CITY OF DAVIS

COMMUNITY FOREST MANAGEMENT PLAN

September 2002

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Adopted by City Council
September 11, 2002

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Community Forest Management Plan

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CHAPTER I.
Overview of the Community Forest Management Plan

The City of Davis' Community Forest Management Plan (CFMP) is a supporting document to the most recent City of Davis General Plan. This plan provides a framework for the community's trees, clarifies general goals and policies as they relate to trees, and recommends a community forest management implementation strategy and alternative funding sources for the Fiscal Year(s) 2002 through 2007.

A. Vision Statement

The City of Davis adopts this vision for the future of the community forest:

> The City of Davis will be a community identified and shaded by a "living umbrella." Relying on the Community Forest Management Plan for guidance, the City of Davis will actively encourage participation in tree planting and stewardship, preserve and protect existing trees, promote public safety and tree health, implement cost-effective enhancement and maintenance of the forest, increase public awareness of the value of our community forest, and maximize the social, economic and environmental benefits of the community forest for current residents and future generations.

'Welcome to Davis', Russell Boulevard

This vision is intended to act as a catalyst for extending our living umbrella of trees. Planting new trees combined with maintaining the health of existing trees will increase the tree canopy spreading over our community streets, parking lots, parks and open spaces, and private properties.

B. Benefits and Value of the Community Forest

The City of Davis is fortunate to have many community assets: a vital downtown, fine schools, pleasant neighborhoods, a world-class university, and amenities for all residents, including exemplary programs for seniors and children. Located within the Central Valley landscape, a single element in our environment creates both a strong visual

framework and functions as the most significant micro-climate enhancer in the community. The crowning jewel of Davis is its tree canopy.

There are approximately 30,000 city-maintained trees in Davis' parks and streets, and many more trees on private property. This resource represents a multi-million dollar investment – a valuable community asset. How could we ever replace the valley oak that towers near the Farmers' Market, the flowering trees that brighten the downtown every spring, the trees under which we picnic in our greenbelts, parks and in open spaces and along waterways, or the venerable street trees whose shade makes it feasible to take a walk on a sizzling summer afternoon?

The Community Forest Management Plan provides a vision for the future of Davis's 'living umbrella' and a roadmap to direct us toward that vision for the coming years. The quality of our community forest is relevant to the environmental and economic health of Davis.

Greg McPherson, Chair,
Davis Tree Commission, 2002

The City of Davis acknowledges the importance of trees to the community's health, safety, welfare and tranquility. Much of the town's admired and valued appearance and ambiance is due to its tree canopy, a dominant visual and spatial element of the landscape. Trees in Davis benefit the community in many important ways. Trees serve to:

- create an aesthetically pleasing environment
- increase property values
- provide visual continuity
- provide shade and cooling
- conserve energy
- provide erosion control and reduce stormwater runoff
- release oxygen and filter airborne pollutants
- reduce noise
- provide privacy
- provide wildlife habitat
- provide historical awareness and continuity of historical setting

The community forest, consisting of both public and private trees, must be prudently protected and managed to secure these benefits.

C. Current Priorities for Community Forest Management

This overview addresses current priorities for community forest management. Management goals enumerate the six goals established in this CFMP, followed by immediate management priorities and recommended special projects. A summary of potential funding sources is enumerated. 'What's in this Document' gives an overview of the remaining chapters in the plan.

1. Management Goals

This plan establishes six over-arching community forest management goals for the City of Davis. Chapter III expands upon these goals with policies, standards and actions. Also, this plan prioritizes needs for management and special projects over the next five years. Because of the inherent nature of managing a living entity—the community forest—these priorities will change over time, both through completion of specific projects, allowing us to turn our sights to other management priorities, and through the changing nature, age and composition of our "living umbrella" over the years.

Goals of the Community Forest Management Plan

Goal 1. Improve the quality of the Community Forest (consisting of all public and private trees) over time in ways that will optimize environmental, economic, habitat, food and social benefits to the City and its neighborhoods.

Goal 2. Promote planting, preservation and protection of the existing Community Forest resource.

Goal 3. Continue to maintain the City's trees in a safe and healthy condition as cost-effectively as possible.

Goal 4. Facilitate collaboration among City departments related to issues and projects involving trees.

This Community Forest Management Plan is a positive, inclusive step towards inspiring the people of our region to understand the importance of the urban forest through education and training, volunteer citizen forestry, planting and stewardship, and community partnerships.

Dena Kirtley, Director, TREE Davis

Goal 5. Provide awareness of the importance of the Community Forest; educate the community on proper tree planting and care; and encourage greater participation in tree planting and stewardship activities.

Goal 6. Adopt the Community Forest Management Plan to guide long-term tree planting and maintenance activities, and update it every five years.

Management Priorities

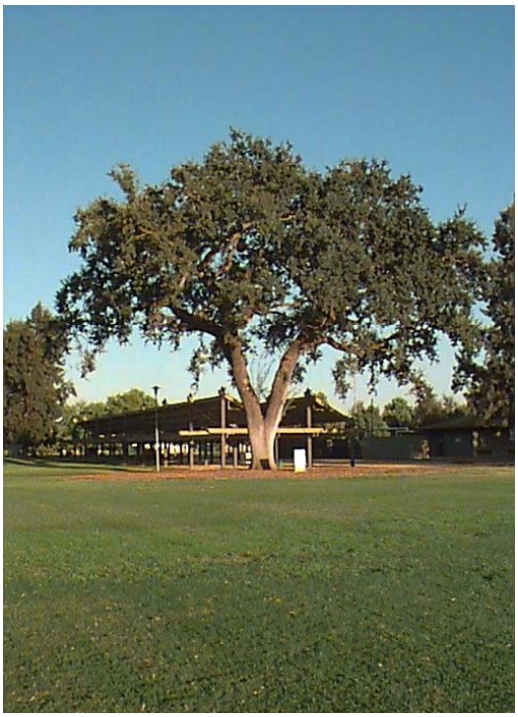
There are five tree program management elements that must be addressed every year: Hazard Tree Abatement, Mature Tree Care, Young Tree Care, Tree

Planting, and Program Administration. Although each of these programs is essential to the maintenance and life of the community forest, an annual and/or five-year plan for management priorities should be established to determine where available budget dollars will be spent. For Fiscal Years 2002-2007, the City establishes public safety and responsible management of the existing community forest as highest priorities, based on the current state of the community forest (See Chapter II, Context: Existing Conditions).

Priority 1: Hazard Tree Abatement: Hazard tree abatement, or removal of dead or dying trees within the community forest, is the highest budget priority due to potential public safety concerns. Dead and dying trees can be in danger of falling or losing major branches, with resultant property and/or personal injury concerns.

- Recommendation: Eliminate any backlog of hazard street trees. Maintain the City's ability to remove all dead/dying trees in a timely manner.

Priority 2: Mature Tree Care: Mature tree care is a high priority for the tree management budget over the next five years. Large trees are the most significant component of our community forest. They form the umbrella over our streets, parks and private properties, and create the backbone of the urban form. Some mature trees have been designated as Landmark and/or Historical Resources and have a special acknowledged value to the community. Although care of mature trees is the most costly management element, it is a priority because of the importance of safety and tree health issues; the consequences of lack of care are more immediate for large trees than smaller trees. The mature trees that are managed within the City budget include all street, park and other city-owned trees over four-inch diameter at breast height (DBH), as well as Trees of Significance, Landmark Trees, and parking lot trees (See Glossary).



Landmark Oak Tree at Community Park

- Recommendation: As funds permit, reduce the current 8-year pruning cycle to 5-years for larger trees.

Priorities 3 and 4: Young Street Tree Care and Planting: Young tree care and new tree planting are essential parts of community forest management. The health and stability of our future forest depends in large part on judicious tree selection today, as well as ongoing maintenance of young street trees. These recommendations assume that City staff will be assisted in young tree care and planting activities by community based partners, who can train volunteers and apply for outside grants, thereby producing a substantial cost savings to the City.

- Recommendation: Increase young tree care service by moving from existing three-year inspection/pruning cycle to an optimal 2-year cycle. Eliminate the annual backlog of any young street trees that are not receiving early training/pruning.

- Recommendation: Use city-funded tree planting for replacement trees, and seek outside grant money with the help of community based partners (such as TREE Davis) for additional planting to reach our goal of 100% stocking in ten years. Provide one-time funds to replant removed hazard trees.

It is not so much for its beauty that the forest makes a claim upon men's hearts, as for that subtle something, that quality of air that emanates from old trees, that so wonderfully changes and renews a weary spirit.

Robert Lewis Stevenson

Priority 5: Administration: Administration refers to activities such as supervision, scheduling, coordination, planning and education overseen by the City's supervisory arborists. Current tasks performed by the arborists are numerous and varied. They respond to public contact, including comments, work orders and special requests related to trees, and coordinate with other City departments such as Public Works, Planning & Building, various commissions including the Tree Commission, and other organizations. Part of this coordination responsibility is to review proposed development and construction plans to ensure that adequate existing tree preservation and protection measures are taken and that tree planting follows city guidelines. During construction, the arborists supervise contractors working on or near City and/or private property trees and enforce ordinances for tree-related work.

- Recommendation: Maintain the current level of Program Administration.

Special Projects

The following community forestry projects are identified as highest priority for funding in the next five years, described in order of importance.

1. Create job description(s) for and maintain City Arborist position (and/or professional Urban Forester). The role filled by this professional is of invaluable

service to the City of Davis and the perpetuation of the community forest. Maintaining this position with a highly qualified arborist (and/or urban forester) is critical to building upon the program's successes.

2. Conduct a comprehensive public tree inventory, updated regularly, and develop a master street tree plan. An improved public tree GIS database can support cost-effective contracting, work scheduling, and reduce liability. The master street tree plan will direct future planting efforts by identifying types of species, spacing, and patterns for streets, neighborhoods and historic areas.

Tree canopy over residential street

3. Develop neighborhood canopy cover targets. This project will develop reasonable tree canopy cover targets for Davis neighborhoods, providing a basis for collaborative tree planting and management activities on public and private lands by working with community based partners, the Davis Joint Unified School District, and UC Davis.

4. Develop tree removal and replacement programs for targeted areas. This proactive tree management approach extends the success of previous projects that involved local residents in planning neighborhood tree removals and replacements and it promotes healthy trees with a diverse species and age distribution.

5. Conduct a tree failure survey to identify potentially hazardous, dead or dying street trees, and schedule removal and replacement.

Estimated costs for each of these projects are included in Chapter V.

2. Potential Funding Sources

Expanding funding for Community Forestry makes it possible to increase the number of projects accomplished and reduce reliance on limited municipal funds. Leveraging municipal funds through partnerships with other sources of funding from state, federal, and local organizations will increase the number of partners with a vested interest in sustaining a healthy community forest. Potential sources of additional revenue have been identified as follows:

- Tree planting grants, available from sources such as the National Tree Trust, American Forests, and the California Department of

Transportation, as well as Yolo-Solano Air Quality Management District for parking lot tree planting (as an ozone reduction measure), CALFED for stormwater runoff reduction and groundwater recharge, PG&E/SMUD for energy conservation, and other funding organizations.

- Public awareness and volunteer training. California ReLeaf and California Department of Forestry and Fire Protection award grants to grassroots groups across California for education, public awareness, tree planting and care, and volunteer development.

- Local measures and funding for tree planting and maintenance. City bonds, infrastructure costs paid by property owners, and other local measures could increase revenue for the community forest management program. One possible way to expand support for maintenance of street and park trees is to create a Municipal Tree District. This approach assumes that street and park trees are commodities that produce essential services/benefits that can be retailed.

- Tree planting and stewardship. Developers are currently required to plant approved street and parking lot shade trees with new projects. The city then inherits these trees to maintain. Local businesses, industry, UC Davis, and the City may consider investing in tree planting and stewardship.

- Other revenue-generating sources. When considered creatively, there may be other sources for revenue and program cost reduction that will increase program benefits and decrease reliance on municipal funds.

It is well that you should celebrate your Arbor Day thoughtfully, for within your lifetime the nation's need of trees will become serious. We of an older generation can get along with what we have, though with growing hardship; but in your full manhood and womanhood you will want what nature once so bountifully supplied and man so thoughtlessly destroyed; and because of that want you will reproach us, not for what we have used, but for what we have wasted.

President Theodore Roosevelt,
Arbor Day Message 1907

D. What's in this Document

The remaining chapters in the Community Forest Management Plan provide more in-depth discussion of issues presented in this overview.

Chapter II establishes the context for this CFMP. It recounts the history of tree

management in Davis, current administration and management, and the state of the community forest:

The history of tree management in Davis covers the events, issues and people who have impacted our community forest from the region's early history through the present time.

The context of existing community forest administration and management includes discussion of

- existing City laws, policies and standards related to trees
- a summary of the departments and organizations dedicated to the stewardship of trees
- a review of the current staffing, program resources and levels of service related to tree management.

The state of the community forest section describes existing tree structure and health, planting and management needs and benefits and costs associated with management of the community forest. Much of this information is summarized from the 2001 document, "A Practical Approach to Assessing Structure Function and Value of Street Tree Populations in Small Communities," a study of Davis' trees by Scott Maco (UC Davis, Dept. of Environmental Horticulture), provided through a grant to the City from the California Department of Forestry and Fire Protection.

Our 'living umbrella' of trees provides shade over streets, parks and open spaces.

Chapter III presents the goals, policies, standards and actions recommended by this Community Forest Management Plan.

Chapter IV is a Glossary of terms used in the CFMP.

Chapter V, the Appendix, presents specific recommendations and costs for the current fiscal year in a Level of Service Matrix. This tool can be used to establish priorities and budgets for subsequent years' planning. In addition, references, resources and reviewers of the CFMP are listed.

The document as a whole is thoughtful and thorough and should serve the community well for years to come.

Historic Resources Management Commission, 2002

By working toward the goals presented in the CFMP, initiating the management priorities and special projects, encouraging public participation, and incorporating alternative funding through private partnerships, we will be extending our living umbrella and thereby:

- **Protecting** People – by providing shade and environmental amelioration, as well as protecting people from potentially hazardous trees through timely pruning or removal.
- **Perpetuating** the Community Forest – through planting new trees and providing intensive care of mature and young trees to promote their health and longevity, and creating diversity of tree age and species for a healthy community forest.
- **Partnering** – by actively involving the community in stewardship of the community forest, increasing the effectiveness and range of our tree budget through cost-effective management, and ensuring an equitable distribution of tree canopy cover for generations to come.

Creation of this Community Forest Management Plan and related projects is the next step in our ongoing City stewardship and commitment to tree management.

"You can gauge a country's wealth, its real wealth, by its tree cover."
--- Dr. Richard St. Barbe Baker, *Man of the Trees*

Davis, California
Regional Area Map

CHAPTER II.
Context: Existing Conditions

This chapter establishes the context for the Community Forest Management Plan, with a look at the history of tree management in Davis; followed by an overview of existing City laws, policies and standards, departments and organizations dedicated to the stewardship of trees, and a review of current staffing, program resources and levels of service; and concluding with a summary of the state of the community forest.

A. An Illustrated History of Tree Management in Davis

From early settlement to the present, trees have played an important role in Davis' identity. Generations of residents have recognized the city's trees as a significant resource. This chapter gives a brief history of tree-related issues, events, and key people involved with management of the community forest.

1. Early History

Prior to the arrival of settlers, the Central California Valley was home to Native Americans. In the area now called Davis, along the shores of the original channel of Putah Creek, was a village called Pu-tah-toi. This area is now a non-flowing part of the stream, following diversion for agriculture decades ago, and is part of the U. C. Davis Arboretum. Small family groups of Native Californians in the Southern Wintun tribe, called the Patwin Indians, lived here in the spring, summer and fall, retreating toward the Berryessa hills in the winter when much of the valley floor was flooded and marshy.

The native trees and plants of the region, some of which still remain in the Arboretum and in the town of Davis, were used for food, shelter, basket-making, trading, medicine, and many other daily needs. Many parts of these plants were employed, each for a special purpose, including the bark, roots, wood, leaves, nuts and fruits. Significant native trees include the valley oak and coast live oak, willow, cottonwood, alder, box elder, California sycamore, gray pine, California bay, California buckeye, western redbud, and California walnut. The oaks, specifically, were an integral part of the culture of the Patwins, as a major staple of their diet was created from harvesting, grinding and leaching acorns into flour. Historians speculate that the main reason these Wintun tribes did not become farmers or follow another lifestyle than hunter/gatherer was because of the bounty of the natural environment in which they lived. While these Native Californians did not plant the trees in orchards, they carefully managed use of the trees and other plants in their native habitat to sustain their lifestyle.

Courtesy M. Lee, Indians of the Oaks

Native Americans harvesting acorns under oak trees

In 1842, the first American settler in Yolo and Solano Counties arrived. John Wolfskill brought olive tree cuttings from his brother's Los Angeles ranch and the old mission gardens in Sonoma. "El Rancho del Río de los Putos", his newly founded homestead on a Mexican land grant, extended for eight miles on both sides of Putah Creek in the area where Winters was later founded (from Pleasant Valley Road to Stevenson's Bridge). He was called the "father of the fruit industry" in this region, for his propagation of many different fruit tree varieties in his orchards. He shared many cuttings with other American and Mexican immigrants in the area, and by the early 1850s, many olives, walnuts, almonds, figs and fruit trees were being established throughout the region. Almost a century later, in 1934, one hundred acres of his orchard were bequeathed to UC Davis; they are currently used for research and still called the Wolfskill Tract. The giant olive trees present today along the entry road of the property were dedicated "as a symbol of peace to the State of California."

Rows of venerable olive trees in and around Davis were planted by early settlers.

Settlement of the area happened rapidly following Wolfskill's arrival. In 1852, the California State Agricultural Society was formed. Champion Hutchison, charter vice president of the organization, was a Sacramento County resident, and also had a ranch in Yolo County, the "Big Ranch" on Putah Creek west of Davis (later sold to G. W. Pierce). In 1860, an Agricultural Experiment Station was established in Winters. In 1867, I. N. Hoag began planting mulberry trees as a business venture for production of silk. By 1871, the orchard had reached 20,000 trees and the business had taken off. However, in that year, an extreme heat wave killed all the silk worms, prompting sale of the land and an end to silk production in Solano County. The Davisville Orchard, part of the property, had 45 acres of choice figs, pomegranates, cherries, plum, nectarines and peaches. While agriculture and grain were the founding industries in the region, the orchard industry was also significant in creation and development of Davisville.

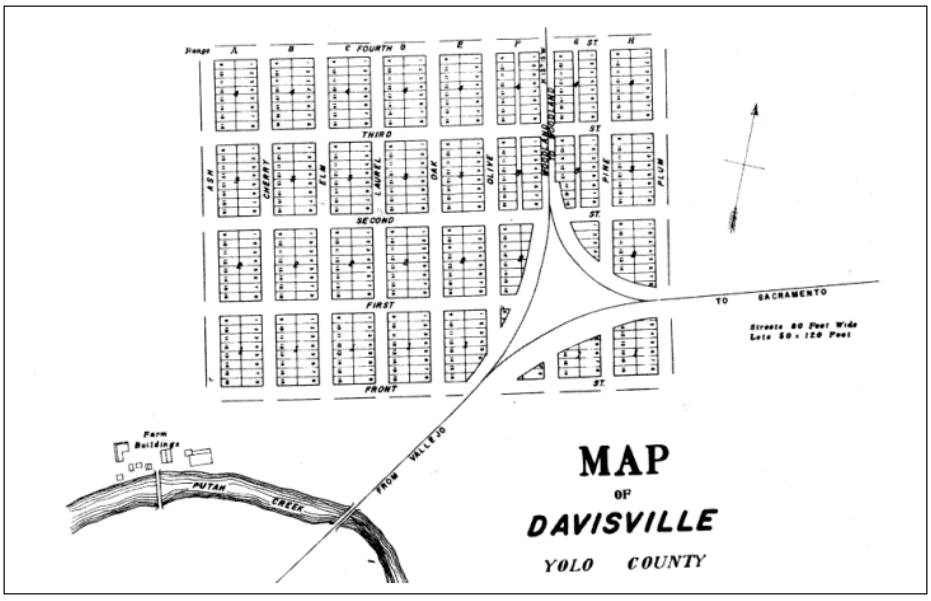
It is clear that existing and newly planted trees played a key role in settlement of the region. When initially settled, most towns in the Central Valley of California first planted and established trees as the primary source of property boundary definition, shade for the homestead and as a major food source. Rows of trees between properties had significance as landmarks used in land titles. For example, a large oak tree north of the Mondavi Center for Performing Arts at U. C. Davis, was originally used as the official designation of the southwest corner of the Jerome Davis farm, purchased around 1850. The property description of the Joseph Chiles (Davis' father-in-law) land purchase also relied on locations of large native trees to define the property.

Today, we honor these early trees with a plaque on campus dedicated in 1968 at the location of two fig trees and near two olive trees from the same period (then 110 years old) between Olson and Sproul Halls, which were originally planted by Jerome Davis. While today trees are considered too impermanent to be used in legal documents, their historic use underscores the respect shown and significance of these native trees to settlers at that time. It also highlights our good fortune at having some of these trees still alive today, over a century and a half later.

2. The Town of Davisville

Davisville was founded by the directors of the California Pacific Railroad, on land formerly owned by Jerome Davis and his father, Isaac. Jerome Davis, for whom Davisville was named, owned a 12,000-acre farm on which he had a "nursery of 65,000 trees and vines of a great number of varieties for planting." He also focused on propagating olive trees. In 1858, he won a "Best Improved Prize" for his development of new varieties. Availability of these trees at the nursery or through exchanging cuttings with other landowners was extremely important to these new residents.

On March 23, 1868, Davisville was founded as a 119-acre settlement with city streets laid out and lined with trees. In the same year, a public school system was founded in Davisville and the California Pacific Railroad line was completed from Vallejo to a junction in the newly founded town. These events established the importance of Davisville in the region. Also in 1868 but elsewhere in the state, the University of California, the state's land grant institution of higher learning, was chartered.



Original town plat of Davisville, 1868 (redrawn in 1968)

In that early town, the original streets were all named for the trees that were so significant to life in the area: Olive, the main street, and Ash, Cherry, Elm, Laurel, Oak, Pine and

Plum Streets formed the framework of the town. Although today we have streets with some of these same names, they are not in their original locations, as all the street names in town were changed in 1917 after a fire destroyed parts of the downtown a year earlier.

As early as 1869, a number of Davisville newspaper stories and editorials encouraged downtown beautification by planting more street trees on private property. While the streets were dirt, and used only for horse and carriage travel, the addition of trees in front of the wood frame stores and residences was perceived to be an important amenity for town life. At that time, the most significant management menace was the horses and grazing livestock, such as cows and goats, that ate the foliage and bark of young trees. High fences or boxes were constructed around the trunks of the trees to exclude these animals.

We always … praise … a person beautifying his residence; and how can a man do it better than by adorning his residence with shrubbery. In our wanderings about town we notice that Mr. Marden has … (planted) about his butchershop a lot of new trees; also Mr. Million, Express Agent, has set out over 100. Let other citizens go and do likewise, and when the hot days of Summer come you will reap your reward.

Davisville Advertiser, January 15, 1870

Following its founding in 1868, many milestone dates in Davis' history are significant also to the history of the community forest. The following are some of the key dates.

In 1879, California State Legislation was enacted that helped pay for planting roadside trees in the region at the cost of $1.00 apiece. State Assemblyman Hugh M. LaRue planted trees in the area, including California black walnuts planted along the county road that bisected his Arlington Farm property west of Davisville at the turn of the century. These trees later lined the Davis portion of the first trans-national road, the Lincoln Highway (US 40), completed in the 1920s.

The 1879 Legislation for roadside planting was the first State highway beautification project that I know of, although such legislation was proposed in the Davisville Advertiser as early as 1870. State Assemblyman LaRue of Davisville planted many trees under its provisions; some of these trees exist today, such as the Russell Boulevard 'Avenue of the Trees.'

Joanne Leach Larkey, Historian

These walnuts, also called Avenue of the Trees, still exist along Russell Boulevard west of Highway 113 and are now considered our living legacy of this highway and a part of our place in national history. In 1969, at the request of the Yolo County Board of Supervisors, the State of California designated Russell Boulevard between Highway 113 and Road 98 as a "Point of Historical Interest." They were designated by the City in 1984 as an "Outstanding Historical Resource" and as such are protected in accordance with the Secretary of Interior's Standards for the Treatment of Historic Properties. The walnuts are maintained with care by the City of Davis. As many of the trees are aging, potentially becoming unsafe, the City has an ongoing program of inter-planting the rows of large, mature trees with younger walnut trees in anticipation of future removals as needed to perpetuate the historic planting. Priority is given, however, to keeping as many of the original trees as possible. Removal, planting and other cultural landscape changes of these trees now

require review and approval of the Historical Resources Management Commission and the Tree Commission.

Outstanding Historical Resource: 'Avenue of the Trees', Russell Boulevard

On April 5, 1906, a site adjacent to Davisville was selected as the location for the University of California State Farm out of seventy potential sites in the state. On October 29, 1907, the campus was dedicated, with reference made to the beautiful newly planted trees lining the campus avenues.

In 1917, following a fire the previous year, and downtown rebuilding efforts including street name changes, Davisville was incorporated and the town name was shortened to Davis. Also in that year, Senate Bill 1126 was enacted to finance a highway landscaping project. It provided for trees to be planted between the downtown and the Yolo Causeway and established the State Forestry Nursery four miles east of Davis, which still exists in that location.

From the early 1910s to 1920, members of the Yolo County Farm Bureau and volunteer organizations planted street trees in many Yolo County communities. In Davis, the Women's Improvement Club sought to preserve and protect existing ornamental and shade trees and to promote community beautification and improvements.

Courtesy Hattie Weber Museum

**Historic photograph at Putah Creek:
picnickers enjoying the shade of the riparian trees**

3. Recent History of Davis' Community Forest

Trees on private property, in open space and parks, and on University lands are very significant elements of our community forest. At the University of California, Davis campus, the UC Davis Arboretum was established in 1936, along the original course of Putah Creek, now redirected past town. The Arboretum is still an oasis containing very ancient trees as well as new trees and plants, both native and from around the world.

In the 1930s, the City of Davis established the first city park, now called Central Park. It was designed by Harry Shepherd of the U. C. Davis Horticulture Department, and planted by college students. Bob Nash, a volunteer in the City, was involved in the planting and maintenance of the sycamore grove in Central Park at this time. Not until the 1960s were more parks added: neighborhood parks in east and west Davis were dedicated. Community Park, a 26-acre site then on the north side of town, was constructed in 1968 and is now central to the activities of all Davis residents.

In 1947, my parents opened Davis' first nursery at the corner of 6th and G Streets (now Coop's parking lot), called Barlow's Nursery. Sometime during the next several years, Dad planted the deep pink crape myrtles along F and 2nd Streets, because he wanted to beautify downtown. He was later a charter member of the Street Tree Committee.

Mickey Barlow, Davis Resident

In 1963, a volunteer commission was renamed the Davis Parks and Recreation Commission, established under Frank Fargo, the Davis City Manager at the time. The active charter Street Tree Committee of that commission included joint efforts by the City of Davis, the University of California, and the County of Yolo. Members of this first committee included Ron Adams, Phil Barker, Dick Barlow, Richard Harris, Bob Nash, Mrs. Shoemaker, and others. The City's first Forester, Gerry Chaster, Park Superintendent, was hired in 1962.

Prior to the 1960s and formation of the Street Tree Committee, developers of private properties were encouraged to plant a tree in the "parkway" of subdivisions, which, in most cases, the City assumed as street trees. Little official documentation for establishment and acceptance of street trees was undertaken. Priorities of the newly formed Street Tree Committee included an inventory and management plan of street trees, a protection ordinance for all trees, preserving landmark trees and encouraging private and public tree planting and care.

The 1963 Street Tree Committee spent a "month of Saturdays" inventorying the trees on private property as well as along streets and in public areas. Trees were rated as 'Landmark Trees' for their unique value, 'Trees of Significance' and others. When the use of a property that had one of these trees was planned, the owner had to agree to make a reasonable effort to preserve the trees in order to obtain a building permit. It was quite successful and a number of trees in the downtown area were saved.

Dr. Richard Harris, Arborist
Professor Emeritus, UC Davis

Beginning in 1963, the inventory completed by this group entailed extensive volunteer hours of surveying public and street trees as well as trees on private property, and formed the basis for our current information. The first Landmark Tree List

was established by this committee, and included approximately one hundred trees that were the largest or oldest trees of historical interest, distinctive form, or otherwise outstanding specimens. Because of the work of this committee, efforts to preserve these Landmark Trees and other Trees of Significance were greatly enhanced, and many plans for development in the growing town were changed to accommodate tree preservation and protection.

Former Davis City Hall, historic photograph prior to street tree planting

Same view of City Hall building with mature street trees

Also in the 1960s, the City adopted the concept of creating off-road bicycle paths through community greenbelts and open spaces, and first called itself the "City of Bicycles." In 1975, the Energy Conservation Building Ordinance was enacted, requiring the planting of deciduous shade trees on the south and west sides of buildings for energy conservation.

In 1976, the National Bicentennial "Rotary Grove" was planted in Community Park, adjacent to the high school, which had been moved from downtown in the 1960s, and was established in the new location with a limited landscaping budget. The community event, designated Project Change, provided for planting 1776 trees and shrubs, and was the result of many volunteers including the Davis Rotary Club, the school board, the Senior High School student body, the U. C. Davis Arboretum, Environmental Horticulture department, and other community volunteers, commissions and business representatives.

The City first received national recognition for its Street Tree Program by the National Arbor Day Foundation in 1977. Davis continues to receive the annual award as a "Tree City U.S.A." from the Foundation on Arbor Day each year. This award is associated with a community celebration of trees which includes a ceremonial tree planting at a significant site in the City and a mayoral proclamation.

Everybody likes trees and wants to care for them. The collaboration between the City of Davis and community-based partner TREE Davis is a way for people of all ages to make sure that our community trees remain green and healthy. Also, recognition and celebration of our trees happens with the Tree City U.S.A. award and tree planting on National Arbor Day each year.

Lois Wolk, Yolo County Supervisor

Volunteer activity has long been an important component of managing the Davis community forest. Dedicated community volunteers have had a significant past and present impact on our community forest by planting and maintaining public trees and volunteering on committees and commissions. In addition, every property owner or resident who properly maintains the private trees they are responsible for contributes to the community forest.

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The non-profit community based group, TREE Davis, founded on Arbor Day in 1992, has grown into a successful organization with over two hundred active members. Started as the brainchild of Lois Wolk, City Councilmember at the time, Bob Cordrey, Park and Open Space Administrator, and John Mott-Smith, community volunteer, the organization works in partnership with the City of Davis to enact its mission: "to inspire people of our region to understand the importance of the urban forest through education and training, volunteer citizen forestry, planting and stewardship, and community partnerships." Over the last decade, the group has prompted public education about the care and planting of trees; accomplished extensive new tree planting in greenbelts and parks, at schools and along Highway 113; obtained and managed grants and other funds for tree planting and care in the City and the county; published technical pamphlets and a quarterly newsletter; and trained and coordinated volunteer tree care including planting, pruning and other maintenance for public trees.

TREE Davis Training Workshop

The City of Davis Parks and Community Services Department's Adopt-a-Park program is another innovative and successful program helping in part to manage and expand the community forest. Begun in 1998 in response to decreasing City budget and difficulty of managing the city's parks and open spaces solely with paid staff support, the Adopt-a-Park program trains and monitors community volunteers who help with tree and other landscape planting, park clean-up and other tasks.

Adopt-a-Park Tree Planting

The City's recently approved "Davis Downtown and Traditional Residential Neighborhood Design Guidelines", approved in 2001, were the result of over two years of citizen efforts, led by the Historical Resources Management Commission. These guidelines establish conservation

standards for the city's oldest neighborhoods, as defined by the 1917 city limits. In setting standards for conserving neighborhood character, the guidelines emphasize the importance maintaining traditional landscape character, preservation of street trees and the existing streetscape and sidewalk design pattern.

The City of Davis Tree Commission is comprised of community volunteers who have the interest of the community forest in mind. The commission meets at least once a month to set strategy for care of the community forest, to review street tree removal requests, and to act as an advisory body to the City Council, staff and other City departments that affect the community forest. The current Tree Commission, who have devoted countless hours to preparing this Community Forest Management Plan and related documents, is comprised of five members: Greg McPherson (Chair), Ken Murray (Vice Chair), Vernon Burton, Nancy Houlding, and David Robinson.

4. Key People Related to Tree Stewardship

City of Davis Tree Commissioners

Dave Adams, 1984-1988
Ron Adams, 1963 Charter Member
Jessica Archer, 2000-01
Phil Barker, 1963 Charter Member
Laurie Barley, 1998-2000
Dick Barlow, 1963 Charter Member
Bruce Berry, 1983-1992
Richard Blanchard, 1990-1995
Vernon Burton, 1998-present
Mary Chapell, 1974-1979
Claudia Ciucci, 1972-1975
Bob Cordrey, 1986-1988
Gretchen Coyle, 1991-1994
Cliff Fago, 1983-1986
Richard Harris, 1963 Charter Member
Carlton Holte, 1981-1990
Nancy Houlding, 2000-present
Robin Kulakow, 1988-1990
Andrew Leiser
John Lichter, 1992-1998
Greg McPherson, 1995-present
Kenneth Murray, 1998-present
Bob Nash, 1963 Charter Member
Jim Nussbaum, 1971-1973
Ei Sun Oh, 1995-1998
Dorothy Peterson, 1973-1980
Warren Roberts, 1973-1979
David Robinson, 1986-present
Shoemaker, 1963 Charter Member
David Showers, 1986-1998
Steve Souza, 1988-1992
Stephen Stombler 1990-1999
Joann Wildenradt, 1983-1986

Community Partners

TREE Davis;
Volunteers of the **Adopt-a-Park Program**, City of Davis;
Yolo Basin Foundation;
and others.

Davis Parks and Community Service staff (partial list) responsible for trees since 1960s:

Gerry Chaster, Park Superintendent, 1962- 1972
Jim Teddleton, Arborist, 1965-1971
Dwight Henry, Tree Crew Supervisor, 1967-1974
Jim King, Parks Supervisor, 1972-1975
Diane Medlock, Administrative Analyst, 1972-present
Ken Nunes, City Arborist, 1972-present
Shig Yoshimine, Park Superintendent, 1972-1987
Mike Krezman, Tree Crew Supervisor, 1975-present
Richard Garcia, Small Tree Specialist, 1977-present
Joe Young, Supervisor, 1984-1986
Bob Cordrey, Parks and Open Space Administrator, 1988-present
Sandy Dietrich, Adopt-a-Park Volunteer Coordinator, 1998-present

B. Administration and Management

The context of existing community forest administration and management is covered in this section with an overview of existing City laws, policies and standards related to trees; a summary of the departments and groups, public and private, dedicated to the stewardship of trees; and a review of the current staffing, program resources and levels of service.

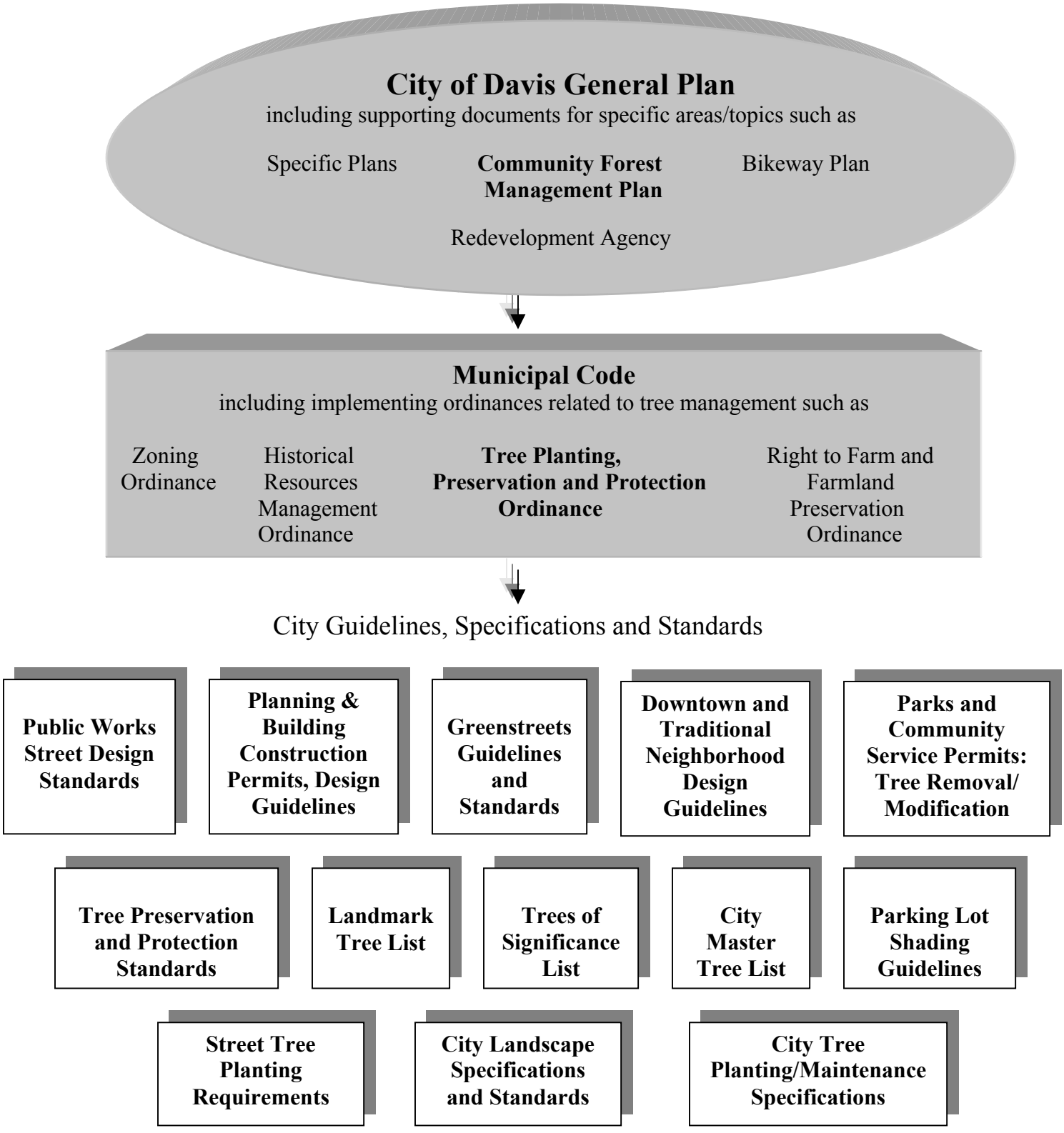
1. Existing Laws, Policies and Standards

Management of the community forest in the City of Davis is accomplished by application of established laws, policies and standards. These documents and tools provide for planting trees, tree protection and maintenance, management and funding.

City policy is documented in the City of Davis General Plan, most recently adopted in 2001. In the General Plan, the Urban Design Goal 2 (pp.157-159) states the City will "maintain an aesthetically pleasing environment and manage a sustainable community forest to optimize environmental, aesthetic, social and economic benefits." Policies with related standards and actions include preservation and protection of resources; maintenance and increase in numbers of street trees to provide shade, cooling, habitat, air quality benefits, and visual continuity; a policy establishing the need for a street tree master plan with a strategy for funding, maintenance and replacement; a requirement to implement the Tree Preservation Ordinance of the Municipal Code; and a recommendation for the development of this Community Forest Management Plan.

This Community Forest Management Plan (CFMP) is a supporting document to the General Plan, providing a framework for managing the community's trees, and is adopted by the Davis City Council as the guiding document toward this end.

The Municipal Code establishes the basic laws and ordinances of the City of Davis and implements the policies and directions of the General Plan. The Municipal Code



General Hierarchy of City-Adopted Documents and Standards
Related to the Community Forest

includes chapters relating to Tree Planting, Preservation and Protection, Historical Resources Management, Zoning, Building Codes, and Subdivisions that impact community forest management.

In addition, guidelines and standards of specific City departments help to define tree-related issues, including Public Works Street Standards; Planning & Building Department discretionary permits, design and construction guidelines, Greenstreets Guidelines and Standards, Davis Downtown and Traditional Residential Neighborhood Design Guidelines; Parks and Community Services Street Tree Planting Requirements, City Master Tree List, Landmark Tree List, Trees of Significance List, Tree Preservation and Protection Standards, Parking Lot Shading Guidelines, Tree Planting and Maintenance Specifications and City of Davis Landscape Specifications and Standards. All of these documents are available from Parks and Community Services and/or Planning & Building Departments, and are defined in the following text.

Trees outstrip most people in the extent and depth of their work for the public good.

Sara Ebenreck, American Forests

Tree Planting, Preservation and Protection Ordinance, adopted by the City Council in 2000, establishes regulations for tree planting and preservation and protection of Street Trees, City Trees, Landmark Trees, Trees of Significance, Parking Lot Trees, and certain private trees in order to retain and augment the health of the community forest. The Ordinance defines the Tree Commission and its duties, the responsibilities of the Parks and Community Services Director, and the rights and obligations of subdividers, private property owners and utilities relating to trees. Requirements for tree permits and fees are defined, and authorization for enforcement of violations of Ordinance requirements is described.

Historical Resources Management Ordinance, adopted by the City Council in 2001, authorizes the designation and protection of certain resources including landscape such as the Avenue of the Trees and also the sites for historic buildings that includes their historic trees, such as the palm trees at the Depot, the remaining orange trees at Hunt/Boyer and the historic planting at the Davis Cemetery.

Core Area Specific Plan: The implementation of this plan states that the City, in conjunction with the UC Davis Department of Environmental Horticulture and the USDA Western Center for Urban Forest Research shall consider a 'Downtown Davis Urban Forest Research Demonstration Site' and develop and adopt an 'Urban Forestry Master Plan' for the Core Area. This plan shall include a recommended street tree list for the Core Area.

Planning & Building Department Discretionary Permits and Design Guidelines: Applicants to the Planning & Building Department for new construction, remodels or any work requiring a building permit or discretionary project review must conform to the requirements for existing tree preservation and protection and street tree planting as determined by the project review.

Greenstreets Guidelines and Standards: The adopted Greenstreets Guidelines establish a system of planned major arterial, minor arterial and collector streets in the City which are intended to provide convenient and attractive circulation routes for bicyclists and pedestrians as well as cars, and are planted with trees along street edges and in medians to provide a shaded canopy over the street.

Davis Downtown and Traditional Residential Neighborhood Design Guidelines: This document addresses the historic importance of mature trees in the core area in addition to the historic buildings. Although landscaping changes are exempt from the guidelines, projects subject to Design Review are evaluated for their impacts on trees. Projects that include designated Historic Trees, Landmark Trees or Trees of Significance require approval by the appropriate commissions for any tree modifications, removals or replacements.

Street Tree Planting Requirements: Subdividers creating new lots are required to deposit a street tree fee and plant a minimum of one street tree per lot for each lot fronting a public street, as per the standards of this document.

City Master Tree List: This City-adopted document establishes the acceptable tree species for street trees and parking lot trees.

Landmark Tree List: This is the list of trees that have been determined by resolution of City Council to be of high value because of species, size, age, form, historical significance or other professional criterion.

Trees of Significance List: This is the list of trees (included but not limited to) which may be considered significant over 5" diameter at breast height, as per Planning & Building or Parks and Community Services Department review.

Tree Preservation and Protection Standards: This document establishes specifications for preservation and protection of existing trees during construction.

Parking Lot Shading Guidelines: This document establishes parking lot tree design, planting and maintenance to ensure a shaded canopy over new and/or reconstructed parking lots.

I was recently among several dozen residents of Old North Davis who conducted a neighborhood survey and found that maintenance and improvement of our urban forest was one of three major concerns of residents. The Old North Davis Neighborhood Association (ONDNA) will therefore … find out how it can best participate in actions to upgrade street tree activity in our area.

John Lofland, Historian

2. Stewardship

Trees within the City of Davis community forest are important for the community's health, safety, welfare and tranquility. The community forest coexists with buildings, streets and bike paths, infrastructure, other landscape elements and people. This section identifies the key agencies and individuals responsible for stewardship of our trees, and

encourages alliances and cooperation among these groups to promote the protection and management of the community forest.

The stewardship of the community forest as part of the integrated urban ecosystem is the responsibility of many inter-related groups and individuals in the community of Davis. First and foremost, the residents and property owners of Davis are important stewards of the trees on private property, as well as many street trees and trees within public property areas, open space, parks and easements. In concert with these individuals, the following groups have interest in and responsibilities for protection and management of the community forest:

- Davis City Council
- City Commissions (Tree Commission, Planning Commission, Open Space Commission, Natural Resources Commission, Historical Resources Management Commission, etc.)
- City staff (Parks and Community Services, Planning & Building, Public Works, etc.)
- Other public agencies (University of California at Davis, Davis Joint Unified School District, CalTrans, etc.) and private companies with land holdings in Davis or impact on our community forest (Pacific Gas and Electric, Pacific Bell, contractors and developers, etc.)
- Non-profit groups and community based partners (Adopt-a-Park volunteers, TREE Davis, etc.)
- Community and neighborhood associations (such as Davis Downtown Business Association (DDBA), Old North Davis Neighborhood Association (ONDNA), Old East Davis Neighborhood Association, Davis Manor Neighborhood Association, and many others.)

The following paragraphs describe the primary agencies and other stewards of the community forest selected from the list above.

City Council and Advisory Commissions

The Davis City Council is an elected body of five representatives, who serve staggered four-year terms, with a Mayor elected by majority vote (two-year term). The City Council, working with the City Manager and staff, establishes policy and makes decisions within the City of Davis, based on the provisions of the General Plan and adopted ordinances and related documents. A number of Advisory Commissions are appointed by the City Council. These Commissions work in partnership on related issues, including the management of the community forest.

The wrongs done to trees, wrongs of every sort, are done in the darkness of ignorance and unbelief, for when light comes, the heart of people is always right.

John Muir, Naturalist

The Tree Commission, comprised of five regular members and one alternate on three year (staggered) terms and required to be residents of Davis, acts in an advisory capacity to the City Council and the Director of Parks and Community Services on tree related matters, including review and approval of tree removal requests; planting, care and maintenance of new and existing street trees and city trees; and management of Landmark Trees and Trees of Significance on private property. The Tree Commission has developed needs assessment information and standards of care guidelines to benefit and increase long-term health of the community forest. The Tree Commission has been integral in establishing this Community Forest Management Plan, the Tree Planting, Preservation and Protection Ordinance, the City Master Tree List, Street Tree Planting Requirements and other documents related to the community forest.

The Planning Commission acts in an advisory capacity to the City Council on planning matters and reviews applications for projects requiring discretionary review. Many of these projects have an impact on existing trees or require new tree planting to meet City codes and guidelines. The Planning Commission and/or Planning staff can require project conditions to plant, preserve and protect these resources beyond standard requirements if they feel a project warrants such action, and therefore often acts as an important steward of the community forest.

They are beautiful in their peace, they are wise in their silence. They will stand after we are dust. They teach us and we tend them.

Galeain ip
Altiem MacDunelmor

The Historical Resources Management Commission acts in an advisory capacity to the City Council on historic preservation matters. The "Davis Downtown and Traditional Residential Neighborhood Design Guidelines", approved in 2001, establish conservation standards for the city's oldest neighborhoods, including provisions for trees and historic landscapes.

City Staff and Other Public Agencies

The Parks and Community Services Department manages and/or coordinates with other City departments for most issues having an influence on the community forest including daily management and emergency services. The Director of Parks and Community Services or his or her designee is charged with the enforcement of the Tree Planting, Preservation and Protection Ordinance and related documents, including planting, maintenance, preservation, protection and/or removal of trees or other plants in any public way or place, and preservation and protection of private trees covered by the Ordinance. The Director coordinates with other City departments and/or local agencies, adopt-a-Park Coordinator and volunteers, TREE Davis and other non-profit and private community based groups as necessary to manage issues related to the community forest. The City Arborist and other supervisory arborists and tree staff are hired by and work within the Parks and Community Services Department.

The Planning & Building Department and the Public Works Department also have a significant influence on tree-related issues in Davis. Both departments manage and approve projects that require permits or review of tree planting, preservation, protection, modification, or removal.

Planning & Building is the key reviewing agency for most new construction in the City of Davis. It is therefore the first department to identify issues related to tree planting, preservation and protection inherent in privately funded projects that are being proposed for conditional use permits, tentative maps, rezones, design review, minor modifications and improvements, construction, grading, and other permits. Permit checklists and developer/contractor education about the importance of trees begins in the Planning & Building Department. The Director, planners and staff in this department coordinate on community forest related issues with the Director and City Arborist of Parks and Community Services.

The Public Works Department manages many municipal improvement projects that may impact trees, including sidewalk repairs, street improvements, street lighting and signage, and other projects that may involve infrastructure, irrigation, or other construction/grading below or above ground. The Director, engineers and staff in this department coordinate on community forest related issues with the Director and City Arborist of Parks and Community Services.

Within the City of Davis are other public agencies that manage lands with an influence on the community forest. The University of California has extensive properties in and adjacent to Davis, with historic and significant tree populations. The City of Davis works closely with Davis Joint Unified School District; most schools, elementary through high school are adjacent to City parks so the City and school can share resources including facilities, open space and trees.

Riparian trees in City open space area

The City of Davis also enjoys both the expertise and research opportunities offered by UC Davis faculty and graduate students. Recent projects of this type have kept Davis on the forefront of new tree management developments.

Non-Profit Groups

The community based group, TREE Davis, founded on Arbor Day in 1992, has grown into a successful urban forestry organization with over two hundred active members. The organization works in partnership with the City of Davis "to inspire people of our region to understand the importance of the urban forest through education and training, volunteer citizen forestry, planting and stewardship, and community partnerships." TREE Davis educates through a variety of programs including demonstrations and workshops on tree planting, tree pruning and maintenance; community planting projects in greenbelts and parks, at schools and along the highway; and publishing educational literature such as technical pamphlets and a quarterly newsletter.

The City has established a public/private partnership with TREE Davis for planting and young tree care. TREE Davis has obtained and managed grants and other funds for tree planting and care in the City and the county. Projects may also include parking lot shade tree monitoring. This non-profit organization works closely with the City, the Davis Joint Unified School District, neighborhood groups, local businesses, and others. This partnership allows for wider community participation in community forest stewardship and reduced management costs for maintenance efforts.

3. Current Staffing and Program Resources

A canopy of mature street trees casts dappled shade over a residential street

The information in this section is summarized from Parks and Community Services budget data and a 2001 study, "A Practical Approach to Assessing Structure, Function and Value of Street Tree Populations" by Scott Maco.

The Fiscal Year 2000-2001 operating budget for the Community Forestry Program of the Parks and Open Space Division was approximately $512,500 (see Illustration 14: Community Forestry Program xpenditures). This amount represents about 13% of the total Parks and Open Space Division budget ($4 million) and 0.5% of the City's total operating budget ($97 million). The average annual expenditure per person is $8.54 (60,000 population). Assuming the figure of 30,000 street and park trees, Community Forestry spent $17.08 per tree on average during the fiscal year. The Community Forestry Division's per tree expenditure is less than the 1997 mean value of $19 per tree reported for 256 California cities (Thompson and Ahern 2000). Based on

Maco's study (2001), an estimated additional $54,000 was spent on tree-related matters by other City departments. These external expenditures involve clean-up of tree litter, hardscape repair, and legal issues. Overall, about $566,500 was spent on management of Davis' community forest in FY 2001. Community Forestry Division expenditures fell into three categories: small tree planting and care, large tree care, and administration/overhead.

Small Tree	Trees/yr	$/Tree	Total $
Plant	480	75	36,000
Prune	1,200	38	45,000
Water & Mulching	500	18	9,000
Total			90,000
Large Tree			
Request Prune	650	162	105,000
Mistletoe	300	70	21,000
Clearance Trim	500	63	31,500
Tree Remove/Stump	125	252	31,500
Storm Clean-Up	40	525	21,000
In-House Subtotal		75	210,000
Block Prune	1,471	68	100,000
Total			310,000
Admin/Overhead (1.5 FTE Supervisory Arborists @ $75,000 each)			
Schedule/Phone Respond	30,000		22,500
Inspecion	30,000		22,500
IPM	30,000		11,250
Program Develop/Imp	30,000		22,500
Ordinance Enforcement	30,000		11,250
Comm & Council	30,000		11,250
Other	30,000		11,250
Total			112,500
Grand Total			512,500
Does not include $10,000 to TREE Davis for small tree pruning (350 trees @ $29/tree)			

Fiscal Year 2000-01

Community Forestry Program:
Parks and Open Space Division Expenditures

Tree Planting and Small Tree Care

In 2000-01, the City planted 480 street and park trees at a cost of $36,000. Seasonal/part-time assistant staff worked to prune, water, and mulch young trees ($54,000). These activities consumed 18% of the tree program budget, or $90,000. In addition, TREE Davis trained volunteers who planted and/or pruned hundreds of trees in parks, open spaces and streets.

Large Tree Care

Davis' community forest contains many mature and old trees. It is not surprising that 60% ($310,000) of the tree program's FY2001 budget was spent keeping these trees healthy and safe. Inspection and pruning accounted for most of this amount ($257,500). A three-person in-house crew performed request pruning, mistletoe removal, and clearance trimming. Block or programmed pruning was contracted out (1,471 trees, $100,000). The Division removed 125 trees at a cost of $31,500 (includes stump removal). Clean-up after storms occur on a periodic basis and the expenditure varies year to year. In FY 2000-01, $21,000 was spent for treatment of forty trees. The City also oversees management and inspections of other large trees, including memorial trees planted by the public and adopted by the City, public parking lot trees planted in response to the parking lot shading guidelines, and issues related to Landmark Trees as requested by property owners. No costs are available for these programs.

Pest infestations can pose a serious threat to the health and survival of susceptible tree species. Drip from aphids and other insects is a nuisance to residents. Expenditures for integrated pest management and disease control usually occur on an as-needed basis.

Administration/Overhead

Salaries and benefits of one and one-half supervisory staff that perform planning and management functions totaled $112,500, or 22% of the budget. Tasks requiring the most time included responding to phone calls from residents, scheduling work, supervising contractors, and inspecting trees.

Expenses by Other City Departments

Tree-related expenses accrue to the city that were not captured in the Community Forestry Program's budget. These expenditures for sidewalk and curb repair, leaf clean-up, and claims totaled approximately $54,000.

Coordination between Parks and Community Services and the Wildlife Resources Specialist in Public Works is important when implementing the Community Forest Management Plan. The CFMP promotes trees as a benefit to wildlife. Consideration for protection of threatened, sensitive and common wildlife, and preservation of nests in trees should be included in the plan.

John McNerney,
Wildlife Specialist

Shallow roots that heave sidewalks, crack curbs, and damage driveways are an important aspect of mature tree care. To protect sidewalks and private property from this type of damage, Public Works and the City Arborist conduct preventative root pruning. Once problems occur the city attempts to remediate the problem without removing the tree. Strategies include ramping the sidewalk over the root, meandering or narrowing the sidewalk, replacing concrete with more flexible materials like unit pavers, decomposed

granite, root pruning, and installation of root barriers. Approximately $25,000 was spent on repairs and preventative measures (Maco 2001).

The City removed approximately 385 tons of leaf litter during autumn. Approximately $6,500 was spent in FY 2001, assuming that 40% of the total cost was related to leaves and other litter from public trees (Maco 2001).

Although the Community Forestry Program has an excellent service record, with no personal injuries, damage occasionally occurs to private property due to limb failure, inaccurately located irrigation or sewer lines, or conflicting landscaping. Expenditures for property claims were estimated to be $22,500 during FY 2000-01 (Maco 2001).

Total expenditures for the Community Forestry Division during FY 2000-01 were $566,500 (see below). Program costs were responsible for 90% of the total, while external expenditures accounted for the remaining 10%. The average annual costs per tree and per capita were $17.08 and $8.54, respectively.

Program Expenditures	$ Total
Planting & small tree care	90,000
Large tree care	310,000
Administration/overhead	112,500
Total Program Expenditures	512,500
Non-Program Expenditures	
Hardscape repair/root pruning	25,000
Liability & legal	22,500
Litter clean-up	6,500
Total Non-Program Expenditures	54,000
Grand Total	566,500
Avg $ / tree/ yr	17

Fiscal Year 2000-01

Community Forestry Program: Total Expenditures

C. State of the Community Forest

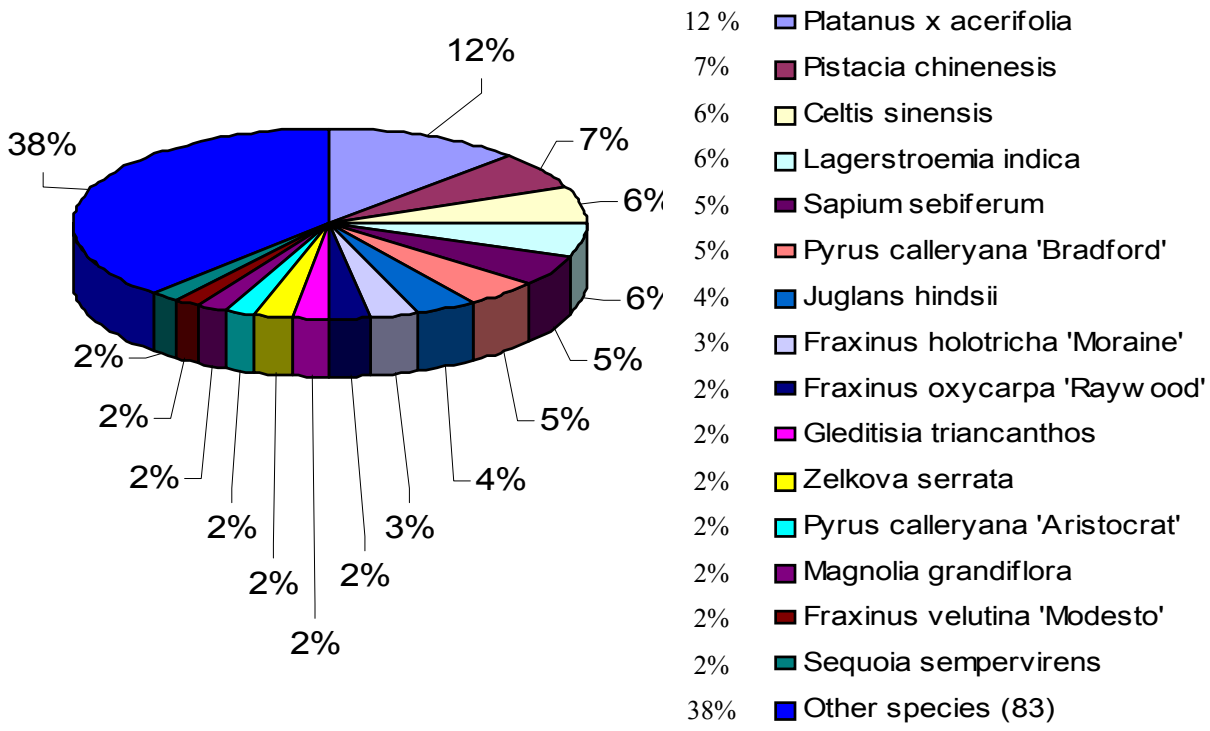
Residents of Davis are fortunate to live in a community forest that has grown more extensive as the city has developed. This section discusses the state of the community forest related specifically to street trees and City trees. In 2000-2001, a study was conducted to develop an approach to better understanding the extent, condition, and

management needs of trees in small communities. As Davis was the case study area, the project analyzed the structure, function, value and management needs of Davis' expanding street tree population ("A Practical Approach to Assessing Structure Function and Value of Street Tree Populations in Small Communities," by Scott Maco, UC Davis, Dept. of Environmental Horticulture, provided through a grant to the City from the California Department of Forestry and Fire Protection.) This section summarizes results from that study and identifies short-term street tree management needs.

1. Structure and Health

According to results from the 2000-01 study, there are approximately 24,000 city street trees and another 7,300 private trees in the public right-of-way. In Fiscal Year 1999-2000 the city managed approximately 6,000 park trees, assuming 300 acres of park and 20 trees/acre. Hence, there are a total of approximately 30,000 street and park trees in Davis, as of the year 2000.

Davis has an estimated 0.5 public trees per capita (pop. 60,000), over twice the statewide average of 0.24. However, there are approximately 2,400 vacant street tree planting sites in Davis (9% of 26,400 total planting sites). The most recently developed areas in East and South Davis have the largest numbers of empty sites.



Citywide public street tree composition (Maco 2001)

Over 100 different species of trees are found on city streets, but only ten species make up 52% of all public street trees. London plane (*Platanus x acerifolia*) and flowering pear (*Pyrus calleryana* cvs.) comprise 12% and 11% respectively of the tree population, exceeding the guideline that no single species should comprise more than 10% of the total. Other important species that each account for 5% of the street tree population are Chinese pistache (*Pistacia chinensis*), Chinese hackberry (*Celtis sinensis*), crape myrtle (*Lagerstroemia indica*), and Chinese tallow (*Sapium sebiferum*). Other species that are important by virtue of their size and numbers are Moraine, Raywood, and Modesto ash (*Fraxinus spp.*), zelkova (*Zelkova serrata*), honey locust (*Gleditsia triacanthos*), and European hackberry (*Celtis australis*). Of these, many of the tree species have significant problems as street trees in Davis, including London plane (diseases, overplanting), flowering pear (breakage, overplanting, potentially messy fruits), Chinese pistache (Verticillium), Chinese hackberry (diseases, mistletoe), most ashes (diseases, borers, mistletoe, breakage), honey locust (pests, mistletoe, spines and pods). Attempts should be made to select and experiment with new, better-adapted large stature street tree species for the difficult growing conditions in Davis (climate, winds, water and soil conditions, pests and diseases).

I hope that this document helps promote collaboration between cities and research agencies to develop improved trees for city street tree use.

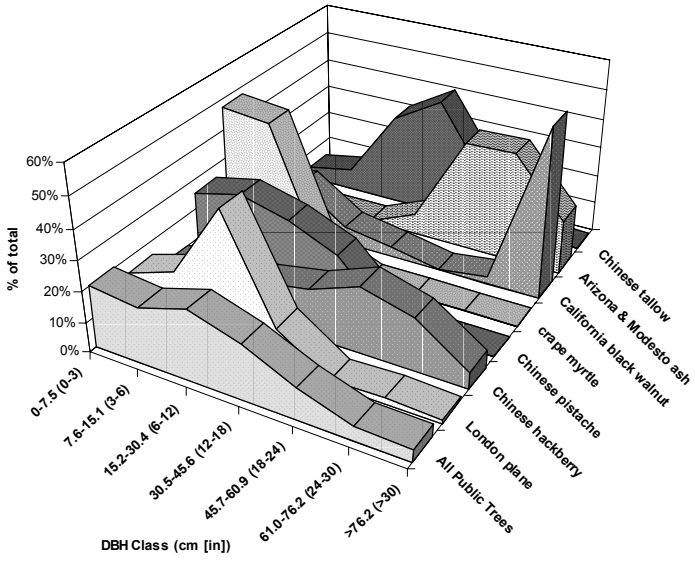
Phil Barker

For purpose of the study, the city was divided into eleven zones, which have now been simplified into seven general management areas: Downtown Core Area, Central Davis, West Davis, North Davis, East Davis, Far East Davis, and South Davis. Although citywide species diversity is good, some management areas rely too heavily on a single species. Examples include London plane in the Downtown Core Area and South Davis, Chinese hackberry in East Davis, and Japanese pagoda tree (*Sophora japonica*) in portions of Central Davis. These areas are highly susceptible to loss of tree canopy cover from diseases, pests, or other threats. A more detailed assessment of planting and management needs by management area follows below.

Davis' street tree population is well distributed among age classes. Forty percent are young trees of less than six inches diameter at breast height (< 6" DBH) that will grow into maturing trees. A preponderance of trees in this age class is desirable because these trees face the highest mortality rates. About 25% of the population is maturing (6-12" DBH), 25% is mature (12-24" DBH), and 10% is old (> 24" DBH). The majority of ash and hackberry trees are old, with very few young replacements. London plane and Chinese tallow are primarily in the maturing and mature age classes. Pistache and crape myrtle are largely young and maturing trees. Retaining Davis' overall tree cover during the next ten years will depend on the successful replacement of the old ash and hackberry trees as they senesce and need removal with appropriate selections of new trees from the current City Master Tree List. Also, management of the existing younger and maturing London plane, Chinese tallow, Chinese pistache and zelkova as they age to stately trees is important. It must be recognized that Davis faces limitations in available large stature species selections which perform well due to our poor water conditions, soil alkalinity, pests and disease susceptibility and climate conditions.

Public street trees in good condition account for 59% of the population, 32% are fair, 7% poor, and 1% dead or dying. West and East Davis have the highest percentages of poor, dead, or dying trees (10-12% in these classes). However, these are limited to only a few species: walnuts in West Davis, Japanese pagoda trees in Central Davis, etc.

Public street trees shade approximately 5% of the entire city and 14% of the paved street and sidewalk area. However, tree canopy cover can be as much as 40% of these impervious surfaces in parts of the Core Area and Central Davis, where large, old trees prevail.



Relative age distribution of selected tree species and total public tree population (Maco 2002)

2. Citywide Planting and Management Needs

Currently about 125 street and park trees are planted annually to replace trees that have been removed. In addition, there are approximately 2,400 vacant tree sites along city streets that can be planted to achieve full stocking. The number of vacant tree planting sites in parks has not been estimated

In 2001, 4% of all public street trees had stakes that were damaging the trees and require adjustment. This problem was limited to young trees, and indicated that young tree care was inadequate. Attention to the inspection, care, pruning and other maintenance of young trees is crucial to their development into healthy mature trees. The City should increase the Level of Service of care of young trees.

Overall in 2001, 3% of the public street tree population needed immediate pruning because potentially hazardous conditions were apparent, such as large weakly attached branches and significant deadwood, or an assessment that lack of immediate pruning would reduce tree longevity. About 17% of all street trees needed pruning (e.g., crown

cleaning, thinning, reduction, raising, restoration) that was classified as "not immediate". The percentages of trees needing pruning were greatest in Central and East Davis, where older trees required the most intensive care. Trees were pruned in 1999 in North Davis and Mace Ranch, and accordingly trees in these areas had less immediate need for pruning than trees in other areas.

Approximately 308 public trees and an additional 135 private trees needed pruning to lift and clear branches that obstructed street signage, traffic at intersections, or street lighting. In Central Davis about 360 public trees and 240 private trees were interfering with overhead lines and in need of pruning to eliminate this conflict. Pacific Gas & Electric is responsible for this work and it is accomplished in accordance with trimming specifications outlined by the city.

Approximately 1,500 public and 1,500 private street trees have been planted so close to other trees or structures that their growth will be inhibited by limited space. At some point in the future, most of these trees will need pruning to reduce the size of their crowns or selective removal.

There were 100 public street trees and 21 private trees identified in 2001 that were structurally unsound and located near structures, people, or vehicles that would be damaged if a failure occurred. California walnut (*Juglans hindsii*) and Japanese pagoda *(Sophora japonica)* were the primary type of hazard tree.

Public trees were responsible for 1,114 incidences of sidewalk heave greater than ¾ inches. Tallow in West Davis and Chinese hackberry, Modesto ash and honey locust in Central and East Davis were responsible for 65% of the damage. Root conflicts and heaving paving were relatively more frequent in downtown cutouts and narrow planting strips than in front yards.

Current Management Activities	**DBH Class**							
	0-3"	**3-6"**	**6-12"**	**12-18"**	**18-24"**	**24-30"**	**>30"**	**Total**
Needs Pruning	517	229	607	776	935	468	517	4,050
Needs Immediate Pruning	109	60	80	119	179	99	129	776
Conflict—safety (clearance trim)	10	30	80	99	80	10	--	308
Conflict—spacing (20%@avg trim)	348	418	557	239	60	10	--	1,632
Hazard tree (remove w/ stump)	--	--	--	--	20	30	50	99
Plant vacant sites	2,400							
Total street trees (2001)	**4,680**	**4,465**	**5,643**	**4,343**	**2,475**	**1,084**	**939**	**23,809**
Total street and park trees (estimated 2001)	**6,124**	**5,626**	**7,110**	**5,472**	**3,119**	**1,336**	**1,183**	**29,999**

Estimated Number of Trees Requiring Management
(Information provided by City of Davis staff, 2002)

3. Planting and Management Needs within Tree Management Zones

The City of Davis uses fourteen Tree Management Zones for recording information about City and street trees. These zones, labeled Zone #101 through #114, are shown on the map at the end of this section.

For the purposes of the Maco (2001) study, the zones used for recording data were somewhat different. The existing tree condition information from that study, valuable for understanding the state of the community forest in Davis, is summarized below into simplified neighborhood areas for presentation in the CFMP. Each area has a notation of generally which City of Davis Tree Management Zones are included in the description. Within each of these areas, smaller neighborhood zones and/or identified neighborhood groups/associations with specific management needs may be identified and studied for specific tree-related projects.

Downtown Core Area (generally Zone # 109, but including Historic Conservation District)

The Downtown Core Area has the lowest species diversity in the City, with London plane and Moraine ash accounting for nearly one-half of all public street trees. Future replacement planting should strive to increase diversity. The condition of trees in this area is relatively poor, due in part to difficult growing conditions associated with trees in commercial settings. Trees in the Core Area require intensive management to promote health, provide visibility to business signs and lighting, and ensure public safety. In the residential areas, many of the trees are older, stately trees that tower over the streets. The Core Area Specific Plan recommends that the City shall consider a 'Downtown Davis Urban Forest Demonstration Site' and develop and adopt an 'Urban Forest Master Plan' for the Core Area, including a recommended street tree list specific to the core.

Central Davis (Zones #102 and #108)

This management area contains the highest percentage of dead and dying trees. In particular, areas with Japanese pagoda, various ashes, Chinese hackberry, and honey locust need immediate rejuvenation. Management should emphasize intensive care to trees in the best condition to enhance their longevity and canopy cover, while gradually replacing failing trees with a diverse selection of large statured species. Mature stands of ginkgo and zelkova have many functional years ahead of them provided they receive regular care.

West Davis (Zones #101 and #114)

This area contains a relatively large number of young trees that need regular inspection and pruning. Over-reliance on the shallow-rooted Chinese tallow (primarily in Village Homes) has led to sidewalk repair problems. Solutions that gradually replace this species with better-suited trees without dramatically reducing canopy cover are required. Also, there are many old walnut trees along Russell Blvd. that are senescent. The City has begun a replacement program of

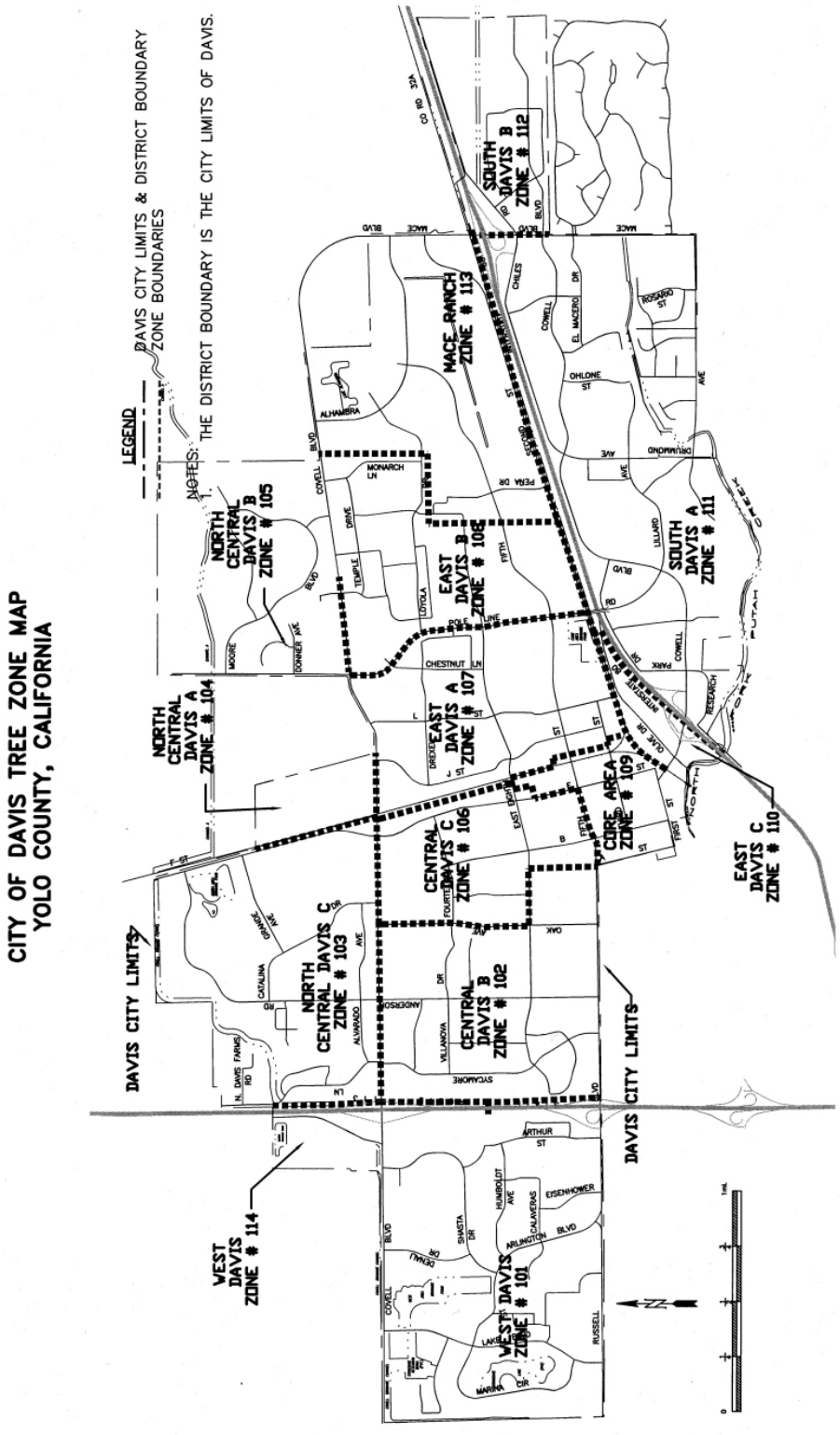
planting new young trees between the old trees, in anticipation of replacing the mature trees as they need to be removed for safety reasons. These old trees require annual inspection/pruning and continuation of the comprehensive removal and replacement plan to ensure their perpetuation as an historical grove.

North Davis (Zone #103, #104, #105)
Ornamental pear and London plane account for over one-third of all street trees in this area. Most of the other existing species, such as crape myrtle, Chinese pistache, and Chinese tallow are small to medium stature trees. This management area also has the smallest percentage of trees in good condition (42%), indicating species are not well adapted or maintained, most likely due to alkalinity and its effects on soil and water in the area. Increased monitoring and tree care is needed, as is increasing diversity and number of appropriate large stature trees when space becomes available through removals.

East Davis (Zones #107, #108)
Sustaining high levels of benefits from large hackberry and ash trees is a top priority in this area. New planting sites should be filled with large deciduous trees where space permits. Younger pistache, plane, and hornbeam should produce sizable benefits as they mature if given regular maintenance. Some stands of casuarina, silk tree, and ash need rejuvenation because the trees become mature or are near the end of their life spans.

Far East Davis (Zones #112, #113)
Nearly all of the street trees in this management area are young trees planted by developers with new home construction. London plane, Raywood ash, crape myrtle, and pistache account for about one-half the tree population. The trend away from planting large stature trees is evident here, and means that future benefits will be lower than in other neighborhoods with more extensive street tree canopy cover. Approximately 700 sites are vacant and should be filled with large stature trees where feasible. Many trees are spaced too closely. Alternating large and small trees where lot frontages are narrow is one way to reduce spacing conflicts. Young tree care is also a priority.

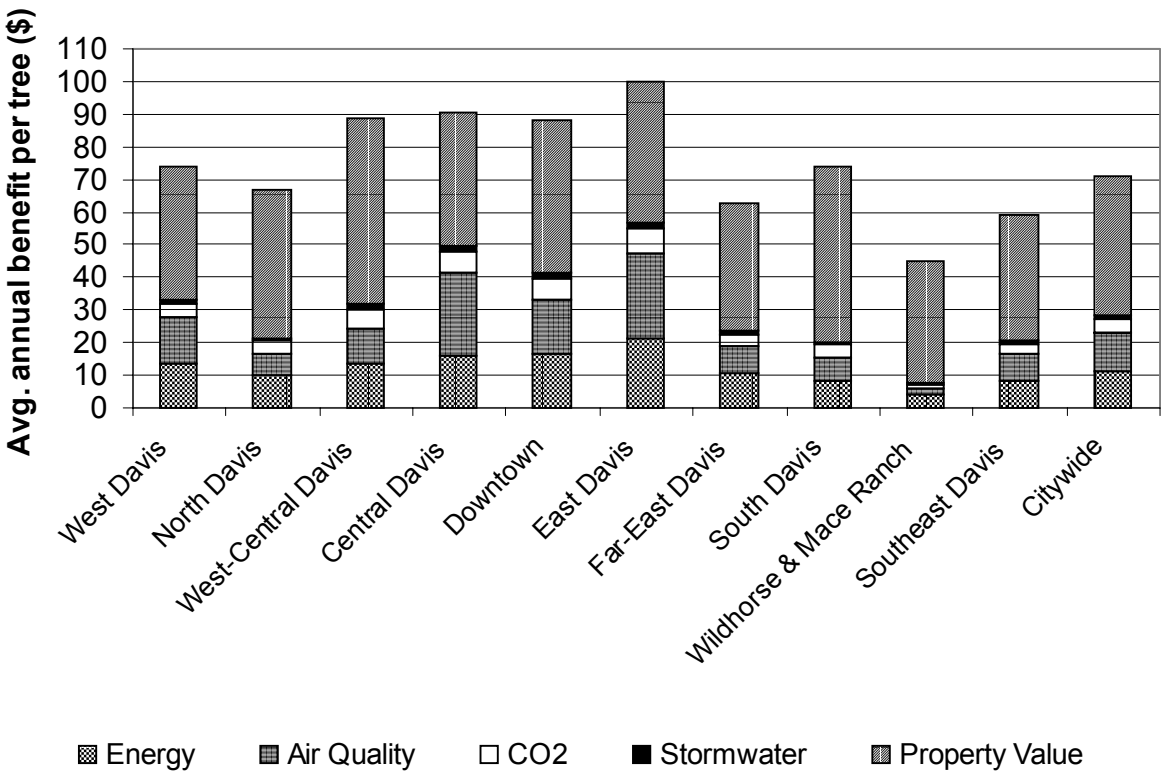
South Davis (Zones #110, #111)
South Davis has a mix of new and older neighborhoods. Older areas are heavily planted with London plane, magnolia, tallow, and hackberry. Ornamental pear, plane, and pistache are most common in newer neighborhoods. Because young trees abound there is need for young tree care and pruning to ensure proper structure and form. Numerous planting sites remain unfilled, so planting with large stature trees (except London plane) will help increase canopy cover as these trees mature.



City of Davis Tree Management Zones Map

4. Benefits and Costs Associated with Management of the Community Forest

Maco (2001) reported that in Fiscal Year 1999 public street trees were estimated to produce annual savings of $274,000 ($11.52/tree) in reduced energy bills, $279,000 ($11.54/tree) in improved local air quality, $102,000 ($4.30/tree) in atmospheric CO_2 reductions, $24,000 ($1.02/tree) in stormwater management offsets due to rainfall interception by canopies, and over $1 million ($42.74/tree) in increased property values. The total value of annual benefits was $1.7 million, or $71/tree on average. Environmental benefits accounted for 40% of the total, while property value increase and other benefits accounted for 60%.



Average Annual Benefit per Tree (Maco 2001).

In FY 1999 the City spent approximately $450,000, or an average of $18.88/tree annually to plant, prune, and remove dead trees, treat diseases, and repair sidewalks damaged by tree roots (Table 4). The net benefit was $1.25 million ($1.7 million less $0.45 million) and the benefit-cost ratio was 1:3.78 ($1.7 million / $0.45 million). Hence, for every $1 spent on street tree management residents received $3.78 in benefits. Each Davis resident spent $7.67 annually on street tree management and received about $29 in environmental, economic, social, and aesthetic benefits. Sustaining these benefits hinges upon the city's ability to continue to actively manage the community forest resource.

Fiscal Year 1999

	Total $ (millions)	$/capita	$/tree
Benefits	1.7	28.97	71.12
Costs	0.45	7.67	18.87
Net Benefits	1.25	21.3	52.25
Benefit-Cost Ratio	3.78	3.78	3.78

Benefit-cost Analysis Summary (Maco 2001)

As mentioned previously, Davis has a relatively large number of street and park trees, one tree for every two residents compared to an average ratio of one tree for every two and one-half residents from a 1999 survey of 21 California cities. However, Davis' FY 1999 per capita annual expenditure of $7.67 was well below the $11.11 average compared to other cities in California. Since this study, per capita expenditures have gradually increased to $8.54 in FY 2001. Nevertheless, Davis has been under-investing in the care and perpetuation of its signature tree canopy cover. While this strategy may save dollars in the short-term, it increases the risk of much greater costs in the future if large numbers of trees die and require removal, or a single tree fails, resulting in personal or property damage for which the city is responsible.

The best friend on earth of man is the tree. When we use the tree respectfully and economically we have one of the greatest resources on earth.
--Frank Lloyd Wright, Architect

CHAPTER III.
Community Forest Goals, Policies, Standards and Actions

This section of the Community Forest Management Plan (CFMP) presents the goals, policies, standards and actions adopted by the Davis City Council, for management of the community forest for the foreseeable future. These goals address issues related to all public and private trees. Their intent is to maximize net benefits of the existing tree canopy and extend our living umbrella.

Actions and recommendations required to work toward these goals, policies and standards are prioritized and undertaken by the Parks and Community Services Department Director and City Arborist, working in concert with the Tree Commission, City Council, other City departments and staff and other public and private partners.

A. Summary: Management Goals of the Community Forest Management Plan

Goal 1. Improve the quality of the Community Forest (consisting of all public and private trees) over time in ways that will optimize environmental, economic, habitat, food and social benefits to the City and its neighborhoods.

Goal 2. Promote planting, preservation and protection of the existing Community Forest resource.

Goal 3. Continue to maintain the City's trees in a safe and healthy condition as cost-effectively as possible.

Goal 4. Facilitate collaboration among City departments related to issues and projects involving trees.

Goal 5. Provide awareness of the importance of the Community Forest; educate the community on proper tree planting and care; and encourage greater participation in tree planting and stewardship activities.

Goal 6. Adopt the Community Forest Management Plan to guide long-term tree planting and maintenance activities, and update it every five years.

B. Goals, Policies, Standards and Actions

Goal 1. Improve the quality of the Community Forest (consisting of all public and private trees) over time in ways that will optimize environmental, economic, habitat, food, to the City and its neighborhoods.

Policy 1.1 Develop standards for optimum tree canopy cover levels throughout the City.

Actions

A. Develop recommendations for optimum tree canopy cover levels for specific land use types designated in the City, such as single family residential, multi-family residential, commercial, industrial, urban areas, etc. Using these recommended standards, establish the optimum tree canopy cover level for each of the neighborhood Tree Management Zones (i.e. Downtown Core, Central, North, West, South, East and Far East Davis) within the City based on the amount of each land use therein. (See text and map, page 35.)

B. Estimate the number of years required to achieve the optimum canopy cover level for each planning area based on the current stocking level, species mix, age structure and several planting and maintenance scenarios.

C. Establish street tree shading coverage standards for City streets.

    1. Review Parking Lot Shading Guidelines and establish attainable shading coverage guidelines for City streets for both new residential development and established neighborhoods. Consider all implications of street tree shading requirements.

    2. Review the Planning Department Greenstreets Guidelines and evaluate appropriateness for community forest management and street tree location recommendations.

Policy 1.2 Increase the existing tree canopy cover to optimum tree canopy cover levels through implementation of Best Management Practices (BMPs) for tree selection, placement, and care.

Standards

A. Follow guiding principles to maintaining a healthy, stable, and functional tree canopy, including selection of species that 1) are well adapted and long-lived, 2) maximize tree biomass given each site's spatial constraints, 3) avoid over-reliance on too few species, and 4) control management costs (pruning, removal, liability).

B. Follow BMPs for tree selection and placement by tree type and landscape use:

1. Streetscapes – public road right-of-ways (including corridors and medians) adjacent ten foot wide street tree easement (i.e., residential front yards) and commercial, institutional, industrial, etc. frontages.
    a. For new streets, follow recommendations of Greenstreets Guidelines for street design, and Street Tree Planting Requirements and City Master Tree List for street tree placement and selection. In addition to above standards, consider the following recommendations:
        i. In new developments, where narrow lots do not allow for large trees to be planted on each lot, large-growing trees and smaller filler trees can be alternately planted so as to provide one tree per lot without future crowding. Locate trees to minimize future conflicts with streetlights, signage, and other infrastructure.
        ii. Avoid shallow-rooted species in sidewalk cutouts or planting strips less than 6' wide unless structural soils or other mitigation measures are taken to reduce infrastructure damage.
        iii. Where appropriate, introduce seasonal changes and color variations.
        iv. Where appropriate, recommend native tree species at sites close to existing natural areas.
        v. Encourage diversity of species and age.
        vi. Where trees are character-defining elements in historic areas, replacements shall reflect the appropriate historical theme.
        vii. Plant appropriately-sized trees under utility lines.
    b. For existing streetscapes, follow recommendations of Tree Commission and Davis Downtown and Traditional Residential Neighborhood Design Guidelines for street tree preservation, removal and replacement; Tree Planting, Preservation and Protection Ordinance, Tree Planting and Maintenance Specification and City Master Tree List for street tree placement and selection. In addition, consider the above recommendations.

2. Large Landscape Areas– parks, greenbelts, golf courses, cemeteries, office and industrial parks, rural lands: For new developments, follow conditions and recommendations of Planning & Building Department in coordination with Parks and Community Services during design and permit processes. In addition, consider the following standards:
    a. Preserve and plant trees in mixed groups and stands, as well as singly where appropriate.
    b. Save groups of trees whenever possible.
    c. Preserve riparian buffers along streams (see Policy 1.2B-5).
    d. Preserve and plant trees of different ages/container sizes.

e. Where appropriate, plant native trees that will blend into the larger landscape and ecology of the region.
f. Select trees for their suitability to the existing topography, soils, and vegetation.
g. Manage areas containing young trees to create valuable mature tree areas over time.
h. Work with natural plant succession to achieve landscape goals.
i. Create tree islands with understory to enhance wildlife habitats. Consider the wildlife habitat value of snags and broken branches existing in open space trees before pruning or removing, and retain if appropriate.

3. Parking Lots – public, commercial, industrial, office, and multi-family residential land use areas. Follow the City Master Tree List and Parking Lot Shading Guidelines.

4. Plazas and Downtown Settings – sidewalks, paved walkways, tree wells, building plazas, pocket parks. For new plazas, follow conditions and recommendations of Planning & Building Department in coordination with Parks and Community Services during design and permit processes. In addition, consider the following standards:

a. With increasing densification/in-fill in commercial areas, consideration of preservation and protection of existing trees and mature canopies should be made a priority. Follow the requirements of the Tree Planting, Preservation and Protection Ordinance and related documents.
b. Match the species mature size to the amount of available growing space, and allow for pedestrian and vehicular clearance.
c. Select trees to enhance architectural design; do not block important building and structure detailing, signage, and lighting.
d. Plant trees where limbs will not impede access for delivery or emergency vehicles.
e. Consider alternative (permeable or open) paving systems that accommodate pedestrians and vehicles but increase moisture to tree roots and gas exchange between the roots and the surface.
f. Encourage use of structural soils to expand the amount of soil volume available to tree roots.
g. Minimize compaction of soils during construction phase. Locate trees where tree roots are not constricted by underground utilities and compacted soils where possible; include consideration for overhead utilities that will limit mature tree size. (See 1.2.B-6 for Utility Corridor standards).

5. Riparian Zones, Drainage Areas and Buffers – drainage channels, wetlands, retention and detention ponds, windbreaks, hedgerows, screens and noise barriers:
    a. Where possible, preserve at least 70% tree canopy cover in riparian zones.
    b. Plant from seed or small liner stock whenever possible to maximize tree/site adaptation.
    c. Plant trees in staggered, natural pattern instead of a single row.
    d. Plant as wide a buffer as possible.
    e. Save existing woodlands with undisturbed understory trees, shrubs, herbaceous plants, leaf litter, and soil. Consider the wildlife habitat value of snags and broken branches existing in open space trees before pruning or removing, and retain if appropriate.
    f. Plant and preserve trees in mixed groups and stands of diverse ages and species.
    g. Select species that are adaptable to existing soil conditions and occasional flooding, where appropriate.
    h. Manage areas containing young trees to develop valuable mature tree stands over time.
    i. Avoid exotic species; many are aggressive along creeks and streams.
    j. When removing trees in riparian zones, consider a 75 foot undisturbed buffer along streams.

6. Utility Corridors – linear landscape corridors for electrical power, gas, water, sewer service easements, etc. and both underground and overhead utility corridors.
    a. Exercise caution to avoid planting trees too near underground utilities (including water and sewer lines).
    b. Plant only appropriately-sized trees ("the right tree in the right place") beneath overhead utility lines to ensure line clearance can be maintained. Selection of new trees planted under utility lines shall be approved by City Arborist.
    c. For street trees and City trees, follow Utility Easement Agreements 241, 242 and ANSI Standards for pruning and maintenance.
    d. For private trees, develop agreement with utility companies for appropriate maintenance standards, including the following considerations:
        i. Prune trees according to professional standards, employing target pruning to remove undesirable limbs at the branch collar.
        ii. Employ crown reduction pruning instead of tree "topping" to reduce tree size beneath utility lines.

iii. Remove and replace trees in conflict with overhead utility lines if clearance cannot be maintained through proper pruning.
iv. Tunnel (boring technique) beneath tree roots within the tree protection zone instead of trenching for the installation or repair of underground utilities.
v. Never use spikes to climb trees during overhead utility line clearance.

Policy 1.3 Ensure that the Community Forest has a diverse mix of tree species and ages.

Actions

A. Work with the public, City staff (such as Adopt-a-Park) and private partners (such as TREE Davis) to educate and encourage public awareness of importance of tree species and age diversity within the Community Forest. (See Goal 5 and related policies).

B. When projects are submitted to Planning & Building Department for building permits or discretionary project review, encourage planting of diverse sizes and species of trees on private property, working with the City Arborist as necessary.

C. Identify species that are widely adapted to conditions in Davis. Selecting species that are well adapted to local conditions is just as important as achieving desired levels of diversity. However, also encourage experimentation with appropriate trees not on the City Master Tree List for planting on private property. Successful introductions of new species on private property may be considered for incorporation into the City Master Tree List after a trial period.

D. Research and monitor tree survival and growth under various conditions expected in Davis (i.e. structural soils, parking lots, bare root vs. container, asphalt/concrete cut-outs, etc.) Use these studies to set standards for tree planting.

Goal 2. **Promote planting, preservation and protection of the existing Community Forest resource.**

Policy 2.1 Protect the existing Community Forest through application of the Tree Planting, Preservation and Protection Ordinance (and other tree-related City standards and guidelines), including designation of trees as “Landmark Trees” or “Trees of Significance”, and preservation and protection of private, City and street trees when developing or constructing public improvement projects or projects requiring a building permit or discretionary project review.

Standards

A. The Tree Planting, Preservation and Protection Ordinance and the Tree Preservation and Protection Standards shall be the standard for protecting trees in the Community Forest.

B. When public improvement projects will impact City or street trees the City's priority shall be to preserve these trees through site design and/or transplanting where possible.

C. Establish a standard to protect existing "planting strips" between curb and sidewalk as landscape planting sites.

D. Where possible, the City will make significant efforts to preserve and protect historic trees.

Actions

E. Implement the Tree Planting, Preservation, and Protection Ordinance (and other tree-related City standards and guidelines).

1. Promote coordination among all City Departments whose operations have potential impacts on the Community Forest: Parks and Community Services (PCS), Planning & Building (P&B), Public Works (PW) (including Wildlife Resource Specialist), and including relevant City Commissions, etc.

2. Coordinating among PCS, P&B, PW, etc., create informational material and summaries to inform the public about the standards in the Ordinance and their responsibilities when submitting applications.

3. Periodically review the Tree Planting, Preservation, and Protection Ordinance (and other tree-related City standards and guidelines) and its implementation to ensure that it is effectively written and enforced.

F. Review and update existing Landmark Tree List, standards for selection and other elements. Review list every five years for updates to list if necessary. Explore working with U.C. Davis Environmental Horticulture Department as an advisory body for review and updates. Identify significant benefits to property owners of Landmark Trees, including recognition and letters of appreciation from the City Council every five years.

G. Implement practices to reduce tree removals, such as systematic tree inspection and pruning.

H. Explore new methods of repairing sidewalks using alternative materials to provide safe and shady walkways while retaining large, healthy trees.

Policy 2.2 Review, expand and improve existing comprehensive inventory of all City trees in the Community Forest.

Actions

A. Inventory City and street trees; include their locations in the city GIS database. Continuously update inventory to develop work history of City and street trees.

B. Use the inventory as the basis for tree-related work scheduling.

Policy 2.3 Maintain limited and clear criteria for tree removal, and implement practices to retain healthy and safe trees.

Standards

A. Tree removals may need approval by Tree Commission, and under certain circumstances, the Historical Resources Management Commission or other advisory bodies. See Tree Planting Preservation and Protection Ordinance for standards and approval procedure. Tree removal requests may be approved if one or more of the following conditions exist: 1) tree is dead or in declining health that will result in its death within a year, 2) tree is a hazard because of its high potential for failure due to considerable dead or dying foliage, branches, roots, or trunk, 3) tree is structurally unsound due to root pruning or crown damage, 4) tree has reached an over-mature condition, is in declining health, and limits planting/growth of a replacement tree, 5) tree is infected with a disease that cannot be treated successfully and/or there is strong potential that the pathogen could spread to other trees in the area.

B. When a tree has been identified as hazardous by the above definitions, remove tree within no more than thirty (30) days following Tree Commission approval (if required) or immediately by decision of the Director, if determined to be a safety concern.

C. The City Council has discretion to identify special situations where a comprehensive tree removal and replacement program may be desirable.

Actions

D. Replace trees removed or lost to damage on site whenever practical or in a nearby available site with no net loss to the Community Forest.

E. Where removal of healthy City or street trees is necessary, the option of relocation/transplanting of trees should be explored and implemented where possible.

Goal 3. Continue to maintain the City's trees in a safe and healthy condition as cost-effectively as possible.

Policy 3.1 Develop a Master Street Tree Plan that identifies a long-term strategy for City and street tree selection, siting and replacement.

Standards

A. Every five years, review City Master Tree List, and update with additions and deletions as recommended by the Tree Commission and the City Arborist. Establish standard that Citywide no single genus shall constitute over 15% of the total number of city trees and no single species shall account for more than 5% of all trees.

B. Establish standard that Citywide the desired age structure is approximately 40% young (< 6" DBH), 30% maturing (6-12" DBH), 20% mature (12-24" DBH), and 10% old (>24" DBH).

C. Establish standard that within a single neighborhood management area (see Policy 1.1A), no single genus and species shall constitute over 25% and 10% of City trees, respectively. The exception shall be that within historic areas, historic preservation goals to retain character and historic plantings may need to be considered.

D. Within a single neighborhood management area, trees will be removed and replaced in a planned manner to achieve a diverse age structure. See C above.

E. Optimal species selection for a neighborhood management area shall be as recommended in "A Practical Approach to Assessing Structure, Function and Value of Street Tree Populations in Small Communities" (Maco, 2001).

F. Plant and monitor the success of new introductions. These species shall constitute 1% to 5% of new plantings. After approximately five years, determine whether trees should be added to City Master Tree List.

G. Achieving diversity can be obtained while still maintaining character-defining uniformity or historic continuity along a street or street-segment. Advance planning can ensure proper distribution of species and ages throughout the City, enhance the visual impact of street trees, and reduce costs by clustering trees with similar pruning requirements.

Policy 3.2 Develop Tree Planting and Maintenance Specifications for use by City staff, and available to the public if requested.

Standards

A. Include planting and care of new trees, and routine maintenance of large trees (pruning, fertilization, irrigation, pest management, removal and replacement, etc.).

B. Coordinate these specifications with relevant portions of existing City of Davis Landscape Specifications and Standards and other standards already in place by the Tree Division.

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Policy 3.3 Provide optimum care during planting and subsequent maintenance of newly planted City and street trees.

Standards

A. Follow currently accepted ANSI and International Society of Arboriculture (ISA) standards, and Tree Planting/Maintenance Specifications adopted by the Tree Commission (see Policy 3.2 above).

Actions

B. Continue community based partnerships for Tree Planting and Small Tree Care Program for new and young trees.

Policy 3.4 Implement routine inspection and maintenance for large City, parking lot and street trees using established standards to reduce long-term tree care costs.

Actions

A. Follow currently accepted ANSI and International Society of Arboriculture (ISA) standards, and Tree Planting/Maintenance Specifications adopted by the Tree Commission (see Policy 3.2 above).

B. Establish a 1-8 year cycle for routine maintenance of large trees. Record annual maintenance procedures in GIS data base/inventory.

C. Maintain acceptable visual clearance for intersections, traffic signals, signs, etc., and overhead clearance for vehicular and pedestrian traffic.

D. Continue to use Memoranda of Understanding (MOU) with local utilities to ensure that City and local residents are notified prior to pruning City and street trees. Update MOU as necessary.

E. Coordinate with City Wildlife Resource Specialist when nests are found in trees; protect wildlife nests and include in inventory. See Policy 2.2.

E. Review regular maintenance procedures periodically to ensure Best Management Practices for large tree care.

F. Consider community based partnerships for inspection and monitoring of parking lot shade trees, as per the Parking Lot Shading Guidelines.

Policy 3.5 Implement root management practices that use emerging technologies in soil science and pavement engineering to reduce hardscape repairs and tree removals.

Standards

A. For new tree planting, encourage large, adequate planting pits to maximize initial root soil volume. See Planting and Maintenance Specifications for detailed information.

B. For existing trees, when a tree is structurally sound, stable, and healthy, use best management practices to repair the pavement and preserve the tree and its roots such as:

1. Replace concrete with unit pavers, decomposed granite, asphalt, rubberized sidewalk, or other flexible materials.
2. Meander the sidewalk around existing roots.
3. Ramp the sidewalk over existing roots.
4. If hardscape engineering solutions are not feasible, root pruning shall be considered as a second option. Root pruning will be performed after determining that it will not adversely impact the stability and viability of the tree.

C. Tree removal and replacement shall be considered only where there is no compatible hardscape design alternative and root pruning is not feasible without causing irreparable harm to the tree.

D. Encourage use of structural soils in commercial areas and parking lots where soil volumes are typically too small to support long-term tree growth.

Policy 3.6 Develop and implement tree removal and replacement plans for City and street trees in areas where significant loss of tree canopy cover is likely in the short-term. (See also Policy 2.3 and 3.4)

Actions

A. Identify and prioritize areas with large numbers of over-mature or declining City and/or street trees. Initiate phased replacement tree program for these areas,

in order to create and maintain a diversity of species and ages of trees. Work with local residents and public input, conduct a tree failure survey that prioritizes which trees to preserve and which trees to remove.

B. Periodically review removal rates for different city tree species to assess which species are performing poorly and which have high survival rates and long life spans.

C. Where possible, avoid planning to remove more than 25 % of total trees or more than two trees in a row at any one time to maintain the distribution of tree canopy cover.

D. Implement the removal and replacement plan over multiple years to ensure continuous canopy cover.

E. For street trees, replacement trees shall be selected from the City Master Tree List, as recommended by the City Arborist.

F. Wherever possible, establish replacement tree prior to removal of existing tree.

Policy 3.7 Continue and/or expand the existing greenwaste recycling program using byproducts from the Community Forest.

Actions

A. Existing City practice does not send any City wood waste to land fill. Explore increasing the amount of wood waste that goes into lumber, mulch, soil amendment and other value-added products.

B. Work with the California Department of Forestry and Fire Protection, Davis Waste Removal, and local woodworkers.

C. Partner with local neighborhoods, community based partnerships, Davis Waste Removal, and others to promote increased recycling of wood waste from private trees.

Goal 4. Facilitate collaboration among City departments related to issues and projects involving trees.

Policy 4.1 Review existing Tree Division staffing levels. Create City Arborist (and/or professional Urban Forester) job description and continue to maintain the position with a highly qualified urban forester.

Policy 4.2 Follow existing plan review process that includes the City Arborist's review of public works projects and/or projects requiring a building permit or discretionary project

review and their potential impacts to the Community Forest, according to provisions of the Tree Planting, Preservation and Protection Ordinance.

Policy 4.3 Establish an annual tree management plan, prepared by the City Arborist.

Standards

A. Use the Tree Management Planning Tool/Level of Service (LOS) Matrix, page 53, as a tool for establishing the priorities and implementation strategies for ongoing community forest management and administration needs, along with the potential budget as set by City Council and Parks and Community Services Department, by the following recommended process.

1. Establish minimum to optimum tree management budget range (including City and street trees) for the planning period (i.e. annual, 5-year, etc.)

2. Review inventory data and existing conditions. Establish size of community forest being managed, including City and street trees (i.e. 40,000 trees: percent at 0-3", percent at 3"-6", percent at 6"-12", etc.)

3. Prioritize program areas for planning period and rank importance in LOS matrix. Establish special management projects and prioritize.

4. Consider budget implications of priorities:

    a. Evaluate budget implications of all applicable levels of service; modify generic LOS definitions as necessary for conditions (i.e. delete minimal LOS 1 and/or upgrade LOS 2,3,4 with additional special projects if adequate budget exists.)
    b. Evaluate budget demands of special projects.
    c. Evaluate best funding options, including capabilities of community based partners and private funding, grant availability, comparative costs for private service contracts compared to staff costs, and other alternative sources of funding.

5. Parks and Community Services Director/City Arborist and/or Tree Commission recommend budget and Level of Service (LOS) to City Council for adoption.

Actions

B. In preparation for each new fiscal year, the City Arborist will prepare an annual tree management plan for City and street trees, including annual goals for new tree plantings, routine maintenance and pruning, tree removals and replacement program, parking lot shade enforcement, task scheduling, public education programs, funding and resources, inspections, etc.

Tree Management Planning Tool

Levels of Service (L.O.S.) and Budget Determination for City-funded Tree Management ♦

Program Area	Rank for Fiscal Year ____ *	Potential Level of Service 1 (minimal)	Potential Level of Service 2	Potential Level of Service 3	Potential Level of Service 4 (optimal)	Staff/Tree Commission Recommen-dation for Fiscal Year _____ *
Planting		No new city-funded tree planting	Replace City and street tree removals only	Replace removals and plant on request; increase stocking by ½% per year	Replace removals and plant on request; increase stocking by 1% per year; provide for special planting projects.	
Young Tree Care		No young tree care	± 5-year cycle inspection/ pruning (no special training/ funding)	± 3-year cycle inspection/ pruning (fund education/ training)	± 1-year cycle inspection/ pruning (fund special projects/ education)	
Mature Tree Care		±12-year cycle inspection/ pruning	±9-year cycle inspection/ pruning	±7-year cycle inspection/ pruning; fund parking lot shade ordinance monitoring	5-year cycle inspection/ pruning; fund parking lot shade monitoring; other special projects	
Hazard Tree Abatement		Removals on homeowner request only	Removals on request; maintain <5% 'dead or dying' backlog	Removals on request; maintain <2% backlog; fund special projects	Removals on request; maintain <1% backlog; fund removal/ replacement programs; inventory and other special projects	
Administration (2002 Dollars)		$2.00/tree admin budget or .25 supervisory arborists/ 10,000 trees	$3.00/tree admin budget or .40 supervisory arborists/ 10,000 trees	$3.75/tree admin budget or .5 supervisory arborists/ 10,000 trees	$4.50/tree admin budget or .65 supervisory arborists/ 10,000 trees	

♦ See prototype for completed matrix in Chapter V. Appendix.
* Column to be filled in annually when planning budget and proposed Level of Service.

C. The City Arborist will circulate the plan among City departments to better coordinate annual City and street tree maintenance/improvement projects and avoid scheduling conflicts with other City departments.

D. The City Arborist will use this plan as a basis for an annual report to City Council (see Policy 5.2).

Policy 4.4 Implement a landscape inspection and ordinance enforcement process to promote compliance with City policies and regulations that influence the Community Forest.

Actions

A. The City Arborist will meet once each year, before preparing annual tree maintenance plan, with appropriate City staff from Parks and Community Services and other departments, TREE Davis, and other partners to discuss procedures outlined in the plan, including tree planting and maintenance, removals and replacement program, Small Tree Care Program; reviewing street and parking lot shade monitoring in accordance with Parking Lot Shading Guidelines; inspections; monitoring compliance with ordinances, enforcement, etc. Decisions about coordination and responsibilities for these tasks will be made. City Arborist will continue to meet with these partners as necessary throughout the year to operate the tree program.

B. Produce summaries and informational material about tree-related issues to better inform the public and City staff about responsibilities related to Community Forest policies and regulations.

Goal 5. Provide awareness of the importance of the Community Forest; educate the community on proper tree planting and care; and encourage greater participation in tree planting and stewardship activities.

Policy 5.1 Promote awareness of the policies and standards in the Community Forest Management Plan (CFMP) and related documents.

Actions

A. Distribute the CFMP to City Council, City Advisory Commissions, all other City departments, public agencies and private partners. Make the plan available to interested parties including the general public. Interested private parties and residents may include landscape contractors, tree service contractors, developers, designers, and real estate agents.

B. Develop news releases and educational material aimed at preventing the unwarranted and illegal pruning and removal of trees, as well as tree planting responsibilities and procedures.

Policy 5.2 Promote an ongoing program to disseminate information and educate the general public on the care and value of trees in cooperation with Tree Commission, community based partners, Adopt-a-Park, Davis Joint Unified School District and local media.

Actions

A. Develop and disseminate a general brochure to each residence in the City of Davis on the City's tree care policies and identify where residents can obtain more detailed information.

B. Continue participating in the Davis Enterprise's monthly newspaper article "Community Trees" and other columns, in addition to other noteworthy tree-related publications when possible.

C. Organize and publicize annual Arbor Day activities and Tree City USA events.

D. Integrate community awareness into other important City events as appropriate.

E. Utilize community information links, such as libraries, Community Cable TV, and the City's Web site to disseminate information (e.g., on-line catalog of tree species, locations of Landmark Trees, annual pruning schedules).

F. Complete an annual Community Forest program report written by City Arborist. Present this report to Tree Commission and City Council. Information shall summarize all work completed in the year as per the annual tree maintenance plan.

Policy 5.3 Collaborate with Adopt-a-Park, community based partners, UC Davis, Davis Joint Unified School District, and other local and regional groups to increase participation in tree planting and stewardship activities.

Actions

A. Participate in educational programs with local schools, churches, and service groups, such as Boy/Girl Scouts, senior organizations, neighborhood groups, UC Davis organizations, etc.

B. Collaborate with Adopt-a-Park, community based partners and others to hold workshops and other educational programs about young tree care, neighborhood-based tree planting, and school plantings, etc.

C. Provide internships for urban forestry students, environmental horticulture students and other related majors at UC Davis.

D. Make the City's Community Forest Management Plan (CFMP) and management practices available to other local governments and identify opportunities for collaboration to enhance community forests throughout the region.

Goal 6. Adopt the Community Forest Management Plan (CFMP) to guide long-term tree planting and maintenance activities, and update it every five years.

Policy 6.1 Amend existing City plans and ordinances to incorporate the provisions of this Community Forest Management Plan (CFMP).

Actions

A. Identify current codes, statutes, and ordinances that require updating.

B. Implement amendments following adoption or updating of this CFMP.

Policy 6.2 Update this CFMP on a regular basis.

Actions

A. Solicit input on effectiveness of this plan from other City Arborists and Urban Foresters, Tree Commission and Parks and Community Services staff, other City departments, partners, etc.

B. Review and revise this plan within 5 years of adoption.

The cultivation of trees is the cultivation of the good, the beautiful and the ennobling in man.
--Sterling Morton

CHAPTER IV.
Glossary

The following words and phrases may be used in the Community Forest Management Plan (CFMP) and are defined for purposes of this document as follows:

1) **"Adopt-a-Park"** is a program run by the Parks and Community Services Department which trains and monitors community volunteers to help in parks and with other community projects.

2) **"Arborist"** means an individual certified as an arborist by the International Society of Arboriculture (ISA), the California Arborist Association (CAA), or other nationally recognized tree research, care and preservation organization approved by the Director.

3) **"Arborist's report"** means a report prepared by a certified or consulting arborist containing specific information on the location, condition, potential impacts of development, recommended actions and mitigation measures regarding one or more trees on an individual lot or project site with the arborist's signature and seal.

4) **"Building permit"** refers to any permit required by the Planning and Building Department for any construction (above ground or underground).

5) **"City Arborist"** means the urban forester/arborist employed by the City, and designated by the Director, responsible for review, evaluation and/or preparation of reports, permits and requests regarding pruning, construction damage, removing and/or relocating City-owned or other protected trees. In performing these duties and responsibility, the City Arborist may conduct field inspections independently as an authorized representative of the City.

6) **"City Master Tree List"** refers to the city-adopted tree list for street trees and parking lot trees. It is available by request from the Planning and Building Department and/or the Parks and Community Services Department.

7) **"City tree"** means any tree, other than a street tree, planted or maintained by the City within a City easement, right-of-way, park, greenbelt, public place or property owned or leased by the City.

8) **"City Tree Planting and Maintenance Specifications"** are the city-adopted standards for care of trees, including but not limited to tree planting, young tree care, pruning, mulching, fertilization, irrigation, pest management and removal and replacement. They are available by request from the Parks and Community Services Department.

9) **"Community Forest"** refers to all publicly and privately owned trees within the City, its open space areas and surrounding planning area(s).

10) **"Community Forest Management Plan" (CFMP)** is this document, the City's long-term plan for comprehensive management of the Community Forest. The CFMP is available by request from the Planning and Building Department and/or the Parks and Community Services Department.

11) **"Damage"** means any action undertaken which causes injury, death or disfigurement of a tree. This includes, but is not limited to, cutting, poisoning, over-watering, relocating or transplanting a tree, or trenching, excavating or paving within the Tree Protection Zone of a tree.

12) **"Diameter at breast height (DBH)"** means the diameter of a tree measured at four feet six inches above ground level. The diameter may be calculated by use of the following formula: DBH = circumference at breast height ÷ 3.14. DBH is one factor used for many forms of tree evaluation, such as determining Trees of Significance, and is a factor in establishing replacement fees, penalties for violations, etc.

13) **"Director"** means the Director of the Parks and Community Services Department or his or her designee.

14) **"Discretionary project"** means any non-ministerial development project that is subject to the approval of the City Council, the Planning, Historical Resources Management or Tree Commissions, Subdivision Committee, or by city staff through an approved administrative process. Discretionary projects include, but are not limited to, conditional use permits, tentative maps or waivers thereof, rezones, design review, minor modifications, modifications to historic resources, minor improvement, sign permits, variances or planned developments.

15) **"Encroachment**" means any activity conducted within the Tree Protection Zone or drip line of a protected tree.

16) **"General Plan"** refers to the document adopted by City Council and updated on a regular basis, which provides the long-term policy framework for the community. The CFMP is the specific plan for the management of trees; a supporting document to the most recent General Plan.

17) **"Grading"** means the removal, movement or addition of soil or earth material.

18) **"Irrigation"** means application of water by artificial means.

19) **"Landmark Tree"** means a tree that has been determined by resolution of the City Council to be of high value because of its species, size, age, form, historical significance, or some other professional criterion. The Landmark Tree List, available by

request from the Parks and Community Services Department, designates these identified trees.

20) **"Level of Service (LOS) Matrix"** refers to the planning tool used to establish priorities and budget recommendations for tree-related management issues.

21) **"Modification"** refers to direct (e.g. pruning) and indirect (e.g. grade changes, trenching) impacts and modifications to trees in the surrounding area that result in physical impacts upon a tree.

22) **"Parking Lot Shading Guidelines"** refer to the informational handout for design and shading of new and/or reconstructed parking lots, and available by request from the Planning and Building Department and/or the Parks and Community Services Department.

23) **"Private tree"** means any tree privately owned and growing on private property, which may include Landmark Trees and/or Trees of Significance, and may be located within the City landscape easement.

24) **"Protected tree"** means trees protected under Tree Planting, Preservation and Protection Ordinance: Landmark Trees, Trees of Significance, city-owned street trees, city trees and trees identified to become city trees.

25) **"Prune"** shall apply to both above surface and underground cutting; to cut off or cut back parts to enhance health and structure.

26) **"Removal"** means removal of a tree by cutting to the ground, complete extraction, or killing by spraying, girdling, or any other means.

27) **"Single family or duplex dwelling"** means up to two buildings on a lot designed for and/or occupied by one family per dwelling.

28) **"Street tree"** means any tree planted and/or maintained by the City, or recorded as a street tree, adjacent to a street or within a city easement or right-of-way on private property, within the street tree easement.

29) **"Street tree easement"** refers to the ten (10) foot zone behind the sidewalk or between curb and sidewalk (or if no sidewalk exists, behind the street curb, gutter, edge of street or property line at street) within which a street tree may exist or be planted.

30) **"Street Tree Planting Requirements"** are the standards and requirements for subdividers to provide and plant street trees and street tree fees for each lot fronting a public street, available from the Planning Department and/or the Parks and Community Services Department.

31) **"Subdivider"** means any developer or individual creating new single family, duplex or multi-family lots or developing multi-family or commercial property fronting a public street.

32) **"Tree"** means any woody perennial plant having one or several main stems commonly achieving ten or more feet in height and capable of being pruned and shaped to develop a branch-free trunk at least nine feet in height. Reference to any tree indicates the entire plant, including both visible (canopy, trunk) and below grade (roots).

33) "**Tree Commission"** refers to the advisory body, appointed by the City Council, to advise the Council and the Director on tree-related matters, including review and approval of tree removal requests and recommendations regarding trees and landscaping materials to be used on city-owned property.

34) **"TREE Davis"** refers to the existing community based partner for tree-related issues in Davis and surrounding areas, a non-profit membership organization. Their mission is to enhance the Davis community forest while educating area residents, businesses, and schools on the value of trees within the community, to offer technical advice, tree planting and care workshops, community planting projects and educational literature.

35) **"Tree of Significance"** means any tree including but not limited to those listed in the Tree Planting, Preservation and Protection Ordinance as a small tree which measures 5 inches or more in diameter (DBH) or any tree listed as a large tree which measures 10 inches or greater in diameter (DBH).

36) **"Tree Preservation, Planting and Protection Ordinance"**, Chapter 37 of the Municipal Code, establishes the Tree Commission and its responsibilities, defines trees protected by the ordinance, provides standards and requirements for tree planting and maintenance, preservation, protection, and removal and authorizes enforcement for violations.

37) **"Tree Preservation and Protection Standards"** are the standards for preservation and protection of trees during construction, available from Parks and Community Services Department and/or Planning and Building Department.

38) **"Tree Protection Zone (TPZ)"** means the outermost edge of a tree's canopy (or drip line). In certain instances, the TPZ may extend beyond the drip line, as determined by the Director.

The wonder is that we can look at these trees and not wonder more.
--Ralph Waldo Emerson

CHAPTER V.
Appendices

A. List of Plan Reviewers

The Tree Commission would like to thank all of the members of the public and selected reviewers who have helped with this document. In particular, the following individuals have made significant contributions:

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C. Level of Service Matrix: Five Year Master Plan Case Study

The Goals, Policies, Actions and Standards in Chapter III establish the framework for tree-related management issues. Implementation of these recommendations must be prioritized and budgeted on a long-term basis (a five-year master plan) as well as annually. The Tree Management Planning Tool/Level of Service (LOS) Matrix, page 53, has been developed to direct this prioritizing and budgeting process.

This chapter presents the working document for master planning for the 2002-2007 fiscal year. The LOS Matrix, with accompanying text, explains the issues and processes involved in developing recommendation for this time frame. It is included in this plan for its value at the present time and for reference as a model for future years' planning and budgeting.

The purpose of the LOS Matrix is to identify priorities for care of city-owned/maintained trees along with identifying annual and long-term projected management costs. In this prototype, the analysis does not include private trees, which are an extremely important part of the community forest, but the City does not manage these trees nor budget for their care. The LOS Matrix is designed to respond to budget levels from optimal (in adequate budget years) down to minimal service (to be used rarely and only for extremely lean budget years.) When funding exceeds the optimal service levels for annual maintenance and administration needs, the five year plan may address additional long-term goals of the Community Forest Master Plan (CFMP), such as completing a tree inventory, addressing landmark tree issues, establishing a removal/replacement program for targeted neighborhoods, or other goals, priorities and actions contained in the recommendations of Chapter III.

1. Proposed Priorities and Budget for FY 2002-2007

This FY 2002-2007 Level of Service (LOS) matrix and resulting budget are based on the FY 2001 budget. The recommended implementation strategy included in this Chapter combines cost effective management and contracted service opportunities with City-provided services to maximize high standards with reasonable budget demands for the current fiscal climate.

The LOS Matrix compares current levels of service (identified in the first column) with four possible levels/ budgetary demands for the next five years: minimal care (LOS 1) through optimal care (LOS 4). Within the matrix, five annual ongoing maintenance/program management areas are: Tree Planting, Young Tree Care, Mature Tree Care, Hazard Tree Abatement, and Program Administration/Management.

Although each of these annual ongoing program areas is essential to the maintenance and life of the community forest, they have been prioritized for the budget in this five year time frame, based on existing conditions and planned available budget. Concern for public safety and responsible management of the existing community forest has been

placed as the highest priority. The final column of the matrix proposes the recommended implementation strategy and budget for the next five years. In this fiscal year, there are adequate funds to evaluate existing service levels, and have planned for Levels of Service that meet or exceed these standards.

The analysis extends current patterns of community forest management in terms of urban forest structure, growth, mortality and documented costs for the next five years. Given these planning and mortality rates, the projected tree population (of City-owned/maintained trees only) is estimated to increase by as many as 480 trees annually, from 30,379 currently existing trees in 2002 to 32,779 trees in 2006, depending on the Level of Service selected.

The issues inherent in the management of each program area and related implementation standards are addressed in the text below, organized by budget priority.

2. Hazard Tree Abatement

Hazard tree abatement, or removal of dead or dying trees within the community forest, has been given the highest budget priority for FY 2002-2007 due to potential public safety concerns. Dead and dying trees can be in danger of falling or loosing major branches, with resultant property and/or personal injury concerns.

There is no national standard for hazard tree abatement. Local standards typically reflect the city risk manager's assessment of acceptable level of risk for hazardous trees. Cities with established street tree programs typically have less than five percent (5%) of their inventory classified as dead or dying--in other words in a 'hazard tree' situation. In the City of Davis, with our weather conditions and extensive population of large, old trees, a more acceptable standard for safety concerns would be a goal of less than one percent (1%) dead or dying trees, with elimination of any existing backlog of potentially hazardous trees.

During the typical year in Davis about 125 city-owned trees require removal. These trees are removed on request by homeowners and City staff as well as in emergency removal situations such as following a storm. About 75% of all tree removals are 'hazard trees' while the remainders are removed due to declining tree health, conflicts, nuisance species, or making space for replanting a tree. These 125 trees can be thought of as trees that become candidates for removal due to the normal aging process of Davis' community forest.

Assuming current mortality rates in Davis continue during the next five years, 125 city-owned trees per year will need to be removed. There may also be a projected backlog of hazard trees identified, based on a 10% sample area of the recent survey (the number of backlog trees used for budgeting is 250). The total number of tree removals anticipated during the next five years is 875, and includes any backlog plus the 125 per year due to normal aging of the population.

Tree removal costs vary depending on the size (and possibly species/growth habit) and location/situation of the tree (i.e., removal around power lines or adjacent to structures.) The current cost is $252/tree and we have established an average rate of $275/tree removal for the next five years, based on projected City maintenance cost data and cost of living increases. The total cost for removing all 875 trees and stumps for a five-year time frame is $240,625 or $48,125/year. This expenditure is approximately 34% higher than the FY2001 tree removal cost of $31,500 due to the increased removal rate and unit cost.

However, to meet the public safety goal of eliminating any hazard tree backlog as soon as possible, a preferable approach is to plan for a first year one-time capital expenditure of $68,750. Additional funds in the amount of $34,375/year are budgeted for the five-year period to remove 125 trees each year that normally become dead or dying due to aging. This recommendation is identified as Level of Service Four and is considered optimal.

Therefore, to summarize the matrix, levels of service identified for hazard tree abatement are as follows:

Current Level of Service: About 125 tree removals each year on homeowner request. Budget impact: 125 trees/year at $252/tree = $31,500/year.

Level of Service 1 (minimal): Tree removals on homeowner request only; no backlog hazard tree removal. Budget impact: 125 trees/year at $275/tree. $34,375/year = $343,750/ 10-year or **$171,875/ 5-year** (leaving any hazard tree backlog after 5 years)

Level of Service 2: Tree removals on homeowner request; eliminate backlog of hazard trees in ten (10) years (approximately 25 trees/year). Budget impact: 150 trees/year at $275/tree. $41,250/year = $412,250/10-year or **$206,250/ 5-year** (potentially leaving 125 hazard tree backlog after 5 years)

Level of Service 3: Tree removals on homeowner request; eliminate backlog of hazard trees in five (5) years (approximately 50 trees/year). Budget impact: 175 trees/year at $275/tree. $48,125/year = **$240,625/ 5-year** (no backlog remaining after 5 years)

Recommended level:
Level of Service 4 (optimal): Tree removals on homeowner request; eliminate any backlog of hazard trees with one-time capital expense in one (1) year. Budget impact: 125 trees/year at $275/tree for 5 years ($34,375/year; $171,875/5-year) and one-time capital expenditure of $68,750 to remove any hazard tree backlog. First year expense of $103,125 plus remaining four years at $34,375/year = **$240,625/ 5-year**

3. Mature Tree Care

Mature tree care is identified as the second highest priority for the tree management budget over the next five years. Large trees are the most significant component of our community forest. They form the "living umbrella" over our streets, parks and private properties, and create the backbone of our urban form. The mature trees that are managed within the City budget include all street, park and other city-owned trees over four-inch diameter at breast height (4" DBH), as well as, in selected instances, Trees of Significance, Landmark Trees, and parking lot trees (See Glossary).

Because the majority of mature trees have an established structure, they need less frequent but more intensive care than young trees to keep them healthy as they age. Regular inspection and maintenance are crucial to protecting this important resource and maintaining public safety. Pruning to maintain sound structure, provide clearance and visibility, eliminate conflicts with buildings and trees, remove mistletoe and other pests/diseases, reduce damage from storms, and other maintenance is recommended on a five-year cycle. The Society of Municipal Arborists (SMA), the leading professional organization in the field of municipal urban forestry, supports this standard. They established a minimum standard for pruning street trees at least once every eight years, with recommended pruning every five years for older trees.

The current Level of Service for mature trees in Davis is about an eight-year cycle. Approximately 3,000 trees are inspected/pruned each year at an average cost of $94/tree. At the current time, the budget is $278,500/year, with the City staff providing $178,000 worth of services, and privately contracted arborists providing $100,000 worth of services. This equates to LOS 3.

About 23,400 trees larger than 6" DBH will require inspection/ pruning over the next five years, or 4,680 trees/year, assuming a five-year pruning cycle. To determine a per tree maintenance cost for the next five years, a study of current mature tree inspection/pruning suggests an average cost at $130/tree for City staff provided services, taking into account salary/benefits, direct costs and inflation. With existing staffing, the City can prune up to 1,500 trees/year. Pruning solely by City staff allows for more stringent quality control, scheduling flexibility, emergency care and better communication among arborist staff, other city employees, and the public. However, contracts for private arborist services for street trees are also made, at a reduced cost of $100/tree in current dollars. It is recommended that a mix of these services provides the most flexible and cost-effective care of the mature trees in our urban forest.

To reach the optimal LOS 4, pruning on a five-year cycle, costs could be budgeted as follows. Even with the City providing services to only approximately 30% of the mature trees, or 1,500 trees/year, the cost at $130/tree is $195,000/year. Contracted private arborists provide services for the remaining 3,180 trees/year at a cost of $100/tree or $318,000. Total annual costs for five years under this scenario are $513,000/year. This is almost twice the current annual budget for mature tree care of $278,500/year.

The recommended Level of Service for mature tree care, considering the significant impact of this large budget element, is to maintain the current pruning cycle as a minimum, and as funds permit, increase LOS to an optimum five-year cycle. On the eight-year cycle, 2,925 trees/year require inspection/pruning. With the City providing service to approximately 60% of the trees (as is currently done), it would be 1,500 trees/year at $130/tree or $195,000/year. Contracted private arborists would inspect/prune the remaining 1,425 trees for $142,500/year. Total annual costs are $337,500, or 20% higher than the current level, due to inflation.

Therefore, to summarize the matrix, the levels of service identified for mature tree care are as follows:

> Current Level of Service (3): Eight-year inspection/pruning cycle: 2,971 trees/year at current average cost of $93.65/tree. Current budget: $278,500/fiscal year 2001.
>
> Level of Service 1 (minimal): City inspection/pruning only of 1,500 trees/year at $130/tree; this equates to a sixteen (16) year cycle. Budget impact: $195,000/year = **$975,000/ 5-year**
>
> Level of Service 2: City inspection/pruning of 1,500 trees/year at $130/tree ($195,000), and contracted services for inspection/pruning of additional 750 trees/year at $100/tree ($75,000). Total pruning of 2250 trees/year equates to a ten (10) year cycle. Budget impact: $270,000/year = **$1,350,000/ 5-year**
>
> **Recommended level (minimum):**
> Level of Service 3: City inspection/pruning of 1,500 trees/year at $130/tree ($195,000), and contracted services for inspection/pruning of additional 1425 trees/year at $100/tree ($142,500). Total pruning of 2925 trees/year equates to an eight-year (8) year cycle. Budget impact: $337,500/year = **$1,687,500/ 5-year**
>
> **Recommended level (as funds permit, work toward this LOS):**
> Level of Service 4 (optimal): City inspection/pruning of 1,500trees/year at $130/tree ($195,000), and contracted services for inspection/pruning of additional 3,180 trees/year at $100/tree ($318,000). Total pruning of 4680 trees/year equates to a five-year (5) year cycle. Budget impact: $513,000/year = **$2,565,000/ 5-year**

4. Young Tree Care

Young tree care and new tree planting are essential parts of community forest management. The health and stability of our future forest depends in large part on judicious tree selection today, as well as ongoing maintenance of young trees.

Conscientious care of young trees is a prudent and cost-saving measure in the long run, because trees that are frequently inspected and pruned in the first six years of growth need much less attention and costly maintenance when mature. Young trees are defined as trees newly planted to about four-inch (4") DBH, assuming the time frame encompassing planting through three years after planting. Regular watering and basin adjustment, mulching, stake adjustment and removal, pruning to remove broken and dead wood, establish central leader, select lowest permanent branch, establish scaffold branches, and other maintenance is provided to young trees. Davis has a Small Tree Program which provides planting and young tree care during these first three years.

The Society of Municipal Arborists (SMA) established a minimum standard for pruning young trees once every three years, or two prunes during the first six years. In practice, a more optimal goal is to create a two-year prune cycle, or four prunes in the first six years, which will more readily establish healthy, long-lived mature trees. The pruning sequence recommended by Dr. Larry Costello (UC Cooperative Extension) in his publication "Training Young Trees for Structure and Form" is to properly train young trees by inspecting/pruning at the time of planting, one year later, then three and five years after planting. To meet this goal will require starting newly planted trees on this program, as well as increasing pruning of existing young trees over the next five years to bring all trees to the same level of care.

Davis has about 9,325 trees sized 0-6" DBH. To reach the optimal two-year cycle approximately 4,766 trees will need to be inspected/pruned annually. City staff currently prunes 1,700 trees/year. TREE Davis, a volunteer organization that educates the public and trains volunteers to prune trees, currently prunes 350 trees/year. In FY 2001 city staff and TREE Davis combined to prune 2,050 trees/year at a cost of $64,000/year or about $31/tree. This works out to a 4.5-year cycle, with an annual backlog of 2,716 trees, assuming the optimal two-year pruning cycle. This includes staff costs and start-up volunteer costs for supervision, training, equipment and materials. At this time, interest in the volunteer program is high, and increasing numbers of volunteers and sustainability of the program seems assured, allowing for increased numbers of young trees that can be managed by the program. Once the TREE Davis program and/or other community based partners are solidly in place, the anticipated cost/tree is $20, compared to City staff cost of $35/tree for the next five years.

The recommended Level of Service for young tree care is LOS 4, representing the optimal two-year pruning cycle, including elimination of the backlog in five years. This requires doubling the current pruning rate to 4,766 trees/year. The budget reflects City staff pruning 2,000 trees/year at $35/tree ($70,000) and TREE Davis and/or other community based partners pruning 2,766/year at $20/tree ($55,320) for a total of $125,320/year. These costs are just under twice as much as currently budgeted, but prune 60% more trees than currently pruned, bringing the standard up to the recommended two-year cycle.

Therefore, to summarize the matrix, the levels of service identified for young tree care are as follows:

> Current Level of Service (3): Four and one-half year cycle, 2,050 trees/year. Current budget: $64,000/fiscal year 2001.
>
> Level of Service 1 (minimal): No young tree care. Budget impact: **$0**
>
> Level of Service 2: Only TREE Davis prunes young trees: thirteen-year cycle, 350 trees/year at $20/tree. Budget impact: $7,000/year = **$35,000/ 5-year**
>
> Level of Service 3: Only TREE Davis prunes young trees at 50% of optimal goal: four-year cycle, 2,383 trees/year at $20/tree. Budget impact: $47,660/year = **$238,300/ 5-year**
>
> **Recommended level:**
> Level of Service 4 (optimal): Two-year prune cycle, with backlog elimination in five years, City and TREE Davis both prune young trees. City prunes 2,000 trees at $35/tree ($70,000), TREE Davis prunes 2,766 trees/year at $20/tree ($55,320). Budget impact: $125,320/year = **$626,600/ 5-year**

5. Tree Planting

New tree planting on an annual basis is an important element of perpetuating the community forest. Failure to plant trees on a regular basis will reduce age diversity and leave gaps in canopy cover. For new residences and development projects in Davis, the City Municipal Code requires developers/homeowners of remodels or new subdivisions to purchase, plant and initially maintain street trees. The minimum requirement is to have one street tree per residential property. For existing residential areas, homeowners without a street tree may request a city-provided and planted street tree within the street tree easement on their property. Replacement of removed trees and filling in vacant street tree sites are the major goals of new tree planting.

Standards for new tree planting vary city to city and by community commitment to trees. In a community such as Davis, maximizing the opportunity for tree placement on streets and in parks has an extremely beneficial impact on microclimate and other environmental and aesthetic measures. Cities such as Vancouver, Spokane, Modesto and Santa Monica are known for their commitment to a managed urban forest. They report having a range of 60%-90% of all inventoried street tree planting sites filled with trees, so 80% full stocking is a reasonable standard (100% full stocking implies that all planting sites are filled).

The projected inventory completed in 2000 (Maco 2001) showed a current range of 79% to 92% full stocking based on samples from each of the neighborhood zones studied. The

inventory showed that 2,500 trees need to be planted in the next five years (500 trees/year) to fill in vacant street tree locations and to approach 100% full stocking. In addition to vacant tree locations, approximately 125 trees/year (625 trees in five years) are removed and replaced due to damage or health concerns. Therefore, to achieve full stocking, levels of service analysis must provide for 3,125 trees in the next five years.

Current Level of Service in Davis approaches the optimal level 4. The City plants 480 trees/year at $75/tree, for an annual budget allotment of $36,000. A current proposal to the City from TREE Davis offers tree planting over the next five years at $50/tree. Planting under both these options includes planting, staking, mulching and pruning a bare root tree.

The optimal LOS 4 plants 3,125 trees in five years (625 trees/year). To save funds, the matrix shows 50% planting by TREE Davis (313 trees at $50/tree or $15,650/year) and 50% planting by City staff (312 trees a $75/tree or $23,400/year) for a total budget of $39,050/year. In the short-term, due to relatively high existing stocking levels, higher priority of hazard tree removal and mature tree care, it is acceptable to slightly reduce tree planting funds as necessary if budgetary constraints demand. Therefore, the recommended Level of Service is between 3 and 4, which replaces all trees that are removed and plants on request as tree stock is available and budgeted. It also suggests partnering with TREE Davis on neighborhood tree planting projects that rely on grants and other outside funding sources.

Therefore, to summarize the matrix, the levels of service identified for tree planting are as follows:

> Current Level of Service 4: 480 trees planted/year at $75/tree. Current budget: $36,000/fiscal year 2001.
>
> Level of Service 1 (minimal): No new plantings. Budget impact: **$0**
>
> Level of Service 2: Replace removals only by TREE Davis. 125 trees/year at $50/tree. Budget impact: $6,250/year = **$31,250/ 5-year**
>
> Level of Service 3: Replace removals and plant on request (125 trees/year) and approach 100% full stocking in ten years (250 trees/year) by TREE Davis. 375 trees/year at $50/tree. Budget impact: $18,750/year = **$93,750/ 5-year**
>
> Level of Service 4 (optimal): Replace removals and plant on request (125 trees/year) and approach 100% full stocking in five years (500 trees/year) 625 trees/year at $50-$75/tree. 50% (313) by TREE Davis ($15,650) and 50% (312) by staff ($23,400). Budget impact: $39,050/year = **$195,250/ 5-year**

Recommended level:
Level of Service 3/ 4 with modification: Replace removals, and plant on request (125 trees/year). Approach 100% full stocking in ten years (250 trees/year) by TREE Davis. Total 375 trees/year at $50/tree; plus one-time funds to re-plant 250 removed hazard trees by TREE Davis. Budget impact: $18,750/year + one time funds $12,500 = **$106,250/5-year**

6. Administration

Administration refers to activities overseen by supervisory city arborists such as supervision, coordination, planning and education. Currently there is the equivalent of 1.5 full time supervisory arborists in Davis responsible for managing 30,000 trees, although there is no full-time position dedicated solely to arborist duties.

Current tasks performed by the City Arborist are numerous and varied, and include coordinating with other City departments such as Public Works, Planning and Building, various commissions including the Tree Commission, community based partners such as TREE Davis and other organizations. Part of this responsibility is to review proposed development and construction plans to ensure that adequate existing tree preservation and protection measures are taken and that tree planting follows city guidelines. During construction, the City Arborist supervises contractors working on or near City and/or private property trees and enforces ordinances for tree-related work.

The City Arborist schedules crews, fills job orders, supervises pest management and staff training. Additionally, the City Arborist educates developers, contractors, designers and residents concerning tree-related policies and benefits of healthy trees. As part of his/her interactions with the public, the City Arborist is responsible for replying to phone requests, inspections, monitoring projects and diagnosing tree problems.

There is no national standard for this service, however, these activities are fundamental to effective implementation of street tree programs. Our standard of 1 FTE supervisory arborist for every 20,000 street trees is based on an informal analysis of 22 programs in California (1999 Berkeley Benchmarking Survey). Assuming typical salary and benefits of $75,000/FTE, the standard is $3.75/tree.

Davis' 1.5 FTE supervisory arborists translate into a current Level of Service of one full time supervisory arborist for 20,000 public trees at a rate of $3.75/tree, or $112,500/year. In the long-term, the City supports LOS 4, which will provide the desired level of oversight needed to enforce ordinances, educate stakeholders, and guide a model program by increasing administration/management to 1.17 supervisory arborists per 20,000 trees. However, for the next five years the goal is to maintain the current LOS 3.

Current Level of Service (3): One supervisory arborist per 20,000 trees, or $3.75 per tree. Current budget: $112,500/fiscal year 2001.

Level of Service 1 (minimal): 0.67 supervisory arborist per 20,000 trees, or $2.50 per tree. Budget impact: $81,824/year = **$409,120/5-year**

Level of Service 2: 0.83 supervisory arborist per 20,000 trees, or $3.13 per tree. Budget impact: $94,696/year = **$473,480/5-year**

Level of Service 3: 1.00 supervisory arborist per 20,000 trees, or $3.75 per tree. Budget impact: $117,673/year = **$588,365/5-year**

Level of Service 4 (optimal) 1.17 supervisory arborist per 20,000 trees, or $4.37 per tree. Budget impact: $143,246/year = **$716,230/5-year**

Recommended level:

Level of Service 3: 1.00 supervisory arborist per 20,000 trees, or $3.75 per tree. Budget impact: $117,673/year = **$588,365/5-year**

D. Future Program Priorities

The following community forestry program projects have been identified for selection as long-term management goals. The first five projects are the highest priority for funding in the next five years, described in order of importance.

1. Create job description(s) for and maintain City Arborist position (and/or professional Urban Forester). The role filled by this professional is of invaluable service to the City of Davis and the perpetuation of the community forest. Maintaining this position with a professional, highly qualified arborist (and/or urban forester) is critical to building upon the program's successes.

    - Budget Impact: No additional cost to City.

2. Conduct a comprehensive public tree inventory and develop a master street tree plan. An improved public tree GIS database will support cost-effective contracting, work scheduling, reduce liability and allow for more efficient use of available funds. The GIS database should be updated continuously as work is performed on trees. Once an inventory has been conducted a master street tree plan should be developed. Development and implementation of a master street tree plan can enhance species diversity, promote sense of place, and maximize net benefits. The master plan directs future planting efforts by identifying types of species, spacing and patterns for streets neighborhoods and historic areas.

    - Budget Impact: An inventory is estimated to cost $1- $4 per tree ($30,000 - $120,000) depending who does the work and the

amount of data collected. A master street tree plan is expected to cost about the same amount as the inventory.

3. Develop neighborhood canopy cover targets. Approximately 75% of Davis' tree canopy is on private property, where residents are responsible for management. Based on the amount of existing cover/vacant tree planting sites obtained using remotely sensed images, establish reasonable canopy cover targets for Davis neighborhoods. Once canopy cover targets are established, the City can work with community based partners, the Davis Joint Unified School District, and UC Davis to implement coordinated tree planting and management activities on public and private lands.

    - Budget Impact: $10,000 - $20,000.

4. Develop tree removal and replacement programs for targeted areas. There are areas of Davis where many of the street trees are nearing the end of their lifespan or creating conflicts with sidewalks and other paving. A comprehensive approach that involves local residents in the planning process for tree removal and replacement is an asset to long-term tree survival and has proven successful in previous projects of this type in Davis, such as in projects on Miller Drive and Rutgers. Projects should focus on selectively removing only trees that pose the greatest problems, while establishing an understory of newly planted replacement trees for older trees as they are gradually removed.

    - Budget Impact: No additional cost if conducted by City staff, otherwise $5,000 per area.

5. Conduct a tree failure survey to identify potentially hazardous, dead or dying trees and schedule removal and replacement.

The following projects are needed but are a lower priority in the short-term:

- Expand and further define the historic and landmark tree program.
- Implement monitoring and evaluation process for parking lot shading requirements. Establish street tree shading guidelines
- Pursue new sources of revenue for the Community Forestry program. (See alternative funding sources below.)
- Expand public education programs and work with community partners for outreach and education.

- Research and monitor tree survival and growth under different conditions in the city (i.e., structural soils, parking lots, bare root vs. container, cut-outs).

- Prepare guidelines for restoration plantings in newly acquired open space.

- Support the need for and work with research agencies such as U.S. Forest Service, universities including U.C. Davis, etc. to develop, plant and assess improved street tree varieties. If possible, assist with grants and other funding sources to this end.

E. Potential Funding Sources for Community Forestry

Expanding funding for Community Forestry make it possible to increase the number of projects accomplished and reduce reliance on limited municipal funds. Leveraging municipal funds with other sources of funding from state, federal, and local organizations will increase the number of partners with a vested interest in sustaining a healthy community forest. Potential sources of additional revenue are identified as follows:

- Tree planting grants: California ReLeaf, the National Tree Trust, and American Forests offer tree planting grants to local governments and partnering non-profits. The California Department of Transportation includes landscape improvements in its state highway renovations and funds tree planting as mitigation for highway projects. The recently passed Proposition 40 includes $10 million for urban forestry that will augment existing funds from Proposition 12. Other potential funding sources include the Yolo-Solano Air Quality Management District for parking lot tree planting as an ozone reduction measure, CALFED for stormwater runoff reduction and groundwater recharge, PG&E/SMUD for energy conservation, and other funding organizations.

- Public awareness and volunteer training. In 2002 California ReLeaf awarded $120,000 to grassroots groups across California for education, public awareness, tree-care, and volunteer development. These types of funds can augment municipal efforts to increase public participation and support for community forestry.

- Local measures and funding for tree planting and maintenance. City bonds, infrastructure costs paid by property owners, and other local measures could increase revenue for the community forest management program. One possible way to expand support for street and park tree maintenance is to create a Municipal Tree District. This approach assumes that street and park trees are commodities that produce essential services/benefits that can be retailed.

- Tree planting and stewardship. Developers are currently required to plant street and parking lot shade trees with new projects. The city then inherits these trees to maintain. Local businesses, industry, UC Davis, and the City may consider investing in tree planting and stewardship to obtain the resulting carbon dioxide emission reduction credits. Long-term tree care is required to maximize carbon credits for investors.

- Other revenue-generating sources. When considered creatively, there may be other sources for revenue and program cost reduction, in order to increase the program benefits and decrease reliance on municipal funds.

If we represent knowledge as a tree we know that things that are divided are yet connected. We know that to observe the divisions and ignore the connections is to destroy the tree.
--Wendell Berry

Program Area:	**Current (2000) Levels of Service** for Davis Street Trees (in $FY01)		**Potential Level of Service 1** (inflated to FY04 dollars)		**Potential Level of Service 2** (inflated to FY04 dollars)		**Potential Level of Service 3** (inflated to FY04 dollars)		**Potential Level of Service 4** (inflated to FY04 dollars)		**RECOMMENDED** (Davis Tree Comm '01--inflated to FY04 dollars)	
Tree Planting	Level of Service: 4 (480 / yr by City at $75 / tree)	Budget Impact: $36,000	No new plantings	Budget Impact: $0	Replace removals only (125 trees / yr)	Budget Impact: $6,250 / yr (TREE Davis @ $50/tree)	Replace removals, plant on request, and achieve > 90% full stocking in 10 years (375 trees / yr)	Budget Impact: $18,750 for 10 yrs (TREE Davis @ $50/tree)	Replace removals , plant on request, and achieve > 90% full stocking in 5 years (625 trees / yr)	Budget Impact: $39,050 for 5 yrs, City = $23,400 ($75/tree), TREE Davis = $15,650 ($50/tree)	**Level of Service 2**: Replace removals (125 / yr by TREE Davis at $50 / tree) and one-time funds to re-plant 250 removed trees.	Budget Impact: $6,250 for five years, and one-time capital expenditure of $12,500 to re-plant removed trees.
Young Tree Care	Level of Service: 3 (4.5-yr cycle, 2,050 / yr by City and TREE Davis at $31 / tree)	Budget Impact: $64,000, City = $54,000, TREE Davis = $10,000	No young tree care	Budget Impact: $0	Only TREE Davis prunes (13-yr cycle, 350 trees / yr @ $20/tree)	Budget Impact: $7,000 / yr	Only TreeDavis prunes at 50% of goal (4-yr cycle, 2,383 trees / yr @ $20/tree)	Budget Impact: $47,660 / yr	TREE Davis prunes 2,766 / yr and City prunes 2,000 / yr (2-yr cycle, 4,766 / yr)	Budget Impact: $125,320 for 5 yrs, City = $70,000 ($35/tree), TREE Davis = $55,320 ($20/tree)	**Level of Service 4**: (2-yr cycle, 4,766/yr, 2,766 / yr by TREE Davis at $20 / tree, 2,000 by City at $35 / tree)	Budget Impact: $125,320 for 5 yrs, City = $70,000 ($35/tree), TREE Davis = $55,320 ($20/tree)
Mature Tree Care	Level of Service: 3 (8-yr cycle, 2,971 / yr at $94 / tree)	Budget Impact: $278,500, City = $178,500, Contractor = $100,000	City prunes 1,500 trees / yr (16-yr cycle)	Budget Impact: $195,000 / yr ($130/tree)	City prunes 1,500 / yr and West Coast Arborist (WCA) prunes 750 / yr (10-yr cycle, 2,250 trees/yr)	Budget Impact: $270,000 / yr, City = $195,000 ($130/tree), WCA = $75,000 ($100/tree)	City prunes 1,500 / yr and WCA prunes 1,425 / yr (8-yr cycle, 2,925 trees / yr)	Budget Impact: $337,500 / yr, City = $195,000 ($130/tree), WCA = $142,500 ($100/tree)	Prune on 5-yr cycle (4,680 trees / yr), City prunes 1,500 / yr and WCA prunes 3,180 / yr	Budget Impact: $513,000 /yr, City = $195,000 ($130/tree), WCA = $318,000 ($100/tree)	**Level of Service 3**: (8-yr cycle, 2,925 / yr)	Budget Impact: $337,500, City = $195,000, Contractor = $142,500
Hazard Tree Abatement	Level of Service: 1 (125 / yr by City at $252 / tree)	Budget Impact: $31,500	On request only (City removes 125 trees / yr)	Budget Impact: $34,375 / yr ($275 / tree)	Remove on request (125 / yr) and eliminate backlog of trees in 10 yrs (25 trees / yr)	Budget Impact: $41,250 /yr for 10 yrs ($275 / tree)	Remove on request (125 / yr) and eliminate backlog in 5 yrs (50 trees / yr) total 175 /yr @ $275 / tree)	Budget Impact: $48,125 / yr for 5 yrs, then $34,375 /yr	Remove on request (125 / yr) and eliminate backlog in 1 yr (250 trees / yr @ $275 /tree)	Budget Impact: $34,375 / yr for five years, and one-time capital expenditure of $68,750 to remove 250 trees	**Level of Service 4**: (125 / yr by City at $275 / tree and one-time removal of 250 trees to eliminate backlog)	Budget Impact: $34,375 / yr for five years, and one-time capital expenditure of $68,750 to remove 250 trees.
Admin-istration	Level of Service: 3 (1 FTE supervisory arborist for 20,000 public trees, $3.75 / tree)	Budget Impact: $112,500	0.67 Supervisory Arborist / 20,000 trees, $2.50 / tree	Budget Impact: $81,824	0.83 Supervisory Arborist / 20,000 trees, $3.13 / tree	Budget Impact: $94,696	1 Supervisory Arborist / 20,000 trees, $3.75 / tree	Budget Impact: $117,673	1.17 Supervisory Arborist / 20,000 trees, $4.37 / tree	Budget Impact: $143,246	**Level of Service 3:** (1 FTE supervisory arborist for 20,000 public trees, $3.75 / tree)	Budget Impact: $117,673
Total Budget Impact	City = $412,500, TREE Davis = $10,000, Contractor = $110,000	$ 522,500	City = $311,199	$ 311,199	City = $330,946, TREE Davis = $13,250, WCA = $75,000	$ 419,196	City = $360,798, TREE Davis = $66,410, WCA = $142,500	$ 569,708	City = $466,021, TREE Davis = $70,970, WCA = $318,000, plus one-time capital expenditure by City of	$854,991 plus one-time capital expenditure by City of $68,750	City = $417,048, TREE Davis = $61,570, Contractor = $142,500, Capital Exp: City = $68,750, TREE Davis = $12,500	$621,118, plus one-time capital expenditure of $81,250 to remove and replace 250 trees.