URBAN FORESTRY MANAGEMENT

Warren Nevad, Management Consultant
February 2009

THE UNIVERSITY of TENNESSEE
MUNICIPAL TECHNICAL ADVISORY SERVICE

In cooperation with the Tennessee Municipal League

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URBAN FORESTRY MANAGEMENT

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INTRODUCTION

Urban forestry is the art, science, and technology of managing trees, forests, and natural systems in and around cities, suburbs, and towns for the health and well being of all people. Urban forestry has become a critical emerging local government function for communities across Tennessee. Urban forestry transcends public works, parks, storm water and public safety.

On Jan. 4, 1872, J. Sterling Morton first proposed a tree-planting holiday to be called Arbor Day at a meeting of the Nebraska State Board of Agriculture. The date was set for April 10, 1872. Prizes were offered to counties and individuals for planting properly the largest number of trees on that day. It was estimated that more than 1 million trees were planted in Nebraska on the first Arbor Day.

Arbor Day was officially proclaimed by the young state's governor, Robert W. Furnas, on March 12, 1874, and the day itself was observed April 10, 1874. In 1885, Arbor Day was named a legal holiday in Nebraska, and April 22, Morton's birthday, was selected as the date for its permanent observance.

Today in Tennessee, there are six communities that meet the four elements of the U.S. Department of Agriculture's national allocation model for federal funding. It is a goal of the workshops to increase that number to more than 20. This will provide more grant funding opportunities from the federal government to the state of Tennessee. In addition, there currently are 36 Tennessee cities that meet the Tree City U.S.A. designation. Another goal of these workshops is to increase that total to 50 Tree City U.S.A designations.

This Urban Forestry workshop course provides an overview of the purpose and importance of a municipal urban forestry program. Topics covered include the economic and environmental benefits of urban forestry, how to start an urban forestry program for your community, roles of tree boards and staff, identifying potential community stakeholders, technical assistance providers, and best management practices in urban forestry.

DEFINITION OF URBAN FORESTRY

Urban forestry is the management of trees for their contribution to the physiological, sociological and economic well-being of the urban society. Urban forestry deals with woodlands, groups of trees, individual trees, and where people live, urban tree areas include a great variety of habitats (streets, parks, derelict corners, etc.) where trees bestow numerous benefits and present numerous problems (Grey and Deneke, 1986).

Urban forestry is the art, science, and technology of managing trees, forests, and natural systems in and around cities, suburbs, and towns for the health and well being of all people.

Trees are major capital assets for communities. Just as streets, sidewalks, sewers, public buildings and recreational facilities are part of a community's infrastructure, so are publicly owned trees. Trees, and collectively, the urban forest, are important assets that require the same care and maintenance as other public property.

It is very important to have a comprehensive urban forestry program that includes the following steps for successful implementation:

1. Select a program or standards.
2. Establish a tree board.
3. Adopt a tree/landscape ordinance.
4. Establish a budget.
5. Staff the program.
6. Develop an Urban Forestry Management Plan.

BENEFITS OF URBAN FORESTRY

Benefits — Environment:

1) ***Trees improve air quality*** by trapping and holding dust particles that can damage lungs. Tree leaves absorb carbon dioxide and other poisonous gases and, in turn, replenish the atmosphere with oxygen for us to breathe. One acre of trees provides oxygen for 18 people and will absorb the amount of carbon dioxide each year equivalent to that produced by a car driven 26,000 miles. Trees act as a carbon sink by removing the carbon from CO_2 and storing it as cellulous in the trunk.

2) ***Trees reduce noise pollution*** by absorbing unpleasant sounds from the urban environment.

3) ***Trees improve water quality*** by mitigating the impact of raindrops resulting in less surface runoff of water from storms and reduced soil erosion. This allows more recharging of the ground water supply, which is significantly reduced by paving. Wooded areas help prevent the transport of sediment and chemicals into streams.

4) ***Trees reduce wind erosion of soil*** by providing a shield from heavy winds.

5) ***Trees create wildlife diversity*** by providing a local ecosystem. Trees provide a suitable habitat for animals and birds that would otherwise be absent from urban areas.

Benefits — Economy:

1) ***Trees create a favorable first impression*** of a community to visitors.

2) ***Trees enhance community economic stability*** by attracting businesses and tourists.

3) ***People spend more*** because they tend to linger and shop along tree-lined streets.

4) ***Trees make better employees.*** When businesses lease office space in wooded developments they find that their workers are more productive and absenteeism is reduced.

5) ***Higher occupancy rates*** are found in apartments and offices in wooded areas, and tenants stay longer.

6) ***Higher property values*** result from well landscaped properties that are more desirable. Studies have shown that property value can increase by 15 percent. Larger specimens equal higher values.

Benefits — Energy:

1) ***Trees save energy*** by providing cooling in the hotter months and serving as a windbreak in winter. As a result, less fossil fuel is burned for heating and cooling. Trees properly placed around buildings can reduce air conditioning needs by 30 percent. Trees strategically placed for windbreak protection can save 20 to 50 percent in energy used for heating.

2) ***Trees reduce glare on sunny days.***

Benefits — Health:

1) ***Trees create feelings of relaxation and well-being*** when people live and work within urban forests.

2) ***Trees provide privacy and sense of solitude and security.***

3) ***Trees shorten post-operative hospital stays*** when patients are placed in rooms with a view of trees and open spaces.

MAJOR ELEMENTS OF AN URBAN FORESTRY PROGRAM

Major Elements and/or Steps:

1. Select a program or standards.
2. Establish a tree board.
3. Adopt a model tree ordinance/ landscape ordinance.
4. Establish a program budget.
5. Staff the program.
6. Develop a management plan/inventory.

Step 1. Select a Program or Standards.
The two most popular options for urban forestry programs or standards are the National Arbor Foundation and the National Allocation Method.

A. National Arbor Foundation — USA Program standards
To qualify for Tree City USA, a city must meet four standards established by the Arbor Day Foundation and the National Association of State Foresters. These standards were established to ensure that every qualifying community would have a viable tree management plan and program. The standards include the following:

1. Tree board or department
Someone must be legally responsible for the care and management of the community's trees. This may be a professional forester or arborist, an entire forestry department, or a volunteer tree board. Often, both a professional staff and an advisory tree board are present, which is a good goal for most communities. A tree board, or commission, is a group of concerned volunteer citizens directed by ordinance with developing and administering a comprehensive tree management program. Balanced, broad-based community involvement is encouraged. Boards function best if not composed entirely of tree-related professionals such as professors, nursery operators, arborists, etc. Fresh ideas and different perspectives are added by citizens with an interest in trees that is entirely vocational. Limited, staggered terms of service will prevent stagnation or burnout, while at the same assuring continuity.

2. Tree care ordinance
The tree ordinance must establish a tree board or urban forestry department and give this body the responsibility for writing and implementing an annual community forestry work plan along with authority over all publicly owned lands. Beyond that, the ordinance shall be flexible enough to fit the needs and circumstances of the particular community. A tree ordinance provides an opportunity to set good policy and back it with the force of law when necessary. Ideally, it will provide clear guidance for planting, maintaining and removing trees from streets, parks and other public places.

3. Community forestry program with an annual budget of at least $2 per capita
Evidence is required that the community has established a community forestry program that is supported by an annual budget of at least $2 per capita. At first, this may seem like an impossible barrier to some communities. However, a little investigation usually reveals that more than this amount is already spent by the municipality on its trees. If not, this may signal serious neglect that will cost far more in the long run. In such a case, working toward Tree City USA recognition can be used to reexamine the community's budget priorities and redirect funds to properly care for its tree resource before it is too late. Ideally, this standard

will be met by focusing funding on an annual work plan developed after an inventory is completed and a report is approved by the city council. Such a plan will address species diversity, planting needs, hazardous trees, insect and disease problems, and a pattern of regular care such as pruning and watering.

4. An Arbor Day observance and proclamation

This is the least challenging and probably the most enjoyable standard to accomplish. An Arbor Day celebration can be simple and brief or an all-day or all-week observation. It can be a simple tree planting event or an award ceremony that honors leading tree planters. For children, Arbor Day may be their only exposure to the green world or a springboard to discussions about the complex issue of environmental quality. The benefits of Arbor Day go far beyond the shade and beauty of new trees for the next generation. Arbor Day is a golden opportunity for publicity and to educate homeowners about proper tree care. Utility companies can join in to promote planting small trees beneath power lines or being careful when digging. Smokey Bear's fire prevention messages can be worked into the event as can conservation education about soil erosion or the need to protect wildlife habitat. Still another way to develop Arbor Day is to link it with a tree-related festival. Some that are currently celebrated include dogwood festivals, locust bloom festivals and Macon, Georgia's Cherry Blossom Festival that annually brings more than $ 4.25 million into the local economy. In meeting the four standards, help is available. The urban and community forestry coordinator in your state forester's office will work with communities to take these first steps toward better community forestry.

B. National Allocation method

This model, governed by the Department of Agriculture, Division of Forestry, stresses the need for a community to meet the following four urban forestry elements:

1. Tree board;
2. Tree ordinance;
3. Staffing; and
4. Inventory/management plan.

Step 2. Establish a tree board.

Usually, the first step after initial educational efforts is to establish a legally constituted board, commission or committee to act as an advisory group to city government. This can be accomplished through an ordinance or charter procedure. Tree boards in larger cities may perform in broad planning, policy making, advisory and coordinating roles. In smaller towns, a tree board will be more involved in developing budgets, creating specific forestry plans and annual work plans, and perhaps even in helping carry out program operations.

Tree board members may be elected or appointed and may or may not be given policy-making powers. The board may be financially independent, an incorporated entity or a budgeted agency of city government.

A broad representation on the board from various agencies and interest groups will increase the board's credibility to balance the needs of different segments of the community.

A tree board ordinance is sometimes a stand-alone ordinance or part of a broader overall tree ordinance providing for care of urban trees. However constituted, the following elements should be included:

1. Statement of creation and establishment;
2. Number of members;
3. Qualifications of members;
4. Term of office, succession, and provision for staggered terms;

5. Provision for vacancies;
6. Compensation, if any;
7. Board duties and responsibilities;
8. Scope of responsibility; and
9. Operational provisions, rules, recordkeeping, etc.

Step 3. Adopt a tree ordinance/ landscape ordinance.

The next step is to develop a tree ordinance. The purpose of most ordinances is to protect and maintain existing trees while providing for new ones. Ordinances providing for the overall care of the urban forest vary greatly. The ordinance should provide for and facilitate adequate management of your urban forest. To do so, your ordinance should do three things: 1) provide authority to conduct forestry programs; 2) define responsibility — who is responsible for certain parts of the urban forest — particularly important in cases of street side or other easement areas; and 3) set forth minimum standards for management to provide for public safety, health, convenience, and general welfare.

To ensure the above, city tree ordinances generally include the following elements:

1. Purpose and intent;
2. Definitions;
3. Establishment of a tree board (may be a separate ordinance);
4. Clarification of title to and responsibility for trees on city property;
5. Designation of city forester or other official with responsibility and authority;
6. Planting requirements for trees on municipal property or easements;
7. Maintenance responsibilities and clarification of responsibilities of adjacent property owners in cases of street sides or other easements;
8. Removal requirements and specifications;
9. Condemnation of trees on private property;
10. Requirements of private arborists and landscape contractors (licensing, bonding, insurance);
11. Preservation or protection of heritage and historic trees and other vegetation;
12. Prohibition of interference with forestry officials; and
13. Violations, penalties and appeals.

A comprehensive tree ordinance addresses the following three key components: 1) tree protection; 2) landscape architecture standards; and 3) street tree requirements.

MODEL TREE ORDINANCE
Establishing a Tree Board

This document is designed to assist communities in preparing tree ordinances. It is intended to supplement, not replace, the expertise of the community's legal resources.

Note: Discussions and explanations are in bold and single spaced. Ordinance sections are in regular type and are double spaced to allow for insertions appropriate for the individual community.

The purpose of this tree ordinance is to provide a mechanism for the management of trees and woody vegetation in the City/Town of _____. Since adoption of an ordinance is one of the requirements for Tree City USA recognition, the City/Town of _____ hereby adopts this ordinance in order to establish guidelines for tree planting, cutting and care in the City/Town of _____.

Article I. Definitions

The following definitions may be considered for inclusion in a city tree ordinance.

1. Tree — a woody plant with a single trunk or multiple trunks capable of growing to a height of 15 feet or more.
2. Shrub — a woody plant with a multiple stem capable of growing to a height of up to 15 feet.
3. Small Tree — a tree that grows up to 25 feet in height.
4. Medium Tree — a tree that grows between 25 and 45 feet in height.
5. Large Tree — a tree that grows greater than 45 feet in height.
6. Public Tree — a tree growing in an area owned by the community, including parks, public buildings, schools, hospitals and other areas to which the public has free access.
7. Private Tree — a tree growing in an area owned by a private individual, business or commercial establishment, company, industry, private institution or other area not owned by government entities.
8. Street Tree — a tree growing within a public right of way along a street, in a median or in a similar area in which the public right of way borders areas owned by private individuals.
9. Public Utility — that section of local government in charge of electrical, water, sewer, natural gas, telephone or cable television distribution in the community and having responsibility for keeping distribution lines free of hazards, including trees.
10. Private Utility — an entity similar to above that is a private for-profit corporation.
11. City Forester — a city employee responsible for the city's tree program. He or she also may be titled urban forester, city arborist, municipal forester or tree warden.
12. Pruning — selective removal and thinning of the upper portions of the tree, taking into account the shape and natural structure of the tree.
13. Topping — arbitrary removal of various portions of the tree, thereby leaving stubs, with no regard for the natural structure of the tree.
14. Crownspread — the distance from the ends of branches on one side of the tree, through the trunk, to the ends of the branches on the other side.
15. Line Clearance — removal of limbs and branches growing within a set distance of electrical distribution lines.
16. Tree Density Factor — a number derived from the combination of the density of trees remaining on a site and the density of additional trees to be planted.
17. Other definitions may be required by a particular city's unique situation.

Article II. Tree Board

Section 1 — Creation of a Tree Board

There is hereby created a Tree Board for the City/Town of _____, which shall consist of five (5) members (*more or less if the city chooses*) who are citizens and residents of the city. Members shall be appointed by the mayor and approved by the governing body.

*(**Note:** Depending on expertise available, this section may specify that one or more members of the board be representatives of institutions that deal with trees and have expertise in the area of forestry, such as colleges, government agencies, etc.)*

Section 2 — Term of Office

Members shall serve three (3) year terms, except the first board, which will have two (2) members appointed for one year and three (3) members appointed for two years. Members may serve successive terms. Vacancies are filled by appointment by the Mayor until the end of the term.

Section 3 — Operation

The board shall choose its own officers, make its own administrative rules and regulations, and keep a record of its proceedings. Copies of the minutes shall be available to the governing body after each Tree Board meeting. Meetings shall be held quarterly, or more often if called by the chairman of the board. A majority of the members shall constitute a quorum for transaction of business.

Section 4 — Duties and Responsibilities

The duties of the Tree Board shall include, but not be limited to the following:

a. Prepare a tree plan for the community
b. Coordinate tree-related activities
c. Conduct an Arbor Day ceremony
d. Provide tree information to the community
e. Maintain a recommended tree list for the community
f. Recognize groups and individuals completing tree projects
g. Coordinate publicity concerning trees and tree programs
h. Coordinate donations of trees or money to purchase trees
i. Adopt rules and regulations pertaining to the tree program
j. Perform other tree-related duties and opportunities that arise from time to time

The Tree Board may consult with arborists, foresters and others with specific expertise in the subject area when performing their duties and responsibilities. Any compensation or contracts for services performed by such experts or professionals shall be approved by the governing body.

Section 5 — Compensation

Members of the board shall serve without compensation.

*(**Note:** Most cities do not pay their tree board members.)*

Article IIIA. Tree Planting Option 1

The following sections provide only a general statement about tree planting. This option should be used if the city Tree Board will adopt rules and regulations governing planting.

Section 1 — Tree planting shall be undertaken by the City/Town on all public areas in a systematic manner to assure diversity of age classes and species. Areas to be planted, density, appropriate species, and other aspects of the planting function shall be determined by the Tree Board and contained in rules and regulations adopted by the board.

Section 2 — Planting of trees on private property is encouraged, especially in areas where the public may have an extraordinary interest. The Tree Board will provide information about species, planting techniques, and placement guidelines when requested by residents.

Article IIIB. Tree Planting Option 2

The following sections provide a detailed outline of planting requirements as an alternative to rules and regulations adopted by the Tree Board.

Section 1 — Size

All trees in public areas capable of reaching a mature height of more than 30 feet shall be at least 1-1/4" diameter (at 6" height) and 8 to 10 feet tall at time of planting. Small maturing trees, between 15 feet and 30 feet at maturity, shall be 5 feet to 6 feet tall at planting.

Section 2 — Grade

Trees to be planted shall be free of insects, diseases, and mechanical injuries and have reasonably straight trunks with a strong leader branch. Balled and burlapped trees shall be required where bare root trees cannot be handled and stored properly prior to planting.

Section 3 — Spacing

Large trees capable of achieving more than 45 feet in height should be spaced at least 40 feet apart. Medium trees capable of achieving 30 to 45 feet in height should be spaced 30 feet apart. Small trees capable of achieving 15 to 30 feet in height should be spaced at 20-foot intervals. Exceptions may be granted by the Tree Board when a valid landscape plan is followed or when larger or smaller spacings are needed to achieve a desired effect.

Section 4 — Planting near existing objects

Only small trees are permitted to be planted within 10 feet of utility lines. In street plantings, no tree may be planted closer than 10 feet from a fire hydrant, utility pole or street light, 15 feet from a driveway or street intersection, or 30 feet from a street or street intersections. When planting between sidewalks and curbs, 6 feet between curb and sidewalk is the minimum distance required for small trees, 8 feet for medium trees, and 10 feet for large trees.

Section 5 — Planting Techniques
Holes shall be dug to give adequate room for the root system. The diameter of the hole should be at least 12 inches larger than the diameter of the root ball or root system. The depth of planting should be at the same level as the tree had grown previously. Backfill should be the same material that was removed from the hole, with no additives except low nitrogen fertilizer, which may be added if the Tree Board deems it necessary. Holes dug by power augers must have their sides chipped by a hand shovel to break glazing affected by the auger. Trees may be guyed in windy areas or in other areas where support is determined necessary by the Tree Board. All guy wires shall be removed within 18 months.

Article IVA. Tree Care Option 1

Ordinances generally have one or more sections dealing with tree care and maintenance. As in Article III, there is the option of including a broad statement about tree care, to be supplemented later by rules and regulations adopted by the tree board. The following sections are general and should be supplemented by the board's rules and regulations.

Section 1 — Tree maintenance rules and regulations may address pruning, fertilizing, watering, insect and disease control or other tree care activities. The city/town shall take responsibility for maintenance activities needed to keep the public trees reasonably healthy and minimize the risk of hazard trees could cause to residents and visitors of the city/town. Determination of maintenance needs will be made by the Tree Board. Tree care may be accomplished by city/town personnel or by contract with commercial tree care companies.

Section 2 — Care and maintenance of private trees are encouraged to minimize safety hazards to people and the health risk to other trees in the community. The Tree Board will provide information in a timely manner to residents about all aspects of tree care, including the latest techniques and procedures currently being practiced.

Section 3 — The practice of tree topping is prohibited on all public trees and is strongly discouraged as a tree care practice for private trees. Proper pruning with branch removal at branch or trunk junctures is the best practice for limb removal.

Article IVB. Tree Care and Protection Option 2

A number of other options also may be included in a tree care section. For instance, certain specifications about pruning, fertilizing, or specific insect or disease problems may be included as an alternative to the prior section, which leaves such determinations to the tree board.

Section 1 — Trees growing along side streets and sidewalks must be pruned free of limbs to a height of 8 feet for sidewalks and 12 feet for streets.

Section 2 — The standard tree pruning method will be branch collar pruning as opposed to stubs or flush cuts. Large limbs and branches will be precut to prevent excessive peeling of the bark, followed by cutting the remaining stub.

Section 3 — Fertilization of trees will be accomplished when the Tree Board determines a tree is deficient in nutrients. Determination is made by leaf color or size, twig growth, soil test or other diagnostic methods. Fertilizer will be applied on the soil surface at the appropriate time of year.

Section 4 — Because of the special significance of the dogwood tree (this also could apply to oak, elm, crabapple or any species of tree) to the city/town, the Tree Board will inspect trees for dogwood borer (or other insect or disease problems) and effect treatment, where infestation has occurred, at the appropriate time of year. The Tree Board also shall give notice to owners of private infested trees and encourage said private owners to effect treatment of affected trees growing on their property.

Section 5 — Extensive root system damage to public trees is prohibited. Grade changes and trenching within the crown spread (ends of branches) is prohibited without permission of the Tree Board. Private owners of trees are encouraged to consult the Tree Board before proceeding with these activities.

Article V. Tree Removal

Section 1 — Dead trees and dying trees on public property that pose a safety or health risk to residents or to other trees will be removed. Upon inspection by the Tree Board, trees on public property found to be dead and those found to be dying that pose a safety or health risk to residents or other trees shall be removed in a timely manner.

Section 2 — Upon finding dead or dying trees on private property, the Tree Board shall notify the landowner of such condition in writing, by mail, and encourage the landowner to remove said tree.

Section 3. — Stump removal to below ground level is considered part of the tree removal process.

Article VI. Special Considerations

Section 1 — Tree topping of all public trees is prohibited, and topping of private trees is strongly discouraged. The Tree Board shall promote the use of proper pruning procedures.

Section 2 — Tree pruning in the vicinity of public power lines shall be undertaken by the public utility (or private utility, if applicable) to assure the supply of electricity to its customers. Drop crotch pruning and pruning to laterals are the required methods. Where possible, the utility shall undertake a program of replacing large trees with small maturing ornamental trees of the kind recommended by the Tree Board.

Article VII. Protection from Construction, Development and Land Use Changes

The city/town maintains that it is in the best interest of all concerned to save as many existing trees as practical. In this interest, as it pertains to commercial and residential development, the city/town may adopt regulations requiring developers and builders to create tree impact plans prior to removing any tree from project sites. Regulations adopted by the city/town may further require minimum tree densities for different classes or types of developments, and developers/builders may be required to plant trees to meet such density requirements. The Tree Board will assist the city/town in drafting the regulations to be adopted

or will provide recommendations for regulations that should be adopted. Regulations adopted by the city/town may be incorporated into subdivision regulations to be enforced by the Planning Commission or may be incorporated into the city/town zoning ordinance to be enforced by the board or official having authority over zoning issues.

MODEL TREE ORDINANCE
Requiring City Forester

This document is designed to assist communities in preparing tree ordinances. It is intended to supplement, not replace, the expertise of the community's legal resources.

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6. Public Tree — a tree growing in an area owned by the community, including parks, public buildings, schools, hospitals, and other areas to which the public has free access.
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8. Street Tree — a tree growing within a public right of way along a street, in a median or in a similar area in which the public right of way borders areas owned by private individuals.
9. Public Utility — that section of local government in charge of electrical, water, sewer, natural gas, telephone or cable television distribution in the community and having responsibility for keeping distribution lines free of hazards, including trees.
10. Private Utility — an entity similar to above that is a private for-profit corporation.
11. City Forester — a city employee responsible for the city's tree program. He or she may also be titled urban forester, city arborist, municipal forester, or tree warden.
12. Pruning — selective removal and thinning of the upper portions of the tree, taking into account the shape and natural structure of the tree.
13. Topping — arbitrary removal of various portions of the tree, thereby leaving stubs, with no regard for the natural structure of the tree.
14. Crownspread — the distance from the ends of branches on one side of the tree, through the trunk, to the ends of the branches on the other side.
15. Line Clearance — removal of limbs and branches growing within a set distance of electrical distribution lines.
16. Tree Density Factor — a number derived from the combination of the density of trees remaining on a site and the density of additional trees to be planted.
17. Other definitions may be required by a particular city's unique situation.

Article II. City Forester

Section 1 — Appointment

The City Forester shall be appointed by the governing body after completing a competitive review process. The governing body shall determine whether the City Forester shall be a contractor, performing duties for the city/town in accordance with terms specified in a contract, or shall be a municipal employee subject to all the rules, regulations and terms of employment pertaining to municipal employees. The City Forester shall, through education and experience, be skilled and trained in the art and science of municipal arboriculture.

Section 2 — Compensation

If the governing body determines that the City Forester shall be a municipal employee, he or she shall receive a salary commensurate with training and experience, plus any other benefits that municipal employees at that position level may receive. If the governing body determines that the City Forester shall be a contractor, the compensation and any benefits that may be made available to the City Forester shall be specified in the contract.

Section 3 — Duties

The duties of the City Forester shall include but not be limited to the following:

a. Plant, maintain and remove trees under his jurisdiction
b. Coordinate all tree activities with other agencies, organizations and groups in the city
c. Provide information and public relations to citizens and groups in the city regarding trees
d. Maintain a recommended tree species list
e. Gather information and publish reports as needed about the city tree resource
f. Respond to complaints about tree problems
g. Prepare long-range and annual plans for city trees
h. Perform other tree-related duties

The City Forester shall further provide recommendations to the governing body regarding rules and regulations to be adopted governing the planting, care and maintenance and removal of trees in the city/town.

Article IIIA. Tree planting Option 1

Ordinances generally contain guidelines governing tree planting. One ordinance option is to broadly state planting requirements and leave details to rules and regulations to be adopted by the city/town at a later date. In all options, it is recommended that lists of tree species NOT be incorporated into the ordinance. Lists should be formulated by the City Forester where flexibility for updating is greatest.

Section 1 — Tree planting shall be undertaken by the city on all public areas in a systematic manner to assure diversity of age classes and species. Areas to be planted, density, appropriate species, and other aspects of the planting function shall be determined by the governing body, in consultation with the City Forester.

Section 2 — Planting of trees on private property is encouraged, especially in areas where the public may have an extraordinary interest. The City Forester will provide information about species, planting techniques, and placement guidelines when requested by residents.

Article IIIB. Tree Planting Option 2

The following sections provide a detailed outline of planting requirements. If they are not included in the ordinance, they should be adopted as rules and regulations at a later date.

Section 1 — Size

All trees in public areas capable of reaching a mature height of more than 30 feet shall be at least 1-1/4" diameter (at 6" height) and 8 to 10 feet tall at time of planting. Small maturing trees, between 15 feet and 30 feet at maturity, shall be 5 feet to 6 feet tall at planting.

Section 2 — Grade

Trees to be planted shall be free of insects, diseases and mechanical injuries and have reasonably straight trunks with a strong leader branch. Balled and burlapped trees shall be required where bare root trees cannot be handled and stored properly prior to planting.

Section 3 — Spacing

Large trees capable of achieving more than 45 feet in height should be spaced at least 40 feet apart. Medium trees capable of achieving 30 to 45 feet in height should be spaced 30 feet apart. Small trees capable of achieving 15 to 30 feet in height should be spaced at 20 feet intervals. Exceptions may be granted by the City Forester when a valid landscape plan is followed, or when larger or smaller spacings are needed to achieve a desired effect.

Section 4 — Planting near existing objects

Only small trees are permitted to be planted within 10 feet of utility lines. In street plantings, no tree may be planted closer than 10 feet from a fire hydrant, utility pole or street light, 15 feet from a driveway or street intersection, or 30 feet from a street or street intersections. When planting between sidewalks and curbs, 6 feet between curb and sidewalk is the minimum distance required for small trees, 8 feet for medium trees, and 10 feet for large trees.

Section 5 — Planting Techniques

Holes shall be dug to give adequate room for the root system. The diameter of the hole should be at least 12 inches larger than the diameter of the root ball or root system. The depth of planting should be at the same level as the tree had grown previously. Backfill should be the same material that was removed from the hole with no additives except low nitrogen fertilizer, which may be added if the City Forester deems it necessary. Holes dug by power augers must have their sides chipped by a hand shovel to break glazing affected by the auger. Trees may be guyed in windy areas or in other areas where support is determined necessary by the City Forester. All guy wires shall be removed within 18 months.

Article IVA. Tree Care Option 1

Ordinances generally have one or more sections dealing with tree care and maintenance. As in Article III, there is the option of including a broad statement about tree care or outlining detailed sections about maintenance. The following section is broad and should be supplemented later by rules and regulations to be adopted by the governing body.

Section 1 — Tree maintenance may include pruning, fertilizing, watering, insect and disease control or other tree care activities. The city/town shall take responsibility for maintenance activities needed to keep the public trees reasonably healthy and to minimize the risk hazard trees could cause to residents and visitors of the city/town. Determination of maintenance needs will be made by the City Forester. Tree care may be accomplished by city personnel, by the City Forester or by contract with commercial tree care companies.

Section 2 — Care and maintenance of private trees are encouraged to minimize safety hazards to people and the health risk to other trees in the community. The City Forester will provide information in a timely manner to residents about all aspects of tree care, including the latest techniques and procedures currently being practiced.

Section 3 — The practice of tree topping is prohibited on all public trees and is strongly discouraged as a tree care practice for private trees. Proper pruning with branch removal at branch or trunk junctures is the best practice for limb removal.

Article IVB. Tree Care and Protection Option 2

A number of other options also may be included in a tree care section. For instance, certain specifications about pruning, fertilizing, or specific insect or disease problems may be included.

The following provisions apply to trees growing on public property and on public right-of-ways and easements.

Section 1 — Trees growing along side streets and sidewalks must be pruned free of limbs to a height of 8 feet for sidewalks and 12 feet for streets.

Section 2 — The standard tree pruning method will be branch collar pruning as opposed to stubs or flush cuts. Large limbs and branches will be precut to prevent excessive peeling of the bark, followed by cutting the remaining stub.

Section 3 — Fertilization of trees will be accomplished when the City Forester determines a tree is deficient in nutrients. Determination is made by leaf color or size, twig growth, soil test, or other diagnostic methods. Fertilizer will be applied on the soil surface at the appropriate time of year.

Section 4 — Because of the special significance of the dogwood tree (this also could apply to oak, elm, crabapple or any species of tree) to the city/town, the City Forester will inspect trees for dogwood borer (or other insect or disease problems) and effect treatment, where infestation has occurred, at the appropriate time of year. The City Forester shall also give notice to owners of private infested trees and encourage said private property owners to effect treatment of affected trees growing on their property.

Section 5 — Extensive root system damage to public trees is prohibited. Grade changes and trenching within the crown spread (ends of branches) is prohibited without permission of the City Forester. Owners of private trees are encouraged to consult the City Forester before proceeding with these activities.

Article V. Tree Removal

Section 1 — Dead trees and dying trees on public property that pose a safety or health risk to residents or to other trees will be removed. Upon inspection by the City Forester, trees on public property found to be dead and those found to be dying that pose a safety or health risk to residents or other trees shall be removed in a timely manner.

Section 2 — Upon finding dead or dying trees on private property, the City Forester shall notify the landowner of such condition in writing, by mail, and encourage the landowner to remove said tree.

Section 3 — Stump removal to below ground level is considered part of the tree removal process.

Article VI. Special Considerations

Section 1 — Tree topping of all public trees is prohibited, and topping of private trees is strongly discouraged. The City Forester shall promote the use of proper pruning procedures.

Section 2 — Tree pruning in the vicinity of power lines shall be undertaken by the public utility (or private utility, if applicable) to assure the supply of electricity to its customers. Drop crotch pruning and pruning to laterals are the required methods. Where possible, the utility shall undertake a program of replacing large trees with small maturing ornamental trees of the kind recommended by the City Forester.

Article VII. Protection from Construction, Developments and Land Use Changes

The city/town maintains that it is in the best interest of all concerned to save as many existing trees as practical. In this interest, as it pertains to commercial and residential development, the city/town may adopt regulations requiring developers and builders to create tree impact plans prior to removing any tree from project sites. The regulations adopted by the city/town may further require minimum tree densities for different classes or types of developments, and developers/builders may be required to plant trees to meet such density requirements. The City Forester will assist the city/town in drafting the regulations to be adopted, or by providing recommendations for regulations which should be adopted. Regulations adopted by the city/town may be incorporated into subdivision regulations to be enforced by the Planning Commission or may be incorporated into the city/town zoning ordinance to be enforced by the board or official having authority over zoning issues.

Step 4. Develop a Program Budget.
For any program to be successful there must be a budget. To qualify for Tree City USA a city must establish an annual budget of at least $2 per capita.

Step 5. Staff the Program.
A good way to ensure adequate staffing is to cross train your employees in public works to take care of trees. City arborists should be certified. Work plans should indicate how the jobs will be accomplished. There are several possibilities depending on each municipality's situation and preference for getting work done. A few options include the use of in-house (city or county) crews, outside contracts, volunteer or contractual labor, or any combination of these.

The decision on whether to use municipal workers and equipment or contractors, or both, to perform community forestry activities depends on many variables. Following are some of the more common ones:

1. The size of the municipality and its urban forest dictate, to a degree, the community's degree of flexibility in the mix of resources used. Larger municipalities have a portion of their work done by in-house crews because it assures that crews are available for emergencies and provides for more flexibility,
2. Local policies and regulations relating to municipal work forces and purchasing and contracting for services may determine use of in-house resources instead of contracting.
3. Cost effectiveness of in-house services is certainly a consideration. Some activities may be done more effectively by contractors. While this may not be the overriding factor, it should be part of the overall consideration.
4. Periodic or seasonal characteristics of some jobs may lend themselves to contracted services, and this may appeal to some decision makers. Because there is no long-term commitment in financing contract operations, as opposed to establishing a municipal work force and purchasing equipment, funds for the use of contractor services may be easier to secure for certain activities.
5. Employees involved in urban forestry should have accompanying job descriptions, and employers should provide ample training and development opportunities.

TIPS FOR SELECTING AN ARBORIST

Hiring a tree care provider deserves careful consideration and caution. A mistake can be expensive and long lasting, while the right choice can assure health, beauty and longer life for your trees and landscape. The following suggestions will help a board select an arborist:

1. Look for professional membership affiliations.
2. Request that the arborist or tree worker be certified through a program of the International Society of Arboriculture (ISA). This program is the standard of performance for appropriate training, experience and knowledge about tree care. Additionally, it is best to use an arborist who is familiar with native trees.
3. Require certificate insurance.
4. Ask for local references.
5. A good arborist will offer a wide range of services, including removal, pruning, fertilizing, pest control, etc.
6. A good arborist will not recommend topping.
7. A knowledgeable arborist will not use climbing spikes if the tree is to remain in the landscape.

TIPS FOR WORKING WITH VOLUNTEERS

Sustainable urban forestry requires far more than a single department or organization responsible for a community's trees. It requires a partnership of all interested people, young and old, professional and non-professional. Volunteers can fill this need. Some of the benefits when using volunteers include:

1. Obtaining skills that may not be on staff. Volunteers typically include a cross section of the community: lawyers, landscapers, writers, artists, business people, teachers and many others. Their talents and contacts can add depth and power to any forestry program.
2. New ideas. An array of vocational and cultural backgrounds is sure to bring ideas. Some may not be workable, but others can lead to great new projects or the success of old ones.
3. Public support. Volunteers can serve as a conduit between urban foresters and their constituents. They can speak up for funding, defend management decisions, challenge politicians or special interests, and serve as a link with broad segments of the community.
4. Extra hands, more work. Whether it is pruning young trees, planting, or staffing exhibits and educational programs, volunteers expand the urban forestry work force. More can be accomplished, benefiting the tree resource, citizens of the community, and the volunteers themselves.

According to the National Arbor Day Foundation, there are five important tips to working well with volunteers:

1. Work with existing volunteer groups when possible instead of creating yet another organization. Or, if you are involved in the leadership of a group, aggressively recruit members. Of course, be open to all who are interested, but also personally ask people to join who you know would add strength, balance, diversity and the kind of talent needed to accomplish your goals.
2. Provide direction. Most volunteers want guidance and do not want their time wasted. Use an agenda at meetings, assign specific doable tasks complete with deadlines and a clear idea about the expected outcome or product. For specific positions (secretary, treasurer, etc.) develop job descriptions just like those for paid positions.
3. Provide orientation and training. Orientation can be a presentation or at least a manual. The manual should include the history, mission and goals of your organization; policies; a directory of who's who; and basic information about tree care and urban forestry.

Volunteers are suited for ...	**Professionals are best at ...**
Planting trees	Selecting and ordering trees
Watering trees	Fertilizing
Mulching	Aerating
Removing stakes	Making staking recommendations
Distributing door hangers	Preparing educational content
Sponsoring beautification contests	Conducting workshops and training
Staffing fair booths	Developing budgets
Monitoring and preventing vandalism	Controlling insects and diseases
Advocating planning and zoning reform	Advising on planning and zoning
Cleaning tree wells	Removing tree grates

4. Supervise. An important part of successful volunteer management is trust and delegation of duties. Train and explain, then step back and let the volunteers do their jobs. However, provide helpful feedback as needed and plenty of positive reinforcement.
5. Thank! Virtually everyone likes to be recognized for the good works they perform, especially volunteers. Often, this is the only pay they receive. Express appreciation often and sincerely, including written notes, formal letters, plaques or other tokens of appreciation.

Step 6. Develop a Management Plan.
In order to prepare an up-to-date, comprehensive management plan, it is essential to follow a three-tiered model including 1) tree inventory 2) assessment and 3) urban forestry management plan. (See more details on the following pages.)

TREE INVENTORY PLAN

[The following text was prepared by State Forester Bruce Webster.]

Tree Inventory Plan

The simplest form of inventory is a tree count. It is the quickest, easiest, cheapest inventory, and it can be done by anyone who can count. The results would be useful to someone who might want to know the number of trees on a given property or within a certain area, but a simple tree count has major limitations. Almost immediately questions such as "What kinds of trees are there?" or "How big are they?" are asked.

It is of the utmost importance to ask these types of questions before an inventory is conducted. A manager or owner must decide what information he or she needs and how that information will be used. Is knowing the tree species important? How much detail about tree location is required? Gathering information about trees is expensive and time consuming. Collecting more information than is needed is wasteful, but gathering too little information would necessitate redoing the inventory.

Why is an inventory of trees so important? There are several reasons. First, trees are a community resource. They produce shade, absorb air pollutants and mitigate storm water runoff. They have a direct, measurable positive economic benefit to a community. Second, trees provide psychological and aesthetic benefits. Third, trees are long lived, and as such, need to be considered part of the capital assets of the community. Fourth, trees need periodic maintenance. Because they are long lived, they cannot be ignored without adverse consequences to the community. And finally, they are large organisms and can create conflicts with and cause damage to homes, cars and other community assets.

Inventory Techniques

The task of developing an inventory of a forest can be daunting. For instance, how does one go about getting information about a plot of forestland that is 200 to 300 acres in size? It would be impossible to measure and record every tree.

Foresters collect data from sample plots from the forest. The plot may be a quarter-acre in size, and they might take data from 25 to 30 plots. Within each plot the species; tree sizes, usually diameter and log length; conditions, especially of the trunks; and locations are recorded. The location includes the plot location within the forest, and many times the locations of individual trees within the plot.

The data from all the plots are then summarized, and a process called developing an assessment of the woods is completed. This leads to the development of a plan for the forest.

When inventorying urban and landscape trees, the system may employ a plot sampling or a complete

inventory. For public trees, a complete inventory typically is undertaken. The argument for this is that since it is not a natural forest, sampling would not give statistically valid data, and the information gathered may be applied directly to management needs for an individual tree. Again, data from all the trees are summarized in an assessment then used to develop a management plan. If other aspects of the urban forest, such as private property or wooded areas, need to be inventoried, a sampling technique may be employed.

What technique should be used in a greenway where there is a mix of landscape trees and forestland? It may require both techniques and two inventories. The landscape tree inventory may be used for landscape trees in mowed areas, while a sampling may be used in wooded areas.

Because greenways may be long narrow strips of land, a special plot system may be employed that takes a cross section of the greenway at periodic intervals.

An aerial imagery inventory has its own unique set of uses and has a completely different approach with its unique data set of information collected.

Data Collection

Generally there are four pieces of information collected on each tree during an inventory: species, size, condition and location. Many inventories include work needed as a fifth piece of information, but here it will be considered a subset of the condition determination. The reasoning is that a poor condition rating often can be attributed to a lack of maintenance, and completing tree maintenance often improves the condition rating. Tennessee's inventory system also includes a target classification, which is a component of evaluating whether a tree is hazardous.

A Note About Planting

In addition to recording information about trees, an inventory often samples tree spaces so that managers can have an indication of planting needs. Obviously, species, size and condition data cannot be collected on a tree that isn't there, but the potential location of a tree is important in developing the long-term management plan.

Species

Knowing what trees are growing in the park, greenway, or other forested area is vital. The types and frequencies of trees can provide a significant amount of information. For instance, an area dominated by one species can indicate the potential for insect and disease problems. (Dutch elm disease taught us that a monoculture of American elms along city streets is an invitation to disaster.) Also, knowing the species mix present can be a guide to developing diversity by planting less common species of trees.

Information on species typically is recorded by species name. Either the common or the scientific name can be used. Some inventory systems use a species code. This is useful to speed data recording, but it requires familiarity with the codes. Unless an individual is doing an extensive inventory, memorizing codes is not practical.

Occasionally inventories will record variety or cultivar, if known. Because cultivars and varieties are so similar to the species, collecting this information typically is not recommended unless there is a specific use for this data. An inventory will sometimes record only genus information, such as oak, elm or hickory, but species specific information is preferred.

Size

There are three components that make up tree size. They are diameter or circumference of the trunk, height or crown height, and crown spread (canopy cover).

Measurements of forest trees include diameter or circumference and a trunk height. These dimensions give the volume of wood in a tree that then can be converted to lumber.

Urban and landscape trees may be measured in any number of ways. The most common is to measure diameter because of the speed and convenience of collecting data while giving an indication of size. This data can be used to make general conclusions about age of a population. (Species frequency may skew any age conclusions if the tree population includes a significant number of small maturing trees. Also, any direct correlation between size and age for an individual tree cannot be determined.)

Other size measurements may be taken if specialized data is needed. This relates back to the real purpose of doing an inventory. For instance, crown spread and crown height may be measured to give data on total canopy cover and crown volume over the landscape, which can be plugged into formulas that calculate the amount of solar or rainfall interception (heat island effect, storm water impact). Another size measurement combination could be trunk diameter and trunk height that would give information about urban tree biomass (biomass energy potential).

Some tree inventory systems record the actual tree size, while others use a size class. The advantage to record the actual trunk diameter in 2" diameter classes is that detailed information is gathered but can be categorized into size classes. Commonly used size classes are 0-6", 7-12", 13-18", 19-24", 25-30", and 31" and up.

Condition

The purpose of recording condition is to get a general idea of the health and potential hazard of the tree. Condition looks at insect and disease problems, structure of the tree's limbs, crown balance, foliage color (if available), trunk decay and missing bark, trunk flare wounds, estimate of life expectancy, growth (twig), dieback and other potential problems.

Assessment: Condition is usually converted to a numeric code relating to the factors mentioned. A common condition class system uses a 1 through 5 condition rating, with 1 being excellent condition. Other systems may use 1 through 10.

If the purpose of the inventory is to implement maintenance on the tree population, then recording the work needed is required. Work needed may include removal, light or extensive pruning, insect or disease treatment, or other intervention. If the purpose of the inventory is to evaluate tree hazard, then potential failure and potential target are subsets of the condition class that should be recorded.

Location

Location data is driven primarily by the amount of detail needed. If the purpose of the inventory is to have a general idea about the tree population within a park or certain area of a community, identifying that tree within the park or community may be sufficient. The location usually is identified sufficiently so that an individual tree may be found by another person. This detail can be provided by GPS coordinates or through construction of a map when the inventory is completed or with other detailed location methods. A detailed location must be recorded if follow-up evaluation or maintenance of an individual tree is one of the purposes of conducting the inventory.

Repeating the Inventory

Because trees are biological organisms, they create a dynamic environment. The forest or landscape is not static; it is constantly changing. Therefore, while data from the first inventory is used to guide development of the tree management, maintenance, or planting plan, the trees are changing, creating the need to repeat the inventory after a period of years.

The second inventory can be more valuable than the first because an inventory is a picture of the trees when data are collected. The second picture not only provides the basis for the revised management plan, it can be compared with the first and reveal the changes and trends that are occurring. To accurately capture these trends and changes, the same area must be inventoried the second time, whether or not it is the same plots or landscaped areas.

URBAN FORESTRY MANAGEMENT PLANNING

Urban forestry planning occurs on several levels. At the broadest level, strategic plans establish the overall goals and objectives of the organization's urban forestry efforts. Ideally, strategic planning is one of the first tasks undertaken in establishing a community forestry program. Also called long-range, comprehensive or master plans, strategic plans create a blueprint for administering and managing a community tree program. Strategic plans include input from local citizens, organizations, businesses, municipal staff and elected officials. They are integrated with other comprehensive community plans.

Urban forest management plans are specific to field operations of the community tree program. Typically based on a detailed tree inventory, management plans identify and prioritize site-specific tree planting, maintenance and removal activities within a multiyear time frame.

Urban forestry planning also takes on a variety of other forms. Land use plans, greenway plans, site development plans, public landscape design and maintenance plans and similar planning efforts require input from those involved with public tree care.

STRATEGIC PLAN

I. Executive Summary

II. Introduction
- A. Statement of Purpose and Scope
- B. Historical Background
- C. Current Situation
  - 1. People
  - 2. Policies
  - 3. Funding
  - 4. Trees

III. Goals
- A. Administrative/Management
- B. Public Awareness
- C. Tree Resource

IV. Strategies
- A. Actions
  - 1. Regulation/Policy
  - 2. Public Awareness/Education
  - 3. Program Management
  - 4. Funding
- B. Implementation Schedule with Budget
- C. Budget Justification

V. Evaluation Mechanism

VI. Appendices
- A. Community Map
- B. Survey Summaries
- C. Potential Funding Source(s)
- D. Technical Resources

MANAGEMENT PLAN

I. Executive Summary

II. Introduction
- A. Statement of Purpose and Scope
- B. Historical Background
- C. Current Situation
  - 1. Tree Planting and Care
    - a. Key Players and Roles
    - b. Contracted vs. In-House
    - c. Equipment Inventory
    - d. funding
  - 2. Tree Inventory Summary and Analysis

III. Goals: Forest

IV. Strategies
- A. Actions
  - 1. Tree and Stump Removal
  - 2. Maintenance
  - 3. Planting
  - 4. Administrative Support
- B. Implementation Schedule with Budget
- C. Budget Justification

V. Evaluation Mechanism

VI. Appendices
- A. Map of Management Districts
- B. Map of Utilities
- C. Technical and Safety Standards
- D. Species List

ROLES OF TREE BOARDS AND EMPLOYEES

To help prevent potential crisis situations that trees create periodically, a community should establish a tree board. This board is charged with looking ahead to the needs and potential problems of the community's tree resource. Doing so can save the community money and create a more aesthetically pleasing city or town.

Roles of tree board members may include any or all of the following:

- Policy formulation;
- Advising;
- Administration;
- Management;
- Representation; and
- Advocacy.

Roles

In addition to the long-term look at their trees, a community tree board may be responsible for accomplishing some or all of the following:

1. Planting trees;
2. Coordinating with other groups that might plant trees;
3. Preparing a plan of tree activities for the community;
4. Planning the Arbor Day ceremony;
5. Providing tree information to other groups;
6. Selecting species for various planting projects;
7. Arranging for donations of trees or money for trees;
8. Pruning young trees;
9. Collecting data on trees or arranging for a tree inventory to be accomplished;
10. Making safety inspections of public trees;
11. Advising municipal departments on tree problems and removal needs;
12. Setting up memorial tree planting programs;
13. Arranging for publicity about trees;
14. Establishing a local awards program to recognize individuals and groups for their tree efforts;
15. Handling complaints about tree problems;
16. Serving as a body of expertise about trees for the local government and its local citizens, especially when there is no city forester; and
17. Advising the local government on ordinance needs and revisions.

SAMPLE JOB DESCRIPTION: TREE BOARD MEMBER

Responsibilities: Develop, keep current, and help facilitate a plan to develop, conserve and care for the urban forest resources of the city.

Qualifications: Resident of the city with an interest in and knowledge of trees and related resources and their relationship to the human and physical environment of the city.

Activities:

- Develop and/or review annually and update as necessary a comprehensive community forestry plan.
- Assess the community urban forest situation using some type of inventory to determine short- and long-range program goals and objectives.
- Review, in cooperation with the city forester, annual plans for the city's urban forestry program.
- Advise the mayor, city council, and various departments on matters concerning trees and related resources.
- Inform residents on matters concerning the betterment of trees and related resources in cooperation with the city forester.
- Coordinate or conduct special projects for the betterment of the urban forest. Such projects should be included in annual plans.
- Keep abreast of current trends and issues in urban forestry through appropriate training and developmeny.

Examples of tasks, roles and responsibilities for a tree board member:

- Strategic planning: SWOT Analysis — What are the strengths, weaknesses, opportunities and threats to the city's urban forestry programs? This external scan will provide a snapshot of the city's current urban forestry condition and can be used as a catalyst to provide a long-range plan.
- Adopting an urban forestry management plan.
- Requesting appropriations from city council to fund urban forestry projects.
- Hiring an arborist.

SAMPLE JOB DESCRIPTION: ARBORIST (STAFF)

Responsibilities: Manages and supervises the urban forestry program, including planting, maintenance and removal activities. This position is responsible for maintaining trees and woody plants to ensure their healthy, safe, and attractive condition, including chemical applications, repairing, cabling, fertilizing, watering, pruning, and removing any dead, diseased or declining trees or other woody plants.

Supervision received: Receives general direction from the Public Works Director.

Essential functions may include, but are not limited to, the following:

1. Supervises the activities of crews involved in the planting, maintenance and removal of city trees; hires, trains, evaluates and manages subordinate personnel.
2. Reviews and evaluates tree maintenance needs by reviewing complaints and observing problems or upon direction from supervisor, and determines work priorities and assigns work to subordinates.
3. Receives and responds to a variety of complaints concerning status of city trees; provides procedural and policy information regarding tree trimming and removal. Schedules emergency action based on complaints; provides advice on proper care of trees and possible remedies for disease and pest problems; prepares tree damage and claim reports.
4. Prepares, maintains, updates and reviews street tree master plan; prepares written and oral reports regarding tree planting and tree removal to city commissions and committees.

5. Manages annual budget for Forestry Section, prepares specifications for and monitors contractual tree maintenance operations; completes necessary requisitions and reports to maintain the operations of the Forestry Section.
6. Keeps accurate records of the tree board's actions and maintains the computerized Tree Keeper program of all maintenance activity and tree inventory changes.

Qualifications: Knowledge of local tree and plant species and arboricultural practices in streets and parks; knowledge of insects and diseases that infect trees and plants in the southern region and the actions necessary to correct problems; knowledge of tree maintenance methods and equipment; knowledge of principles of supervision and people management skills; and knowledge of computer software applications to manage the urban forest. Ability to communicate effectively and concisely, both orally and in writing; ability to establish and maintain effective working relationships with city staff, contractors, citizen groups, and the public; and skill in directing, supervising, training and evaluating staff.

Training and Experience: Any combination of experience and training that would likely provide the required knowledge and abilities to perform the essential functions of the position.

BEST MANAGEMENT PRACTICES

The following cities are representative of best management practices of urban forestry:

1. Chattanooga, Tenn. — Tree maintenance program
2. Walla Walla, Wash. — Urban forestry management plan
3. Palo Alto, Calif. — Tree manual
4. Athens-Clarke County, Ga. — Tree program
5. Seattle, Wash. — Street plan

Chattanooga Tree Maintenance

The city of Chattanooga spent more than 7,000 hours in 2002 pruning and maintaining nearly 4,500 trees. The city was on a mission to add technology to Chattanooga's tree maintenance process as part of an effort to document maintenance costs for the city's urban forest. They are now using GPS and GIS to map tree locations and track the size and type of every tree along Chattanooga's city streets and downtown parks.

It took four months to inventory the trees in Chattanooga's expanded central business district, an area that covers about 200 square blocks. Members of the city forester's team hiked through downtown carrying backpack GPS units, entering data on each tree's location, species and size of the planting pit. They also noted whether or not the tree was irrigated.

Once the data was collected, the Chattanooga Urban Forestry Division created five categories based on the tree diameter and assigned each tree to its appropriate category. Classifying the trees in this way helped determine the number of pruning hours required to maintain them.

In addition to maintenance projections, the GIS tree inventory map helps the city in other ways. Because the map has the power of a database behind it, Urban Forestry personnel can query by

tree height, condition, pests, maintenance needs — whatever information is in the database. For example, overloading on one tree species could be disastrous should a pathogen, insect or disease attack that species, so experts suggest that cities have no more than 5 percent of one species in their overall mix. (Source: J. Brown, Saving the Urban Forest, Government Technology, 9/23/2003.)

Walla Walla, Wash.
In 1982 a citizen group, calling itself ReLeaf Walla Walla, formed with the purpose of addressing Walla Walla's street trees and to determine what could be done to prevent the loss of so many old trees and preserve the priceless canopy they provided. This group began to inventory all the trees in an effort to record them and to introduce ordinances protecting street trees. The ad hoc tree committee drafted a street tree ordinance, which was adopted by the city council in July 2000. The ordinance provided for the creation of an Urban Forestry Advisory Commission (UFAC) with membership comprising volunteer citizens. In addition the UFAC wrote an ordinance pertaining to heritage trees on both public and private property. This has been an effective means for private homeowners to protect their special trees from topping and otherwise detrimental practices. The UFAC also was given the task of producing an urban forest management plan (UFMP) to govern the urban forest under the jurisdiction of the city of Walla Walla. The UFMP presented the following program goals:

- Maintain, preserve, conserve, and improve existing urban canopy in Walla Walla;
- Remain a "Tree City USA";
- Preserve and protect native, significant and historical treescapes; and
- Coordinate all construction activities related to trees with the urban forestry program.

The UFMP also contained management and maintenance recommendations that addressed the urban forestry funding program; reduction of high risk trees and community outreach/education.

Palo Alto, Calif. — Tree Technical Manual
The Palo Alto Tree Technical Manual is a separately published document issued by the city manager through the departments of Planning and Community Environment and Public Works to establish specific technical regulations, standards and specifications necessary to implement the tree protection ordinance and to achieve the city's tree preservation goals. These goals are intended to provide consistent care and serve as benchmark indicators to measure achievement in the following areas:

- Ensure and promote preservation of the existing tree canopy cover with the city limits;
- Provide standards of maintenance required for protected and city-owned trees;
- Provide a standardized content for tree reports required by the city;
- Establish criteria for determining when a tree is unsafe and a possible threat to the public health, safety and welfare;
- Provide standards for replacing trees that are permitted to be removed; and
- Increase the survivability of trees during and after construction events by providing protection standards and best management practices.

Athens-Clarke County, Ga. — Community Tree Program
The Landscape Management Division (LMD) of the Athens-Clarke County Central Services Department administers the Community Tree Program. The community forester (CF), a tree care professional working in the LMD, is responsible for coordinating the Community Tree Program, including public tree maintenance. There are many other departments and individuals who are involved in community tree management and are considered fundamental

to the success of the Community Tree Program. The Community Tree Council and the Planning Department are two such partners who have a primary role in tree conservation and management.

The Community Tree Council is an active group of citizen volunteers who meet regularly. The LMD provides support services to the Community Tree Council and the community forester fills the role of council secretary. Each year the LMD develops a Community Tree Program annual work plan and budget based on that plan. The LMD also maintains a current inventory of public street trees that is used in the planning and budgeting processes.

The Community Tree Program also produced a best management practices guide for tree selection and placement, tree care and tree species selection.

Seattle, Wash. — Master Street Tree Plan

The City of Seattle Street Tree Master Plan is a comprehensive three-phase study that recommends priorities, provides a list of appropriate plantings for Seattle's arterial streets, and explores new concepts for street tree plantings to connect existing open spaces and green areas in the Seattle. The Street Tree Master Plan serves as a mechanism to prioritize areas for tree plantings and identifies tree species for planting and removal.

Phase I inventoried the location, type and condition of trees planted along all improved city streets. From 1991 to 1992, nearly 84,000 trees were assessed for a wide range of factors, including age, species, health, site features, planting strip width and relationship to power lines.

Phase II developed criteria for deciding priorities for planting street trees and designated arterial streets for tree plantings. It also quantified the planting and maintenance needs of Seattle's street trees and created a comprehensive list of old and diseased trees for removal.

Phase III identified goals for urban forestry growth for the city of Seattle and presented new ideas to increase the quantity and quality of green spaces within the city limits. Goals include a 13 percent increase in Seattle's tree canopy, to a total of 40 percent. Fresh ideas and new partnerships are now being made among the public, private, commercial and nonprofit sectors to reach the goals for a green Seattle.



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