

.....

# M a k i n g O u r Urban Forests S a f e r



**S**torms are a way of life in Alabama. Somewhere each year, a natural disaster will occur and change forever the face of a city, town, community, or neighborhood.

No person or place is immune.

Urban forests are also a way of life in Alabama. Our cities and towns have more urban trees than any other state except Georgia. Yet when storms and urban trees collide, the results can be severe. Storm-damaged trees may topple over or break apart. Some can be damaged

beyond repair and fail long after the storm occurred. The results can be clogged streets and accesses, disrupted utility service, loss of city services, increased debris removal, damaged property, increased recovery costs, and a threat to public safety. No matter what our opinions are about urban trees, we learn that nature's forces can turn a tree into a problem for both people and the places they live.

Storm-damaged trees and their consequences can never be prevented, but there is much that can be done to mitigate the problem. This publication is written for those involved with or interested in their community's emergency management efforts. It shows how to strengthen a community's emergency management program through mitigation, particularly as it relates to urban trees.

**The goals of this handbook are:**

- raise your awareness of the benefits of our urban forest
- describe how an urban forestry program can mitigate disaster damage in your community
- better equip you to lead your community in hazard mitigation



A foot of rain on parts of Alabama softened soil and made trees more vulnerable to the winds of Hurricane Opal.

**March 1993.** The National Weather Service anxiously tracked two massive weather systems across the United States. The systems collided over the Atlantic states, plunging Alabama into what became known as “The Storm of the Century.”

Tornadoes ripped through Alabama communities, stripping roofs, flipping house trailers, and breaking and uprooting trees. Roads were made impassable by downed trees and live power lines. It took eight days to fully restore service to over 400,000 Alabamians.

In north Alabama, record snowfalls occurred in areas that were ill equipped to handle it. Trees and branches, snapped by ice and snow, clogged roads and downed power lines, bringing society to a standstill.

The aftermath of the Storm of the Century was millions of tons of tree debris scattered across the state for communities to clean up.

Two years later, Hurricane Opal slammed across Alabama with a tidal wave of 100-mph winds. The “Category 3” storm weakened the soil by dumping up to 12 inches of rain on parts of the state, making the trees more vulnerable to the wind. Again, downed trees and tree debris figured significantly in the \$2 billion worth of property loss and cleanup.

## Definition of Terms

**Community emergency preparedness team**—representatives from municipal and county government and the private sector responsible for public safety during disasters.

**Hazard**—a possible source of danger that threatens life and property.

**Hazard mitigation**—any sustained action taken to eliminate future loss and damage to human life and property by natural hazards (Local Hazard Mitigation Planning Manual, AEMA, p.2).

**Hazard mitigation team**—a group of civic and county leaders organized and responsible for planning and executing a program to reduce the hazards and effects of a disaster. Representatives may include police, fire and public works departments; forestry departments; private arboricultural firms; media contacts; climatological centers; utility companies; nurseries; and the emergency management office.

**Hazard tree**—the combination of a failure of a tree (or tree part) with the presence of an adjacent target.

**Hazard tree mitigation**—activities, such as regular inspection, assessment, maintenance, and removal, that reduce the risk of trees to personal safety and property.

**Mitigation**—actions and efforts that cause certain conditions or results to be less severe or harsh.

**Urban forest**—trees growing within urbanized or developed areas.

These include street trees, open green spaces, undeveloped forested areas, trees in municipal parks and playgrounds, trees and vegetation on private property, and trees around public buildings.

**Urban forester**—also called city forester, a professional trained in tree selection, planting, care, and maintenance. In some communities, a city horticulturist may perform these functions.

**Urban forest management**—an administered program that increases the quality, quantity, and benefits of urban trees through planning, planting, removal, utilization, and education.

.....  
*“Hazard mitigation should be viewed as the foundation of emergency management.”*

Local Hazard Mitigation Planning Manual, AEMA, p. 2

.....  
*“When a storm strikes, I no longer work for the city of Mobile—I work for Emergency Management.”*

Ron Jackson  
 Mobile City Forester

**Trees and Emergency Management Preparedness Planning**

Communities can improve their emergency management capability through planning. Good planning includes an urban tree-related component.

**Sixty percent** of Alabama residents live in urban areas. Urban forests provide many benefits to a community’s quality of life. But when storms or other natural events occur, urban trees can turn dangerous and even deadly. Each community must take this into account and look for ways to better care for their urban forest as they formulate their emergency management plans.

The best emergency plan is a mitigation plan—one that reduces the need for post-disaster response, advises the Alabama Emergency Management Agency.

Hazard mitigation is defined by the AEMA as any sustained action taken “to eliminate future loss and damage to human life and property by natural hazards” (Local Hazard Mitigation Planning Manual, AEMA, p. 2). Trees are cited as one of the Risk Specific Recommendations in the AEMA Local Hazard Mitigation Planning Manual (p. 55).



The urban canopy in Alabama is one of our biggest assets and one of our biggest liabilities in the aftermath of storms. “If municipalities invest more in urban forest mitigation, cities will be safer.” Chuck Weber, City Forester, Huntsville

Hazard mitigation helps communities manage trees before the storm to reduce the likelihood of injury and damage.

It reduces cost and time in restoring the beauty and function of neighborhoods and business districts after a storm strikes.

.....  
*“Hazard mitigation is planning for the unplanned. But knowing that storms will come, city leaders can work together to reduce storm damage by identifying and correcting hazard tree situations.”*

Neil Letson, Urban Forester  
 Alabama Cooperative Extension System

**Four Steps in Developing a Plan to Mitigate the Impact of Trees as Natural Hazards**

- 1. Evaluate urban trees, whether growing on public property or on private property, that endanger public safety or property.**
- 2. Describe and analyze state and local hazard management policies, programs, and capabilities needed to mitigate trees as hazards.**
- 3. Establish hazard mitigation goals and objectives; propose strategies and plans to reduce or avoid the effects of urban tree hazards.**
- 4. Devise a method of implementing, monitoring, evaluating, and updating the urban forestry element of your mitigation plan.**



Utility companies can mitigate urban tree hazards through proper trimming, tree planting, and public education.

### Alabama's Natural Disaster Scorecard

For many Alabama communities, Hurricane Opal was a wake-up call as to the importance of—and potential dangers of—their city trees. In Alabama, 38 counties qualified for full disaster aid through FEMA.

Alabama Power Company crews worked around the clock for seven days to restore services to nearly 500,000 people. Thirteen cities were approved for half a million dollars in federal funds just to contract for hazard tree removals and tree replacements.

Secondary cleanup to dispose of fallen trees and stumps took months and strained the budgets of affected communities. Cities that had urban forestry management programs fared better than those cities without

a program so far as amount of damage and amount of time to clear streets and restore services.

While a hurricane like Opal is an unusual occurrence in Alabama, every year we face other natural disasters: ice and snow storms, freezes, high velocity winds from tornadoes

and thunderstorms, floods, droughts, fires, and widespread insect and disease infestations. These natural disasters cost millions of dollars in cleanup and recovery of urban forest vegetation and pose serious threats to property and human life.

### Alabama's Weather Scoreboard 2000

Event	Number*	Human Deaths	Injuries
Tornadoes	43	13	163
Lightning	20	0	11
Thunderstorms	416	0	0
Flash Floods	26	0	0
Hail	257	0	0

\*Number of documented events

Source: NOAA/National Weather Service

.....  
*"The devastation from Hurricane Opal caused Alabama communities to qualify for \$41 million in public assistance for damage and cleanup costs, much of it due to tree failure. Every year we have major tornadoes, thunderstorms, and ice storms, and trees are a major cause of problems."*

David Poundstone  
 Public Assistance Officer, AEMA



Alabama has some 206 million urban trees, or about 78 trees for every person living in urban areas. These grow along street right-of-ways, in public parks and recreation areas, in cemeteries, on school campuses, and around public buildings. Cities are liable for the maintenance of trees on public property. So when a tree or limb fails, the city may have to pay for damages.





“Trees are the main cause of damage to power lines during storms. The damage is the most costly to repair and the most likely to interrupt service—outage that can be an inconvenience or life threatening.” Danny Glover, Alabama Power Company

## Benefits of Trees

Yes, trees can cause problems when they fail, but if actively managed, their benefits will far outweigh their costs.

Urban trees provide these benefits:

- **Economic**—Trees increase property value. They reduce heating and cooling bills.

Trees may increase real estate value by 8 to 15 percent. Realtors report that wooded lots sell faster than bare lots.

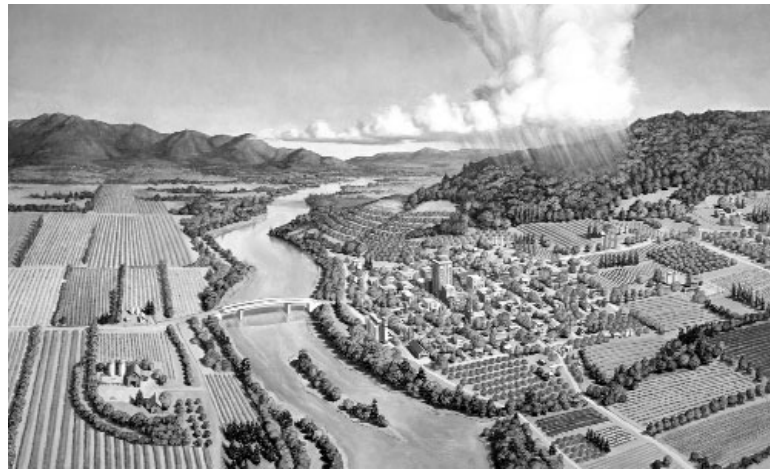
“The rule of thumb is that a tree is worth about \$100 per inch diameter,” says Ron Jackson, Mobile City Forester.

According to Jackson, Mobile is a city that recognizes the value of their trees. Some of the old live oaks that line Mobile city streets are valued at \$20,000 to \$25,000. A 3-mile stretch of Government Street alone has about \$7 million worth of trees.

“Having a large live oak in the front yard of a house in Mobile probably increases the value of the property by \$10,000-\$15,000,” estimates David Daughenbaugh of the Mobile Forestry Department.



Illustrations courtesy of the National Arbor Day Foundation



A city scene with well-placed trees increases property value, conserves energy, protects the environment, provides wildlife habitat, adds beauty, and enhances community character.

The benefits of urban trees far outweigh their costs.

Trees conserve energy by reducing heating and cooling costs. The USDA estimates that the net cooling effect of a young, healthy tree is equivalent to ten room-size air conditioners operating for 20 hours a day. Trees properly placed around buildings can reduce air conditioning needs by 30 percent. They can also shelter buildings from winter temperatures. This can save a city a lot of money.

- **Environmental**—Trees aid conservation of natural resources, reduce pollution, shelter wildlife, and provide educational settings.

Trees improve water quality by lessening the impact of precipitation on the ground, stabilizing soil with their roots, and reducing erosion and runoff. Trees can reduce noise by scattering and reflecting sound with their leaves and branches. They help control air pollution by removing and filtering airborne pollutants.



Photograph courtesy of  
The National Arbor Day Foundation

City trees provide wildlife habitat.

Trees create wildlife diversity and provide educational value. People enjoy observing and interacting with wildlife in the urban forest. Wooded areas provide opportunities for teachers and parents to share with students the importance of trees and how they benefit us.

Vasha Rosenblum, a teacher at South Shades Crest School in Birmingham, has pushed back the walls of her classroom to establish Eco-Site, using grants from Alabama Power Company and the Urban and Community Forestry Financial Assistance Program. Eco-Site allows students to plan, plant, maintain, and observe trees and other plants on the school grounds. Rosenblum uses the children's experiences with Eco-Site to enrich science, math, and language studies.

- Quality of life—Trees improve people's health and well-being.



School children in Birmingham learn from and about trees at Eco-Site.



Urban trees enhance tourism in a community and improve the local economy.

Trees add beauty to our lives. We all enjoy walking and playing under shady trees, picnicking in a tree-covered park, enjoying the blaze of fall colors during an autumn drive, and reveling in the sights and smells of flowering trees in the spring.

People in the city of Huntsville placed so high a value on a century-old pink dogwood that they spent thousands of dollars to relocate it to the local botanical garden when a road-widening project condemned it.

"It was worth every penny spent," says Chuck Weber, Huntsville City Forester. "That tree is a community treasure." Properly planted trees screen unpleasant views and enhance the street view of buildings. Architecturally, they create spaces by dividing large areas into smaller, more comprehensible units. They define areas, emphasize direction, and provide boundaries.

Trees enhance the character of a community. Communities

with tree-lined streets and downtown areas tend to be associated with high quality of life standards and civic pride.

Imagine the city of Eufaula without the trees lining the historic main street. Imagine Washington, D.C., without the cherry trees. Trees attract people to visit and live in communities.

"People come to Mobile because they like the live oaks," says Ron Jackson. The live oaks are part of the reason Mobile is known nationally as "The City Under The Trees."

Trees improve personal health. Studies show that trees actually reduce stress associated with urban settings, creating feelings of relaxation and well-being. Hospital surgery patients provided a view of trees and vegetation had fewer complications, needed less medication, and had shorter hospital stays than people whose windows overlooked buildings. (Dr. Roger S. Ulrich, Texas A&M University, 1984)



## Whose Trees Are These?

Ultimately, those who will buy into urban forest mitigation are those who are liable—elected officials, risk managers, public works and parks and recreation directors—and those to whom the community has entrusted the safety of property and citizens—EMA personnel, utility company representatives, police and fire departments. These people can form powerful alliances to cooperate in making their communities less susceptible to tree damage.

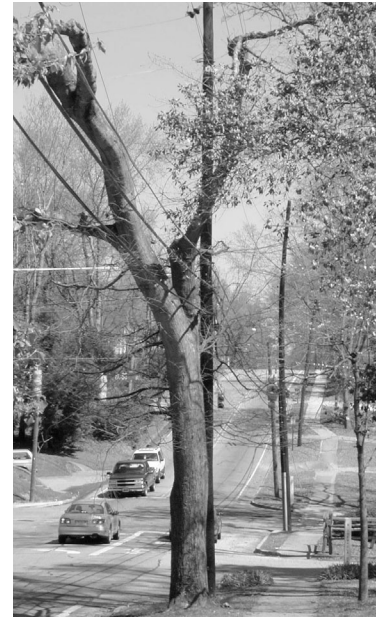
While everybody in a community benefits from urban trees, there is debate and often great emotion about whose responsibility it is to maintain trees growing on public property

and right-of-ways. Too often, these trees are both “nobody’s trees” when it comes to funding and maintenance and “everybody’s trees” when it comes to enjoying the benefits.

Activity that spells “mitigation” to the city may be perceived as “mutilation” to the citizen.

“In some cities there is a combative attitude,” says Rachel Buice. “The utility companies are trying to protect services at all costs; so if a tree or limb is in the way, they are apt to cut it. The citizen often wants the tree left as it is and hurts when they perceive that a utility ‘mutilates’ it.”

Allen Hendrix, Public Works Director in Valley, sees a different perspective. “People often call and want us to take trees down.



Power takes precedence over trees.

Our forester does an assessment and takes a recommendation before the city tree commission, then to the city council, before authorizing that a tree be removed,” Allen explains.



“The urban forest is a limited resource. It’s a hard life being an urban tree, contending with bad soil, pavement, and sidewalks on a right-of-way; sewer lines that block root growth; and power lines that necessitate branches being trimmed. But our economic development has improved since we started improving our city’s gateways with plantings.” Rachel Buice, City Horticulturist, Opelika

.....  
***“Our tree program used to consist of: If a tree falls in the road, we clean it up. Some lawsuits—mostly related to tree-damaged vehicles—got our attention, so now we have a tree program in place. Even more importantly, public safety has been improved.”***

Allen Hendrix  
Director of Public Works  
Valley



## *It takes all the pieces!*

Having an urban forestry management program with prescribed tree maintenance procedures can help avoid misunderstanding and confrontation while improving the health, safety, and attractiveness of the trees in the community.

When it comes to public safety, tree care can become a matter for the courts. Even during a storm, cities may not be relieved of all liability for damage due to failed trees. Cities have some legal responsibility for trees that grow either totally or partially on public property.

City officials should consult the city attorney or the Alabama League of Municipalities for legal guidance regarding urban trees.

.....  
*"We have work orders showing that we've done the best care of trees that we could. I can't think of a [court] case we've lost, because we maintain good records."*

Ron Jackson  
 City Forester, Mobile

### **Tree maintenance duties of a municipality include the following:**

- 1) Provide reasonable care for trees growing on public property.**
- 2) Take reasonable actions to prevent hazard trees.**
- 3) Inspect trees for flaws based on what is obvious to any reasonable person and what he or she should know.**

Those in positions of leadership in establishing and maintaining a community's emergency preparedness should be informed about liability and trees. For further information and/or training, contact the Arbor Day Foundation about their workshops. [See Resources for contact information]

### **Cost vs. Value—Some Questions and Answers**

#### **Won't an urban forestry management program cost my community money?**

Yes. One estimate is that municipalities with forestry programs spend between \$8 and \$11 per tree each year. These costs include repairing, fertilizing, watering, spraying, storm work, supervision, pruning, planting, and removal.

#### **How can we justify spending that much money?**

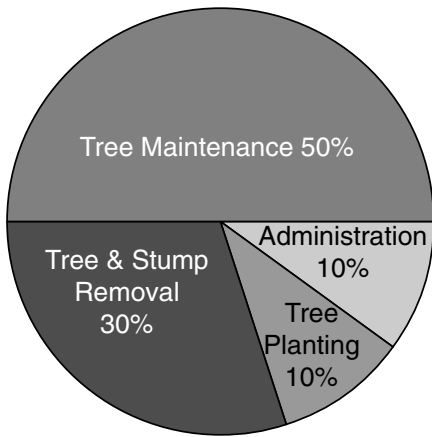
The AEMA's Local Hazard Mitigation Planning Manual puts it this way: "A fundamental premise of mitigation strategy is that current dollars spent on mitigation will significantly reduce the demand for future



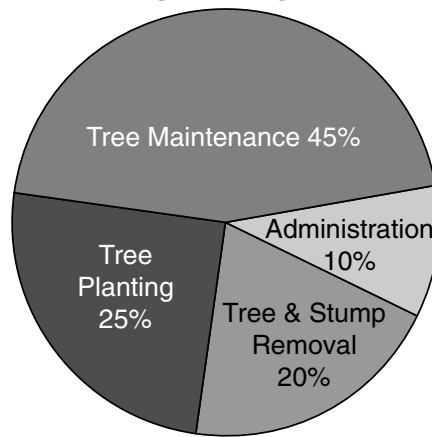
"If a tree trunk is on your property, then it's your tree." Kristy Ellinberg, Forester and Lawyer, Clemson (S.C.) University



**New Urban Forestry Program Budget**



**Established Urban Forestry Program Budget**



Utility companies are usually interested in removing hazard trees that threaten their lines. They can be valuable allies in hazard tree mitigation.

dollars needed for emergency recovery, repair, and reconstruction following a disaster” (p. 2). Translation: To save money, you must spend money. Besides, mitigation makes your community a safer place.

**We’re a small municipality. How can we afford an urban forestry management program?**

The real question may be, How can we afford not to have a tree program? An urban forestry management program is like an investment. You invest resources and expect greater benefits in return. If a community invests wisely, then the returns will be even greater. The key is to use all of its resources creatively.

Some municipalities have realized a direct financial reward for their tree risk management programs, as explained by Allen Hendrix, Director of Public Works, Valley:

“The Valley tree program has saved the city money by inclining judges in favor of our management practices in potential lawsuits, but it has also increased the value of our property.”

**If we implement an urban forestry management program, what will we be spending our money to do?**

According to a national study by Dr. J. James Kielbaso of Michigan State University, the typical street-tree budget in a new urban forestry program will designate about 50 percent of its funds to tree maintenance, including emergency repairs from storms and other disasters. The rest covers tree and stump removal, tree planting, and administrative and supervision costs.

Once the street-tree management program is established, the budget should shift some of the tree maintenance and tree and stump removal funds into mitigation activities such as proper tree planting.

**Are there ways to stretch our budget to help us get a tree program started?**

Yes. For example, not all communities can afford a full-time urban forester. Many will find resourceful ways to gain the

urban forest expertise they need. One approach is to use the services of a local, regional, or state-level urban forester. In southwest Alabama, the Regional Conservation and Development Council hired an urban forester to serve 13 towns and cities within its region. Each community received assistance in proportion to the amount contributed.

Some communities jointly fund an urban forester or contract with a professional forester to get the forestry expertise they need. Others have called on county Extension agents or the county offices of the Alabama Forestry Commission with specific questions. Local experts and qualified citizens may also provide assistance.

.....  
***“There is a way for every municipality to have access to urban forestry expertise.”***

Norman Burton  
 Ala-Tom RC&D Coordinator

For a stable source of program funding, most communities will rely on the general tax fund, although some municipalities collect special levies or assessments. Each community must decide the best way to fund its urban forestry management program.

**Is there any group already doing some urban forestry mitigation that we could partner with to get us started or to stretch our budget?**

Yes. Nearly all Alabama communities have local businesses, groups, and organizations that can provide needed services and funding. An excellent example is a utility company. City officials can often partner with a local utility company to remove trees to their mutual benefit. Some utility companies may entertain a tree replacement program where it makes good business sense. Utilities want to work with

municipalities for the common interest of keeping services available.

**So what you are saying is...**

In a balanced hazard mitigation program approach, the value of trees to our communities justifies the expenditures to plant, maintain, and repair trees. Add to that the immeasurable value of lives saved and damage avoided, and it doesn't make sense NOT to have an urban forestry management program. Potential sources for funding and assistance are listed on page 23.



Urban Forestry program includes regular inspection and assessment of municipal trees. This provides the best way for local government and the resident to have safer trees in their community.



Urban forestry plays a key role in the emergency management planning cycle.



Cutting and trimming hazard trees before the storm reduces the risk of injury and damage.

## Fitting Urban Forestry into the Hazard Mitigation Plan

Four major categories of emergency management planning are mitigation, preparation, response, and recovery. An urban forestry management program has a role in all four phases, but its greatest impact may be in the mitigation phase.

“Mitigation is the cornerstone of emergency management. It’s the ongoing effort to lessen the impact disasters have on people and property. Mitigation involves keeping homes away from flood plains, engineering bridges to withstand earthquakes, creating and enforcing effective building codes to protect property from hurricanes—and it also involves identifying and managing hazard trees,” says Debbie Peery, AEMA Hazard Mitigation Officer.

Communities with an effective urban forestry management program will:

1. help business and industry reduce or avoid damage and remain operational when disaster strikes.

2. protect critical service facilities so that they can remain operational or reopen more quickly.

3. help reduce property losses and human suffering. This saves money and resources after the storm.

To maximize the benefits of a mitigation plan, include these urban forestry features:

- a qualified urban forester
- a tree policy
- a tree board
- a plan to educate the public

### ***Starting an Urban Forestry Management Program***

No two communities will have the same urban forestry management program or structure. Each town and each city has its own set of needs, abilities, and resources. An urban forestry management program must be tailored to fit the local circumstances of the community itself.

Even then, an urban forestry program may not become a reality unless there is local interest. Many times this will begin with one person or a group with the knowledge and understanding to sell urban forestry to their community.

“One of our city council members was interested in creating a tree management program. He educated the entire council and got the city to establish and fund a tree board,” says Allen Hendrix, Director of Public Works, Valley. “We have a population of 9,500 and a tree budget that has increased to \$36,000.”

Valley’s tree management program, including essential urban forest mitigation, has already saved the city money by helping avoid costly tree-related lawsuits.

A local hazard mitigation team is a good choice to take the lead in promoting a community urban forestry program. The team will have the credibility to sell the concept as beneficial to the community and as mitigation to future natural disasters.





Getting a good tree program started can begin with one interested individual.

### ***The Hazard Mitigation Team***

All local hazard mitigation teams should include someone with urban forestry expertise whether a staff urban forester, a private forester under contract, or some other professional urban forester. Urban foresters bring expertise because they oversee the monitoring, assessment, protection, maintenance, planting, and removal of trees on public property. They also have experience in surveying tree damage after a disaster and can recommend maintenance, removal, and replacement. In addition, they can review development plans to identify potential harm to trees and recommend alternatives.

The urban forester is just one of the professionals to include when developing a hazard mitigation plan. A core group of people that plan and manage activities should include representatives from the following groups:

- police, fire, and public works departments
- forestry department
- private arboricultural firms
- media contacts
- climatological consultant
- utility companies
- nurseries
- emergency management office

All mitigation plans in the community—fire, flood, and tree-related—should be coordinated by this mitigation team.

Funding to implement goals and objectives may be available from sources such as the Hazard Mitigation Grant Program administered through the Alabama Emergency Management Agency.

### **Urban Tree Issues in a Pre-Disaster Mitigation Plan**

**A disaster mitigation plan should include these goals and objectives for managing the public tree resource in a community:**

#### **Recognize value**

- 1) Recognize that trees are important to the community.**
- 2) Recognize the specific benefits of urban trees.**
- 3) Recognize that trees need management and care.**
- 4) Identify the fact that trees can become hazards.**

#### **Establish procedure**

- 1) Recommend that tree expertise be sought.**
- 2) Establish the authority responsible for administering the urban forestry management program. This is often accomplished through local ordinances and policies.**
- 3) Suggest strategies for assessing hazard trees and recording mitigation measures.**
- 4) Provide resources and oversight for management and care of the urban trees.**
- 5) Identify cooperating agencies and possible funding sources.**

#### **Prescribe activity**

- 1) Remove trees that are no longer healthy.**
- 2) Promote regreening, replanting, and recovery activities and proper tree placement.**
- 3) Follow the suggestions from successful and knowledgeable organizations for a sound urban forestry management program (see Suggestions for a Sound Urban Forestry Hazard Mitigation Program box).**

## Suggestions for a Sound Urban Forestry Hazard Mitigation Program

1. **Require up-to-date knowledge and the practice of good tree care.**
2. **Conduct regular assessments and inspection. Carry out frequent, close inspections of every tree within striking distance of a road or structure.**
3. **Keep systematic records of trees and tree activity.**
4. **Use trained urban foresters to recognize defects.**
5. **Don't ignore identified hazards. Remove trees when they are no longer healthy.**
6. **Select the right tree for the right spot. Plant trees correctly. Maintain the trees for vigor, structure, and form.**

—from Tree City USA Bulletin No. 15, National Arbor Day Foundation

### *Practical Steps You Can Take to Implement an Urban Forestry Management Program as Part of a Community Hazard Mitigation Plan*

#### 1. Lay the groundwork.

- Learn about urban forestry, especially as it relates to storms and natural disasters.
- Develop a personal commitment to the potential of how an organized tree program can mitigate storm damage.
- Find out what's already being done in your community or county, who are the foresters, city tree commission members, and elected officials committed to preserving and managing the urban forest. The people who should be talking about how urban forestry fits into the overall hazard mitigation plan are EMA directors, city clerks, risk managers, urban foresters, directors of public works, and directors of parks and recreation.
- Focus your efforts. Research and understand the conditions and framework that will make the community more receptive to this concept. Find a credible member of the community who can validate the community's needs and encourage receptivity to the mitigation plan.

#### 2. Sell your concept.

- Identify key people to approach with this concept. A natural starting point is the community's hazard mitigation planning committee, which should contain some mix of public works directors, department of parks and recreation directors, mayors, city planners, EMA directors, urban foresters, and representatives from the media and from public safety (fire and police). Remind them that trees add much value and pleasure to the community and the city is responsible for and liable for each tree growing on municipal property.
- Hold a meeting or discussion with this group. Try to answer these basic questions: Do they understand the concept of an urban forestry management program as a means of mitigating storm damage? Do they agree that their community needs an urban forestry management component in their planning process? Will they agree to pursue this concept in their mitigation planning process?
- Encourage the mitigation planning team to add key urban forestry-related representatives. These include representatives from



Communities who decide to make urban forest management a priority may choose to follow the guidelines in award and recognition programs such as Tree City USA. See Resources for contact information.

local utility companies and private arboricultural companies, an urban forester, directors of parks and recreation and public works departments, and appropriate state agencies.

- In your overall planning, include provisions for urban forestry mitigation. Help the local mitigation planning team incorporate forestry management in their mitigation planning.

#### 3. Support local mitigation planning committee efforts.

- Maintain a list of urban forestry management resources. Help committee members locate knowledgeable people, compete for funding, and become aware of successful examples in the community.
- Inform the public and the media about the urban forest management program. Have a news packet and public information ready to distribute. [see Resources, p. 23].
- Recognize success. If your community includes urban forest management in their local mitigation planning efforts, find ways to acknowledge this in private and in public ways.

- Visit communities that have a good tree program to see how they do it. Several such cities are cited in this publication.

### ***Informing the Public***

Citizens should know how the local urban forestry program makes their community safer for people and property. As the urban forestry component of your mitigation plan is carried out, look for ways to tell your story.

Media such as radio, newspapers, and brochures can be used to promote special tree program and activities.

In addition, student and adult groups and civic clubs often need speakers, so have one or more presentations ready.

In these and other cases citizens can learn tree planting and care techniques that will make trees safer on private property.

Two such informational emphases are helping citizens focus on the value of trees in Lee County. The City of Auburn Tree Commission launched their “2000 in 2000” program, encouraging citizens to begin planting 2000 “heritage” trees in the year 2000. The emphasis was on planting the right tree the right way in the right place.

Explains James Jennings, City Forester, Auburn: “Through this tree program, the Tree Commission plants a tree on private property in exchange for the landowner’s promise to care for the tree. The community benefits from the resulting beauty and shade.”

Nearby, in Opelika, a Tree Trust program is being promoted through an effort called “Rooted in Opelika.” The Opelika Tree Commission invites citizens to honor or memorialize a person or event by donating to the Tree



Trees add immeasurably to the City of Eufaula’s character.

Trust Fund. Funds are used to purchase and plant trees. The program educates the public about which trees grow best in Opelika and how to plant them properly.

### ***Enlisting the Media***

The media is an essential partner in educating the public about planting and maintaining trees and about coping with tree debris after a storm. The National Arbor Day Foundation has an excellent press kit available called “Storm Recovery—Trees.” It can be ordered or downloaded from their Web site [see Resources].

Whenever a tree program is being developed or implemented, it’s wise to include representatives from the media in the planning stages.

### ***Training the Workers***

Professional and technical training for those who will actually do the tree mitigation is available from a variety of sources. See Resources, p. 23, for contact information about training opportunities.



Auburn is mitigating the urban forest by promoting proper planting techniques through its “2000 in 2000” tree-planting program.





Educating city workers can make or break your urban forest management program. Information on training is available from the National Arbor Day Foundation, National Arborist Association, and International Society of Arboriculture.

## What to Include in Public Service Announcements

Develop or obtain public service announcements that can be easily modified and distributed before, during, and after a natural disaster. Topics to include:

- chain saw safety
- safety hazards when clearing debris
- debris disposal options
- equitable vendor prices
- selecting a qualified arborist or tree care professional
- selecting quality nursery stock
- benefits of trees and the advantage of a healthy and safe urban forest
- how to identify trees worth saving

—from *Storms Over the Urban Forest*, p. 34



Alabama Forestry Commission and county Cooperative Extension System offices have free educational materials available. See Resources, p. 23.



After a storm, remove immediate hazards first. Contract with reputable arborists to save trees that might otherwise be removed and to prevent further damage.

## Planning Ahead

Hazard mitigation plans that successfully address urban tree issues will promote ongoing urban forestry programs at the local level. Communities that support a sustained urban forestry program can greatly reduce the impact of any future storm or natural disaster. A regular, well-organized urban forestry program will include the following activities:

- Plant trees appropriate for the space and site. When trees mature, they must not be near wires, too close to a building, or in spots where they will be in danger of blowing over, such as on steep sites.
  - Avoid planting trees with weak structures.
  - Promote construction and development activities that avoid or minimize root damage.



When building or repairing sidewalks, or trenching for gas or water lines, keep root damage to a minimum.

- Regularly inspect and assess trees.
  - Prune trees to promote good structure and health.
  - Keep trees healthy and vigorous through proper maintenance.
  - Protect trees from soil disturbance and compaction.



Improper care and abuse can make trees more susceptible to failure.



Protect roots from compaction by erecting barriers around or slightly beyond the dripline of trees during construction.

- Maintain water channels to prevent downed trees from clogging drainage.
- Remove trees that have a structural defect that may cause the tree or a portion of the tree to fall on someone or something of value. A hazard tree by definition has to have a “target” on which it may fall, such as people, vehicles, and structures. Old or dead trees that pose no threat to anything or anyone should they fall may be left for wildlife.
- Inform the public, the media, and community leaders about the value, benefits, and care of urban trees. This will



By definition, a hazard tree has to have a “target” that would be damaged if the tree fell. This can be a street, a sidewalk, or even a park bench.

help facilitate public acceptance of mitigation (especially tree trimming) in “public” areas.

- Inventory publicly owned trees and keep records of work done.

### ***Keeping Track of Urban Trees***

Tree inventories provide a valuable tool to any community’s emergency response or assessment. A tree inventory is a management technique that documents the status of the urban forest. Basic information includes species,

stem diameter, location, condition, and maintenance needs. Using the tree inventory, urban foresters or government officials can determine actual storm damage done to the urban forest. This is the only way damage can be assessed in dollars so that the community can apply for reimbursement. Costs to repair the urban forest, including pruning, removal, cabling, and replanting, may be included.

For selected sites, high value or historical areas, a tree inventory computer software program may be an effective way to catalog trees. These are available commercially. Consult an urban forester for recommendations.

Other ways to inventory trees are using geographic information systems, aerial photography, or a systematic observation and recording system.



Removing hazard trees can prevent injury to people and damage to vehicles and structures.





Educate construction workers, developers, and city crew members as to your community's standards of tree protection and care.

## Mitigating for Disaster: The Role of Urban Forestry

### *Before the Storm*

1. Help local governments set urban forestry management guidelines, rules, and policies through an organized tree program format. This should include building codes, land-use plans, zoning ordinances, a city or county tree ordinance, and a hazard tree policy.

2. Inform the public about the tree management program and how they can make their trees safer.

3. Help local governments obtain professional tree expertise needed to carry out the urban forestry program, especially as it relates to tree assessment, protection, care, and planting.

4. Support and promote tree care training opportunities for appropriate community employees, service personnel, and the general public.

5. Establish an emergency management plan that includes an urban forestry component. The planning group should include elected officials, the EMA director, a director of public works, urban foresters, emergency personnel (fire, police), and representatives from the media.

Develop a written tree debris removal plan that establishes priorities, staging areas, and processing and disposal of wood debris. Provide an early warning system, a chain of command, a reaction plan that prioritizes cleanup activities, and a list of cooperating bureaus or organizations.

### *During the Storm*

Follow the established emergency plan for removal of hazardous trees. Coordinate work with outside organizations and volunteers.

In an emergency, extra hands are appreciated but must be trained in tree care so that they don't cause further damage to the downed and damaged trees. Their work must also be carefully coordinated with the established response procedure.

The National Guard may respond with labor and equipment. However, soldiers adhere to strict chain-of-command, so know whom you must talk to in their organization to get a particular job done.





Just as volunteers and outside assistance are important to the mitigation phase, they can help during a disaster. While outside help is appreciated during emergencies, it must be carefully coordinated.

Volunteers also offer to help during emergencies. Each community response plan should describe the procedure to be followed in utilizing these volunteers. Designate a volunteer coordinator who is responsible for delegating and coordinating volunteer efforts. Never allow untrained volunteers to do tree work. A municipality may establish a training program for these volunteers. Each volunteer should know whom his or her supervisor will be. Above all, have the procedure reviewed by the municipal attorney before implementing it.

Another source of outside assistance is other communities. Having a written agreement with other communities to help during emergencies can expand your labor and equipment resources. A written agreement outlines procedure and provides chain of command, which eliminates confusion during the emergency.

One other source of assistance during response is professional tree service companies. Be sure you contract with licensed

## Emergency Tree Assessment During Disaster Response: Priorities

**\*Trees down, trapping injured people**

**\*Trees down, blocking arterial streets**

**\*Trees down and blocking exits from residences**

**\*Trees split and in danger of falling and causing injury**

**\*Trees fallen and at rest on homes or other buildings**

**\*Trees fallen and at rest on vehicles**

companies who have training and skills to deal with immediate hazards. Recommended standards for tree service companies are that they be licensed, insured, bonded, and professionally qualified.

### *After the Storm*

After the immediate danger has passed, the urban forestry program moves into the recovery phase:

1. Assess the damage.
2. Clean up debris and repair damaged trees. Select professionals, as needed, to help with the cleanup. Hire only qualified arborists—individuals who have been trained in the art and science of planting, caring for, and maintaining individual trees.
3. Take advantage of the “teachable moment” to educate the public about the importance of a good community tree program. Work with the media to provide news and information that the public needs.

4. Create good public relations out of a bad situation by demonstrating to the public the city’s concern for its citizens. Provide outside pickup of tree debris; make chips available for free mulch. Assist with removal of hazardous trees [see “Emergency Tree Assessment” box].

5. Apply for financial assistance for cleanup and restoration. Include all related costs (labor, equipment, materials, and replacement trees).

6. Evaluate how well the hazard mitigation plan performed in reducing the damage. Revise and improve as needed.

After Hurricane Opal in 1995, the City of Opelika hauled enough inert debris (mostly tree debris) to fill a football field three stories high. “There’s no way a city can budget for that,” Rachel warns.



.....  
***“It’s after the storm that we evaluate and mitigate for the future—while protecting our trees.”***

Rachel Buice  
 City Horticulturist, Opelika

## ***Regreening: Back to the Mitigation Phase***

Restoring the urban forest to its pre-disaster status takes careful planning and a lot of hard work. It can also be quite expensive, especially when you consider the price of the tree, the cost of planting, and the cost of maintenance.

Communities that have lost many trees face a huge financial burden in regreening their public and private spaces. Help is available from several sources.

- The USDA Forest Service can provide technical assistance in the form of publications and information sharing and guidance on available grants and funding.

### **Record Keeping During Debris Removal**

- **Track employee time, equipment and service contract costs, purchased supplies and equipment, and tree assessment reports.**

- **Take photos of damaged trees and property.**

- **Record tree work:**

- Location of trees serviced**

- Size and species of trees serviced**

- Time required for cleanup**

- Corrective action taken**

- Description of property damage**

- Instructions for follow-up work to a site**

- County and state Cooperative Extension System offices can provide educational information.

- Professional organizations such as the National Arborist Association, the International Society of Arboriculture, and the Society of American Foresters can provide technical and program advice.

- Volunteer organizations such as American Forests, the Garden Clubs of America, the National Arbor Day Foundation, and state beautification councils and environmental groups can help.

- Environmental education organizations such as Legacy provide grants for educational tree planting projects.

- The Alabama Nurserymen's Association can advise on tree nursery stock.

- Master Gardeners provide volunteer gardening hours to the community. Contact them through the county Cooperative Extension System office.

- Local corporations, nurseries, civic clubs, and individuals might sponsor replanting efforts.

See Resources, p. 23, for information on how to contact these and other groups.

**Only about 25 percent of Alabama's citizens live in communities served by urban foresters. Yet the single most effective step communities could take in establishing an effective tree component in hazard mitigation planning is to hire an urban forester.**

.....  
***"I'm responsible in case of a disaster. I want to look ahead and avoid problems. I don't want people to say, 'Why didn't you anticipate this problem with the trees?'"***

Anita Patterson  
Director of EMA  
Montgomery County

### ***The Final Word: Public Safety***

In any hazard mitigation plan, public safety is, of course, the primary concern. Selma recognizes the role trees play in their community. They are a city concerned both with their heritage trees and the safety of their citizens.

"Trees are a very valuable part of Selma's image. The trees throughout our neighborhoods and historic districts have to be maintained and monitored for structural defects and damage on a regular basis," explains Charles W. Himes, a member of the Selma Tree Commission.

.....  
"One key to effective urban forest mitigation as it relates to emergency management is to get the urban forester involved early in the decision-making process to care for and protect trees."

Rachel Buice  
City Horticulturist, Opelika

In short, a tree is a valuable community resource like power and water, which, while costly to protect, is more costly to lose or replace. It becomes a liability—something to be removed—when it interrupts services or threatens life or property.

Every county in Alabama is under obligation to include hazard mitigation as part of their emergency preparedness plans. Including urban forestry management in hazard mitigation makes it a better plan.



Urban tree residue can be a huge challenge following a storm or natural disaster.

### **Emergency Preparedness Checklist**

- **Regularly meet with local and county emergency managers, city foresters, and/or directors of parks and recreation and city public works to discuss disaster readiness.**
- **Know the community emergency response plan.**
- **Make sure the disaster response plan includes assessing tree damage, clearing debris, surveying for hazards, and replanting trees.**
- **Keep on hand a response kit that includes the disaster response plan, maps, and names and phone numbers of key contact persons.**
- **Make agreements with neighbor cities to share workers and equipment in a disaster.**
- **Maintain an agreement with a qualified tree service company to clear debris after storms.**
- **Identify at least one site selected for tree debris collection, processing, and storage.**
- **Conduct and keep updated a tree inventory and photographs of the most significant trees on public property.**
- **Make sure your community has an employee or contractor trained in hazard tree evaluation.**



## ***Is Your Community Prepared for Its Next Emergency?***

Take this simple questionnaire and analyze emergency preparedness as it relates to urban trees in your community. Better emergency planning saves lives and property.

<b>Yes</b>	<b>No</b>	<b>Do Not Know</b>	
------------	-----------	--------------------	--

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Does your emergency management plan include a goal or objective that addresses urban forestry?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Does your city/county emergency manager work frequently with all departments and community groups in performing the planning function? Does he/she include representatives from city forestry departments, public works, elected officials, utility companies, tree commissions, etc.?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Does your community's emergency operations plan reflect potential hazards that face your community due to tree failure?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Do urban forestry-related agreements exist between your community and other communities and/or other units of government for assistance in emergencies?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. If a disaster occurs in your community, do officials and emergency management personnel coordinate the response, including hazard tree response, out of a designated city/county emergency operations center?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Do you know how to include requests for reimbursements for tree damage in your community's request for emergency disaster aid?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Do you know your community's resources to mitigate or reduce disaster or damage due to trees?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Is there in place in your community a plan to educate the public about appropriate disaster response, including tree management and cleanup?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. Does your hazard mitigation team have an urban forestry representative?

### ***Evaluating Your Response***

“No” means there is a deficiency in your current emergency management plan.

“Yes” means that your community is capable of providing effective disaster management services.

“I don't know” could signal a potential problem or a lack of communication.

If you checked many “no” or “I don't know” answers, you and your staff need to conduct a more detailed review of your local emergency management plan and expand it to include larger representation from related/supporting departments and agencies.

Based on a questionnaire prepared by the Alabama Emergency Management Agency

## ***Urban Forestry Mitigation Checklist: What the Community Can Do***

### **1. Getting Started**

If your community has no urban forestry management program, then start one.

- Determine the community's need for an urban forestry management program. Consider all the values of a community tree program—economic, environmental, and quality of life benefits—in addition to hazard mitigation.
- Solicit, recruit, and solidify community support. Secure political, governmental, private sector, and public opinion and awareness for the program.
- Establish a legal framework and foundation. Pass a municipal tree ordinance that creates a tree board and/or city forestry department.
- Strive toward a comprehensive program. Expanded community urban forestry management programs are involved in planning, tree planting, tree maintenance, tree removal, urban wood waste utilization, and education.
- Build program coordination and cooperation. Consolidate municipal services where practical, and provide interaction between other departments and outside agencies.

### **2. Building**

Once there is an urban forestry management program in place, develop program capacity.

- Build a strong support base. Strengthen and maximize program funding, in-kind services, and public approval.
- Invest in employee education. Allow and provide opportunities for worker training through workshops, seminars, certification programs, professional memberships, and classwork.
- Initiate or update the community tree program management plan. Develop short- and long-term plans for tree planting, tree maintenance, tree assessments and inventories, education and training, partnerships, and equipment.

### **3. Incorporating Mitigation Elements**

A well-balanced urban forestry management program will incorporate hazard mitigation.

- Plant tree species that are more resistant to storm damage.
- Plant trees in places where they are less apt to fail or cause damage during a storm.
- Train young trees to develop stronger structure and form.
- Maintain older trees for health, function, and safety.
- Require the use of professional tree care standards on all trees.
- Remove trees or limbs that pose a certain level of risk to community safety and/or property.
- Systematically assess trees for health, function, and safety.

- Work with and coordinate with the local emergency management hazard mitigation planning team.

- Incorporate a community tree management plan with other local emergency management plans.
- Establish and pre-assign emergency related tasks and responsibilities to community tree program personnel.
- Pre-determine employee management work units with priority routes, actions, and needs.
- Establish better communications with other emergency management agencies for efficient use of community urban forestry management equipment and personnel.
- Pre-arrange or contract for storm-related services with a qualified tree service company.
- Establish a record-keeping system that will satisfy FEMA requirements.
- Include storm-related training for community urban forestry management personnel.
- Include strategies and methods to utilize and handle excess wood waste and debris.
- Develop arrangements with nearby communities for assistance.
- Identify opportunities for volunteer assistance.
- Develop informational messages for media release to the public.

## Resources

### *Funding/Assistance*

- Alabama Cooperative Extension System. Provides educational materials and events; has contacts in each county. Web site: [www.aces.edu](http://www.aces.edu)
- Alabama Forestry Commission. Provides educational materials and expertise; has contacts in each county. Web site: [www.forestry.state.al.us](http://www.forestry.state.al.us)
- Alabama Nurserymen's Association, P.O. Box 9, Auburn, AL 36831. E-mail: [alna@prodigy.net](mailto:alna@prodigy.net). Web site: [www.alna.org](http://www.alna.org)
- Alabama Urban Forestry Association (AUFA) serves as advocate, forum, and clearinghouse for urban forestry. Web site: [www.aufa.com](http://www.aufa.com)
- American Forests Global Re-Leaf Program, P.O. Box 2000, Washington, D.C. 20013-2000. Web site: [www.amfor.org](http://www.amfor.org)
- Federal Emergency Management Agency (FEMA). FEMA provides funds to help communities recover from all types of hazards. Meticulous record keeping is the key to receiving maximum FEMA funds to clean up debris. Contact FEMA through the local EMA office. Web site: [www.FEMA.gov](http://www.FEMA.gov)
- Hazard Mitigation Grant Program (HMGP). Contact local EMA office.
- International Society of Arboriculture, P.O. Box 3129, Champaign, IL 61826-3129 (217) 355-9411. Web site: [www2.champaign.isa-arbor.com](http://www2.champaign.isa-arbor.com)
- Legacy. Legacy is an environmental education agency. Legacy, P.O. Box 3813, Montgomery, AL 36109 (334) 270-5921 or (800) 240-5115 E-mail: [legacypartners@mindspring.com](mailto:legacypartners@mindspring.com)
- The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410 (402) 474-5655. Web site: [www.arborday.org](http://www.arborday.org)
- National Arborist Association, 3 Perimeter Road, Unit 1, Manchester, NH 03103 (800) 733-2622. Web site: [www.natlarb.com](http://www.natlarb.com)
- The National Tree Trust. Funds from this source are intended for supporting community tree organizations and projects. Contact: The National Tree Trust, 1120 G St. NW, Suite 770, Washington, D.C. 20005 (202) 628-8733 or (800) 846-8733. Web site: [nationaltreetrust.org](http://nationaltreetrust.org)
- National Urban and Community Forestry Advisory Council. This council provides grants for development of model municipal or volunteer urban forestry programs that serve underrepresented, diverse publics. Contact: USDA Forest Service, 20628 Diane Drive, Senora, CA 95370. (209)536-9201 Web site: [www.treelink.org/nucfac](http://www.treelink.org/nucfac)
- Natural Resource Conservation Service (formerly Soil Conservation Service) Web site: [seweb.ga.nrcs.usda.gov/al](http://seweb.ga.nrcs.usda.gov/al)
- Resource Conservation and Development (RC&D) Programs. Administered through the Natural Resource Conservation Service (formerly Soil Conservation Service), RC&D Councils are masters at putting together partnerships. They secure grants, donations, and meet cost-sharing requirements for selected projects.
- Rural Community Assistance From National Forests—contact the nearest Forest Supervisor's Office or Regional Office of the USDA Forest Service.
- Society of American Foresters, 5400 Grosvenor Lane, Bethesda, MD 20814 (301) 897-8720. Web site: [www.safnet.org](http://www.safnet.org)
- Society of Municipal Arborists. Promotes and improves the practice of professional municipal arboriculture. Web site: [www.urban-forestry.com](http://www.urban-forestry.com)
- Urban and Community Forestry Financial Assistance Program. This program funds projects that meet primary urban forestry program needs. Projects include public education, interpretive facilities, arboretum planning, workshops and training programs, tree inventories, tree board establishments, and seed money for hiring city foresters. Contact: Urban and Community Forestry, Financial Assistance Program, P.O. Box 302550, Montgomery, AL 36130-2550. Web site: [www.aces.edu/ucf](http://www.aces.edu/ucf)
- USDA Forest Service (Southern Region). Provides urban forestry information and technical assistance. 1720 Peachtree Road, NW Suite 850, Atlanta, Ga 30309 (404)347-4177 Web site: [www.urbanforestry.south.org](http://www.urbanforestry.south.org)
- Local support. The basis of any good tree program is local support. Federal assistance, state assistance, and special grants help boost programs but can't substitute for including tree programs in local municipal budgets.



