WOLFE PARK COMMUNITY STREET TREE INVENTORY SUMMARY REPORT

THE CITY OF COLUMBUS RECREATION AND PARKS

SPRING 2023

TREE INVENTORY EXECUTIVE SUMMARY

WOLFE PARK COMMUNITY

PROJECT OVERVIEW

In 2022, the City of Columbus Recreation and Parks Department commissioned an update to the city's existing street tree inventory in the Wolfe Park neighborhood. This project directly supports the implementation of the recently completed Columbus Urban Forestry Master Plan, which establishes a vision and future goals for Columbus' urban forest.

COMMUNITY OVERVIEW

Wolfe Park is a largely non-residential community, primarily made up of public greenspace adjacent to Alum Creek with neighborhood streets leading into the park. The estimated population of Wolfe Park is 106 residents. The community has two miles of city-maintained vehicle roads. Wolfe Park has an area of 0.14 square miles, which is 0.06% of the area of Columbus. Current canopy cover within Wolfe Park is estimated to be 49%.

VISION FOR THE URBAN FOREST

To prioritize, preserve, and grow the tree canopy in Columbus equitably across neighborhoods, to improve health and quality of life for all residents.

COLUMBUS' URBAN FOREST GOALS

- **GOAL 1.** 40% CITYWIDE CANOPY COVER (BY 2050)
- **GOAL 2.** STOP NET CANOPY LOSS (BY 2030)
- **GOAL 3.** EQUITABLE INVESTMENT (BY 2030)

154

Sites Inventoried

148 Trees

4 Planting Sites

2 Stumps

OVERALL CONDITION OF WOLFE PARK'S INVENTORIED TREES: GOOD

Good	Fair	Poor	Dead
52%	37%	7%	1%

THE CITY OF COLUMBUS RECREATION AND PARKS

Contact Info

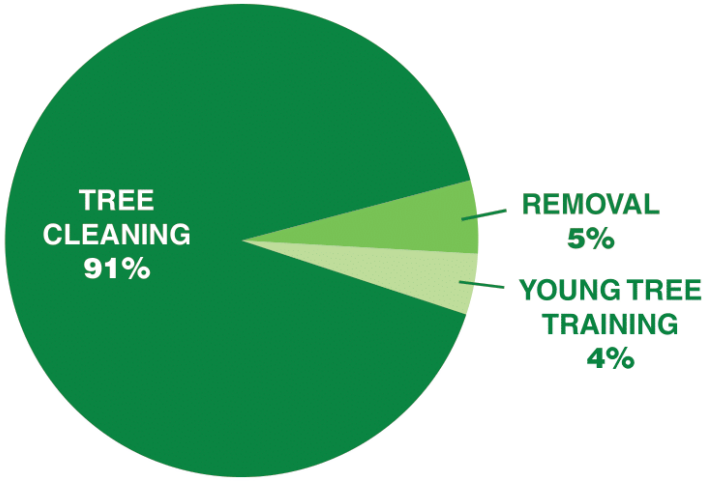
City of Columbus
Recreation & Parks Dept.
1111 East Broad Street
Columbus, Ohio 43205

DAVEY Resource Group

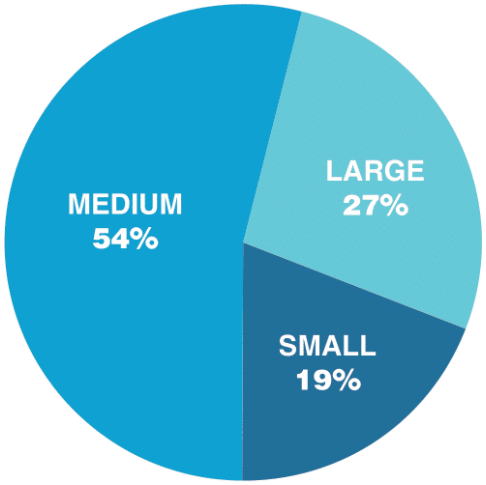
Inventory Details

DRG's team of ISA Certified Arborists completed the tree inventory in 2022.

TREES BY MAINTENANCE RECOMMENDATION



PLANTING SITES BY TREE SIZE



$1.3 million

Estimated value of Wolfe Park's inventoried street trees.

2 metric tons

Annual CO_2 captured

309 pounds

Annual air pollutants removed

84,130 gallons

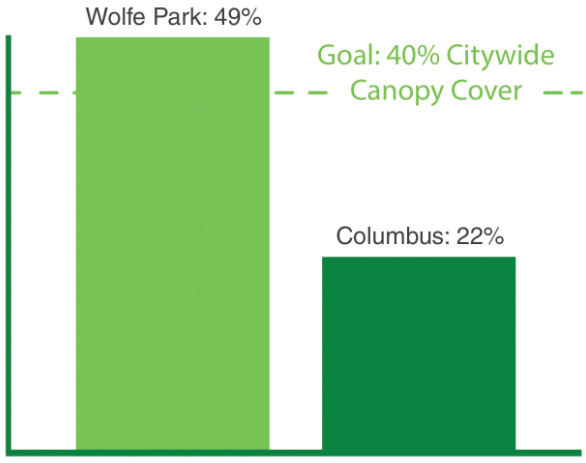
Annual stormwater runoff intercepted

CREATING EQUITABLE CANOPY COVER

Implementation of the following action steps will significantly increase canopy cover over time, provide greater value and more benefits to Wolfe Park's residents, and help the city realize its vision and achieve its goals for the urban forest.

THE WAY FORWARD: ACTION STEPS

1. Preserve and maintain existing canopy.
2. Prioritize planting of large- and medium-size planting sites.
3. Develop neighborhood tree planting initiatives and community outreach focused on planting trees on private property.
4. Explore retrofitting existing street infrastructure and updating design standards to expand and improve available tree growing spaces.



Current levels of community and citywide canopy coverage compared to the city's 2050 canopy goal.

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FIGURES

MAPS

TABLES

DAVEY Resource Group

SECTION 1: STRUCTURE, COMPOSITION, AND MAINTENANCE

The City of Columbus Recreation and Parks Department (CRPD) designated the street rights-of-way (ROW) within the Wolfe Park community as an area of interest for an on-going update to the city's existing GIS-based public tree inventory. The Wolfe Park community street tree inventory supports the *Columbus Urban Forestry Master Plan* (CUFMP).

154 SITES INVENTORIED

In 2022, DRG arborists performed field data collection and catalogued new data on potential viable planting sites, existing trees, and tree stumps located within the ROW of the Wolfe Park community (Figure 1 and Map 1).

Of the 154 total inventoried sites:

***99%* = Existing street trees**

***0.7%* = Potential planting sites**

***0.3%* = Existing stumps**

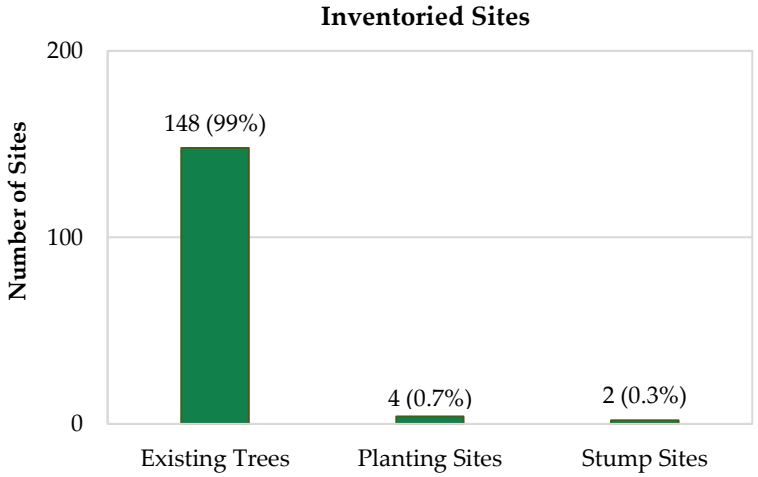

Figure 1. Quantity of inventoried sites by site type.

A well-stocked right-of-way holds promise for the urban forest

Stocking level is a forestry term used to report the ratio of existing street trees to the total number of suitable tree locations within the street ROW, which includes trees, stumps, and vacant planting locations.

The stocking level of the Wolfe Park right-of-way is currently 96%. Most available planting sites are occupied with trees. Planting opportunities in Wolfe Park should be explored in the public greenspace that the neighborhood is named for.

DRG arborists identified vacant potential planting sites within Wolfe Park's street rights-of-way (ROW). There are few ROW spaces that can accommodate new trees, so CRPD may explore planting in public parks like the one pictured here to improve canopy coverage and increase the quantity of benefits trees provide to the community.

Map 1. Approximate locations of sites inventoried during the 2022 Wolfe Park community street tree inventory.

IMPROVE TREE POPULATION DIVERSITY

Urban forest resiliency is positively correlated with tree population diversity; greater diversity helps reduce exposure to harmful pests and disease which can target individual tree species, groups of species, or even entire tree genera.

Species and genus diversity distributions offer a critical measure of a tree population's resiliency to such attacks and help managers to identify and remedy potential areas of overexposure.

When assessing tree population diversity, it is widely accepted that **no more than 10% of an urban tree population should be composed of a single species and no greater than 20% from a single genus.**

Species Distribution is Skewed

A total of 28 unique tree species were catalogued. Of the five most abundant tree species recorded during the inventory, one species, London planetree (*Platanus x acerifolia*), exceeded the recommended 10% threshold (Figure 2). London planetree is the most abundant species found within the community's street ROW, accounting for 39% of all inventoried trees.

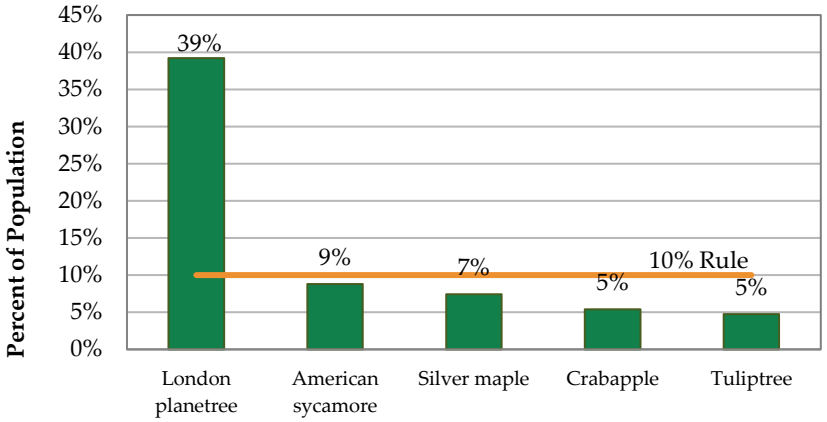

Figure 2. Species distribution of inventoried trees.

Genus Distribution is Skewed

Wolfe Park has 16 unique tree genera, or groups of tree species that are closely related (Figure 3).

The genus *Platanus*, which is composed of maple trees, accounts for 49% of the entire inventoried population—well above the suggested threshold of 20%. The genus *Acer*, comprised of maple trees, is 24% of the population.

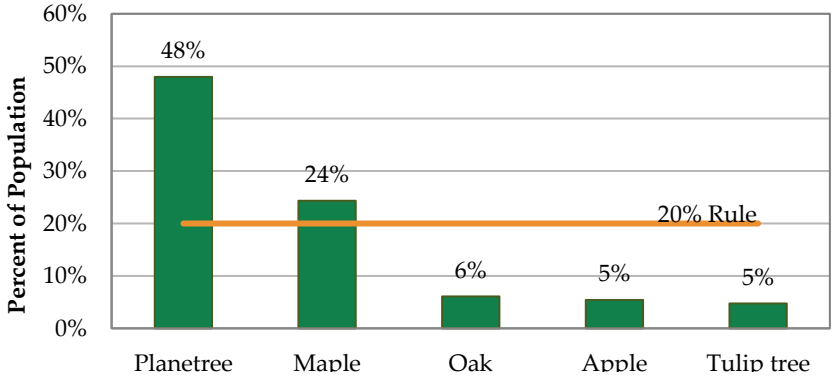

Figure 3. Genus distribution of inventoried trees.

Planetrees and Maples are Overrepresented

Future planting initiatives should minimize the installation of additional planetrees and maples within Wolfe Park until representation from the genera *Platanus* and *Acer* falls within the recommended 20% threshold.

Planetrees are susceptible to a fungal pathogen called anthracnose. Maple trees are susceptible to a variety of harmful pests and disease, including the fungal pathogen Verticillium wilt (*Verticillium* spp.) and the invasive Asian longhorned beetle (*Anoplophora glabripennis*). Improved genus diversity will reduce the potential for tree loss and help ensure long-term urban forest health and viability.

Above: Asian Longhorned Beetle. Photo: Jeff Tessner, DRG.

Left: Sugar maple with Verticillium wilt. Photo: Jerry Weiland, USDA-ARS.

OVERALL TREE CONDITION IS GOOD

The condition of each inventoried tree was evaluated and rated as good, fair, poor, or dead. Several factors affecting condition were considered for each tree, including root characteristics, branch structure, trunk, canopy, foliage condition, and the presence of pests.

The general health of the inventoried tree population is characterized by the median average condition rating. Overall, **Wolfe Park's street trees are in good condition** (Figure 4).

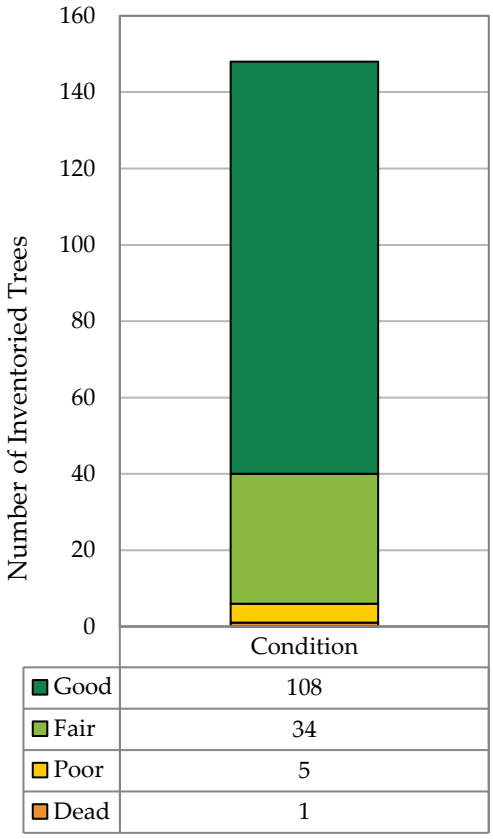

Figure 4. Condition of inventoried trees.

Routine Inspections Are Key

Proactive monitoring helps identify, prevent, and mitigate concerns. Routine tree inspections are necessary to monitor for changes in tree condition, the presence of pests and/or disease, or the worsening of existing defects – particularly among trees rated in poor condition.

Poor condition ratings are generally due to visible signs of decline and stress, such as decay, dead limbs, or discolored foliage. If retained, these trees will likely require corrective pruning and intensive plant health care to improve their vigor. Dead trees and trees with defects that cannot be remedied should be removed as soon as possible.

Routine inspection helps keep trees healthy, like the trees pictured here in Wolfe Park.

TREE DIAMETER-AGE DISTRIBUTION

Understanding the relative age of a tree population can help planners align future management strategies with current policy goals. To determine relative tree age, DRG first categorized Wolfe Park's inventoried tree population by small- and large-growing trees and then assigned each tree to an age grouping based on the tree diameter measured at breast height (DBH) as outline in Table 1.[1]

Table 1. Tree age by growing size at maturity and diameter at breast height (DBH).

Relative Tree Age	Large-Growing		Small-Growing		Combined
	DBH	Quantity	DBH	Quantity	Quantity
Young	0–8"	23	0–4"	7	30
Established	9–17"	22	5–8"	6	28
Maturing	18–24"	15	9–12"	0	15
Mature	> 24"	72	>12"	3	75

The relative age distribution of Wolfe Park's inventoried tree population was then compared to an ideal distribution for an expanding urban forest, which suggests the tree population composition be equivalent to 40% young trees, 30% establishing, 20% maturing, and 10% mature trees (Figure 5).

A Lack of Young and Established Trees

Overall, 20% of Wolfe Park's inventoried trees are classified as young, compared to an ideal level of 40%, and 19% of inventoried trees are in the established size class, compared to an ideal of 30%. In both age classes, large-form trees are also underrepresented. Future maintenance should prioritize activities that help establish these young trees in the urban landscape through pruning to train future tree growth, watering programs, and routine tree health inspections. As maturing and mature trees are lost, they should be replaced with the largest possible tree for the space so that canopy succession and expansion continue uninterrupted.

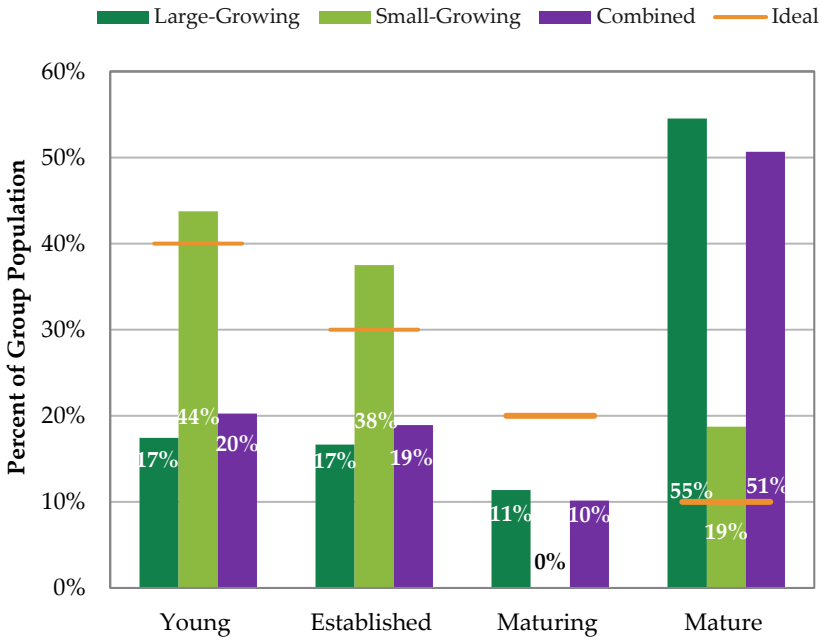

Figure 5. Distribution of relative tree age by diameter size class.

A Gap in Age Classes Exists

Overall, there is a disparity in representation from the maturing and mature age classes. Only 10% of trees are in the maturing size class compared to an ideal of 20%, and 51% of trees are in the mature size class, compared to an ideal of 10%. Both age classes have more small-form trees than large form trees. An overabundance of mature trees can create a maintenance burden as mature trees reach the end of their life and require pruning to remove hazardous limbs or need to be removed. However, maintenance and preservation of existing trees in these age groups is critical to preserve older trees while young and establishing trees continue to mature.

[1] Tree size is only a rough approximation of tree age; tree size alone is not a definitive or appropriate measure of tree age. In the urban environment in particular, numerous factors play a role in determining tree size, including the availability of water, soil, and sunlight, proper tree care and planting techniques, the presence of pests and pathogens, etc.

TREE MAINTENANCE RECOMMENDATIONS

During the inventory, DRG arborists assigned a primary recommended maintenance activity to each of the 148 inventoried trees (Figure 6).

City managers generally prioritize maintenance activities by risk. For example, a large dead tree by a busy intersection should be removed before a small dead tree at the end of a little-used secondary street.

PRIMARY MAINTENANCE CATEGORIES

Tree Cleaning = 123 Trees

Tree cleaning describes pruning to remove dead, dying, broken, decayed, and/or crossing limbs. Trees in this category are recommended for inclusion in a regularly scheduled, routine maintenance program. Over time, routine pruning minimizes the occurrence of reactive maintenance.

Tree Removal = 3 Trees

Within Wolfe Park, 3 trees are designated for removal. City Forestry only removes trees that are hazardous: either dead, dying, or dangerous to public safety.

Young Tree Training = 22 Trees

Younger trees can have branch structures that lead to potential problems as the tree ages. These trees should be pruned to train future growth patterns and correct or eliminate weak, interfering, or objectionable branches to minimize future maintenance requirements.

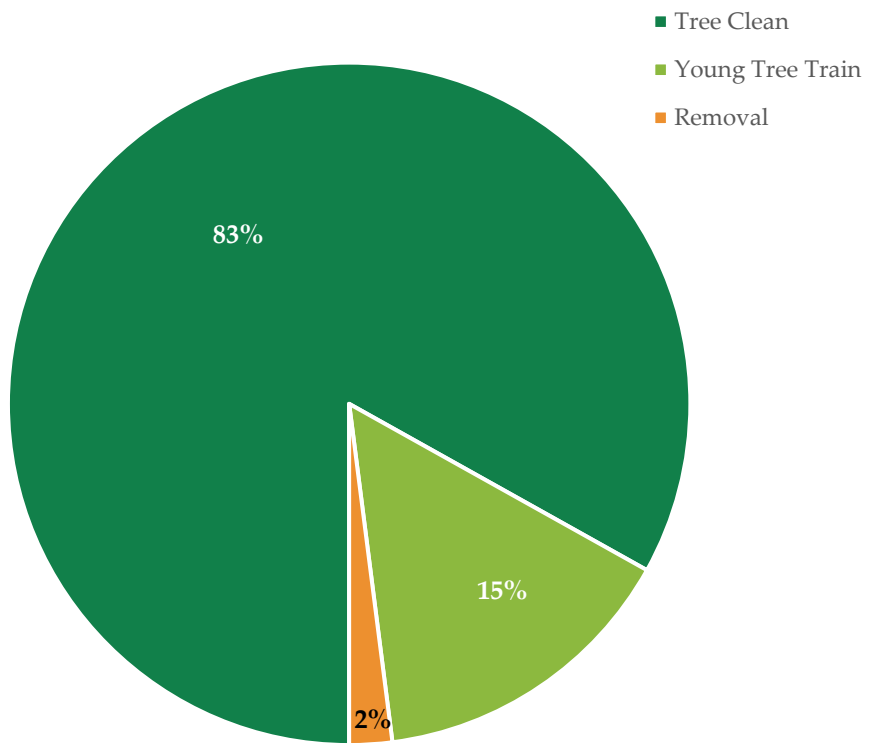

Figure 6. Primary maintenance recommendations for 148 trees in the Wolfe Park neighborhood, by type.

SECTION 2: TREE BENEFITS

STRUCTURAL VALUE OF WOLFE PARK'S STREET TREES: $1.3 MILLION

Trees are critical to public health and contribute significantly to quality of life for every community resident. In addition to improving air quality, water quality, and alleviating heat stress, trees provide significant social benefits such as reducing mental stress, encouraging greater neighborhood-level involvement, and fulfilling spiritual and aesthetic needs. **Structural value calculates the total cost it takes to replace trees, meaning that all of the street trees in Wolfe Park are estimated at $1.3 million.**

Because of the significant value of these benefits, cities across the country now recognize trees are critical infrastructure. In fact, they are the only type of infrastructure that increases in value over time and have been proven to pay for themselves. Urban trees in the Midwest consistently provide benefits value three times more than the cost to maintain them.[2]

Table 2. Estimated benefits provided by Wolfe Park's street trees

Category	Value
Ecosystem Services	$52,226.41
Structural Value	$1,332,496.88
Combined Value	**$1,384,723.29**
Per Tree Average	**$9,356.24**

The street trees inventoried within the Wolfe Park community currently provide an ecosystem value of $52,226 through air filtration, water quality improvements, and carbon storage–and those are just the benefits quantified by this analysis. Trees also boost property values, reduce energy costs, lower crime rates, and help create more successful business districts.[3]

ECOSYSTEM SERVICES

Annual Carbon Captured – 4,409 pounds

As the primary greenhouse gas driving climate change, carbon dioxide (CO_2) impacts people, property, and the environment. Trees are carbon sinks—constantly absorbing CO_2 from the atmosphere and storing it within tree tissue. Over the course of their lifetime, Wolfe Park's inventoried trees have captured over 262 metric tons of carbon. Using trees to sequester CO_2 is a key part of the *Columbus Climate Adaptation Plan*'s goal to make the city more resilient.

Annual Air Pollution Removed – 309 pounds

Ozone and particulates can especially aggravate existing respiratory conditions (like asthma) and create long-term chronic health problems.

Annual Rainwater Intercepted – 84,131 gallons

As cities grow, land that naturally absorbs rainwater (i.e., lawns, parks, fields) tends to be replaced by hard surfaces that cause rain to runoff (i.e., roads, buildings, parking lots). Rainwater flowing over these hard surfaces accumulates pollutants, and the contaminated stormwater flows into overloaded sewers, ultimately reaching the local lakes and streams. Polluted water is a major cause of human health issues and degrades the local ecology. Tree leaves intercept rainwater as it falls, which slows the rate at which stormwater enters sewer systems.

STRUCTURAL VALUE – $1.3 million

Structural value represents the cost to replace a given tree with an identical one. Structural value increases over time as more trees are planted and existing trees mature. The total value of the Wolfe Park community forest will grow considerably in future years as more trees are planted, existing trees are maintained and become healthier, and the city works toward achieving the goals of the *Columbus Urban Forestry Master Plan*.

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[2] Peper, Paula J.; McPherson, E. Gregory; Simpson, James R.; Vargas, Kelaine E.; Xiao, Qingfu. 2009. Lower Midwest community tree guide: benefits, costs, and strategic planting. Gen. Tech. Rep. PSW-GTR-219. Albany, CA: U.S. Forest Service, Pacific Southwest Research Station. 115 p.

[3] See the Columbus Urban Forestry Master Plan for in-depth discussion on tree benefits and their impact on the city's residents.

SECTION 3: FUTURE CONSIDERATIONS

Every neighborhood deserves access to the benefits trees provide as well as public greenspace. The large park space and canopied streets leading into Wolfe Park are critical for improving quality of life for neighborhood and city residents. With 49% tree canopy, Wolfe Park is an important asset for Columbus residents and for CRPD. Realizing the vision and achieving the goals of the *Columbus Urban Forestry Master Plan* will take planned strategic effort guided, in part, by data analysis and application.

PLANTING RECOMMENDATIONS

A key objective of the tree inventory update is to catalog and analyze growing spaces along the neighborhood's street ROW. Analysis results will inform future planting initiatives and help ensure the selection of the most appropriate tree species given the available growing spaces within the neighborhood.

DRG arborists found a total of 4 vacant sites potentially suitable for planting street trees.[4] Vacant planting sites were evaluated for suitability for trees and characterized by size and type. DRG considered the presence of existing utilities, overhead lines, and distances from stop signs, fire hydrants, driveways, and other existing infrastructure in the evaluation of planting sites.

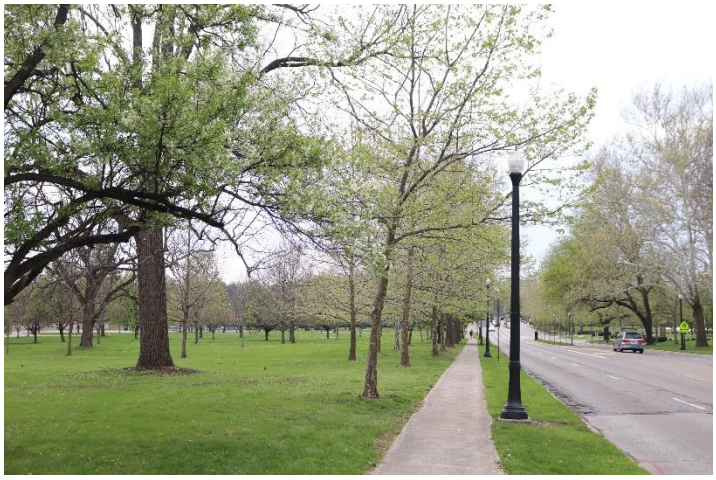
Just because planting sites in the street right of way are limited does not mean that there are no options for planting trees in Wolfe Park. Planting should be explored on private residential property and public parks. In the Wolfe Park greenspace, there may be room for a dense tree planting where large-form trees can be prioritized.

PLANTING CONSIDERATIONS

Site Selection: Urban environments constrain what tree species are appropriate. Existing infrastructure such as utilities and sidewalks, growing space size, and other trees all impact what tree is appropriate for a site. In parks or on private property, it is equally as important to measure out appropriate spacing for trees as it is in the right-of-way.

Tree Selection: Tree species should be resilient to the urban environment, diverse, and the appropriate height and width for the growing space.

Blocking an unsightly view or creating shade may be a priority, but the impact of a tree on its environment – and vice versa – must be considered. Sustainable and successful planting initiatives select tree species that thrive and flourish in the chosen planting location in a way that harmonizes with the surrounding urban environment.



[4] All planting locations will require further investigation by the city and CRPD prior to any final determination of suitability for planting.

THE WAY FORWARD: ACTION STEPS

Investing in equitable canopy does not just entail increasing overall tree canopy cover through planting, but also addressing the quality of the trees, caring for the existing trees, planning for trees within the different land uses and infrastructure, and reaching out to residents about the importance of trees.

In Wolfe Park, we know that existing canopy cover is high, the community needs equitable investment, and CRPD will need to look for planting spaces outside of the street right-of-way. Given this set of facts, what can be done in Wolfe Park to maximize growth of the neighborhood forest for the benefit of its residents, stakeholders, and the entire City of Columbus?

Maintain and Preserve Existing Trees (Near-Term)

It takes a long time for a young tree to become a large, stately mature shade tree. Preserving what is already there is a major component of an urban forest growth strategy.

Prioritize Planting of Large and Medium Trees (Short-Term)

Larger trees provide residents with greater benefits. Within Wolfe Park, only 4 planting sites were identified in the street right-of-way, but more places to plant trees may be available in city parks or other public property. Care should be taken to ensure that in these spots, the largest possible trees are planted for the benefit of residents.

Explore Planting Beyond Public Property (Intermediate-Term)

Where insufficient space or overhead utilities restrict available planting options, planting on private property can allow for the selection of more desirable tree species. Urban forestry stewardship on private property will require education and outreach initiatives, as well as easy and low-cost access to trees.

Expand Right-of-Way Growing Spaces (Intermediate to Long-Term)

Future policy initiatives should consider options to improve available grow space, including retrofitting existing infrastructure and implementing design standards that provide adequate grow space for trees within street rights-of-way. Examples include the addition of bump-outs, expanding the size of tree lawns during utility or development projects, and exploring the use of green infrastructure technologies (e.g., silva cells, structural soils). Ensuring canopy equity requires sufficient growing space for trees to survive and thrive in an urban setting.