



*City of Decatur*

# COMMUNITY FOREST MANAGEMENT PLAN

Version 1.0

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TREE CITY USA®



*The development of this Community Forest Management Program Plan was one component of a 2011 Urban and Community Forestry Assistance program grant the city received. Additional components of this grant project include the street tree inventory, a review of existing regulation, assessments of completed developments, and presentation materials.*

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## Part I. Overview

**Decatur's community forest** is composed of all of the trees around us—in our yard, around our businesses and places of work, where we shop and dine, along our city streets and around our public buildings, in our city parks and greenspaces, and around city schools. This forest also includes the other vegetation and animals living among the trees. Our community forest covers 45 percent of the land area within our city.

Our community forest provides us with many environmental, economic, and social benefits and trees are essential components of our community's infrastructure. Trees provide irreplaceable contributions to our air and water quality, our economic vitality, social interaction and recreational activity, and overall enhance the quality of life in Decatur. Considering these benefits and contributions, our city street trees alone are estimated to be worth over *\$7.4 million dollars*.

These valuable and hard-working trees require regular protection, establishment, maintenance, inspection and removal, just like our other city infrastructure. Unlike other infrastructure, however, trees are living entities with biological requirements—soil, water, nutrients, sunlight, oxygen (roots) and carbon dioxide (crown). They also grow larger with age, unlike anything else we manage.

Maintaining safe, healthy trees and an abundance of them across the city in a comprehensive and cost effective manner requires a planned approach that incorporates the city's community forest goals, applies smart management strategies, and defines specific program actions for achieving the goals. It also requires the allocation of time, effort, and funds.

Decatur is committed to managing its community forest and has demonstrated this commitment for nearly 25 years. The city has an annual tree care budget, a tree preservation ordinance and employs a City Tree Consultant. The city regularly maintains trees in downtown, plants trees annually, and sponsors periodic tree care education and promotion programs. It is assisted in these endeavors by a group of dedicated tree care partners.

Decatur's residents are engaged in their community and appreciate their trees. They support programs and infrastructure that improve their quality of life, including public safety and health, schools, historic preservation, business opportunities, recreational



opportunities and conservation of the environment. They support community forest management.

The city's *Environmental Sustainability Advisory Board* serves as the city's tree board. The following information from the city's *Environmental Sustainability Plan* and other sources provides a useful description of the physical setting for community tree management:

- 🌳 ***Decatur has a land area of 4.2 miles and is the most densely populated city in Georgia, with 4,600 residents per square mile.***
- 🌳 ***Land use within the city is about 15 percent commercial and 85 percent residential.***
- 🌳 ***There are 67 miles of city streets.***
- 🌳 ***The city has been largely built out since the 1960s.***
- 🌳 ***Ozone and particulate matter in the area have improved in recent years and the Atlanta metro area has now reached attainment status.***
- 🌳 ***Most soils in the area are designated as urban land and are in areas with high density land uses.***
- 🌳 ***There are 14 city-owned parks in Decatur totaling 56.5 acres and the Historic Decatur Cemetery which covers an additional 43 acres.***

In recent years the city has made a commitment to further increase the level of management of the community tree resource. The city's tree preservation ordinance and administrative standards have been under review since 2008. In 2010 the city applied for and received designation as a Tree City USA by the National Arbor Day Foundation. Over the past few years there has been a significant increase in tree planting initiatives in downtown, on capital improvement projects, along major thoroughfares, and in the neighborhoods. In the spring of 2012 the city conducted a tree canopy cover assessment and initiated a comprehensive city tree inventory. And, the city has now initiated the development of this ***City of Decatur Community Forest Management Plan*** to guide the community toward a more comprehensive and higher quality of community forest management.

The development of this plan took into account the urban tree canopy assessment, the street tree inventory results, a review of existing tree regulations and the 2008 draft



regulations, field assessments of recently completed developments, goals in the *City of Decatur 2010 Strategic Plan* and the *Environmental Sustainability Plan*, and community input gathered at meetings with the Planning Director, Deputy City Manager, City Tree Consultant and the Environmental Sustainability Board. Community input was also provided through the city's website. A detailed discussion of how this *Community Forest Management Plan* and other community plans are integrated is included in Appendix A.

The results of the research on existing conditions show that:

- 🌳 ***Tree canopy cover has decreased 4 percent over the last 17 years.***
- 🌳 ***Street trees are in need of risk mitigation and remedial maintenance.***
- 🌳 ***Tree planting and maintenance techniques for both city trees and regulated trees on developments need improvement.***
- 🌳 ***The city's tree ordinance and administrative guidelines need revision to improve clarity, consistency, strengthening of tree canopy conservation requirements, and updated standards.***
- 🌳 ***The capacity for program administration is inadequate for meeting current community forest management goals.***

This *City of Decatur Community Forest Management Plan* establishes a framework for community forest management that recommends:

- 🌳 ***No net loss of tree canopy cover (45 percent) and an increase to 50 percent cover within 25 years.***
- 🌳 ***The hiring of a full-time City Arborist.***
- 🌳 ***Cost efficiency through quality management and community-wide involvement in tree canopy conservation.***
- 🌳 ***The adoption and implementation of Community Standards for Tree Conservation.***
- 🌳 ***Revisions to the tree preservation ordinance and administrative guidelines that include a change in the measurement of tree density from tree density units to tree canopy cover percent and the incorporation of updated standards and an official tree species list for Decatur.***



- 🌳 ***Increased monitoring and inspections of city trees and trees regulated by the tree preservation ordinance.***
- 🌳 ***Expanded routine tree maintenance programs to include pruning, mulching, irrigation, pest management, cabling and bracing, inspections, and removals.***
- 🌳 ***Maintenance of accurate and current information on tree canopy, city trees, and the value of this asset.***
- 🌳 ***A strong focus on community-wide education to increase tree literacy and community engagement.***
- 🌳 ***Development of neighborhood tree conservation plans to engage residents, develop and enhance neighborhood character and serve as a basis for creating integrated city and private tree protection, establishment, and maintenance programs.***
- 🌳 ***A diversity of funding sources and the establishment of a tree utility fee to fund the expanded community forest management program.***

Part II of this plan contains work plans for tree canopy conservation, program administration, standards and best management practices, tree regulation, tree establishment, tree protection, tree maintenance, forest resource information, and education and outreach. The work plans include goals, strategies, and recommended actions for each program element.

The appendices contain supplemental information that provides additional context for the goals, strategies, and recommended actions.



For further information about this plan or the city's community forest management program, please contact Amanda Thompson, Planning Director, at 404.370.4102 or [amanda.thompson@decaturga.com](mailto:amanda.thompson@decaturga.com).



## Part II: Program Work Plans

***The primary goals of the community forest management program are to maintain a healthy and abundant tree canopy and utilize trees for the irreplaceable and valuable functions and benefits they provide to our community.***

***The primary strategies that guide management plan activities are quality management in accordance with standards and best management practices and engaging the community in tree canopy conservation.***

***The primary purpose of the community forest management plan is to provide a basic framework of goals, strategies, and actions to guide management activities toward achieving community goals over the next 5 years, and beyond.***

Goals, strategies, and actions follow for implementing a comprehensive and cost effective community forest management program. The implementation period for this plan is the next 5 years, from 2013 to 2018, after which time many of the activities recommended will become routine and well-established.

The goals, strategies, and actions are organized by the program components listed below.

- 🌳 ***Tree Canopy Conservation***
- 🌳 ***Program Administration***
- 🌳 ***Tree Regulation***
- 🌳 ***Tree Care Standards & Best Management Practices***
- 🌳 ***Tree Establishment***
- 🌳 ***Tree Protection***
- 🌳 ***Tree Maintenance***
- 🌳 ***Forest Resource Information***
- 🌳 ***Tree Education and Outreach***



## Tree Canopy Conservation

*The tree canopy that spreads over our community is composed of many individual trees growing in our yards, along city streets, in parks, around city offices and facilities, around businesses and in parking lots.*

*These community trees, along with the other plants, animals, and soil, air and water resources around them, make up our community forest. Our community forest provides us with many environmental, economic, and social benefits.*

*The conservation of our tree canopy is important to maintaining our community's environmental, economic, and social health because trees perform many functions and provide us with a wide variety of irreplaceable benefits. Trees are a community asset and an important part of our city's infrastructure.*

*Tree canopy conservation requires specific actions that involve the protection of the forest resource from major changes, losses, and damage and the management and care of individual trees to preserve their health, condition, structural integrity, longevity, and contribution. Maintaining or increasing the amount of tree canopy cover throughout the community also requires the regular establishment of new trees to replace those removed.*

*From 1991 to 2008 tree canopy cover in Decatur declined 4.1 percent, from 50.9 to 46.8. A 2012 urban tree canopy assessment showed that in 2005 tree canopy covered 45.7 percent of the 4.27 square mile land area within the city and in 2010 this amount was reduced slight to 45.1 percent. Tree canopy cover in Decatur is declining.*

*In response to the recent urban tree canopy assessment, the Environmental Sustainability Advisory Board set a goal of NO NET LOSS of tree canopy cover for Decatur.*

### Goals

- 1. No net loss of tree canopy cover.*
- 2. An increase in tree canopy cover to 50 percent within the next 25 years.*



3. *Maintenance and enhancement of the economic vitality of Decatur's downtown commercial district by achieving at least 40 percent tree canopy cover on commercial properties.*
4. *Maintaining and enhancing the beauty and historic character of Decatur's neighborhoods by achieving at least 55 percent tree canopy cover on residential properties.*
5. *Healthy, structurally sound, long-lived community trees that contribute to Decatur's environmental, economic, and social health.*

## Strategies

1. *Actively conserve tree canopy cover for the environmental, economic and social functions that trees provide.*
2. *Actively conserve the city tree resource through routine maintenance and the implementation of standards and best management practices.*
3. *Support the conservation of the private tree resource through education and minimum regulation.*
4. *Consider impacts on tree canopy cover in policy and planning decisions.*
5. *Use regular assessments of tree cover to develop trends and evaluate the effectiveness of program changes in tree establishment, regulations, tree maintenance, and education and outreach.*

## Actions

1. *Adopt, implement, and enforce standards and best management practices for tree care practices.*
2. *Establish tree canopy cover requirements and goals by zoning district.*
3. *Increase tree canopy cover through an expanded community tree establishment program.*
4. *Monitor tree canopy cover changes over time; conduct tree canopy cover assessments every 10 years for the previous year.*



- 5. Advocate for tree canopy cover at staff meetings, educational programs, and community events.**
- 6. Encourage staff to consider the effects of all departmental management decisions on city trees and tree canopy cover.**
- 7. Provide technical assistance and education to residents, businesses, agencies and organizations to increase and maintain tree canopy.**
- 8. Develop neighborhood tree conservation plans; develop at least one (1) neighborhood tree conservation plan each year.**
- 9. Reduce conflicts between tree conservation and storm water management structures on development sites.**
- 10. Require a minimum of 50 percent mature tree canopy cover in parking lots.**

The conservation of trees and tree canopy involves protecting and maintaining existing trees as well as establishing new trees where available space exists, then protecting and maintaining those new trees so that they live and thrive for as long as possible. Tree conservation also involves conserving some land area for trees on an individual lot, in a neighborhood, and across the city—including ample space above and below ground—for trees to grow free from conflicts with buildings, pavement, utilities and other infrastructure.

The greatest losses in tree canopy cover occur when trees are removed due to development or timber harvesting. Since much of Decatur is already built out, large scale removal of trees from wooded areas does not often occur. Tree canopy is most commonly lost when building demolition, building construction, or building, utility, or landscape renovation occurs. Because 85 percent of land in Decatur is dedicated to residential use, Decatur residents control the greatest portion of tree canopy and the conservation of trees on residential properties is extremely important. However, because commercial properties have larger amounts of impervious surfaces, including building footprints and parking lots, maintaining tree canopy cover on these properties is also extremely important to reduce the negative impacts of built environments on our temperature, air quality, and water quality.

To maintain no net loss of tree canopy cover, the city, residents and businesses all need to regularly assess the amount of existing cover they have, plant additional trees



as needed to meet tree canopy conservation goals, and replace trees as soon as they are lost.

To increase tree canopy cover and achieve approximately the same amount of canopy that was present in 1991, the city, residents and businesses all should begin aggressive tree planting programs. The number of large, canopy trees that will need to be planted in the city to add 5 percent to tree canopy cover is 3,720, based on a total city area of 4.27 square miles and an average crown size of 1,600 feet for a large, canopy tree. Assuming no net loss, for every 1 percent increase in tree canopy cover 744 large canopy trees must be planted according to the calculations below.

$$\begin{aligned} 1\% \text{ increase} &= .0427 \text{ square miles} = 27.3 \text{ acres} = 1,190,407 \text{ square} \\ &\text{feet}/1,600 \text{ square feet per canopy tree} = \\ &744 \text{ canopy trees} \end{aligned}$$

$$5\% \text{ increase} = 5 \times 744 \text{ trees} = 3,720 \text{ trees}$$

$$3,720 \text{ trees planted over 25 years} = 150 \text{ canopy trees planted each year}$$

**to increase from 45% tree canopy in 2012 to 50% tree canopy in 2037**

To achieve this goal of a 5 percent increase within the next 25 years, then 150 additional large canopy trees above replacement need to be planted each year throughout the community. This goal is included in the tree establishment work plan.





## Program Administration

*Expanding efforts to conserve tree canopy cover and managing the community forest resource in a quality manner requires the allocation of additional resources. The level of expansion and sustainability of the city's community forest management program is dependent on the level of resources allocated to program administration.*

*Administration involves assigning roles and responsibilities, routine planning, developing funding requests, managing partnerships, keeping accurate records, and regular reporting on project activities, accomplishments, needs and priorities.*

### Goals

- 1. A sustainable community forest resource.*
- 2. A cost-effective community forest management program.*
- 3. Sufficient capacity of the city and its partners to manage the community forest at a sustainable level.*

### Strategies

- 1. Continue and expand professional management of the community forest by an ISA Certified Arborist.*
- 2. Strengthen, build and diversify partnerships to increase program support and capacity.*
- 3. Continue existing successful program elements and activities while expanding the program to include additional essential elements and activities.*

### Actions: Personnel and Partnerships

- 1. Hire a full-time City Arborist to administer the community forest management program.*



- 2. Identify key partners in community forest management; develop a contact list to be used for distributing program information and soliciting program support.**
- 3. Define tree management roles and responsibilities for key partners.**
- 4. Support partners and their tree conservation initiatives with program resources and by providing technical expertise.**
- 5. Sponsor an annual neighborhood event with a local non-profit organization and other partners to promote, plant or mulch city trees.**

There is current need, without adding any new program activities, for additional capacity for monitoring and inspections, managing information, and education and outreach. The adoption of this *Community Forest Management Plan* and the implementation of an expanded program will substantially increase the workload and need for additional capacity if the program is to be successful.

There are a number of options available to the city for increasing the capacity to administer and coordinate the program. Ideally, this capacity will be provided by hiring a full-time City Arborist who will have considerable responsibility for tree canopy conservation and the implementation of the community forest management program and plan. The City Arborist should be, at a minimum, an ISA Certified Arborist with a degree in forestry, landscape architecture, horticulture, or a closely-related field.

Having a full-time arborist would guarantee that program implementation remains a high priority and that sufficient time and expertise is available to successfully move the program forward. Management activities would be more centralized with the hiring of the arborist, who would coordinate many management activities, but involvement by a variety of partners would continue to be encouraged and should be enhanced.

The city could also build capacity by increasing the activity and responsibilities of the City Tree Consultant. This individual is very familiar with the needs of city trees, with development and tree issues, and with the city's neighborhoods and neighborhood character, and is well respected by city staff, community residents and business owners. Even with the hiring of a City Arborist, the city could continue to utilize the City Tree Consultant for site plan review, development site monitoring, inspections and tree evaluations to take advantage of the consultant's considerable and valuable knowledge of the city's trees.



Throughout this management plan the assumption is made that the city will increase the capacity of the City Arborist, whether continuing to utilize a consultant or creating a full-time staff position. The activities listed in the work plans reflect this assumption of increased capacity.

Primary partners of the city include residents, neighborhood associations, non-profit and civic organizations, business owners, consultants and contractors, developers and building contractors, and utility providers. Figure 1 shows the City of Decatur’s primary community forest management partners.

**Figure 1. Community Partners in Forest Management**



The city contracts with Arboguard Tree Specialists to provide annual pruning, fertilization and pest management for trees in downtown. Trees Atlanta has been instrumental in the planting, maintenance and promotion of trees throughout Decatur. A



local Garden Club planted flowering cherry trees along city street rights-of-way in several neighborhoods. Local businesses have been involved in special tree planting and conservation projects within the city. The Georgia Forestry Commission has provided grant funding for many of the city's recent initiatives to advance its community forest management programs.

Among Decatur's citizens are several active tree advocates who have completed special projects for the city, including a pilot tree inventory project and the development of trails and greenspace. The most notable and accomplished of these citizen volunteers is Neil Norton, who works for the Georgia Urban Forest Council, a statewide organization that has its headquarters in downtown Decatur on West Ponce de Leon Avenue.

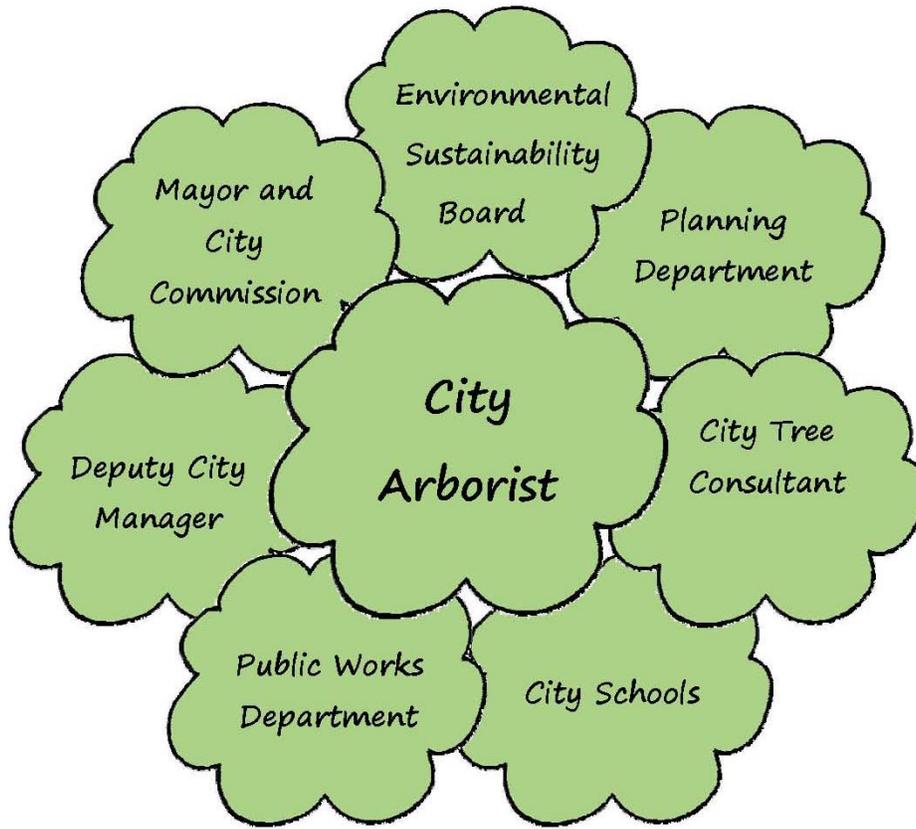
Within the city, management partners include the City Arborist, the Environmental Sustainability Advisory Board, the Planning Department, the City Tree Consultant, City Schools, Public Works, the Deputy City Manager, and the Mayor and City Commission, as shown in Figure 2.

Decatur's existing tree program is currently administered by a team of city officials, city staff, public agencies, private contractors, and community partners. The City Manager, Deputy City Manager, and the Mayor and City Commission appear to be well informed about city tree programs and tree planting initiatives and supportive of current programs based on a review of Commission meeting minutes and actions over the last year.

Deputy City Manager Hugh Saxon is currently responsible for the implementation of the city's tree management program, new tree plantings, downtown street tree maintenance and capital improvement projects that include tree preservation and planting. He also supervises the City Tree Consultant and directs the work of the grounds maintenance crews that care for trees in the public rights-of-way. He prepares an annual work plan and budget for tree maintenance and administers tree bank funds. He administers all maintenance contracts with vendors for downtown street tree care and invasive species removal in greenspaces. He coordinates the work of Trees Atlanta for street tree plantings and assisted with the establishment of the Oakhurst Arboretum.



Figure 2. City Partners in Forest Management



Amanda Thompson, Planning Director, is responsible for all planning and zoning issues in the city, the administration of the city's tree preservation ordinance, and special projects related to the conservation of the city's tree canopy cover.

The City Tree Consultant role as established in the city's tree preservation ordinance in 1990 is filled by Ed Macie, a consulting urban forester and Decatur resident, who has filled this role for the city since the adoption of the ordinance. He completes site plan



reviews, site inspections, city and private property tree evaluations and other program activities requested by the city<sup>1</sup>.

The city's Environmental Sustainability Advisory Board, established in 2008, is charged with the protection of the city's tree canopy and serves as the city's official tree board. There are nine (9) members of this board and they meet on the third Friday of every month at 8:00 a.m. at City Hall. Recent tree related projects have included a review of proposed changes to the city's current tree ordinance and providing input on this management plan. Lena Stevens is the city's Resource Conservation Coordinator and staff coordinator of the board. She serves as the primary contact for environmental initiatives and promotes sustainability among staff and the community.

City maintenance is also the responsibility of David Junger, Assistant City Manager for Public Works, and Gerry Knotts, Grounds Supervisor. Jason Ware, Director of Facilities & Maintenance, manages trees for Decatur City Schools. Private corporations, civic organizations and other non-governmental entities also assist and support the city in the planting and maintenance.

## **Actions: Roles and Responsibilities**

- 1. Define, document and assign community forest management roles and responsibilities.***
- 2. Assess workloads at semi-annually planning meetings and adjust roles and responsibilities as necessary to make sure that essential program tasks are being completed.***

Both city and community partners have important roles to play in maintaining and improving tree canopy cover. The partners and their primary roles and responsibilities are summarized in Table 1. If a full-time arborist is not hired, then the responsibilities assigned to the City Arborist need to be reconsidered or redistributed to other staff and consultants.

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<sup>1</sup> Role description per the City's 2010 Tree City USA recertification application



**Table 1. Community Forest Management Roles and Responsibilities**

TITLE/DEPARTMENT/GROUP	PRIMARY ROLES	PRIMARY RESPONSIBILITIES
<b>CITY OF DECATUR STAFF/ELECTED OFFICIALS</b>		
<b>City Arborist</b>	Tree Canopy Conservation Program Administration Standards & BMPs Tree Regulation Tree Establishment Tree Protection Tree Maintenance Forest Resource Information Education and Outreach	Program coordination Coordinate semi-annual planning meetings Budget development Annual plans and specifications for tree establishment and maintenance Technical assistance Tree inspections and evaluations Promote tree canopy conservation Monitor standards & BMPs Develop Neighborhood Tree Conservation Plans Coordinate and conduct education and outreach programs Attend Environmental Sustainability Advisory Board Meetings City tree inventory Tree benefit and value calculations Tree City USA annual re-certification application Grant applications and grant project management
<b>Deputy City Manager</b>	Program Administration Tree Establishment Tree Maintenance	Promote tree canopy conservation Monitor standards & BMPs Manage City Arborist and City Tree Consultant Assign roles and responsibilities Submit program budget



**Table 1. Community Forest Management Roles and Responsibilities**

TITLE/DEPARTMENT/GROUP	PRIMARY ROLES	PRIMARY RESPONSIBILITIES
		Manage tree establishment and maintenance contracts Manage Decatur tree bank funds Report program service hours
<b>Planning Department (Planning Commission)</b>	Tree Canopy Conservation Program Administration Standards & BMPs Tree Regulation Forest Resource Information Education and Outreach	Promote tree canopy conservation Adopt standards & BMPs Increase tree literacy Adopt revised tree regulations Tree canopy cover assessments Report program service hours
<b>City Tree Consultant</b>	Tree Canopy Conservation Standards & BMPs Tree Regulation Education and Outreach	Promote tree canopy conservation Technical assistance Tree inspections and evaluations Monitor standards & BMPs Revise tree preservation ordinance and administrative standards Educational materials and presentations
<b>Public Works Department</b>	Tree Canopy Conservation Standards & BMPs Tree Protection Tree Maintenance	Promote tree canopy conservation Implement standards & BMPs Increase tree literacy Protect city trees City tree establishment and maintenance Report program service hours
<b>Decatur City Schools</b>	Tree Canopy Conservation Standards & BMPs Tree Establishment	Promote tree canopy conservation Implement standards & BMPs Increase tree literacy



**Table 1. Community Forest Management Roles and Responsibilities**

TITLE/DEPARTMENT/GROUP	PRIMARY ROLES	PRIMARY RESPONSIBILITIES
	Tree Protection Tree Maintenance Education and Outreach	Protect city trees Report program service hours
<b>Environmental Sustainability Advisory Board</b>	Tree Canopy Conservation Program Administration Tree Establishment Forest Resource Information Education and Outreach	Promote tree canopy conservation Guide community forest management Increase tree literacy Establish City Arborist as an ex-officio member Establish an annual tree conservation award Report program service hours
<b>Mayor and City Commission</b>	Tree Canopy Conservation Program Administration Tree Regulation	Promote tree canopy conservation Increase tree literacy Adopt the <i>Community Forest Management Plan</i> Approve City Arborist position Approve Tree Utility Fee Approve community forest management budget
<b>COMMUNITY PARTNERS</b>		
<b>Residents</b>	Tree Canopy Conservation Standards & BMPs Tree Establishment Tree Protection Tree Maintenance Education and Outreach	Promote tree canopy conservation Implement standards & BMPs Protect city trees Increase tree literacy Mulch and water city street trees Remove invasive plants around city street trees Attend city-wide and neighborhood tree events Support Neighborhood Tree



**Table 1. Community Forest Management Roles and Responsibilities**

TITLE/DEPARTMENT/GROUP	PRIMARY ROLES	PRIMARY RESPONSIBILITIES
		Conservation Plan activities Report program service hours
<b>Neighborhood Associations</b>	Tree Canopy Conservation Tree Establishment Tree Protection Tree Maintenance Education and Outreach	Promote tree canopy conservation Support Neighborhood Tree Conservation Plans Sponsor city-wide and neighborhood tree events Report program service hours
<b>Non-Profit Organizations</b>	Tree Establishment Tree Maintenance Education and Outreach	Promote tree canopy conservation Implement standards & BMPs New tree maintenance Sponsor city-wide and neighborhood tree events Report program service hours
<b>Utility Providers</b>	Tree Canopy Conservation Standards & BMPs Tree Protection Tree Maintenance	Promote tree canopy conservation Implement standards & BMPs Protect city trees
<b>Business Owners</b>	Tree Canopy Conservation Standards & BMPs Tree Regulation Tree Establishment Tree Protection Tree Maintenance	Promote tree canopy conservation Implement standards & BMPs Increase tree literacy Protect city trees Sponsor city-wide and neighborhood tree events
<b>Developers and Building Contractors (construction)</b>	Tree Canopy Conservation Standards & BMPs Tree Regulation Tree Establishment Tree Protection Tree Maintenance	Promote tree canopy conservation Implement standards & BMPs Increase tree literacy Protect city trees



**Table 1. Community Forest Management Roles and Responsibilities**

TITLE/DEPARTMENT/GROUP	PRIMARY ROLES	PRIMARY RESPONSIBILITIES
<b>Consultants and Contractors (arborists, landscape contractors, tree services)</b>	Tree Canopy Conservation Standards & BMPs Tree Protection Tree Maintenance Forest Resource Information Education and Outreach	Promote tree canopy conservation Implement standards & BMPs Increase tree literacy Protect city trees City tree establishment and maintenance

**Actions: Planning**

- 1. Conduct semi-annual program planning meetings.**
- 2. Include the City Arborist as an ex-officio member of the Environmental Sustainability Advisory Board.**
- 3. Include the City Arborist in planning meetings for development projects, city capital projects, major infrastructure maintenance and repair, tree planting projects on city property, Arbor Day and other special events, and education and training programs.**
- 4. Develop annual plans for routine tree establishment, mulching, irrigation, pruning, inspection, and removal.**

The addition of semi-annual planning meetings to discuss and plan for upcoming community forest management activities will also provide opportunities for gathering input on current needs and priorities. Planning meetings should include discussions of upcoming city construction projects, tree establishment, pruning, cabling and bracing, pest management and removal needs, and education and outreach needs and events.

In addition to organizing the community forest management program planning meetings, the involvement of the City Arborist in Environmental Sustainability Advisory Board meetings and other meetings where capital projects, major infrastructure maintenance and repair projects, tree protection needs, and tree planting initiatives are being discussed or planned is critical in ensuring the protection and conservation of city trees. The arborist’s professional expertise in evaluating the feasibility of protecting, conserving, and establishing trees in conjunction with these activities can be considered



in project planning and decision-making, and utilized in developing specifications for requests for bids and negotiating contracts.

## **Actions: Funding**

- 1. Develop an annual budget proposal to fund basic community forest management program activities at a minimum level of \$115,000 to include appropriations for professional services, operating supplies, advertising, office supplies, and education.**
- 2. Establish a tree utility fee in the amount of \$1.50 per household per month and \$3.00 per business per month to cover the costs for a full-time City Arborist and expanded routine tree maintenance and education and outreach programs.**
- 3. Establish a tree conservation permit fee of \$300 to cover the costs of plan review, site monitoring and inspections for sites regulated by the tree ordinance.**
- 4. Establish a value of \$200 for 1,000 square feet of tree canopy cover as a basis for calculating contributions to the Decatur tree bank in lieu of conservation or planting.**
- 5. Utilize Decatur tree bank funds to cover the costs of annual tree establishment and new tree maintenance.**
- 6. Seek grant funding for special projects to supplement the program budget and allow for further expansion of program capacity.**
- 7. Assign responsibility to the City Arborist for the development of the annual budget proposal and for approval, monitoring, and reporting of budget expenditures.**

The city budget for tree care was \$72,965 in FY2010, and a similar amount was spent in FY2011. This includes \$2,500 for the City Tree Consultant, \$17,980 for the Arborguard contract for downtown tree maintenance, \$15,000 for tree replacement in the city rights-of-way, \$2,485 for City Hall new tree plantings, \$6,000 for kudzu removal, and \$29,000 for a multi-year woodland restoration contract with Trees Atlanta. An additional \$9,000 was spent by Trees Atlanta for tree care within the city.



In 2011 the city received a \$15,000 grant and supplemented the grant funding with an additional \$18,825 for the completion of a tree inventory, tree ordinance review, and development of this management plan by a consulting urban forester. The total project cost was \$33,825. Based on city and non-city expenditures over the last couple of years, the city's current annual community forest management costs are estimated to average \$115,000 per year.

The city also has a tree bank established to receive monies in lieu of tree planting on development sites when approved by the City Tree Consultant. These monies are used for tree planting and maintenance on city property and are administered by the Deputy City Manager.

A diversity of funding sources for the city's program is proposed. Funds for development activities will be provided through a tree conservation permit fee. Funds for routine tree maintenance will be provided from the city's current general revenue fund. Funds for a city arborist and expanded program activities will originate from the new tree utility fee to be paid by residents and businesses. Funds for new tree establishment and maintenance will originate from the Decatur tree bank which accepts funds from the development community in lieu of meeting required tree density. Special projects will be funded with grants from local, state, and federal agencies and non-profit organizations.

Additional capacity for accomplishing program activities will come from engaging the community in doing some basic tree maintenance for city trees located in front of their residences or businesses, and from donation from local residents and businesses to special program initiatives.

An estimate of the potential funding that could be available to the Community Forest Management Program is illustrated in Figure 3. It shows a potential of \$302,500 in funding. The amount available from permit fees and grants would be dependent on the activity and effort level in those areas, respectively.



**Figure 3. Potential Program Funding Sources**

Decatur’s residents are knowledgeable about the need to maintain trees for the public good and are aware of the functions, benefits and value of trees. They have expressed support for the tree inventory project and for expanding the city’s community forest management program<sup>2</sup>. Their support for a minimum tree utility fee should be researched through a question on the city’s online forum.

<sup>2</sup> Anecdotal Information from the consultants working in the field during the tree inventory.



If a tree utility fee is adopted, then a reduction or elimination in the fee could be offered for those individuals that exceed tree canopy requirements or goals by at least 15 percent. For example, if 60 percent cover is established as the goal for residential properties, then coverage of 75 percent would result in eligibility for a waiver. For commercial properties with a goal of 45 percent, achieving 60 percent would result in eligibility for a waiver. An interactive system for property owners for measuring tree canopy using aerial photography available online could be developed. The City Arborist would be responsible for field checking tree canopy cover estimates submitted with applications for fee waivers.

Other options could be explored for increasing revenues for hiring a City Arborist and expanding program capacity. The tree utility fee could be established as a voluntary check-off on the monthly utility bill instead of a mandatory fee. Check-off amounts of \$1, \$3, \$5 and "Other" options could be included. The city could suggest that larger amounts be donated when significant tree cover is not present on a property. For those that have significant tree cover, a \$1 minimum would be encouraged. For those without, a \$5 minimum would be encouraged. The results of such a system may, or may not, provide enough revenue to significantly expand capacity. There are 8,143 households in Decatur. If half of the households choose to check off \$1 for trees each month, an additional \$48,858 would be raised annually. If the check-off averaged \$2 per month for half the households, an additional \$97,716 would be raised annually. The success of this option would depend solely on the willingness and enthusiasm of residents and business to sponsor the city's program.

Another option for increasing program capacity and raising additional revenues would be to utilize the existing system for Stormwater Utility Fees and add a small amount for maintaining tree canopy cover to each of the households within the city. Currently the fee is \$6.25 per month, or \$75 annually. This could be increased by \$1.50 per month to \$7.75 for a total increase of \$18 per year to \$93 per month which would bring in an additional \$146,574 annually at a minimum (based on the 8,143 households within the city). Since tree canopy substantially reduces the amount of stormwater runoff that occurs and reduces the demand in capacity for stormwater control structures, and since the fee would be used to plant and maintain more trees, this may be a common sense option for funding the expanded program.



## **Actions: Record Keeping**

- 1. *Maintain copies of all tree canopy cover assessment reports.***
- 2. *Maintain tree inventory database digital files.***
- 3. *Maintain copies of all tree inventory summary reports.***
- 4. *Maintain records of the number of city trees protected, planted, mulched, pruned, inspected, and removed by month and summarize this information by quarter, calendar year, and fiscal year; record historical information on these activities where records are lacking.***
- 5. *Maintain records of city tree planting locations, by year, street, species, who planted the trees, and the nursery where the trees were purchased, and all associated expenses; record historical information on tree planting where records are lacking.***
- 6. *Maintain records of tree maintenance operations time and expenses for labor and equipment, by dates, hours, type of activity.***
- 7. *Maintain digital copies of all approved tree protection and replacement plans (tree conservation plans).***
- 8. *Maintain a digital and paper copy of all program and special event announcements, flyers, press releases, articles, and photographs.***
- 9. *Maintain records of in-kind service hours provided for tree related work by city staff.***
- 10. *Maintain a list of volunteer hours by names, dates, hours, and project activities; develop a template for a volunteer in-kind service sign-in sheet.***
- 11. *Maintain a record and current accounting of program revenues and expenses.***
- 12. *Maintain a record and current accounting of Decatur Tree Bank account revenue and expenditures.***

Recordkeeping is minimal in the current program and many details of past projects, planting initiatives, program activities and accomplishments are not recorded or readily available. The Deputy City Manager and City Tree Consultant hold considerable



knowledge about city trees, development activity, and program activities. The retro-active recording of historical information is a priority.

Keeping accurate records of program activities, accomplishments, and expenditures will help in developing accurate and justifiable program plans, funding requests, and grant proposals. The community forest management program documents and records listed above should be archived and accessible for use in reporting and providing justification and background for funding requests and grant applications. All of these records should be kept in hard copy format as well as digital files.

## **Actions: Reporting**

- 13. *Submit and present quarterly and annual reports on community forest management program activities, progress, results, accomplishments, and expenditures to the Environmental Sustainability Board, the Deputy City Manager, and the Mayor and City Commission.***
- 14. *Develop a template for quarterly program reports.***
- 15. *Develop a template for an annual program reports.***
- 16. *Gather monthly, summarize by department, and report quarterly the in-kind service hours provided by each employee; include all services provided in the activity areas listed on the Tree City USA eligible expenditures list<sup>3</sup>.***
- 17. *Develop a template for staff reporting of in-kind service hours.***
- 18. *Publish periodic and annual reports of program activities, accomplishments, and expenditures online on the city's website.***
- 19. *Complete the Tree City USA recertification application annually by November 15.***
- 20. *Complete a Tree City Growth Award application annually by November 15.***
- 21. *The routine reports and reporting activities listed above are recommended to increase awareness of and support for the community forest management***

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<sup>3</sup> Available online at [www.arboday.org/](http://www.arboday.org/)



*program and its critical components (funding, standards, regulation, and education).*

**22. Information about program activities, results, and accomplishments are currently presented on a periodic basis in public forums such as Environmental Sustainability Advisory Board meetings, City Commission work session and voting meetings, and Planning Commission meetings. No formal or routine reporting schedule is in place.**

**23. The reporting of program information to those involved in and supportive of the program is a key activity to maintaining their involvement and support.**





## **Tree Care Standards & Best Management Practices**

*The adoption, implementation, and enforcement of standards and best management practices for all tree care operations are critical to conserving trees and maintaining and improving tree canopy cover in a cost effective manner.*

### **Goals**

- 1. Become a model community for quality management of the community forest resource.*
- 2. Increase tree survival, health, longevity and contribution.*
- 3. Create a strong connection between trees to stormwater.*
- 4. Increase the benefit to cost ratio of managing city trees.*

### **Strategies**

- 1. Implement standards and best management practices for the care of city trees.*
- 2. Encourage and support the implementation of standards and best management practices community-wide.*

### **Actions**

- 1. Adopt, implement and enforce Community Standards for Tree Conservation developed as part of this plan for city trees and regulated trees on private property.*
- 2. Incorporate the community standards into the tree ordinance and administrative guidelines.*
- 3. Develop standard details to include on site plans for tree protection, planting, and mulching.*



- 4. Develop design standards for development sites, and especially parking lots, that incorporate permeable pavement, expanded rooting zones, and greater infiltration of stormwater.**
- 5. Purchase two (2) complete sets of ANSI Z133.1, ANSI A300, and ANSI Z60.1 standards for tree care operations and ISA Best Management Practices and provide staff and public access to these documents.**
- 6. Revise standards and best management practices as professional standards are updated or as necessary to improve practices.**
- 7. Develop a PowerPoint presentation highlighting the community standards; conduct regular educational programs on standards.**
- 8. Provide utility companies and contractors, construction contractors, tree services and landscape contractors working within the city with standards and best management practices and enlist their help in increasing the quality of tree care throughout the community.**
- 9. Monitor all construction projects and city tree care activities for compliance with standards.**
- 10. Assign the responsibility for monitoring field operations for compliance with standards and for educating the public about the standards to the City Arborist.**

A proposed set of *Community Standards for Tree Conservation* has been developed as part of the tree ordinance and administrative standards review; they are included in Appendix B. These standards reflect community values and the city's commitment to quality tree management. They incorporate *American National Standards* for safety, nursery stock, and tree care operations adopted by the American National Standards Institute, International Society of Arboriculture Best Management Practices, and additional custom standards that address local tree conservation issues.

The adoption, implementation and enforcement of these standards will result in immediate and long-term improvements in the health, safety, longevity and contribution of the community's trees. They should also increase time and cost efficiency for the management and regulation of trees.



The connection of trees and stormwater is an important goal. As tree canopy cover is increased, stormwater runoff is decreased. More trees equal more uptake of water by trees through their root systems. As rooting zones for trees are increased through pervious pavement and expanded rooting zones, stormwater infiltration is increased.

Enforcement of the standards is key component of their effectiveness. Adoption will be meaningless unless individuals are trained in their interpretation and proper implementation, and compliance is consistently monitored and enforced. A commitment to training and enforcement will require a commitment to providing additional staff time, consultant time and budget appropriations for frequent site monitoring and education of city staff, development permit applicants, businesses and residents on the standards on a regular and ongoing basis. Regular education and monitoring should reduce the number of violations that occur, the incidence of citations and stop work orders, and the amount of penalties and fines assessed for non-compliance with standards.





## Tree Regulation

*Because tree canopy cover provides benefits across our community, some minimal regulations to require responsible conservation, protection, establishment, and care of trees is necessary. These regulations establish the importance of trees in the community and set minimum standards for taking care of this valuable resource.*

*The city's tree preservation ordinance and administrative guidelines are 23 years old and relatively unchanged. These regulations need updating and revisions to improve clarity, consistency, standards, illustrations and tree density requirements.*

*A detailed set of recommendations for revisions to the tree preservation ordinance, administrative guidelines and other tree-related regulations are included as part of this plan in the Summary, Analysis and Recommendations for Tree Regulation in Decatur, Georgia in Appendix C. Tree regulations, and these revisions, are focused on conserving trees, utilizing trees for their functions and benefits, establishing new trees where their functions are maximized, quality tree maintenance and maintaining community forest health.*

*With declining tree canopy cover, the revisions of these regulations are a priority and should be completed over the next year.*

### Goals

- 1. Maintain a minimum amount of tree canopy cover throughout the city.*
- 2. Provide flexibility in satisfying tree canopy cover requirements.*
- 3. Provide fair and consistent enforcement of tree regulations.*

### Strategies

- 1. Regulate trees only to the extent necessary to reach tree canopy cover goals.*
- 2. Utilize trees as infrastructure to provide specific environmental, economic, or social functions.*



3. *Use education as a tool for reducing the need for regulation.*

## **Actions**

1. *Revise the tree preservation ordinance in accordance to the recommendations in the tree regulation summary in Appendix C.*
2. *Change the title of the regulations to Tree Canopy Conservation; move the Tree Canopy Conservation ordinance to Chapter 42. Environment.*
3. *Revise the tree preservation ordinance administrative guidelines to incorporate the Community Standards for Tree Conservation and other recommendations in tree regulation summary in Appendix C.*
4. *Change the title of the tree preservation administrative guidelines to Tree Canopy Conservation Administrative Guidelines.*
5. *Establish minimum requirements and goals for tree cover by zoning district.*
6. *Incorporate incentives such as reductions in the tree utility fee or stormwater utility fee for conserving existing trees, exceeding tree canopy cover requirements, permeable pavement, expanded tree rooting zones, and bioswales, rain gardens, bioretention areas that incorporate trees and reduce stormwater runoff.*
7. *Continue current procedures for tree plan review and site inspection; increase site monitoring for compliance.*
8. *Require that approved revisions to tree conservation and planting be recorded on site plans or require submittal of final site plans for archiving.*
9. *Conduct ongoing development assessments to gather data on the effectiveness of tree regulations and inspection and enforcement procedures.*
10. *Re-assess the need for expanding the applicability of tree regulations to trees over 8 inches DBH on single-family residential properties that are now excluded from compliance after each tree canopy cover analysis.*
11. *Review the tree regulations and administrative guidelines at least every 3 years and revise according to current needs and latest results of ongoing development assessments.*



**12. Provide training annually or as needed for city staff, the development community, and citizens in the implementation of the tree regulations and community standards for tree conservation.**

The city's code of ordinances includes many references to trees, but the primary regulations that affect trees on public and private property is the tree preservation ordinance. As previously mentioned, tree preservation ordinance and administrative standards have been in effect for 23 years and have remained relatively unchanged during that time. A single supplement was adopted in 1999 to amend the administrative guidelines. In 2008 revisions to the ordinance and guidelines were developed but to date have not been adopted.

The adoption of the recommendations for revision of the tree ordinance and administrative guidelines will require an increased level of monitoring and educational programming, and an increased workload for the City Arborist or City Tree Consultant, Planning Director and Deputy City Manager.

Because of the commitment of time that would be required for administration and because residents recognize the value of their trees and the contribution of the trees to neighborhood character and their quality of life, requiring permits to remove trees above a minimum diameter on existing single-family residential properties is not recommended at this time. On February 14, 2012, the city posted the following question on its website:

*To what extent do you support or oppose changing the City's tree ordinance to regulate the removal of healthy trees of a minimum size (e.g., 6" caliper) on existing single family properties where such trees do not interfere with permitted building improvements?*

The majority of people that replied to this question did not support a requirement for a permit to remove trees 6 inches DBH and larger from residential properties. While tree loss certainly occurs on residential lots, tree canopy coverage on most lots is substantial because residents prefer trees and understand their benefits. Most lots have a wooded back yard and at least a few trees in the front yard. The yards that include flower, fruit, and vegetable gardens that require full sun have fewer trees, but usually either the back or front yard is still wooded.

Trees on properties in a designated historic district or involved in demolition and infill development above 8 inches in diameter should still be regulated as they are now with a permit required for their removal.



Requirements for 55 percent tree canopy cover on residential sites and 40 percent on commercial sites is recommended as shown in Table 2. Adopting these requirements should eventually result in a tree canopy cover of just over 50 percent city-wide. For single-family residential properties (R-60, R-85), tree canopy cover goals would take the place of requirements. A waiver of the tree utility fee could be used as an incentive for property owners who maintain tree canopy cover at least 15 percent above the requirement or goal.

**Table 2. Recommended Tree Canopy Cover Requirements by Zoning District**

<b>ZONING</b>	<b>TOTAL ACRES</b>	<b>PERCENT OF CITY</b>	<b>IMPERVIOUS ALLOWED</b>	<b>CANOPY REQUIRED</b>
<i>Conditional General Commercial</i>	10.6	0.5%	n/a	<b>40%</b>
<i>Conditional High Density Single Family Residential</i>	2.9	0.1%	n/a	<b>40%</b>
<i>Conditional Local Commercial</i>	3.2	0.1%	n/a	<b>40%</b>
<i>Conditional Multiple Family Residential</i>	8.8	0.4%	n/a	<b>55%</b>
<i>Conditional Professional Office</i>	0.8	0.0%	n/a	<b>40%</b>
<i>Conditional Single Family Residential</i>	5.6	0.2%	n/a	<b>55%</b>
<i>General Commercial</i>	112.8	4.9%	60%	<b>40%</b>
<i>Heavy Commercial</i>	51.6	2.2%	60%	<b>40%</b>
<i>High Density Single Family Residential</i>	141.7	6.2%	60-75%	<b>40%</b>
<i>Institutional</i>	252.4	11.0%	n/a	<b>40%</b>
<i>Local Commercial</i>	31.8	1.4%	60%	<b>40%</b>
<i>Mixed Use</i>	20.6	0.9%	80%	<b>40%</b>
<i>Multiple Family Residential</i>	27.0	1.2%	60%	<b>40%</b>
<i>Multiple Family Residential (High Rise)</i>	13.6	0.6%	60%	<b>40%</b>
<i>Professional Office</i>	1.2	0.1%	n/a	<b>40%</b>

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**Table 2. Recommended Tree Canopy Cover Requirements by Zoning District**

ZONING	TOTAL ACRES	PERCENT OF CITY	IMPERVIOUS ALLOWED	CANOPY REQUIRED
<i>Single Family Residential (R-60)</i>	1,505.2	65.5%	40%	<b>55% (goal)</b>
<i>Single Family Residential (R-85)</i>	107.1	4.7%	40%	<b>55% (goal)</b>
<b>TOTAL</b>	<b>2,296.9</b>	<b>100.0%</b>	<b>n/a</b>	<b>51%</b>





## Tree Establishment

***Tree establishment is a multi-stage, 3-year process that begins with selecting suitable species and sites, selecting quality trees, installing trees properly, and providing new tree maintenance and annual inspections.***

***An ongoing tree establishment program is essential to maintaining no net loss and for increasing tree canopy cover.***

***The city tree inventory identified 911 individual tree planting locations for 602 small-maturing trees, 159 medium maturing trees, and 150 large maturing trees.***

***Regular tree establishment will increase age diversity in the tree population and provide the opportunity to enhance species diversity along a street, in a neighborhood, and across the city.***

### Goals

- 1. Increase species and age diversity.***
- 2. Improve species to site match.***
- 3. Increase the amount and quality of the growing space around trees.***
- 4. Reduce conflicts between trees and infrastructure.***

### Strategies

- 1. Maintain control of the tree establishment process.***
- 2. Plant large, canopy trees wherever adequate growing space is available.***
- 3. Work within current space limits when establishing trees but improve soil and site conditions whenever possible.***
- 4. Plant sites that meet minimum growing space standards first.***
- 5. Establish trees where they will provide specific functions.***
- 6. Plant trees annually.***



7. *Do not plant more trees than can be adequately maintained.*
8. *Hire only experienced contractors to plant trees on city property and require compliance with standards and best management practices.*

## **Actions**

1. *Develop neighborhood tree establishment plans as part of neighborhood tree conservation plans; combine neighborhood tree establishment plans into a city-wide tree establishment plan.*
2. *Plant 3,720 canopy trees in addition to tree replacements community-wide over the next 25 years.*
3. *Join and engage the community in planting 150 additional large canopy trees above replacement each year.*
4. *Plant at least 50 canopy trees per year on city property; encourage the planting of at least 100 canopy trees per year on private property.*
5. *Fill 30 vacant tree planting sites in residential neighborhoods each year as part of the neighborhood tree establishment plans.*
6. *Begin street tree planting in the neighborhoods in northwest Decatur where tree planting sites have been identified.*
7. *Incorporate the planting of 150 large, 159 medium, and 602 small vacant tree planting sites identified during the city street tree inventory into annual tree establishment plans.*
8. *Incorporate trees into all streetscape plans.*
9. *For every tree removed plant at least 1 tree as replacement tree canopy for no net loss; plant 3 trees for every 1 tree removed to increase tree canopy cover.*
10. *Develop a list of trees recommended for planting in Decatur; post the list online for access by the general public.*
11. *Develop design standards for streets that incorporate growing space standards for street trees.*



- 12. Utilize information gathered during the tree inventory to assess species performance and suitability for planting in Decatur.**
- 13. Guide tree planting decisions by developing a list of recommended trees for planting in Decatur.**
- 14. Fill 30 vacant tree planting sites in residential neighborhoods each year as part of the neighborhood tree establishment plans.**
- 15. Include newly planted city trees in the city tree inventory within 1 year after planting.**
- 16. Inspect all newly planted trees annually for 3 years after planting.**

Future tree planting decision should consider a variety of factors, including the purpose for planting, the size and general characteristics of the tree, the potential for the tree to thrive at the chosen location, and the level of maintenance the tree will need. Most importantly, trees should be chosen and planted where they will provide a specific function such as traffic calming, reducing surface temperatures and formation of ground level ozone, intercepting stormwater and reducing runoff, reducing soil erosion, and enhancing recreational areas, such as Decatur's bicycling and walking corridors. Of course, trees should also be chosen for their beauty and personal preference.

Growing space for trees is limited in Decatur, with the city's high population density and at least 26 percent of the land covered in impervious surfaces.<sup>4</sup> While growing space is often far from ideal in the landscape strips between the sidewalk and curb, this is where trees provide considerable functions and benefits so planting here is a compromise. Residential yards, city parks and city schools have the greatest amount of space available for additional trees and greatest potential for increasing tree canopy cover. To the greatest extent possible, avoid locating trees where they will cause a future conflict with overhead and underground utility lines, pavement, roadways, buildings, mailboxes, signs, walls, fences, and other trees. A database of vacant tree planting locations in the central business district and the northwest section of Decatur is included within the street tree inventory database.

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<sup>4</sup> From *Urban Tree Canopy Assessment for Decatur, Georgia*, April 2012.



Currently no master plan exists for the establishment of trees in the city, although trees are established more or less routinely by the city and by its community partners. The city has completed four (4) phases of a tree planting program in downtown Decatur.

The number of trees planted annually varies based on current initiatives and capital improvement and construction projects, but averages around 50 each year. The focus of tree planting projects are street tree replacement, increasing tree diversity, maintaining tree canopy cover, and utilizing the functions and benefits that trees provide. Trees planted in the downtown area not only enhance the aesthetic quality of the landscape but also enhance the environment and economy by providing shade and cooling.

Many of the trees recently planted in Decatur neighborhoods have been planted by Trees Atlanta<sup>5</sup>. Since the mid 1990's, Trees Atlanta has collaborated with the City of Decatur to plant over 1,200 trees in the city, including more than 250 trees planted in the last 3 years. In July 2011 the Decatur City Commission presented Trees Atlanta with a proclamation thanking the organization for its contributions to the city's tree canopy. Some of these collaborative projects are further described below.

In 2011 the Asbury Group, representing several car dealerships including Nalley Nissan, committed to the planting of 100,000 trees as a carbon offset project, with 10,000 of those to be planted in Decatur and DeKalb County over a 3 year period. Nalley is partnering with Trees Atlanta, DeKalb County, the Georgia Forestry Commission, and other non-profit groups in this effort. The trees are small diameter, containerized saplings that are easily planted by citizens. Trees and training are provided for volunteers who assist getting trees planted. The Decatur Environmental Sustainability Board has assisted in promoting the program and engaging volunteers. Decatur resident Neil Norton has been instrumental in coordinating this project with Nalley, DeKalb County, the city of Decatur, the Environmental Sustainability Board and Trees Atlanta.

To distribute these trees, a Nalley Tree Festival has been held twice in the Decatur Square—in February 2011 and April 2012. In 2011 about 3,600 trees were planted and about 3,000 were planted in 2012. The varieties available in 2012 included flowering

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<sup>5</sup> A tree advocacy, education and planting organization in the Atlanta metro area; for more information visit [www.treesatlanta.org](http://www.treesatlanta.org)



dogwood, oaks, and redbuds. These trees have been planted on public and private property, with many of them planted along trails, street rights-of-way, and in yards.

Support for community tree planting initiatives such as those just described can continue under an expanded tree establishment program. Tree planting within the scope of these programs should be done in accordance with tree planting standards and best management practices adopted by the city, and especially when planting occurs on city property. All trees planted on city property should be incorporated into the city's annual tree establishment program.





## Tree Protection

*Trees can live a long time, during which they are subjected to both gradual and sudden decline of their growing conditions and impacts on their health. To mitigate this decline, tree roots, trunks, and crowns, and the soils in which trees grow should be actively protected from activities and conditions occurring around and beneath them that can cause harm. Often this damage is permanent and may precipitate tree decline and death.*

*Activities harmful to trees include soil compaction from foot, vehicle, and heavy equipment traffic; materials storage; soil trenching, excavation, backfill, and contamination; grade and drainage changes; chemical and equipment washout into the root zone; wounding of roots, trunks, and scaffold limbs; excessive heat; topping, improper pruning, and improper mulching. These activities most often occur during land development, building or infrastructure construction or repair, utility installation and repair, and landscape installation and renovation.*

*The consequences of not protecting trees can be serious and expensive. Trees grow large and heavy and their failure can cause considerable damage and threaten public safety. The more damage that occurs, the greater the chances will be for tree decline and early death and the higher the costs will be for more frequent tree replacement.*

### Goals

- 1. Maintain public health and safety.*
- 2. Maintain tree health and maximize tree longevity.*
- 3. Reduce the amount of damage from human activity that occurs to trees and the soils in which they grow.*
- 4. Create an awareness of the need for ongoing protection of city trees.*



## Strategies

- 1. Protect trees to avoid damage and reduce costs of remedial maintenance and tree replacement.***
- 2. Create awareness within the community of the importance of ongoing tree protection to tree conservation.***
- 3. Engage the community in protecting city trees adjacent to their properties and trees on private property.***

## Activities

- 1. Inspect 62 trees recommended for protection during the city tree inventory and develop tree protection plans for trees with the highest priority need.***
- 2. Incorporate individual tree protection plans into neighborhood tree conservation plans.***
- 3. Promote city tree protection efforts as demonstration projects that provide examples to the community of quality tree protection.***
- 4. Include a statement on the city's website that city trees must be protected and compliance with standards and best management practices are required.***
- 5. Include a written statement with all city construction project and contract documents that the protection of city trees is required and must be done in accordance with tree protection standards and best management practices.***
- 6. Include a written statement with all approved development and building permits that city trees and conserved trees given tree canopy credit must be protected according to standards.***

The protection of city trees, trees conserved for tree canopy credit on private property, and all community trees is essential for achieving tree conservation goals. Tree protection should be ongoing as part of our daily activities. During building and infrastructure installation, repair, or renovation, tree protection should be thoughtfully planned, actively implemented, and regularly monitored before, during, and after site disturbance and construction activities take place.





## Tree Maintenance

***Implementing routine, basic tree maintenance programs will keep trees healthy, structurally sound, functioning well and continually providing benefits to the community. The healthier trees remain and the longer they live the more benefits they will provide.***

***It requires time, effort and money to maintain trees. They pay us back by providing many benefits and the greatest returns occur when maintenance is done correctly and in a timely manner. Proper and timely tree maintenance enhances tree health. Improper maintenance practices or neglect both result in poor tree health.***

***Essential tree maintenance includes mulching, irrigation, pruning, inspection and removal. Some trees may also need fertilization, pest management, supplemental support or lightning protection.***

***The maintenance goals, strategies, and actions that follow for the various tree maintenance activities are based primarily on the results of the street tree inventories and development assessments. Goals and strategies are established for tree maintenance in general, and actions steps are recommended in general and by activity.***

***The City Tree Inventory Summary Report and tree inventory databases provide extensive information on city trees and their maintenance needs and should be consulted for additional details. The appendices of the report contain lists of trees with hazard ratings, trees to be inspected regularly, and trees to be removed. Additional lists can be generated using the tree inventory databases.***

***A project summary describing the results of the tree inventory is located in Appendix D. The maintenance actions listed here address only those trees that were inventoried in 2012; additional maintenance needs will be identified during Phase II of the city tree inventory to be completed in 2013.***



## Goals

- 1. Maintain public health and safety.*
- 2. Maintain city tree health and structural integrity.*
- 3. Increase the benefit to cost ratio of tree maintenance.*
- 4. Develop a fiscally sustainable tree maintenance program.*
- 5. Complete risk mitigation within 3 years and remedial maintenance within 10 years.*

## Strategies

- 1. Be pro-active in completing tree maintenance.*
- 2. Begin addressing maintenance recommendations from the inventory with risk mitigation and other high priority activities. Continue with remedial maintenance while establishing routine tree maintenance programs for each maintenance activity.*

## Actions: General

- 1. Implement plans for annual tree mulching, pruning, inspection and removal; complete other tree maintenance such as fertilization, cabling and bracing, and soil aeration on an as needed basis.*
- 2. Fund routine tree maintenance through the general fund, the tree utility, and the Decatur tree bank.*
- 3. Implement and enforce standards and best management practices for all tree care practices; develop specifications for tree maintenance on city property.*
- 4. Enlist the help of Decatur residents in mulching, watering, and removing vines from city trees.*



## **Actions: Mulching**

- 1. Mulch all city trees in city parks, on city school property, along city streets in downtown, and around city offices and facilities where practical on an annual basis.***
- 2. Ask residents to mulch city street trees annually in neighborhoods; include mulching demonstrations in neighborhood educational programs.***
- 3. Develop a source of good quality organic mulch for mulching city trees; offer free mulch to residents.***

## **Actions: Irrigation**

- 1. Irrigate all newly planted city trees in city parks, on city school property, along city streets in downtown, and around city offices and facilities throughout the growing season during the 3-year establishment period.***
- 2. Ask residents to water newly planted trees and drought-affected city trees in neighborhoods during the growing season in the absence of rainfall; include irrigation for the 137 trees in need identified during the city tree inventory in neighborhood tree conservation plans.***
- 3. Provide information on watering restrictions to residents and businesses.***

## **Actions: Pruning**

- 1. Continue the current routine pruning program for trees in downtown.***
- 2. Expand the city's routine tree pruning program to include trees outside of downtown; prune one-tenth of city trees every year for clearance, crown cleaning, and structure improvement.***
- 3. Prune 1,039 large trees that need pruning as identified during the city tree inventory within the next 10 years.***
- 4. Begin remedial pruning with the 91 large trees in need of risk reduction pruning that were identified during the city tree inventory; continue with the 465 trees in need of training pruning, and then prune the remainder of trees, addressing trees with the largest diameters first.***



5. *Utilize the city tree inventory database to develop lists of trees to be pruned by type of pruning, hazard rating, DBH, street or section that can be attached to requests for bids for tree pruning.*
6. *After remedial pruning is completed in 10 years, begin pruning trees area by area within the city to increase work and cost efficiency.*
7. *Enforce standards and best management practices for utility line clearance pruning by utility providers and their contractors.*
8. *Hire only experienced contractors to prune trees on city property and require compliance with standards, BMPs, and specifications; require supervision by an ISA Certified Arborist.*

### **Actions: Pest Management**

1. *Continue the existing pest management program to treat the 87 city trees with scale in downtown and begin treating the additional 33 city trees found with scale located in other areas of Decatur.*
2. *Begin the removal of mistletoe during routine pruning operations for the 104 city trees found during the city tree inventory that are affected by this parasite.*
3. *Enlist the help of residents to remove invasive English ivy, wisteria and other vines from around the base, on the trunk, and in the crown of 217 affected city trees.*
4. *Mulch and irrigate flowering dogwood trees throughout Decatur to reduce tree stress and the incidence of dogwood borer; plant these trees in partial sun to reduce stress that can lead to insect and disease problems.*
5. *Include pest management activities in neighborhood tree conservation plans.*
6. *Remove competing vegetation (primarily liriope) from tree wells in downtown and replace with mulch to increase the amount of soil moisture available to trees.*



## **Actions: Inspections**

- 1. Conduct regular inspections of development sites under construction, completed development sites, and city trees in marginal condition.***
- 2. Maintain lists of trees at risk and trees in marginal condition.***
- 3. Conduct immediate inspections of 107 trees recommended for inspection and removal during the city tree inventory.***
- 4. Continue initial inspections of all 611 trees identified during the city tree inventory that are in marginal condition to verify maintenance needs.***
- 5. Inspect all marginal trees identified during the tree inventory at least annually and after major storm events or as necessary based upon their condition.***
- 6. Develop a tree risk assessment form based on the latest standards for tree risk assessment to use for future tree risk assessments.***
- 7. Prune, cable and brace, or remove trees as necessary to mitigate tree risk.***
- 8. Maintain a list of completed developments and developments in progress and visit on a regular basis to assess compliance and outcomes.***

## **Actions: Removals**

- 1. Remove 39 city trees with high priority removal recommendations in 2013.***
- 2. Remove 95 city trees with medium priority removal recommendations in 2014 and 2015.***
- 3. Remove an additional 159 trees with low priority removal recommendations in 2016 and 2017.***
- 4. Maintain a list of recommended tree removals by removal priority, hazard rating, and DBH.***
- 5. Plant at least 1 and up to 3 trees for every 1 tree removed on city property.***



## **Actions: Other Tree Maintenance**

- 1. Avoid over-fertilization of willow oaks to reduce favorable conditions for scale.***
- 2. Fertilize trees in tree wells where nutrient availability is limited due to reduced soil volumes.***
- 3. Investigate the feasibility of cabling and bracing 32 trees with structural defects identified during the city tree inventory.***
- 4. Cable and brace 10 trees each year over the next 3 years, and cable and brace additional trees as needs are identified.***
- 5. Aerate the soil to the extent feasible for 1,024 city street trees growing in severely compacted soil using a compressed air tool.***
- 6. Where soil aeration is not feasible, mulch areas of compacted soil to improve soil aeration over time.***

Current tree maintenance that is routinely conducted in the city includes pruning, fertilization, and pest management. This occurs primarily for trees in the downtown area. Outside the downtown area trees are maintained on an as needed basis. Large tree pruning and removal is done by contractors. City crews do some pruning and removal of trees as necessary along city street rights-of-way. Power company contractors also prune trees for line clearance along city street rights-of-way and on private property throughout the community.

Tree inspections and evaluations are made by the City Tree Consultant. No list of trees that need regular inspection is maintained; however, both the deputy city manager and the City Tree Consultant have an excellent working knowledge of the condition of many city trees, especially the larger trees, throughout town and periodically inspect trees in marginal condition.

The city contracts with Trees Atlanta for new tree maintenance and currently has a 5-year contract with the group for woodland restoration. Trees Atlanta's website states that they have summer and winter urban forestry crews that are responsible for the inspection and maintenance of trees they plant. Their maintenance program consists of watering, fertilization, mulching, weeding, pest management, and structural pruning during a tree's first 3 growing seasons.



In the expanded program described in this *Community Forest Management Plan*, the focus of tree maintenance is to complete the maintenance recommended during the street tree inventory. After the recommended maintenance is completed the same activities should be conducted routinely for all established trees and as needed throughout their lives.

The City Arborist has the responsibility for coordinating all tree maintenance activities. The tree inventory database is available to be used to plan maintenance activities and to develop lists of trees recommended for specific types maintenance. These lists can be used by the City Arborist, other city staff, or provided to contractors who will complete the work. The database can be sorted by location, species, diameter, condition, hazard rating, tree or site condition, or maintenance recommendation.

Separate databases can be created that include only those trees with a specific characteristic. The Excel database already contains separate databases (worksheets) that list trees recommended for pruning, inspection, and removal, as well as for trees with hazard ratings. In addition to the Excel database, the GIS shapefile can be queried to select and display trees with specific characteristics or recommendations, and the trees can be displayed in a map format for use in reports, presentations, and field work.





## Forest Resource Information

*To determine if community forest management is successful and to maintain support of management programs, current and accurate information on the community forest resource should be gathered.*

*Resource information useful for planning, budgeting, education and promotion include assessments of tree canopy cover, city tree inventories, and estimates of the value of the benefits of trees and tree canopy cover.*

### Goals

- 1. To maintain accurate and current information about the extent, character, needs and value of city trees and the city's tree canopy cover.*
- 2. Create awareness of the extent, character, needs and value of community trees.*
- 3. Sustain program support.*

### Strategies

- 1. Utilize tree canopy assessment results to promote the conservation of trees in Decatur.*
- 2. Utilize tree inventory data to more efficiently, effectively, and pro-actively manage city trees.*
- 3. Utilize information on the value and benefits of trees to maintain and increase support for the community forest management program.*

### Actions: Tree Canopy Assessments

- 1. Conduct regular assessments of tree cover.*
- 2. Develop tree canopy cover change trends.*



**3. Consider tree canopy cover change trends when assessing the effectiveness of past policy decisions, educational programs or tree care operations, and in future planning and policy decisions.**

The tree canopy that existed in Decatur in 2005 and 2010 was assessed in 2012 using satellite imagery. The assessment included documentation of urban forest canopy and associated ecosystem service values. The results of this assessment can now be considered when making policy decisions, developing budgets, and making resource management decisions. Highlights from this report and other tree canopy cover assessments are addressed later in this plan under Forest Resource Information. The complete tree canopy assessment report is located for reference in Appendix E.

The assessment showed that tree canopy covered 45.7 percent of the 4.27 square mile land area within the city in 2005 and 45.1 percent in 2010. Tree canopy cover in Decatur has been steadily decreasing since 1991.

In addition to tree canopy, other types of land cover were also measured and the results are summarized in Table 3.

**Table 3. Land Cover by Acres and Percent**

LAND COVER	2005		2010	
	ACRES	PERCENT	ACRES	PERCENT
<i>Impervious Surfaces</i>	720.5	26.2	732.9	26.6
<i>Open Space</i>	768.6	27.9	769.5	27.9
<i>Trees</i>	1,258.0	45.7	1242.4	45.1
<i>Bare Land</i>	6.5	0.2	8.8	0.3
<i>Water</i>	1.0	<0.1	0.9	<0.1
<b>TOTAL</b>	<b>2,754.6</b>	<b>100</b>	<b>2754.5</b>	<b>100</b>

The change in tree canopy and other land cover over this 5 year period is minimal and since only 2 years were measured, the change cannot be considered a trend. However, a trend can be seen with tree canopy cover data provided by Dr. Liz Kramer at the University of Georgia’s Natural Resource Spatial Analysis Laboratory (NARSAL)<sup>6</sup>. Her

<sup>6</sup> <http://narsal.uga.edu/>



assessments, which also used satellite imagery, show a trend of decreasing tree canopy cover over the 17 years prior to 2008. The total decrease over this period is 4.05 percent. The measurement results are shown in Table 4.

**Table 4. Tree Canopy Change in Decatur from 1991 to 2008**

Measurement Year	1991	2001	2005	2008	Change
Tree Canopy Cover	50.88	50.50	49.18	46.83	-4.05

### **Actions: City Tree Inventory**

- 1. Add the street tree inventory data to the city's GIS system as a separate tree layer. Create awareness among city staff of the availability of the tree layer and information on the GIS system.***
- 2. Complete the city tree inventory in 2013.***
- 3. Keep the inventory updated as trees are planted, removed, or maintained to ensure that it remains accurate, relevant and useful.***
- 4. Complete the maintenance recommended in the inventory to the greatest extent possible with available resources.***
- 5. Conduct an ongoing inventory of city trees, either inventorying all trees every 10 years or one-tenth of all trees each year.***
- 6. Coordinate city tree inventory with development or revision of neighborhood tree conservation plans.***

While tree canopy cover measurements provided information about the overall extent of the community forest, they provided little information about the characteristics or condition of individual community trees. To gather additional information about the city tree component of the canopy, a program was initiated to inventory all city trees.

The city tree inventory began with a pilot project coordinated by Planning Director Amanda Thompson and conducted by Decatur citizen volunteer and activist. Neil completed an inventory of 153 trees in downtown Decatur and summarized the findings in a project report that is available from the Planning Department. The University of Georgia provided the training and equipment for this inventory project.



During the second phase of the inventory program, a comprehensive city tree inventory was completed by an urban forestry consultant throughout Decatur. Information on city tree locations, species composition, size and age, condition, and maintenance needs was collected. The results of this inventory are summarized in a *City Tree Inventory Summary and Report*, which is available from the Planning Department. A project summary excerpted from the report has been included in Appendix D.

The 2012 city street tree inventory collected information on 2,606 trees and 571 planting sites. There were 110 tree species identified and the most common species found were flowering dogwoods, willow oaks, crapemyrtles, Chinese elms, red maples, water oaks, flowering cherries, and sweetgums. Most trees require some pruning. Large trees require risk reduction pruning and crown cleaning. Small trees require crown cleaning and clearance pruning over sidewalks and roadways. Many trees were found growing in compacted soils and restricted rooting zones and need mulching and soil aeration, where feasible.

For the purpose of the inventory, the city was divided into five (5) sections. All canopy trees 12 inches DBH and larger were inventoried along city streets; no ornamental species such as flowering dogwood, Bradford pear, or Japanese flowering cherry were included regardless of size. However, in two (2) sections—the central business district and the northwest section of Decatur—available tree planting sites, trees with DBHs 2 to 11 inches, and all ornamental trees were also inventoried.

In the final phase of the inventory, tree planting sites and trees 2 to 11 inches DBH will be inventoried in the NE, SE, and SW sections, along with trees located in city parks and around city buildings and facilities.

### **Actions: Forest Resource Value**

- 1. *Use i-Tree Tools to provide ongoing urban and community forestry analysis and benefits assessment.***
- 2. *Use benefits assessments to promote trees as green infrastructure.***
- 3. *Conduct benefits assessments periodically as the tree population changes significantly or as special needs arise.***
- 4. *Calculate the value of individual trees using the latest edition of the Guide for Plant Appraisal.***



Trees provide quantifiable environmental, economic, and social benefits. The value of these benefits can be calculated using several methods regularly employed by professional arborists. One of these methods was used to develop a valuation of the city's tree canopy after the tree canopy cover assessment was completed. The company<sup>7</sup> completing this assessment used a program called *iTree Canopy* (see the *Urban Tree Canopy Assessment Report* included in Appendix E). *Canopy* is one part of the i-Tree suite of urban forest management tools from the USDA Forest Service that can be accessed online at [www.itreetools.org](http://www.itreetools.org).

The analysis of the value of the benefits provided by the tree canopy showed that in 2010 the 45 percent tree cover reduced stormwater by 12 million cubic feet—a service with a value of \$2,074,400 annually and \$23,793,202 overall. The tree canopy also removes approximately 119,000 pounds of pollution and stores 420 tons of carbon annually—a service valued at \$335,501. Total carbon storage of the tree cover is approximately 53,500 tons.

Using the street tree inventory data, two (2) additional methods of calculating tree value have been completed by the urban forestry consultant completing the tree inventory. The first method uses the trunk formula methodology described in the 9<sup>th</sup> Edition of the *Guide for Plant Appraisal* developed by the Council of Tree and Landscape Appraisers and published by the International Society of Arboriculture ([www.isa-arbor.com](http://www.isa-arbor.com)). This method takes into account the environmental, engineering, economic, and aesthetic benefits of trees.

The trunk formula method takes into account the tree trunk diameter and cross sectional area, a basic value per square inch of cross sectional area, a species percent value developed by the Southern Chapter of the International Society of Arboriculture, the tree's condition percent, and a location percent that values the quality of the site, the placement on that site, and the tree's contribution. The consultant calculated a basic value of \$30 which is lower than the 2000 (\$45) through 2005 (\$66) values cited in the *Southeastern United States Tree Species Rating Guide* published July 2005 by the Southern Chapter of the International Society of Arboriculture, but this low value reflects current economic conditions in the nursery and landscape industry. The consultant assigned tree species values based on upon the species rating guide and observations made of species quality during the street tree inventory. An average location value of

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<sup>7</sup> Global Ecosystem Center, [www.systemecology.org](http://www.systemecology.org)



70 percent was used for all trees. The results of the trunk formula calculation show a total tree asset value of \$7.4 million and an average value of \$2,830 per tree. If the \$66 basic value was used instead, these values would more than double to \$16.2 million total value and \$6,224 per tree value.

The second method uses a program called *i-Tree Streets*, another tool in the i-Tree suite mentioned previously.

The results of the i-Tree Streets analysis of the city's street trees are summarized below. A set of reports generated from the program are located in Appendix F. This analysis will be completed for the complete population of street trees when the city's tree inventory is completed and the numbers reported here will substantially increase in the final analysis.

The inputs that were required by the i-Tree Streets program so that benefits could be generated include:

- 🌳 Street tree inventory information converted into an Access database format specific to i-Tree
- 🌳 Annual tree management costs; the costs cited on the 2010 Tree City USA Application were used
- 🌳 City information such as area in the city limits in square miles, miles of streets, average width of city streets, average width of sidewalks, and geographic location
- 🌳 Costs of energy and utilities; the default values for the southeastern US were used

All 2,606 trees inventoried were included in the i-Tree analysis. The results show a total per person annual management cost of \$3.73 and a total per person benefit of \$7.88. For every \$1 spent in city tree management costs, the trees provide \$3.11 in benefits. The annual management cost per tree is \$28 and the annual benefits provided are worth \$59.10 per tree.

All trees provide a total of \$226,977 per year in total benefits, and \$154,012 in net benefits. The city street trees contribute 1.88 percent of the overall tree canopy cover (45.1 percent overall). Street trees provide canopy cover over 10.4 percent of the



streets and sidewalk pavement. *These numbers, and the benefit to cost ratio, will be substantially higher once all trees are inventoried and included in the analysis.*

The values of annual environmental, aesthetic, and other benefits are:

- 💡 \$27,949 for energy conservation for reduced natural gas use in winter and reduced electricity use for air conditioning in summer; the water oaks and willow oaks contribute the most to energy conservation.
- 💡 -\$9,390 for air quality; while trees remove considerable pollutants and reduce emissions from power plants for reduced electricity use, they can also have a negative effect on air quality due to volatile organic compounds they produce; water oaks produce the most VOC emissions and along with willow oaks, Southern red oaks, sweetgums, loblolly pines, and tuliptree have the greatest negative effect on air quality; flowering dogwoods, red maples, Bradford pears, and sugar maples have the greatest positive effect on air quality.
- 💡 \$8,194 for annual reductions in atmospheric carbon dioxide due to sequestration by the trees and reduced emissions from power plants due to reduced energy use; the carbon dioxide released when trees die and decompose and during the care and maintenance of trees is also accounted for in this calculation; the water oaks, willow oaks, and red maple contribute the most in carbon sequestration.
- 💡 \$112,013 in carbon dioxide stored in the urban forest over the life of the trees as a result of sequestration; a total of 14,935,107 pounds of carbon will be stored over the life of these street trees; water oaks, tuliptrees, pecans, red maples, dogwoods, and southern red oaks store the most carbon due to their size or large numbers in the street tree population.
- 💡 \$90,355 in reductions in annual stormwater runoff due to rainfall interception by trees; the street trees intercept 9,126,108 gallons of water per year; water oaks and tuliptrees intercept the most amount of water on a per tree basis.
- 💡 \$109,869 in annual aesthetic and other benefits of city street trees; these are tangible and intangible benefits that are reflected in increased property values; on a per tree basis, water oaks, sweetgums, tuliptrees, loblolly pines, and pecans provide the most aesthetic benefits.



Overall, on a per tree basis, water oaks, tuliptrees, sweetgums, pecans, loblolly pines, scarlet oaks, sugar maples, Southern red oaks, and willow oaks make the greatest contributions to the community on a dollar per tree basis. The total replacement value of all street trees inventoried is estimated to be \$14,221,559. This more detailed environmental analysis and benefits assessment values the trees at nearly twice the \$7.4 million estimate obtained using the trunk formula method. As mentioned previously, if the basic value was increased to the 2005 number recommended by the Southern Chapter of \$66 per square inch of cross sectional area, then the trunk formula total value would be estimated at \$16.2 million, much closer to the \$14.2 million calculated using i-Tree. Therefore, the i-Tree value can be considered to be a solid estimate of tree replacement value.





## Education and Outreach

***A program of regular education and outreach that provides opportunities for engaging the community in community forest management is essential to a successful and cost-effective program.***

***Information and learning opportunities should be provided by a variety of media and methods including the city's website, social networking, newspapers, written materials including fact sheets, brochures, door hangers and handouts, classroom and outdoor workshops, demonstrations and hands-on training sessions, and person-to-person contacts between the City Arborist, city staff, residents, and businesses.***

### Goals

- 1. Increase the tree literacy of the community.***
- 2. Create a general awareness of the function, value and maintenance needs of trees, and community forest management program goals and activities among city staff, residents, local businesses, and visitors.***
- 3. Sustain community involvement and support for trees and tree care.***

### Strategies

- 1. Create simple messages that reach a wide audience.***
- 2. Utilize existing opportunities for disseminating information on the community forest management program, tree canopy conservation, and tree care practices (staff, board, and commission meetings; community festivals and neighborhood events; city websites and social media).***
- 3. Provide additional educational opportunities through periodic, targeted programs on topics of importance to the success of the program.***
- 4. Gradually increase the amount of information and programs available and avoid overwhelming the community on tree topics.***



## Actions

1. *Develop program fact sheets on the tree resource, its value, and its management.*
2. *Continue participation in the National Arbor Day Foundation's Tree City USA Program.*
3. *Continue support of the Georgia Urban Forest Council through an annual membership.*
4. *Include education and information on the topics essential to program success, including the Community Standards for Tree Conservation, tree regulations, tree protection, tree establishment, mulching, pruning, mature tree care, tree biology, the benefits and value of community trees, and tree species for planting in Decatur; other topics of interest can be added as they are identified.*
5. *Include city staff, elected and appointed officials, businesses, residents, visitors, non-profit and civic organizations and construction, utility providers, and tree service, construction and landscape contractors as target audiences for educational programs.*
6. *Conduct at least two (2) city-sponsored tree care educational programs each year.*
7. *Sponsor breakfast meetings with landscape contractors working within the city to distribute standards and best management practices and enlist their help in implementing them community-wide.*
8. *Utilize opportunities provided by other city programs, meetings, and events to provide target audiences with information about program activities, event announcements, and the tree resource.*
9. *Purchase and keep on hand ISA Tree Owner's Manuals, ISA consumer information brochures, and National Arbor Day Foundation Tree City USA Bulletins to distribute to staff, with development permits, and at neighborhood and community-wide educational events*



- 10. Regularly assess current skill levels and training needs in staff meetings, during field inspections and monitoring of tree care operations, and through established public forums such as the city's website.**
- 11. Develop a community forest website to promote tree conservation, the benefits and value of trees, tree maintenance techniques, standards and best management practices, and the community forest management program.**
- 12. Provide quarterly program updates to the Mayor and City Commission and post on the city's website.**
- 13. Develop a template for neighborhood forest management plans that will include a tree conservation plan, tree establishment plan, tree maintenance plan, and tree care education program; include unique elements to address special needs and meet neighborhood goals, and develop a palette of tree species to promote neighborhood character.**
- 14. Complete at least one (1) neighborhood tree conservation plan each year; begin with neighborhoods in the northwest section of Decatur.**
- 15. Establish a neighborhood tree steward program; train citizen volunteers and enlist resident help in watering, mulching, and inspecting newly planted trees.**
- 16. Develop a methodology for individuals to measure the tree canopy cover on their property using aerial photography and a dot grid, or on-the-ground measurements.**
- 17. Develop a tree category for the Environmental Sustainability Board for their Sustainability Award for sites, developments, individuals and organizations that support and enhance the conservation of community trees.**
- 18. Assign the responsibility for developing and coordinating educational programs to the City Arborist. The arborist should be encouraged to work with the City Tree Consultant, other consulting arborists, other city staff, or partner organizations in conducting the programs.**

As the action list shows, education will be a large part of the city's community forest management program. Some of the activities listed above are already in place. The level of educational programming can be gradually built to a sustainable level to avoid being too aggressive and overwhelming the community.



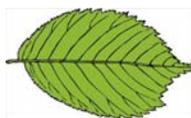
In addition to the city being designated a Tree City USA for the past 2 years, a tree festival has been held in the city for the last 2 years. Periodic tree care workshops have also been conducted.

In October of 2009 the City Tree Consultant held an afternoon training session for the city's public works and development staff to explain how tree protection plans are developed, implemented and enforced. The goal of the training was to create awareness among the inspections staff and enlist their help in identifying violations of tree protection requirements in the tree preservation ordinance.

A presentation that describes the importance and benefits of trees, issues that trees face living and growing in the urban environment, the current tree ordinance, and some solutions for improving the quality and quantity of trees within the city can be found on the city's website at [www.decaturga.com](http://www.decaturga.com). This presentation was developed in April 2012 by the City Tree Consultant.

Decatur has benefited from the Trees Atlanta Neighborwoods Program which focuses on the planting of native species to renew and sustain the city's tree canopy and educate the community on tree care and management. The program provides the necessary tools and resources to plant new trees, develop educational programs for tree advocates, and provide ongoing tree care and preservation.

In partnership with Trees Atlanta an arboretum has been established in the Oakhurst Neighborhood. A brochure is available online on the Trees Atlanta website ([www.treesatlanta.org](http://www.treesatlanta.org)) describing this and other arboreta established by Trees Atlanta, includes a list of trees and map of their locations. Many of the trees are identified in the Oakhurst neighborhood by granite markers that list the species botanical and common names and some common uses or special characteristics of the trees.



The Appendices that follow include background information that provides additional context for the goals, strategies, and work plans that make up this *City of Decatur Community Forest Management Plan*. Additional information is available from Amanda Thompson, Planning Director, at 404.370.4102 or [amanda.thompson@decaturga.com](mailto:amanda.thompson@decaturga.com).



## Appendix A. Community Plan Support

Community forest management is addressed within other community plans, especially the *2010 Strategic Plan* and the *Environmental Sustainability Plan*. The *Stormwater Management Plan* and *Decatur Cemetery Plan* also address trees and tree establishment. The Community Forest Management Plan is supportive of, and its development and implementation are supported by, these plans.

The goals and strategies of the *City of Decatur Community Forest Management Plan*, *2010 Strategic Plan*, and *Environmental Sustainability Plan* are integrated. The development of the *Community Forest Management Plan* by itself achieves one of the major goals in the *Environmental Sustainability Plan*.

This community forest management plan directly supports the 2010 Strategic Plan and Environmental Sustainability Plan and will assure a healthy tree canopy that provides valuable and irreplaceable benefits now and into the future. Trees are an important element of community character and the community forest management and tree regulation as described in the plan allow for growth but use trees to maintain and enhance neighborhood and community character. With a focus in the plan on conservation and active management and with the adoption and enforcement of standards for tree care, management activities will foster good stewardship of this community resource. Periodic inventories, annual inspections, and routine maintenance support the development of safe and healthy trees and demonstrate an ongoing commitment to having a sustainable community forest. This plan also engages the community in tree protection, care, and support, advancing one of the goals in the strategic plan—to encourage all residents to be engaged in their community.

The goals from these other plans that have been integrated into the *Community Forest Management Plan* and are supportive of the program activities proposed within this plan are discussed below.

### 2010 Strategic Plan

The city's 2010 Strategic Plan is a broad guide for prioritizing and implementing recommendations from previously developed plans such as those for transportation, greenways, redevelopment, affordable housing, cultural facilities, environmental sustainability, and other quality of life issues within the city. This Community Forest



Management Plan, along with the aforementioned plans, is intended to be used as a tool for implementing the broader tasks outlined in the strategic plan.

The strategic planning process resulted in the development of a vision for the city along with four (4) guiding principles:

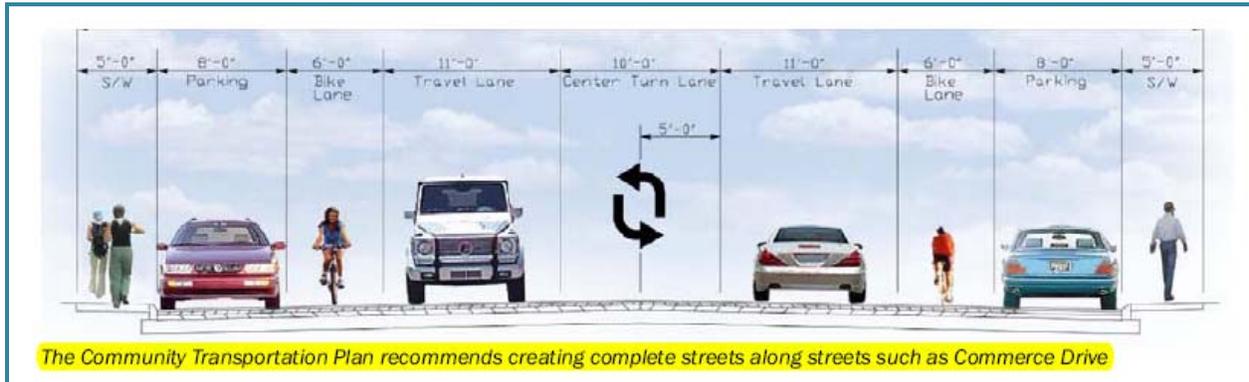
- 🌳 **VISION: The City of Decatur will assure a high quality of life for its residents, businesses, and visitors both today and in the future.**
- 🌳 **Principle A: Manage growth while retaining character**
- 🌳 **Principle B: Encourage a diverse and engaged community**
- 🌳 **Principle C: Serve as good stewards of the environment and community resources**
- 🌳 **Principle D: Support a safe, healthy, lifelong community**

In the city's 2000 Strategic Plan several recommendations that directly and positively impact trees have been implemented. These include:

- 🌳 **Improve linkages between greenspaces**
- 🌳 **Preserve and expand greenspace, wetlands, and trees**
- 🌳 **Study air and water quality problems**
- 🌳 **Support and expand volunteer activities**

Several initiatives that will involve trees are ongoing or have not yet begun, including streetscape and traffic calming projects planned throughout the city. Trees are tools for traffic calming and planned streetscape projects usually incorporate trees.

The complete street concept proposed in the Strategic Plan does not incorporate a place for trees in the design, based on the graphic found in the plan and reproduced here. This assumes that trees will be available on private property behind the sidewalks to provide essential canopy over the roadway.



## Environmental Sustainability Plan

The City Commission adopted an *Environmental Sustainability Plan* in June 2012 (available online at [www.decaturga.com](http://www.decaturga.com)). From the title “Decatur Grows Greener” to the vision and tasks it proposes, this plan directly supports the development of an expanded community forest management program.

The *Environmental Sustainability Plan* goals and strategies that specifically address trees or support community forest management are:

- 🌱 **Promote sustainable practices within local government operations (from Goal 1)**
- 🌱 **Maintain healthy ecosystems and outdoor recreational opportunities (Goal 3); protect and enhance the city’s tree canopy (Task E)**
- 🌱 **Raise public awareness and engagement in the city’s sustainability initiatives (Goal 10)**
- 🌱 **Educate and encourage city residents and business to adopt more sustainable behaviors and practices (Goal 11)**
- 🌱 **Ensure Decatur is recognized for its leadership in its sustainability program and initiatives (Goal 12)**

### *Environmental Sustainability Vision for Decatur*

*A community where our relationship with the environment will protect and enhance natural resources and ensure that future generations will be able to share in the benefits they provide.*



Recent accomplishments described in the plan directly related to trees and their management include:

- 🌳 ***Designated as a Tree City USA since 2010***
- 🌳 ***Conducted a survey of 153 street trees in downtown along Ponce de Leon Avenue***
- 🌳 ***Hosted community information tables at Earth Day and Greenfest***
- 🌳 ***Developed ongoing communication programs to educate and engage community on various initiatives***

In the sustainability plan, a *Sustainable Landscaping Procedures* policy for city-owned property is described. The policy outlines guidelines for plant selection, water conservation, soil preparation, and care and landscape maintenance.

The strategies outlined in *Goal 3, Task E: Protect and enhance the city's tree canopy*, are:

- 🌳 ***Update the city-wide tree ordinance with a specific focus on development/redevelopment projects.***
- 🌳 ***Develop a city-wide tree replacement plan and strategies to assist property owners to plant and care for trees***
- 🌳 ***Integrate street trees and a green infrastructure stormwater system***
- 🌳 ***Develop city-wide goals related to tree diversity and preferred species***
- 🌳 ***Incorporate changes as part of the Unified Land Development ordinance***

All of the strategies identified in *Goal 10, Task A: develop annual communications and outreach plans to ensure residents (individuals and businesses) are aware of key city programs and initiatives* are applicable to the tree program. These strategies focus creating awareness, providing information, and encouraging the involvement of individuals and businesses in green initiatives and events. Likewise, the strategies identified in *Goal 11, Tasks A, B, C, and D* to provide educational programs and information to encourage participant in environmental sustainability programs, hosting eco-focused educational programs and supporting third party events to engage residents, businesses, and organizations, to find creative ways to recognize contributors



to sustainability, and to seek recognition for environmental leadership are all applicable to tree-specific programs.

- 🌳 **GOAL 1: RETAIN AND ENHANCE THE CHARACTER OF EXISTING COMMERCIAL DISTRICTS AND EXPAND IT TO NEW DISTRICTS; includes a desire to expand the lively, pedestrian-friendly development patterns that make the commercial districts special, including compatible signage and improving the landscaping and physical appearance of the square; also supports refining commercial design standards to recognize the unique character and scale for the neighborhoods**
- 🌳 **GOAL 6: STRENGTHEN COMMUNICATION AND INVOLVEMENT IN AND AMONG NEIGHBORHOODS, CITY GOVERNMENT, VOLUNTEER GROUPS AND COMMISSION, INSTITUTIONS, COMMUNITY ORGANIZATIONS, LOCAL BUSINESSES, AND DECATUR AS A WHOLE; includes a desire to provide communication in a variety of formats and expanding the use of social media and electronic tools to encourage citizen participation; strives to provide focused support for interaction between neighborhood and community groups**
- 🌳 **GOAL 7: SUPPORT, EXPAND, AND DEVELOP PROGRAMS, SERVICES, EVENTS, AND OPPORTUNITIES THAT RESPOND TO DIVERSE INTERESTS, ENCOURAGE COMMUNITY INTERACTION, AND PROMOTE A STRONGER SENSE OF COMMUNITY; includes exploring opportunities for events that educate citizens about their community, and connects them with organizations that promote community pride, volunteerism, neighborhood interaction, and communication with the public; includes a suggestion to consider creating a neighborhood mini-grant program that encourages grass roots community improvement projects including tree plantings to build a stronger partnership between city government and neighborhood organizations**
- 🌳 **GOAL 9: EXPAND AND DIVERSIFY THE CITY'S REVENUE BASE; includes support for the redevelopment of surface parking lots and underperforming properties including properties in the Downtown and Oakhurst commercial districts**
- 🌳 **GOAL 10: CONTINUE TO PROVIDE QUALITY SERVICES WITHIN FISCAL LIMITS ACCEPTABLE TO THE COMMUNITY; includes a desire to pursue energy saving options and long-term sustainability policies to reduce the**



*cost of providing services; includes a desire to continue to seek grant funding to pay for capital projects, support strategic goals, and improve quality of life; suggests using the budget process to assure the most cost effective use of city resources to implement the city's vision*

- 💡 **GOAL 12: FOSTER ENVIRONMENTAL, SOCIAL, AND ECONOMIC SUSTAINABILITY IN ALL ASPECTS OF CITY LIFE AND GOVERNMENT PRACTICE; includes a desire to reduce the heat island effect; includes a suggestion to update and create a unified land development ordinance that requires sustainable building practices; supports the expansion of urban gardening opportunities**
- 💡 **GOAL 13: PROTECT AND RESTORE NATURAL RESOURCES, SUPPORT ENVIRONMENTAL HEALTH, AND INCREASE ECOLOGICAL AWARENESS; recommends the development of an urban forest management plan to assess Decatur's existing tree canopy, recommend strategies for protection, maintenance, and new tree plantings, and revise the city's tree ordinance; recommends creating an updated storm water management plan; supports educational programs to encourage individual support of environmental sustainability programs; recommends long-range maintenance schedules for parks and greenspace; includes conducting stream bank restoration and naturalization of stream channels and removing invasive plant species from city property**
- 💡 **GOAL 14: ENHANCE MOBILITY OPTIONS WITHIN AND TO DECATUR; includes updating parking standards to allow innovative parking strategies and pedestrian friendly, environmentally sustainable, and affordable developments**

The plan states that while it is intended to guide the work of city government that many of its goals and tasks are best implemented in cooperation with citizen boards and community groups. The plan suggests that the ESB promotes composting, water conservation best practices, and an annual Sustainability Award to increase awareness by recognizing buildings, landscapes, businesses, and other activities that exemplify sustainable principles.



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## Stormwater Management Plan

The city's 2004 Stormwater Management Plan available online at the city's website includes goals to protect riparian areas and water quality. The role of trees and forests in stormwater interception, erosion control, and maintenance of water quality is not specifically mentioned and trees are not required on sites to reduce stormwater runoff.

In 1999 the city established a stormwater utility, which is responsible for the maintenance and upgrade to the stormwater system, enforcement of environmental regulations, and for the city's compliance with the Clean Water Act and other environmental regulations related to stormwater. The utility charges property owners an annual stormwater fee that is billed in monthly or quarterly installments. There is currently no connection between trees existing on a site and the amount of the stormwater utility fee.

A PowerPoint presentation available online describing the Stormwater Management Plan cites the tree ordinance and zoning ordinance as contributing to water quality and stormwater management by promoting tree conservation, an increase in tree canopy, and protection of existing trees, as well as limiting the amount of impervious surfaces on residential lots, where the maximum lot coverage is 40 percent.

## Cemetery Master Plan

The *Decatur Cemetery Master Plan* includes pedestrian and landscape improvements leading to a pond-side park in the central part of the cemetery, stormwater improvements to reduce flooding damage to the historic Old Cemetery, stream restoration leading to Glenlake Park, and pedestrian bridges. The plan creates a centrally located greenspace of 60 acres. The plan states that the woodland area near the stream is being restored by Trees Atlanta.

A walking trail, tree replacement, recommendations for memorial gifts such as trees and benches, tree replacement program, removal of kudzu and other invasive plants, and stream bank protection are included.

Trees shown on the master plan include 'October Glory' red maple, 'Legacy' sugar maple, Southern magnolia, blackgum, white pine, loblolly pine, Virginia pine, Yoshino cherry, white oak, willow oak, weeping willow, pondcypress, chalkbark maple, American

*City of Decatur*

*Community Forest Management Plan*

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hornbeam, eastern redbud, Washington hawthorne, Eastern redcedar, crapemyrtle, ironwood, Georgia oak, and sassafras.

More information about the *Decatur Cemetery Master Plan* can be found online at Decatur's website ([www.decaturga.com](http://www.decaturga.com)).



## Appendix B. Community Standards for Tree Conservation

A separate PDF file of *The Community Standards for Tree Conservation* is available from the Planning Department.

### 1. GENERAL

- 1.1. These community standards for tree conservation shall apply to all city trees and properties and all trees, properties, and activities regulated by the city's code of ordinances
- 1.2. The objectives of these standards are to improve tree health, safety, longevity, and contribution; to provide performance standards for the care and maintenance of trees; and, to increase the cost effectiveness of tree management
- 1.3. The usage and meaning of arboricultural terms shall conform to the current edition of the *Glossary of Arboricultural Terms* published by the International Society of Arboriculture
- 1.4. These standards shall be used for developing written tree care specifications
- 1.5. The standards shall be administered, and tree care specifications developed, by an arborist; the arborist may approve a waiver of any of these standards as warranted and as long as city tree conservation goals are met
- 1.6. The arborist administering these standards and specifications shall hold a current arborist certification by the International Society of Arboriculture
- 1.7. All tree care and maintenance work shall be done in accordance with these community standards and current *ANSI Z133.1 Standards for Arboricultural Operations—Safety Requirements*; these safety requirements address pruning, repairing, maintaining and removing trees; cutting brush; and using equipment in these operations



- 1.8. Each person (employee or otherwise) shall be responsible for his or her own safety while on the jobsite and shall comply with the appropriate federal and state occupational safety and health standards and all rules, regulations, and orders that are applicable to his or her own actions and conduct

## 2. TREE PROTECTION

- 2.1. All tree protection activities shall be done in accordance with current *ANSI A300 (Part 5) American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction)* and *Best Management Practices for Managing Trees During Construction*
- 2.2. The objectives of tree protection standards are to manage trees and shrubs and the soil in which they grow during site planning, site development, and construction; to conserve trees and promote their health and longevity to maximize economic, social, environmental, and cultural benefits
- 2.3. City trees may not be damaged, destroyed, or removed without the permission of the city arborist
- 2.4. City trees shall be actively protected by individuals, organization, or businesses engaging in potentially harmful activities adjacent to or within the CRZ of a city tree; a tree protection plan shall be developed by the city arborist prior to site disturbance and implemented by the city and the entity engaging in potentially harmful activities
- 2.5. Trees proposed for conservation during land disturbance or construction shall be assessed by the city arborist for their suitability for conservation and their potential for successful protection before they can be approved for tree density credits
- 2.6. Trees on private property regulated by the tree ordinance and the soil within their CRZs shall be actively protected to avoid damage from potentially harmful activities
- 2.7. Potentially harmful activities shall include, but not be limited to, clearing and grading, building construction, materials storage, temporary building placement, vehicle and equipment traffic, infrastructure and utility installation or repair,



- landscape renovations, irrigation system installation, paving or repaving, trenching, soil excavation, soil backfill, soil compaction, soil contamination, equipment washout, excessive heat from fires or heat from exhaust pipes, limb breakage, wounding of the trunk, or any other potentially harmful activity or damage
- 2.8. Active protection shall include the mulching of the tree's exposed CRZ; irrigation in the absence of rain before, during, and after construction; erection of sturdy fencing prior to site disturbance at the limits of the critical root zone; and, posting of "tree protection area – do not enter" signs on the fencing; no activities are allowed within the tree protection fencing other than tree maintenance activities
  - 2.9. Tree protection fencing shall be sturdy post and rail, chain link, or orange polyethylene mesh and shall be at least 4 feet high; fencing shall remain upright and shall not be removed for any purpose until construction is complete
  - 2.10. The application of soil over the roots of established trees within the critical root zone shall be prohibited
  - 2.11. Trenching and any type of soil disturbance within the CRZ of trees is prohibited; alternatives to trenching include altering the location of soil disturbing activities; boring or augering beneath tree roots; and, the construction of retaining walls, tree islands, and tree wells with aeration to minimize cutting and filling
  - 2.12. The attachment of signs, animal leashes, bicycles, or other materials or belongings to any tree using nails, staples, strapping, wire, chains, twine, tape, or other fastener shall be prohibited
  - 2.13. The application of wound dressing paint or other paint on wounds, including pruning wounds, shall be prohibited unless warranted to reduce susceptibility to specific pests
  - 2.14. Mowers shall not be operated over the top of exposed roots; exposed roots should be mulched to suppress the growth of grass and weeds
  - 2.15. String weed trimmers shall not be used within 2 feet of tree trunks to avoid trunk wounds



### 3. TREE ESTABLISHMENT

#### 3.1. General

- 3.1.1. All tree planting and transplanting shall be done in accordance with current *ANSI A300 (Part 6) American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Transplanting)* and *Best Management Practices for Tree Planting*
- 3.1.2. The objectives of tree establishment standards are to increase the chances of tree survival; to place trees in sites where they will thrive and have adequate growing space above and below ground; to maximize the functions and benefits of trees; to increase the extent and species and age diversity of the city's tree resource

#### 3.2. Site Selection

- 3.2.1. Only small species shall be planted beneath or within 10 lateral feet from overhead power lines; medium species shall be planted a minimum of 20 lateral feet from overhead power lines; large species shall be planted a minimum of 30 lateral feet from overhead power lines
- 3.2.2. Trees shall be planted a minimum of 5 feet from underground utility lines or structures
- 3.2.3. Trees shall be planted a minimum of 10 feet from utility poles, lines and equipment (electrical, cable, telephone, fiber optic, gas lines, utility boxes, utility meters and other utility features)
- 3.2.4. Trees shall be planted a minimum of 35 feet from street intersections
- 3.2.5. Trees shall be planted a minimum of 15 feet from the edge of driveway pavement, buildings,
- 3.2.6. Unless approved by the arborist, small trees shall be planted a minimum of 15 feet from other trees; medium trees shall be planted a minimum of 25 feet from other trees; large trees shall be planted a minimum of 40 feet from other trees



3.2.7. The minimum soil volume available to an individual tree shall be 300 cubic feet; the maximum depth of rooting for calculating soil volume shall be 3 feet; the minimum dimension of a landscape island that will include a tree shall be 6 feet; the minimum width of a landscape strip along a street right-of-way that will include trees is 3 feet; sites that do not meet these soil volume requirements and rooting zone dimensions shall not be planted with trees

3.2.8. The minimum soil volume required for multiple trees in contiguous planting areas may be reduced to 150 cubic feet per tree

### 3.3. Species Selection

3.3.1. Small trees shall be those that are typically less than 25 feet tall at maturity; medium trees shall be those that are typically between 25 and 50 feet tall at maturity; large trees shall be those trees that are typically greater than 50 feet tall at maturity

3.3.2. Only those species listed in the city's official tree species list shall be approved for planting; species not listed may be approved for planting by the city arborist

3.3.3. Tree species shall be ecologically compatible with the conditions on the site; consider growing space, available light, soil moisture, temperature, and the leaf and fruiting habits of the tree

3.3.4. Invasive or poor performing species shall not be approved for planting

3.3.5. The species selected shall match the available growing space on the site based on the typical mature height and crown width of the tree listed in the official tree species list

3.3.6. Species selected for planting in the interior of parking lots or in any restricted rooting zone shall be drought tolerant

3.3.7. No more than 30 percent of all trees planted within a single parcel or development site or mile of city street right-of-way may be of a single genus (e.g., elm, maple, oak); no more than 10 percent of all trees planted within a



single parcel or development site or mile of city street right-of-way may be of a single species (e.g., Chinese elm, red maple, willow oak)

#### 3.4. Tree Selection

- 3.4.1. All trees selected for planting shall meet current *ANSI Z60.1 American National Standards for Nursery Stock*; this includes minimum size and form standards and minimum root ball size and wrap specifications for shade and flowering trees, coniferous evergreens, and broadleaf evergreens
- 3.4.2. The objectives of selecting quality nursery stock are to increase initial tree health and structure; to install only those trees that have a high potential to survive, thrive, and grow to maturity; and, to avoid increased maintenance time and costs required for substandard trees
- 3.4.3. Nursery stock that is balled and burlapped, bare root, or growing in a container shall be acceptable
- 3.4.4. Trees with trunk wounds, broken scaffold limbs, co-dominant leaders, included bark, pest signs and symptoms, stem encircling or girdling roots or other objectionable characteristics shall not be acceptable
- 3.4.5. Trees shall be a minimum of 2.5 inches caliper for shade and flowering trees or 8 feet in height for coniferous or broadleaf evergreens

#### 3.5. Soil Preparation

- 3.5.1. Soil preparation and modification prior to tree planting shall be done in accordance with ANSI A300 (Part 2) American National Standards for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Soil Management, a. Modification, b. Fertilization, and c. Drainage)
- 3.5.2. Soil characteristics shall be assessed prior to tree species selection including soil nutrients, bulk density, texture and water percolation



- 3.5.3. Where soil conditions do not meet minimum standards for organic matter, bulk density, or drainage soils shall be improved prior to planting or replaced to a depth of 30 inches
  - 3.5.4. Soil in landscape islands or within at least 3 feet of a tree planting location shall be well-aerated with a bulk density between 1.1 to 1.4 g/cc<sup>3</sup>, not to exceed 1.6 g/cc<sup>3</sup>; compacted soils shall be mechanically loosened
  - 3.5.5. Mechanical loosening of soil using tilling shall be the preferred method for increasing soil aeration before trees are planted or in areas outside of the critical root zones of existing trees; compacted soil should be mechanically loosened before adding topsoil to a minimum depth of 8 inches; the moisture compact of compacted soils should be less than field capacity before being mechanically tilled
  - 3.5.6. Soil that is aerated by tilling or compressed air shall be settled prior to planting by either rainfall or irrigation
  - 3.5.7. Soil shall be well-drained throughout the planting area and drainage of water out of the planting hole shall be tested before planting; water should drain out of the hole at a rate of ¼ inch or more per hour
  - 3.5.8. Soil shall have a pH between 5.0 and 7.2; applications of materials to adjust soil pH shall be considered when pH is outside of the acceptable range
  - 3.5.9. Soil organic matter shall be a minimum of 3 percent by weight; if organic matter content is low, composted organic materials shall be uniformly incorporated into the soil within at least 3 feet of the tree planting location; organic matter may be applied to the surface as mulch if approved by the city arborist
- 3.6. Tree Transport, Handling and Storage
- 3.6.1. Trees shall be lifted without damaging the root ball, trunk or crowns; trees shall not be lifted or transported by the trunk or branches
  - 3.6.2. Trees shall be covered during transport with a tarp or landscape fabric to avoid desiccation



3.6.3. Damage to the crown, trunk and root ball shall be avoided

3.6.4. The location and length of tree storage shall be such that trees shall not be mechanically damaged or damaged by freezing, dessication, excessive heat, or other environmental conditions

3.7. Tree Installation

3.7.1. The location of utilities shall be marked prior to the excavation of soil for tree planting or transplanting in accordance with state and local regulations

3.7.2. All twine, tags, tape, flagging tape, trunk wrapping and other non-tree material shall be removed from the tree's trunk and branches prior to placement in the planting hole

3.7.3. All strapping shall be removed from the root ball after placement in the planting hole; a minimum of one-third of the burlap and wire basket shall be removed from the top of the root ball and planting hole, and more shall be removed if feasible; the remaining burlap and wire basket shall be folded down into the bottom of the planting hole

3.7.4. The depth of the planting hole shall not exceed the depth of the root ball; the depth of the root ball shall be measured from the bottom of the trunk flare to the bottom of the ball

3.7.5. The soil directly beneath the root ball shall be undisturbed or prepared to prevent settling

3.7.6. The width of the planting hole shall be a minimum of 2 times the diameter of the root ball

3.7.7. The planting hole shall have sloping sides and be wider at the top than at the bottom

3.7.8. The sides of the planting hole shall be scarified

3.7.9. The bottom of the trunk flare shall be at or slightly above the finished grade and shall be visible after installation is complete to avoid conditions favoring the



formation of stem encircling and stem girdling roots; when the trunk flare is not pronounced, the depth of planting shall be such that the tree's first structural roots shall be located 1 to 2 inches beneath the finished grade

3.7.10. The planting hole shall be filled with the same soil as the soil surrounding the planting hole

3.7.11. Soil amendments shall not be incorporated into the backfill unless a specific need is identified

3.7.12. The planting hole shall be backfilled in layers to settle the soil and prevent air pockets; backfill shall not be compacted to a density that inhibits root growth

3.7.13. A soil ring shall not be created around the planting hole unless the planting site is not level or water percolates slowly into the soil

3.7.14. Water shall be added to the root ball and backfill to reach field capacity

3.7.15. Watering devices, such as Ooze Tubes or TreeGators may be used for irrigation, but shall be removed before the second growing season

3.7.16. Mulch shall be applied in a 2 to 4 inch layer around the tree beginning 3 to 6 inches from the trunk and extend out at least 3 feet from the trunk

3.7.17. Supplemental support shall be provided only if necessary according to standards

### 3.8. New Tree Maintenance

3.8.1. New tree maintenance shall be required for 3 growing seasons after planting

3.8.2. New tree maintenance shall include, at a minimum, irrigation to maintain adequate soil moisture, annual mulching, removal of staking and guying materials and training pruning

3.8.3. Trees shall be irrigated during the growing season to maintain adequate soil moisture to maintain tree health; as a general rule trees should receive at least 1 inch of rainfall or irrigation in the absence of rainfall per week that penetrates a minimum depth of 8 inches into the soil



- 3.8.4. If a staking and guying system is installed at time of planting, staking and guying materials shall be inspected regularly and removed before the beginning of the second growing season
- 3.8.5. Training pruning to improve tree structure shall be done in the second and third growing seasons after planting, and thereafter pruning should be done routinely or as needed

#### 4. SUPPLEMENTAL SUPPORT

- 4.1. Supplemental support of trees shall be done in accordance with current *ANSI A300 (Part 3) American National Standard for Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Supplemental Support Systems)* and *Best Management Practices for Tree Support Systems: Cabling, Bracing, Guying, and Propping*
- 4.2. The objectives of supplemental support shall be to stabilize the root ball of newly planted trees during the first year after planting; to limit movement of a tree or tree part; and to provide additional support for and increase structural integrity of established trees
- 4.3. Supplemental support systems to increase the structural integrity of established trees shall only be installed by qualified and experienced arborists
- 4.4. Supplemental support systems on established trees shall be inspected periodically and problems, if detected, should be repaired, replace or modified, or in the case of newly planted trees they should be removed
- 4.5. Only those trees that have an increased chance of the root ball shifting in the planting hole and the tree subsequently leaning shall be supported with stakes and guying materials at the time of planting; trees trunks that cannot remain upright on their own are unacceptable for planting
- 4.6. For newly planted trees the installation of a minimum of two (2) metal fence posts at least 4 feet high with soft guying material affixed laterally from the top of the post to the tree trunk is the preferred method of staking; guying should allow for very



- little stem flexibility; guying materials shall be located at or below two-thirds the height of the tree
- 4.7. Guying material shall be wide, smooth, nonabrasive, flexible, and if possible, photodegradable material; wire, cables, twine, rope, or other such materials are unacceptable for guying
  - 4.8. New trees shall be supported for 1 year only and all stakes and guying materials shall be removed before the second growing season after planting
  - 4.9. Damage to the tree trunk during the removal of guying materials shall be prohibited; the use of box cutters or razor knives to cut guying materials off the trunk is unacceptable

## 5. MULCHING

- 5.1. Mulching shall be done in accordance with current *ANSI A300 (Part 2) American National Standards for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Soil Management, a. Modification, b. Fertilization, and c. Drainage)*
- 5.2. Mulching objectives shall be to inhibit weed growth, conserve soil moisture, moderate soil temperature extremes, prevent and alleviate soil compaction, prevent soil erosion and surface crusting, improve soil structure and fertility, encourage beneficial soil microorganisms, inhibit root pathogens, and increase root growth and plant vigor
- 5.3. Trees conserved and planted to satisfy tree density requirements shall be mulched annually
- 5.4. Where possible and practical, city trees should be mulched annually
- 5.5. Approved mulch materials include leaves, pine straw, composted wood chips, shredded bark, and other organic materials that recreate natural soil conditions in wooded areas; the use of grass clippings, rocks, rubber, plastic, or landscape fabric as mulch is prohibited



- 5.6. Mulch shall be applied in an even layer 2 to 4 inches deep
- 5.7. Mulch shall remain at 3 to 6 inches from the trunk of newly planted trees and 12 inches from the trunk of established trees to avoid the formation of stem encircling and stem girdling roots
- 5.8. Mulch shall extend out from the tree a minimum of 3 feet (at time of planting) or to the dripline, whichever is greater; the mulch radius shall increase as the tree grows; where the open soil area around the tree is less than the dripline, mulch shall be extended out to the limits of the open soil area

## 6. FERTILIZATION

- 6.1. Fertilization shall be done in accordance with current *ANSI A300 (Part 2) American National Standards for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Soil Management, a. Modification, b. Fertilization, and c. Drainage)* and *Best Management Practices for Tree and Shrub Fertilization*
- 6.2. The objectives of fertilization are to promote tree health, increase growth and improve appearance; and to correct nutrient deficiencies and adjust soil chemistry to the extent possible
- 6.3. Fertilization and pH adjustment needs shall be determined through a soil and/or foliar nutrient analysis to determine the need for, formulation of, and rate of fertilizer or soil amendments
- 6.4. Fertilizer may be applied using surface or subsurface dry or liquid applications; foliar sprays may be used to address visual symptoms of nutrient deficiencies; trunk injection of macro- and micro-nutrients is acceptable if done no more frequently than once per year
- 6.5. Slow release fertilizers with a minimum 50 percent of water insoluble nitrogen are preferred
- 6.6. Fertilizers shall have a salt index of less than 50



- 6.7. Slow-release fertilizers shall be applied at a rate between 2 and 4 pounds of actual nitrogen per 1000 square feet per application and shall not exceed 6 pounds of actual nitrogen per 1000 square feet within 12 months
- 6.8. Quick-release fertilizers shall be applied at a rate between 1 and 2 pounds of actual nitrogen per 1000 square feet per application and shall not exceed 4 pounds actual nitrogen per 1000 square feet within 12 months

## 7. SOIL MANAGEMENT

- 7.1. Soil management shall be done in accordance with *ANSI A300 (Part 2) American National Standards for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Soil Management, a. Modification, b. Fertilization, and c. Drainage)*
- 7.2. The objectives of soil management are to prevent damage to soil structure and mitigate soil compaction; manage soil organic matter; improve soil conditions to enhance root development; protect tree roots; and, maintain and enhance tree health
- 7.3. The objectives of soil aeration are to mitigate soil compaction; to enhance root penetration; to maintain or increase water penetration, percolation, water-holding capacity and drainage; to reduce surface runoff and soil erosion
- 7.4. The objectives of managing soil organic matter are to improve moisture holding capacity; improve aeration; manage diseases; and, manage cation exchange capacity for increasing nutrient availability
- 7.5. The objectives of managing soil drainage are to prevent environmental stress; manage disease problems; promote plant growth; mitigate plant damage from human activity; improve plan aesthetics; increase fire-resistance; prevent excess water from collecting within the root zone; improve soil aeration; manage subsurface and surface water flow
- 7.6. Soil structure shall be protected by avoiding activity on soils at field capacity
- 7.7. Soil compaction shall be avoided



- 7.8. Soil aeration to mitigate soil compaction shall be accomplished by mulching, incorporation of soil amendments, mechanical loosening (cultivation), and loosening using high pressure air
- 7.9. Mulching should be considered a long-term method of mitigating moderately compacted soils within the critical root zone of existing trees
- 7.10. Loosening soil using high pressure air shall be the preferred method for mitigating compaction around existing trees; compacted soils should be moist before pneumatic excavation

## 8. TREE PRUNING

- 8.1. Pruning shall be done in accordance with current *ANSI A300 (Part 1) American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning) and Best Management Practices for Tree Pruning*
- 8.2. The objectives of tree pruning standards are to reduce risk, manage tree health, provide clearance, improve or correct structure, improve or create views, improve aesthetics, restore the crown or achieve other specific objectives; pruning practices for agricultural, horticultural, or silvicultural purposes are exempt from this standard
- 8.3. Pruning objectives shall be determined prior to beginning any pruning operation
- 8.4. City trees shall be pruned by an arborist familiar with the practices and hazards of pruning and the equipment used in such operations
- 8.5. Trees shall be visually inspected before beginning pruning
- 8.6. Pruning equipment, tools, and practices shall not damage living tissue and bark beyond the scope of normal work practices
- 8.7. Climbing spurs shall not be used when entering and climbing trees for the purpose of pruning
- 8.8. Pruning tools shall be sharp



- 8.9. Pruning cuts shall be made close to the trunk or parent branch without cutting into the branch bark ridge or branch collar or leaving a stub
- 8.10. When pruning to a later, the remaining lateral branch shall be large enough to assume the terminal role
- 8.11. The final pruning cut shall be a flat surface with adjacent bark firmly attached
- 8.12. When removing a dead branch, the final cut shall be made just outside the collar of living tissue
- 8.13. No more than 25 percent of the tree's foliage shall be removed within an annual growing season, with the amount adjusted to the tree's species, age, health, and site
- 8.14. Tree branches shall be removed in such a manner that damage to other parts of the tree or other plant or property is avoided; branches too large to support with one hand shall be precut to avoid splitting of the wood or tearing of the bark
- 8.15. Where necessary, ropes or other equipment shall be used to lower large branches or portions of branches to the ground
- 8.16. Topping is unacceptable and shall be prohibited
- 8.17. Lion's tailing is unacceptable and shall be prohibited
- 8.18. Wound treatments shall not be used to cover wounds or pruning cuts, except in rare cases when necessary for disease, insect, mistletoe, or sprout control; wound treatments that are damaging to tree tissues shall not be used
- 8.19. Stem girdling roots should be pruned as they become obvious; root collar excavation may be required when symptoms of stem girdling roots are observed but not visible

## 9. INTEGRATED VEGETATION MANAGEMENT

- 9.1. The management of vegetation growing around electric utility rights-of-way shall be done in accordance with *ANSI A300 (Part 7) American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standards*



*Practices (Integrated Vegetation Management a. Electric Utility Rights-of-way) and Best Management Practices for Integrated Vegetation Management*

- 9.2. The objectives of integrated vegetation management is to promote sustainable plant communities that are compatible with the intended use of a site, and discourage incompatible trees or other plants that pose concerns for safety, security, access, fire hazard, electric service reliability, emergency restoration, visibility, line-of-sight requirements, regulatory compliance, environmental, or other specific concerns
- 9.3. The standards shall be implemented by a qualified vegetation manager familiar and experienced with the practices and hazards of vegetation management and the equipment used in such operations
- 9.4. All individuals, businesses, or agencies conducting vegetation management activities affecting city trees shall submit an annual vegetation management plan to the city by January 1 indicating the methods of vegetation management to be employed, the schedule of vegetation management activities, and contact information for the entities performing the activities
- 9.5. The pruning of trees for vegetation management shall be done in accordance with *ANSI A300 (Part 1), Section 5.9 - Utility Pruning standard*

10. UTILITY PRUNING

- 10.1. Pruning shall be done in accordance with current *ANSI A300 (Part 1) American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning) and Best Management Practices for Utility Pruning of Trees*
- 10.2. The purpose of pruning trees for clearance around utility lines and facilities shall be to prevent the loss of service; comply with mandated clearance laws; prevent damage to equipment; maintain access; and, uphold the intended usage of the utility space while adhering to standards for tree care operations
- 10.3. Utility pruning shall only be done by a qualified line-clearance arborist or trainee; only those individuals properly trained in the practices and hazards associated with utility arboriculture shall engage in clearing vegetation from power lines; members



- of the public or arborists who are not qualified to work around high-voltage power lines shall never attempt to clear trees and branches from these facilities
- 10.4. Pruning cuts made for utility clearance shall be made in accordance with standards for all pruning cuts as described *ANSI A300 (Part 1), Section 5.3, Pruning cuts*
  - 10.5. Directional pruning (natural target pruning) shall be the preferred method of pruning trees growing directly beneath power lines
  - 10.6. Rounding over, stub cuts, and topping shall not be acceptable methods of achieving utility line clearance
  - 10.7. A minimum number of pruning cuts shall be made to accomplish the purpose of utility clearance pruning
  - 10.8. Trees growing next to, into, or toward utility spaces shall be pruned by reducing branches to laterals to direct growth away from the space or by removing entire branches
  - 10.9. Trees directly under and growing into utility spaces shall be pruned or removed
  - 10.10. Branches shall be cut to laterals or the parent branch and shall not be cut at a pre-established clearing limit; if clearing limits are established, pruning cuts should be made at laterals or parent branches outside the specified clearance zone
  - 10.11. During a utility declared emergency it may be necessary, because of safety and urgency of service restoration, to deviate from the use of proper pruning techniques as defined in the standards; following the emergency corrective pruning shall be done as necessary
  - 10.12. The removal of city trees incompatible with electric power lines shall require the approval of the city arborist

## 11. LIGHTNING PROTECTION

- 11.1. Lightning protection systems for trees shall be installed in accordance with current *ANSI A300 (Part 4) – American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Lightning*



*Protection Systems) and Best Management Practices for Tree Lightning Protection Systems*

- 11.2. The purpose of lightning protection systems are to reduce the risk of damage to trees from lightning strikes and provide a preferred path to the ground for the electrical charge; protected trees shall not be considered a safe haven from lightning strikes; tree lightning protection systems do not protect buildings or property from damage
- 11.3. Lightning protection systems should be installed on trees with trunks within 10 feet of a structure or branches that extend to a height above the structure; trees of historical significance; trees of unusual and high value; tall trees in recreational or park areas; trees that are more likely to be struck by lightning due to their location, such as isolated trees on a hill, in a golf course or in a pasture, and similar trees
- 11.4. Lightning protection systems for trees shall only be installed and implemented by an arborist experienced with these systems and the equipment used in such operations
- 11.5. Periodic inspections of the system should be made and the scheduling of such inspections shall be the responsibility of the tree owner
- 11.6. Treatment of lightning damaged trees should be done if the tree is not at a high risk of failure and is likely to survive
- 11.7. Treatment of lightning damaged trees may consist of water management, bark repair, limiting bark desiccation, pruning, fertilization, pest monitoring, and pest management
- 11.8. Water management is critical and irrigation should begin as soon as possible after the strike; mulch should be applied within the critical root zone
- 11.9. Bark repair and limiting bark desiccation should be performed within hours of a lightning strike; bark can be tightly reattached and wounds covered with 2 to 3 layers of burlap or 1 layer of opaque plastic or other waterproof materials to prevent desiccation, protect the wood from direct sunlight, and promote new bark growth



- 11.10. Lightning damaged trees should be inspected regularly to determine current maintenance needs

## 12. TREE INSPECTION and RISK ASSESSMENT

- 12.1. The inspection of city trees and trees on private property regulated by the tree ordinance that are in marginal condition, and the assessment of their risk when necessary, shall be done in accordance with current *ANSI A300 (Part 9) American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management – Standard Practices (Tree Risk Assessment a. Tree Structure Assessment)* and *Best Management Practices for Tree Risk Assessment*
- 12.2. The objectives of regular inspections of trees in marginal condition and risk assessments of trees with identified structural defects are to evaluate tree health and structural integrity and the level of risk the tree may pose to people or property; to determine a plan for improving tree health; to mitigate the risk and assess mitigation methods implemented; to maintain an ongoing awareness of the current management needs of trees at risk or in marginal condition; and, to determine when such trees should be removed due to the level of risk they present
- 12.3. The standard level of risk assessment of city trees shall be a Level 2 assessment; a Level 1 or Level 3 assessment shall be performed if recommended by the city arborist
- 12.4. A list of city trees to be inspected shall be maintained and updated regularly; trees at risk shall be included on the list along with trees in marginal condition
- 12.5. Trees on the inspection list should be visited regularly or as often as determined appropriate by the city arborist to assess current condition and needs
- 12.6. Tree inspection and risk assessment shall be done by the city arborist or other arborist competent in tree risk management

## 13. INTEGRATED PEST MANAGEMENT

- 13.1. All integrated pest management should be conducted in accordance with current *Best Management Practices for Integrated Pest Management*



- 13.2. The objectives of integrated pest management shall be to promote plant health, appearance, structure, and vitality; to avoid harmful effects on non-target organisms; cause minimal disturbance to the built and natural environment; and to achieve pest control in a cost-effective manner
- 13.3. Pest management tactics should include prevention through minimizing tree stress by compatible species to site match, encouraging favorable site and growing conditions, and discouraging favorable pest development conditions; routine and proper cultural practices such as mulching, irrigation, fertilization, and pruning to create favorable conditions; and, avoiding landscape conditions that promote pest activity, such as improper irrigation, fertilization and pruning, and lack of sanitation
- 13.4. When the presence of a pest is identified, an acceptable threshold of action to manage the pest shall be established; factors considered in determining an acceptable threshold of action shall include, but not be limited to, tree owner tolerances and expectations, tree value, condition, and susceptibility, pest damage potential, time of year, site conditions, prevailing weather conditions, inspection frequency, and potential for natural pest control
- 13.5. City trees with significant pest problems shall be listed on the city's tree inspection list and inspected routinely along with other trees in marginal condition and at risk

#### 14. TREE REMOVAL

##### 14.1. City Trees

- 14.1.1. City trees shall only be removed when they are dead or in poor health; have less than 50 percent live crown remaining; are severely affected from an insect or disease infestation and are not expected to survive or they threaten the survival of surrounding trees; are in irreversible decline; are in severe conflict with infrastructure and the conflict cannot be mitigated; have been damaged or destroyed and the damage cannot be repaired or reversed; are at an elevated risk of structural failure and the risk cannot be mitigated; or are approved for removal and replacement as part of a site renovation, construction, or development plan



- 14.1.2. City trees removed should be replaced in the next planting season on a 1 to 1 basis in the same or a nearby location where site conditions are suitable, and with the largest size species possible for the site
- 14.1.3. The damage, destruction, or removal of a city tree without written permission from the city arborist shall be prohibited
- 14.1.4. The fine for the damage or removal of a city tree without permission shall be the value of the tree before damage or removal as calculated by the city arborist using methodology outlined in the latest edition of the *Guide for Plant Appraisal*, developed by the Council of Tree and Landscape Appraisers and published by the International Society of Arboriculture.

#### 14.2. Trees on Private Property

- 14.2.1. Trees conserved or planted to satisfy tree regulations shall only be removed when they are dead or in poor health; have less than 50 percent live crown remaining; are severely affected from an insect or disease infestation and are not expected to survive or they threaten the survival of surrounding trees; are in irreversible decline; are in severe conflict with infrastructure and the conflict cannot be mitigated; have been damaged or destroyed and the damage cannot be repaired or reversed; are at an elevated risk of structural failure and the risk cannot be mitigated; or are approved for removal and replacement as part of a site renovation, construction, or development plan
- 14.2.2. Trees removed should be replaced in the next planting season on a 1 to 1 basis in the same or a nearby location where site conditions are suitable, and with the largest size species possible for the site; except that when tree removal occurs on regulated sites and the remaining trees on the site satisfy tree density requirements, no tree replacement shall be required

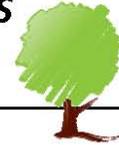


## Appendix C. Tree Regulation Summary, Analysis and Recommendations

The *Summary, Analysis and Recommendations for Tree Regulation in the City of Decatur* is located on the following pages. This document is available separately in PDF format from the Planning Department.



**SUMMARY, ANALYSIS AND RECOMMENDATIONS  
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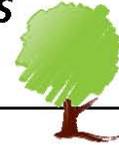
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**INTRODUCTION**

An analysis of the city's tree related regulations was completed in October 2012 by an urban forestry consultant<sup>1</sup> and the recommendations for changes and additions made by the consultant are summarized here. The recommendations are based on assessments of completed developments for which compliance with the existing tree preservation ordinance was required, an analysis of existing tree regulations, and the results of the 2012 street tree inventory<sup>2</sup>.

Also reviewed for this analysis were the 2008 drafts of a *Decatur Tree Conservation Ordinance* and *Administrative Guidelines and Best Management Practices* forwarded to the consultant by the city arborist.

The goals of the analysis and recommended changes are to:

- Protect, maintain, and renew the existing tree canopy in Decatur
- Strengthen regulations for the preservation of existing trees
- Reduce conflicts between tree preservation and stormwater management practices on development sites
- Review existing maintenance and planting standards and revise in accordance with current professional standards and best management practices
- Create clarity and consistency in tree regulations

To begin the tree regulation analysis process, the consultant reviewed and revised the city's technical standards and developed revised *Community Standards for Tree Conservation* which is included in Appendix C of this document. These new standards have been written such that they can be incorporated into new administrative standards and best management practices and specifications written for tree care operations.

The revised standards and the recommendations for revisions of the tree regulations that follow have been incorporated into the city's *Community Forest Management Plan*.

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<sup>1</sup> Connie Head, Consulting Urban Forester, Technical Forestry Services, Commerce, Georgia; author of *Georgia's Tree Ordinances: Results of the Survey of Community Tree Regulation in Georgia*, November 2006, for the Georgia Urban Forest Council (see [www.gufc.org](http://www.gufc.org)).

<sup>2</sup> A report summarizing the results of the 2012 street tree inventory is available from the Amanda Thompson, Planning Director, City of Decatur, [amanda.thompson@decaturga.com](mailto:amanda.thompson@decaturga.com), 404.370.4102.



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**DEVELOPMENT ASSESSMENTS**

In advance of the review of the tree preservation ordinance and administrative guidelines and development of recommendations, Technical Forestry Services<sup>3</sup> conducted an assessment of 11 completed developments in the city to gather information on the effectiveness of the tree regulations and their administration. Eleven (11) sites to visit were chosen by the Planning Director, Deputy City Manager, and City Tree Consultant. Documentation of the results of the development assessments is included in Appendix A.

Tree protection and replacement plans were not available to take to the field for all sites, but when available were used to compare approved plans with existing site conditions. The results of the assessments show:

- Trees were conserved on 8 out of the 11 sites visited
- Surface temperatures on a 90 degree day were reduced an average of 30 degrees under the shade of trees and beneath mulch
- Several plans had incorrect or no tree planting details or inaccurate tree identification and DBH measurements
- Half of the sites that had plans available showed that the trees conserved and planted on the site did not match the approved plan, although in two of these cases trees were over planted and adequate tree density was found
- Diversity was low on four (4) sites
- Small maturing, ornamental trees were given credit on one site
- Two (2) of the sites had trees planted where they will conflict with buildings and infrastructure
- There were missed planting opportunities on two (2) sites
- New trees were in poor health or existing, conserved trees were declining on a third of all sites
- Post-planting tree maintenance was generally lacking, including pruning and the regular replenishment of mulch
- Some improper pruning of large trees was seen and crapemyrtles were topped on a couple of sites

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<sup>3</sup> Field assessments completed by subcontractor Gretchen A. Musser, ISA Certified Arborist and Registered Landscape Architect, Elements of Land Design, LLC, Smyrna, Georgia.



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- Mulch was misapplied on a few sites—piled up against the trunk “volcano” style and not spread out far enough
- Staking that should have been removed instead remained on new trees on a third of the sites
- Two (2) sites had dead trees

*RECOMMENDATION: Conduct ongoing assessments of sites completed under the scope of the tree preservation ordinance. Gather input from individuals that administer and implement the ordinance in addition.*

*RECOMMENDATION: Routinely revise regulations to better meet community goals and objectives. The tree ordinance should be formally reviewed at least every 3 years and revisions submitted for consideration and adoption to the City Commission and Planning Commission.*

**SUMMARY, ANALYSIS AND RECOMMENDATIONS**

There are nine (9) chapters in the city’s code of ordinances with regulations that affect trees and tree canopy cover. These chapters are all located within *Part III. Code of Ordinances*, with one additional tree-related regulation located in Part II. The ordinance chapters with references to trees include:

- *Chapter 18. Buildings and Building Regulations*
- *Chapter 26. Cemeteries*
- *Chapter 42. Environment*
- *Chapter 52. Historical Preservation*
- *Chapter 78. Signs*
- *Chapter 82. Solid Waste*
- *Chapter 86. Streets, Sidewalks and Other Public Places*
- *Chapter 90. Subdivisions*
- *Appendix A. Zoning*

Some of the regulations in these chapters directly affect the conservation of tree canopy cover by requiring the protection, planting, removal, and replacement of trees on city and private property. These regulations have a major effect on the amount and quality of trees and tree canopy existing throughout the city and a major effect on the environmental health of the community.



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Other regulations address the protection of city trees during non-tree related activities or establish the city's right to plant and remove trees on city property. They have a minor or indirect effect on tree canopy but are instrumental in protecting individual city trees and their health.

**PRIMARY REGULATIONS**

The regulations that directly affect tree canopy conservation and are primary factors in its extent, distribution and condition are listed and described below. Recommended changes to improve their effectiveness and outcome are included for each chapter, article, or section.

**Chapter 86 – Streets, Sidewalks and Other Public Places**

Within Chapter 86 there are two (2) articles that directly address trees. *Article III* addresses tree protection and replacement on city and private property and *Article V* includes requirements for parking lots. *Article III* references the *Tree Preservation Ordinance Administrative Guidelines*. Analyses and recommendations for Article III, the Tree Preservation Ordinance Administrative Guidelines, and *Article V* follow.

***Article III. Modification or Alteration of Landscaping on City Rights-of-way***

This article was adopted December 4, 1989, and implemented March 19, 1990. This is essentially the Tree Preservation Ordinance (TPO) which appears in its original form on the city's website, and in an updated version on Municode<sup>4</sup>. The *Administrative Guidelines* are incorporated by reference and were developed just after the adoption of the TPO and implemented along with it on March 19, 1990.

A *Supplement to the Administrative Guidelines* was adopted on September 20, 1999. The TPO and the administrative guidelines are now 23 years old have not otherwise substantially changed since adoption. The guidelines and supplement appear only on the city's website and are not available on the Municode website.

The titles of *Chapter 26 and Article III* indicate that the provisions they contain are applicable to public property only, but many provisions in Articles III (and Article V) apply to private property and trees. The applicability is not always clearly defined.

**RECOMMENDATION:** *Remove this article from Chapter 86 and place in Chapter 42 Environment, within a new Article XIII. Tree Canopy Conservation. The location is a better fit as*

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<sup>4</sup> A website that publishes and provides public access to a library of municipal codes of communities in Georgia and throughout the nation; see [www.municode.com](http://www.municode.com)



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*trees are an environmental resource; the title better describes the intent of the ordinance—to conserve tree canopy.*

*RECOMMENDATION: Change the title of the administrative guidelines to the Tree Canopy Conservation Administrative Guidelines.*

**Section 86-76. - Intent of article.** The intent section (86-76) references only city trees, but the applicability seems to include private property and the trees thereon, although the word “private” is not included.

*RECOMMENDATION: Include in tree or property references whether public, private or both are included.*

**Sec. 86-77. – Definitions.** There are several terms and definitions that are missing from this section, such as critical root zone, city tree consultant, and DBH. The city tree consultant and DBH are defined in the administrative guidelines, however, but it would be helpful for them to be placed in this section also. The description of a tree’s critical root zone is found later in the ordinance and is described as the extent of the dripline.

The definition of a tree is 2 inches trunk diameter and a height of 10 feet. This is a small minimum size for defining a tree.

The definitions for developed property and undeveloped property do not state if both public and private property are included.

*RECOMMENDATION: Add definitions for critical root zone (CRZ), city arborist, and DBH (diameter at breast height).*

*RECOMMENDATION: Change the definition of a tree to include a minimum DBH at maturity of 3 inches and a minimum mature height of 15 feet.*

*RECOMMENDATION: Add a definition for “protected tree” to include all city trees and all trees regulated by the city’s code of ordinances.*

*RECOMMENDATION: Include in definitions the Tree Canopy Conservation Administrative Guidelines.*

**Section 86-78. – Penalty for violation of article.**

No changes are recommended.



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**Section 86-79. – Appointment and qualifications of a city tree consultant; duties.** The city tree consultant is commonly referred to among staff and in the community as the city arborist. While this role is currently filled by a consultant, there may be a time in the future when the city arborist is staff.

*RECOMMENDATION: The title of city tree consultant should be changed to city arborist or, if preferred, Decatur city arborist. The title does not preclude either staff or a consultant filling this role and still having an appropriate title.*

The responsibilities of the consultant described in this section include the identification and maintenance of a record of specimen trees and tree stands. These specimen trees are defined in the definitions section and in the administrative guidelines. This list is not available online.

*RECOMMENDATION: Abandon the designation of specimen tree and include a definite for protected tree as discussed previously.*

**Section 86-80. – General rules and regulations for city property.** This section describes who needs a permit for any modification of the landscape and references the administrative guidelines, but does not use the correct title. In this section the guidelines are cited as the tree protection and replacement administrative guidelines instead of tree preservation ordinance administrative guidelines.

*RECOMMENDATION: Change the reference to the guidelines as the Tree Canopy Conservation Administrative Guidelines.*

A requirement for the protection of public trees from root damage and soil compaction is included here, but does not mention the limits of this protection.

*RECOMMENDATION: When describing the requirement for the protection of public trees refer to the area to be protected as the critical root zone.*

**Section 86-81. – Applicability of article.** It appears that only specimen trees or stands are regulated, but this is not definitive and the applicability could be all trees on all undeveloped property and the yard areas of all developed property, along with public rights-of-way and parks.

*RECOMMENDATION: Include public and private tree references to clarify that applicability extends to both types of ownership.*



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**Section. 86-82. – Exemptions.** In exemptions, it is clear that some privately owned property is exempt, but not clear that other private property is not exempt. The only private properties that are exempt are R-85 and R-60 lots with single- or two-family residential uses.

No changes are recommended.

**Section 86-83. – Removal permits; procedure.** A permit is required to remove a tree, but it is not given a specific name such as “tree removal permit.” A statement is included that the issuance of a building or soil erosion control permit constitutes the approval of the required landscape plan (or landscaping plan—references are inconsistent), but does not mention the tree protection and replacement plan, and does not say that a separate tree permit is not required. There is no fee cited for the tree removal permit.

It is also unclear if a separate tree removal permit is required or if the approval of other site development permits constitutes the tree removal permit.

Several plans are cited and may be required including a landscaping plan, a plan for protection of trees during construction, and a replacement plan. Whether or not tree replacement is required seems to be up to the city tree consultant. This can be interpreted that three (3) separate plans might be required. This section does reference the administrative guidelines.

**RECOMMENDATION:** *Clearly establish that a separate tree removal permit is required in addition to a building permit or soil erosion control permit. Title the permit “Tree Conservation Permit”.*

**RECOMMENDATION:** *Combine the landscape plan, tree protection plan and replacement plan into one plan called the tree conservation plan that would include all necessary elements.*

**RECOMMENDATION:** *State that a tree conservation plan is required, unless the requirement is waived by the city arborist (city tree consultant).*

**RECOMMENDATION:** *Establish subsection “(d) Tree Conservation Administrative Guidelines” and clearly state that compliance with these guidelines and BMPs is required. State that compliance with standards and BMPs are established for tree protection, replacement, and maintenance.*

**RECOMMENDATION:** *Require a review of the Tree Conservation Administrative Guidelines prior to plan submittal and a signature on the tree conservation plan submittal checklist affirming that the document has been read and will be implemented.*



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**Section 86-84. – Protection of trees.** This section includes requirements for the protection of public trees, for a permit for excavation within 10 feet of any public tree and prohibits the damaging of any public tree. In addition, it requires private property owners to maintain clearance of their trees over sidewalks, streets, and alleys.

*RECOMMENDATION: The title of this section should be changed to Protection of city trees.*

*RECOMMENDATION: Require a permit for excavation that will occur within the critical root zone of a city tree instead of within 10 feet.*

**Section 86-85. – Planting of trees.** This section requires that the city engineer approve plans and issue permits for the cutting of paved sidewalks for the planting of a tree or shrub within the city right-of-way.

*RECOMMENDATION: Include a sub-section that describes the establishment of an official tree species list, and state that only those species on the list can be planted on city or private property regulated by the ordinance, unless other species are approved by the city arborist.*

*RECOMMENDATIONS: The official tree species list for Decatur should be included in the administrative guidelines.*

**Section 86-86. – Acquisition of easements to plant trees on private property.** This section describes the authority for the city to enter into agreements to acquire easements for tree planting.

No changes are recommended.

**Tree Preservation Ordinance Administrative Guidelines**

Terminology and Definitions

There is some inconsistency and inaccuracy in the use of the terms *caliper* and *DBH*. And, the dripline is used as the location of the limits of the critical root zone, instead of a number of feet for each inch of trunk diameter which is a more commonly used definition of the limits of this zone.

*RECOMMENDATION: Define the critical root zone in the TPO definitions and use 1.5 feet for every 1 inch of trunk diameter as the radius for the critical root zone instead of the dripline to assure adequate root protection for trees with narrow or upright crown forms.*

*RECOMMENDATION: Throughout the ordinances, terminology should remain consistent. For example, the tree protection and replacement plan is referred to by various combinations of*



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*terms, including tree protection plan, landscaping plan, and tree replacement plan. This is also true of the administrative guidelines. Measurements should also be standardized and the terms used appropriately, as for caliper and DBH. Consistency and clarity should be improved wherever necessary throughout the tree regulations.*

Standards

The greatest opportunity for improvement in the administrative guidelines (and tree health) is in the area of tree maintenance standards. Detailed standards are currently included for tree protection and the identification of specimen and significant trees, but there are no standards for species selection, site selection, nursery stock, tree planting, tree mulching, or tree pruning. The 2008 revision does include these additional standards to address this need.

The protection of public trees is required.

The graphics in Figure 1 through Figure 9 need to be updated in quality and readability.

Based on the consultant's observations during the tree inventory, the tree protection standards included in the tree preservation ordinance have not been enforced for some private construction projects that affect city trees or for city construction projects. Based on the results of the development site assessments and the tree inventory, it is clear that these standards are needed.

Trees planted to satisfy tree density requirements are sometimes substandard in health and structure; trees are being planted incorrectly (planted too deep); maintenance is sporadic or lacking; routine tree pruning is not being done, especially on younger and newly planted trees; mulch is almost universally being incorrectly applied; city trees are not being protected during city construction projects.

The following *ANSI Standards for Tree Care Operations* exist and were consulted in developing the new Community Standards for Tree Conservation included in the administrative guidelines:

- ANSI A133.1-2006 American National Standard for Arboricultural Operations—Safety Requirements
- ANSI A300 (Part 1) – 2008 Pruning Revision of ANSI A300 (Part 1) – 2001, American National Standard for Tree Care Operations—Tree, Shrub, and Other Woody Plant Management—Standard Practices (Pruning)



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- ANSI A300 (Part 2) – 2004 Fertilization Revision of ANSI A300 (Part 2) – 1998, American National Standard for Tree Care Operations—Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices (Fertilization)
- ANSI A300 (Part 3) – 2006 Revision of ANSI A300 (Part 3) – 2000, American National Standard Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices (Supplemental Support Systems)
- ANSI A300 (Part 4) – 2008 Lightning Protection Systems Revision of ANSI A300 (Part 4) – 2002, American National Standard for Tree Care Operations—Tree, Shrub, and Other Woody Plant Management—Standard Practices (Lightning Protection Systems)
- ANSI A300 (Part 5) – 2005 Management, American National Standard for Tree Care Operations—Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction)
- ANSI A300 (Part 6) – 2005 Transplanting, American National Standard for Tree Care Operations—Tree, Shrub, and Other Woody Plant Maintenance—Standard Practices (Transplanting)
- ANSI Z60.1 – 2004, American Standard for Nursery Stock (American Nursery & Landscape Association)

The following ISA Best Management Practices exist and were consulted in developing the recommended standards and best management practices in the administrative guidelines.

- Tree Planting
- Utility Pruning
- Tree Pruning
- Integrated Vegetation Management
- Cabling, Bracing and Guying
- Lightning Protection
- Fertilization

*RECOMMENDATION: A statement that the city adopts and requires compliance with ANSI Standards for Tree Care Operations and ISA Best Management Practices should be included in the ordinance.*



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*RECOMMENDATION: Minimum community standards for tree selection, tree placement, tree planting, tree pruning, tree mulching, and tree protection should be adopted and enforced. Recommended minimum standards are included in Appendix X.*

*RECOMMENDATION: Include requirements for compliance with standards for tree selection, site selection, tree planting, tree mulching, and tree pruning.*

*RECOMMENDATION: Include standards and best management practices in the guidelines.*

*RECOMMENDATION: Adopt an official tree species list for the city of Decatur that would contain information on species approved for planting on private and public property, in specific site situations (parking lots, street rights-of-way, beneath overhead utility lines, etc.), and for tree density unit credit.*

Tree Density Requirements

Tree density is currently measured in tree density units which are based on the cross-sectional area of a tree trunk in square feet. The current requirement of 30 units of tree density per acre actually represents 30 square feet of trunk area across the acre (basal area). The basal area might be satisfied by many small trees (tree planting) or several large trees that already exist on the site (tree conservation), or a combination of the two. The guidelines allow for all of these options for satisfying tree density requirements. There is no stated requirement that trees, or TDUs, are required in perpetuity.

The same density is required for all zoning districts. Tree preservation is a focus and the 1999 supplement to the ordinance requires that 25 percent of the tree density required on private property (30 units) be provided by the preservation of existing trees (7.5 units). Trees on private property designated R-85 or R-60 single-family residential are exempt.

*RECOMMENDATION: Include a statement that the required tree density must remain on the site in perpetuity to remain in compliance.*

Although generally larger diameter trees will have larger crowns so using units of trunk diameter is appropriate, a more direct relationship between tree density and the benefits trees provide could be made by measuring density as the percent of the site covered by tree canopy. The greater the tree canopy cover, the greater the interception of stormwater, the greater the reduction in surface temperatures and ground level ozone formation, and the greater the benefits overall.



***SUMMARY, ANALYSIS AND RECOMMENDATIONS  
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If tree canopy requirements are adopted, an incentive in the form of a reduction in stormwater fee, or waiver of the tree utility fee if adopted, could be given for sites exceeding minimum tree canopy cover requirements by at least 15 percent.

The current tree density requirements do not vary from one type of land use or zoning district to another. This means that on some sites, especially those with high maximum lot coverage allowances, the required amount of density does reasonably fit on the site. In these cases a donation to the Decatur Tree Bank can be made in lieu of planting all of the required tree density.

*RECOMMENDATION: Transition to using percent tree canopy cover as a measure of tree density on a site.*

Suggested tree canopy cover requirements by zoning district are listed in the city's Community Forest Management Plan and were chosen to contribute toward achieving a 50 percent tree canopy cover in Decatur over the long-term. In developing the tree canopy cover requirements the minimum lot area required and maximum lot coverage allowed were considered, along with the number of acres included within that zoning district. The more acres and the higher the tree canopy requirement, the greater the contribution to the city overall.

*RECOMMENDATION: For properties not regulated by the tree ordinance, the tree canopy cover requirements should be considered goals. Incentives for voluntarily maintaining and exceeding tree canopy cover requirements should be developed and might include reductions in stormwater or tree utility fees.*

Permit and Tree Bank Fees

Fees are included on the website version of the TPO but are not included on city inspection and permit fee schedule available on the city's website. The Fee Schedule for the Planning, Zoning and Inspections Department fees found on the city's website does not list any fee associated with the review of the tree protection and replacement plan or any values set for payment into the Decatur Tree Bank. A fee schedule is included with the original Tree Preservation Ordinance effective March 19, 1990. In the 1999 supplement to the Tree Preservation Ordinance a rate of \$275 for each .5 unit of replacement tree density is established for tree bank contributions.

*RECOMMENDATION: List plan review and tree bank fees on the Planning, Zoning and Inspections Fee Schedule instead of in the tree ordinance so that they can be administratively and routinely changed to reflect current costs.*



**SUMMARY, ANALYSIS AND RECOMMENDATIONS  
FOR TREE REGULATION IN DECATUR, GEORGIA**



*RECOMMENDATION:* Establish the value of tree canopy cover at \$200 per 1,000 square feet of tree canopy.

A *Check List for Tree Preservation Ordinance Plan Review* is included with the TPO on the city's website which facilitates the application process.

**Article V. Requirements for Parking Lots**

This article was adopted in 1989. It requires 10 percent landscaped area within parking lots, a minimum size of landscape islands, 1 canopy tree in each island, and canopy trees at least every 42.5 feet in perimeter landscape strips (minimum 5 feet wide) when these strips are required

This article addresses surface parking lots within commercial C-2 zoning districts with 30 or more parking spaces. Surface parking lots must have 10% of the paved area landscaped. Landscaped areas must be at least 6 feet in width. A minimum of 1 tree for every 8 parking spaces is required. Where parking lots are adjacent to sidewalks and public rights-of-way, a landscaped buffer strip at least 5 feet wide must be established and contain trees planted at a maximum of 42.5 feet on center along the entire length of the landscape strip.

This article includes requirements for barrier curbs within parking lots, but they may be placed in the parking space, and the pavement behind can be removed and the area added to the required landscaped area. There is no incentive for or mention of the inclusion of bio retention areas, bioswales, rain gardens, engineered soils or pervious pavement within parking lots. These should be encouraged to reduce stormwater control costs and improve soil moisture conditions for trees in landscape islands.

Ground cover is required, which can be shrubs, ivy, liriope pine bark mulch, or other landscaping materials. None of these ground covers improve tree growth, with the exception of pine bark mulch, which is not the best mulch for landscaped areas. The large texture of pine bark mulch and waxy coating on the bark can shed water instead of absorb it and transfer it to the soil. All of the vegetation cited as acceptable ground cover will compete with the trees for water. Ivy should not be allowed as many of the choices available can become invasive; this is especially true of English ivy.

There are no restrictions for the species that are placed in the landscape islands other than they must be drought tolerant, at least 40 feet at maturity, and at least 2.5 inches DBH and 10 feet in height at planting. There is no requirement for what size of tree. There is no preference stated for mulch as a ground cover—this should be preferred.



**SUMMARY, ANALYSIS AND RECOMMENDATIONS  
FOR TREE REGULATION IN DECATUR, GEORGIA**



The measurement point for caliper is erroneously listed as 36 inches. New trees must be at least 2.5 inches caliper and a minimum of 10 feet in height. Existing trees must be 2.5 inches caliper (at 36 inches).

*RECOMMENDATION: Change the minimum DBH for eligible existing trees to 4 inches DBH.*

Trees must have a 40-foot minimum mature height. They must be drought tolerant. Trees must be planted at least 30 inches from barrier curbs. Trees must be properly maintained in accordance with approved plans, and dead trees must be replaced within 6 months.

The amount of compact car spaces may be increased from 25 percent up to 35 percent when a loss of parking spaces will occur due to the tree regulations. Existing parking lots do not have to lose more than 3 percent of their existing spaces.

Interior landscaped areas must be at least 36 square feet in size. This is very small unless expanded rooting zones are constructed beneath the pavement or pervious pavement is installed.

*RECOMMENDATION: Require medium or large maturing canopy trees in parking lots as identified in the official tree species list found in the administrative guidelines.*

*RECOMMENDATION: Require compliance with arboricultural standards for all tree conservation, establishment, maintenance, and protection practices.*

*RECOMMENDATION: Require that only those trees approved for parking lots be planted in these areas as identified the official tree species list found in the administrative guidelines and best management practices.*

*RECOMMENDATION: Increase the minimum soil volume required for a tree to 320 cubic feet, the minimum depth of quality soil to 3 feet, and the minimum area for a landscape island within a parking lot to 100 square feet with a minimum width of 6 feet.*

*RECOMMENDATION: Change the description of minimum size for an existing tree to 2.5 inches DBH (diameter at breast height, 4.5 feet above the ground).*

*RECOMMENDATION: Encourage the use of bioswales, bioretention areas, and rain gardens in parking lots. Encourage the elimination of curbing to direct stormwater into landscape islands where water can percolate and increase soil moisture for parking lot trees.*

*RECOMMENDATION: Consider a reduction in the stormwater utility for sites that incorporate minimum areas of bioswales, bioretention, rain gardens, and excess tree canopy cover.*



***SUMMARY, ANALYSIS AND RECOMMENDATIONS  
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***Chapter 52. Historical Preservation***

There are two (2) articles within this chapter that affect tree canopy cover within the city. The sections including references to trees are described and recommendations for changes are included where appropriate.

***Article I. In General***

Sections 58.8, 58.9, 58.10, and 58.11 describe requirements for certificates of appropriateness and certificates of exemption for the removal of trees 12 inches DBH and greater within the front yards of properties in the historic district. The type of trees regulated varies from one historic district to the next.

*RECOMMENDATION: Reduce the minimum size of trees requiring tree removal permits on historic properties to 8 inches DBH.*

***Article III. – Recommendation and Designation of Historic Districts and Properties***

Section 58-64 describes requirements for adopting an ordinance for the designation of historic districts and properties. It places a moratorium on applications for alteration or demolition of structures while the ordinance is under consideration by the Historic Preservation Commission, and states that applications for any permit that would allow tree removal will not be approved during the moratorium.

***Chapter 90 – Subdivisions***

The three (3) articles addressing trees in this chapter emphasize the preservation of existing trees and establish the city's right to require preservation and other landscaping conditions.

***Article III. – Design Standards, Division 4. – Blocks,***

In *Section 90-134. – Preservation of trees* there is a single statement that "when feasible, all trees of major growth in the subdivision shall be preserved."

No changes are recommended.

***Article III. – Design Standards, Division 7. – General Suitability, Section 90-202. – Same—Conditions***

*Section 90-202.Same – Conditions*, of this division allows the city commission to require the preservation of trees and other vegetation as special conditions to approval of subdivision plans. Landscaping conditions may include the location, type and maintenance of plant



**SUMMARY, ANALYSIS AND RECOMMENDATIONS  
FOR TREE REGULATION IN DECATUR, GEORGIA**



materials, buffers and screening, and special measures to alleviate undesirable views, light, glare, noise, dust and odors.

No changes are recommended.

**Article VI. – Conservation Subdivision/Open Space Development**

*Section 90-505.* – *Open space* requires that a minimum of 40 percent of the gross tract area of conservation subdivisions must remain in open space and secondary conservation areas within the open space should include existing, healthy, native forests of at least 1 acre contiguous area and individual existing healthy trees greater than 8 inches caliper [DBH], as measured from their outermost drip line [?]. Also states that open space may not be used for forestry that does not conform to best management practices.

RECOMMENDATION: Change the description of trees to healthy trees 8 inches DBH or greater.

**Appendix A – Zoning**

District regulations include minimum lot sizes and maximum lot coverage, which significantly affects the amount of quality growing space available for trees.

RECOMMENDATION: *Take into account the maximum lot coverage when establishing requirements for tree density and tree canopy cover.*

**Article VII. – District Regulations**

For C-1 and Mixed Use developments, street tree are required within a continuous street tree and street furniture zone adjacent to the curb that must be at least 5 feet in width. Trees are to be planted at least every 40 feet on center within these zones, and trees must be at least 33.5 inches caliper [this is obviously incorrect and it is assumed that this is intended to be 3.5 inches caliper]. Trees must be limbed up a minimum of 6 feet.

RECOMMENDATION: *Correct minimum caliper to 3.5 inches.*

**CONTRIBUTORY REGULATIONS**

The regulations in the code of ordinances that address the protection and health of city trees to a lesser degree than those discussed above, but can still provide a significant contribution, are described below. Recommendations, if made, are included after the description.

The following section is included in Part I. Charter in the city's code of ordinances.



***SUMMARY, ANALYSIS AND RECOMMENDATIONS  
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***Article II. – Municipal Powers***

*Section 2.13. – Public improvements, assessment of costs* establishes the city’s right to remove or cause to be removed trees in the streets, alleys, lanes, sidewalks, or public places within the city.

No changes are recommended.

The following chapters are found in *Part III. Code of Ordinances*.

***Chapter 18 – Buildings and Building Regulations***

***Article II. – Building and Construction Codes, Division 4. – Standard Housing Code***

*Section 18-102. – Amendments, Section 306.4. Care of premises* requires owners or occupants of residential buildings to remove dead trees upon notice from the building official.

No changes are recommended.

***Chapter 26 – Cemeteries***

*Section 26-7. – Trees* and *Section 26-9. – Removal of trees and shrubbery* prohibit the planting of trees in the cemetery by any individual and establishes the city’s right to remove trees in the cemetery.

No changes are recommended.

***Chapter 42 – Environment***

***Article IV – Soil Erosion and Sedimentation Control***

*Section 42-83. – Exemptions* exempts forestry land management practices from requirements for a permit, including harvesting, except that when exempt forestry practices result in land-disturbing or other activities otherwise prohibited in a buffer no other land-disturbing activities, except for normal forest management practices, are allowed on the property for a period of 3 years after completion of the activity.

*Section 42.82. – Definitions* includes in the definition of *final stabilization* a requirement that 100 percent of the soil surface is uniformly covered in permanent vegetation with a density of 70 percent or greater and includes planted trees as a form of permanent vegetation.

***RECOMMENDATION:*** *Create a greater emphasis on and incentives for the use of trees for final stabilization for soil erosion and sedimentation control.*



**SUMMARY, ANALYSIS AND RECOMMENDATIONS  
FOR TREE REGULATION IN DECATUR, GEORGIA**

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**Article XI – Stream Buffer Protection**

*Section 42-202. – Findings and purposes* states that one of the purposes of the article is to provide tree canopy to shade streams and promote desirable aquatic habitat.

No changes are recommended.

*Section 42-404. – Applicability;* article applies to all land development activity on property containing a stream protection area but exempts forestry and silviculture activities on land zone for forestry, silviculture or agriculture and not incidental to other land development activity; if buffer is disturbed then no other land disturbing activity other than normal forest management practices will be allowed for 3 years after the end of the intrusive activity

**Article XII. – Miscellaneous**

*Section 42-500* restricts outdoor watering for trees, shrubs, or other plants to between the hours of 4:00 p.m. and 10:00 a.m.

No changes are recommended.

**Chapter 78 – Signs**

*Section 78-6. Fastening signs, notices and posters to property—On public property generally* prohibits the fastening or printing of any advertising, notice or any written material to a tree.

No changes are recommended.

*Section 78-10. – General regulations* prohibits the erection, painting or drawing of a sign on any tree.

No changes are recommended.

**Chapter 82 – Solid Waste**

**Article II. – Collection and Disposal**

In *Section 82-32. – Preparation and storage of residential refuse and recyclables for collection; placement of certain refuse and recyclables for collection prohibited*, regulations describe how yard trimmings should be handled and prepared for curbside pick-up by the city. This section encourages the chipping, composting, and use of yard trimmings as mulch. It states that tree branches may not exceed 4 feet and must be stacked in a compact pile on the curb or property lines in front of the premises, and that the city will not collect logs and limbs over 4 feet in length, larger than 6 inches in diameter, or weighing more than 50 pounds.



***SUMMARY, ANALYSIS AND RECOMMENDATIONS  
FOR TREE REGULATION IN DECATUR, GEORGIA***

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No changes are recommended.

***Chapter 86 – Streets, Sidewalks and Other Public Places***

***Article I. – In General***

*Section 86-23. – Regulation of publication vending devices states that vending devices may not be chained, bolted or otherwise attached to any tree.*

No changes are recommended.

***Appendix A – Zoning***

***Article VII. – Off-street parking and loading requirements***

No mention of a requirement for trees. This requirement is instead located in Part III, Chapter 86, Article V as discussed above.

*RECOMMENDATION: Add incentives (reduction in stormwater utility fee, reduction in the required number of parking spaces) for the incorporation of bioswales, bioretention areas and rain gardens that include trees to control and utilize stormwater for tree growth.*

***Article XII. – Zoning Board of Appeals***

*Section 12.5. – Powers and duties* allows the board to impose special conditions that include the preservation of existing trees and other vegetation and special measures to alleviate undesirable views, light, glare, noise, dust or odor.

No changes are recommended.

***Article XIII. – Amendment and Changes***

*Section 13.5. – Conditional zoning* states that the planning commission may recommend and the city commission may impose special conditions in approving an amendment to the zoning map which may include the preservation of existing trees and other vegetation and special measures to alleviate undesirable views, light, glare, noise, dust or odor.

No changes are recommended.

**2008 DRAFT REVISIONS**

The consultant was provided with a draft of a proposed *City of Decatur Tree Conservation Ordinance* dated February 19, 2008, along with a draft of revised *Administrative Standards and Best Management Practices for Decatur's Urban Forest*, both developed by the city tree



***SUMMARY, ANALYSIS AND RECOMMENDATIONS  
FOR TREE REGULATION IN DECATUR, GEORGIA***

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consultant to improve the current ordinance and guidelines. These documents have been reviewed internally but have not been adopted. Changes proposed in these documents were considered and some were incorporated into the recommendations.

The *Decatur Tree Conservation Ordinance* differs from the current tree ordinance in the following ways:

- The city tree consultant is renamed the Decatur Arborist
- A new category of tree, landmark tree, is established; a landmark tree is any canopy tree 30 inches DBH or larger or any understory tree 8 inches DBH or larger with a life expectancy of 5 years or greater that is growing on a property regulated by the ordinance; the designation of specimen tree is abandoned
- A permit is required to remove a landmark tree from any property
- Landmark trees removed must be replaced with a new tree of comparables species and canopy, or payment can be made into the Decatur Tree Bank in lieu of planting
- Another new category of tree, protected tree, is established; a protected tree is any tree 8 inches DBH or larger with a life expectancy of 5 years or longer that is growing on a property regulated by the ordinance; protected trees are all trees 8 inches DBH or larger outside the buildable area of a property on a development site; the requirement to conserve and protect trees that fit these criteria is the same as in the current ordinance
- Mitigation for the removal of protected trees is required in addition to the overall site canopy requirements
- The *tree protection and replacement plan* currently required is renamed to a *site-tree conservation plan* and requires more information to be documented on the plan; the location of all trees 8 inches DBH and greater and the limits of their CRZs are required; the exact location of any tree if encroachment is proposed within its CRZ is required; the location of all landmark trees is required (no requirement for the location of the CRZ is stated)
- A 2-page *Site/Tree Conservation Plan Checklist* accompanies the draft ordinance
- Minimum canopy requirements are established and located in the administrative standards document
- The Decatur Tree Bank is established; costs are established in the administrative standards document



***SUMMARY, ANALYSIS AND RECOMMENDATIONS  
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- Tree removal permits applications procedures are defined; permits are required to remodel owner-occupied single-family houses and permit holders are required to protect and replace trees according to prescriptions prepared by the Decatur Arborist
- Standard details on the STCP for tree protection and tree planting must conform with the administrative standards
- The requirements for the protection of boundary trees are significantly expanded
- The Decatur Arborist must verify successful compliance with the STCP prior to the issuance of a permit and must verify final field compliance prior to the issuance of a certificate of occupancy
- There is no mention of the city's right to acquire easements to plant trees on private property

The *City of Decatur Tree Conservation Ordinance Administrative Standards and Best Management Practices* draft includes:

- Further details on the landmark tree removal permits
- Requirements for a permit to remodel
- Requirements for approval of the Site/Tree Conservation Plan prior to the issuance of a land disturbance, demolition, or building permit
- Requirements for a minimum amount of tree canopy; the canopy requirement for residential properties is 45 percent and for all other properties is 35 percent
- Establishment a system for purchasing tree canopy credits from the Decatur Tree Bank to compensate for deficits when permit applicants are unable to meet canopy requirements due to limited space; tree canopy credits cost \$375 per credit and 1 credit is required for every 250 square foot deficit in canopy
- Requirement that trees planted to meet canopy requirements to be maintained for a minimum of 3 growing seasons
- Detailed requirements for landmark trees
- Standards for landscape plans
- Tree establishment standards
- Minimum soil volumes are required
- Regulations for planting trees within public rights-of-way
- Requirement for the planting of trees in parking lots, increased from 1 tree per 8 spaces currently to 1 tree per 6 spaces



***SUMMARY, ANALYSIS AND RECOMMENDATIONS  
FOR TREE REGULATION IN DECATUR, GEORGIA***

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- Requirement that at least 1 tree be planted in each landscape island
- Allowance for stormwater runoff into parking lot landscape islands with approval of Decatur Stormwater Engineer and Decatur Arborist
- Guidelines for project planning
- Guidelines for ordinance implementation and compliance
- Requirements for follow-up maintenance
- Updated diagrams of tree protection fencing, tunneling, grade changes, structural cells and their installation, tree planting standard detail, 3-cut pruning method, mulching,
- Standards for tree selection
- Standards for tree planting
- Standards for tree maintenance
- Decatur Tree Species List with a key to symbols and characteristics

Some of the revisions in these draft documents, along with the recommendations for changes to the existing *Tree Preservation Ordinance* and *Tree Preservation Ordinance Administrative Guidelines*, have been incorporated into the *City of Decatur Community Forest Management Plan* completed subsequent to this tree regulation summary and analysis.



APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

Agnes Scott College  
Bullock Science Center & Julia Thompson Smith Chapel

Bullock Science Center Findings:

- 90 degree day – laser thermometer readings below:
  - 116 on sidewalk
  - 109 in planting bed
  - 87 in shade under willow oaks
- Crapemyrtles at the front entrance & Willow Oaks along street; Red Oak, Red Maple & Tulip Poplars all around 6-7" dbh along north side of building.
- No pruning has been performed. Mulch has not been replenished. A couple trees have moss on compacted root balls. Canopies are quite thin.

Impressions:

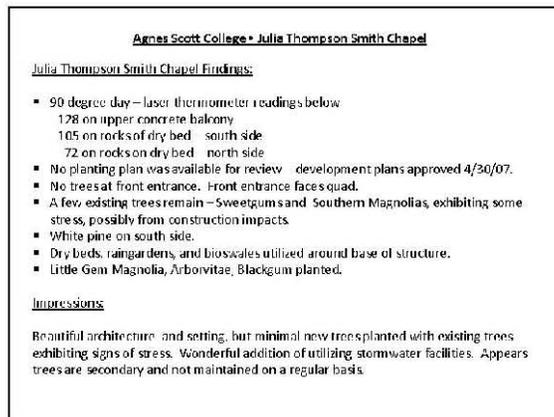
- Beautiful building – surrounding turf appears to be more important than newly planted trees.





APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

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# City of Decatur Community Forest Management Plan



SUMMARY, ANALYSIS AND RECOMMENDATIONS FOR TREE REGULATION IN DECATUR, GEORGIA



## APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

Agnes Scott College • Julia Thompson Smith Chapel



Agnes Scott College • Julia Thompson Smith Chapel



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APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

Columbia Seminary – Dorms & Classrooms

Findings:

- Laser readings were not taken at this site.
- Planting plan was available for comparison – approved 3/17/11.
- Plantings were installed per plan.
- One large oak which was to be removed was kept and is declining.
- A good variety of species was planted.
- Eleven trees were dead or in severe decline.

Impressions:

- A nice diversity of both overstory and understory trees.
- Plantings took place within CBZ of existing trees.
- Planting plan more than fulfilled tree ordinance requirements.
- Gator bags and staking still on new tree plantings.

Columbia Seminary – Dorms & Classrooms





APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

**Decatur City Schools - 4/5 Academy on Fifth & High School on North McDonough Street**

Findings:

- Laser readings were not taken at this site.
- Planting plans were available for comparison – approved 8/25/10 & 1/26/08.



4/5 Academy on Fifth Avenue



Decatur High School

**4/5 Academy on Fifth Avenue**

Findings:

- Laser readings were not taken at this site.
- Planting plan was available for comparison – approved 8/25/10.
- Plantings were installed fairly close to plan.
- Staking still on trees – rubber hosing & wire.
- Burlap still present.
- Mulch was not replenished.
- Savannah Holly approximately 42% of species planted.
- Four dead trees.

Impressions:

- Beautiful architecture.
- Savannah Hollies are small and appear to be struggling.
- A couple trees planted too close to building.
- Diversity could have been increased.
- Retained existing trees around new play equipment.



APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012



Decatur High School on North McDonough Street

Findings:

- Laser readings were not taken at this site.
- Planting plan was available for comparison – approved 1/26/08.
- Plantings were not installed to plan.
- Existing 8" in dia along street were noted as Maples on plan.
- Existing 30" Magnolia to be preserved was not on plan.
- Existing 20" Pecan called to be removed was still on site.
- Several existing trees on plan were not close to size noted.
- Standing still left on some trees.
- Plan called for existing 6" Maples on site to be relocated but those were not found nor noted on plan.
- Serviceberry & Dogwood were given points toward meeting density. (Procedure IV, B, 2).
- No evidence of pruning.
- A few trees were planted too deep.

Impressions:

- Nice selection of trees.
- Trees would be healthier with proper training, pruning, removal, stacking, and adequate irrigation.
- Some existing trees have been subjected to improper pruning.
- Clearance pruning is needed on the street trees along McDonough Street.



APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012



**Knob Hill Townhouses**

Findings:

- Laser readings were taken at this site.  
Temperture of 90 degrees today  
Pavement: -11.6 degrees  
Shaded Pavement: -31 degrees
- Planting plan was not available for comparison.
- Lacebark Elm, Savannah Holly around parking area.
- Trident Maples planted a bit high. Volcano mulch sporadically throughout site.
- Crapemyrtle's around amenity area - topped.
- Willow Oak planted within 10' of building and light poles.
- Some dieback noted on new plantings.
- Existing trees exhibiting some dieback.
- Deck buffer - Little Gem Magnolia - large amount of English Ivy in groundcover.
- Willow oaks planted along back property about 15' apart - dieback - little sun.

Impressions:

- Diversity is limited, however, space is limited for larger overstory trees.
- Well kept.
- Mulch has not been replenished.
- Some suffering dieback, but no evidence of deep planting.



APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012





APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

Knob Hill Townhouses



Clairmont Condos

Findings:

- Laser readings were taken at this site.  
Temperature of 90 degrees today.  
Pavement – 117 degrees  
Shaded Pavement – 87 degrees
- Planting plan was not available for comparison
- Lacebark Elm, Savannah Holly, Japanese Maple
- Savannah Holly used in locations by building.
- Central crop off area – heavily pruned Bloodgood Japanese Maple in planting bed.
- Entrance onto Church has a double-sided entrance planting of cypresses – one side topped due to overhead lines.
- Entrance from Clairmont – Savannah Hollies flank the south side, north side has brick wall with mulched area that could accommodate some tree plantings. Laser readings show 141 degrees on top of mulch whereas 117 away in shade of Hollies is 79 degrees.
- Front entrance on Clairmont has a nice mixture of overstory and understory trees. In relatively good shape. Grass area showed laser reading of 99 degrees in full sun.
- Inner courtyard with pool and fountain – predominantly rounded Cypresses.

Impressions:

- Very pleasant condo units.
- More opportunities of additional planting space in larger overstory species in the central courtyard area instead of the Japanese Maple.
- Limited diversity.
- Overhead utility lines for cypress entrance plantings.



APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012





APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012



Brownstones @ 1021 Scott Boulevard

Findings:

- Laser readings were not taken at this site.
- Planting plan was available for comparison – approved 7/11/10.
- Installation does not match planting plan; however, more than enough density units are planted.
- Trees show varying degrees of health.
- Staking still on some trees.
- Planting details on plan does not call for wire basket to be removed.
- West side buffer Brodiae, Rodocarpus and Lobelia were replaced with Waxmyrtle and Ligustrum.
- East side buffer was recently planted with 3" to 1" Loblolly Cypress and small Crapemyrtles.
- Tree save areas along south side appears to be respected and heavily planted.
- Development on 5/18/12 was still under construction.

Impressions:

- A good diversity of trees planted.
- Some overstory trees planted in locations with restricted root zones. Over time, trees will mature and provide the benefit they could.
- Better species substitutes will not provide the screening originally required.
- Streetscape is pleasant with good diversity. Maintenance of mulch and periodic irrigation has not been kept up well.

# City of Decatur Community Forest Management Plan

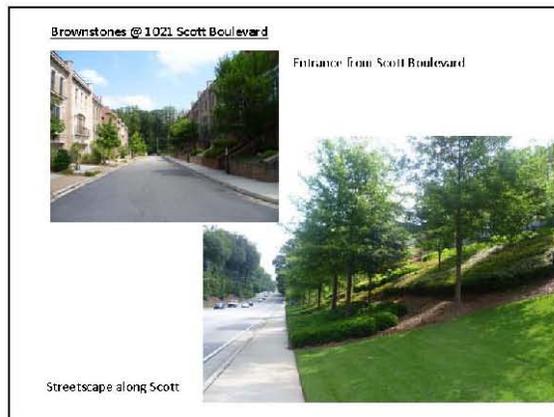


SUMMARY, ANALYSIS AND RECOMMENDATIONS FOR TREE REGULATION IN DECATUR, GEORGIA



## APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012



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APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012





APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

**425 Fayetteville Road – Single Family**

Findings:

- Laser readings were not taken at this site.
- Planting plan was available for comparison – approved 7/19/11.
- Irrigation does not match planting plan; however, density units are met.
- New Maples have small mulched rings. Wounds on a couple of the trunks.
- No planting detail on planting plan.
- Trees saved appear to be in decline – thinning crowns on both the Post Oak and the Water Oak.

Impressions:

- New homes in older neighborhood – retaining existing trees helps to blend the new homes into the neighborhood.
- New trees appear to have been planted in small planting holes.

**425 Fayetteville – Single Family**





APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

Sycamore Ridge @ Pinehurst – Single Family

Findings:

- Laser readings were taken at this site.
  - 51 degree day
  - 128 degrees on pavement in sun
  - 100 degrees on grass in sun
  - 87 degrees in shade under tree (87 under mulch on shady side)
  - 120 on top of mulch in sun/54 degrees in same spot under mulch (2" depth)
- Planting plan was not available for comparison.
- Predominantly Red Maples planted along streets.
- Adequate planting spaces, but very compacted soils with exposed and girdling roots.
- A few Crapemyrtles (have not been topped) at intersections.

Impressions:

- Very nice subdivision.
- Diversity is missing along with a few locations where trees could have been planted.

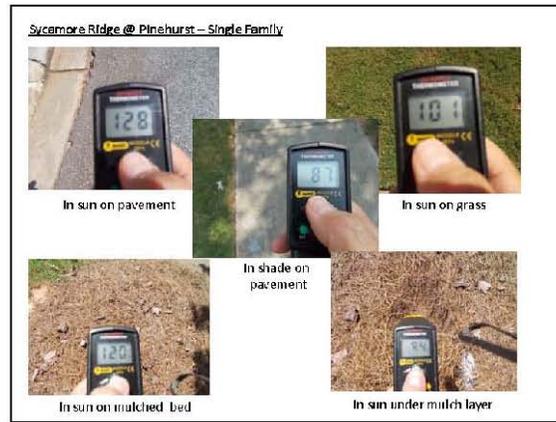
Sycamore Ridge @ Pinehurst – Single Family





APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012





APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

238 Winnona Drive – Single Family

Findings:

- Laser readings were not taken at this site.
- Planting permit was available for comparison – approved 11/23/11.
- Overcup Oaks and Red Maples allowed. Could benefit from pruning.
- Utility lines are present along the street ROW where a Red Maple was protected. Cater bags still present.
- One existing 6" Maple was wrapped with utility line.
- One 28" dbh Sweetgum was originally on adjacent property – lot line revised to incorporate this tree on this lot. Planting done within UICZ.

Impressions:

- New home in older neighborhood – retaining existing trees helps to blend the new homes into the neighborhood.
- New trees appear to have been planted in small planting holes.
- New Overcup Oaks planted within 2' of new fence.

238 Winnona Drive – Single Family



Small planting hole for size of tree –  
reasonable location for large overstory tree.

City of Decatur  
Community Forest Management Plan



SUMMARY, ANALYSIS AND RECOMMENDATIONS FOR TREE REGULATION IN DECATUR, GEORGIA



APPENDIX A. DEVELOPMENT ASSESSMENT RESULTS

11/14/2012

238 Winnona Drive – Single Family



238 Winnona Drive – Single Family





## Appendix D. Tree Ordinance Project Summary

An inventory of city street trees was conducted in Decatur during the summer of 2012. A total of 3,177 data entries were made for 2,597 trees, 9 tree groups, and 571 vacant tree planting sites. The data collected included location, species, trunk diameter, condition, and management needs.

The city was divided into five (5) sections for inventory purposes. The sections included the central business district and northeast, northwest, southeast, and southwest sections divided Ponce de Leon Avenue in the east-west direction, and Church Street and Commerce Drive in the north-south direction.

All street trees and vacant planting sites were inventoried in the CBD and the NW section, but in the NE, SE, and SW sections, only non-ornamental trees 12 inches DBH and larger were included and no planting sites were inventoried due to grant budget constraints. The number of all trees inventoried is 2,606 and the total number of all large trees inventoried is 1,136.

There were 571 vacant tree planting sites identified, but many of these sites can accommodate more than one tree. The total number of trees that could be planted is 150 large, 159 medium, and 602 small.

There were 110 tree species identified overall, and 71 species identified among the 1,136 large trees. The most common street trees overall are flowering dogwoods, willow oaks, crapemyrtles, red maples, water oaks, flowering cherries, and Chinese elms. The most common large trees are water oaks, willow oaks, red maples, and sweetgums. Water and willow oaks account for 40 percent of all large street trees in the city.

Trees range in size from 1 to 61 inches DBH (trunk diameter measured at 4.5 feet above the ground). The average DBH of all trees is 13.3 inches, and the average DBH of the large tree population is 22.5 inches. The species inventoried with the largest average diameters are water oak, tuliptree, post oak, white oak, and American sycamore.



The remaining results and comparisons include only the 1,136 large trees. The average condition of all large trees is 80%. Post, white, scarlet, willow and Nuttall oaks have the best average condition among the oaks and water and southern red oaks have the lowest. Loblolly pines average 90 percent overall and had one of the best average conditions of all species. The sweetgums, American elms, Southern magnolias, tuliptrees, and pecans were generally in fair condition overall and the maples--silver, red, and sugar--were generally in poor condition overall.

Soil compaction was present around 77 percent of all trees. Forked (co-dominant) stems were found on 69 percent of all trees and 44 percent of all trees have included bark within these forks. Girdling roots were found on 56 percent of all trees. Trees were growing in restricted root zones in 39 percent of the cases. Decay was found on the scaffold limbs of 41 percent of all trees, on the trunk of 19 percent of all trees, and at the root flare for 11 percent of the trees. Trunk wounds were found on 15 percent of the trees and scaffold limb wounds were found on 27 percent of trees. Crown dieback was observed on 30 percent of all trees.

No catastrophic or wide-spread pest problems were observed. However, a variety of insect and disease signs and symptoms were identified and include scale on willow oaks and borers on dogwoods, powdery mildew on crapemyrtles and dogwoods, fusiform rust on pines, hypoxylon canker and wetwood/slime flux on water oaks, and fire blight on pears and cherries. Mistletoe, a parasite, was found on 9 percent of the large trees, primarily water oaks.

The pavement around 58 percent of all trees was cracked, heaved, or displaced; 55 percent of all trees were in conflict with pavement. The root zone of 26 percent of all trees is 75 percent or more covered by pavement, and another 31 percent have at least half their root zones paved. Conflicts with infrastructure are common: 25 percent of trees are in conflict with the roadway, vehicular traffic, or parking; 6 percent are in conflict with buildings; 5 percent are in conflict with mailboxes; and 4 percent are in conflict with signs.

Power lines were located above 30 percent of all trees and near an additional 13 percent; 32 percent of all trees were in conflict with overhead power lines to some degree.

There are 135 large trees with an elevated risk of whole or partial tree failure and 73 of these are considered to have a high risk of failure. A recommendation for regular



inspections was assigned to 489 trees in marginal condition. There are 132 live trees and 1 dead tree recommended for removal.

Pruning was recommended for clearance around buildings and over roadways, to correct structure, to clean the crown of deadwood, to reduce risk, or to train tree structure for 1,039 trees. Often more than one type of pruning recommendation was made for a single tree. The pruning of 273 trees was considered to be a high priority need. The most common pruning recommendations were for crown cleaning, clearance and corrective pruning.

Other management recommendations include mulching for 554 trees, soil aeration for 452 trees, irrigation for 125 trees, fertilization for 40 trees, and cabling and bracing for 31 trees.

Data was collected in this first phase of the inventory by urban forestry consultant Connie Head of Technical Forestry Services and Gretchen Musser of Elements of Land Design, LLC, using Trimble GeoXH 2005 Series Pocket PCs provided by the University of Georgia, Department of Horticulture. The tree inventory data has been provided to the city in an ESRI ArcMap shapefile and a Microsoft Excel spreadsheet. The tree inventory summary report has been provided to the city in an Adobe Acrobat PDF file on a project DVD that also includes the shapefile, spreadsheet, and photographs of trees throughout the city.

A second phase of the inventory project is planned to collect data on ornamental trees, trees less than 12 inches DBH, and planting sites along the streets in the NE, SE, and SW sections and all trees in parks and on public properties (parks, city offices and facilities). Data collected in both phases will be combined and analyzed to create a comprehensive picture of the state of the city-owned tree resource.

For more information on this project or the city's community forest management program, please contact Amanda Thompson, Planning Director, City of Decatur at (404)370-4102, or [amanda.thompson@decaturga.com](mailto:amanda.thompson@decaturga.com).



## Appendix E. Urban Tree Canopy Assessment

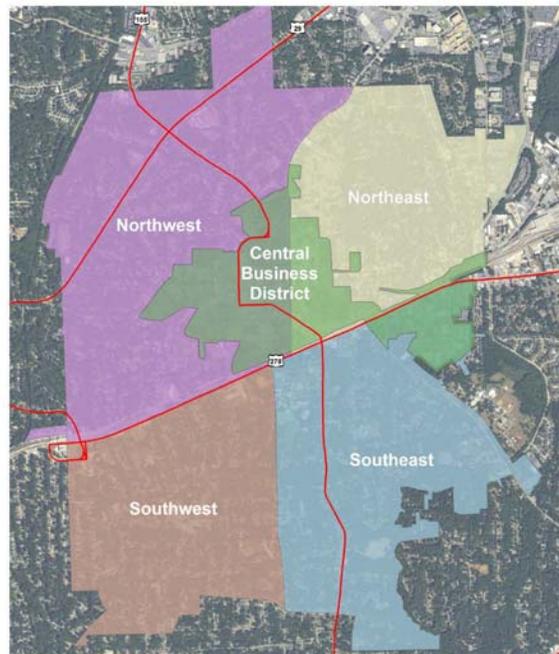
The *Urban Tree Canopy Assessment for Decatur, Georgia* is located on the following pages. This document is available separately in PDF format from the Planning Department.



## Urban Tree Canopy Assessment Decatur, Georgia

### Table of Contents

1. Project Background
2. Project Goal
3. Assessment Procedure
4. Economic Benefits
5. Results
6. Recommendations





Decatur, Georgia - Urban Tree Canopy Assessment

1. Project Background

Decatur is a small city in DeKalb County, Georgia. The 2010 Census reported the population as 19,335. The Global Ecosystem Center (GEC) was contracted by the Decatur City Government to perform an Urban Tree Canopy Assessment (UTCA) for the City for 2005 and 2010.

2. Project Goal

The goal of this project was to accurately and inexpensively document urban forest canopy and ecosystem service values so the canopy value as infrastructure can be considered in policy decision making, budget deliberations, and resource management. As a tool, canopy analysis enabled managers effectively measure, monitor and communicate the effectiveness of their programs and practices.



Decatur natural-color NAIP imagery (left) and resulting classified land cover (right)



### 3.0 Assessment Procedure

- 3.1 Image Acquisition
- 3.2 Data Processing
- 3.3 Land Cover Classification
- 3.4 Change Analysis
- 3.5 Quality Assurance and Quality Control
- 3.6 Canopy Assessment

#### 3.1 Imagery Acquisition

GEC used 1-meter, 3-band NAIP imagery acquired in 2005 and 2010 (4-band imagery is preferred, but was not available). Land cover classification with 3-band imagery requires additional effort by the analyst.

NAIP imagery is acquired during the agricultural growing seasons in the continental United States.

#### 3.2 Data Processing

After NAIP imagery is acquired, the imagery is clipped to the project boundary and resampled at a 3-meter pixel resolution. The resampling of 1-meter resolution imagery to 3-meter resolution essentially leaves important details of natural and man-made features intact while providing a high level of accuracy. A 1-meter classification was conducted on the Central Business District since impervious surface is the dominant feature and average tree canopy size tends to be small.

#### Key Terms

**Land Cover:** The physical cover on the Earth's surface such trees, grass, concrete, bare ground and water.

**NAIP:** National Agriculture Imagery Program

**Ortho-Imagery:** Geo-referenced image data of the Earth's surface from. The image can be collected by satellite or airborne sensors.

**TR-55:** The stormwater runoff calculations incorporate volume of runoff formulas from the Urban Hydrology of small Watersheds model (TR-55) <http://www.hydrocad.net/tr-55.htm> developed by the U.S. Natural Resources Conservation Service (NRCS), formerly known as the U. S. Soil Conservation Service. Don Woodward, P. E., a hydrologic engineer with NRCS, customized the formulas to determine the benefits of trees and other urban vegetation with respect to stormwater management.

**L-THIA:** Long-Term Hydrological Impact Assessment model developed by Purdue University to estimate the change in the concentration of the pollutants in runoff during a typical storm event given the change in the land cover from existing trees to a no tree condition.

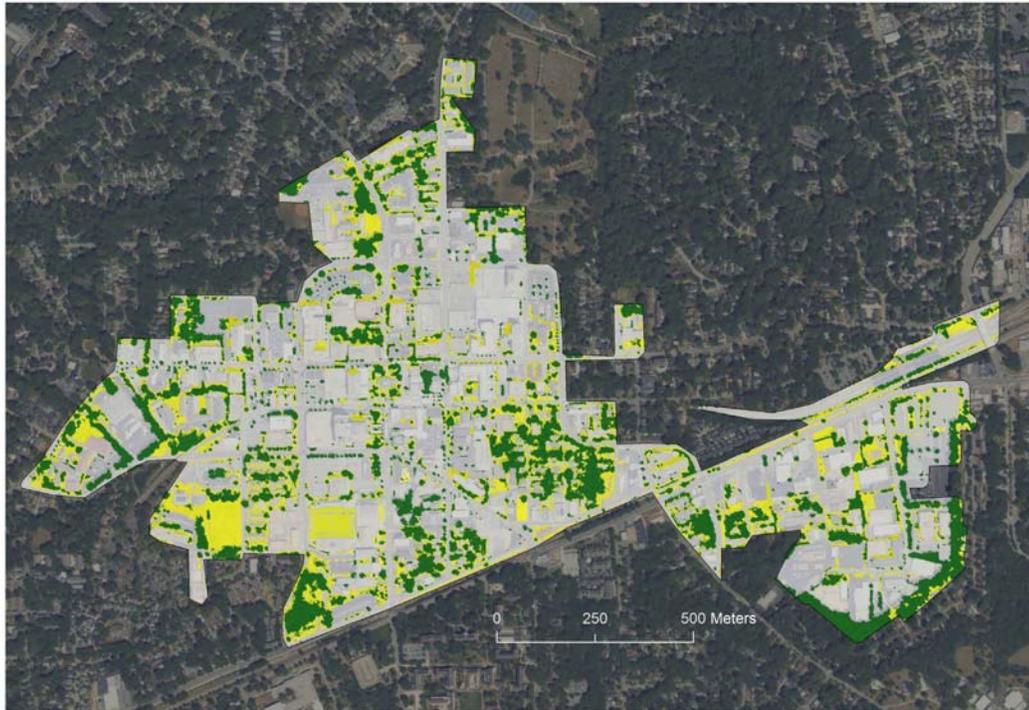
**UFORE:** The Urban Forest Effect model developed by USDA Forest Service to estimate mass of greenhouse gases stored in tree canopies. UFORE model is based on data collected in 55 U. S. cities.



### 3.3 Land Cover Classification

In order to create consistent and accurate land cover products, automated and semi-automated processes are used to conduct classifications. Automated processes provide precise and accurate assessments while eliminating analyst bias. This methodology requires the analyst to establish create extensive training sets before the automated process begins.

Once the imagery was clipped and re-sampled, a supervised classification was conducted to extract land cover features. Graphic models were applied to reduce speckle and correct some misclassifications. The final classification was reviewed and edited as needed.



The 1-meter, 5-class land cover classification of the Central Business District. The 1-meter resolution was used to better identify smaller trees in this area.

### 3.4 Change Analysis

Specialized image processing software was used to extract land cover features and for change-mask creation between the 2005 and 2010 imagery. Once the land cover changes were captured in a binary mask, a regression tool called Classification and Regression Tree (CART) was used to classify these areas. In-house models were utilized to ensure consistency, accuracy, and quality of the land cover classification within the change-areas. This classification was used to create the final 2010 land cover classification.



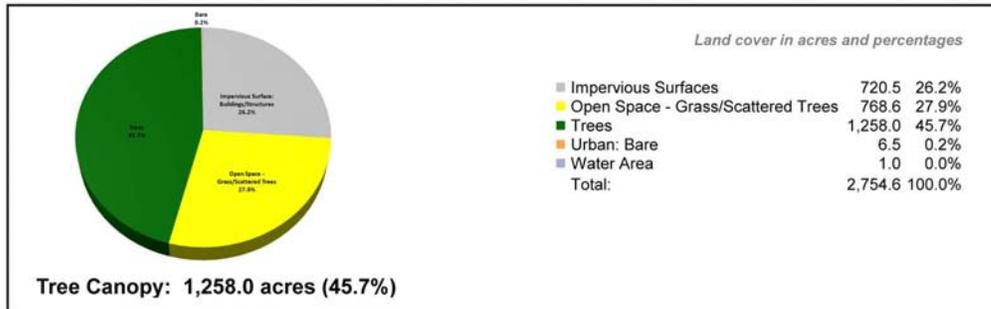
### 3.5 Quality Assurance and Quality Control

Custom models were used to ensure product quality and accuracy. The final land cover classification was validated against randomly selected sample points. The minimum mapping unit was set to 3 meters and 95%+ accuracy for land cover categories overall.

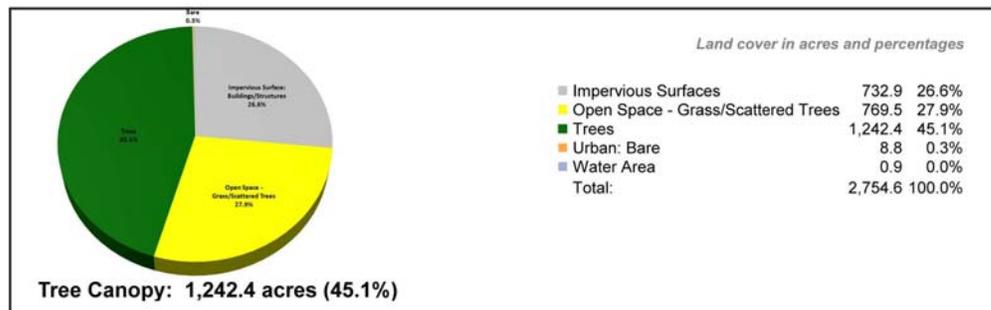
As more objective approaches have been adopted in the classification process, the resulting land cover classification has increasingly realistic and accurate land cover features. To ensure the quality of land cover classifications, hand edits are performed only at the final stage of the classification.

### 3.6 Canopy Assessment

Using the land cover data interpreted from the NAIP imagery along with soil and weather data provided by the NRCS and the National Weather Service, ecosystem services are calculated.



Land cover percentages for 2005



Land cover percentages for 2010

The 2005 canopy assessment documents that Decatur had canopy coverage of 1,258 acres (45.7%) and this category was the dominant land cover feature. The second largest land cover class was open space, which accounted for 768.6 acres (27.9%) and impervious surfaces accounted for 720.5 acres (26.2%).

As of 2010, Decatur showed some loss in canopy coverage. The assessment showed that canopy coverage was reduced from 1,258 acres to 1,242.4 acres, a net loss of 16 acres of tree canopy. The canopy assessment chart demonstrates that almost all of the canopy loss was converted to urban development.



#### 4. Economic Benefits

In addition to classifying the spectral image into land cover categories so canopy measurements can be established, the land cover classification is used to calculate ecosystem services. By using land cover along with soil, weather, and air quality to populate scientific and engineering models, land cover can be translated into economic values.

Economic benefits are calculated in terms of stormwater management, air quality and carbon storage. Additionally, water quality is calculated in terms of specific nutrients added to the water.

#### 5.0 Results

The data provided by the assessment provides decision makers and resource managers with a framework for improving their urban forest and increasing the economic values produced by the resource in the future. The classified geo-referenced data can be used in an ArcGIS project to plan growth and development that includes improving the green infrastructure.

##### 5.2 Stormwater Management

Stormwater management using green infrastructure as non structural devices (trees etc) offers huge financial benefits to a community and can be accomplished during the urban planning process. GEC's ecosystem services use a hydrological model (TR-55) to calculate stormwater numbers for any given urban areas. Results show that 45.7% of the tree coverage has saved over 12 million cubic feet of rain water from running off, and saved over \$2 million annually as of 2005. As of 2010, the reduction to 45.1% tree canopy resulted in 11.9 million cubic feet of stormwater runoff, which means Decatur received 130,017 cubic feet of runoff benefits in 2010.

Stormwater Management	
<b>Water Quantity (Runoff Volume)</b>	
2-yr, 24-hr Rainfall in inches:	3.25
Curve Number reflecting existing conditions:	76
Curve Number of replacement land cover:	84
Dominant Soil Type: <b>B</b>	
Replacement land cover type: (existing condition)	
Impervious Surfaces: Buildings/ structures	
Additional cu. ft. storage needed:	<b>3,488,340</b>
Construction cost per cu. ft.:	\$2.00
<b>Total Stormwater Value:</b>	<b>\$6,976,679</b>
<b>Annual Stormwater Value:</b>	<b>\$608,259</b>
(based on 20-year financing at 6% interest)	

Stormwater Statistics for 2005

##### 5.1 Air Pollution and Carbon

The ecosystem analysis also calculates air pollution removal and carbon storage/sequestration. Using an UFORE model with the land cover classification, results were produced for each pollutant. Results indicate as of 2005, 45.7% canopy coverage removed a total of 119,986 lbs of air pollutants per year. This same canopy coverage stored 54,132 ton of carbon and sequestered 421 ton annually.

However, by 2010 pollution removal was just 118,505 lbs/year and carbon storage was only 53,464 tons and sequestration was 416 tons annually. The 16 acres of tree canopy loss contributed to this decrease in ecosystem services.

Air Pollution Removal		
Nearest air quality reference city: <i>Washington DC</i>		
	<i>Lbs. Removed/yr.</i>	<i>Dollar Value/yr.</i>
Carbon Monoxide:	1,918	\$941
Ozone:	14,961	\$52,858
Nitrogen Dioxide:	7,672	\$27,107
Particulate Matter:	12,659	\$29,861
Sulfur Dioxide:	6,138	\$5,297
<b>Totals:</b>	<b>43,348</b>	<b>\$116,064</b>
<i>Dollar values are based on 2009 dollars</i>		
Carbon Storage and Sequestration		
Tons Stored (Total):	<b>18,518</b>	
Tons Sequestered (Annually):	<b>144</b>	

Air Pollution & Carbon Statistics for 2005

# City of Decatur Community Forest Management Plan



Stormwater Management	
<b>Water Quantity (Runoff Volume)</b>	
2-yr, 24-hr Rainfall in inches:	3.75
Curve Number reflecting existing conditions:	75
Curve Number of replacement land cover:	90
Dominant Soil Type: <b>B</b>	
Replacement land cover type: (existing condition) Impervious Surfaces: Buildings/ structures	
Additional cu. ft. storage needed:	11,896,601
Construction cost per cu. ft.:	\$2.00
<b>Total Stormwater Value:</b>	<b>\$23,793,202</b>
<b>Annual Stormwater Value:</b>	<b>\$2,074,400</b>
<small>(based on 20-year financing at 6% interest)</small>	

Air Pollution Removal		
Nearest air quality reference city: <i>Atlanta</i>		
	<b>Lbs. Removed/yr</b>	<b>Dollar Value/yr</b>
Carbon Monoxide:	3,323	\$1,631
Ozone:	50,948	\$179,995
Nitrogen Dioxide:	13,290	\$46,955
Particulate Matter:	42,086	\$99,274
Sulfur Dioxide:	8,860	\$7,647
<b>Totals:</b>	<b>118,505</b>	<b>\$335,501</b>
<small>Dollar values are based on 2009 dollars</small>		
Carbon Storage and Sequestration		
Tons Stored (Total):	53,464	
Tons Sequestered (Annually):	416	

Air Pollution & Carbon Statistics for 2010

Stormwater Statistics for 2010

## Ecosystem Services Provided by Natural Systems

### City of Decatur - NE

Year	Air Pollution Removal	Air Pollution Removal Value	Carbon Stored	Carbon Sequestered	Stormwater Runoff Reduction*	Stormwater Benefit @ \$2 per cu.ft	Additional Stormwater Runoff**	Value after the Additional Stormwater
	lbs/yr	\$	tons	tons	cu.Ft	\$	cu.Ft	\$
City of Decatur 2005	20,292	\$57,449	9,155	71	2,046,416	\$4,092,831		
City of Decatur 2010	20,139	\$57,017	9,086	71	2,032,364	\$4,064,727	14,052	-\$28,104

### City of Decatur - NW

Year	Air Pollution Removal	Air Pollution Removal Value	Carbon Stored	Carbon Sequestered	Stormwater Runoff Reduction*	Stormwater Benefit @ \$2 per cu.ft	Additional Stormwater Runoff**	Value after the Additional Stormwater
	lbs/yr	\$	tons	tons	cu.Ft	\$	cu.Ft	\$
City of Decatur 2005	41,806	\$118,357	18,861	147	4,261,424	\$8,522,848		
City of Decatur 2010	41,182	\$116,590	18,579	145	4,210,173	\$8,420,346	51,251	-\$102,502

### City of Decatur - SE

Year	Air Pollution Removal	Air Pollution Removal Value	Carbon Stored	Carbon Sequestered	Stormwater Runoff Reduction*	Stormwater Benefit @ \$2 per cu.ft	Additional Stormwater Runoff**	Value after the Additional Stormwater
	lbs/yr	\$	tons	tons	cu.Ft	\$	cu.Ft	\$
City of Decatur 2005	33,701	\$95,411	15,204	118	3,329,798	\$6,659,597		
City of Decatur 2010	33,100	\$93,709	14,933	116	3,273,761	\$6,547,523	56,037	-\$112,074

### City of Decatur - SW

Year	Air Pollution Removal	Air Pollution Removal Value	Carbon Stored	Carbon Sequestered	Stormwater Runoff Reduction*	Stormwater Benefit @ \$2 per cu.ft	Additional Stormwater Runoff**	Value after the Additional Stormwater
	lbs/yr	\$	tons	tons	cu.Ft	\$	cu.Ft	\$
City of Decatur 2005	24,154	\$68,382	10,897	85	2,382,048	\$4,767,096		
City of Decatur 2010	24,051	\$68,091	10,851	84	2,373,076	\$4,746,152	8,972	-\$20,944

\* Stormwater Runoff Reduction = If existing land cover replaced to Impervious Surfaces: Buildings/Structure  
 \*\* Additional Stormwater based on earliest land cover 2005 and compared to 2010



## 6.0 Recommendations

A first step for any city or town to better manage their natural systems and man-made infrastructure is to map canopy coverage. The change detection analysis conducted for Decatur provides data that allows managers and public policy makers to adjust their strategy for the immediate future. By conducting a third analysis in approximately three years will provide data needed to establish a trend analysis. The ability to document, map, and project future trends in land use and would be a logical approach to managing and calculating costs and benefits.

Therefore, it is highly recommended the following analysis are conducted to further enhance existing land cover classification:

### 6.1 Scenario Modeling

GEC has developed a scenario modeling tool that enables decision-makers to create hypothetical scenarios of land cover change, and used to calculate the resulting impacts on ecosystem services and future costs. This powerful tool can be applied to other GIS data layers as well. The best application of this model is to apply it to future planning maps to compute ecosystem service values.

### 6.2 Change Analysis

The GEC has developed methodologies to conduct inexpensive high-resolution change analysis that document economic and ecological change. This analysis reveals the cost and benefits of land use change. In Decatur, the change analysis between 2005 and 2010 documented the exact nature of canopy loss and urban development illustrating how changes in land cover directly affected the ecosystem services.

### 6.3 Trend Analysis

As change analysis provides valuable information regarding land cover for two dates, it cannot be used to draw decisive projections of future growth. Trend analysis can reveal socio-economic changes and the direction of such changes. Based on a series of change over multiple years of data, trend analysis can provide crucial information on the state of the land use management and pin-point the areas of concern. Furthermore, trend analysis can give detailed cost/benefit information for decision making.



## **Appendix F. i-Tree Reports on Tree Benefits and Values**

Reports generated from the i-Tree Streets program are located on the following pages.

# City of Decatur

## Community Forest Management Plan



Decatur

Page 1 of 2

### Population Summary of All Trees

9/25/2012

Species	DBH Class (in)									Total Standard Error
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	
<b>Broadleaf Deciduous Large (BDL)</b>										
Quercus phellos	5	44	95	74	62	24	10	5	2	321
Quercus nigra	2	3	7	35	55	73	57	43	22	297
Liquidambar styraciflua	1	0	1	17	23	18	12	3	0	75
Quercus falcata	8	22	1	4	3	10	5	6	1	60
Ulmus americana	28	16	5	2	1	5	0	1	0	58
Acer saccharum	0	5	9	31	6	2	1	0	0	54
Carya illinoensis	0	2	1	12	13	8	3	1	0	40
Liriodendron tulipifera	0	1	0	7	5	5	10	6	1	35
Quercus coccinea	1	1	4	10	10	2	1	0	0	29
BDL OTHER	6	17	35	52	46	22	15	10	3	206
<b>Total</b>	<b>51</b>	<b>111</b>	<b>158</b>	<b>244</b>	<b>224</b>	<b>169</b>	<b>114</b>	<b>75</b>	<b>29</b>	<b>1,175 (±NaN)</b>
<b>Broadleaf Deciduous Medium (BDM)</b>										
Acer rubrum	7	46	65	60	10	6	2	1	2	199
Ulmus parvifolia	1	15	38	3	0	0	0	0	0	57
BDM OTHER	20	19	12	24	10	1	0	1	0	87
<b>Total</b>	<b>28</b>	<b>80</b>	<b>115</b>	<b>87</b>	<b>20</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>343 (±NaN)</b>
<b>Broadleaf Deciduous Small (BDS)</b>										
Cornus florida	34	87	182	50	6	0	0	0	0	359
Lagerstroemia spp	71	120	61	9	2	0	0	0	0	263
Prunus serrulata	6	10	37	21	2	0	0	0	0	76
Pyrus calleryana	1	1	1	19	28	8	2	0	0	60
Acer buergerianum	1	15	18	0	0	0	0	0	0	34
Cornus kousa	6	15	11	0	0	0	0	0	0	32
BDS OTHER	19	52	26	13	5	2	0	0	0	117
<b>Total</b>	<b>138</b>	<b>300</b>	<b>336</b>	<b>112</b>	<b>43</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>941 (±NaN)</b>
<b>Broadleaf Evergreen Large (BEL)</b>										
BEL OTHER	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (±NaN)</b>
<b>Broadleaf Evergreen Medium (BEM)</b>										
BEM OTHER	5	4	0	7	6	2	1	1	0	26
<b>Total</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>26 (±NaN)</b>
<b>Broadleaf Evergreen Small (BES)</b>										
BES OTHER	2	7	13	8	3	0	0	1	0	34
<b>Total</b>	<b>2</b>	<b>7</b>	<b>13</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>34 (±NaN)</b>
<b>Conifer Evergreen Large (CEL)</b>										
Pinus taeda	0	0	1	6	19	14	7	1	0	48
CEL OTHER	1	0	1	2	6	3	0	1	0	14
<b>Total</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>8</b>	<b>25</b>	<b>17</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>62 (±NaN)</b>
<b>Conifer Evergreen Medium (CEM)</b>										
CEM OTHER	5	1	8	5	4	0	1	0	0	24
<b>Total</b>	<b>5</b>	<b>1</b>	<b>8</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>24 (±NaN)</b>
<b>Conifer Evergreen Small (CES)</b>										
CES OTHER	0	0	1	0	0	0	0	0	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1 (±NaN)</b>
<b>Palm Evergreen Large (PEL)</b>										
PEL OTHER	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (±NaN)</b>
<b>Palm Evergreen Medium (PEM)</b>										
PEM OTHER	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (±NaN)</b>
<b>Palm Evergreen Small (PES)</b>										

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**Population Summary of All Trees**

9/25/2012

Species	DBH Class (in)									Total Standard Error
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	
PES OTHER	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (±NaN)</b>
<b>Grand Total</b>	<b>230</b>	<b>503</b>	<b>633</b>	<b>471</b>	<b>325</b>	<b>205</b>	<b>127</b>	<b>81</b>	<b>31</b>	<b>2,606 (±0)</b>

# City of Decatur

## Community Forest Management Plan



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### Complete Population of All Trees

9/25/2012

Species	DBH Class (in)									Total Standard Error
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	
<b>Broadleaf Deciduous Large (BDL)</b>										
Quercus phellos	5	44	95	74	62	24	10	5	2	321
Quercus nigra	2	3	7	35	55	73	57	43	22	297
Liquidambar styraciflua	1	0	1	17	23	18	12	3	0	75
Quercus falcata	8	22	1	4	3	10	5	6	1	60
Ulmus americana	28	16	5	2	1	5	0	1	0	58
Acer saccharum	0	5	9	31	6	2	1	0	0	54
Carya illinoensis	0	2	1	12	13	8	3	1	0	40
Liriodendron tulipifera	0	1	0	7	5	5	10	6	1	35
Quercus coccinea	1	1	4	10	10	2	1	0	0	29
Ulmus alata	0	0	0	11	7	3	0	0	0	21
Acer saccharinum	0	0	1	6	6	4	0	1	2	20
Quercus alba	0	1	5	4	0	2	3	5	0	20
Ulmus spp	0	0	0	5	10	4	0	0	0	19
Broadleaf Deciduous Large	1	4	2	5	3	1	0	0	0	16
Prunus serotina	2	1	3	7	1	2	0	0	0	16
Quercus stellata	1	0	0	0	2	2	9	2	0	16
Morus rubra	0	4	6	2	2	0	0	0	0	14
Zelkova serrata	0	2	9	0	1	0	0	0	0	12
Platanus occidentalis	0	1	0	0	2	3	0	1	1	8
Fraxinus pennsylvanica	0	2	2	0	2	0	0	0	0	6
Quercus rubra	0	1	1	1	1	0	0	1	0	5
Fagus grandifolia	0	0	0	0	2	1	1	0	0	4
Quercus palustris	0	1	1	2	0	0	0	0	0	4
Celtis occidentalis	0	0	0	0	3	0	0	0	0	3
Juglans nigra	0	0	2	0	1	0	0	0	0	3
Populus deltoides	0	0	0	2	1	0	0	0	0	3
Carya tomentosa	1	0	0	0	0	0	1	0	0	2
Platanus acerifolia	0	0	0	1	1	0	0	0	0	2
Quercus bicolor	1	0	1	0	0	0	0	0	0	2
Ulmus pumila	0	0	0	2	0	0	0	0	0	2
Acer x freemanii	0	0	1	0	0	0	0	0	0	1
Acer platanoides	0	0	0	1	0	0	0	0	0	1
Carya glabra	0	0	0	1	0	0	0	0	0	1
Carya ovata	0	0	0	0	0	0	1	0	0	1
Gleditsia triacanthos	0	0	0	0	1	0	0	0	0	1
Populus alba	0	0	1	0	0	0	0	0	0	1
Quercus macrocarpa	0	0	0	1	0	0	0	0	0	1
Quercus velutina	0	0	0	1	0	0	0	0	0	1
<b>Total</b>	<b>51</b>	<b>111</b>	<b>158</b>	<b>244</b>	<b>224</b>	<b>169</b>	<b>114</b>	<b>75</b>	<b>29</b>	<b>1,175 (±NaN)</b>

<b>Broadleaf Deciduous Medium (BDM)</b>										
Acer rubrum	7	46	65	60	10	6	2	1	2	199
Ulmus parvifolia	1	15	38	3	0	0	0	0	0	57
Quercus muehlenbergii	20	0	0	0	0	0	0	0	0	20
Quercus lyrata	0	7	5	4	2	0	0	0	0	18
Tilia cordata	0	0	1	9	3	0	0	0	0	13
Carpinus caroliniana	0	9	0	0	0	0	0	0	0	9
Nyssa sylvatica	0	1	3	3	1	0	0	0	0	8
Acer negundo	0	0	1	2	0	1	0	0	0	4
Ginkgo biloba	0	2	0	0	2	0	0	0	0	4
Betula nigra	0	0	1	1	0	0	0	0	0	2
Populus nigra	0	0	1	1	0	0	0	0	0	2
Quercus acutissima	0	0	0	0	2	0	0	0	0	2
Quercus marilandica	0	0	0	2	0	0	0	0	0	2
Maclura pomifera	0	0	0	0	0	0	0	1	0	1
Melia azedarach	0	0	0	1	0	0	0	0	0	1
Robinia pseudoacacia	0	0	0	1	0	0	0	0	0	1
<b>Total</b>	<b>28</b>	<b>80</b>	<b>115</b>	<b>87</b>	<b>20</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>343 (±NaN)</b>

Broadleaf Deciduous Small (BDS)

# City of Decatur

## Community Forest Management Plan



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### Complete Population of All Trees

9/25/2012

Species	DBH Class (in)									Total Standard Error
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	
<i>Cornus florida</i>	34	87	182	50	6	0	0	0	0	359
<i>Lagerstroemia</i> spp	71	120	61	9	2	0	0	0	0	263
<i>Prunus serotina</i>	6	10	37	21	2	0	0	0	0	76
<i>Pyrus calleryana</i>	1	1	1	19	28	8	2	0	0	60
<i>Acer buergerianum</i>	1	15	18	0	0	0	0	0	0	34
<i>Cornus kousa</i>	6	15	11	0	0	0	0	0	0	32
<i>Cercis canadensis</i>	5	11	3	4	1	0	0	0	0	24
<i>Acer palmatum</i>	0	4	12	6	1	0	0	0	0	23
<i>Crataegus</i> spp	5	16	1	0	0	0	0	0	0	22
<i>Magnolia x soulangeana</i>	6	6	3	1	2	1	0	0	0	19
<i>Albizia julibrissin</i>	0	2	0	1	1	1	0	0	0	5
<i>Vitex agnus-castus</i>	0	3	2	0	0	0	0	0	0	5
<i>Pyrus</i> spp	0	2	1	1	0	0	0	0	0	4
<i>Amelanchier arborea</i>	2	1	0	0	0	0	0	0	0	3
<i>Acer ginnala</i>	0	2	0	0	0	0	0	0	0	2
<i>Cornus alternifolia</i>	1	1	0	0	0	0	0	0	0	2
<i>Prunus cerasifera</i>	0	1	1	0	0	0	0	0	0	2
<i>Sorbus aucuparia</i>	0	1	1	0	0	0	0	0	0	2
<i>Acer griseum</i>	0	1	0	0	0	0	0	0	0	1
<i>Cotinus coggygria</i>	0	0	1	0	0	0	0	0	0	1
<i>Ficus carica</i>	0	0	1	0	0	0	0	0	0	1
<i>Viburnum prunifolium</i>	0	1	0	0	0	0	0	0	0	1
<b>Total</b>	<b>138</b>	<b>300</b>	<b>336</b>	<b>112</b>	<b>43</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>941 (±NaN)</b>
<b>Broadleaf Evergreen Large (BEL)</b>										
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0 (±NaN)</b>
<b>Broadleaf Evergreen Medium (BEM)</b>										
<i>Magnolia grandiflora</i>	0	4	0	7	6	2	1	1	0	21
<i>Magnolia virginiana</i>	5	0	0	0	0	0	0	0	0	5
<b>Total</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>7</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>26 (±NaN)</b>
<b>Broadleaf Evergreen Small (BES)</b>										
<i>Prunus caroliniana</i>	1	1	6	3	1	0	0	0	0	12
<i>Ilex opaca</i>	0	3	4	2	0	0	0	1	0	10
<i>Ilex</i> spp	0	0	1	3	2	0	0	0	0	6
<i>Mahonia bealei</i>	0	2	2	0	0	0	0	0	0	4
<i>Myrica cerifera</i>	1	1	0	0	0	0	0	0	0	2
<b>Total</b>	<b>2</b>	<b>7</b>	<b>13</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>34 (±NaN)</b>
<b>Conifer Evergreen Large (CEL)</b>										
<i>Pinus taeda</i>	0	0	1	6	19	14	7	1	0	48
<i>Pinus echinata</i>	0	0	0	1	2	2	0	0	0	5
<i>Pinus strobus</i>	0	0	0	0	2	1	0	0	0	3
<i>Celtis laevigata</i>	0	0	0	1	1	0	0	0	0	2
<i>Pinus</i> spp	0	0	1	0	1	0	0	0	0	2
<i>Cunninghamia lanceolata</i>	0	0	0	0	0	0	0	1	0	1
<i>xCupressocyparis leylandii</i>	1	0	0	0	0	0	0	0	0	1
<b>Total</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>8</b>	<b>25</b>	<b>17</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>62 (±NaN)</b>
<b>Conifer Evergreen Medium (CEM)</b>										
<i>Juniperus virginiana</i>	1	1	7	3	0	0	0	0	0	12
<i>Pinus virginiana</i>	0	0	1	0	3	0	1	0	0	5
<i>Chamaecyparis thuyoides</i>	4	0	0	0	0	0	0	0	0	4
<i>Tsuga canadensis</i>	0	0	0	2	1	0	0	0	0	3
<b>Total</b>	<b>5</b>	<b>1</b>	<b>8</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>24 (±NaN)</b>
<b>Conifer Evergreen Small (CES)</b>										
<i>Conifer Evergreen Small</i>	0	0	1	0	0	0	0	0	0	1
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1 (±NaN)</b>
<b>Palm Evergreen Large (PEL)</b>										

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**Complete Population of All Trees**

9/25/2012

Species	DBH Class (in)									Total Standard Error
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	
<b>Total</b>	0	0	0	0	0	0	0	0	0	0 (±NaN)
<b>Palm Evergreen Medium (PEM)</b>										
<b>Total</b>	0	0	0	0	0	0	0	0	0	0 (±NaN)
<b>Palm Evergreen Small (PES)</b>										
<b>Total</b>	0	0	0	0	0	0	0	0	0	0 (±NaN)
<b>Grand Total</b>	230	503	633	471	325	205	127	81	31	2,606 (±0)



**Decatur**

**Total Annual Benefits, Net Benefits, and Costs for All Trees**

9/25/2012

Benefits	Total (\$)	Standard Error	\$/tree	Standard Error	\$/capita	Standard Error
Energy	27,949	(N/A)	10.72	(N/A)	1.43	(N/A)
CO2	8,194	(N/A)	3.14	(N/A)	0.42	(N/A)
Air Quality	-9,390	(N/A)	-3.60	(N/A)	-0.48	(N/A)
Stormwater	90,355	(N/A)	34.67	(N/A)	4.62	(N/A)
Aesthetic/Other	109,869	(N/A)	42.16	(N/A)	5.62	(N/A)
<b>Total Benefits</b>	<b>226,977</b>	<b>(N/A)</b>	<b>87.10</b>	<b>(N/A)</b>	<b>11.61</b>	<b>(N/A)</b>
<b>Costs</b>						
Planting	46,485		17.84		2.38	
Contract Pruning	17,980		6.90		0.92	
Pest Management	6,000		2.30		0.31	
Irrigation	0		0.00		0.00	
Removal	0		0.00		0.00	
Administration	2,500		0.96		0.13	
Inspection/Service	0		0.00		0.00	
Infrastructure Repairs	0		0.00		0.00	
Litter Clean-up	0		0.00		0.00	
Liability/Claims	0		0.00		0.00	
Other Costs	0		0.00		0.00	
<b>Total Costs</b>	<b>72,965</b>		<b>28.00</b>		<b>3.73</b>	
<b>Net Benefits</b>	<b>154,012</b>	<b>(N/A)</b>	<b>59.10</b>	<b>(N/A)</b>	<b>7.88</b>	<b>(N/A)</b>
<b>Benefit-cost ratio</b>	<b>3.11</b>	<b>(N/A)</b>				



**Decatur**

**Importance Values for All Most Abundant Trees**

9/25/2012

Species	Number of Trees	% of Total Trees	Leaf Area (ft <sup>2</sup> )	% of Total Leaf Area	Canopy Cover (ft <sup>2</sup> )	% of Total Canopy Cover	Importance Value
Cornus florida	359	13.8	119,165	1.1	109,115	5.0	6.6
Quercus phellos	321	12.3	1,399,218	13.3	267,651	12.2	12.6
Quercus nigra	297	11.4	4,069,330	38.6	658,733	30.0	26.7
Lagerstroemia spp	263	10.1	28,081	0.3	39,402	1.8	4.1
Acer rubrum	199	7.6	563,956	5.4	129,266	5.9	6.3
Prunus serrulata	76	2.9	33,581	0.3	28,455	1.3	1.5
Liquidambar styraciflua	75	2.9	578,423	5.5	105,106	4.8	4.4
Pyrus calleryana	60	2.3	154,145	1.5	65,416	3.0	2.2
Quercus falcata	60	2.3	422,805	4.0	64,244	2.9	3.1
Ulmus americana	58	2.2	104,115	1.0	20,024	0.9	1.4
Ulmus parvifolia	57	2.2	49,003	0.5	28,017	1.3	1.3
Acer saccharum	54	2.1	187,160	1.8	58,910	2.7	2.2
Pinus taeda	48	1.8	277,528	2.6	70,577	3.2	2.6
Carya illinoensis	40	1.5	298,910	2.8	52,420	2.4	2.3
Liriodendron tulipifera	35	1.3	472,575	4.5	69,137	3.1	3.0
Acer buergerianum	34	1.3	7,368	0.1	7,917	0.4	0.6
Cornus kousa	32	1.2	5,239	0.0	6,091	0.3	0.5
Quercus coccinea	29	1.1	144,901	1.4	28,362	1.3	1.3
OTHER TREES	509	19.5	1,617,948	15.4	390,463	17.8	17.5
<b>Total</b>	<b>2,606</b>	<b>100.0</b>	<b>10,533,451</b>	<b>100.0</b>	<b>2,199,305</b>	<b>100.0</b>	<b>100.0</b>



**Decatur**

**Stored CO2 Benefits of All Trees by Species**

9/25/2012

Species	Total Stored CO2 (lbs)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Cornus florida	592,519	4,444	(N/A)	13.8	4.0	12.38
Quercus phellos	1,776,101	13,321	(N/A)	12.3	11.9	41.50
Quercus nigra	5,745,465	43,091	(N/A)	11.4	38.5	145.09
Lagerstroemia spp	41,865	314	(N/A)	10.1	0.3	1.19
Acer rubrum	624,719	4,685	(N/A)	7.6	4.2	23.54
Prunus serrulata	184,528	1,384	(N/A)	2.9	1.2	18.21
Liquidambar styracifl	496,795	3,726	(N/A)	2.9	3.3	49.68
Pyrus calleryana	315,029	2,363	(N/A)	2.3	2.1	39.38
Quercus falcata	592,913	4,447	(N/A)	2.3	4.0	74.11
Ulmus americana	137,679	1,033	(N/A)	2.2	0.9	17.80
Ulmus parvifolia	55,992	420	(N/A)	2.2	0.4	7.37
Acer saccharum	222,385	1,668	(N/A)	2.1	1.5	30.89
Pinus taeda	387,036	2,903	(N/A)	1.8	2.6	60.47
Carya illinoensis	385,754	2,893	(N/A)	1.5	2.6	72.33
Liriodendron tulipifer	663,654	4,977	(N/A)	1.3	4.4	142.21
Acer buergeranum	26,935	202	(N/A)	1.3	0.2	5.94
Cornus kousa	17,738	133	(N/A)	1.2	0.1	4.16
Quercus coccinea	177,857	1,334	(N/A)	1.1	1.2	46.00
OTHER STREET TR	1,129,512	18,676	(N/A)	19.5	16.7	36.69
Citywide total	14,935,107	112,013	(N/A)	100.0	100.0	42.98



Decatur

**Annual CO<sub>2</sub> Benefits of All Trees by Species**

9/25/2012

Species	Sequestered (lb)	Sequestered (\$)	Decomposition Release (lb)	Maintenance Release (lb)	Total Released (\$)	Avoided (lb)	Avoided (\$)	Net Total (lb)	Total Standard (\$)	% of Total Trees	% of Total \$	Avg. \$/tree
Cornus florida	49,113	368	-2,033	-218	-17	10,064	75	56,926	427 (N/A)	13.8	5.2	1.19
Quercus phellos	127,749	958	-6,090	-350	-48	26,478	199	147,788	1,108 (N/A)	12.3	13.5	3.45
Quercus nigra	276,994	2,077	-19,701	-607	-152	62,642	470	319,328	2,395 (N/A)	11.4	29.2	8.06
Lagerstroemia spp	7,957	60	-145	-101	-2	3,530	26	11,241	84 (N/A)	10.1	1.0	0.32
Acer rubrum	59,077	443	-2,188	-167	-18	12,837	96	69,558	522 (N/A)	7.6	6.4	2.62
Prunus serrulata	13,112	98	-633	-55	-5	2,702	20	15,126	113 (N/A)	2.9	1.4	1.49
Liquidambar styraciflua	36,409	273	-1,703	-129	-14	10,446	78	45,022	338 (N/A)	2.9	4.1	4.50
Pyrus calleryana	20,392	153	-1,081	-86	-9	6,200	46	25,425	191 (N/A)	2.3	2.3	3.18
Quercus falcata	25,634	192	-2,033	-71	-16	6,154	46	29,685	223 (N/A)	2.3	2.7	3.71
Ulmus americana	8,822	66	-474	-28	-4	1,930	14	10,250	77 (N/A)	2.2	0.9	1.33
Ulmus parvifolia	13,422	101	-207	-34	-2	2,671	20	15,852	119 (N/A)	2.2	1.5	2.09
Acer saccharum	19,426	146	-767	-58	-6	5,858	44	24,459	183 (N/A)	2.1	2.2	3.40
Pinus taeda	26,123	196	-1,327	-84	-11	6,827	51	31,538	237 (N/A)	1.8	2.9	4.93
Carya illinotensis	24,007	180	-1,323	-61	-10	5,137	39	27,761	208 (N/A)	1.5	2.5	5.21
Liriodendron tulipifera	27,373	205	-2,275	-71	-18	6,619	50	31,646	237 (N/A)	1.3	2.9	6.78
Acer buergerianum	3,463	26	-92	-17	-1	695	5	4,048	30 (N/A)	1.3	0.4	0.89
Cornus kousa	2,464	18	-61	-13	-1	527	4	2,916	22 (N/A)	1.2	0.3	0.68
Quercus coccinea	13,854	104	-610	-36	-5	2,824	21	16,032	120 (N/A)	1.1	1.5	4.15
OTHER STREET TREES	179,214	1,344	-8,566	-498	-68	37,785	283	207,935	1,560 (N/A)	19.5	19.0	3.06
Citywide total	934,607	7,010	-51,311	-2,684	-405	211,923	1,589	1,092,535	8,194 (N/A)	100.0	100.0	3.14



**Decatur**

**Annual Management Costs of All Trees**

9/25/2012

Expenditures	Total (\$)	\$/Tree	\$/Capita
Purchasing Trees and Planting	46,485	17.84	2.38
Contract Pruning	17,980	6.90	0.92
Pest Management	6,000	2.30	0.31
Irrigation	0	0.00	0.00
Removal	0	0.00	0.00
Administration	2,500	0.96	0.13
Inspection/Service	0	0.00	0.00
Infrastructure Repairs	0	0.00	0.00
Litter Clean-up	0	0.00	0.00
Liability/Claim	0	0.00	0.00
Other Cost	0	0.00	0.00
<b>Total Expenditures</b>	<b>72,965</b>	<b>28.00</b>	<b>3.73</b>



**Decatur**

**Annual Energy Benefits of All Trees By Species**

9/25/2012

Species	Total Electricity (MWh)	Electricity (\$)	Total Natural Gas (Therms)	Natural Gas (\$)	Total Standard Error (\$)	% of Total Trees	% of Total \$	Avg. \$/tree
Cornus florida	11.9	904	590.7	618	1,522 (N/A)	13.8	5.4	4.24
Quercus phellos	31.3	2,378	1,139.1	1,191	3,569 (N/A)	12.3	12.8	11.12
Quercus nigra	74.1	5,626	2,091.6	2,188	7,813 (N/A)	11.4	28.0	26.31
Lagerstroemia spp	4.2	317	222.6	233	550 (N/A)	10.1	2.0	2.09
Acer rubrum	15.2	1,153	574.8	601	1,754 (N/A)	7.6	6.3	8.81
Prunus serrulata	3.2	243	149.9	157	399 (N/A)	2.9	1.4	5.26
Liquidambar styraciflua	12.4	938	413.9	433	1,371 (N/A)	2.9	4.9	18.28
Pyrus calleryana	7.3	557	263.9	276	833 (N/A)	2.3	3.0	13.88
Quercus falcata	7.3	553	225.1	235	788 (N/A)	2.3	2.8	13.14
Ulmus americana	2.3	173	83.4	87	260 (N/A)	2.2	0.9	4.49
Ulmus parvifolia	3.2	240	136.3	143	382 (N/A)	2.2	1.4	6.71
Acer saccharum	6.9	526	256.5	268	794 (N/A)	2.1	2.8	14.71
Pinus taeda	8.1	613	202.2	212	825 (N/A)	1.8	3.0	17.18
Carya illinoensis	6.1	461	210.1	220	681 (N/A)	1.5	2.4	17.03
Liriodendron tulipifera	7.8	594	236.1	247	841 (N/A)	1.3	3.0	24.04
Acer buergeranum	0.8	62	44.9	47	109 (N/A)	1.3	0.4	3.22
Cornus kousa	0.6	47	35.1	37	84 (N/A)	1.2	0.3	2.62
Quercus coccinea	3.3	254	123.2	129	382 (N/A)	1.1	1.4	13.19
OTHER STREET TREES	44.7	3,393	1,526.2	1,596	4,990 (N/A)	19.5	17.9	9.80
Citywide total	250.7	19,032	8,325.5	8,918	27,949 (N/A)	100.0	100.0	10.73



**Decatur**

**Total Annual Benefits of All Trees by Species (\$)**

9/25/2012

Species	Energy	CO <sub>2</sub>	Air Quality	Stormwater	Aesthetic/Other	Total Standard (\$)	Error	% of Total
Cornus florida	1,522	427	610	2,108	2,610	7,276	(±0)	3.2
Quercus phellos	3,569	1,108	-2,001	11,512	18,412	32,601	(±0)	14.4
Quercus nigra	7,813	2,395	-4,721	31,735	27,927	65,149	(±0)	28.7
Lagerstroemia spp	550	84	201	659	1,122	2,616	(±0)	1.2
Acer rubrum	1,754	522	481	4,881	10,117	17,754	(±0)	7.8
Prunus serrulata	399	113	161	565	640	1,879	(±0)	0.8
Liquidambar styraciflua	1,371	338	-1,499	4,796	6,880	11,886	(±0)	5.2
Pyrus calleryana	833	191	383	1,811	2,218	5,435	(±0)	2.4
Quercus falcata	788	223	-705	3,200	3,177	6,682	(±0)	2.9
Ulmus americana	260	77	-150	852	1,308	2,347	(±0)	1.0
Ulmus parvifolia	382	119	145	655	1,562	2,863	(±0)	1.3
Acer saccharum	794	183	219	1,825	3,029	6,051	(±0)	2.7
Pinus taeda	825	237	-1,057	3,525	3,603	7,132	(±0)	3.1
Carya illinoensis	681	208	-456	2,393	3,145	5,971	(±0)	2.6
Liriodendron tulipifera	841	237	-802	3,541	3,204	7,022	(±0)	3.1
Acer buergeranum	109	30	43	145	210	538	(±0)	0.2
Cornus kousa	84	22	33	109	169	417	(±0)	0.2
Quercus coccinea	382	120	-203	1,208	1,948	3,456	(±0)	1.5
OTHER STREET TREE	4,990	1,560	-73	14,835	18,589	39,901	(±0)	17.6
Citywide Total	27,949	8,194	-9,390	90,355	109,869	226,977	(±0)	100.0



**Decatur**

**Annual Benefits of All Trees by Species (\$/tree)**

9/25/2012

Species	Energy	CO <sub>2</sub>	Air Quality	Stormwater	Aesthetic/Other	Total (\$)	Standard Error
Cornus florida	4.24	1.19	1.70	5.87	7.27	20.27	(N/A)
Quercus phellos	11.12	3.45	-6.24	35.86	57.36	101.56	(N/A)
Quercus nigra	26.31	8.06	-15.90	106.85	94.03	219.36	(N/A)
Lagerstroemia spp	2.09	0.32	0.76	2.50	4.27	9.95	(N/A)
Acer rubrum	8.81	2.62	2.42	24.53	50.84	89.22	(N/A)
Prunus serrulata	5.26	1.49	2.12	7.44	8.42	24.73	(N/A)
Liquidambar styracifl	18.28	4.50	-19.99	63.94	91.74	158.47	(N/A)
Pyrus calleryana	13.88	3.18	6.39	30.19	36.96	90.59	(N/A)
Quercus falcata	13.14	3.71	-11.74	53.33	52.94	111.37	(N/A)
Ulmus americana	4.49	1.33	-2.59	14.69	22.55	40.47	(N/A)
Ulmus parvifolia	6.71	2.09	2.54	11.49	27.40	50.23	(N/A)
Acer saccharum	14.71	3.40	4.06	33.80	56.09	112.06	(N/A)
Pinus taeda	17.18	4.93	-22.02	73.44	75.06	148.58	(N/A)
Carya illinoensis	17.03	5.21	-11.39	59.82	78.62	149.28	(N/A)
Liriodendron tulipifera	24.04	6.78	-22.92	101.18	91.54	200.63	(N/A)
Acer buergeranum	3.22	0.89	1.28	4.26	6.18	15.83	(N/A)
Cornus kousa	2.62	0.68	1.04	3.40	5.29	13.04	(N/A)
Quercus coccinea	13.19	4.15	-7.00	41.65	67.18	119.17	(N/A)
OTHER STREET TRI	9.80	3.06	-0.14	29.15	36.52	78.39	(N/A)



Decatur

**Annual Air Quality Benefits of All Trees by Species**

9/25/2012

Species	Deposition (lb)				Avoided (lb)				Total Depos. (\$)	NO <sub>2</sub>	PM <sub>10</sub>	VOC	SO <sub>2</sub>	Total Avoided Emissions (\$)	BVOC Emissions (lb)	BVOC Emissions (\$)	Total (lb)	Total Standard Error (\$)	% of Total Trees	Avg. \$/tree
	O <sub>3</sub>	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	O <sub>3</sub>	NO <sub>2</sub>	PM <sub>10</sub>	VOC												
Cornus florida	26.1	8.5	22.2	4.1	290	26.0	5.0	4.9	54.4	320	0.0	0.0	0	151.2	610 (N/A)	13.8	1.70			
Quercus phellos	48.7	22.9	56.0	11.2	630	65.1	12.8	12.6	143.2	819	-551.3	-3,451	-178.8	-2,001 (N/A)	12.3	-6.24				
Quercus nigra	119.8	56.4	137.8	27.7	1,552	147.7	29.8	29.3	335.7	1,887	-1,303.4	-8,159	-419.3	-4,721 (N/A)	11.4	-15.90				
Lagerstroemia spp	7.6	2.7	7.1	1.2	87	9.2	1.8	1.7	19.1	113	0.0	0	50.3	201 (N/A)	10.1	0.76				
Acer rubrum	24.9	8.9	23.1	4.0	287	31.7	6.2	6.1	69.5	399	-32.7	-205	141.8	481 (N/A)	7.6	2.42				
Prunus serotina	6.8	2.2	5.8	1.1	76	6.9	1.3	1.3	14.6	86	0.0	0	40.0	161 (N/A)	2.9	2.12				
Liquidambar styraciflua	20.3	7.2	18.8	3.2	233	25.4	5.0	5.0	56.4	321	-328.0	-2,053	-186.7	-1,499 (N/A)	2.9	-19.99				
Pinus calleryana	15.6	6.6	16.0	3.4	192	15.2	3.0	2.9	33.5	191	0.0	0	96.2	383 (N/A)	2.3	6.39				
Quercus falcata	11.7	5.5	13.4	2.7	151	14.7	2.9	2.9	33.1	187	-166.6	-1,043	-79.7	-705 (N/A)	2.3	-11.74				
Ulmus americana	3.6	1.7	4.2	0.8	47	4.7	0.9	0.9	10.4	60	-41.0	-257	-13.6	-150 (N/A)	2.2	-2.59				
Ulmus parvifolia	5.4	1.9	5.0	0.9	62	6.7	1.3	1.3	14.4	84	-0.2	-1	36.7	145 (N/A)	2.2	2.54				
Acer saccharum	8.9	3.8	9.2	1.8	110	14.5	2.8	2.8	31.7	182	-11.6	-72	64.0	219 (N/A)	2.1	4.06				
Pinus taeda	34.9	11.8	25.4	7.0	383	15.9	3.2	3.2	36.8	204	-262.8	-1,645	-124.5	-1,057 (N/A)	1.8	-22.02				
Carya illinoensis	9.5	4.5	11.0	2.2	123	12.5	2.5	2.4	27.7	158	-117.8	-737	-45.4	-456 (N/A)	1.5	-11.39				
Liriodendron tulipifera	12.6	5.9	14.5	2.9	163	15.8	3.2	3.1	35.5	201	-186.2	-1,166	-92.8	-802 (N/A)	1.3	-22.92				
Acer buergerianum	1.9	0.6	1.6	0.3	21	1.8	0.3	0.3	3.8	22	0.0	0	10.7	43 (N/A)	1.3	1.28				
Cornus kousa	1.5	0.5	1.2	0.2	16	1.4	0.3	0.3	2.8	17	0.0	0	8.2	33 (N/A)	1.2	1.04				
Quercus coccinea	5.2	2.4	5.9	1.2	67	7.0	1.4	1.3	15.3	88	-57.1	-357	-17.4	-203 (N/A)	1.1	-7.00				
OTHER STREET TREES	94.2	36.4	87.3	18.6	1,109	91.7	18.2	17.9	203.9	1,160	-374.1	-2,342	194.1	-73 (N/A)	19.5	-0.14				
Citywide total	459.2	190.5	465.4	94.5	5,601	513.8	102.1	100.4	1,141.9	6,498	-3,432.7	-21,489	-364.8	-9,390 (N/A)	100.0	-3.60				

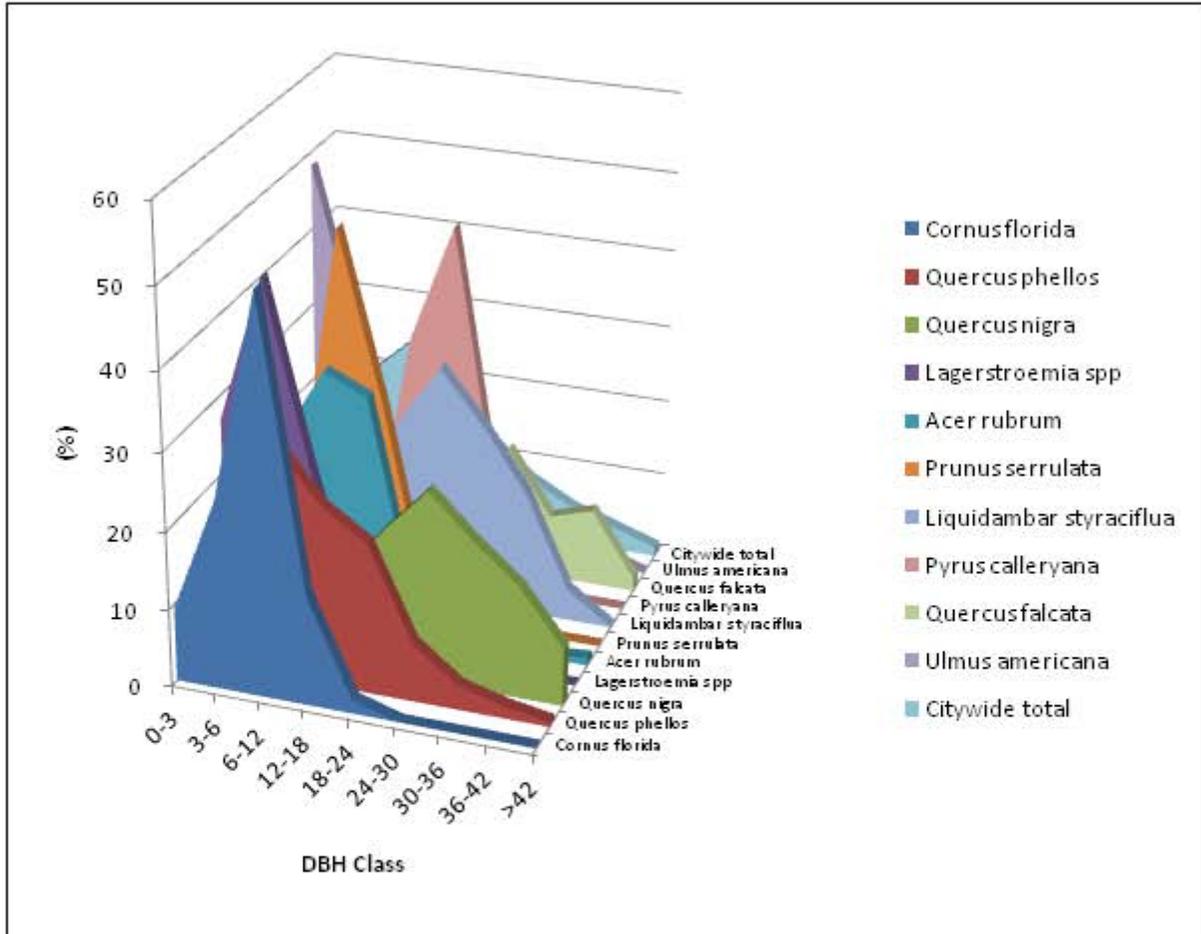
City of Decatur  
Community Forest Management Plan



Decatur

**Relative Age Distribution of Top 10 All Tree Species (%)**

9/25/2012



Species	DBH class (in)									
	0-3	3-6	6-12	12-18	18-24	24-30	30-36	36-42	>42	
Cornus florida	9.47	24.23	50.70	13.93	1.67	0.00	0.00	0.00	0.00	
Quercus phellos	1.56	13.71	29.60	23.05	19.31	7.48	3.12	1.56	0.62	
Quercus nigra	0.67	1.01	2.36	11.78	18.52	24.58	19.19	14.48	7.41	
Lagerstroemia spp	27.00	45.63	23.19	3.42	0.76	0.00	0.00	0.00	0.00	
Acer rubrum	3.52	23.12	32.66	30.15	5.03	3.02	1.01	0.50	1.01	
Prunus serrulata	7.89	13.16	48.68	27.63	2.63	0.00	0.00	0.00	0.00	
Liquidambar styraciflua	1.33	0.00	1.33	22.67	30.67	24.00	16.00	4.00	0.00	
Pyrus calleryana	1.67	1.67	1.67	31.67	46.67	13.33	3.33	0.00	0.00	
Quercus falcata	13.33	36.67	1.67	6.67	5.00	16.67	8.33	10.00	1.67	
Ulmus americana	48.28	27.59	8.62	3.45	1.72	8.62	0.00	1.72	0.00	
Citywide total	8.83	19.30	24.29	18.07	12.47	7.87	4.87	3.11	1.19	



**Decatur**

**Annual Aesthetic/Other Benefits of All Trees by Species**

9/25/2012

Species	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Cornus florida	2,610	(N/A)	13.8	2.4	7.27
Quercus phellos	18,412	(N/A)	12.3	16.8	57.36
Quercus nigra	27,927	(N/A)	11.4	25.4	94.03
Lagerstroemia spp	1,122	(N/A)	10.1	1.0	4.27
Acer rubrum	10,117	(N/A)	7.6	9.2	50.84
Prunus serrulata	640	(N/A)	2.9	0.6	8.42
Liquidambar styraciflua	6,880	(N/A)	2.9	6.3	91.74
Pyrus calleryana	2,218	(N/A)	2.3	2.0	36.96
Quercus falcata	3,177	(N/A)	2.3	2.9	52.94
Ulmus americana	1,308	(N/A)	2.2	1.2	22.55
Ulmus parvifolia	1,562	(N/A)	2.2	1.4	27.40
Acer saccharum	3,029	(N/A)	2.1	2.8	56.09
Pinus taeda	3,603	(N/A)	1.8	3.3	75.06
Carya illinoensis	3,145	(N/A)	1.5	2.9	78.62
Liriodendron tulipifera	3,204	(N/A)	1.3	2.9	91.54
Acer buergeranum	210	(N/A)	1.3	0.2	6.18
Cornus kousa	169	(N/A)	1.2	0.2	5.29
Quercus coccinea	1,948	(N/A)	1.1	1.8	67.18
OTHER STREET TREES	18,589	(N/A)	19.5	16.9	36.52
Citywide total	109,869	(N/A)	100.0	100.0	42.16



**Decatur**

**Annual Stormwater Benefits of All Trees by Species**

9/25/2012

Species	Total rainfall interception (Gal)	Total (\$)	Standard Error	% of Total Trees	% of Total \$	Avg. \$/tree
Cornus florida	212,871	2,108	(N/A)	13.8	2.3	5.87
Quercus phellos	1,162,785	11,512	(N/A)	12.3	12.7	35.86
Quercus nigra	3,205,297	31,735	(N/A)	11.4	35.1	106.85
Lagerstroemia spp	66,511	659	(N/A)	10.1	0.7	2.50
Acer rubrum	493,025	4,881	(N/A)	7.6	5.4	24.53
Prunus serrulata	57,097	565	(N/A)	2.9	0.6	7.44
Liquidambar styraciflua	484,386	4,796	(N/A)	2.9	5.3	63.94
Pyrus calleryana	182,939	1,811	(N/A)	2.3	2.0	30.19
Quercus falcata	323,177	3,200	(N/A)	2.3	3.5	53.33
Ulmus americana	86,055	852	(N/A)	2.2	0.9	14.69
Ulmus parvifolia	66,167	655	(N/A)	2.2	0.7	11.49
Acer saccharum	184,363	1,825	(N/A)	2.1	2.0	33.80
Pinus taeda	356,028	3,525	(N/A)	1.8	3.9	73.44
Carya illinoensis	241,686	2,393	(N/A)	1.5	2.7	59.82
Liriodendron tulipifera	357,699	3,541	(N/A)	1.3	3.9	101.18
Acer buergeranum	14,638	145	(N/A)	1.3	0.2	4.26
Cornus kousa	10,987	109	(N/A)	1.2	0.1	3.40
Quercus coccinea	122,001	1,208	(N/A)	1.1	1.3	41.65
OTHER STREET TREES	1,498,397	14,835	(N/A)	19.5	16.4	29.15
Citywide total	9,126,108	90,355	(N/A)	100.0	100.0	34.67