Protecting and Developing the Urban Tree Canopy

A 135-City Survey

THE UNITED STATES CONFERENCE OF MAYORS

FOUNDATION

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Dear Mayor:

I am pleased to provide you with our report on cities' efforts to protect and develop the urban forests that are critical to moving this nation closer to its current climate protection goals. This report, *Protecting and Developing the Urban Tree Canopy: A 135-City Survey*, is the latest volume in our U.S. Conference of Mayors Best Practices series.

Trees make important contributions to society and are an integral part of urban infrastructure, as critical to the health and livability of communities as roads, sewers, and buildings. Community trees leverage the social, economic, and environmental value of cities, with forestry and related industries providing employment for over 1.6 million people and contributing $231.5 billion to the U.S. economy.

Mayors recognize the invaluable role of urban forests in the protection of public health and reduction of harmful greenhouse gases. And mayors have long appreciated the contributions of urban tree canopies to the sustainability and beautification goals they have established for their cities. During its 76th Annual Meeting this year in Miami, the Conference adopted policies that specifically address energy conservation and efforts to combat the non-native insects and diseases that threaten the urban tree canopy.

We surveyed our members to establish a baseline of information on their current community tree efforts; with this report, we are pleased to share that baseline of information with all mayors and all others dedicated to protecting and expanding the critical national resource our urban forests represent.

For the past three years the Conference of Mayors has partnered with the Home Depot Foundation on initiatives aimed at building sustainable communities. The Conference's annual Excellence in Community Trees Award has been made possible through this partnership, as has this survey report. The Conference appreciates the support provided by The Home Depot Foundation and, in particular, by The Foundation's Director and Chief Operating Officer, Frederick D. Wacker.

Thanks are due, as well, to all the mayors and their urban forestry specialists who contributed the valuable information on which this report is based. Their willingness to share their experiences benefits all America's cities.

Sincerely,

tom cochran

Tom Cochran
CEO and Executive Director

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EXECUTIVE SUMMARY

In cities across America, efforts to preserve and enlarge the tree canopy in support of both sustainability and beautification goals have grown in importance over the past several years. The U.S. Conference of Mayors Community Trees Task Force was created in 2006 in response to mayors' increasing awareness of the value of urban forests and their increasing interest in ways that communities can be improved through expansion of community tree programs. The Task Force requested that Conference staff undertake a survey of current efforts in cities to expand and protect the urban tree canopy; The Home Depot Foundation provided funding for the effort. The goal was to produce a baseline of information – essentially, a report on the state of community trees in America – that could be shared by all mayors and other stakeholders concerned with the management and care of an increasingly important urban forest.

The Conference survey was distributed in September to the nation's principal cities – basically those having populations of 30,000 and larger. Responses were received by early November from 135 cities in 36 states in all regions of the country. For each question, survey findings were calculated based on the number of cities which responded to that question, not on the total number responding to the survey. Among the survey's key findings:

On Climate Protection:

- ***Sustainability Efforts:*** Eighty-four percent of the cities view their activities relating to trees as part of their overall sustainability and/or climate protection efforts. Thirty-eight percent of those which have adopted a sustainability or climate protection plan report that their plan specifically cites the contribution of trees or the tree canopy to achieving the plan's goals.
- ***Carbon Sequestration Measurement:*** Forty-four percent of the cities anticipate being able to measure the carbon sequestered by their tree canopy within the next few years.

On City Organization, Roles, and Authority:

- ***City Ordinances:*** Ninety-five percent of the survey cities have adopted one or more ordinances governing tree management and care. Among these, 85 percent have ordinances which require new development projects to retain trees on site, plant new trees, or pay into a tree mitigation fund; in 63 percent they cover removal of trees from private property; in 46 percent they cover utility practices regarding trees; in 38 percent they cover the planting of public trees on private property. In two-thirds (67 percent) of the cities the ordinances' enforcement provisions impose replacement costs; in two-thirds (66 percent) the ordinances impose fines.
- ***Tree Canopy:*** Forty-seven percent of the cities have made enlarging the tree canopy a stated goal of their overall tree resource management plan or an ordinance. Among those cities which have not done this, 46 percent have undertaken a separate initiative specifically aimed at enlarging the tree canopy.
- ***Tree Inventory:*** Seven in 10 of the survey cities maintain an inventory of city-owned trees, and 55 percent of these inventories are up to date. Forty-seven percent of the cities maintain an inventory of park trees, and 53 percent of these inventories are up to date.

- ***Green Infrastructure Tree Value:*** Thirty-two percent of the cities estimate the value of trees as part of their green infrastructure. The estimated total value for the 32 cities able to report it is $6.58 billion.
- ***New Technologies:*** Three in five of the survey cities are employing new and emerging tools and technologies to inventory trees, map the tree canopy, assess damage, assess value, or perform other functions related to tree resource management.
- ***Threats to Tree Resource Management:*** Cities report that their tree resource management efforts are being hampered or have been hampered by several specific problems: Serious storms are responsible for recent problems in half the survey cities, problems within the past two years in 53 percent of the cities. Infestations are responsible for current problems in 46 percent of the cities, problems within the past two years in 41 percent. Drought conditions are responsible for current problems in 42 percent of the cities, problems within the past two years in 55 percent. Fire is responsible for recent problems in less than one percent of the cities, problems within the past two years in two percent. Other threats, such as budgetary constraints, are reported as current problems by 15 percent of the cities, recent problems by 16 percent, and problems experienced within the past two years by 13 percent. Fifty-seven percent of the cities report that they have plans in place to respond to problems which reach crisis proportions.
- ***City Budgets:*** The 124 cities which reported the amount they had budgeted in the current fiscal year for tree management and care are spending, in the aggregate, nearly $132 million. Sixty percent of the cities said the amount currently budgeted for tree management and care is about the same as the amounts budgeted in recent years; 23 percent said it was somewhat higher, and two percent said it was much higher. Fourteen percent said it was lower.
- ***Staffing:*** Across the survey cities, 69 percent of tree management and care is handled by city employees, 29 percent is handled by contracted workers, and one percent is handled by others, principally volunteers. Seventy-two percent of the cities report that their staff includes certified arborists. Among those cities which do not have certified arborists on staff, 89 percent said that they obtain the services of certified arborists, when needed, through contracts or other means.
- ***Coordination:*** In 63 percent of the survey cities there is an individual at, or reporting to, the executive level of city government who is responsible for coordination of multi-agency and public-private efforts to preserve and/or enlarge the tree canopy.
- ***Responsibility for Street Trees:*** Public works departments were cited by 38 percent of the cities as responsible for street trees; parks agencies were cited by 26 percent of the cities; 14 percent of the cities specified forestry divisions within larger departments, generally public works. Across the survey cities, nearly all (98 percent) said their street tree responsibilities included removal; 95 percent said it included pruning; nine in 10 said it included planting; and four in five said they included protection.
  Responsibility for Park Trees: Parks agencies (including park districts) were cited by 63 percent of the cities as responsible for park trees; public works departments were cited by 16 percent; 12 percent specified forestry divisions within larger departments, generally parks. Across the survey cities, nearly all said their park tree responsibilities included pruning (98 percent); removal (98 percent); and planting (97 percent); nearly nine in 10 (88 percent) said they included protection.

On Partnerships and Community Outreach:

- ***Partnerships with Community Organizations:*** To support the preservation and/or planting of trees, 57 percent of the survey cities maintain formal partnership agreements with volunteer, nonprofit, or community groups.
- ***Partnerships with Adjacent Jurisdictions:*** Twenty-seven percent of the survey cities are working across boundaries with adjacent jurisdictions to preserve or enlarge the tree canopy on a watershed or multi-jurisdictional scale.
- ***Community Outreach:*** Nine in 10 (91percent) of the cities work with partner organizations to provide programs that educate residents on the importance of trees, and 53 percent of the cities believe that public awareness of the importance of the preservation and growth of the tree canopy is increasing.

INTRODUCTION

In cities across America, efforts to preserve and enlarge the tree canopy in support of both sustainability and beautification goals have grown in importance over the past several years. With the emergence of climate change as a priority issue for governments around the world, the role of forests in mitigating global warming is receiving increasing attention by all involved in the shaping of climate protection policy at all levels of government. Mayors in cities across the nation have long understood the value of urban tree canopies; in many cities, this has translated into investments in significantly larger canopies.

The U.S. Conference of Mayors Community Trees Task Force was created in 2006 in response to mayors' increasing awareness of the value of urban forests and their increasing interest in ways that communities can be improved through expansion of community tree programs. The Task Force was intended to serve as a vehicle for sharing information on urban forests among cities and for disseminating information on both federal and private resources of value to cities in their community tree efforts. The first meeting of the Task Force, held in June 2006 during the 74th Annual Meeting of the Conference of Mayors in Las Vegas, was chaired by Honolulu Mayor Mufi Hannemann. The Task Force is currently co-chaired by Palatine (IL) Mayor Rita Mullins and Sacramento Mayor Heather Fargo.

During the winter meeting of the Conference of Mayors in January of this year, the Community Trees Task Force requested that Conference staff undertake a survey of current efforts in cities to expand and protect the urban tree canopy. The goal was to produce a baseline of information – essentially, a report on the state of community trees in America – that could be shared by all mayors and other stakeholders concerned with the management and care of the increasingly important urban forest. Support for this effort was provided by The Home Depot Foundation.

The survey instrument sought information from individual cities on how they had:

- linked their community tree activities to other efforts to promote sustainability and climate protection.
- organized their activities relating to trees, including the roles they play and the authorities they exercise;
- partnered with other organizations in undertaking these activities; and
- reached out to and educated residents and community organizations on the importance of preserving and enlarging the tree canopy.

The survey was distributed in September to the nation's principal cities – basically those having populations of 30,000 and larger. Responses were received by early November from 135 cities in 36 states in all regions of the country. For each question, survey findings were calculated based on the number of cities which responded to that question, not on the total number responding to the survey.

FINDINGS

CLIMATE PROTECTION

Sustainability

Eighty-four percent of the survey cities view their activities relating to trees as part of their overall sustainability and/or climate protection efforts. Thirty-eight percent of those which have adopted a sustainability or climate protection plan report that their plan specifically cites the contribution of trees or the tree canopy to achieving the plan's goals. Among survey cities' descriptions of provisions in plans relating to trees or the tree canopy:

Chandler, AZ: We have a green building initiative that includes trees as part of the plan.

Riverside, CA: The initiative commits Riverside to expanding the urban forest with 100,000 new trees by 2010. Item #24 of the initiative also commits Riverside to plant 1,000 trees in City parks and rights-of-way and encourages the annual planting of 3,000 shade trees on private property.

Norwalk, CT: Sustainability is a key component of the City's Master Plan of Conservation and Development, which has just been updated. It not only addresses tree programs under the purview of the Tree Advisory Committee, but also incorporates tree considerations (among other green initiatives) into planning, zoning, development criteria, etc.

West Haven, CT: We recognize the benefits provided by trees, including but not limited to buffering noise and unsightly views, improving air quality, offering habitat to birds and other animals, preventing erosion, absorbing water, mitigating climate, and improving quality of life.

Wilmington, DE: Trees for Wilmington is a working group of the Wilmington Beautification Commission. The plan acknowledges that the urban forest is a necessary part of the infrastructure, which provides numerous benefits crucial to the community, including environmental (carbon storage, air pollution removal, building energy savings, avoided carbon emissions), social, and economic benefits.
Miami, FL: It includes increasing the tree canopy by 30 percent by 2017.

Oakland Park, FL: It includes increasing the tree canopy in the City to 30 percent.

Honolulu, HI: The plan describes the benefits of trees, with a goal of planting at least 100 trees per year, not including trees required for new developments.

Chicago, IL: The mitigation strategy for trees in the Chicago Climate Action Plan establishes a target savings against business as usual (BAU) of 0.10-0.17 MMT CO2 emissions by increasing canopy cover from 14 to 17 percent.

Evansville, IN: "Maintain healthy urban forests" is one of 12 objectives. Specifics include reevaluating land use, development and zoning ordinances to require larger tree islands/green spaces in parking lots and to require larger vegetative buffer zones between residential, commercial, and industrial developments and along streambed corridors and lakes (riparian habitats).

Michigan City, IN: Tree loss due to large scale infrastructure improvements is mitigated with at least a one-to-one tree replacement.

Alexandria, LA: It includes increasing the canopy to provide a cooler environment.

Minneapolis, MN: Included are no net loss of Citywide tree canopy cover by 2015, and the planting of at least 2,500 trees on public land annually through 2015.

Las Vegas, NV: "Whereas, the city actively promotes the planting of trees and for thirteen years (in 2006) has been recognized as a Tree City USA by the Arbor Day Foundation" is included in the City's Climate Protection Resolution.

Providence, RI: The urban tree canopy goal of 30 percent by 2020 is included.

Alexandria, VA: Alexandria's Climate Change Initiative explicitly describes the current commitment to plant 350 trees annually. The City's Urban Forestry Master Plan (now under final review) recommends that the City plant an additional 400 trees annually to achieve recommended street tree stocking levels by the year 2020 and expand the City's tree canopy.

Seattle, WA: The current plan references the Seattle Urban Forest Management Plan's goal to increase the overall canopy of Seattle from the current 18 percent to 30 percent in the next 30 years.

Carbon Sequestration Measurement

Forty-four percent of the survey cities anticipate being able to measure the carbon being sequestered by their tree canopy within the next few years.

CITY ORGANIZATION, ROLES, AUTHORITY

City Ordinances

Ninety-five percent of the survey cities have adopted one or more ordinances governing tree management and care. Eighty-five percent of these cities have ordinances which require new development projects to retain trees on site, plant new trees, or pay into a tree mitigation fund. Ordinances cover removal of trees from private property in 63 percent of these cities; utility practices regarding trees in 46 percent; and the planting of public trees on private property in 38 percent. Among other areas covered by ordinances are regulation of right-of-way trees, identified by six cities; protection of historic or exceptional trees, identified by five; and regulations relating to disease or pest management, identified by three.

In 67 percent of the cities the ordinances' enforcement provisions impose replacement costs; in 66 percent they impose fines. Other penalties identified include civil and/or criminal actions, by six cities; permit-related penalties, such as increased fees or denial of future permits, by four cities; fees in lieu of planting trees, by two; and stopping work orders, by two.

Tree Canopy

Seventeen percent of the survey cities have mapped the total (public and private) tree canopy. Forty-seven percent of the cities have made enlarging the tree canopy a stated goal of

their overall tree resource management plan or an ordinance. Most of these cities described, in varying detail, the goals they have set:

North Little Rock, AR: The Land Use Plan specifically lists the preservation of trees and enhancement of open spaces as a goal to preserve the local environment. The Screening Ordinance requires one tree per six parking spaces and street trees with all new developments.

Chico, CA: The City's street tree population expands with each new residential and commercial development.

Lakewood, CA: The goal is to eliminate tree vacancies.

Riverside, CA: The current goal is to plant 100,000 new trees by 2010.

Santa Ana, CA: The Public Works Agency allocates $50,000 for infill planting yearly. The Parks Department conducts several Adopt-A-Park projects each year. Infilling trees is a part of these events. We partner with Shade Tree Nursery, a non-profit organization which donates trees to help enlarge our City's park tree canopy.

Temecula, CA: The purpose of the ordinance is to protect and preserve a variety of native and non-native trees on public and private property whose visual and historic importance to the community is sufficient to justify special efforts to protect and preserve them, and to encourage the application of management techniques to control the pruning, trimming, shaping, and removal or relocation of these trees within the City.

Tustin, CA: The goal is a tree in every planting site.

West Hollywood, CA: The City has adopted a streetscape master plan whose goal is to plant out residential and commercial streets.

Colorado Springs, CO: Work with neighborhood homeowners to plant and care for street trees.

Norwalk, CT: Over the decades (centuries, actually) trees have been removed from many parts of the City, particularly the urban core, in favor of development. A major goal is to restore the canopy on streets where it has either been totally removed or damaged. Additionally, our goals include expanding the canopy where conditions will accommodate it.

West Haven, CT: The goal is to recognize the benefits provided by trees, including but not limited to buffering noise and unsightly views, improving air quality, offering a habitat to birds and other animals, preventing erosion, absorbing water, mitigating climate, and improving quality of life.

Wilmington, DE: The goal is to increase the tree canopy by 10 percent.

Coral Gables, FL: The goal is to fill all empty planting spaces on the public right-of-way.

Largo, FL: The goal is to plant 5,000 street trees over five years.

Miami, FL: Currently, the City is at a 21 percent canopy. Our goal is to be at 30 percent by 2017. The initiative is called GreenMiami.

Oakland Park, FL: The goal is to increase tree canopy in the City to 30 percent.

Orlando, FL: We would like to get to 30 percent tree-covered.

Plantation, FL: Our urban forest is considered a part of the City's infrastructure. After the loss of tree canopy (25-30 percent) in the middle of the decade, we have made great efforts to replace what we lost and enhance the general canopy. We have applied part of what we have leaned from the hurricanes in the middle of the decade to our many urban forestry programs.

Tamarac, FL: The goal is to preserve the old trees because they have better root structure.

Tampa, FL: The City is currently in the process of updating our comprehensive plan. Objective 32.3 under Tree Canopy states: "The City will provide 800 trees annually to preserve and augment the community's canopy and sustainability." In addition, Policy 38.7.2 under Urban Forestry states: "The City will develop a 'greening' program with a goal of increasing tree cover in areas of concentrated vehicular use where the urban heat island effect could be mitigated through planting trees and shrubs."

Savannah, GA: Satellite images helped us set a goal of 50 percent overall canopy coverage.

Chicago, IL: The City's Chicago Climate Action Plan has a stated goal of increasing canopy cover from 14 percent to 17 percent by 2020. Our upcoming Urban Forest Management Plan is exploring targets of doubling the canopy by 2040.

Evanston, IL: The Overall Management Plan goal is to achieve a fully planted status on all public property Citywide.

Lombard, IL: The goal is to continually increase the number of parkway trees.

Northbrook, IL: Reforestation fees are collected via our tree preservation ordinance. Money is utilized to reforest unplanted public rights-of-way.

Palatine, IL: The goal is 100 percent parkway plant out; City is at roughly 93 percent today.

Schaumberg, IL: The "Fill the Gap Program" provides parkway trees at +/- 40-foot spacing.

Evansville, IN: We attempt to plant two trees for each tree removed, as time and funding allow.

Michigan City, IN: Currently our goal is to replace what is removed from the street tree inventory and increase our total tree cover in our park lands.

Manhattan, KS: We attempt to maintain a positive tree-planting-to-removal ratio of three planted to one removed.

Muskegon, MI: Goals are to improve the tree canopy, plant as many trees as we remove, and plant a variety of trees to prevent disease devastation.

Sterling Heights, MI: The goal is to maintain 37 percent of tree canopy on any new development.

Westland, MI: Goals are to plant a tree for every tree removed and to replace all of the trees removed due to the Emerald Ash borer.

Burnsville, MN: Goals are to increase tree cover and diversity, and to reduce and prevent tree loss due to existing and potential threats.

Minneapolis, MN: The City's sustainability report/greenprint sets a target of no net loss of Citywide tree canopy cover by 2015. We use a baseline from 2004 of 26 percent.

St. Louis, MO: Tree removals must result in tree reforestation; a no net loss policy ensures sufficient tree canopy Citywide.

Hattiesburg, MS: The 2008-2028 Twenty-Year Comprehensive Plan has goals of improvement and sustainability for green infrastructure for both the public and private sectors. The City's parks program continues to improve with better maintenance, yearly tree planting initiatives, and creation of new green areas. We have land development ordinances which require developers to use the urban forest as an important building block with preservation, protection, and establishment of green infrastructure.

Clifton, NJ: Since 2000, the City has committed to a Community Forestry Management Plan. The plan's goal is to increase the City's overall tree resources through many different programs, such as mini-woodlots, reforestation of park and open lands, adopt-a-tree program on City streets, and replacement of City trees during construction and renovation related to street improvement projects.

Las Vegas, NV: The goal is to double the average tree canopy coverage to 20 percent by 2035. (Resolution 26-2008)

Scranton, PA: Our goal concerning the planting of trees is to plant as many trees curbside as possible in the treeless area of the City. We have a current contract to plant 238 trees in South Scranton and have planted over 600 trees during the last six years.

Providence, RI: Increasing the City's urban tree canopy from 23 percent to 30 percent by the year 2020 is the goal.

Columbia, SC: Enlarging is not a stated goal but maintaining is, even for planting vs. removals. As newly planted trees grow, we hope to have an increase goal.

Chattanooga, TN: The goal is increasing the tree canopy in the downtown area from the current seven percent to 15 percent, with an overall canopy goal of 40 percent Citywide.

Frisco, TX: Under the heading "objectives," our landscape ordinance states several items, including providing shade for outdoor activities, providing habitat for wildlife, and planting for energy conservation.

Laredo, TX: Under the current land development code, a landscape ordinance requires trees and shrubs in new residential and commercial development.

McKinney, TX: Enlarging the tree canopy itself is not the official goal. Through tree preservation and tree mitigation we are conserving and replacing.

Roanoke, VA: Achieving 40 percent canopy in 10 years is the goal.

Everett, WA: Short term goal: no net loss of forest canopy cover on public lands. Long term goal: measurable gain.

Seattle, WA: The goal is increasing the tree canopy to 30 percent from the current level of about 18 percent. Goals have been set for each land use category (single family residential, industrial, parks, etc.).

Milwaukee, WI: Forty percent canopy coverage is the goal.

Among those cities which have not made enlarging the tree canopy a stated goal of their overall tree resource management plan or an ordinance, 46 percent have undertaken a separate initiative specifically aimed at enlarging the tree canopy. Several of these cities described their initiatives:

Napa, CA: The City is insuring that the canopy is not reduced and trees that must be removed are replaced.

Santa Clarita, CA: The City plants 1,000 trees per year. As a result, the City has been awarded Tree City USA recognition for 18 consecutive years.

Pinellas Park, FL: The City Tree Bank enables contractors and developers to contribute money in lieu of certain landscape requirements when necessary or allowable. The tree bank funds a tree giveaway program for residents and provides trees for public areas.

Carol Stream, IL: Once trees have been reestablished in areas with parkway trees, we will focus on enlarging the canopy outside the area where parkway trees were not allowed during construction.

Muncie, IN: We are planting about 100 trees a year, but that is not enough.

Lexington, KY: A volunteer tree planting event is held each spring.

New Bedford, MA: The City replaces all trees when road construction takes place. Also, the City has budgeted for new tree plantings throughout the year.

Meridian, MS: As trees are removed from public property, we document and make provisions for tree replacement the following planting season with the largest species that the site will sustain.

Albuquerque, NM: We are following the U.S. Forest Service and Dr. Greg McPherson's specific recommendations based on the Municipal Forest Research Analysis (MFRA) completed for Albuquerque. We have been planting 2,000 trees annually to increase the canopy while maintaining diversity. A Citywide urban forestry initiative is in the planning stage; it includes implementing urban forestry programs and high levels of tree planting on streets and private property. Outreach is a key element of this program and we are coordinating efforts with all the local tree nurseries, providing educational information in various formats, working on non-traditional methods of outreach, and establishing a tree-planting goal. We have contracted with a marketing firm to research sponsorships for these efforts.

Garfield Heights, OH: We are replacing diseased, damaged, problem trees.

Warwick, RI: We are planting street trees on major arterial roadways as well as in neighborhoods.

Charleston, SC: A new ordinance, currently being crafted, makes increasing overall tree canopy a goal.

Columbia, SC: We have programs for donations to plant more trees (Forever Forest) and designate Treasured Trees.

Chattanooga, TN: The Take Root initiative has a stated goal of increasing the canopy in the Central Business District from seven percent to 15 percent.

Mesquite, TX: The Tree City USA goal of 20,000 trees by year 2000 was accomplished.

Alexandria, VA: The Urban Forestry Master Plan is now under final review.

Redmond, WA: The Green Redmond partnership with Cascade Land Conservancy is restoring forest lands in parks.

Tree Inventory

Seventy percent of the survey cities maintain an inventory of city-owned trees, and 55 percent of these inventories are up to date. Forty-seven percent of the cities maintain an inventory of park trees, and 53 percent of these are up to date.

Thirty-two percent of the cities estimate the value of trees as part of their green infrastructure. The estimated total value for the 32 cities able to report this is $6.58 billion. The estimated value ranges from $200,000 in Beloit, $500,000 in Lakewood (WA), and $692,907 in Evansville, to $520 million in Chattanooga, $756 million in Minneapolis, $1.466 billion in Tampa, and $2.315 billion in Chicago.

Sixty percent of the survey cities are employing new and emerging tools and technologies to inventory trees, map the tree canopy, assess damage, assess value, or perform other functions related to tree resource management. The technologies most frequently identified by the cities are GIS (Geographic Information System) and GPS (Global Positioning System), with the two often used in combination. Also mentioned by several cities were ArborPro and elements of the I Tree software suite, including UFORE (Urban Forests Effects) and STRATUM (Street Tree Management Tool for Urban Forest Managers). Identified by at least one city each were Landsat 5 Thematic Mapper and IKONOS, both satellite imagery programs; CITYgreen, software used to analyze the ecosystem; and ConVis, an image editing program used to create natural resource planning simulations. A few of the cities' commented on inventorying; among their comments are the following:

Chico, CA: The City is currently updating its inventory using GPS to locate the trees on our GIS map. Our database is being upgraded to a Web-based data system.

Sacramento, CA: The City is currently implementing a public tree inventory and mapping project in a GIS/asset management application. Part of this effort will include the value of the infrastructure.

Santa Clarita, CA: The City is implementing a digital inventory system using global positioning system technology. Tree coordinates will be overlaid onto an aerial map of the City with tree data imbedded into position links.

Tampa, FL: We are currently using information provided by partnerships with the University of South Florida, University of Florida, and the Hillsborough County Extension Office in our recent Urban Ecological Analysis. Tools utilized were Landsat 5 Thematic Mapper satellite imagery for the tree canopy cover change detection analysis, and high resolution IKONOS satellite imagery (GeoEye, Inc.) for the full study area used to classify existing tree canopy cover. In addition, the Urban Forest Effects Model (UFORE) (Nowak et.al. 2002) was used to assist with the analysis of the data collected. The UFORE model calculates values for variables such as tree diversity, species origin, abundance, density, size, cover and energy savings, air pollution removal, carbon storage, carbon sequestration, and compensatory or replacement values.

Albuquerque, NM: The newest research in urban forest benefits comes from coordination with the U.S. Forest Service to establish Albuquerque as a Climate Reference City. That provides us with the direct information needed to place a value on our urban forest. We are one of only 12 Reference Cities nationwide.

Threats to Tree Resource Management

Cities were asked whether their tree resource management efforts had been hampered or were being hampered by several specific problems. Their responses on specific threats:

- Serious storms – Recent problems in half the survey cities; problems within the past two years in 53 percent of the cities.
- Infestations – Current problems in 46 percent of the cities; problems within the past two years in 41 percent.
- Drought conditions – Current problems in 42 percent of the cities; problems within the past two years in 55 percent.
- Fire – Recent problems in less than one percent of the cities; problems within the past two years in two percent.
- Other threats – Current problems reported by 15 percent of the cities; recent problems reported by 16 percent; problems within the past two years by 13 percent. The problem identified most frequently was budgetary constraints, followed by development and redevelopment.

Fifty-seven percent of the cities have plans in place to respond to problems which reach crisis proportions. When asked to identify the threats for which their city has crisis response plans in place, survey respondents most frequently mentioned efforts to prevent and respond to particular infestations, such as Emerald Ash Borers and Gypsy Moths, and to diseases, such as Dutch Elm disease; responses to storm damage, including clean-up, tree removal, and tree replacement; and irrigation efforts in response to droughts.

City Budgets

The 124 cities which reported the amount they had budgeted in the current fiscal year for tree management and care are spending, in the aggregate, $131,981,750. Amounts budgeted range from $5,000 in Lima, $10,000 in Warwick and McKinney, and $15,000 in Auburn to $7,383,877 in Honolulu, $9,734,940 in Minneapolis, $15 million in Milwaukee, and $27 million in Chicago. Sixty percent of the cities said the amount currently budgeted for tree management

and care is about the same as the amounts budgeted in recent years; 23 percent said it was somewhat higher, and two percent said it was much higher. Fourteen percent reported that it was lower.[1]

Staffing

Across the survey cities, 69 percent of tree management and care is handled by city employees, 29 percent is handled by contracted workers, and one percent is handled by others, principally volunteers.[2]

Seventy-two percent of the cities report that their staff includes certified arborists. Among those cities which do not have certified arborists on staff, 89 percent said that they obtain the services of certified arborists, when needed, through contracts or other means.

Across the survey cities having arborists on staff, the average number employed is six. Sixteen of the cities have one certified arborist, 12 have two, and 13 have four. Seattle has 25, Minneapolis 31, Honolulu 33, and Chicago 80. Forty-nine cities specified that their arborists have received certification from the International Society of Arboriculture (ISA). In addition, several cities indicated that at least some of their arborists were also certified as municipal specialists.

In 63 percent of the survey cities there is an individual at, or reporting to, the executive level of city government who is responsible for coordination of multi-agency and public-private efforts to preserve and/or enlarge the tree canopy.

Responsibility for Street Trees

In an open-ended question, the cities were asked to name the city agency or department responsible for the management and care of street trees. Most frequently cited were public works departments, by 38 percent of the cities, and parks agencies, by 26 percent. These were followed by service departments – general, public, central, or other – by six percent of the cities, and transportation or street departments, by 4.5 percent. Four percent of the cities reported that they had urban forestry departments which were responsible for street trees; 14 percent of the cities specified forestry divisions within larger departments, generally public works.[3] Seven percent of the cities reported that two or more agencies were jointly responsible for street trees. In all but two of these cities the public works department was one of the agencies identified.

Across the survey cities, 98 percent said their street tree responsibilities included removal; 95 percent said they included pruning; 90 percent said they included planting; and 81 percent said they included protection. Among the other responsibilities identified by the survey cities were pest management and control, infestation control, fertilizing, and watering and irrigation.

Responsibility for Park Trees

In another open-ended question, the cities were asked to name the city agency or department responsible for the management and care of park trees. Most frequently cited were parks agencies (including park districts), by 63 percent of the cities. Public works departments

[1] Percentages do not total 100 due to rounding.
[2] Percentages do not total 100 due to rounding.
[3] Those cities which identified a forestry division in a larger department are also included in the count for the larger department.

were identified by 16 percent of the cities, and service departments by seven percent. Four percent of the cities reported that public works or services and parks and recreation departments are jointly responsible for park trees. Three percent of the cities reported having urban forestry departments which were responsible for park trees; 12 percent specified forestry divisions within larger departments, generally parks.[4]

Across the survey cities, 98 percent said their park tree responsibilities included pruning; 98 percent also said they included removal; 97 percent said they included planting; and 88 percent said they included protection. Among the other responsibilities identified by the cities were pest management and control, infestation control, fertilizing, watering and irrigation, and the planting of memorial trees.

PARTNERSHIPS AND COMMUNITY OUTREACH

Partnerships

Fifty-seven percent of the cities maintain formal partnership agreements with volunteer, nonprofit, or community groups to support the preservation and/or planting of trees in the city. Twenty-seven percent are working across boundaries with adjacent jurisdictions to preserve or enlarge the tree canopy on a watershed or multi-jurisdictional scale.

Community Outreach

Ninety-one percent of the cities work with partner organizations to provide programs that educate residents on the importance of trees. Among these cities, 81 percent work with these organizations to educate residents on the maintenance of healthy trees; 63 percent do so to provide residents with trees and/or other assistance to encourage or enable them to plant trees on their property; and 59 percent do so to provide schools with educational materials for students. Among other kinds of community services cities provide in partnership with other organizations are tree planting programs, Arbor Day and Earth Day events, city beautification activities, adopt-a-tree programs, and one-on-one consultations with homeowners concerning the health and care of their trees and shrubs. Among the specific activities described by the cities:

Chandler, AZ: Our Water Conservation Division works with individual homeowners and homeowner associations, teaching proper trimming, planting, and care.

Plantation, FL: We work with neighborhoods and other homeowner associations to help establish, restore, and maintain tree canopies on their properties.

Tampa, FL: Parks and Recreation provides community outreach programs to schools and neighborhood associations. Development and design professionals provide information on the benefits of trees and on construction with trees, as well as proper pruning and planting. In addition, numerous events, such as the Mayor's Beautification Program and National Arbor Day, are held throughout the year.

Bolingbrook, IL: We attend homeowner association meetings to answer tree-related questions and provide tree care seminars to homeowner associations, hour-long seminars at local garden

[4] Those cities which identified a forestry division in a larger department are also included in the count for the larger department.

centers, and Arbor Day events to distribute educational materials and saplings, with an arborist on hand to answer questions.

Rockville, MD: The Parks Department works with neighborhood volunteers to plant trees when we have adopt-a-park volunteer efforts in our parks.

Meridian, MS: The City has conducted eight Tree Care and Maintenance workshops through Urban and Community Forestry grants from the Mississippi Forestry Commission.

Clifton, NJ: The City obtains free trees from the New Jersey Tree Foundation. Most of those trees have been planted at schools and in parks to reforest school grounds and create mini-woodlots. The City also partners with the New Jersey Community Forestry Service to obtain grants and free trees, and to meet the goals of our community forestry management plan.

Albuquerque, NM: As part of our Bio-Park we have an arboretum that holds various classes and events focusing on appreciation of trees, plants, and wildlife.

Scranton, PA: Our City Forester, upon requests from residents, will examine trees and shrubs on private property and make recommendations at no cost to them. The City Forester also aids the Scranton School District by providing information on the realm of trees during classes and field trips to McDade Park; he helped one school erect 15 birdhouses at Nay Aug Park.

Charleston, SC: Department of Parks staff members regularly make presentations on the value and care of community trees to school groups, neighborhood organizations, garden clubs, and professional and service organizations.

Frisco, TX: The City has a very active urban forestry board which promotes tree planting, preservation, and tree care in the community and schools.

Seattle, WA: The City supports volunteer efforts working to help restore forested parklands; this has produced 95,000 volunteer hours in 2008.

Fifty-three percent of the cities believe that public awareness of the importance of the preservation and growth of the tree canopy is increasing; 44 percent believe it is staying at the same level; three percent believe it is decreasing. This assessment is based on communications received during the past year from city residents, or on resident response to city education efforts.

BEST PRACTICES

Survey respondents were invited to provide a brief description of what they considered to be one of their city's most exemplary initiatives to preserve and/or enlarge its tree canopy. Many provided descriptions – some detailed, some brief – of individual initiatives; many others responded with summaries of their overall approaches to urban forestry management or the organization of their urban forestry departments. Respondents ranged from cities which have had urban tree policies and programs in place for decades to those just getting programs underway.

Goodyear, AZ: Efforts to preserve the tree canopy in Goodyear include adequate budgeting for proper large tree canopy trimming on an annual basis and purchasing GBA software to keep an inventory of all trees and a record of the maintenance that should occur. The City in the process of becoming a Tree City USA and is seeking grants to help gather information for the tree inventory.
Contact: Jennifer Campbell, Parks and Recreation Superintendent, (623) 882-7531, or jennifer.campbell@goodyearaz.gov.

Yuma, AZ: The City is getting started on a complete Urban Forestry program. It is now a Tree City USA and is following all the required guidelines. Work is underway on a complete tree inventory and tree resource program, and the City's Urban Forestry Crew is receiving additional personnel, quality training, and top-of-the-line equipment.
Contact: Dave Faires, Supervisory Urban Forester, (928) 373-5000, ext. 5283, or dave.faires@yumaaz.gov.

North Little Rock, AR: The City's effort to expand the urban tree canopy involves the enforcement of the street tree and parking lot tree regulations by the Planning Commission and the routine checking for compliance and required remediation where required by the Planning Department.
Contact: Robert Voyles, Planning Director, (501) 975-8870, or rvoyles@northlittlerock.ar.gov.

Bellflower, CA: The City's goal is to become greener as it builds out. To accomplish this it requires that all new development must include approved street trees, where these do not already exist. Trees must also be included in all on-site landscaping.
Contact: Deborah Chankin, Director of Public Works, (562) 804-1424, or dchankin@bellflower.org.

Chico: CA: Currently, the City's most successful initiative involves a requirement that all new developments provide at least one street tree per home, planted in the City right-of-way and guaranteed by the developer for one year. This has effectively ensured the expansion of Chico's tree canopy into newly developed outlying regions. The City is upgrading its tree ordinance to establish a Heritage Tree Program that gives recognition to significant City trees and provides mitigation requirements for removing trees having trunks over 12 inches in diameter. Proposed new mitigation measures would specify and codify the number and size of replacement trees.
Contact: Denice Britton, Urban Forest Manager, (530) 896-7802, or dbritton@ci.chico.ca.us.

Fairfield, CA: Between 1996 and 2006 the City's Tree Division planted and braced over 1,000 15-gallon trees – between 90 and 110 trees per year. Before City crews departed the work sites

they educated residents on the importance of watering and maintaining their trees, and on the future impact of their trees on the City's urban forest.
Contact: Mike Gray, Landscape Maintenance Manager, (707) 428-7404, or mgray@ci.fairfield.ca.us.

Napa, CA: The purpose of the City's tree protection ordinances is to promote the health, safety, welfare, and quality of life of the residents through the protection of specified trees located on public and private property within the City. In establishing this protection of specified trees, it is the City's intent to promote a healthy urban forest that contributes to clean air, soil conservation, energy conservation, scenic beauty, enhanced property values and a quality of life ensuring that Napa will continue to be a desirable place to live and work.
Contact: Dave Perazzo, Parks Superintendent, (707) 257-9234, or dperazzo@cityofnapa.org.

Pleasanton, CA: Key elements of the City's tree initiative include a consistent tree trimming program, annual updating of the City's inventory of trees, and winter planting and replenishment of 300 to 400 trees each year.
Contact: Lisa Hagopian, Parks Maintenance Superintendent, (925) 931-5565, or lhagopian@ci.pleasanton.ca.us.

Riverside, CA: The City's Public Works Forestry and Landscape Division is moving toward the goal, established by the Mayor in 2000, of planting 100,000 trees by 2010. The Division is currently seeking grant funding from the State, through its Urban Forest for Every City program, and from various other grant sources. Recent collaborations between the City and the Keep Riverside Clean and Beautiful initiative include The Great Clean Air Tree Planting project in October 2007, which resulted in the planting of 200 trees; the Sycamore Highlands Tree Planting project, with 50 trees; and, most recently, the Villegas Park Arbor Day project, with 50 trees. Through the plan check process for new developments and capital improvement projects, the Division has required the planting of thousands of trees. Approximately 34,000 trees have been planted in the last eight years as a result of plan checks; collaborations with businesses, nonprofits, and other City departments; neighborhood improvements; and other tree planting measures. The City's Public Utility Department has given away 53,013 trees by printing coupons for free trees on the back of March utility bills; a Tree Power rebate program has resulted in another 9,000 trees being supplied to residents.
Contact: Robert Filiar, Urban Forester, (951) 351-6112, or rfiliar@riversideca.gov.

Sacramento, CA: The City has two noteworthy initiatives: The first began with a Best Management Practices Report in 2003-04 that reviewed current work practices and organization structure. The outcome was a citizen- and staff-driven Best Management Practices Implementation Plan that prioritized the recommendations resulting from the best practices study, one of which called for an Urban Forest Enhancement Program that included 10 phases of improvements. The initiative includes a comprehensive inspection and care program for some of the City's oldest and most important trees, an inventory of public trees, and tree planting and replacement. The City is currently implementing the second phase of the program with the installation of a modern work/asset management system and an inventory of public trees. The study also recommended restructuring the organization and adding key positions, and revising the City's tree protection ordinances – an effort which is underway. The second initiative involves City participation in the Sacramento Tree Foundation's "Greenprint" program, an award-winning regional effort to lead agencies to better urban forestry practices.
Contact: Joe Benassini, Urban Forestry Manager, (916) 808-6258, or jbenassini@cityofsacramento.org.

Santa Clarita, CA: The City of Santa Clarita has three ordinances aimed at preserving community trees. The Parkway Trees Ordinance regulates planting, maintenance, and removal of trees planted on City property. The Oak Tree Preservation Ordinance protects, preserves, and regulates removal and encroachment of native oaks through a permit and review process. The Public Nuisance Ordinance protects community trees by ensuring their care and maintenance. It requires treatment of trees with pest problems in order to prevent the infection of the community forest. The City's Urban Forestry Division is responsible for the protection and maintenance of the community forest, including the enforcement of the tree protection ordinances.
Contact: Gordon MacKay, Public Works Deputy Director for Operations, (209) 937-8438, or gordon.mackay@ci.stockton.ca.us.

Sunnyvale, CA: Sunnyvale has just been awarded a grant to develop an Urban Forestry Management Plan. The State requires that the plan be comprehensive, to include an evaluation of the City's current canopy cover and a policy to increase the overall canopy to at least 25 percent of total area of the City, including all public and private lands. The Urban Forestry Management Plan is to be a City Council-adopted policy document governing tree management within the City limits.
Contact: Leonard Dunn, Urban Landscape Supervisor, (408) 730-7505, or ldunn@ci.sunnyvale.ca.us.

Temecula, CA: In May 2000 the City embarked on a new urban reforestation campaign, "Street Trees for Temecula," which provides for the replacement of missing or damaged street trees within the public right-of-way areas throughout residential neighborhoods in the community. A variety of tree species, consistent with the California Department of Forestry's approved tree list, are incorporated with existing neighborhood trees. Their selection is also based on the conditions exclusive to that development and the proximity to streets, sidewalks, and overhead and underground utilities. Temecula's residents have been extremely receptive to the program, which has replaced over 65 percent of the missing trees within the initial targeted neighborhoods. Several homeowners' associations have contacted the City, requesting that their neighborhoods be considered for future planting of street trees. Officials believe that by stressing the importance of planting trees at the local government level, citizens will be encouraged to take more of an interest in the environment and, they hope, encouraged to support larger programs on the state and national levels.
Contact: William Hughes, Director of Public Works, (951) 694-6411, or bill.hughes@cityoftemecula.org.

Tustin, CA: For the City's annual Arbor Day ceremony, numerous schools are invited to participate in tree planting throughout the community. The ceremony includes presentations on the importance of trees to the environment, a demonstration of proper planting, and a question and answer session.
Contact: Pat Madsen, Maintenance Supervisor, (714) 573-3350, or pmadsen@tustinca.org.

Vallejo, CA: The City is using a $500,000 grant for a project titled Vallejo Adds Life to the Urban Environment (VALUE). The project includes pruning trees, planting new trees, creating a Web site, producing educational materials, working on the historic tree files, conducting field trips for children, utilizing offenders who are reentering the community, and using the byproducts of the urban forest.
Contact: Jeanine Perasso Kaczmarczyk, Assistant Maintenance Superintendent, (707) 553-7219, or jeaninek@ci-vallejo.ca.us.

West Hollywood, CA: The City has adopted a Heritage Tree Program in order to identify, promote awareness of, maintain, and protect designated heritage trees. The program acknowledges that heritage trees, whether located on public or private property, are distinct and unique living resources of the community. Its intent, beyond increasing public awareness of the heritage trees in the City, is to provide reasonable assurance that West Hollywood's tree heritage will continue for future generations.
Contact: Sam Baxter, Facilities and Field Services Manager, (323) 848-6321, or sbaxter@weho.org.

Whittier, CA: The City has published a Parkway Tree Manual, which addresses the preservation of street trees, and an Uptown Specific Plan and a Whittier Boulevard Specific Plan, both of which identify the trees that can be planted on public and private property.
Contact: Jim Kurkowski, Director of Parks, (562) 464-3375, or jkurkowski@cityofwhittier.org.

Colorado Springs, CO: The New Home Tree Program has added over 35,000 trees to the City's street tree inventory. The program is a joint effort with developers and builders that has been in place for more than 30 years.
Contact: Paul Smith, City Forester, 719-385-6548, or psmith@springsgov.com.

Enfield, CT: As a matter of policy, the Town actively protects its trees as a natural resource. In November 1995 the Connecticut Supreme Court ruled that trees are protected under the State's Environmental Protection Act. Trees over 18 inches in diameter cannot be trimmed or removed by the State or a public utility without first notifying the Mayor. Enfield designates the Director of Public Works as Tree Warden. Connecticut Light and Power and the Tree Warden inspect every tree proposed for trimming or removal by the utility. The Department of Public Works monitors trees along 184 miles of roads and 106 miles of sidewalks, around 12 schools, and in parks and recreation areas daily. Notice of intent to remove Town trees over six inches in diameter must be posted prior to removal to allow individuals to object in writing and request a public hearing: Residents are encouraged to preserve their rights and their trees.
Contact: Piya Hawkes, Tree Warden/Director of Public Works, (860) 763-7599, or phawkes@enfield.org.

West Haven, CT: In 2003 the City launched a partnership with residents through which individuals could sponsor trees that would be planted along the shoreline of the West Haven Historic Green. The sponsorship of a tree includes its purchase and the installation of a commemorative plaque at its base. Individual tree sponsorships have averaged $200 and have resulted in the planting of 170 trees to date. This partnership program, in addition, has generated $34,000 for the planting of trees in a City park.
Contact: Beth Sabo, Commissioner of Public Works, (203) 937-3588, or beth_sabo@cityofwesthaven.com.

Wilmington, DE: The Wilmington Tree Commission was created to advise the City Forester and Director of Public Works regarding the planting, maintenance, and removal of trees.
Contact: Romain Alexander, Director of Parks and Recreation, ralexander@ci.wilmington.de.us.

Coral Gables, FL: The City has a long-standing tree maintenance, preservation, and planting ethic. The City plants approximately 500 trees and trims more than 5,000 trees each year, and has been doing so for decades.
Contact: Dan Keys, Public Service Director, (305) 460-5130, or dkeys@coralgables.com.

Largo, FL: The City adopted its Urban Forest Master Plan in 2000; it calls for an inventory of the City's public trees and vacant planting sites; implementation of a tree maintenance management software package, and the planting of more than 5,000 trees along City streets in a five-year period – a goal that City officials expect will be reached by 2010. The plan and the software, officials say, enable the City to proactively manage trees, extending their life and increasing the tree canopy and its benefits to residents and the environment.
Contact: Joan Byrne, Director, Recreation, Parks and Arts Department, (727) 587-6720, or jbyrne@largo.com.

Miami, FL: "Ourgreenmiami" is the City's comprehensive tree planting, protection, and public education program. Working with community groups, schools, residents, and business partners, the City has developed a Web site and materials to promote the planting and protection of trees. The site (www.ourgreenmiami.org) describes the importance of a healthy tree canopy to Miami's continued prosperity, as well as information on how to obtain free trees, and how to volunteer to plant trees in neighborhoods. The site provides instruction on the planting and maintenance of trees, information on how properly-planted trees protect property during hurricanes, and links to numerous additional sites containing information on trees and tree programs. Partial funding of the City's site is provided by a tree mitigation fund.
Contact: Jennifer Grimm, Environmental Outreach Liaison, (305) 416-1601, or jgrimm@miamigov.com.

Oakland Park, FL: The City has applied for certification as a National Wildlife Federation Community; officials project that certification could be obtained within two years. The certification process involves both the residents and the City in providing wildlife food sources, water sources, places for cover, and places to raise young. The City's effort to increase its tree canopy, especially its native tree canopy, meets three of these four Federation goals.
Contact: John Perrone, Parks Division Manager, (407) 246-2287, or john.perrone@cityoforlando.net.

Pinellas Park, FL: Three City programs work together to encourage preservation and enlargement of the tree canopy: 1) The Tree Bank, started by the City Council to control requests for variances to the landscape ordinance, discourages unnecessary variance requests by requiring the value of required landscape to be contributed to the bank, and provides resources to plant additional trees in the community. 2) The Tree Giveaway Program allows residents to obtain approved trees from a local nursery free of charge and is funded, in part, by the Tree Bank. 3) An annual tree sale and giveaway program partners with Nina Harris School, a local public school for special education students. The City provides seed money (literally), the students plant and grow trees year 'round, and the trees are then sold at very reasonable prices -- $3 to $5 – at the City's annual Country in the Park event, which is attended by 15,000 people. Many years, small seedling trees are given away free to participants. Proceeds from the sale are returned to the school to fund the ongoing program.
Contact: Cara Reed, Neighborhood Services Manager, (727) 541-0800, or creed@pinellas-park.com.

Plantation, FL: The City's street tree program is a staple of its urban forestry program since 1976. Originated by volunteers (the Junior Women's Club), it has grown into a program whose services are in great demand. Through the program, homeowners request trees for their property; the City purchases the appropriate trees, installs them, and does the initial watering; and the homeowners assume responsibility for their day-to-day care. The City also maintains the trees, providing trimming and other services, as they mature. Homeowners are charged $100 per tree; the City covers the balance of the cost – approximately $250-300. Plantation

strives to plant 200 to 300 trees per year through this program, and there is always a long waiting list of homeowners wishing to participate.
Contact: Jeffrey Siegel, Landscape Architect, (954) 797-2246, or jsiegel@plantation.org.

Tamarac, FL: Within the City's Public Works Department, the Landscape Division in the Public Works Department maintains all roadway medians and city facilities except for parks. The Division implements a minimum of 75 percent of the best management practices detailed in the Florida Green Local Government Standard Environment Landscape Module. All landscape personnel must observe standards covering testing and adjusting of irrigation systems, adequate spacing between plantings, annual mulching at proper depth, proper pruning of trees, and appropriate placement of appropriate trees on sites.
Contact: Levertis Byrd, Landscape Supervisor, (954) 597-3717, or levertisb@tamatac.org.

Tampa, FL: The Urban Ecological Analysis, an economic analysis of the City's urban forest resource, is an ongoing program that will analyze these resources every five years, as required by the City's Tree Protection and Landscape Ordinance. An analysis was delivered to the City in April 2008 by the University of South Florida and the University of Florida. The analysis process ensures that the City's canopy is monitored and evaluated through future years, and provides for science-based recommendations and goals for sustainability. Chapter 13 also provides for an elevated level of protection of grand trees, those native specimens that provide the most environmental benefit in relation to carbon storage. The City also has a progressive Urban Forestry Program for the management of existing tree resources, a Community Tree program, and a Tree Trust Fund that is utilized for all Urban Forestry programs and projects.
Contact: Karen Palus, Parks and Recreation Director, (813) 274-7730, or karen.palus@tampagov.net.

Albany, GA: The City hired its first arborist about 18 months ago, is in the process of preparing a five-year tree plan, and is beginning a downtown street tree inventory this year.
Contact: Ili Si Malone, City Arborist, (229) 883-6950, or imalone@dougherty.ga.us.

Athens, GA: The Athens Clarke County Unified Government's adoption of a community tree management ordinance in 2005 has resulted in trees being conserved and replaced during the development process. Tax credits have been issued as an incentive to conserve large or significant trees. Streets and parking lots have plant and tree requirements. The "protected" designation given public trees gives local officials the tool they need to protect the public assets that these trees represent.
Contact: Andrew Saunders, Community Forester, (706) 613-3561, or forester@co.clarke.ga.us.

Bartlett, IL: Under the Village's Street Scape Program, right-of-way areas on parkways are reviewed and trees appropriate to the sites are planted and maintained. This program covers sites not included in the 50/50 Parkway Tree Program, an initiative through which residents and the Village share the cost of trees to be planted by nursery contractors in parkways adjacent to their homes. The Village reviews and approves planting locations and handles all the details.
Contact: Keith Johnson, Arborist, (630) 837-0811, or kjohnson@vbartlett.org.

Bolingbrook, IL: As part of the regular budget, the Village of Bolingbrook plants up to 600 new and replacement parkway trees each year, 300 in spring and 300 in the fall. The Village regularly prunes up to 3,000 parkway trees each year. During the summer of 2008 the Village monitored four Emerald Ash Borer traps. The Village is working towards a co-op with the Park District and the private sector to control Gypsy Moths.
Contact: Michael Drey, Director of Public Works, (630) 226-8800, or mdrey@bolingbrook.com.

Chicago, IL: Chicago's City Foresters review street construction plans to make recommendations on tree preservation, tree removal, and tree planting. Over the years federal highway programs such as ISTEA and TEA-21 have allowed local communities flexibility in roadway design; now Foresters have input on design width. In one instance, a plan called for an arterial street to be widened from its existing 38 feet to 42 feet. This would have required the removal of nearly 95 percent of all the street trees. Foresters worked with engineers and preserved the majority of the trees by maintaining the existing roadway width.
Contact: Joseph McCarthy, Senior City Forester, (312) 746-5254, or jmccarthy@cityofchicago.org.

Evanston, IL: In FY 2005-2006 the City created a business unit to track the activities of a new inoculation program that was implemented to reduce the incidence of Dutch Elm Disease (DED). This program injects all publicly-owned elm trees that meet one or more qualifying criteria: 1) The tree is larger than 10 inches in diameter and located in a park or other City-owned or -maintained property; 2) The tree is 30 inches in diameter or larger and located on a public parkway; and 3) The tree is larger than 10 inches in diameter and located on a public parkway on either a major collector or distributor street, as listed in the City's Comprehensive General Plan. This program injects Abotect fungicide, which is effective in controlling the spread of DED by elm bark beetles for a three-year period.
Contact: Paul D'Agostino, Superintendent of Parks/Forestry Division, (847) 866-2912, or pdagostino@cityofevanston.org.

Northbrook, IL: Through its Tree Preservation Initiative, the Village of Northbrook has preserved more than 20,000 trees and required the replanting of 12,800 new trees on private property. Removal of any tree over six inches in diameter requires a permit, and each removal is assessed prior to permit approval. Hardwood trees larger than 12 inches in diameter are categorized as "landmark" and may not be removed unless an inch-for-inch replacement requirement is met or a fee in lieu of reforestation is paid.
Contact: Terry Cichocki, Village Forester, (847) 272-4711, or cichocki@northbrook.il.us.

Oak Lawn, IL: The Village, a Tree City USA for the past 12 years, maintains over 22,000 parkway trees. It offers a 25/75 cost-share program to residents who wish to have a new tree planted in their parkway; provides parkway tree inspection, trimming, and removal services; and inspects for pests such as the Emerald Ash Borer, Asian Longhorned Beetle, Gypsy Moth, and Oak Wilt.
Contact: Heather Green, Village Forester, (708) 499-7098, or hgreen@oaklawn-il.gov.

Palatine, IL: The Village's 50/50 Tree Planting Program is designed to promote the planting of trees on Village parkways; it allows residents to select the species and location of trees to be planted. Residents who participate agree to water the trees for up to two years and split the cost of the trees with the Village. The Village's Tree Gap Program is designed to plant trees on parkways not adjacent to residential property. Combined with the Village policy of replanting any parkway tree that dies, it has enabled the Village to plant 93 percent of its parkways.
Contact: Andrew Radetski, Director of Public Works, (847) 705-5200, or aradetski@palatine.il.us.

Park Ridge, IL: The City's Urban Forester responds to residents' requests for help in solving various insect and disease problems affecting trees, shrubs, turf grass, and flowers. The City has had success with its Gypsy Moth Spray Program, now in its third year, which targets aerial spraying to areas of the City most affected by the pest.
Contact: Todd Fagan, Urban Forester, (847) 318-5451, or tfagan@parkridge.us.

Quincy, IL: At one time in Quincy's history, Maine Street and many others were flanked by large trees whose branches met above the street to form a leafy canopy. Over the years the loss of many of those trees to disease, weather, and human interference has left gaping holes where majestic trees once stood. Now underway is a grassroots effort, Trees for Tomorrow, which aims to replant the trees needed to restore 12 blocks of the Maine Street canopy. This group of volunteers is inviting residents to contribute to the purchase of suitable trees which they will plant, fertilize, mulch, and water for a year. The volunteers are also offering opportunities for contributors to memorialize loved ones by placing granite tribute stones near the trees they purchase.
Contact: Anne St. John, Trees for Tomorrow Chair, (217) 223-0055.

Elkhart, IN: The City sponsors an annual spring and fall tree planting program through which shade and ornamental trees are planted within street rights-of-way at no cost to homeowners. Homeowners request trees through the Buildings and Grounds Department. The City's goal is two-for-one replacement when removal of a tree is necessary.
Contact: Allysa Diman, City Forester, (574) 970-0542, ext. 204, or allysa.diman@coei.org.

Michigan City, IN: A large-scale initiative to enlarge the City's tree canopy has resulted in the planting of more than 800 trees throughout the City during the past two years.
Contact: Franklin Seilheimer, Urban Forester, (219) 873-1500, or mcforester@emichigancity.com.

Kansas City, KS: The Unified Government of Wyandotte County and Kansas City adopted an ordinance that includes the formation of a Tree Board and specifics for the care, placement, and protection of trees in public rights-of-way.
Contact: John Bower, Deputy Director of Parks, (913) 573-8362, or jbower@wycokck.org.

Manhattan, KS: Through the City's tree planting program, trees removed are automatically placed on a replanting list. Residents can request that trees be planted on the City street right-of-way that adjoins their property; depending on the number of requests and resources available, at least one tree will be planted. Residents can continue to request plantings until their property has the maximum number of trees that proper spacing will allow. This works in conjunction with efforts to remove and replace trees negatively affecting utility lines – the "right tree, right place" concept.
Contact: J. David Mattox, Forestry Supervisor, (785) 587-2757, or mattox@ci.manhattan.ks.us.

Louisville, KY: A coordinating body, "Community of Trees," meets monthly to coordinate work of state and local government agencies, community organizations, and private tree service providers in regard to education and outreach, planning, plant material purchase, research, and fundraising.
Contact: Cynthia Knapek, Chair, Community of Trees, (502) 574-3613, or cynthia.knapek@louisvilleky.gov.

Alexandria, LA: The City maintains an Urban Forestry Web site that provides detailed information on public tree maintenance, private tree maintenance, and utility line tree trimming. It also presents the City's Tree and Landscape Ordinance, and a list of trees of all sizes recommended for the area. A page for the City's Urban Forest Management Plan is under construction. Alexandria has created a Citizen Forester Program which enables residents to become knowledgeable about trees and to become advocates for the benefits trees provide.
Contact: Darren Green, Urban Forester/Landscape Architect, (318) 441-6060, or darren.green@cityofalex.com.

Rockville, MD: The City's Forest and Tree Preservation Ordinance was revised in 2007 to give the City increased authority to require preservation of existing trees during new land development. It also requires a minimum level of tree cover to be planted on new developments.
Contact: Wayne Noll, City Forester, (240) 314-8705, or wnoll@rockvillemd.gov.

New Bedford, MA: In 2007 the Tree City Committee was established to work toward increasing the number of trees planted Citywide. The committee is working to encourage citizen participation through the purchase and adoption of trees; goals are City beautification, neighborhood enhancement, and improved air quality. Members of the Tree City Committee encouraged residents to join the National Arbor Day Foundation and to donate the 10 saplings they received upon joining to the Department of Public Infrastructure. About 100 trees, purchased with a $20,000 urban forestry grant from the State's Department of Conservation and Recreation, are being planted throughout the City, beginning with treeless areas and moving toward downtown.
Contact: Tree City Committee Co-Chairs: Jo Ann Soares, Jo_Ann.Soares@newbedford-ma.gov, or Gig Lang, giglang@hotmail.com.

Southgate, MI: The City's recently-enacted Woodlands Ordinance provides strict guidance on the removal and replacement of trees. The City sells trees to residents and plants the trees for them for $80 each.
Contact: Levon King, City Administrator, (734) 258-3021, or lking@ci.southgate.mi.us.

Westland, MI: The City's tree replacement program is a partnership in which citizens pay $75 toward the City's total cost of purchasing and planting new trees that are over 2.5 inches in diameter. "Rooting for the Rouge" (a reference to the area's Rouge River) is a partnership with local schools through which fourth grade students design projects that help solve local environmental challenges and volunteer their time in carrying out tree planting and other projects at schools and in the community.
Contact: Kevin Buford, Director, Department of Public Service, (734) 467-3241, or dps@cityofwestland.com.

Bloomington, MN: In each of the past four years the City has held a public resident tree sale in which a variety of deciduous bare root trees – hardy varieties suitable for the Minnesota climate – have been offered at wholesale prices. The City also provides buyers an educational packet containing information on proper planting and care, along with information on allowable planting locations relative to rights-of-way, utilities, and other factors. Since the start of the tree sales, more than 1,000 trees have been planted on Bloomington residential properties.
Contact: Paul Edwardson, Assistance Maintenance Superintendent, (952) 563-8760, or pedwardson@ci.bloomington.mn.us.

Saint Paul, MN: Tree Saint Paul was started early in 2008 in response to the loss of about 1,000 trees – many of them mature and of majestic varieties – in an August 2007 windstorm, the third major storm in 10 years. A tree restoration master plan was developed and the Parks and Recreation Department, recognizing that the City budget would be unable to cover the replacement of trees on the scale required, created a program to solicit public donations on a continuing basis. Tree Saint Paul, in its first six months, collected more than $7,000. While originally created to address past storm damage, the program is expected to be in place, contributing to the sustainability of the community's trees, for years to come.
Contact: Cy Kosel, Natural Resources Manager, (651) 632-2412, or cy.kosel@ci.stpaul.mn.us.

Hattiesburg, MS: The City has a full-time Urban Forestry Department which includes an ISA Certified Arborist and a six-man crew responsible for maintaining the City's tree canopy – tree trimming, hazard removals and tree planting – along streets, parks and rights-of-way. The crew plants an average of 300 trees annually and provides the necessary maintenance of young trees with mulching and pruning. The City Arborist works with the City's urban development and code enforcement staff on all tree-related issues. Hattiesburg updated its tree ordinances in November 2007. A seven-member Tree Board helps guide the City's urban forestry program.
Contact: Andy Parker, City Arborist, (601) 545-1541, or aparker@hattiesburgms.com.

St. Louis, MO: The City's 2,682-acre park system contains about 30,000 trees. Prior to 2002, when the Forestry Division instituted its Lawnmower Prevention Program, many of these park trees were being damaged by the lawn maintenance equipment being used by the Park Division. Through the program, a poster, informational handout, and prevention standards (covering inspections, mulch, and trunk guards) were developed and annual staff training was instituted. The cooperative Forestry-Park program has been very successful in reducing tree damage. The program has also produced and distributed to the general public an informational handout on street tree care and avoidance of lawnmower damage.
Contact: Greg Hayes, Commissioner of Forestry, (314) 613-7205, or hayesga@stlouiscity.com.

Lincoln, NE: The City's Parks and Recreation Department offers a cost-share assistance program (when funds are available) to property owners who wish to purchase and plant a street tree on the City right-of-way adjacent to their property. Through the Street Tree Voucher Program, residents can match or exceed the cost-share assistance to purchase and/or plant better street trees, which can increase their property values as well as the City community forest. Because voucher recipients match or exceed the value of the voucher, the impact of the City's investment in street trees is nearly tripled. The effort has provided residents with better information on the proper planting and care of trees; as a result, the community forest has benefited from a higher level of stewardship.
Contact: Steve Schwab, City Forester, (402) 441-7036, or sschwab@lincoln.ne.gov.

Elizabeth, NJ: The City participates in a grant program offered by Union County through the Open Space Recreation and Historic Preservation Trust Fund. Tree purchases by the City are matched, one-for-one, by the program, which also provides installation by forestry professionals and a one-year maintenance guarantee. Another City initiative involves Groundwork Elizabeth, a nonprofit organization established to improve the quality of life in the City by planting trees, landscaping, reclaiming derelict Brownfield properties, restoring parks, and involving the community in regeneration efforts. In the last four years the City and Groundwork Elizabeth have planted more than 2,500 trees in public areas.
Contact: John Papetti, Jr., Director of Public Works, (908) 820-4101, or emadorma@elizabethnj.org.

Clifton, NJ: The City's tree-planting program got underway in the early 1990s, part of a larger effort to make the City an environmentally friendly community, and in response to residents' calls for more greenery in their neighborhoods. The program launched then is still active today and is responsible for planting over 500 trees per year; the trees are purchased using grants from various organizations. The City operates its own tree farm, maintains partnerships with tree organizations and community environmental groups, follows a Community Forestry Management Plan which sets goals set every five years, and maintains a Sustainability Report on the Web site which is constantly under revision.
Contact: Alfred Du Bois, Jr., Recycling Coordinator, (973) 470-2239, or adubois@cliftonnj.org.

Piscataway, NJ: The Township's Tree Preservation Ordinance, which covers the indiscriminate cutting of trees, requires all tree removals on construction sites to be approved by the municipality. A replacement plan is necessary when more trees are being removed then preserved within an area of disturbance. The permit process allows the Township to recognize and preserve quality and specimen trees where possible and prevent the elimination of its tree cover.
Contact: Henry Hinterstein, Landscape Architect, (732) 562-6560, or hhinterstein@piscatawaynj.org.

Albuquerque, NM: A City Forester position created to implement a new City forestry program is responsible for developing the support and methods that will protect and improve the City's urban forests for environmental, economic, and social purposes. Projects implemented include a baseline study from a multi-spectral mapping and environmental assessment contract, and an Urban Forest Initiative, a Citywide tree planting effort undertaken in coordination with outreach programs that will develop new partners and sponsors. This award-winning program is creating an extended base of support that will directly improve the effectiveness of Albuquerque's present and future projects.
Contact: Nick Kuhn, City Forester, (505) 768-5370, or nkuhn@cabq.gov.

Buffalo, NY: ReTreeWNY is a local not-for-profit organization funded by donations, grants, and the City. It provides trees at no cost to residents for planting on City rights-of-way; it also provides education and training seminars. Through this partnership program, 4,000 trees have been planted in a two-year period.
Contact: Jeffrey Brett, City Forester, (716) 851-5013, or jbrett@city-buffalo.com.

Rochester, NY: The City's broad-based effort to preserve its tree canopy includes: an annual street tree inventory survey; an annual hazard tree survey and removal of hazard trees; regular tree maintenance pruning on a seven-year cycle; regular tree planting with aftercare, which yields a 95 percent success rate; a training program for forestry staff, seven of whom are ISA Certified Arborists, six of whom have the State Pesticides License; a Trees and Flowers Program that cost-effectively aids in the establishment of newly planted trees; removal of dead or severely declining trees within 10 days of their identification; and, to ensure quality work, tree planting and stump grinding performed by the City's forestry crews. Rochester has a team of well-trained Urban Forestry Technicians in addition to its professional tree workers.
Contact: Ian Nadar, City Forester, at (585) 428-7581, or nadari@cityofrochester.gov.

Burlington, NC: The City is in the process of approving a downtown revitalization plan that includes the planting of approximately 200 trees within the central business district. The goal is to provide some shade along with the many other benefits trees can add to a streetscape. The trees will be planted along sidewalks and parking lots and in some green spaces.
Contact: Jeff Parsons, Cemetery and Grounds Superintendent, (336) 222-5077, or jparsons@ci.burlington.nc.us.

North Royalton, OH: To improve the aesthetic qualities of the City, the Service Department works closely with garden clubs and Parks and Recreation staff, planting and maintaining trees, shrubs, turf, and flowers. The department also works closely with the City's Building Department to implement provisions of a master tree plan with developers and residents as new construction occurs.
Contact: Kris Kamps, Service Director, (440) 582-3002, or servicedir@northroyalton.org.

Harrisburg, PA: The City has been a Tree City USA for the past 21 consecutive years and has received the Growth Award for the past five years. The City plants appropriate species of trees that are ideal for urban setting while attempting to increase the tree canopy within Corporate limits. The City encourages and assists property owners by identifying appropriate street trees to be planted between sidewalks and curbs; it also assists with placement of new plantings after all underground utility lines are marked – an effort that increases the sustainability of the trees being planted – and advises on proper spacing between trees. Tree wells that are too small and the planting of trees above steam lines can cut into the life of the trees being planted. The City recognizes that appropriate species, spacing, and tree well sizes are all critical when trying to ensure proper growing conditions for an urban landscape.
Contact: Tina Manoogian-King, Parks and Recreation Director, (717) 255-3020, or tking@cityofhbg.com.

Scranton, PA: The City's Urban Forestry Program was started about seven years ago with the addition of a professional graduate forester to the City staff. Currently, the program's main concern is the removal of all potentially dangerous trees and limbs, those that pose a serious threat to life and property throughout the City and its eight parks. Approximately 500-plus dangerous trees have been removed to date; during this same time period, over 600 trees have been planted. A Fall contract will result in the planting of an additional 238 street trees in the South Scranton area. With strong City support, the planting program is expected to continue far into the future. Under a program launched two years ago, the City Forester, working in conjunction with the Bureau of Licensing, Permits and Inspections, can order the removal of very dangerous trees and/or limbs from private property. About 25 such trees have been removed to date.
Contact: Anthony Santoli, City Forester, (570) 947-2885.

Providence, RI: The Providence Neighborhood Planting Program is a partnership between the City and the Mary Elizabeth Sharpe Street Tree Endowment. It provides free street trees to community residents that apply for group plantings, and involves residents in the tree plantings at Saturday events. Since 1989 the program has planted over 7,000 trees.
Contact: Douglas Still, City Forester, (401) 785-9450, or dstill@providenceri.com.

Warwick, RI: In the Spring of 2005 the City dedicated approximately one acre of open space for use as a tree farm – the Barton Farm Pot in Pot Tree Farm. Using pot in pot technology, the City designed and built a farm that would allow harvesting of about 100 trees per year. The trees are purchased as bare root stock, potted up and grown for one to two years, depending on species, and, when ready for harvest, planted on public properties by employees of the Planning and Public Works Departments. The pot is returned to the tree farm, and the process begins again. The tree farm offers the City many advantages: the cost of planting each tree is approximately 20 percent of the cost formerly incurred, there is much greater control over the species available to the City, and the mortality rate appears to be much lower. The City has been growing smaller species, which are commercially unavailable, for planting under utility wires. The smaller trees are easier to plant and they don't require heavy equipment, which saves fuel and operator costs. Tree farm trees are planted with 100 percent of their root ball intact; they don't have to struggle to survive transplant as do traditional larger trees.
Contact: Margaret Ryan, Landscape Project Coordinator, Planning Department, (401) 486-7313, or margaret.e.ryan@warwickri.com.

Charleston, SC: Since the inception of the City's Street/Park Tree Planting Program in 1983, over 10,000 trees have been planted on public property. Through this program, the City resells to citizens, at wholesale cost, trees to be planted on public property. City crews prepare the site

and plant the tree. If the tree to be planted is a street tree, the purchaser agrees to water it for a period of one year. City crews perform all subsequent maintenance for the duration of the tree's life.
Contact: Danny Burbage, Superintendent of Urban Forestry, (843) 724-7416, or burbaged@ci.charleston.sc.us.

Columbia, SC: Columbia has been a Tree City USA for 29 continuous years. Officials believe this designation increases the visibility of tree issues and keeps these issues fresh in the minds of City residents. The City maintains approximately 45,000 street trees and adds 500 trees to this inventory each year.
Contact: Sara Hollar, Forestry and Beautification Superintendent, (803) 545-3860, or sehollar@columbiasc.net.

Sumter, SC: The City requires the submission of tree protection plans for all commercial developments and subdivisions before any permits are issued. Landscaping plans including canopy trees are a part of this requirement.
Contact: Charles Holmes, Arborist, (803) 774-1612, or cholmes@sumter-sc.com.

Chattanooga, TN: In March 2008 the City launched a new program, "Take Root," with a goal of increasing the tree canopy in the Central Business District from the current seven percent to 15 percent. Reaching the goal will necessitate the planting of thousands of new trees. Although the program has been underway for only a few months, the City has already received more than $100,000 in foundation support, and local businesses are creating ways to donate portions of their sales proceeds to the effort. The financial goal is $1 million.
Contact: Gene Hyde, City Forester, (423) 757-7283, or hyde_gene@mail.chattanooga.gov.

Hendersonville, TN: The City requires that, for all new development (except for one- and two-family residential), the developer is required to retain trees, replace them, or pay into a Tree Bank which is used to pay for the planting of trees along streets or on other public property.
Contact: Fred Rogers, Jr., Planning Director, (615) 264-5316, or frogers@hvilletn.org.

Frisco, TX: The City's landscape ordinance emphasizes environmentally responsible landscapes and best management practices. The goal of the ordinance is conservation of 50 percent of the water used for landscapes. It sets a limit on the amount of water that may be used annually and provides the calculations and design tools needed to achieve the conservation goal. The ordinance also provides for the expansion of the tree canopy by requiring that trees be used to provide shade for buildings, outdoor pedestrian areas, parking areas, and streets, and it requires a minimum of 500 square feet of root space per tree to facilitate the growth of larger canopy trees in and around commercial areas. Both the City's landscape and tree preservation ordinances have been used as models by other cities.
Contact: Bob Johnson, Manager of Park Services, (972) 292-6500, or bjohnson@friscotexas.gov.

Laredo, TX: Through its landscape ordinance and the installation of irrigation systems throughout its park sites, the City of Laredo has pursued a strict policy of preserving mature trees in public areas and rights of way. The ordinance requires the planting of trees and shrubs in all new residential and commercial developments throughout the City. The Parks and Leisure Services Department maintains a tree nursery which holds approximately 500 young trees slated for future transplant in parks and other public places. In past efforts, Parks crews have prepared for tree planting with the assistance of volunteers from the "Keep Laredo Beautiful" and Boy Scouts organizations. Planting events are planned throughout the year. In addition to

pruning and maintaining canopy trees in the parks, the Department hosts educational sessions on tree trimming and planting for maintenance personnel and other interested parties and provides educational materials on the benefits of trees to the schools. Enlarging the tree canopy has been an ongoing initiative that has benefited from the generous assistance of schools and local organizations.
Contact: Celinda Rivera, Assistant Director of Parks and Leisure Services, (956) 795-2350, or crivera@ci.laredo.tx.us.

Mesquite, TX: In January 1996 the City Council adopted a landscape and tree ordinance requiring the preservation of the existing tree canopy. It mandates that developers of new properties submit a tree survey/mitigation/preservation plan before work is initiated on a project. The regulations require that a minimum of 10 percent of the property have landscape; they also require a tree canopy equivalent to one three-inch caliper shade tree per 500 square-feet of landscape material, and they restrict the planting of shade trees around or under power lines.
Contact: Travis Sales, Park Superintendent/Municipal Arborist, (972) 216-6913, or tsales@ci.mesquite.tx.us.

Sandy, UT: Sandy Pride Day, an annual Citywide volunteer effort supported by the City and the Chamber of Commerce, includes planting and cleanup projects. In most years more than 200 volunteers are involved in the projects. In some years up to 900 trees and shrubs have been planted in areas with irrigation to sustain them.
Contact: Scott Earl, Parks and Recreation Assistant Director, (801) 568-2910, or searl@sandy.utah.gov.

Alexandria, VA: Currently in final review, the City's Urban Forestry Master Plan presents a comprehensive evaluation of the tree canopy and an analysis of the public and private components that make up the urban forest. The plan includes goals and recommendations for expanding the City's tree canopy and improving its health and longevity, and actions to be taken to improve the management and maintenance of street trees and others on park, school and other public properties, and to expand outreach and educational components that will encourage the planting and maintenance of trees throughout the City.
Contact: John Noelle, City Arborist, (703) 838-4999, or john.noelle@alexandriava.gov.

Roanoke, VA: The City's Urban Forestry Plan, an element of its "Vision 2001-2020" comprehensive plan, was adopted by the City Council in April 2003. Goals of the 10-year plan are to achieve 40 percent tree canopy coverage within the10 years; plant enough street and park trees to reverse the "annual net loss" trend of public (City-owned) trees; strategically target non-residential transportation corridors or gateways to the City that need additional "greening" by planting more trees; plant more trees in neighborhood areas where the City owns easements or roadside strips or medians; encourage planting of trees by citizens in their yards; and improve tree management. The Parks and Recreation Department is the lead agency in the implementation of the plan, but interdepartmental cooperation is essential to reaching the goals.
Contact: Dan Henry, Urban Forester, Roanoke Parks and Recreation, (540) 853-1994, or dan.henry@roanokeva.gov.

Everett, WA: Through the City's tree ordinance and the tree policy established by that ordinance, the City has a fully-staffed, seven-member, appointed Tree Committee that functions as a subcommittee of the Parks Board of Commissioners (although committee members are not Park Board members). This group advocates tree preservation and expansion of the tree inventory in public forums. An active outreach and education program is part of this effort.

Contact: John Petersen, Parks and Recreation Assistant Director, (425) 257-8371, or jpetersen@ci.everett.wa.us.

Seattle, WA: The Green Seattle Partnership is a unique public-private venture dedicated to promoting a livable City by reestablishing and maintaining healthy urban forests. The Green Seattle Partnership 20-Year Plan was inspired by over 10 years and more than 500,000 hours of citizen volunteerism dedicated to reforestation of Seattle's Parks. Formed in 2004 by a Memorandum of Agreement between the City and the Cascade Land Conservancy, the Green Seattle Partnership is working to restore 2,500 acres of forested parkland by 2025.
Contact: Mark Mead, Senior Urban Forester, (206) 684-4113 or mark.mead@seattle.gov.

SURVEY CITIES

Chandler	AZ
Goodyear	AZ
Yuma	AZ
North Little Rock	AR
Antioch	CA
Bellflower	CA
Chico	CA
El Monte	CA
Fairfield	CA
La Mesa	CA
Lakewood	CA
Lancaster	CA
Napa	CA
Oxnard	CA
Pleasanton	CA
Riverside	CA
Sacramento	CA
San Leandro	CA
Santa Ana	CA
Santa Clarita	CA
Stockton	CA
Sunnyvale	CA
Temecula	CA
Tustin	CA
Vallejo	CA
Vista	CA
West Hollywood	CA
West Sacramento	CA
Whittier	CA
Colorado Springs	CO
Enfield	CT
New Haven	CT
Norwalk	CT
West Haven	CT
Wilmington	DE
Coral Gables	FL
Largo	FL
Miami	FL
North Miami	FL
Oakland Park	FL
Orlando	FL
Pembroke Pines	FL
Pinellas Park	FL
Plantation	FL
Tamarac	FL
Tampa	FL
Albany	GA
Athens	GA
Savannah	GA
Honolulu	HI
Twin Falls	ID
Addison	IL
Arlington Heights	IL
Bartlett	IL
Bolingbrook	IL
Carol Stream	IL
Chicago	IL
Evanston	IL
Lombard	IL
Northbrook	IL
Oak Lawn	IL
Palatine	IL
Park Ridge`	IL
Quincy	IL
Schaumburg	IL
Springfield	IL
Elkhart	IN
Evansville	IN
Michigan City	IN
Mishawaka	IN
Muncie	IN
Kansas City	KS
Manhattan	KS
Lexington	KY
Louisville	KY
Alexandria	LA
New Bedford	MA
Rockville	MD
Farmington Hills	MI
Muskegon	MI
Southgate	MI
Sterling Heights	MI
Westland	MI
Bloomington	MN
Burnsville	MN
Edina	MN
Minneapolis	MN
Roseville	MN
St. Paul	MN
Meridian	MS
Hattiesburg	MS
St. Louis	MO
Lincoln	NE
Clifton	NJ
Elizabeth	NJ
Perth Amboy	NJ
Piscataway	NJ
Albuquerque	NM
Las Vegas	NV
Buffalo	NY
Rochester	NY
Utica	NY
Burlington	NC
Canton	OH
Garfield Heights	OH
Lima	OH
North Royalton	OH
Harrisburg	PA
Scranton	PA
Providence	RI
Warwick	RI
Charleston	SC
Columbia	SC
Sumter	SC
Chattanooga	TN
Hendersonville	TN
Bryan	TX
Frisco	TX
Laredo	TX
McKinney	TX
Mesquite	TX
Phair	TX
Orem	UT
Sandy	UT
Alexandria	VA
Newport News	VA
Portsmouth	VA
Roanoke	VA
Auburn	WA
Everett	WA
Lakewood	WA
Redmond	WA
Seattle	WA
Beloit	WI
Milwaukee	WI

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USDA Forest Service
320 Green Street
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Web Site www.urbanforestrysouth.usda.gov

Urban Forestry Resource List

Tree Canopy Ordinances

November 24, 2003

SUMMARY

Tree ordinances that are based on the mature canopy size are currently being developed and tested in the SE United States.

These canopy ordinances have several things in common with tree density unit ordinances:

- Ordinance requirements are triggered by a development activity (e.g. application for a Land Disturbance permit or an Erosion & Sedimentation permit),
- A pre-development tree inventory is required,
- Trees being conserved must be protected throughout the construction project,
- A mathematical calculation is required,
- On-site inspections are made by the local government,
- There is a maintenance requirement (not evident in the Chesapeake ordiannce).

Although some of these ordinances are quite new, they are based on the long-term retention (or replacement) of tree canopy based on development zones. For example, in the Athens-Clarke County (Georgia) ordinance, mature tree canopy cover is between 40% and 50% for residential developments. Single family residential subdivisions are not required to have canopy cover, however they are required to plant street trees. Multi-family residential is required to have canopy cover, as well as street trees and parking lot trees.

Like any ordinance, the success of tree canopy ordinances depends on community acceptance, compliance and enforcement. In addition, to facilitate successful implementation, these ordinances depend on a detailed tree species list that identifies the expected canopy size at maturity, and the type of planting locations that are suitable for that species (e.g. street, parking lot, utility line).

The canopy characteristics outlined in the Athens-Clarke County Tree Species List (see **Resources** for a download URL) are thought to be conservative for trees under moderate care.

In Covington (Georgia), periodic monitoring of canopy cover with aerial photography will help evaluate the ordinance's success. Similar, periodic canopy analysis will be made with satellite imagery in Athens-Clarke County. Both of these monitoring activities are supported by a County/City aerial mapping, which is done every 3-4 years.

DISCUSSION

A canopy ordinance in Chesapeake, Virginia was implemented prior 1997. Canopy requirements include:

Zoning Classification	Mature Canopy
Non-residential Uses	10%
Multi-family residential uses	15%
Single family/duplex residential uses	20%

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Technology Transfer Specialist dhartel@fs.fed.us

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The canopy requirement calculation (mature canopy %) is based on the size of the development site minus the area occupied by the building footprint(s). For example, a single-family residential use on a 10,000 SQFT lot with a 2,000 SQFT building footprint would require mature canopy of 20% x (10,000 – 2,000) or 1,600 SQFT of mature canopy. This canopy may be obtained by preserving existing trees or by planting.

A canopy credit is provided as an incentive to preserve individual or clusters of trees. For individual trees the credit is 2x the canopy area of each tree. In the example above, a single tree with a canopy of 800 SQFT would meet the 1,600 SQFT requirement (2 x 800 = 1,600). For trees in a cluster, the credit is 1.25x the combined canopy area. Consequently, a cluster of trees with a combined canopy of 1,280 SQFT would meet the requirement (1.25 x 1,280 = 1,600).

When trees are planted, the ordinance provides canopy credit of 400 SQFT for large trees and 200 SQFT for small trees (Species identified in the *Chesapeake Landscape Specifications Manual*). In the example above, 4 large trees would have to be planted. Since large maturing trees can have canopies that exceed 1,600 SQFT (22.6' crown radius), the canopy credit (400 SQFT is equivalent to a crown radius of 11.3') appears to take some of the following factors into account:

1. Expected, early mortality (immediately after any guarantee period),
2. Reduced life-cycle issues (because of tree health or owner preference for non-treed lawns),
3. Density of canopy because of tree condition,

In the Chesapeake ordinance, there is also a requirement for front yard trees in residential zones with fewer that 10 units per acre, and a maximum planting requirement of 11 large trees (22 small trees).

Other recently adopted tree ordinances based on tree canopy include the following:

Athens-Clarke County (A-CC), GA (in effect since January 2001)

This canopy ordinance affects some residential (single-family developments exempt), commercial and industrial development. It is implemented through the Zoning & Development Standards (Chapter 9-25).

For each applicable zone, the ordinance establishes the minimum percent of mature tree canopy. For example, for a residential zone (RM-2) the target tree canopy is 45%.

Developers can meet this requirement by conserving existing (healthy) trees or planting new trees.

Street trees are required (1 every 30 feet) and can count toward the mature canopy. Tree placement on streets is defined but flexible.

The tree requirement in parking lots is 1 tree (large maturing) per 7 parking spaces and can count toward the mature canopy requirement for the development.

There is a requirement to distribute canopy throughout the development.

This ordinance has been in effect for 3 years and is currently being evaluated (report expected by early 2004).

This ordinance requires a minimum amount of landscaped area, and a minimum amount of open (permeable) soil surface area for each tree, which is approximately 25% of the mature canopy area (1600 sq ft canopy, 400 sq ft open soil; 900 sq ft canopy, 225 sq ft open soil; 400 sq ft canopy, 100 sq ft open soil, and 150 sq ft canopy, 25 sq ft open soil).

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Urban Forestry Resource List

Covington, GA

The City Council passed this ordinance on October 6, 2003 with an effective date of October 11, 2003.

This ordinance is very similar to the Athens-Clarke County ordinance (Connie Head was involved with the development of both of these ordinances), but with apparent improvements:

- In addition to the points listed above for A-CC, there is a requirement that ½ of the required canopy be met with existing healthy trees (this is encouraged, not required in A-CC).
- The ordinance has a requirement for spatial uniformity of mature tree canopy.
- A separate bond or irrevocable letter of credit will be required for Tree Protection and Tree Establishment since the tree ordinance stands alone (i.e. not part of Zoning & Development ordinance as in A-CC).
- The ordinance applies to redevelopment and in these cases is triggered by an application for a building permit (An application for a Land Disturbance permit triggers this ordinance for new development).
- The County/City GIS department supported by County/City aerial mapping ever 3-4 years, will monitor canopy for Newton County, the City of Covington, each zone (within the City), and each development required to have canopy. The canopy cover analysis done for each development (tagged by parcel number) will monitor canopy into the future and evaluate the performance of the ordinance.
- This ordinance also requires a minimum amount of landscaped area, and a minimum amount of open (permeable) soil surface area for each tree, which is 40% of the mature canopy area (1600 sq ft canopy, 640 sq ft open soil; 900 sq ft canopy, 360 sq ft open soil; 400 sq ft canopy, 160 sq ft open soil, and 150 sq ft canopy, 60 sq ft open soil).

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Urban Forestry Resource List

How They Work (an example using the Covington Ordinance)

Development Description

	Description	Comment
Zone:	RM-2 (Residential)	
Canopy Requirement:	45% of development	½ of this requirement (22.5% of the developed area) must be met by conserving existing, healthy trees.
Development Size:	63.5 acres	
Existing, Healthy Canopy:	36%	
Tree Species for Planting:	Large maturing trees (see A-CC Tree Species List)	
Mature Canopy Size:	1,600 ft^2/tree	
Lot Yield:	100	This information is not relevant for the calculation, but used to illustrate approximate post-construction spatial distribution.

Doing the Math

	Calculation	Comment
Canopy Requirement:	45% of 63.5 acres = 1,244,727 ft^2	½ of this requirement (22.5% of the developed area) must be met by conserving existing, healthy trees.
Conserved, Healthy Canopy:	691,515 ft^2 which is >½ of the canopy requirement for the 63.5 acres development	622,363.5 acres (22.5%) of the development is the minimum conservation requirement.
Planted Canopy Requirement:	1,244,727 ft^2 - 691,515 ft^2 = 553,212 ft^2	
Tree Requirement:	553,212 ft^2 ÷ 1,600 ft^2/tree[1] = 346 trees[2]	
Average Trees/Lot:	346 trees ÷ 100 lots = 3.5 trees/lot[3]	

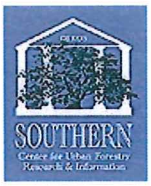
[1] A mix of species with different mature canopy sizes will make this calculation slightly more difficult.

[2] This total requirement can include street and parking lot trees when required.

[3] While lot yield and tree planting per lot is not part of the canopy ordinance, this calculation can be used to make a comparison with other tree ordinances based on tree density units or a minimum tree/lot requirement. For the developer, this calculation can assist in meeting the spatial distribution requirement.

Southern Center for Urban Forestry Research & Information
USDA Forest Service
320 Green Street
Athens, GA 30602-2044

Web Site www.urbanforestrysouth.usda.gov



Urban Forestry Resource List

RESOURCES

Chesapeake (Virginia)

- **Landscape Ordinance**

  http://livepublish.municode.com/19/lpext.dll/Infobase9/1/33cf/4611/473d?fn=altmain-nf.htm&f=templates&2.0

  Section 19-602: Tree preservation and canopy requirements.

- **Chesapeake Landscape Specifications Manual**

Athens-Clarke County (Georgia)

- **Zoning & Development Standards**

  http://livepublish.municode.com/1/lpext.dll?f=templates&fn=main-j.htm&vid=12400

  Title 9: Zoning, Article 1. Zoning, Chapter 9-25

- **Best Management Practices for Community Trees**

  http://www.athensclarkecounty.com/documents/index.htm

  Under Landscape Management (Department)

  PDF download (1.5 MBYTES, 134 pages)

  This is the entire (voluntary) BMPs for tree care that includes the A-CC Tree List with attributes.

Connie Head, Community Forester — forester@co.clarke.ga.us

Connie was primarily involved in Athens in the development of the Tree Species List and canopy cover/soil amounts, and only peripherally involved in the development of the revised Site Design and Use Standards (Chapter 9-25). John Fregonese, a planning consultant from Portland, was the primary author of the development regulations.

City of Covington (Georgia)

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