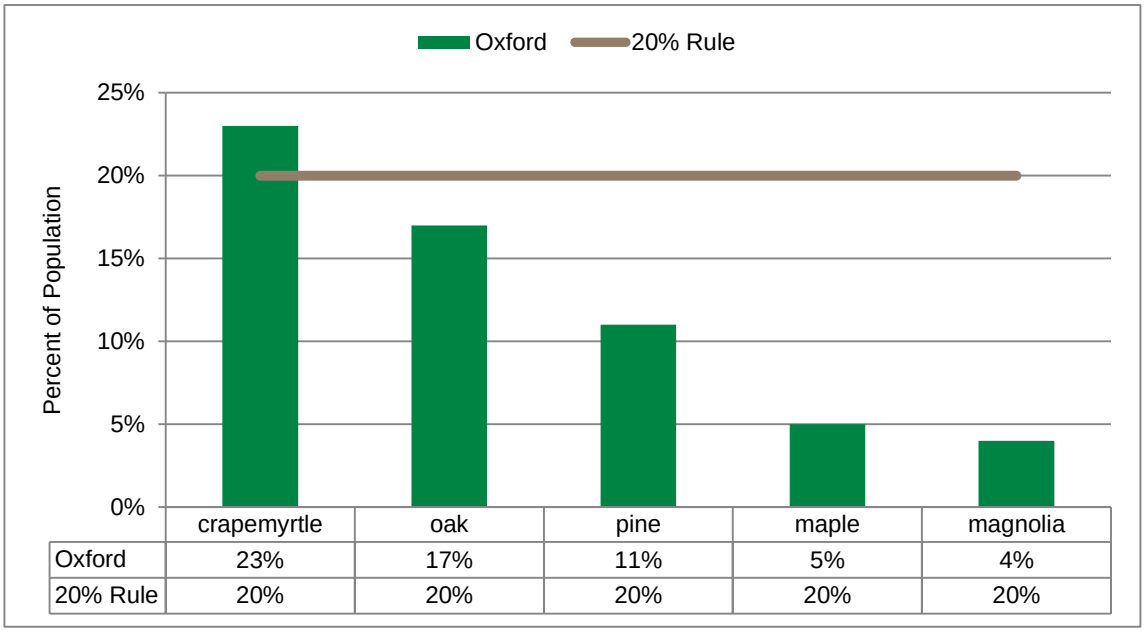


Figure 1. Tree species composition in Oxford, Mississippi.

Figure 2 compares the percentages of the most common genera identified during the inventory to the 20% Rule. *Lagerstroemia* (crapemyrtle) exceeds the recommended 20% threshold for a single genus in a population. Crapemyrtle comprises 23% of the inventoried tree population.



	crapemyrtle	oak	pine	maple	magnolia
Oxford	23%	17%	11%	5%	4%
20% Rule	20%	20%	20%	20%	20%

Figure 2. Top five genera in Oxford, Mississippi, in relation to the 20% Rule.

Diameter Size Class Distribution

Analyzing the diameter size class distribution (measured as diameter at breast height [DBH]) provides an estimate of the relative age of a tree population and lends insight into maintenance practices and needs.

The inventoried trees were categorized into the following diameter size classes: young trees (0–8 inches DBH); established trees (9–17 inches DBH); maturing trees (18–24 inches DBH); and mature trees (greater than 24 inches DBH). These categories were chosen so that the population could be analyzed following Richards' ideal distribution (1983). Richards proposed an ideal diameter size class distribution for street trees based on observations of well-adapted trees in Syracuse, New York. Richards' ideal distribution suggests that the largest fraction of trees (approximately 40% of the population) should be young (less than 8 inches DBH), while a smaller fraction (approximately 10%) should fall in the large-diameter size class (greater than 24 inches DBH). A tree population with an ideal distribution would have an abundance of newly planted and young trees, and lower numbers of established, maturing, and mature trees.

Figure 3 compares Oxford's inventoried street ROW tree diameter size class distribution to the ideal proposed by Richards (1983). Oxford's distribution trends toward the ideal; however, established, maturing, and mature trees fall short of the ideal by 11%, 9%, and 3%, respectively. As the urban forest in Oxford ages, this ideal will begin to balance out. Continued tree planting, care, and maintenance of the young and established tree population will help achieve a more sustainable size distribution of street trees in Oxford.

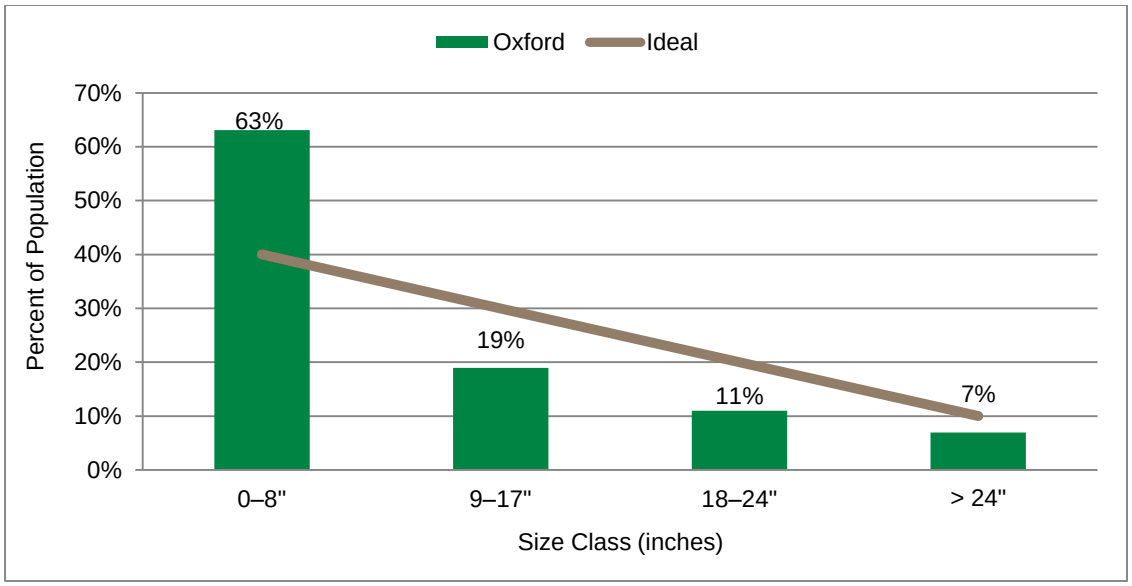


Figure 3. Age class distribution compared to Richards' (1983) ideal.

Condition

Several factors were considered for the condition of each tree, including root characteristics, branch structure, trunk, canopy, foliage condition, and the presence of pests. The condition of each inventoried tree was rated Excellent, Very Good, Good, Fair, Poor, Critical, or Dead.

Most of the inventoried ROW trees were recorded to be in Good or Fair condition, 79% and 15%, respectively (Figure 4). Based on these data, the general health of the overall inventoried tree population is rated Good.

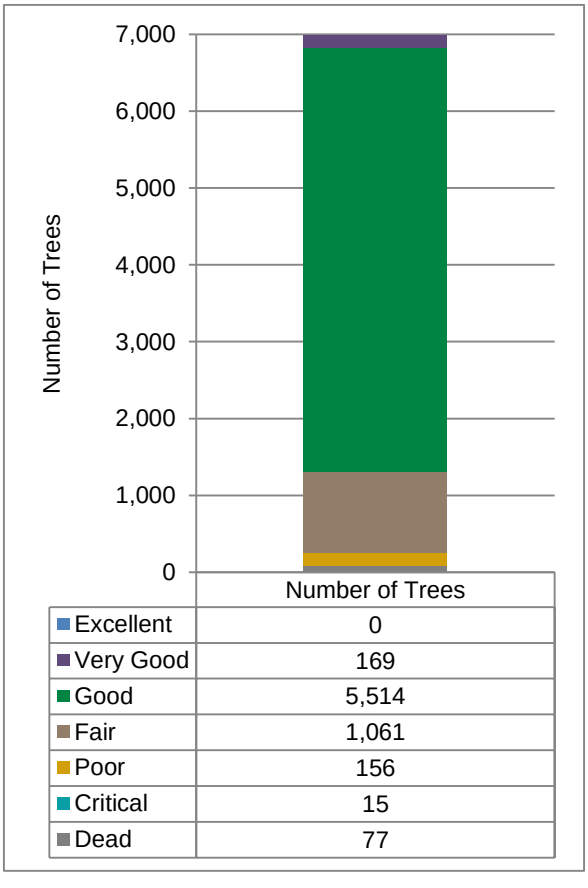


Figure 4. Overall condition of the population.

Figure 5 illustrates the general condition of the urban forest in relation to the relative age classes. The majority of young, established, maturing, and mature trees were rated to be in Good to Excellent condition. With proactive care and an established maintenance schedule, the city can improve the long-term health of its urban forest.

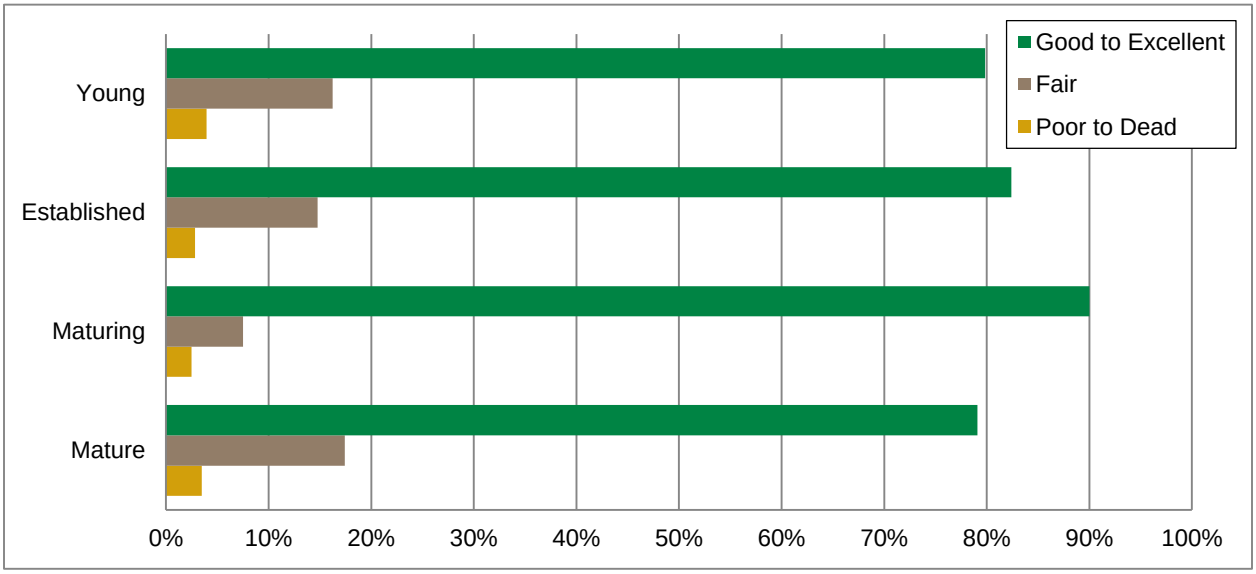


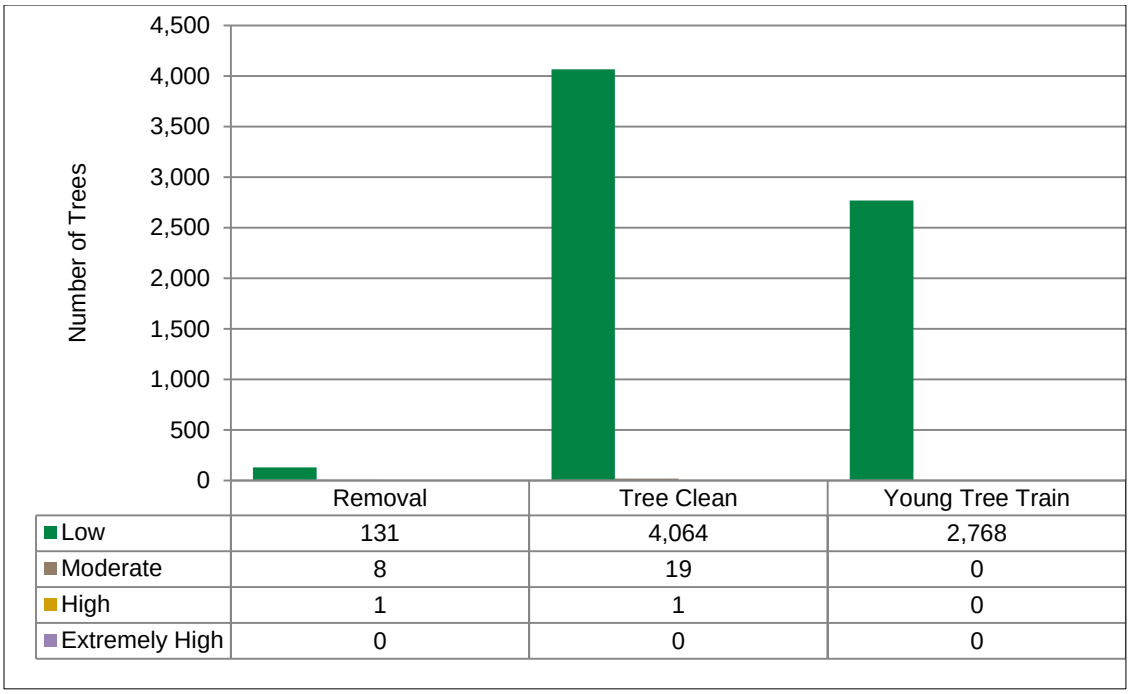
Figure 5. Tree condition by age class.

Primary Maintenance and Risk

Primary maintenance refers to the task identified for a tree or site: Removal, Tree Clean, or Young Tree Train. Risk is a graduated scale that measures potential tree-related hazardous conditions. A tree is considered hazardous when its potential risks exceed an acceptable level.

Davey Resource Group based the maintenance recommendations and risk values (Figure 6) on the evaluation of species, diameter class, condition, impact of hazard, and defects found in each individual tree. Identifying and ranking the maintenance needs of a tree population enable tree work to be assigned priority based on observed defects. Once prioritized, tree work can be systematically addressed to eliminate the greatest risk and liability first (Stamen 2011).

Based on the inventoried population in Oxford, the following maintenance recommendations should be implemented: 140 removals, 4,064 Tree Cleans, and 2,768 Young Tree Trains. Figure 6 illustrates the risk values associated with each maintenance need.



	Removal	Tree Clean	Young Tree Train
Low	131	4,064	2,768
Moderate	8	19	0
High	1	1	0
Extremely High	0	0	0

Figure 6. Maintenance needs by risk rating.

Section 2: i-Tree Streets Benefits

The i-Tree Streets application was used to assess the inventoried trees. This management and analysis tool uses tree inventory data to quantify the dollar value of annual environmental and aesthetic benefits provided by trees, including energy conservation, air quality improvement, carbon dioxide (CO_2) reduction, stormwater control, and increases in property value. The tool estimates the costs and benefits of a street tree population and creates annual benefit reports that reflect the value street trees provide to a community.

The inventoried urban forest of Oxford provides an annual benefit of approximately $318,550 in energy savings, overall air quality improvements, carbon dioxide removal, stormwater reduction, and aesthetic and other tangible benefits. More detailed information about annual benefit analysis reports and maintenance reports can be found in Appendix B.

Table 1 provides a breakdown of the annual benefits provided to Oxford and the City of Oxford.

Table 1. Annual Benefits Provided by Inventoried Tree Population

Benefits	Total ($)	Percent of Total
Aesthetics/Other	158,800	49.9
Air Quality	15,840	5.0
Carbon Dioxide	8,740	2.7
Energy	37,630	11.8
Stormwater	97,540	30.6
ROW Trees Total	318,550	100

Trees and Energy Use

Public trees conserve energy by shading structures and surfaces, reducing electricity use for air conditioning in the summer, and diverting wind in the winter to reduce natural gas use. Based on the inventoried trees, the annual electric and natural gas savings are equivalent to 334.3 MWh of electricity and 11,700 therms of natural gas. When converted into monetary values using default economic data, this accounts for an annual savings of $37,630 in energy consumption. Large leafy canopies provide greater reductions in energy use by providing shade and natural wind barriers. In contrast, smaller trees tend to result in smaller reductions in energy usage.

Table 2. Annual Energy Savings Provided by Inventoried Tree Population

Total Electricity (MWh)	Total Natural Gas (Therms)	Total ($)	Avg. $/Tree
334.3	11,700	37,630	5.38

Air Quality Improvements

The inventoried tree population annually removes 3,190 pounds of air pollutants (including ozone, nitrogen dioxide, sulfur dioxide, and particulate matter) through deposition. The specified street tree population provides a total annual benefit of $15,840 in overall air quality improvements. Each tree provides an average of $2.27 in annual benefits.

Table 3. Annual Air Quality Benefits Provided by Inventoried Tree Population

Net Total Avoided/Deposition (lbs)	Total ($)	Avg. $/tree
3,190	15,840	2.27

Carbon Dioxide Removal

Trees store some of the CO_2 they absorb, thereby preventing it from reaching the upper atmosphere where it can react with other compounds and form harmful gases like ozone, which adversely affect air quality.

The i-Tree Street analysis found that the specified street trees in Oxford have stored 1,215,000 pounds of carbon (measured in CO_2 equivalents). This amount is equal to the amount of carbon these trees have amassed during their lifetime. Through sequestration and avoidance, 19,768 pounds of CO_2 are removed on an annual basis. The inventoried trees provide an annual carbon benefit of $8,740 with a per-tree average of $1.25.

Table 4. Annual Carbon Dioxide Benefits Provided by Inventoried Tree Population

Net Total CO_2 Sequestered/Avoided - Released (lbs.)	Total ($)	Avg. $/tree
1,215,000	8,740	1.25

Stormwater Interception and Mitigation

Trees intercept rainfall, which reduces costs to manage stormwater runoff. Oxford's inventoried trees intercept 9,852,900 gallons of rainfall annually. The estimated average savings for Oxford and the City of Oxford in stormwater management is approximately $97,540 per year. On average, each tree provides an annual stormwater benefit of $13.95.

Table 5. Annual Stormwater Benefits Provided by Inventoried Tree Population

Total Rainfall Interception (gal.)	Total ($)	Avg. $/tree
9,852,900	97,540	13.95

Aesthetic/Other Benefits

The total annual benefit associated with property value increases and other tangible and intangible services trees provide is $158,800. Each tree provided an average benefit of $22.71.

Table 6. Annual Aesthetic and Other Tangible Benefits Provided by Inventoried Tree Population

Total ($)	Avg. $/tree
158,800	22.71

Conclusion and Recommendations

Managing trees in urban areas is often complicated. Navigating the recommendations of experts, the needs of residents, the pressures of local economics and politics, concerns for public safety and liability, physical components of trees, forces of nature and severe weather events, and the expectation that these issues are resolved all at once is a considerable challenge.

The City of Oxford must carefully consider these challenges to fully understand the needs of maintaining an urban forest. By completing a tree inventory, the city has shown interest in preserving the urban forest, but also maintaining it for future generations. If the city successfully implements established planting and maintenance programs that include Young Tree Training, Routine Pruning, and public outreach, the health and safety of Oxford' trees and residents will be maintained for years to come.

Oxford's urban forest is in Good condition and provides $318,550 in annual benefits. With continued dedication to its street tree resource, the city can improve the condition and diversity of its trees and increase the annual benefits they provide.

Glossary

Aesthetic/Other Report: The i-Tree Streets Aesthetic/Other Report presents the tangible and intangible benefits of trees reflected in increases in property values in dollars ($).

Air Quality Report: The i-Tree Streets Air Quality Report quantifies the air pollutants (ozone [O_3], nitrogen dioxide [NO_2], sulfur dioxide [SO_2], coarse particulate matter less than 10 micrometers in diameter [PM_{10}]) deposited on tree surfaces, and reduced emissions from power plants (NO_2, PM_{10}, Volatile Oxygen Compounds [VOCs], SO_2) due to reduced electricity use measured in pounds (lbs.). Also reported are the potential negative effects of trees on air quality due to Biogenic Volatile Organic Compounds (BVOC) emissions.

arboriculture: The art, science, technology, and business of commercial, public, and utility tree care.

canopy: Branches and foliage that make up a tree's crown.

Carbon Dioxide Report: The i-Tree Streets Carbon Dioxide Report presents annual reductions in atmospheric CO_2 due to sequestration by trees and reduced emissions from power plants due to reduced energy use in pounds. The model accounts for CO_2 released as trees die and decompose and CO_2 released during the care and maintenance of trees.

clean (primary maintenance need): Based on *ANSI A300 (Part 1)* standards, selective removal of dead, dying, broken, and/or diseased wood to minimize potential risk.

community forest: see **urban forest**.

condition (data field): The general condition of each tree rated during the inventory according to the following categories adapted from the International Society of Arboriculture's rating system: Excellent (100%), Very Good (90%), Good (80%), Fair (60%), Poor, (40%), Critical (20%), Dead (0%).

diameter at breast height (DBH): See **tree size**.

diameter: See **tree size**.

Energy Report: The i-Tree Streets Energy Report presents the contribution of the urban forest toward conserving energy in terms of reduced natural gas use in winter measured in therms [th] and reduced electricity use for air conditioning in summer measured in megawatt-hours (MWh).

failure: In terms of tree management, failure is the breakage of stem or branches, or loss of mechanical support of the tree's root system.

genus: A taxonomic category ranking below a family and above a species and generally consisting of a group of species exhibiting similar characteristics. In taxonomic nomenclature, the genus name is used, either alone or followed by a Latin adjective or epithet, to form the name of a species.

geographic information system (GIS): A technology that is used to view and analyze data from a geographic perspective. The technology is a piece of an organization's overall information system framework. GIS links location to information (such as people to addresses, buildings to parcels, or streets within a network) and layers that information to give you a better understanding of how it all interrelates.

global positioning system (GPS): GPS is a system of earth-orbiting satellites that makes it possible for people with ground receivers to pinpoint their geographic location.

High Risk tree: Tree that cannot be cost-effectively or practically treated. Most High Risk trees have multiple or significant defects affecting less than 40% of the trunk, crown, or critical root zone. Defective trees and/or tree parts are most likely between 4–20 inches in diameter and can be found in areas of frequent occupation, such as a main thoroughfare, congested streets, and/or near schools.

Importance Values: A calculation in i-Tree Streets. Importance Values (IV) are displayed in table form for all species that make up more than 1% of the population. The Streets IV is the mean of three relative values (percentage of total trees, percentage of total leaf area, and percentage of canopy cover) and can range from 0 to 100 with an IV of 100 suggesting total reliance on one species. IVs offer valuable information about a community's reliance on certain species to provide functional benefits. For example, a species might represent 10% of a population, but have an IV of 25% because of its great size, indicating that the loss of those trees due to pests or disease would be more significant than their numbers suggest.

inventory: See **tree inventory**.

i-Tree Streets: i-Tree Streets is a street tree management and analysis tool that uses tree inventory data to quantify the dollar value of annual environmental and aesthetic benefits: energy conservation, air quality improvement, CO_2 reduction, stormwater control, and property value increase.

i-Tree Tools: State-of-the-art, peer-reviewed software suite from the USDA Forest Service that provides urban forestry analysis and benefits assessment tools. The i-Tree Tools help communities of all sizes to strengthen their urban forest management and advocacy efforts by quantifying the structure of community trees and the environmental services that trees provide.

Low Risk tree: Tree with minor visible structural defects or wounds in areas with moderate to low public access.

mapping coordinate (data field): Helps to locate a tree; X and Y coordinates were generated for each tree using GPS.

Moderate Risk tree: Tree with defects that may be cost-effectively or practically treated. Most of the trees in this category exhibit several moderate defects affecting more than 40% of a tree's trunk, crown, or critical root zone.

monoculture: A population dominated by one single species or very few species.

Net Annual Benefits: Specific data field for i-Tree Streets. Citywide benefits and costs are calculated according to category and summed. Net benefits are calculated as benefits minus costs.

Nitrogen Dioxide (NO_2): Nitrogen dioxide is a compound typically created during the combustion processes and is a major contributor to smog formation and acid deposition.

Ozone (O_3): A strong-smelling, pale blue, reactive toxic chemical gas with molecules of three oxygen atoms. It is a product of the photochemical process involving the Sun's energy. Ozone exists in the upper layer of the atmosphere as well as at the Earth's surface. Ozone at the Earth's surface can cause numerous adverse human health effects. It is a major component of smog.

Particulate Matter (PM_{10}): A major class of air pollutants consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and mists.

primary maintenance need (data field): The type of tree work needed to reduce immediate risk.

pruning: The selective removal of plant parts to meet specific goals and objectives.

removal (primary maintenance need): Data field collected during the inventory identifying the need to remove a tree. Trees designated for removal have defects that cannot be cost-effectively or practically treated. Most of the trees in this category have a large percentage of dead crown.

right-of-way (ROW): See **street right-of-way**.

risk: Combination of the probability of an event occurring and its consequence.

risk assessment (data fields): The risk assessment is a point-based assessment of each tree by an arborist using a protocol based on the U.S. Forest Service Community Tree Risk Rating System. In the field, the probability of tree or tree part failure is assigned 1–4 points (identifies the most likely failure and rates the likelihood that the structural defect(s) will result in failure based on observed, current conditions); the size of defective tree part is assigned 1–3 points (rates the size of the part most likely to fail); the probability of target impact by the tree or tree part is assigned 1–3 points (rates the use and occupancy of the area that would be struck by the defective part); and other risk factors are assigned 0–2 points (used if professional judgment suggests the need to increase the risk rating). The data from the risk assessment is used to calculate the risk rating that is ultimately assigned to the tree.

risk rating: Calculated from the field risk assessment data (see **risk assessment**), this is the sum of total risk assessment values. Risk ratings range from 3–10, with 3 being the lowest risk and 10 being the highest risk. In this Plan, the risk rating was used to identify the severity of risk assigned to a tree and to prioritize tree maintenance needs. The following categories were used:

- risk rating of 9 or 10 = Severe Risk tree
- risk rating of 7 or 8 = High Risk tree
- risk rating of 5 or 6 = Moderate Risk tree
- risk rating of 3 or 4 = Low Risk tree
- risk rating of 0 = no risk (used only for planting sites and stumps)

secondary maintenance need (data field): Recommended maintenance for a tree, which may be risk oriented, such as raising the crown for clearance, but generally was geared toward improving the structure of the tree and enhancing aesthetics.

Severe Risk tree: Tree rated to be Severe Risk cannot be cost-effectively or practically treated. Most Severe Risk trees have multiple and significant defects present in the trunk, crown, or critical root zone. Defective trees and/or tree parts are most likely larger than 20 inches in diameter and can be found in areas of frequent occupation, such as a main thoroughfare, congested streets, and/or near schools.

species: Fundamental category of taxonomic classification, ranking below a genus or subgenus, and consisting of related organisms capable of interbreeding.

stem: A woody structure bearing buds and foliage, and giving rise to other stems.

stems (data field): Identifies the number of stems or trunks splitting less than 1 foot above ground level.

Stored Carbon Report: Whereas, the i-Tree Streets Carbon Dioxide Report quantifies annual CO_2 reductions, and the i-Tree Streets Stored Carbon Report tallies all of the Carbon (C) stored in the urban forest over the life of the trees as a result of sequestration measured in pounds as the CO_2 equivalent.

Stormwater Report: A report generated by i-Tree Streets that presents the reductions in annual stormwater runoff due to rainfall interception by trees measured in gallons (gals.).

street name (data field): The name of a street right-of-way or road identified using posted signage or parcel information.

street right-of-way (ROW): A strip of land generally owned by a public entity over which facilities, such as highways, railroads, or power lines, are built.

street tree: A street tree is defined as a tree within the right-of-way.

structural defect: A feature, condition, or deformity of a tree or tree part that indicates weak structure and contributes to the likelihood of failure.

stump removal (primary maintenance need): Indicates a stump that should be removed.

Sulfur Dioxide (SO_2): A strong-smelling, colorless gas that is formed by the combustion of fossil fuels. Sulfur oxides contribute to the problem of acid rain.

Summary Report: The i-Tree Streets Summary report presents the annual total of energy, stormwater, air quality, carbon dioxide, and aesthetic/other benefits. Values are dollars per tree or total dollars.

tree benefit: An economic, environmental, or social improvement that benefits the community and results mainly from the presence of a tree. The benefit received has real or intrinsic value associated with it.

tree inventory: Comprehensive database containing information or records about individual trees typically collected by an arborist.

tree size (data field): A tree's diameter measured to the nearest inch in 1-inch size classes at 4.5 feet above ground, also known as diameter at breast height (DBH) or diameter.

tree: A tree is defined as a perennial woody plant that may grow more than 20 feet tall. Characteristically, it has one main stem, although many species may grow as multi-stemmed forms.

urban forest: All of the trees within a municipality or a community. This can include the trees along streets or rights-of-way, in parks and greenspaces, in forests, and on private property.

Volatile Organic Compounds (VOCs): Hydrocarbon compounds that exist in the ambient air and are by-products of energy used to heat and cool buildings. Volatile organic compounds contribute to the formation of smog and/or are toxic. Examples of VOCs are gasoline, alcohol, and solvents used in paints.

Young Tree Train (primary maintenance need): Data field based on *ANSI A300 (Part 1)* standards, pruning of young trees to correct or eliminate weak, interfering, or objectionable branches to improve structure. These trees, up to 20 feet in height, can be worked with a pole pruner by a person standing on the ground.

References

Richards, N.A. 1983. "Diversity and Stability in a Street Tree Population." *Urban Ecology* 7(2):159–171.

Stamen, R.S. "Understanding and Preventing Arboriculture Lawsuits." Presented at the Georgia Urban Forest Council Annual Meeting, Madison, Georgia, November 2–3, 2011.

Appendix A
Site Location Methods

Data Collection Methods

Davey Resource Group collected tree inventory data using a system that utilizes a customized ArcPad program loaded onto pen-based field computers equipped with geographic information system (GIS) and global positioning system (GPS) receivers. The knowledge and professional judgment of Davey Resource Group's arborists ensure the high quality of inventory data.

Data fields are defined in the glossary of the Summary Report. At each site, the following data fields were collected:

- aboveground utilities
- block side
- condition
- further inspection
- location
- primary maintenance needs
- mapping coordinates
- observations
- notes
- risk assessment
- risk rating
- species
- stems
- tree height
- tree size*

* measured in inches in diameter at 4.5 feet above ground (or diameter at breast height [DBH])

Maintenance needs are based on ANSI A300 (Part 1) (ANSI 2008). Risk assessment and risk rating are based on *Best Management Practices: Tree Risk Assessment* (International Society of Arboriculture [ISA] 2011).

The data collected were provided in an ESRI® shapefile, Access™ database, and Microsoft Excel™ spreadsheet on a CD-ROM that accompanies this report.

Site Location Methods

Equipment and Base Maps

Inventory arborists use FZ-G1 Panasonic Toughpad® unit(s).

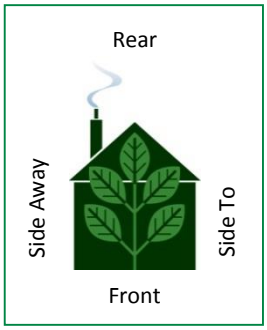
Base map layers were loaded onto these unit(s) to help locate sites during the inventory. Table 1 lists the base map layers, utilized along with source and format information for each layer.

Base Map Layers Utilized for Inventory

Imagery/Data Source	Date	Projection
The City of Oxford Planning Department Judy Daniel (City Planner)	2016-2017 NAD 1983 StatePlane, Mississippi East; Feet	

Street ROW Site Location

Individual street ROW sites (trees or stumps) were located using a methodology that identifies sites by *address number, street name*, and *side*. This methodology was developed by Davey Resource Group to help ensure consistent assignment of location.



Side values for street ROW sites.

Address Number and Street Name

The *address number* was recorded based on visual observation by the arborist at the time of the inventory (the address number was posted on a building at the inventoried site). Where there was no posted address number on a building, or where the site was located by a vacant lot with no GIS parcel addressing data available, the arborist used his/her best judgment to assign an address number based on opposite or adjacent addresses. An "X" was then added to the number in the database to indicate that it was assigned (for example, "37X Choice Avenue").

Sites in medians or islands were assigned an address number using the address on the right side of the street in the direction of collection closest to the site. Each segment was numbered with an assigned address that was interpolated from addresses facing that median/island. If there were multiple median/islands between cross streets, each segment was assigned its own address.

The **street name** assigned to a site was determined by street ROW parcel information and posted street name signage.

Side Value and Site Number

Each site was assigned a *side value*. Side values include: *front*, *side*, *median* (includes islands), or *rear* based on the site's location in relation to the lot's street frontage (Figure above). The *front side* is the side that faces the address street. *Side* indicates the site is on the side of the property. *Median* indicates a median or island. The *rear* is the side of the lot opposite the front.

Block Side

Block side information for a site includes the *on street*.

- The *on street* is the street on which the site is located. The *on street* may not match the address street. A site may be physically located on a street that is different from its street address (i.e., a site located on a side street).

Park and/or Public Space Site Location

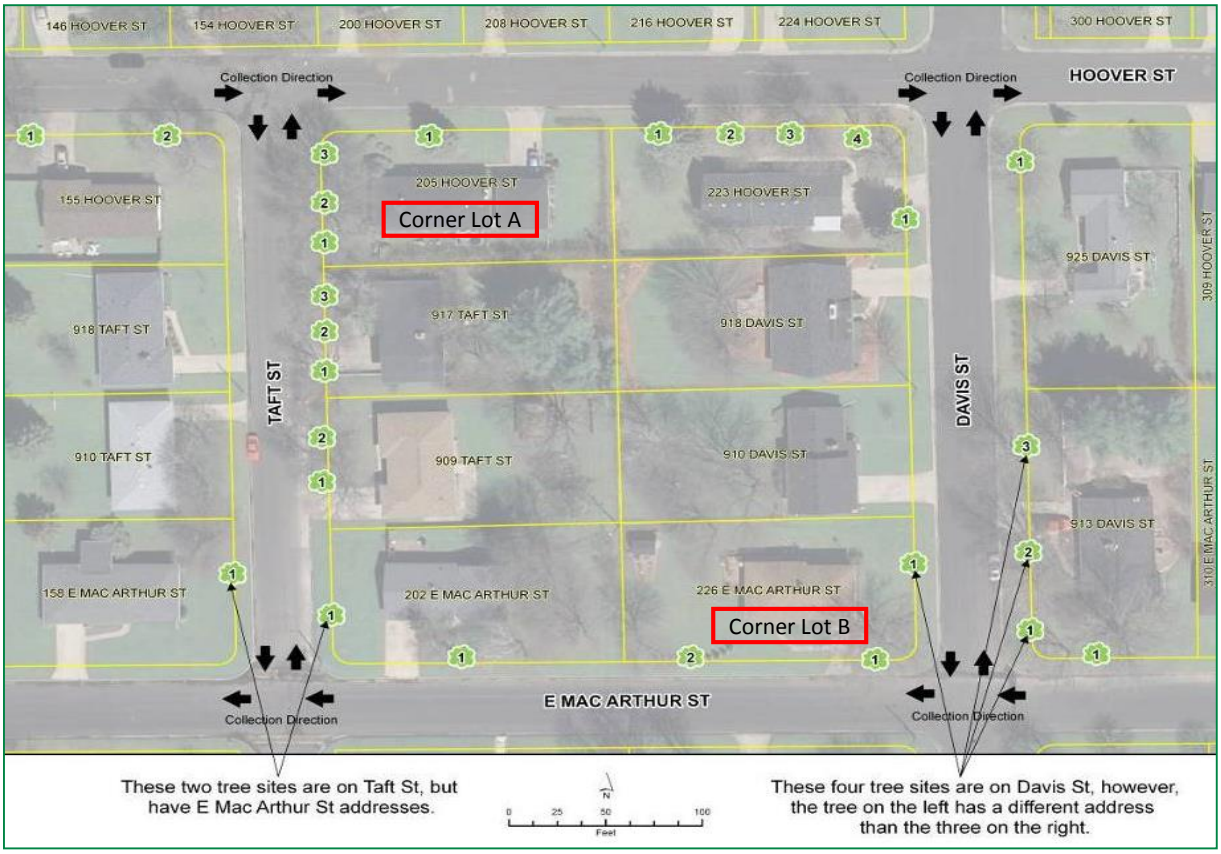
Park and/or public space site locations were collected using the same methodology as street ROW sites; however, the *on street* would be the park and/or public space's name (not street names).

Site Location Examples

The tree trimming crew in the truck traveling westbound on E. Mac Arthur Street is trying to locate an inventoried tree with the following location information:

Address/Street Name:	226 E. Mac Arthur Street
Side:	Side
On Street:	Davis Street

The tree site circled in red signifies the crew's target site. Because the tree is located on the side of the lot, the *on* street is Davis Street, even though it is addressed as 226 East Mac Arthur Street.



Location information collected for inventoried trees at Corner Lots A and B.

Corner Lot A

Address/Street Name:	205 Hoover St.
Side:	Side
On Street:	Taft St.
Address/Street Name:	205 Hoover St.
Side:	Side
On Street:	Taft St.
Address/Street Name:	205 Hoover St.
Side:	Side
On Street:	Taft St.
Address/Street Name:	205 Hoover St.
Side:	Front
On Street:	Hoover St.

Corner Lot B

Address/Street Name:	226 E Mac Arthur St.
Side:	Side
On Street:	Davis St.
Address/Street Name:	226 E Mac Arthur St.
Side:	Front
On Street:	E Mac Arthur St.
Address/Street Name:	226 E Mac Arthur St.
Side:	Front
On Street:	E Mac Arthur St.

Appendix B
Five-Year Maintenance Schedule and Budget

Estimated Costs for Each Activity			2018		2019		2020		2021		2022		Five-Year Cost
Activity	Diameter	Cost/Tree	# of Trees	Total Cost	# of Trees	Total Cost	# of Trees	Total Cost	# of Trees	Total Cost	# of Trees	Total Cost	
Moderate and High-Risk Removal	1-3"	$25	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	4-6"	$105	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	7-12"	$220	2	$440	0	$0	0	$0	0	$0	0	$0	$440
	13-18"	$355	3	$1,065	0	$0	0	$0	0	$0	0	$0	$1,065
	19-24"	$525	4	$2,100	0	$0	0	$0	0	$0	0	$0	$2,100
	25-30"	$845	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	31-36"	$1,140	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	37-42"	$1,470	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	43"+	$1,850	0	$0	0	$0	0	$0	0	$0	0	$0	$0
Activity Total(s)			**9**	**$3,605**	0	$0	0	$0	0	$0	0	$0	**$3,605**
Low-Risk Removal	1-3"	$25	67	$1,675	0	$0	0	$0	0	$0	0	$0	$1,675
	4-6"	$105	21	$2,205	0	$0	0	$0	0	$0	0	$0	$2,205
	7-12"	$220	25	$5,500	0	$0	0	$0	0	$0	0	$0	$5,500
	13-18"	$355	12	$4,260	0	$0	0	$0	0	$0	0	$0	$4,260
	19-24"	$525	1	$525	0	$0	0	$0	0	$0	0	$0	$525
	25-30"	$845	1	$845	0	$0	0	$0	0	$0	0	$0	$845
	31-36"	$1,140	1	$1,140	0	$0	0	$0	0	$0	0	$0	$1,140
	37-42"	$1,470	2	$2,940	0	$0	0	$0	0	$0	0	$0	$2,940
	43"+	$1,850	1	$1,850	0	$0	0	$0	0	$0	0	$0	$1,850
Activity Total(s)			**131**	**$20,940**	0	$0	0	$0	0	$0	0	$0	**$20,940**
Stump Removal	1-3"	$25	0	$0	11	$275	0	$0	0	$0	0	$0	$275
	4-6"	$25	0	$0	22	$550	0	$0	0	$0	0	$0	$550
	7-12"	$25	0	$0	40	$1,000	0	$0	0	$0	0	$0	$1,000
	13-18"	$40	0	$0	27	$1,080	0	$0	0	$0	0	$0	$1,080
	19-24"	$60	0	$0	9	$540	0	$0	0	$0	0	$0	$540
	25-30"	$85	0	$0	4	$340	0	$0	0	$0	0	$0	$340
	31-36"	$110	0	$0	1	$110	0	$0	0	$0	0	$0	$110
	37-42"	$130	0	$0	0	$0	0	$0	0	$0	0	$0	$0
	43"+	$160	0	$0	0	$0	0	$0	0	$0	0	$0	$0
Activity Total(s)			0	$0	**114**	**$3,895**	0	$0	0	$0	0	$0	**$3,895**
Routine Pruning	1-3"	$20	74	$1,480	74	$1,480	74	$1,480	74	$1,480	74	$1,480	$7,400
	4-6"	$30	138	$4,140	138	$4,140	138	$4,140	138	$4,140	138	$4,140	$20,700
	7-12"	$75	245	$18,375	245	$18,375	245	$18,375	245	$18,375	245	$18,375	$91,875
	13-18"	$120	165	$19,800	165	$19,800	165	$19,800	165	$19,800	165	$19,800	$99,000
	19-24"	$170	97	$16,490	97	$16,490	97	$16,490	97	$16,490	97	$16,490	$82,450
	25-30"	$225	48	$10,800	48	$10,800	48	$10,800	48	$10,800	48	$10,800	$54,000
	31-36"	$305	26	$7,930	26	$7,930	26	$7,930	26	$7,930	26	$7,930	$39,650
	37-42"	$380	14	$5,320	14	$5,320	14	$5,320	14	$5,320	14	$5,320	$26,600
	43"+	$590	9	$5,310	9	$5,310	9	$5,310	9	$5,310	9	$5,310	$26,550
Activity Total(s)			**816**	**$89,645**	**816**	**$89,645**	**816**	**$89,645**	**816**	**$89,645**	**816**	**$89,645**	**$448,225**
Young Tree Training Pruning	1-3"	$20	682	$13,640	682	$13,640	682	$13,640	682	$13,640	682	$13,640	$68,200
	4-6"	$30	234	$7,020	234	$7,020	234	$7,020	234	$7,020	234	$7,020	$35,100
	7-12"	$75	6	$450	6	$450	6	$450	6	$450	6	$450	$2,250
Activity Total(s)			**922**	**$21,110**	**922**	**$21,110**	**922**	**$21,110**	**922**	**$21,110**	**922**	**$21,110**	**$105,550**
Activity Grand Total			**1,878**		**1,852**		**1,738**		**1,738**		**1,738**		**8,944**
Cost Grand Total				**$135,300**		**$114,650**		**$110,755**		**$110,755**		**$110,755**	**$582,215**