



SAVANNAH TREE
FOUNDATION

STATE
of the
TREES

REPORT
IV

The purpose of this report is to promote a community forest vision for the twenty-first century.

March 2003

STF is responsible for the stewardship of the Candler Oak, located at Whitaker and Gaston Streets.



OUR MISSION

To promote, through direct action and education, an awareness of trees, particularly the live oak, as vital natural resources and an important part of our heritage.

The Foundation preserves, nurtures and plants trees to enhance the quality of life for present and future generations.



The work of the Savannah Tree Foundation is carried out by a volunteer board of directors and an administrative assistant. Programs are made possible by voluntary contributions from the community.

THE STATE OF THE TREES REPORT

This State of the Trees Report is the fourth in a series that began in 1992. The purpose of the first three reports was to assess current stewardship of Savannah's and Chatham County's urban forest, to make specific recommendations for practices and policies to ensure that trees are part of the urban infrastructure, and to commend accomplishments since the prior report. The first three reports contained recommendations based on needs revealed by research. The purpose of this report is to promote a community forest vision for the 21st century.

State of the Trees IV (March 2003) considers findings from a second satellite study performed in 2001 and 2002 that assess changes in Chatham's canopy coverage and determines the impact tree ordinances might have had. While a great many factors affect our canopy, the second study did indicate a drop in the rate of canopy loss, particularly in the final five years, after stronger City and County Land Use and Tree Protection Ordinances were put into effect in 1995.

This result offers hope that our combined efforts have had a positive impact. Slowing the rate of loss does not change the fact that the second study showed a loss of over 800 acres of canopy a year from 1997-2001.

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The Savannah Tree Foundation (STF)

The Savannah Tree Foundation was established in 1982 and for those 20 years has fulfilled its mission in three major work areas:

EDUCATION

The education program includes workshops on tree maintenance, lectures by experts in urban forestry management and the role of trees in stormwater abatement and road design, introduction of Project Learning Tree programs to schools, informational brochures, addresses to community groups, and sponsorship of satellite studies to identify the rate and location of land cover changes in Chatham County. Additionally, STF facilitated a study that resulted in the addition of an urban forestry component to the Chatham Emergency Management Authority.

ADVOCACY

STF leadership impacts community efforts by advocating for responsible land use planning that incorporates canopy trees as part of the infrastructure. The Foundation is a leader in the creation of and the revision to the community's land clearing and tree protection ordinances and is a major advocate of master plans for parks with emphasis on Daffin and Bacon Parks. STF encourages road improvement activities to include a design and planning process to achieve a canopied result based on preliminary tree surveys to maximize tree preservation and planting opportunities.

TREE PLANTINGS

In the past 14 years STF has added 1,028 hardwoods and 1,791 pines to our public tree inventory through its volunteer tree planting program. For each of the twenty tree planting events there has been a volunteer expert in urban forestry to demonstrate correct planting and mulching techniques and explain the benefits of trees. The success of this program is built upon a partnership of local government, corporate supporters and a broad base of volunteers.

SATELLITE STUDY 1:1973-1992

The first satellite study was conducted by Dr. Charles Watson, Jr. for the Savannah Tree Foundation to determine changes in the tree cover of Chatham County between 1973-1992. This study did not quantify the absolute numbers of trees lost during that period, but rather highlighted the net change to the land covered by the tree canopy. Fifty-one thousand acres or 27% of Chatham County's area lost canopy cover during that period.

- 60% of that loss was in unincorporated areas;
- 20% of that loss was in Savannah with nearly a quarter of that in the historic district;
- Losses significantly outweighed replanting in both the historic district and midtown;
- 60% of the loss in the county and 42% of the loss in the city occurred in residential or mixed use areas;
- Southside Savannah was sited as being significantly impacted with 76% of its loss deemed "catastrophic."

This study gave scientific evidence of the need for a revision to the Land Clearing and Tree Protection Ordinances.

SATELLITE STUDY 2:1993-2001

This study, conducted by Dr. Elizabeth Kramer of the University of Georgia, for the Savannah Tree Foundation showed that the earlier ordinances slowed the rate of canopy loss and that the 1995 ordinances have had additional impact:

- From 1993-1997 the county had a net decrease in canopy cover of 5,308 acres, or about 1,060 acres a year. The net decrease from 1997-2001 was 4,102 acres; about 820 acres per year.
- The 1997 to 2001 figures cover the period after several tree ordinances were enacted. The figures show about a 15% improvement over the preceding five years, and a nearly 37% improvement over 1984-1992.

The examination of the data by land use indicated that:

- The largest decreases in forest vegetation were to "forestry activities," with expected high rates of forest loss occurring in evergreen forests and forested wetland areas. Drought conditions in the 1990s may have exacerbated the loss of bottomland forest areas by allowing access to previously swampy areas.
- Areas of high intensity urban activities showed considerable canopy loss during the early part of the decade, as did areas impacted by transportation activities. Both of these land uses showed significant drops in their net canopy loss in the second half of the decade.

Savannah and Chatham County Land Use and Tree Protection Ordinances

Since the eighties Savannah and Chatham County have had tree ordinances. The present ordinances, in effect since June, 1995, state a community canopy objective of 50% in developed areas. The strengthened ordinances, guided by Satellite Study I and unanimously adopted by the City and County, include these key revisions:

- Bringing single-family subdivisions—previously exempted from the ordinances—under ordinance purview, with street trees required in tree easements;
- Increasing green space requirements from 10% to 20% in industrial, multifamily and commercial development;
- Doubling the required tree quality points per acre in all developments;
- Providing incentives for preservation of trees in undisturbed areas;
- Acknowledging the correlation between the size of the mature tree canopy and the root system and ground space necessary to support it;
- Requiring that tree points be spread over an entire development, allowing parking areas to be broken up;
- Providing flexibility for the land developer, including a full range of tree planting and tree preservation options;
- Stating a community canopy objective of 50% for both ordinances.

Vision: *Uniform compliance, development and enforcement of ordinances that require a 50% tree canopy in developed areas*

Actions for achieving the vision:

- Give stop work authority to field inspectors to halt work in violation of tree ordinances;
- Reinstate the Chatham County Tree Commission which serves to advance tree awareness and protection and to review appeals concerning tree ordinance requirements;
- Encourage adoption and enforcement of effective tree ordinances in all municipalities;
- Hold annual workshops for land clearing and tree protection permit applicants to insure compliance.



Extensive tree removal for canal widening project (top) leads to runoff, erosion and water pollution. Tree plantings (middle and bottom) can make a significant long term impact on stormwater. The trees planted over ten years ago in the White Bluff median (bottom) assist stormwater abatement through interception, absorption and filtration.

Trees Lost, High Stormwater Cost

Trees are critical to stormwater management. "In one respect **a tree acts like a huge straw**: It draws water through its roots and facilitates evaporation through its leaves. The physical barrier it provides regulates the flow of runoff, reducing water's speed and spreading out its flow."

Attorney John Hopkins

The presence of a tree canopy means less runoff and erosion resulting in improved water quality.

"This allows more recharging of the ground water supply. Wooded areas help prevent the transport of sediment and chemicals into streams." *USDA Forest Service*

Urban stormwater runoff is the largest source of pollution in U.S. coastal waters and the second largest source of water pollution in U.S. estuaries, according to EPA data. Growth in urban areas has outpaced conventional engineering capacity to move water efficiently and affordably. A game of "catch-up" ensues, a game noted professionals now say can be won only by **utilizing a combination of natural and engineered systems**. Canals and pipes are added or widened. In the process, more vegetation is removed and more impervious surfaces are laid. In order to improve the current flooding situation and reduce non-point source pollution in our waterways we need to mimic nature by combining natural and conventional systems.

Vision: *To use more natural means to assist engineered systems in stormwater abatement*

Actions for achieving the vision:

- Increase absorption and filtration through the use of pervious materials and the planting of trees;
- Preserve and plant trees to provide canopy intercept over streets and parking lots;
- Promote planting of natural vegetation along the drainage canals to filter non-point source pollution;
- Redesign curbing and contouring of pervious surfaces to divert water first to green areas allowing filtering and slowing the speed of stormwater prior to reaching storm drains;
- Reduce lawns in favor of a landscape which includes trees and plants with large root systems capable of greater water absorption.

Roadways of the Future

Trees must be regarded as an important part of the infrastructure as utilities. Pre-design efforts are essential to develop roadways that will include trees. Tree shade reduces glare on streets and street temperature and adds aesthetic value to our city.

Roadways devoid of trees take us away from the model that has served our community so well for so long. Many of our older thoroughfares—Liberty, Oglethorpe, 37th Street and Victory Drive—were built with a treed central median. White Bluff Road and Johnny Mercer Boulevard were converted from two to four lanes with strikingly positive results using the median canopy model.

Given the stress trees are placed under while construction is under way, the dedicated central median is the closest thing to a guarantee that major roadways will eventually offer shade, assist in stormwater abatement and beautify our roadways.

The redesign of two-lane roads not slated to become four lanes (soon to occur on Skidaway Road) should provide for protection of existing canopy and plan for new tree planting sites.

The first SPLOST-funded roadways included landscaping/tree planting as part of the overall budget. **Future road improvements should include a line-item in the budget for preliminary tree surveys to maximize tree preservation, protection during construction and for planting trees in newly designated sites.**

In a speech sponsored by the Savannah Tree Foundation on February 18, 2003 Dr. Reid Ewing of Rutgers University stated that many studies of urban areas show that communities “cannot pave their way out of congestion.” He stated that studies show increased congestion as new thoroughfares are built because commuters use these alternate routes in increasing numbers. Many models of construction *and* reconstruction of roadways showed the positive effects of using trees as part of the infrastructure to maintain more ecologically sound communities.



Above: Tree-lined Washington Ave. Below: Removal of mature trees on Stephenson Ave.

Vision: *To consider trees as part of the infrastructure when roadways are planned and built*

Actions for achieving the vision:

- Allocate funds for tree protection and planting as line items in the budget process in developing new roads;
- Use road design standards to prioritize tree retention and/or replacement to achieve canopied roadways;
- Provide designated spaces for the planting of street trees (emphasizing canopy trees), preferably using medians;
- Ensure communication and collaboration on tree preservation and planting opportunities among all agencies and departments of city and county government for capital improvement projects.

THE CANOPY GAP

A Canopy Begins

The corner of Estill Avenue (now Victory Drive) and Atlantic Avenue, from a post card printed about the time Ardsley Park first began to be developed. The spindly trees in the foreground with the lollipop pruning (a practice currently not favored) are among the stately oaks that now line our city's famous central east-west corridor.



In Its Maturity/Twilight

Some 75 years after Ardsley Park was platted, an entire urban forest has grown. An ironic downside of the success of the forest planted earlier in the century is that a significant percentage is reaching the end of its serviceable life. To avoid gaps we need to plant trees on a consistent basis to assure a mature and even urban forest.



Canopy gap: *a consistent shortfall in the replacement of canopy cover lost as a part of the natural progression of a forest.* A viable urban forest requires management policies to lessen the impact of a canopy gap.

The City of Savannah has empowered the Park and Tree Department with qualified leadership and a certified work force to plant more trees than it removes on an annual basis. The department is completing and will maintain a city-wide inventory that will track tree loss and guide management practices. Unfortunately lack of communication with the Park and Tree Department concerning tree preservation has led to unnecessary waste of valuable trees on canal, street and sewer projects.

Chatham County and some of the municipal governments do not have adequate reforestation or tree maintenance programs. The management of urban forests should be a line item in their budgets.

Despite management efforts and the success of ordinances to stem or reverse the decrease in our urban canopy, the trends below require an ongoing commitment to achieve a vision of a **forest city**:

- An explosion of large capital improvement projects throughout the city and county;
- A canopy stressed by several consecutive years of drought;
- The influx of population to our area;
- Savannah's aging canopy.

Vision: *For all government agencies and private citizens to increase tree canopy to the goal of 50% in developed areas*

Actions for achieving the vision:

- Plant and properly maintain trees on public property;
- Provide adequate budget for stewardship of all public trees;
- Ensure communication and collaboration on tree preservation and planting opportunities among all agencies and departments of city and county government on capital improvement projects;
- Maintain community parks using master plans that provide for canopy installation that defines areas of use;
- Insure that commercial and industrial developers meet goals of canopy cover and stormwater retention within their developments or allow for mediation;
- Maintain current street tree inventories to assist planning and planting of canopy trees in all vacant public spaces that can accommodate them and to anticipate vacancies that might be caused by losses to age and natural events;
- Require city, county, state and federal agencies and departments to comply with the same tree ordinance requirements they require of private development, thereby leading by example in all capital improvement projects;
- Provide educational opportunities for urban forestry practitioners and professionals, as well as the general public, on tree care, reasons to plant trees, how to plant, etc. (Extensive delivery systems are in place—certified arborist workshops and training, Cooperative Extension Service, websites, newsletters, membership organizations such as the Georgia Urban Forestry Council, University of Georgia, etc.).

Tangible Value of Urban Canopy Trees

- by Dr. Kim Coder

Trees help moderate temperature and energy use

Trees mitigate urban heat islands (urban areas are 3 to 10 degrees warmer than surrounding areas) by providing shade and active evaporation:

- Temperature can be 20°F lower on a site with trees; 35°F lower hard surface temperature under tree shade than in full summer sun.
- There can be a 27% decrease in summer cooling costs with trees and 75% cooling savings under deciduous trees.
- 65% of heat generated in full sunlight on a tree is dissipated by active evaporation from leaf surfaces.
- A one-fifth acre house lot with 30% vegetation cover can dissipate as much heat as running two central air conditioners.

Oxygen Production

An acre of trees generates enough oxygen each day for 18 people.

Air Quality

Community forests cleanse the air by intercepting and slowing particulate materials causing them to fall out, by absorbing pollutant gases on surfaces, and through uptake onto inner leaf surfaces.

- Removal of particulates amounts to 9% across deciduous trees and 13% across evergreen trees.
- There can be a 60% reduction in street level particulates with trees.

Carbon Dioxide Reduction

- Approximately 800 million tons of carbon are currently stored in US community forests with an annual increase of 6.5 million tons per year.

Glare Reduction

Trees block and reflect sunlight and artificial lights to minimize eye strain.

Stormwater/Runoff

Community trees intercept, slow, evaporate, and store water through

normal tree functions, soil surface protection, and soil area of biologically active surfaces.

- For every 5% of tree cover area added to a community, runoff is reduced by approximately 2%.
- Volume is reduced by 7% by community tree canopies in a six-hour storm flow.

Water Quality/Supply/Erosion

Community trees and forests act as filters, removing nutrients and sediments while increasing ground water recharge.

- 10,886 tons of soil can be saved annually with tree cover in a medium-sized city.
- 47% of surface pollutants (pesticides, fertilizers, and biologically derived materials and litter) are removed in first 15 minutes of a storm.

Noise Abatement

Trees block sounds and provide "white noise" that screens undesirable sounds.

Animal Habitat

Trees are living systems that interact with other living things in sharing and recycling resources — as such, trees are living centers where living things congregate and are concentrated.

Source:

Identified Benefits of Community Trees and Forests

Dr. Kim D. Coder
Warnell School of Forest Resources
The University of Georgia

Dr. Coder cites: Literature Review for the QUANTITREE computer program — "Quantifiable Urban Forest Benefits and Costs; Current Findings and Future Research." In a white paper entitled *Consolidating and Communicating Urban Forest Benefits*. Davey Resource Group, Kent, OH. 1993. pp.25.

FOREST CITY

Most of the tools necessary to achieve the vision of a **forest city** are in place. Urban forestry knowledge is far greater now than it was twenty years ago when the Tree Foundation came into being. Much of this knowledge has been substantiated through the use of technological tools such as those used to produce the two satellite studies. Numerous examples of canopy preservation or establishment in the community should be noted:

- our traditional roadways using a dedicated median to allow canopy tree preservation;
- widening of roads using a dedicated median as on White Bluff Road;
- master-planned parks like Daffin Park;
- preserve forested areas like Bacon Park Forest;
- small lot subdivisions with dedicated greenspace, as in our historic districts;
- new developments which include tree preservation and dedicated green space, such as the Landings.

Historically, Savannah has been known as The Forest City. Education of the public is an important component of maintaining that title. It is particularly important for private citizens to plant canopy trees in every available place that can appropriately accommodate them and allow for their mature growth. The citizens of Chatham County should urge their elected representatives to make the preservation, protection and planting of canopy trees a priority during their tenure. Tree canopy preservation and replacement requires a great deal of cooperation and planning.



STATE of the TREES REPORT IV

SAVANNAH & CHATHAM COUNTY, GEORGIA

March 2003

Published by the
**SAVANNAH TREE
FOUNDATION**

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For Questions About...

Call...

Number

Public Trees within Savannah City Limits	Park & Tree Department	651-6610
Public Trees in Chatham County	County Arborist	652-7800
City Land Clearing & Tree Protection Ordinance	Landscape Coordinator	351-3470
County Land Clearing & Tree Protection Ordinance	County Arborist	652-7800
Trees on Private Property	Georgia Forestry Commission	748-4924
Tree Trimming Near Utilities & Lines	Savannah Electric	944-3546
Location of Underground Utilities & Lines	Utility Locator Line	1-800-282-7411

Many thanks to Frank McIntosh for his photography