



Tree Management Plan

Oakland County, Michigan

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Prepared for:
Oakland County Parks and Recreation
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Acknowledgments

Oakland County Parks and Recreation's vision to promote and preserve the forest and improve the management of park and golf course 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.

Oakland County Parks and Recreation recognizes the support of the Road Commission of Oakland County, City of Madison Heights, and Oakland County Executive Officer Dan Stencil.

Notice of Disclaimer: Inventory data provided by Davey Resource Group, a division of The Davey Tree Expert Company, are based on visual recording at the time of inspection. Visual records do not include individual testing or analysis and do not include aerial or subterranean inspection. Davey Resource Group is not responsible for discovery or identification of hidden or otherwise non-observable hazards. Records may not remain accurate after inspection due to variable deterioration of inventoried material. Davey Resource Group provides no warranty with respect to the fitness of the inventoried trees for any use or purpose whatsoever. Clients may choose to accept or disregard Davey Resource Group's recommendations or to seek additional advice. Important: know and understand that visual inspection is confined to the designated subject tree(s) and that the inspections for this project are performed in the interest of facts of the tree(s) without prejudice to or for any other service or any interested party.

i-Tree Streets is a benefit analysis tool developed by a team of researchers at the United States Department of Agriculture (USDA) Forest Service, Pacific Southwest Research Station's Center for Urban Forest Research in Davis, California, in partnership with Davey Resource Group. The purpose of i-Tree Streets is to enable any community organization to assess its tree resource by determining the structure and function and calculating the value. Using the results from this tool, a policy can be developed, priorities can be set, and informed management decisions can be made about the tree resource. i-Tree Streets was originally designed to quantify the environmental and economic functional benefit and corresponding value of street trees. Since the majority of inventoried trees are not growing near buildings or pavement, some of the environmental and economic values reported here may not be definitive. However, this program is still relevant to assessing the environmental and economic benefits and values of inventoried trees, and the numbers reported give a good depiction of what environmental and economic benefits similar trees in Oakland County may provide.

Executive Summary

This plan was developed for Oakland County Parks and Recreation by Davey Resource Group with a focus on addressing short- and long-term maintenance needs for inventoried trees. Davey Resource Group completed a tree inventory to gain an understanding of the needs of the existing forest and to project a recommended maintenance schedule for tree care. Analysis of inventory data and information about Oakland County's existing program and vision for the park and golf course trees was utilized to develop this management plan.

State of the Existing Forest

The March and April 2014 inventory included trees within 13 county park properties. All trees within the built landscape and a subset of trees along trails were included in the inventory. The 2014 inventory is phase one of a potentially two-phased inventory to include additional trails and built landscapes not already inventoried. As part of the 2014 inventory Oakland selected built landscape areas and trails for the inventory, which included: Addison Oaks County Park, Catalpa Oaks County Park, Glen Oaks Golf Course, Groveland Oaks County Park, Highland Oaks County Park, Independence Oaks County Park, Lyon Oaks County Park and Golf Course, Orion Oaks County Park, Red Oaks County Park and Golf Course, Rose Oaks County Park, Springfield Oaks County Park and Golf Course, Waterford Oaks County Park, and White Lake Oaks Golf Course. A total of 19,577 trees were recorded during the inventory: 16,234 built landscape trees and 3,343 trail system trees. Analysis of the tree inventory data

found: One genus, *Pinus* (pine), makes up a large percentage of the built landscape population (21%). Other common genera include *Acer* (maple), *Malus* (apple), *Picea* (spruce), *Prunus* (cherry), and *Quercus* (oak).

- On the overall population level, not one species exceeds 10% of the built landscape trees; however, within many of the 13 parks' populations species do exceed 10%. Those species would include *Acer rubrum* (red maple), *Gleditsia triacanthos* var. *inermis* (thornless honeylocust), *Juglans nigra* (black walnut), *Malus* spp. (flowering crabapple), *Picea abies* (Norway spruce), *Picea glauca* (white spruce), *Picea pungens* (Colorado spruce), *Pinus nigra* (Austrian pine), *Prunus serotina* (black cherry), *Pinus strobus* (eastern white pine), *Pinus sylvestris* (Scotch pine), *Quercus alba* (white oak), and *Quercus coccinea* (scarlet oak).
- The overall condition of the built landscape tree population is rated Fair, and the overall condition of the trail system tree population is rated Dead/Fair.
- Overall, the diameter size class distribution of the inventoried tree population trended towards the ideal with a greater number of young trees than established, maturing, or mature trees.

Quantifiable Benefits

- The appraised value of Oakland County's inventoried tree population is \$50.0 million.
- Inventoried trees provide approximately \$2.0 million in the following annual environmental benefits:
 - *Aesthetic and Other Tangible Benefits*: valued at \$750,000 per year.
 - *Energy Conservation*: valued at \$853,000 per year.
 - *Stormwater*: valued at \$208,000 per year (interception of 26,051,621 gallons).
 - *Air Quality*: valued at \$152,000 per year (27,754 pounds of air pollutants).
 - *Carbon Sequestration*: valued at \$19,000 per year (5,770,278 pounds of carbon dioxide [CO₂]).

For an overview of the methodology used in the inventory and assessment, see Appendix A.

Tree Maintenance and Planting Needs

Trees provide many environmental and economic benefits that justify spending the time and money for planting and maintenance. Maintenance needs recommended during the inventory include tree removal (18%), pruning (72%), and planting (11%). Reducing tree-related risk should be prioritized so that trees with the highest risk are addressed first. The inventory noted several Severe and High Risk trees (less than 1% and 15% of trees assessed, respectively); these trees should be removed or pruned immediately to promote visitor safety. Moderate and Low Risk trees should be addressed after all elevated risk tree maintenance has been completed. Plant trees to mitigate removals and create canopy.

Tree Removal	<ul style="list-style-type: none">• Severe Risk = 26 trees• High Risk = 1,808 trees• Moderate Risk = 1,441 trees• Low Risk = 155 trees
Pruning	<ul style="list-style-type: none">• Severe Risk = 15 trees• High Risk = 1,152 trees
Routine Pruning Cycle	<ul style="list-style-type: none">• Number of trees in cycle each year = approximately 2,300
Young Tree Training Cycle	<ul style="list-style-type: none">• Number of trees in cycle each year = approximately 700
Tree Planting	<ul style="list-style-type: none">• Number of trees each year = approximately 400

Oakland County's park and golf course trees will benefit greatly from a three-year young tree training cycle and a five-year routine pruning cycle. Proactive pruning cycles improve the overall health of the tree population and may eventually reduce program costs. In most cases, pruning cycles will correct defects in trees before they worsen, which will avoid costly problems. Based on inventory data, approximately 700 trees should be structurally pruned each year during the young tree training cycle, and approximately 2,300 trees should be cleaned during the routine pruning cycle each year.

Planting trees is necessary to maintain canopy cover and to replace trees that have been removed or lost to natural mortality (expected to be 1–3% per year) or other threats. We recommend planting at least 400 trees of a variety of species each year to offset these losses and maintain canopy and maximum benefits. Trees of varied species should be planted; however, the planting of red maple, thornless honeylocust, black walnut, flowering crabapple, Norway spruce, white spruce, Colorado spruce, Austrian pine, eastern white pine, Scotch pine, black cherry, white oak, and scarlet oak should be limited until the species distribution normalizes within individual parks. We provide a planting list that offers smart choices for species selection.

Urban Forest Program Needs

Adequate funding will be needed for Oakland County to implement an effective management program that will provide short- and long-term benefits, to ensure that priority maintenance is performed expediently, and to establish proactive maintenance cycles. Davey Resource Group provided a projected budget for the recommended maintenance within each of the 13 parks and golf courses. High-priority removal and pruning is costly; most of this work is scheduled during the first year of the program, which is why budgets will be higher for that year. The estimated total cost for the first year of this multi-year program is \$918,000. After this priority work has been completed, the urban forestry program will mostly involve proactive work, which is generally less costly, so budgets for later years are projected to be lower.

Oakland County has many opportunities to improve its park and golf course tree resource. Planned tree planting and a systematic approach to tree maintenance will create a cost-effective, proactive program. Investing in this tree management program will promote public safety, improve tree care efficiency, and increase the economic, environmental, and social benefits the community receives from trees in Oakland County's park system.