ROSEVILLE URBAN FOREST MASTER PLAN

Planning for the Future of our Community Urban Forest

"When you plant a tree,
you plant a legacy"

~ Julius Sterling Morton

Roseville Urban Forest Master Plan

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2014

Prepared for:
City of Roseville
Parks, Recreation & Libraries Department
Open Space Division
2005 Hilltop Circle, Roseville, California 95747
916-774-5748
www.roseville.ca.us/parks

Prepared by:
Davey Resource Group
A Division of The Davey Tree Expert Company
7627 Morro Road, Atascadero, California 93422
800-966-2021
www.davey.com/drg

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ACKNOWLEDGEMENTS

Roseville City Council

Susan Rohan, *Mayor*
Carol Garcia, *Vice Mayor*
Bonnie Gore
Tim Herman
Pauline Roccucci

Parks & Recreation Commission

Doyle Radford, Jr., *Chair*
Allen Archuleta, Jr., *Vice Chair*
Scott Alvord, *Secretary*
Nick Alexander
Paul Frank
Audrey Huisking
Scott Otsuka
Epsa Sharma, *Youth Commissioner*

City Staff

Parks, Recreation & Libraries Department

Dominick Casey, *Director*
Brian Castelluccio, *Open Space Superintendent*, Open Space Division
Michael-Gerold Neumann, *Urban Forester*, Open Space Division
Scott Miller, *Parks Superintendent*, Park Maintenance Division
Tara Gee, *Park Planning & Development Superintendent,* Park Development Division
Pam Allen, *Market & Communications Analyst*

City Manager's Office

Mark Morse, *Environmental Coordinator*

Human Resources Department

Lisa Achen, *Human Resources Manager,*

Information Technology Department

Scott Adrian, *IT Program Manager*
Marc Ball, *GIS Database Administrator*

Planning Department

Chris Burrows, *Planning Manager*
Derek Ogden, *Associate Planner*

CITY OF ROSEVILLE CALIFORNIA

Environmental Utilities Department

Delyn Ellison-Lloyd, *Sr. Engineer*, Stormwater Management Program
Lisa Brown, *Water Conservation Administrator*, Water Conservation
Terry Shirhall, *Administrative Analyst*

Public Works Department

Jason Shykowski, *Principal Engineer*, Engineering
Mike Wixon, *Alternative Transportation Manager,* Alternative Transportation
Mike Dour, *Alternative Transportation Analyst*, Alternative Transportation
Raul Cervantes, *Sr. Engineer*, Engineering
Carl Walker, *Sr. Engineer*, Engineering/Flood Plain Management
Tito Zamora, *Asst. Engineer*, Engineering
Jerry Dankbar, *Street Maintenance Superintendent*, Streets

Roseville Electric

Sonny Person, *Asst. Electric Utility Director*
Martin Bailey, *Electric Retail Services Supervisor*
Tom Cox, *Line Construction Supervisor*

Public Utilities

Sacramento Municipal Utility District
Pacific Gas & Electric
Western Area Power Administration

Nonprofit Organizations

Tony Clayton, *Roseville Urban Forest Foundation*
Ray Tretheway, *Sacramento Tree Foundation*
Cindy Blain, *Sacramento Tree Foundation*
Anne Fenkner, *Sacramento Tree Foundation*
Zara Wyley, *Sacramento Tree Foundation*
Roseville Coalition of Neighborhood Associations
Dry Creek Conservancy

Roseville Residents

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CAL FIRE

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Cover photo. Trees provide many benefits to the City of Roseville. On average, a blue oak (*Quercus douglasii*) like this one, located in Diamond Oaks Park, provides $112 in benefits each year. These benefits include $16.57 in electricity and natural gas savings, sequestration of 183 pounds of carbon, interception of 1,768 gallons of stormwater, absorption of 1.7 pounds of air pollutants, and $79 in increased property value, retail sales, and human health benefits. These benefits increase over time as trees mature.

SCOPE & PURPOSE

The purpose of the Roseville Urban Forest Master Plan (UFMP) is to provide a framework for the long-term care, preservation, and expansion of the community's public trees. The Plan recognizes the significance of environmental and socioeconomic benefits from public trees and their relationship with community values and expectations for a high quality of life. It is intended to support and guide urban forest programming over the next 25 years. Specifically, the Plan aims to:

- Ensure that policies and regulations support the protection, preservation, and sustainability of the community's urban forest resource
- Ensure interdepartmental cooperation and communication about urban forestry related activities and maintenance operations
- Promote community engagement, involvement, and appreciation for the urban forest
- Encourage and facilitate collaboration between the City and nonprofit organizations, educational institutions, utilities, neighborhood and business groups, volunteers, and other local and regional efforts to grow the urban forest and optimize the benefits of this natural resource
- Ensure cost efficient programming and sustainability of funding resources

The Plan includes objectives and action strategies for both long- and short-term goals aimed at meeting the defined program goals. It is complementary and supportive of the City of Roseville's vision and long-range planning goals, including the General Plan 2025. The Plan identifies appropriate resources to adequately manage the City's public urban forest. The intention of the Urban Forest Master Plan is to explore and implement the recommended actions as funding and resources permit.

The Plan was developed through a systematic review and exploration of existing policies and regulations, current funding and maintenance levels, analyses of the extent, condition, and composition of the existing resources (i.e., trees), stakeholder concerns and objectives, and community input.

While the Plan focuses primarily on publicly-owned trees, including street trees, parks, golf courses, open space and oak mitigation areas, it also recognizes the significant contribution and benefits of private trees to the overall well-being and livability of the community. Therefore, the Plan explores recommendations for increasing canopy cover on both public and private property.

EXECUTIVE SUMMARY

Roseville's community urban forest includes nearly 42,000 (2014) publicly-managed inventoried trees on streets, in parks, on golf courses, and at city facilities. In addition, the City estimates there are another 80,000 to 100,000 publicly-owned trees in open space areas. Along with their aesthetic contribution, these trees provide valuable and critical services to the community including benefits to air quality, water quality, energy savings, wildlife habitat, and socioeconomics. The Urban Forest Master Plan (UFMP) provides long-term management goals and vision for preserving and improving the health, value, and environmental benefits of this public resource.

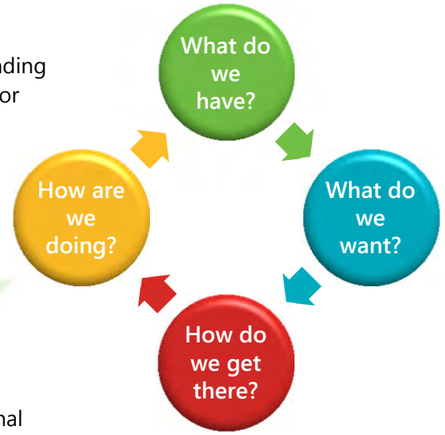
The structure and organization of the UFMP is based on the understanding of what we have, what we want, how we get there, and how we are doing. This structure, referred to as adaptive management, is commonly used for resource planning and management (Miller, R.W.) and provides a good conceptual framework for the process of improving urban forest management.

The plan development process for the UFMP involved a comprehensive review and assessment of the existing urban forest resource, including composition, value, and environmental benefits. The process explored community values and vision, including those expressed in the General Plan 2025, along with community design standards and existing regulations and policies that provide protection and preservation measures affecting the urban forest.

Roseville's Urban Forest Benchmark Values

Community Urban Forest (Public Tree Resource)	
Inventoried Trees (2014)	42,000
Open Space Trees (estimated)	80,000-100,000
Replacement Value (2010)	$77.5 million
Species Diversity (Inventoried Trees, 2010)	
Total number of unique species	160
Prevalence of top ten species	61%
Species exceeding recommended 10%	2
Benefits (Inventoried Trees, 2010)	
Total Annual Benefit	$3.2 million
Annual Per Tree Benefit	$83
Annual Per Capita Benefit	$29
Urban Tree Canopy Cover (Public and Private, 2012)	
Overall Canopy Cover	15.7%
Canopy Cover – Open Space	27.6%
Impervious Surfaces	46.2%
Canopy Benefits (Public and Private, 2012)	
Overall carbon storage	$7.5 million
Annual Air Quality Benefits	$1.6 million

The process also evaluated funding and the current service levels for both in-house and contracted forestry staff. In addition to forestry staff, there are multiple stakeholders, internal and external, who play a role in the planning, design, care, and advocacy of the urban forest. These stakeholders include city departments, utility providers, nonprofit organizations, regional forestry groups, residents, and volunteers. Each of these stakeholders played a role and provided input for the development of this plan.

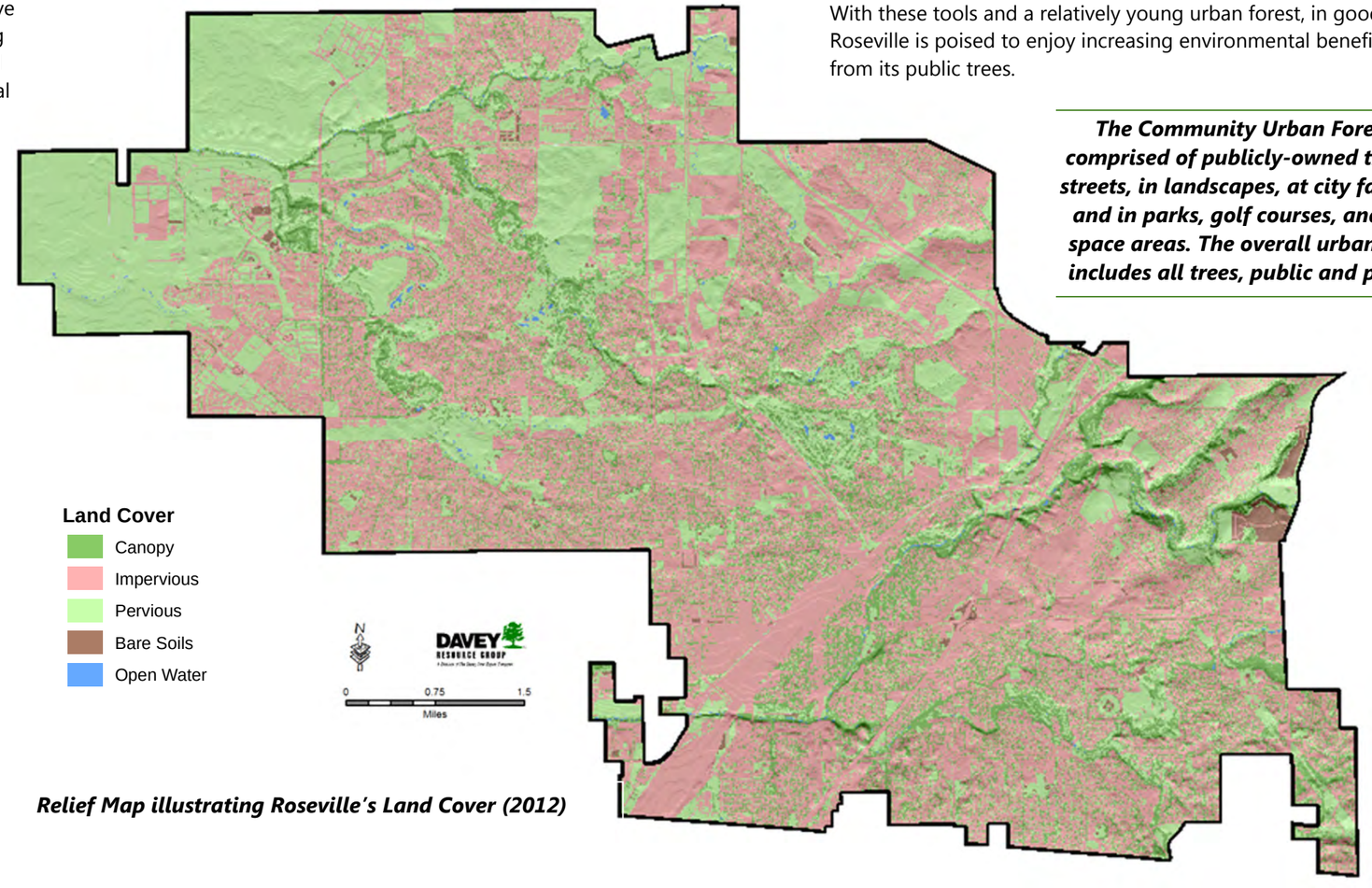


What Do We Have?

The review process established that Roseville has built a strong foundation for an exceptional urban forestry program. The community has made an outstanding commitment to planting, preserving, and promoting the care of trees and other natural resources. Considering the support of two active nonprofit organizations that advocate for the urban forest and provide a solid volunteer base; a detailed inventory management system that tracks urban forest assets; an Urban Tree Canopy Assessment that includes GIS mapping of the location and extent of Roseville's entire tree canopy (public and private); a Resource Analysis that defines the composition, benefits, and benefit versus investment ratio of the public tree resource; tree protection regulations that promote the preservation and protection of community trees; and a well-trained, dedicated Urban Forester, Roseville has the tools and information necessary to make well-informed and effective management choices.

With these tools and a relatively young urban forest, in good condition, Roseville is poised to enjoy increasing environmental benefits and value from its public trees.

The Community Urban Forest is comprised of publicly-owned trees on streets, in landscapes, at city facilities, and in parks, golf courses, and open space areas. The overall urban forest includes all trees, public and private.



Relief Map illustrating Roseville's Land Cover (2012)

What Do We Want?

Roseville's community vision places a focus on preserving natural resources and promoting sustainability and a high quality of life for residents and visitors. The community's urban forest plays a vital role in this vision.

A primary emphasis for the UFMP is to identify adequate resources to ensure that critical tree care needs can be addressed in a timely, cost-effective, and efficient manner. This includes the proactive identification of risk and mitigation measures to promote public safety and reduce liability. Currently, 36% (13,980) of inventoried trees are not funded for regular inspection or maintenance. Trees are living organisms, constantly changing and adapting to their environment and increasing in size over time. Because of this, trees have specific needs at various life stages, including training for proper structure when they are young and increased monitoring and proactive risk management when they become over mature.

Deferring maintenance can have a significant effect on the overall health, structure, value, and lifespan of a tree. In addition, deferred maintenance often results in higher costs and less beneficial results, including increased risk potential. As a result, the UFMP identifies goals for optimizing urban forest programming and existing funding, along with reorganization of staffing.

How Do We Get There?

The UFMP identifies three (3) guiding principles and nine (9) goals for preserving the health, value, services, and sustainability of Roseville's community urban forest. Each of these goals is supported by comprehensive objectives and actions. Recognizing that community engagement is integral to success, the UFMP includes solid objectives for engaging the community and encourages partnership and collaboration.

How Are We Doing?

The long-term success of the UFMP will be measured through the realization of plan goals and demonstrated through increased value and environmental benefits. The Plan identifies methods of measurement and a target date for each of the objectives. The UFMP is intended to be an active tool that can and should be adjusted in response to available resources and emerging opportunities. Perhaps the greatest measurement of success for the UFMP will be its level of success in meeting community expectations for the care and preservation of the public tree resource.

Mission

The mission of the Parks, Recreation & Libraries Department is: *To enhance lives and the community by providing exceptional experiences.*

Guiding Principles	**Grow, maintain, preserve and enhance a sustainable urban forest**	**Optimize the environmental, social, economic, and public health benefits of trees and canopy**	**Align urban forest management policy with community expectations and cost efficiency**
Goals	• A sustainable urban forest resource • Promote tree preservation and protection • Increase outreach and education • Develop and nurture relationships with community partners	• Optimize community planning • Increase connectivity of tree canopy to improve opportunities for passive recreation, alternative transportation, and wildlife habitat	• Optimize urban forestry programming • Optimize funding and identify new opportunities • Review and measure attainment of the UFMP
Primary Objectives	• Apply Tree Care Standards to all contractors and in-house crews engaged in tree care operations • Ensure all inventoried trees are on a regular pruning and maintenance cycle • Develop a tree planting and replacement plan • Increase species diversity and plant health in the public tree resource • Develop and present workshops and seminars that increase awareness and knowledge about trees and the urban forest • Develop outreach materials that communicate information about trees and the community urban forest • Foster relationships and facilitate collaboration with volunteers, nonprofits, HOAs, and businesses	• Preserve and expand existing tree canopy • Update existing planning documents to reference the UFMP • Increase effectiveness of Parking Lot Shade Requirements by adopting them as a City Ordinance • Adopt a Solar Shade Ordinance • Revise design and construction standards that apply to trees and planter sites • Participate in regional planning for the urban forest • Increase availability and connectivity of trails that interface with nature and wildlife	• Optimize the organizational structure for urban forestry operations • Develop an advanced training structure for in-house forestry staff • Develop a policy and identify responsibility for contract monitoring • Develop a policy and responsibility for keeping inventory data current • Develop a Risk Management Plan and policy for urban forest operations • Increase and optimize partnerships and collaborations with individuals, groups, and agencies who share urban forest goals and objectives • Identify and apply for available grant funding • Align UFMP goals and objectives with community expectations

INTRODUCTION

Trees play an essential role in the community of Roseville by providing numerous benefits, tangible and intangible, to residents, visitors, and neighboring communities. Research demonstrates that healthy urban trees can improve the local environment and lessen the impact resulting from urbanization and industry (CUFR[1]). Trees improve air quality, reduce energy consumption, help manage stormwater, reduce erosion, provide critical habitat for wildlife, and promote a connection with nature.

In addition to these direct improvements, healthy urban trees increase the overall attractiveness of a community and have been proven to increase the value of local real estate by 7 to 10% (Dwyer, et al, 1992). Trees in retail districts promote longer and more frequent shopping and greater sales (Wolf, 2007). Urban trees support a more livable community, fostering psychological health and providing residents with a greater sense of place (Ulrich, 1986; Kaplan, 1989). Community trees, both public and private, soften the urban hardscape by providing a green sanctuary and making Roseville a more enjoyable place to live, work, and play.

Recognized for more than 30 years by the National Arbor Day Foundation as a Tree City USA, Roseville has demonstrated that public trees are a valued community resource, an important component of the urban infrastructure, and a part of the City's identity. Since endorsing the regional Greenprint initiative in 2005, the City has shown a continued commitment to enhancing and preserving its urban forest and was honored for this commitment in 2012 with a Growing Greenprint Award.

In 2010, the City completed an inventory of 38,812 public trees on streets, in parks and golf courses, and at city facilities. The inventory data was used in conjunction with i-Tree *Streets*, a STRATUM Analysis Tool (*Streets* v3.0.13; i-Tree v3.0.16), to develop a comprehensive analysis of the current structure, benefits, and value of this public resource (Urban Forest Resource Analysis, 2010). While the inventory does not account for trees in open space areas (estimated at 80,000-100,000), these 38,812 trees play a prominent role in the urban forest benefits provided to the community and residents rely on the City of Roseville to protect and maintain this vital resource.

Continuing their proactive approach to caring for the community's public trees, the City of Roseville contracted with Davey Resource Group (DRG) in 2012 to develop an Urban Forest Master Plan. In addition to the Master Plan, DRG completed an Urban Tree Canopy Analysis to map the extent and location of all trees within the City's boundaries. This information, along with the tree inventory data and the current resource analysis, provides a strong foundation for managing the current health and future sustainability of Roseville's urban forest.

In developing this plan, DRG worked closely with City staff to examine the current structure of both the tree resource and the urban forestry program. The process included a complete review of existing policies and regulations, internal and interdepartmental relationships, the current status of the tree inventory, and an exploration of community values and support for urban forestry. The result is a plan that will guide community leaders, planners, and urban forest managers in making decisions about matters affecting the management, development, and policy of the City's public urban forest.

Mission

The mission of the Parks, Recreation, and Libraries Department is:

To enhance lives and the community by providing exceptional experiences

Vision

The vision of the Parks, Recreation, and Libraries Department is:

To be the leader in creating a healthy community through progressive, sustainable, and memorable experiences

Guiding Principles

The guiding principles for the Urban Forest Master Plan are:

Grow, maintain, preserve and enhance a sustainable urban forest

Optimize the environmental, social, economic, and public health benefits of trees and canopy

Align urban forest management policies with community expectations and cost efficiency

This plan outlines goals, both long- and short-term, in support of these guiding principles and provides objectives for their accomplishment. The results of the plan development process provide valuable benchmarks for measuring and tracking achievement over time.

[1] CUFR. Center for Urban Forest Research, USDA Forest Service Pacific Southwest Research Station

Community

Incorporated in April, 1909, the City of Roseville is located in Placer County, 16 miles north of Sacramento. With a current population estimated at 122,060, the City encompasses approximately 43 square miles. Roseville runs as a charter city with a City Manager-Council government.

The discovery of gold in 1848 gave Roseville its start. However, once miners failed to "make it rich" in gold from the area, these disappointed miners became farmers and ranchers. By 1908, the Southern Pacific Railroad Company moved its terminal to Roseville, bringing jobs and residents to the soon to be incorporated community. For the next half century, Roseville prospered as a railroad town, servicing both freight and passenger lines. Although rail transportation became less critical in the 1950s with the emergence of jet aircraft and a robust interstate highway system, the railroad continues to characterize the community. With the reintroduction of passenger traffic in 1987 and the completion of a new intermodal depot, the railroad remains a major factor in the local economy.

While once considered a bedroom community to the nearby state capital, Roseville has steadily evolved into a progressive urban center with a generous mix of residential, retail, and employment uses. In 2009, the City celebrated its 100th anniversary by being honored in the Rose Parade with the Governor's Trophy for the best depiction of life in California. Also in 2009, *Look Magazine* recognized Roseville as an All American City.

Several schools within Roseville have received "California Distinguished School Awards" from the California Department of Education. With a great selection of local colleges to choose from, including Sierra Community College, California State University, Sacramento and University of California, Davis, it's not surprising that Roseville residents have higher educational attainment rates from high school (95%) and college (37% have a Bachelor's degree or higher) as compared to the California average (82% and 31% respectively). Median home prices remain slightly lower than the state average (Roseville: $342,000, California: $384,000), while household incomes ($68,208 vs. $58,931) are slightly higher (City-data, 2013).

Arguably one of the greatest distinctions enjoyed by Roseville residents is one of the highest parks per capita ratios in the nation (City of Roseville, 2013). The City has an adopted standard of 9 acres of park land per 1,000 residents[2]. With 63 parks and facilities, 3 parks under construction, and 4,275 acres of open space, residents and visitors to Roseville have plenty of opportunities to enjoy outdoor activities and connect with nature. Open space areas provide beautiful scenery, wildlife habitat, miles of trails for hiking, jogging, and biking, and even a few historic sites. The Maidu Regional Park's Maidu Indian Museum, located adjacent to a Maidu village site that is over 3,000 years old, was registered as a National Historic Site in 1973 and includes hundreds of bedrock mortars and petroglyphs surrounded by mature native oaks and a meandering stream.

Roseville's abundant parks, recreation programs, impressive educational system make it a great location to raise a family. The community takes pride in being "a progressive city with its eye on the future, but (that) all the while retains and celebrates its rich historical railroad roots." (City of Roseville, 2013).

The urban forest plays a vital role in realizing Roseville's commitment to sustainability and a high quality of life. The goals defined by the Urban Forest Master Plan reflect the importance of this valuable resource.

[2] Roseville General Plan, Parks and Recreation Element

Definitions

Urban Forest: The collection of privately owned and publicly owned trees and woody shrubs that grow within an urban area.

Community Urban Forest: The collection of publicly owned trees within an urban area, including street trees and trees in parks and other public facilities.

Tree Canopy: The layer of leaves, branches, and stems of trees that cover the ground when viewed from above.

Arboriculture: The science, art, technology, and business of tree care.

Urban Forestry: The cultivation and management of native or introduced trees and related vegetation in urban areas for their present and potential contribution to the economic, physiological, sociological, and ecological well-being of urban society.

Public Tree: A tree located in the public right-of-way and/or in a city park or facility.

Private Tree: A tree located on private property, including residential and commercial parcels.

Right Tree Right Place: The practice of installing the optimal species for a particular planting site. Considerations include existing and planned utilities and other infrastructure, planter size, soil characteristics, water needs, as well as the intended role and characteristics of the species.

Benefits of Urban Tree Canopy

Urban and natural forests work 24/7 to mitigate the effects of urbanization and development and to protect and enhance lives within the community in the following ways:

Air Quality

Urban trees improve air quality in five fundamental ways:

- Reducing particulate matter (dust)
- Absorbing gaseous pollutants
- Shade and transpiration
- Reducing power plant emissions
- Increasing oxygen levels

They protect and improve air quality by intercepting particulate matter (PM_{10}), including dust, ash, pollen, and smoke. The particulates are filtered and held in the tree canopy where they are eventually washed harmlessly to the ground. Trees and forests absorb harmful gaseous pollutants like ozone (O_3), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Shade and transpiration reduces the formation of O_3, which is created during higher temperatures. In fact, scientists are now finding that some trees may absorb more volatile organic compounds (VOC's) than previously thought (Karl, T. et al; Science NOW, 2010). VOC's are a class of carbon-based particles emitted from automobile exhaust, lawnmowers, and other human activities.

By reducing energy needs, trees also reduce emissions from the generation of power. And, through photosynthesis, trees and forests increase oxygen levels.

Roseville's urban tree canopy is directly improving air quality by absorbing and filtering 192 tons of pollutants every year, including, nitrogen dioxide, ozone, sulfur dioxide, and particulates.

~Roseville Urban Tree Canopy Assessment, 2012

Water Quality

Trees and forests improve and protect the quality of surface waters, such as creeks, rivers, and lakes, by reducing the impacts of stormwater runoff through:

- Interception
- Increasing soil capacity and rate of infiltration
- Reducing soil erosion

Trees intercept rainfall in their canopy, which act as a mini-reservoir (Xiao et al, 1998). During storm events, this interception reduces and slows runoff. In addition to catching stormwater, canopy interception lessens the impact of raindrops on barren soils. Root growth and decomposition increase the capacity and rate of soil infiltration by rainfall and snowmelt (McPherson et al, 2002). Each of these processes greatly reduce the flow and volume of stormwater runoff, avoiding erosion and preventing sediments and other pollutants from entering streams, rivers, and lakes.

Each acre of tree canopy in Roseville is intercepting approximately 58,712 gallons of stormwater every year.

On average, each blue oak intercepts and diverts 1,768 gallons of stormwater.

~Roseville Urban Forest Resource Analysis, 2010

Urban stormwater runoff is a major source of pollution for surface waters and riparian areas in the Pacific Northwest, threatening salmon and other wildlife as well as human populations. Requirements for stormwater management are becoming more stringent and costly. Reducing runoff and incorporating urban trees in stormwater management planning has the added benefit of reducing the cost of stormwater management, including the expense of constructing new facilities necessary to detain and control stormwater as well as the cost of treatment to remove sediment and other pollutants.

Carbon Reduction

Trees and forests reduce atmospheric carbon dioxide (CO_2) in two ways:

- Directly, through growth and carbon sequestration
- Indirectly, by lowering the demand for energy

Trees and forests directly reduce CO_2 in the atmosphere through growth and sequestration of CO_2 as woody and foliar biomass. Indirectly, trees and forests reduce CO_2 by lowering the demand for energy and reducing the CO_2 emissions from the consumption of natural gas and the generation of electric power.

As environmental awareness continues to increase, governments and individuals are paying particular attention to climate change and the effects of greenhouse gas emissions. Two national policy options are currently making headlines; the establishment of a carbon tax and a greenhouse gas cap-and-trade system, aimed at reducing atmospheric CO_2 and other greenhouse gases. A carbon tax places a tax burden on each unit of greenhouse gas emissions and would require regulated entities to pay for their level of emissions. Alternatively, in a cap-and-trade system, an upper limit (or cap) is placed on global (federal, regional, or other jurisdiction) levels of greenhouse gas emissions and the regulated entities are required to either reduce emissions to required limits or purchase emissions allowances in order to meet the cap (Williams et al, 2007).

In 2006, California adopted the Global Warming Solutions Act (AB32) which commits California to reduce its greenhouse gas emissions to 1990 levels by 2020. Beginning in 2013, a statewide cap on greenhouse gases places a mandatory limit on large businesses that emit more than 25,000 metric tons of CO_2. The limit is set to decline 2-3% each year and to expand the scope of businesses and industries that are regulated. Companies that are regulated must obtain an allowance (or permit) for each ton of carbon they emit. These allowances have value and can be traded on the open market.

The concept of purchasing emission allowances (offsets) has led to the acceptance of carbon credits as a commodity that can be exchanged for financial gain. As a result, some communities are exploring the concept of planting trees to develop a carbon offset (or credit). The Center for Urban Forest Research Pacific Southwest Research Station and USDA Forest Service recently led the development of Urban Forest Greenhouse Gas Reporting Protocol (McPherson et al, 2008/2010). The protocol incorporates methods of the Kyoto Protocol and Voluntary Carbon Standard and establishes methods for calculating reductions, provides guidance for accounting and reporting, and guides urban forest managers in developing tree planting and stewardship projects that could be registered for greenhouse gas reduction credits. The protocol can be applied to urban tree planting projects within municipalities, educational campuses, and utility service areas anywhere in the U.S. or its territories.

Roseville's urban tree canopy is directly sequestering 15,344 tons of carbon each year.

On average, a single blue oak annually sequesters 183 pounds of carbon.

~Roseville Urban Tree Canopy Assessment, 2012

Energy Savings

Urban trees and forests modify climate and conserve energy in three principal ways:

- Shading dwellings and hardscape
- Transpiration
- Wind reduction

Shade from trees reduces the amount of radiant energy absorbed and stored by hardscapes and other impervious surfaces, thereby reducing the heat island effect, a term that describes the increase in urban temperatures in relation to surrounding locations. Transpiration releases water vapor from tree canopies, which cools the surrounding area. Through shade and transpiration, trees and other vegetation within an urban setting modify the environment and reduce heat island effects. Temperature differences of more than 9°F (5°C) have been observed between city centers without adequate canopy cover and more vegetated suburban areas (Akbari et al, 1997).

Trees reduce wind speeds by up to 50% and influence the movement of warm air and pollutants along streets and out of urban canyons. By reducing air movement into buildings and against conductive surfaces (e.g., glass and metal siding), trees reduce conductive heat loss from buildings, translating into potential annual heating savings of 25% (Heisler, 1986).

Reducing energy needs has the added bonus of reducing carbon dioxide (CO_2) emissions from fossil fuel power plants.

One acre of canopy in Roseville can provide approximately $933 in annual energy savings when trees are planted on the western, eastern, and southern sides of structures.

~Roseville Urban Forest Resource Analysis, 2010

Aesthetics and Socioeconomics

While perhaps the most difficult to quantify, the aesthetic and socioeconomic benefits from trees may be among their greatest gifts, including:

- Beautification, comfort, and aesthetics
- Shade and privacy
- Wildlife habitat
- Opportunities for recreation and passive recreation
- A reduction in violent crime
- Creation of a sense of place and history
- Human health
- Reduced reliance on medication and quicker recovery from injury or illness

Many of these benefits are captured as a percentage of property values, through higher sales prices where individual trees and forests are located.

While some of the benefits of forests are intangible and/or difficult to quantify, such as impacts on physical and psychological health, crime, and violence, empirical evidence of these benefits does exist (Kaplan, 1989; Ulrich, 1986). However, there is limited knowledge about the physical processes at work, and their interactions make quantification imprecise. Exposure to nature, including trees, has a healthy impact on humans, such as increased worker productivity, higher test scores, reduced symptoms of ADD, and faster recovery times following surgery. In addition, trees and forests have positive economic benefits for retailers. There is documented evidence that trees promote better business by stimulating more frequent and extended shopping and a willingness to pay more for goods and parking (Wolf, 2007).

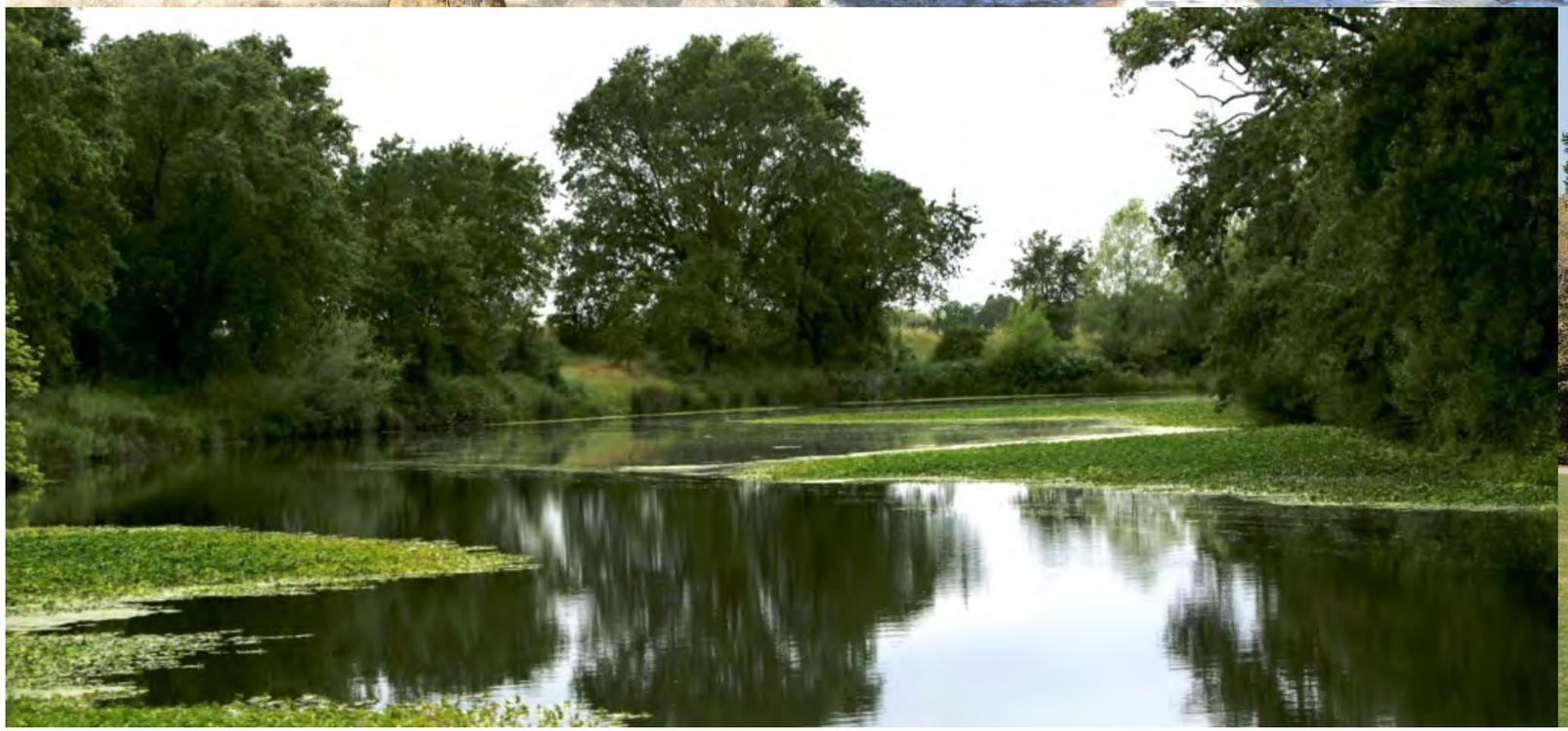
In addition, trees and forestlands provide critical habitat (foraging, nesting, spawning, etc.) for mammals, salmon, and birds, as well as limitless opportunities for recreation, offering a healthful respite from the pressures of work and everyday stress.

Calculating Tree Benefits

Communities can calculate the benefits of their urban forest by using a complete inventory or sample data in conjunction with the USDA Forest Service i-Tree software tools. This state-of-the-art, peer-reviewed software suite considers regional environmental data and costs to quantify the ecosystem services unique to a given urban forest resource.

Calculate My Tree Benefits

Individuals can calculate the benefits of trees to their property by using the National Tree Benefit Calculator or with i-Tree Design. (www.itreetools.org/design)



WHAT DO WE HAVE?

History of Urban Forestry in Roseville

The National Arbor Day Foundation has recognized the City of Roseville for over 30 years as Tree City USA and has also awarded the City over 18 Growth Awards. This commitment shows that Roseville values its community urban forest. Some of Roseville's oldest neighborhoods include trees that are more than 100 years old and there are many native oaks in open space areas that are much older than that. In 1983, the City adopted the Street Tree Ordinance (Ord. 1728; Municipal Code 8.04) for the purpose of establishing rules and regulations relating to the planting, care, and maintenance of street trees on, or which may overhang, public streets.

The community is fortunate to have the support of two urban forest nonprofit organizations: the Sacramento Tree Foundation and the Roseville Urban Forest Foundation (RUFF).

Prior to current urban forestry programming, public trees were the responsibility of Parks staff and only trees in the "Official City Street Tree" areas were on a 5-year pruning cycle. These trees were pruned by contract and a Natural Resource Specialist was responsible for oversight. Routine maintenance pruning of park, golf course, and other street trees was virtually non-existent. When necessary, pruning was performed by in-house crews and generally in response to resident requests. Tree planting and emergency response was also the responsibility of in-house crews.

In 2006, the Open Space Division was founded and Roseville began developing an overarching management plan for open space preserves. As an offshoot of this process, in 2007 the City hired its first Urban Forester and began to formalize its Urban Forestry operations. Initial staff included:

Senior Tree Trimmer (1)
Natural Resource Specialist (ISA[3] Certified Arborist) (1)
Tree Trimmers (3)
Contract Maintenance Staff

With the inception of the Urban Forester and the ongoing development of an urban forestry program, community forestry issues became more visible through events like Arbor Day and Earth Day.

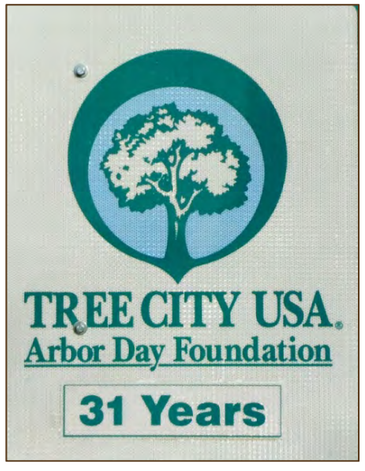
In 2005, the City endorsed the Greenprint initiative, a regional vision intended "to enhance the quality of life by expanding the urban forest and maximizing the benefits of trees" (Sacramento Tree Foundation). Goals for the Greenprint include planting 5 million trees throughout the Sacramento region and increasing canopy cover to a 35% overall average. In 2012, the organization honored the City of Roseville with a Growing Greenprint award for taking a leadership role in advancing the Initiative and showing a strong commitment to improving the community and the region by enhancing and preserving its urban forest.

In late 2008, with an urban forestry grant from CAL FIRE, the City contracted with Davey Resource Group to collect an inventory of public trees on streets, in parks and golf courses, and at City facilities. The inventory, which collected 38,812 trees and planting sites, included the GIS location and other valuable information about each tree, including species, size, condition, and maintenance needs. The inventory data is now a part of the City's GIS database and can be maintained and amended by city staff using TreeKeeper®7.7, a software management system that allows inventory specifics to remain accurate and current with regard to tree characteristics, health, and maintenance performed.

The inventory data was also used in conjunction with i-Tree's Streets, to develop an in-depth analysis of the structure, value, and benefits provided by Roseville's community urban forest (Urban Forest Resource Analysis, 2010).

Included in the development of the Urban Forest Master Plan was an Urban Tree Canopy Assessment. This process involves using high-resolution aerial images to determine and map, the location and extent of tree canopy and other land cover (both public and private) within the City of Roseville.

With a resource analysis, tree canopy assessment, and inventory data, Roseville has laid a strong foundation for a comprehensive master plan to guide their already advanced urban forestry program.



[3] International Society of Arboriculture

Roseville's Public Urban Forest Resource

An urban forest is a living and dynamic resource, changing over time and in constant response to its environment. The health and stability of the urban forest can be influenced by many factors, including pruning, irrigation, climate fluctuations, emerging pests and disease, as well as development and new tree planting. A complete understanding of the current structure, condition, and maintenance needs is essential to making the best possible management decisions. To date, the City has inventoried all trees on streets, in parks and golf courses, and at City facilities. Trees in open space areas (estimated at 80,000-100,000) have not been inventoried. Therefore, analysis of the urban forest resource represents approximately 30% of the resource, but nonetheless provides a comprehensive view of the status of Roseville's urban forest and includes data on the trees that are being actively managed.

An urban forest is a living and dynamic resource, changing over time and in constant response to its environment.

Composition of Inventoried Urban Forest

The composition of an urban forest is defined by its population (species frequency and diversity), age distribution, condition, and replacement value.

Population

A diverse population is important to forest health and to maintain a stable flow of benefits. Dominance of any species or genus can make a forest more susceptible to damage from storms, disease and pest outbreaks, climate change, and other environmental stressors.

London planetree make up more than 11.5% of the Roseville's community urban forest.

Roseville's 2010 urban forest inventory includes 38,812 public trees on streets, in parks and golf courses, and at City facilities. While the inventory includes a mix of more than 160 unique species, the top ten species represent 61% of the total population (Figure 1). The predominant tree species are London planetree (*Platanus* x *acerifolia*, 11.5%), coast redwood (*Sequoia sempervirens*, 10.8%), ornamental pear (*Pyrus calleryana*, 7.4%), and Crape Myrtles (*Lagerstroemia indica*, 6.9%. The populations of both London planetree and coast redwood exceed the industry standard that no single species should be represented by greater than 10% of the overall tree population.

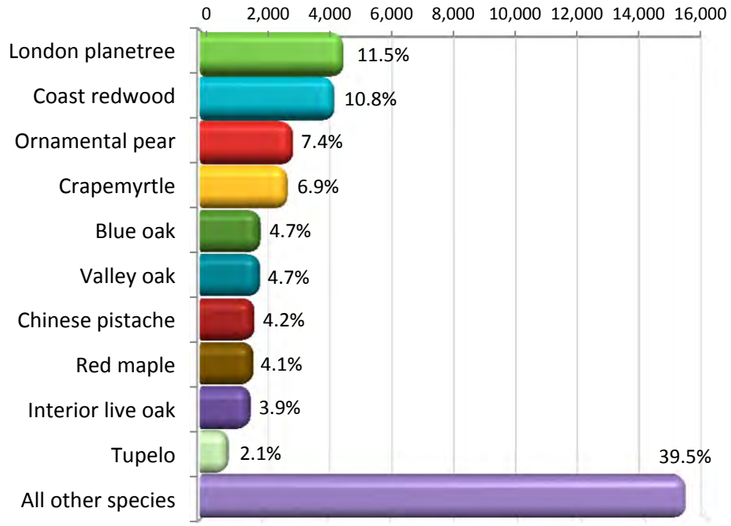


Figure 1. Species Distribution

Age Distribution

The age distribution of the urban forest is a key indicator, and driver, of maintenance needs. The age distribution of Roseville's public tree population is positively weighted in young trees, with 55% (21,428) of the overall population less than 6 inches DBH[4] (Figure 2). More than 75% (16,146) of these young trees are medium and large-stature trees that still have a lot of growing to do before they reach maturity. Training, defined as the selective pruning of small branches to influence the future shape and structure of a young tree, is critical at this stage to prevent costly structural issues and branch failures as these young trees mature into their final size in the landscape.

Twenty eight percent (28%, 10,879) of the population consists of intermediate age trees with a DBH between 7 and 12 inches. Of these, nearly 91% (9,877) are medium and large-stature trees that will also benefit from pruning to influence their developing structure.

Seventeen percent (17%, 6,555) of the overall population is comprised of small-stature trees that generally don't exceed 25 to 30 feet in height. While these trees benefit from pruning to promote an aesthetically pleasing and healthy structure, the risk of branch failure from a small-stature tree is typically mitigated by its size.

Approximately 4% (1,521) of the tree inventory is comprised of mature and over-mature trees. When trees approach or reach the end of their natural lifespan, they often have higher maintenance needs and eventually need to be removed in order to reduce risk and liability.

The remainder of the inventory (Other), less than 1% (84) is made up of palms of all stature.

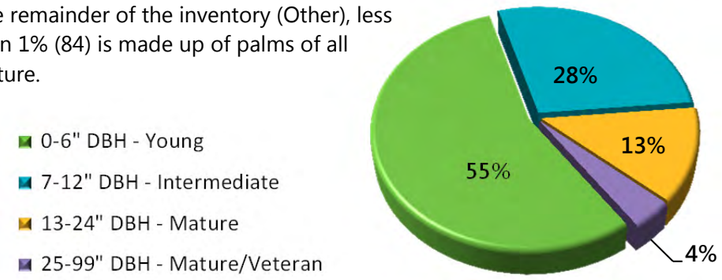


Figure 2. Tree Diameter/Age Class Distribution

Condition

Not surprisingly, given the young age distribution, 71% of Roseville's urban forest is in good condition, based on the 2010 inventory (Figure 3). Twenty-six percent (26%) of trees were found in fair condition and 0.2% were in excellent condition. While 3.2% of trees were found in poor condition, less than one percent (0.4%) of trees were dead or in critical condition.

While there are a number of older, mature trees that require structural maintenance or removal, Roseville is fortunate to have a young and healthy public tree population. However, proactive management, especially timely training and structural pruning, remains critical to maintain the condition of this valuable forest resource.

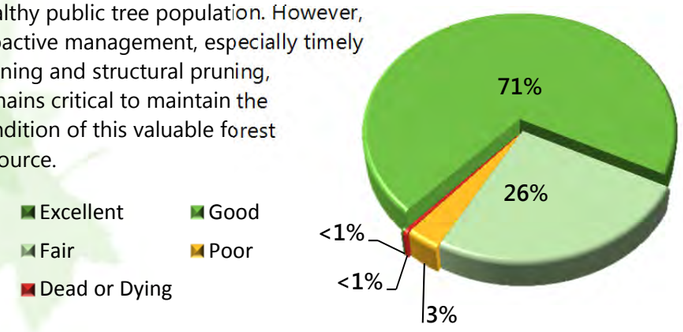
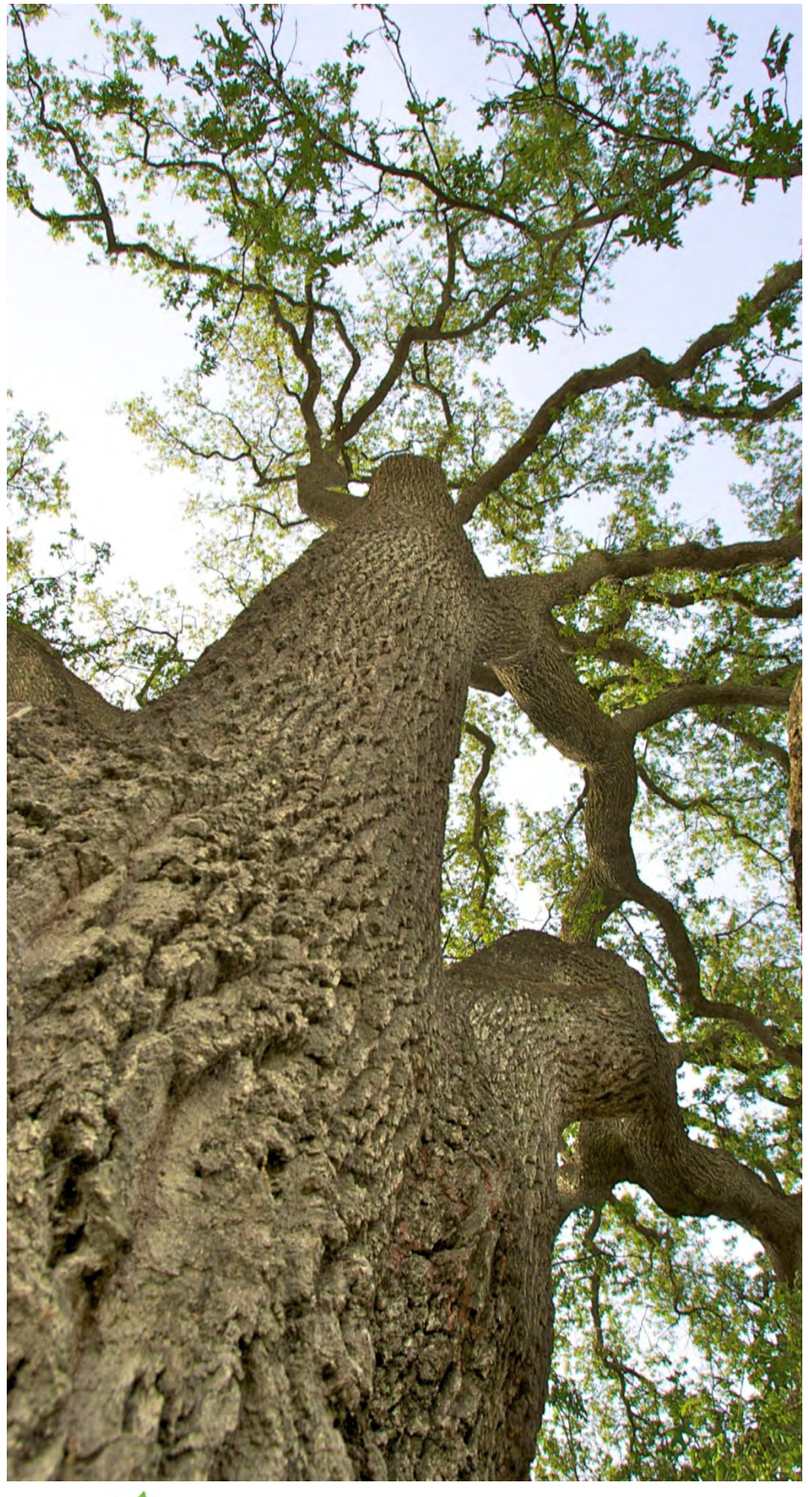


Figure 3. Condition

Replacement Value

To replace Roseville's 38,812 public trees with trees of similar size, species, and condition would cost more than $77.5 million, an average of $2,000 per tree.

[4] DBH (Diameter at breast height) is measured at 54 inches above grade.



Benefits from the Inventoried Urban Forest

The benefits provided by the urban forest are dependent upon the species, age (size), and condition of the tree population. The urban forest is one asset that has the potential to increase in value over time and with proper care.

The benefits provided by the urban forest are dependent upon the species, age, and condition of the tree population.

Based on the 2010 inventory, Roseville's public urban forest annually provides cumulative benefits to the community at an average value of $83.10 per tree (Figure 4), for a total gross value of $3,225,218 (Figure 5). A real potential exists for urban forest benefits to substantially increase over time as Roseville's young, medium and large sized trees mature. Currently, this resource provides benefits each year as described in the following paragraphs.

Air Quality

Net annual air quality improvements, as a result of decreased ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM_{10}), provided by public trees are valued at $209,293, **an average per-tree benefit of $5.39**.

Energy Savings

Through shading and modification of their immediate environment, Roseville's public trees reduce annual electricity needs by 2,461 megawatts and natural gas use by 1,785 therms, for a total benefit of $289,148, **an average of $7.45 per tree**.

Stormwater Management

Roseville's public trees intercept more than 18 million gallons of stormwater annually, protecting ground and surface water supplies from harmful pollutants, for a total value of $141,977, **an average of $3.66 per tree**.

Carbon Reduction

By converting carbon into woody and foliar biomass, Roseville's public trees currently sequester 1,152 tons of atmospheric carbon CO_2 per year. An additional 1,156 tons of CO_2 is avoided through decreased energy use, resulting in a net value of $30,676 and **an average of $0.79 per tree**.

Aesthetic and Socioeconomic Benefits

The total annual benefits contributed by Roseville's public trees to property value increases, aesthetics, and socioeconomics exceed $2.5 million, **an average of $65.81 per tree**.

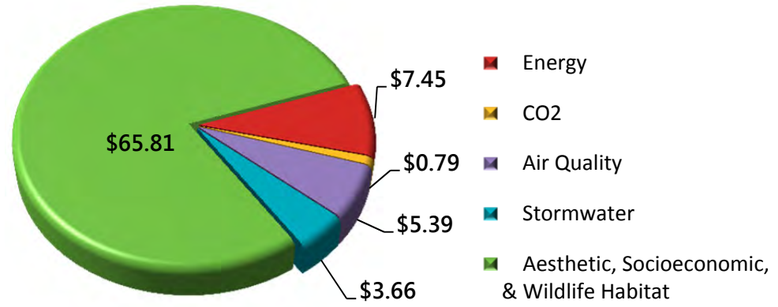


Figure 4. Average Per Tree Benefits

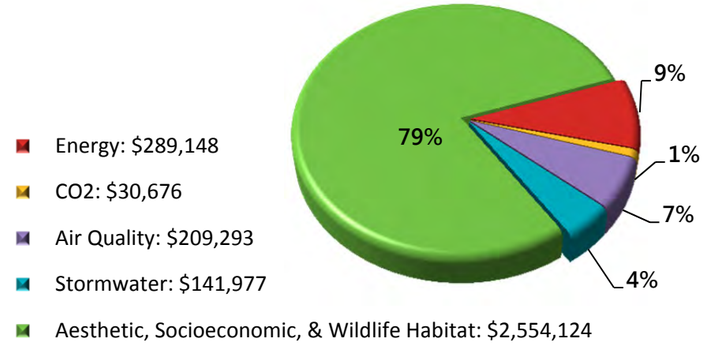


Figure 5. Overall Urban Forest Benefits

Benefits Versus Investment

In order to recognize the full value of the benefits from Roseville's public urban forest, it is important to take into account the investments (cost) of caring for this resource. In 2010, the City spent a total of $839,500 for maintenance, including administration, liability claims, and infrastructure repairs resulting from tree roots. Considering this resource provided $3,225,218 total benefits, for every $1 invested in caring for public trees, the community currently receives $3.84 in benefits[5]

A real potential exists for urban forest benefits to substantially increase over time as Roseville's young, medium, and large sized trees mature.

[5] For additional details on the structure, value, and benefits of Roseville's urban forest, see the City of Roseville Urban Forest Resource Analysis (2010).

Open Space Trees

Besides inventoried landscape, street, golf course and park trees, Roseville's community urban forest resource includes natural and installed forest stands in open space areas. While the dominant vegetation is vernal pool grasslands, within the City's 2,533 acres of assessed open space are approximately 700 acres of tree canopy comprised of riparian woodland/wetlands and oak woodland/savannah and an estimated 80,000 to100,000 trees, including:

- Blue Oak (*Quercus douglasii*)
- Valley Oak (*Quercus lobata*)
- Interior Live Oak (*Quercus wislizenii*)
- Black Willow (*Salix gooddingii*)
- Fremont Cottonwood (*Populus fremontii*)
- California Buckeye (*Aesculus californica*)
- California Sycamore (*Platanus racemosa*)

In addition to providing important resources and habitat for wildlife, these natural and naturalized forest stands make a significant, albeit unquantified, contribution to the overall benefit stream of the community's urban forest.

Oak Mitigation

To mitigate the loss of native oaks removed for development, native oak seedlings (often grown from locally collected acorns) are planted in sites that are carefully selected to enhance existing native oak woodlands in Roseville's open space areas.

RUFF completed the first major oak mitigation project in 2001, planting approximately 1,000 acorns. Currently there are 30 mitigation sites, including nearly 10,000 trees and covering approximately 80 acres. With the exception of one site, which is maintained by contract, all other mitigation sites are maintained in-house by city crews.

Official City Street Trees

In most residential areas of Roseville, official City street trees are identified by their location in maintenance strips between the curb and sidewalk. However, in many older neighborhoods where no sidewalks exist, trees growing within the City right-of-way, as measured from the center line of the street, are also the responsibility of the City. An estimated 600-800 of these trees are not currently included in the urban forest inventory. As a result, although these trees are some of the oldest and largest trees in Roseville, their benefits were not quantified in the Resource Analysis and their overall condition and maintenance needs have not been determined.

The Urban Forest Program

The Open Space Division is currently responsible for the care and management of Roseville's public trees under the Open Space Superintendent. Within this division, urban forestry operations are led by the Urban Forester and currently provide the following services:

- Program administration
- Oversight and quality assurance of maintenance contracts
- Tree inspections and risk assessment
- Maintenance of inventory data in TreeKeeper® 7.7
- Some pruning and removals
- Oak mitigation and regeneration planting and maintenance
- Tree replacement
- Assisting with emergency response
- Interdepartmental and Interagency coordination and collaboration
- Urban Forestry, Natural Resource, and arboricultural recommendations and resource information
- Plan review
- Sidewalk repair oversight
- Grant writing
- GPS and data collection
- Collaboration with nonprofit organizations
- Capital Improvement Project (CIP) coordination

Urban forestry staff is comprised of full-time, part-time, and seasonal staff, as well as contracted personnel. Roseville is fortunate to have a full-time Urban Forester, one of only five in the region, who is highly trained and skilled in arboriculture and urban forest management. The Urban Forester currently provides all tree and risk inspections, contract monitoring and quality assurance, and program administration, including coordination and planning for oak mitigation projects.

In addition to the Urban Forester, the City currently employs one full-time, ISA Certified Tree Worker who is assisted by a seasonal employee.

Due to lack of internal resources, most tree work is completed by contract, including:

- Maintenance pruning
- Plant health care
- Tree planting/replacement
- Emergency response
- Pruning that requires climbing
- Tree removal
- Cabling & support systems

It is often beneficial to perform young tree training and specialized tree pruning of high-value and heritage trees in-house, with a greater understanding and control over the desired outcome. However, for routine and large-scale, cyclical pruning operations, it is often more efficient and cost-effective to contract with a professional tree care company. Furthermore, contracting high-volume, routine tree pruning reduces the risk and liability to the City, especially on heavily trafficked arterial streets.

Training and Skill Development

Managing and caring for trees requires a specialized set of skills and a sufficient level of arboricultural knowledge. While these skills are often underappreciated and taken for granted, research has proven that improper tree care can significantly reduce life span, diminish appraised value, and increase the risk of failure in trees.

Managing and caring for trees requires a specialized set of skills and a sufficient level of arboricultural knowledge . . . research has proven that improper tree care can significantly reduce life span, diminish appraised value, and increase the risk of failure in trees.

Training for Roseville's urban forestry staff has been limited in recent years as a result of funding challenges. The City's Urban Forester is highly trained in basic and advanced arboricultural practices, including risk assessment and tree appraisal and has been able to maintain these skills and remain current of industry standards. However, providing opportunities for skill development for other maintenance staff has been challenging due to limited funding. While an ideal urban forestry program provides internal opportunities for training and skill development, reductions to staffing and funding resources have impeded the development of such programming.

Ideally, urban forestry operations should include senior staff with advanced arboriculture skills who are able to assist the Urban Forester with tree inspection, risk assessment, and field supervision as well as participate in advanced tree care operations such as climbing and specialized pruning.

Lacking senior staff with these advanced skill sets means that there is more responsibility placed on the Urban Forester to provide these services, in turn reducing time spent on program development and administration, including programming opportunities for staff development and lost grant opportunities.

Tree Care and Maintenance Cycles

The amount of available funding has an impact on the timing and opportunities for tree care . . .

The level of maintenance for public trees is highly dependent upon location. Most trees in residential areas are located in Community Facility Districts (CFDs) or Lighting and Landscape Districts (LLDs). As such, their maintenance is funded through Mello-Roos funds and/or a portion of property tax. The availability of funds can vary greatly between districts and funds from one district cannot legally be used to maintain trees in another. The amount of available funding has an impact on the timing and opportunities for tree care within those districts.

Tree maintenance at most city facilities, including parks, is funded through the general fund and subject to fluctuations in funding levels.

Pruning Cycles

The 2010 inventory of public trees includes 38,812 trees in all locations, including CFDs/LLDs, golf courses, and general fund areas. Approximately 64% (24,955) of inventoried trees are on a regular maintenance schedule (Table 1). Of these, 20,621 trees (53%) are on a 5-year pruning cycle and 4,334 trees (11%) are on a 24-year pruning cycle.

In addition to timely maintenance and clearance pruning, a 5-year cycle allows for a regular assessment of the condition, structure, and overall health of each tree. A 24-year cycle, however, is much less than ideal and does not provide an opportunity for either identifying or resolving issues before they become critical.

Based on current funding limitations, 36% (13,857 trees) of inventoried trees are not on any regular maintenance cycle. These trees, in parks, golf courses, and other public facilities are treated on a reactive basis as necessary, in order to mitigate risk and/or clearance issues. As such, maintenance occurs only on an emergency/as necessary basis or when short-term CIP funds are available. The trees in these districts are of mixed age and often when funding is available, it is dedicated to resolving issues in the largest, most mature trees. As a result, younger trees that would benefit greatly from structural pruning and correction are being neglected, which will eventually result in higher, long-term costs.

Ensuring that all public trees receive regularly scheduled maintenance is an objective of the Urban Forest Master Plan. The Plan identifies opportunities to increase funding in districts, golf courses, open space, and general fund areas.

Table 1. Pruning Cycles of Inventoried Trees (2010)

Location/Funding Source	Cycle	# of trees	% of Inventory
General Fund (GF)	5-year	13,738	35.40%
CFD/LLD	5-year	6,883	17.73%
CFD/LLD	24-year	4,334	11.17%
Golf Courses	None/Reactive	2,203	5.68%
Crape myrtles/Conifers	None/Reactive	6,213	16.01%
Other trees (GF/CFD/LLD)	None/Reactive	5,441	14.02%
Total Inventory		**38,812**	**100%**

Official City Street Trees

Older neighborhoods in Roseville are often not located within a specific funding district and maintenance of their public trees is funded by the general fund. Historically, these trees have been referred to as official city street trees and defined in the Street Tree Ordinance as being located in planter strips between the curb and sidewalk. This definition has caused some confusion, however, since there are neighborhoods where there is no sidewalk but where the City's right-of-way extends beyond the existing curb.

As mentioned previously, many of Roseville's largest and most mature trees are located within this right-of-way. As a result of some uncertainty caused by the definition of official city street trees and the lack of a planter strip, maintenance of some trees has been overlooked during various periods in the past.

Current urban forest programming recognizes that these trees are public trees and as such the City has responsibility for their management. However, because these trees were not inventoried in 2010, they are not presently on a maintenance cycle.

The City estimates that there are 600 to 800 of these trees that should be inventoried and inspected to identify their current condition and maintenance needs. Since many of these trees are quite old and very large, it is important that they be integrated into the inventory and maintenance cycles as quickly as possible to ensure a proactive risk management strategy.

Definitions

Inventoried Trees: Includes 38,812 trees collected in the 2010 inventory as well as trees that have since been collected by city staff, for a current total of 42,000 trees.

Heritage Tree: A large, individual tree with unique value, which is considered irreplaceable due to age, size, rarity, aesthetic, botanical, ecological, and/or historical value.

Significant Tree: A healthy evergreen or deciduous tree of specific size as defined by policy and/or regulation.

Tree in Proximity To Trails/Facilities: A tree that, as the result of size and location, has the potential to impact or interfere with the use, safety, and/or condition of a defined trail, structure, or facility (e.g., picnic table, bench, parking area, etc.)

Structural and Training Pruning: Pruning to develop a sound and desirable scaffold branch structure in a tree and to reduce the likelihood of branch failure.

Natural Area: A defined area where native trees and vegetation are allowed to grow and reproduce naturally with little or no management except for control of undesirable and invasive species.

Natural Resource Area: An area that contains one or more natural resources (e.g., forests, mineral deposits, fresh water, etc.)

Tracking Work and Maintaining Inventory Data

When the inventory was collected in 2010, the City purchased inventory management software, TreeKeeper®7.7, to keep the data records up to date. Ideally, the software can be used to generate work orders and track the history of each tree, including pruning, fertilization, pest treatments, and risk assessment and mitigation actions.

While various methods are being used to track work on public trees, depending on whether the work is completed in-house or by a contractor, reduced staffing levels have made it a challenge to transfer the updates into TreeKeeper®. When possible, a seasonal employee integrates the updates into the system. However, the data has been updated infrequently and the majority of the in-house work has not been tracked by location or tree site.

As with other public assets, maintaining an updated inventory system is crucial to work planning and budget development. The City is currently in the process of integrating the tree inventory into Maximo Asset Management (IBM) in an effort to consolidate various public assets into a single management system. However, it will still be necessary to budget time and training resources to ensure that urban forestry staff updates the tree records in an accurate and timely manner. Ideally, the inventory system should be accessible in the field so that tree information can be updated as maintenance and/or inspections are completed (e.g., tablet computers).

TreeKeeper®7.7, inventory management software, tracks work orders and the history of each tree, including pruning, fertilization, pest treatments, and risk assessment.

Emergency Response

Most emergency response is contracted. However, city crews often assist with the removal of hanging and fallen limbs that are in danger of falling onto or blocking sidewalks.

In a major storm event, all park maintenance staff coordinate and partner with contractors, creating strike teams that perform emergency response services and ensure public safety. This includes clearing roadways and sidewalks, as well as branch and tree removal.

Tree Inspections

Primarily the responsibility of the Urban Forester, tree inspections and risk assessments are necessarily performed on a reactionary basis upon request by a resident, city staff, or contractor notification. No formal tree inspection plan is in place and some trees that have been identified for inspection have not been addressed as a result of limited resources and staffing.

Tree inspection and risk assessment requires advanced arboricultural knowledge, including familiarity with biomechanics and tree biology, decay organisms, structure, and unique species characteristics. While the Urban Forester is highly skilled in these areas as well as in advanced inspection techniques, the time available for tree inspections is limited. Additional staffing of a Senior Arborist with high-level skill sets would increase program efficiency and encourage risk identification and reduction.

Tree Planting and Replacement

Recently, public tree planting has been limited to replacing trees that are removed due to death, failure, or risk of failure. Generally, the contractor who removes the tree is also responsible for installing a replacement. Ideally, the City would like to install three trees for every one removal, a 3:1 replacement ratio, to facilitate a faster recovery of previous benefits and to ensure sustainability of the overall resource. However, the current replacement ratio is less than one to one (<1:1).

While Roseville does not currently have a planting plan, the goal is to identify and prioritize vacant and new planting sites and to coordinate with volunteers, nonprofits, and neighborhood groups to replace and plant new trees.

Program Funding

Stable and predictable funding is critical to effective and efficient management of the urban forest. Trees are living organisms, constantly growing and changing over time and in response to their environment. There are a number of factors that affect tree health and structure, including nutrition, available water, pests, disease, wind, and humidity. While it might seem like most changes to trees take a long time to occur, some specific maintenance is critical at certain stages of life. For instance, young trees benefit greatly from early structural pruning and training. Minor corrections that are simple can be applied with low costs when a tree is young. However, if left unattended they can evolve into very expensive structural issues and increase liability as trees mature. At which point it may be impossible to correct the issue without causing greater harm. Then again, over-mature trees often require more frequent inspection and removal of dead or dying limbs to reduce the risk of unexpected failure. A stable budget allows urban forest managers to program the necessary tree care at the appropriate life stage when it is most beneficial and cost effective.

The current budget ($1,543,617) for administration, maintenance, oak mitigation, and tree planting is approximately 0.5% of the overall municipal budget for public services (Figure 6).

Roseville's urban forest funding for contracted tree maintenance is supported by five primary sources:

- 42.6% - Funding districts (CFDs and LLDs)
- 38.8% - General Fund
- 9% - Tree Mitigation Funds (Native and Non-native)[6]
- 7.3% - Golf Course Funds
- 2.3% - Open Space Preserve Fund

CFDs and LLDs

Community Facility Districts (CFDs) and Landscape and Lighting Districts (LLDs) are tax assessment districts and as such, are the most stable and secure source of funding. Combined, funding districts account for 42.6% of the overall cost for contract pruning. The limitations to CFD and LLD funding sources are that they can only be applied to a specific district. As a result, some districts are adequately funded to support trees on a 5-year pruning cycle while others provide for only a 24-year cycle. Some districts have no funding whatsoever for tree care.

Public outreach to residents and neighborhood associations in unfunded and underfunded neighborhoods is recommended. With a clear understanding of the benefits of the urban forest and the costs of deferring maintenance, residents may elect to provide funding, or additional funding, to support tree care.

General Fund

The General Fund provides most of the funding for the care of trees in parks, at City facilities, and street trees in neighborhoods that are not in a specific funding district. Approximately 38.8% of contracted tree care is supported by the General Fund, which also provides for program administration and staffing. The General Fund, however, is dependent upon tax revenue and subject to social and political will. As such, the City continues to seek other funding sources to offset dependence on these funds.

Tree Mitigation Funds

In recent years, urban forestry operations have depended a great deal upon the Tree Mitigation Fund, both for tree mitigation projects (planting and maintenance) and also for transfers to the general fund to support administration and staffing costs. This fund is dependent upon fees generated by the removal of protected, native oaks as a result of development and construction projects in Roseville. Revenues generated through these funds peaked in 2005 at $632,307 and have since decreased dramatically (Figure 7). In 2012, this fund generated only $50,838, of which nearly all was interest. Tree Mitigation Funds are not expected to increase in the future due to the limited existence of native oak trees in undeveloped areas. Considering anticipated expenditures and revenues, it is estimated that the Native Tree Fund will be depleted by the end of 2016 and the Non-native Tree Fund will be depleted by 2018. To sustain the revenue from this source, the City will need to identify other sources of revenue or new mechanisms for generating funds to this account.

Golf Course Fund

Both of Roseville's public golf courses, Woodcreek Oaks and Diamond Oaks, have Enterprise Funds that support tree care. However, these funds only cover reactive pruning, removals, and risk prevention. Trees in golf courses are not on a regular pruning cycle, but are included in the tree inventory. They should be included in a regular pruning cycle to preserve their health and value to the course and to reduce liability.

Open Space Preserve Fund

The Open Space Preserve Fund supports minimal tree care in open space preserves. Trees are cared for on a reactive basis only when a risk is identified by or reported to the Urban Forester. Ideally, additional funding would allow for an inventory and regular maintenance of significant trees located in proximity to trails and other accessible locations.

Roseville's 2,533 acres of assessed open space includes 700 acres of tree canopy and an estimated 80,000 to 100,000 trees.

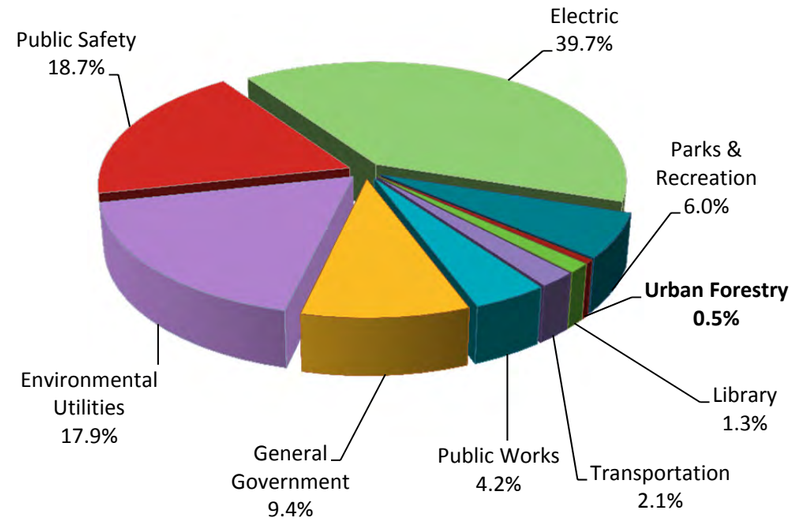


Figure 6. Urban Forestry funding is a very small part (0.5%) of the annual municipal budget.

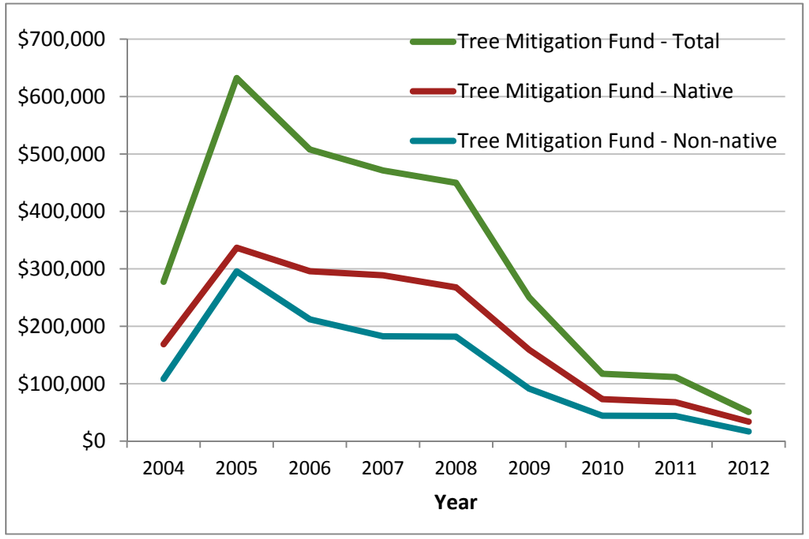
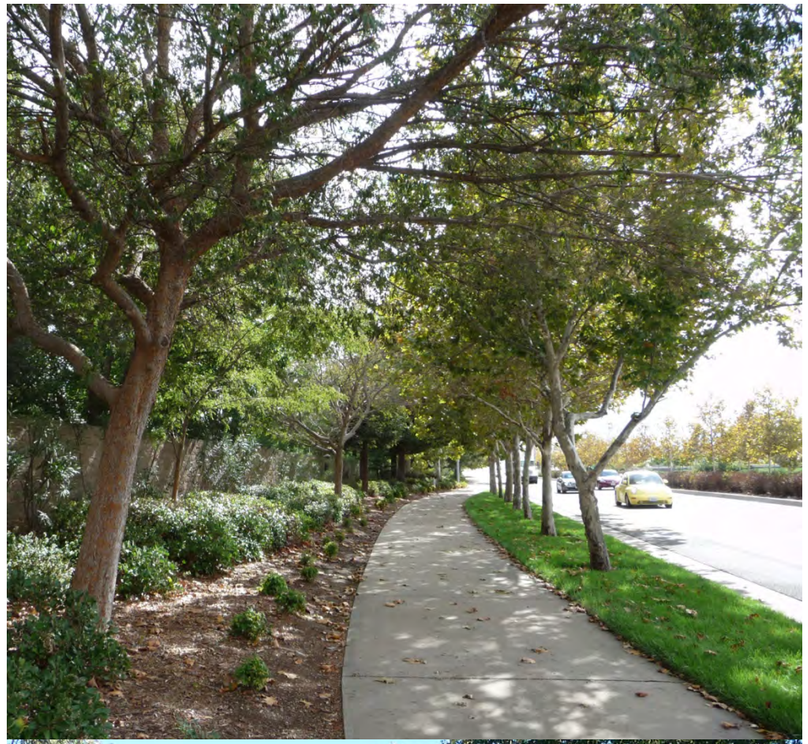
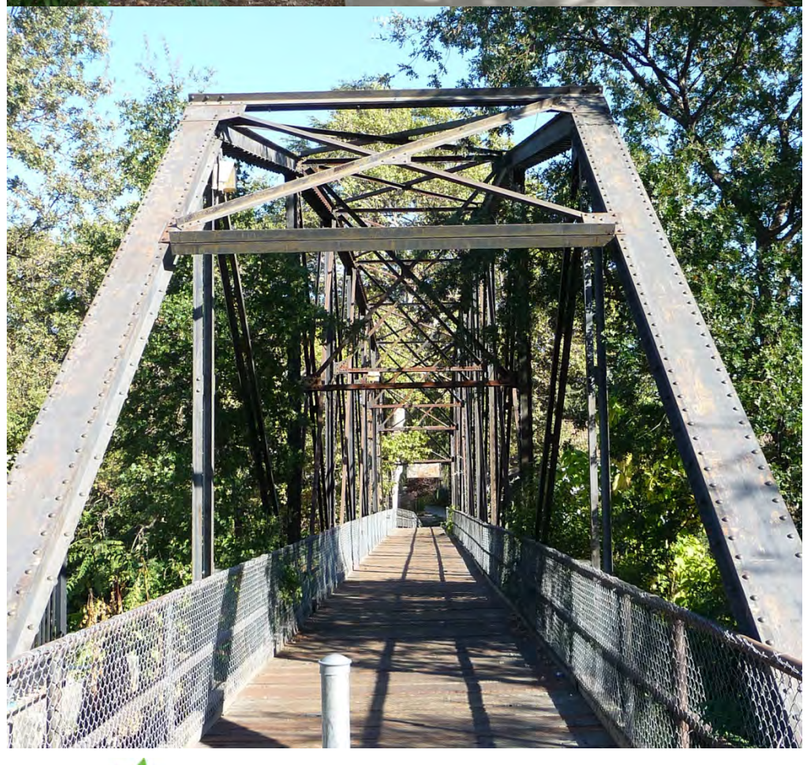


Figure 7. Revenue (by Year) generated by Tree Mitigation Fund (Deposits and interest)

[6] Tree Mitigation Funds support only tree planting.





Policy and Regulation

City policies and regulations provide the foundation for the urban forestry program. They outline requirements and specifications for the planting, installation, and care of Roseville's public trees and provide the regulatory framework for the protection and preservation of the urban forest assets as well as the enforcement of activities and issues that impact the community's trees.

The development of Roseville's Urban Forest Master Plan included a comprehensive review of City policies, development and construction standards, ordinances and other regulations that apply to the urban forest. The following provides a summary of the review process and key findings.

Community Planning

General Plan 2025

The **General Plan 2025** serves as a long-term policy guide for the physical, economic, and environmental growth of the City and is a statement of the community's vision for its ultimate physical growth. While not always specifically recognized, public trees and the urban forest play a vital role in the realization of this vision. The following is a summary of elements of the General Plan and their relationship to the urban forest and urban forest management:

The Land Use Element has the broadest scope of the General Plan and the distribution of land uses represents a primary factor in determining the character of the community. Resource conservation (including trees and forests) achieved through land use design, has been identified as an effective way to reduce greenhouse gas emissions and counteract the effects of climate change (California Energy Commission, 2007). A healthy and vibrant urban forest supports many of the goals of the Land Use Element and especially those of the Community Form and Community Design components. Specific goals relative to trees include:

> ***Goal 4. Community Design****. Emphasize the preservation and enhancement of historically and culturally significant buildings, native oak trees, woodlands, and other significant features, as a primary element in defining Roseville's community character.*

Implementation measures include:

> ***Tree Preservation Regulations (Existing).*** *Enforce and regularly evaluate the Tree Preservation regulations established in Chapter 19.66 of the Zoning Ordinance.*

The Circulation Element defines transportation facilities and includes the goals, policies, and action strategies for the City's circulation system. Increased population and employment will intensify traffic and place stress on Roseville's transportation infrastructure to meet level of service demands. In addition, the California Clean Air Act requires trip reduction measures that promote alternative transportation modes including walking and biking. Roseville's Transportation Systems Management (TSM) ordinance (Chapter 11.33) ensures that developers, property owners, and employers share responsibility for the mitigation of impacts from development. This includes participation in the nationally recognized Safe Routes to School program and right-of-way improvements that enhance safety and promote walking and biking to and from educational facilities. This element acknowledges that certain neighborhoods should be made more amenable to walking and that various pedestrian enhancements (e.g., improved streetscapes) would improve walkability.

Street trees play an important role in walkable neighborhoods and trail connectivity, promoting a more inviting environment through shade, heat reduction, and aesthetics.

Implementation measures and policies for the Circulation Element include strategies for establishing pedestrian districts and increasing connectivity of bikeways and trails. Specific goals supported by public trees include:

> ***Goal 2. Bikeways/Trails.*** *Establish and maintain a safe, comprehensive and integrated bikeway and trail system that encourages the use of bikes and walking for commuting, recreational and other trips.*

Street trees play an important role in walkable neighborhoods and trail connectivity, promoting a more inviting environment with shade, heat reduction, and aesthetics. In addition, while tree root damage can increase pavement maintenance costs, shading from trees can significantly increase the lifespan of paving materials on trails, walkways, and paths.

Roseville's attractive trail system encourages biking and walking as an alternative to automobile travel.

The Air Quality and Climate Change Element is intended to improve air quality, address climate change, and encourage cooperation between the jurisdictions involved in regional air quality improvement efforts. The element is supported by increasing the connectivity of bike and pedestrian trails, reducing vehicle traffic and overall miles traveled, and promoting alternative modes of transportation and street improvements (e.g., trees) that promote access and use.

The California and Federal Clean Air Acts establish air quality standards for several pollutants and require jurisdictions for areas that violate these standards to prepare and implement plans to achieve the standards by certain deadlines. Roseville is a non-attainment area for the state and federal ozone (O_3) standards and for the state standards relating to particulate matter (PM_{10}). The portion of the Sacramento Valley Air Basin that includes Roseville is designated as an attainment area for carbon monoxide (CO). Given this status, PM_{10}, CO, and O_3 are the primary focus of air quality efforts in the region. Trees and urban forests contribute positively to the reduction of these pollutants.

This element includes goals, policies, and implementation measures in support of the Placer County Air Pollution Control District's (PCAPCD) Air Quality Attainment Plan along with other issues important to the citizens of Roseville, including reduction of greenhouse gases (GHGs), health, water and biological resources. The Air Quality and Climate Change Element supports improvements to air quality and sustainability in coordination with other General Plan elements:

- Land Use
- Circulation
- Open Space and Conservation
- Parks and Recreation
- Public Facilities
- Safety Element
- Housing Element

While each of these elements addresses the importance of reducing pollution emissions from both stationary and mobile sources, they do not specifically recognize the role of trees in the removal and reduction of air pollutants, energy use reduction, or stormwater management. Preserving tree canopy is one of the most effective ways to counteract the effects of climate change.

Preserving tree canopy is one of the most effective ways to counteract the effects of climate change.

The Open Space and Conservation Element addresses the preservation, management, and efficient use of open space and natural resources. Conservation efforts are intended to focus on the wise management of natural and manufactured resources (e.g., trees and urban forests) to assure their continued availability for use, appreciation, and enjoyment. This element recognizes that natural resource conservation is one of the most effective ways to counteract the effects of climate change. Roseville's conservation efforts (including oak mitigation) increase and maintain vegetated groundcover through the protection of trees and woodland areas and through the enhancement of urban parks and urban forest management.

This element defines the open space system, identifies the primary components of the City's natural systems (vegetation and wildlife), and focuses on protecting these resources as well as protecting the quantity and quality of ground and surface water resources. The goals, policies, and implementation strategies of this element are intended to ensure the current and future preservation, enhancement, and management of natural resources in the City. Specific goals that are supported by trees and urban forest programming include:

Open Space System Goals supported by trees:

Goal 1. *Establish a comprehensive system of public and private open space, including interconnected open space corridors that should include oak woodlands, riparian areas, grasslands, wetlands, and other open space resources.*

Goal 3. *Provide access to public open space areas though the establishment of a series of public linkages that will be adequately managed and protected.*

Goal 4. *Integrate, where feasible, passive recreational and educational opportunities with the protection of wildlife and vegetation habitat areas.*

Vegetation and Wildlife Goal supported by trees:

Goal 1. *Preserve, protect, and enhance a significant system of interconnected natural habitat areas, including creek and riparian corridors, oak woodlands, wetlands, and adjacent grassland areas.*

Goal 2. *Maintain healthy and well-managed habitat areas in conjunction with one another, maximizing the potential for compatible open space, recreation, and visual experiences.*

Furthermore, it is an overall goal of the Open Space and Conservation Element to preserve a comprehensive interconnecting system of open space, encompassing preservation and enhancement of natural habitat and significant resource areas, for the use, appreciation, and enjoyment of the community.

While not specifically recognizing the value of trees, the goals and policies for groundwater recharge and water quality are supported by trees and tree canopy. Trees intercept stormwater in their leaves and canopy, reducing runoff; tree roots facilitate percolation and groundwater recharge; and trees aid in bioremediation by absorbing pollutants in soils and groundwater.

Tree preservation regulations, resource inventories, and public education programs are some of the implementation strategies that are supported by the Urban Forest Master Plan.

The Open Space and Conservation Element includes goals to protect the natural habitat areas that support native wildlife.

The Parks and Recreation Element recognizes that the presence of plentiful, well-designed parks and recreation facilities contributes to the quality of life in the community. Closely linked with the Open Space Element, the Parks and Recreation Element identifies natural features and wildlife habitat as vital to the City's environmental health and sense of place. The element includes consideration of parks, open space, landscape areas (including streetscapes), paseos, and greenways. The goals and policies of this element are supported by healthy, well-maintained trees and urban forests, and urban forest programming, including:

> ***Policy 7.*** *Plan for safe and secure parks and recreation areas.*
>
> ***Policy 9.*** *Continue to maintain and upgrade as necessary City parks and open space areas through the Parks and Recreation Department, to assure safe, clean, and orderly facilities.*
>
> ***Policy 10.*** *Continue to provide a wide variety of programs, activities, and educational opportunities for the community.*

In addition, Policy 12 of the Parks and Recreation Element supports planned funding for tree installation and urban forest management:

> ***Policy 12.*** *Ensure that new public parks and recreation facilities, open space, paseos, landscape areas and greenways provide adequate funding for initial development, as well as ongoing maintenance and operation.*

The Public Facilities Element is intended to identify facility and service needs of the community as growth and development occur, including water, wastewater, recycled water, solid waste, electric, and library services. While not specifically recognized in this element, trees contribute to the aesthetic and environmental quality of public facilities by shading parking lots and buildings, reducing energy needs, and ensuring the attractiveness of these facilities. In addition, trees and urban forests reduce load on wastewater treatment facilities during storms, contributing to storm surge capacity. The stormwater benefits of trees and tree canopy also include reducing pollution loading of these facilities by intercepting and absorbing harmful substances.

More specifically, recycled water and low-water-use landscaping support goals and policies of this element, including:

> ***Goal 3.Wastewater and Recycled Water Systems.*** *Actively pursue the use of recycled water where appropriate and expand recycled water distribution system to deliver and meet estimated City demands of 4,900 acre-feet/year for landscape irrigation.*
>
> ***Policy 6. Wastewater and Recycled Water Systems.*** *Develop, plan, and provide incentives for use of recycled water by the public and private sectors.*
>
> ***Policy 10. Water System.*** *Develop and implement water conservation standard and measures as necessary elements of the water system.*

In addition to recycled and low-water-use landscaping, reducing energy needs through shade and the cooling processes of tree canopy supports the goals and policies of the Water and Energy Conservation component:

> ***Goal 1.*** *Preserve scarce resources by recognizing the importance of conservation in water and energy management.*
>
> ***Goal 2.*** *Balance conservation efforts with water and energy supplies for the maximum benefit of Roseville's residents.*

Another important component addressed by this element, relative to public trees, is electric utilities, both publicly and privately owned. Roseville Electric constructs, operates, and maintains the City's electric distribution system. Coordination in the development and review process between urban forest managers and utility providers, including Roseville Electric, can reduce potential tree utility conflicts. Avoiding and managing conflicts between trees and utilities, above and below ground, supports reliability goals for electric transmission and distribution:

> ***Goal 1. Electric Utility.*** *Maintain a municipal electric utility that provides an efficient, economical, and reliable electric system.*

The Safety Element addresses the safety concerns of the community, including fire, crime prevention, natural disasters, and other potentially dangerous situations, and sets goals and policies for their resolution. In extreme weather events, urban forestry staff assists in emergency operations, partnering with contractors to create strike teams. These crews work to clear roads and sidewalks, removing fallen trees, hanging and fallen limbs, and providing emergency response to ensure public safety and access. In addition, trees and urban forests provide benefits to other components of the Safety Element:

> ***Seismic and Geologic Hazards.*** *Trees and forests contribute to this component by stabilizing slopes and soils (See Urban Tree Canopy Assessment, Map 7. Priority Planting Sites).*
>
> *Flood Protection. Trees and forestlands contribute to the Flood Protection component by reducing stormwater runoff and flood potential.*
>
> ***Police Services.*** *Higher tree canopy has been linked to reductions in crime, including robbery, burglary, theft, and shootings (Troy, et al, 2012; Donovan G.H., et al, 2011; Kuo, F.E., et al, 2001). Maintenance pruning ensures visibility in neighborhoods and parks.*
>
> ***Health Services.*** *Trees support physical health through direct improvements to the environment and air quality. Trees and other landscaping also have many positive physiological effects on physical, social, and mental health (University of Illinois, Landscape and Human Health Laboratory, Kaplan, et al, Ulrich, R.).*

The Noise Element addresses policies and implementation measures for protecting residents from the harmful and annoying effects of exposure to excessive noise. Trees can provide an effective buffer and help to mitigate noise between different land use and activities.

The Housing Element (DRAFT) is intended to identify and analyze existing and projected housing needs in an effort to preserve, improve, and develop housing for all economic segments of the community.

Street trees contribute to the Residential Energy Efficiency and Conservation component. In addition, the Roseville Shade Tree Program, supported by Roseville Electric provides rebates for specific shade trees along with educational materials to residents.

Trees are a highly visible and vital component to streetscape enhancements and pedestrian friendly improvements. GIS data, mapped by the Urban Tree Canopy Assessment, can allow planners to identify underserved areas and neighborhoods where canopy cover is lowest and where more trees (and canopy benefits) are needed.

Open Space Preserve Overarching Management Plan

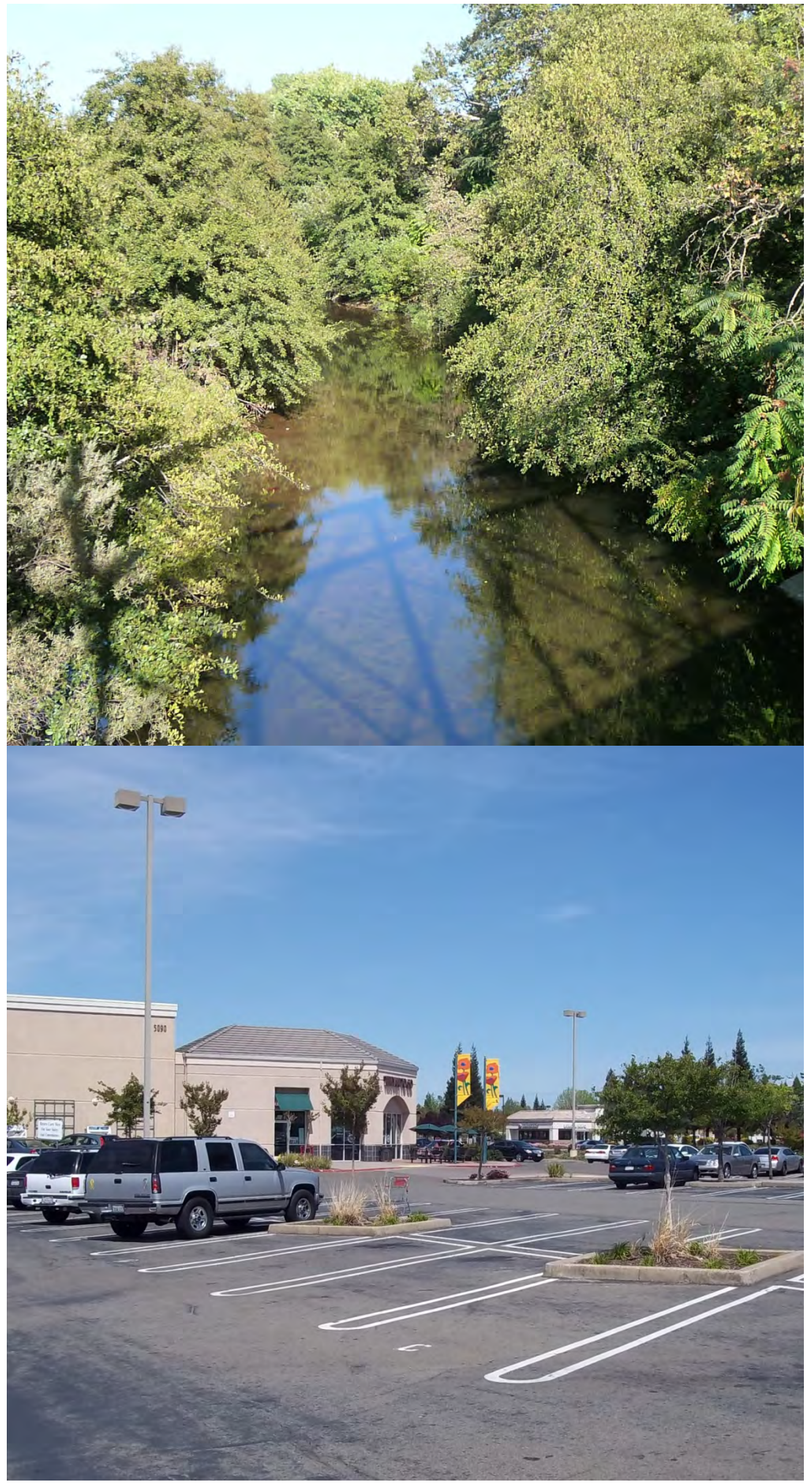
The Open Space Preserve Overarching Management Plan (OSPOMP, 2011) is the result of a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service and the Army Corps of Engineers to develop interim and long-term conservation strategies to minimize adverse effects to federally listed species (plant and animal) and to standardize the monitoring and management of Roseville's system of vernal pool and wetland preserves. With regard to urban forest assets, the plan provides:

- a city-wide approach to open space management, maintenance, and monitoring.
- specific goals and actions for open space management, maintenance, and monitoring, including:
  - Goal 6-2: Identify and map high quality, moderate to marginal quality, and degraded native communities. Prioritize areas to receive resources starting with maintaining high quality habitat, enhancing moderate to marginal habitat, and then restoring degraded habitat.
  - Goal 6-8: Track changes in vegetation community species composition.
  - Goal 6-10: Maintain an oak tree canopy coverage map and an inventory of oak trees within the City's Open Space.
  - Action 8-1-1: Trim trees along roads, sidewalks, and bike trails to maintain 8 feet of clearance over sidewalks and 14 feet of clearance over roadways.
- a mechanism for approval of necessary open space management and maintenance tasks that might adversely affect federally listed species (threatened or endangered) protected by the Endangered Species Act (ESA).
- a defined role for the City Urban Forester in both open space operations and general urban forest management (non-open space) including:
  - Inspecting trees on public property to verify location and determine condition, required maintenance, and suitability for preservation.
  - Inspecting plant materials to ensure quality; making recommendations and developing plans for the street tree planting program.
  - Overseeing the development of a city-wide urban forest program to include: an inventory of all public trees, a Heritage Tree Ordinance, tree replacement and regeneration guidelines, care and maintenance of City street and Open Space trees, volunteer tree planting programs, Arbor Day promotions, acorn plantings, wildflower seed plantings, Eagle Scout projects, etc.
  - Supervising the Parks Maintenance Tree/Streambed Division.
  - Administering contracts; serving as a liaison for the City and other public agencies, City departments and the Community.
  - Implementing and evaluating maintenance activities in area of assignment; evaluate operations and activities of assigned responsibilities.
  - Recommending improvements and modifications.
  - Organizing and scheduling tree plantings, streambed cleaning and tree maintenance activities.
  - Coordinating and cooperating with school officials and community groups regarding program offerings and coordination of services.
  - Maintaining records and developing reports concerning new or ongoing programs and program effectiveness.

Tree species, native to central California and found in Roseville's open space oak woodland/savannah and riparian woodlands provide habitat and important resources for a wide variety of wildlife species including birds, bats, raccoon, mule deer, and beaver. Recognizing this important role, the OSPOMP identifies actions that promote healthy forest stands and the mitigation of oak trees within open space preserves, including[7]:

- Actions 7-7-5, 7-8-5, and 7-9-5: Remove or prune trees that are a fire or safety hazard, or have a disease that has the potential to spread rapidly and have a significant habitat impact (e.g., sudden oak death).
- Actions 7-7-6, 7-8-6, and 7-9-6: If not a hazard, retain declining, hollow, dead, or fallen oak trees as they have a significant value to wildlife for refuge, nesting, and food caching.
- Action 7-8-3: Supplement existing populations of oak trees by actively planting and maintaining acorns or seedlings where insufficient natural regeneration is resulting in a limited age class distribution.
- Action 7-9-3: Restore oak trees to areas appropriate for these species where they have been eliminated or severely reduced by past land use.

[7] Also see *Oak Regeneration Handbook*, Appendix 34 of the Open Space Preserve Overarching Management Plan.



Creek and Riparian Management Plan

The Roseville Creek and Riparian Management and Restoration Plan (RCRMRP) provides direction for the stewardship of Roseville's creek system and for preserving the benefits of this system to wildlife, flood management, and recreation. Native trees and forests are critical to the preservation and enhancement of the primary performance indicators of a healthy creek system:

- Water quality
- Aquatic habitat
- Channel stability
- Wildlife habitat

Riparian tree canopy reduces water temperatures and improves habitat for fish and other wildlife.

Riparian canopy reduces water temperatures, preserving water quality and aquatic food sources. Riparian root systems preserve the integrity of soils and stream channels, preventing erosion and sedimentation. Healthy lush forests are less susceptible to non-native and invasive plant species. Riparian vegetation helps maintain water quality by filtering sediment and nutrients and by moderating the duration and magnitude of storm runoff.

The Urban Forest Management Plan can support the recommendations and objectives of this plan through:

- Restoration of riparian habitat, including native trees
- Preservation and enhancement of native oak community and habitat within and adjacent to the City's creek corridors

Community Design Guidelines and Specific Plans

As identified in the General Plan, the Community Design Guidelines are the primary implementation measure for the goals and policies of the Community Design component and for enhancing the community's identity through the establishment of common design elements and expectations. The guidelines provide specific recommendations and requirements for all types of development, including commercial, industrial, and residential. Relative to public trees, the standards:

- Provide landscaping and tree requirements for streetscapes and parking areas
- Place an emphasis on tree placement for maximum shading of parking areas, sidewalks, and outdoor public spaces

An important principal of these standards is:

> *Integrate the natural and built environments by preserving and enhancing significant natural features with particular emphasis on native oak trees and woodlands.*

Specific Plans and Planning Areas provide additional details and requirements for design elements in defined areas.

Parking Lot Shade Requirements

Shading parking lots can have a big impact on reducing summertime temperatures. Unshaded asphalt surfaces are one of the greatest contributors to the urban heat island and can increase the overall ambient temperature of a community by as much as 9°F over a city, compared to air temperatures over adjacent rural areas (EPA). In warmer months, the difference in surface temperature between asphalt and vegetated (shaded) areas can be greater than 40°F. The composition and lack of solar reflection from an asphalt surface allows it to absorb and store greater amounts of solar energy (heat). Since asphalt stores heat so well, it remains warmer and releases stored heat long after the sun goes down (NASA, 1996).

In addition to heat island effects, the cabin temperature of a car parked in full sun can quickly reach 160 degrees and dark surfaces can reach temperatures of 180-200 degrees (NOAA, 2012). Parking in the shade reduces temperatures and the emissions from parked vehicles, including nitrogen oxides (NOx) and hydrocarbons, which are precursors to ozone (O_3) formation.

Parking Lot Shade Requirements are included in the Community Design Guidelines for commercial, industrial, and multi-family development, specifying:

> *Trees should shade at least 50% of the paved parking areas as measured at 15 year maturity based on the tree species and mid-summer sun angle conditions.*

Meeting parking lot shading goals requires the appropriate selection of tree species.

This is a good guideline that is in agreement with other communities in the region. The Planning Department strives to implement these requirements on all projects as a standard condition of approval. However, as written, it is only a suggested guideline rather than a requirement. Parking lot shade can have a big impact on controlling summertime temperatures as well as protecting air quality for the overall community. This is especially true for Roseville, with an overall impervious surface (e.g., streets, sidewalks, parking lots) of 46%.[8] Considering the impact on overall quality of life in the community, parking lot shade requirements should be adopted and enforced as a city ordinance. Meeting parking lot shading goals requires the appropriate selection of tree species. Small-stature species, like crape myrtle will never grow large enough to provide substantial shading.

[8] Urban Tree Canopy Assessment, 2013

Tree Protection

Roseville Municipal Code – Title 8 Parks and Recreation
- Chapter 8.04 Street Trees, Shrubs and Plants

Chapter 8.04 in the Municipal Code, also known as the Street Tree Ordinance, establishes rules and regulations relating to the planting, care, and maintenance of trees in, or which may overhang, public streets within the city.

Roseville Municipal Code – Title 19, Zoning
- Chapter 19.66 Tree Preservation

The Tree Preservation Code provides for the protection and preservation of native oak species equal to or greater than six (6) inches diameter at breast height (DBH):

- *Quercus douglasii*
- *Quercus lobata*
- *Quercus wislizenii*
- Hybrids of *Q. douglasii*, *Q. lobata*, or *Q. wislizenii*

The protection of large, native oaks during development is a requirement of Roseville's Tree Protection Code.

The Code requires a permit and defines the circumstances for conducting any regulated activities within the zone of protected trees, public or private, that may kill, destroy, harm, or cause the removal of a protected tree. While there are exemptions for hazardous situations that potentially could harm people or property, the Code regulates and defines enforcement procedures for activities within the protected zone, including trenching, grade changes, soil disturbance, construction, landscaping, and pruning.

When development necessitates the removal of a protected tree, the Code defines the requirements and options for replacement or mitigation. When trees are not replaced, the cost of mitigation fees is set by City Council resolution (currently $118/inch DBH). The fees are transferred into one or both of the following funds:

1. **Native Oak Tree Propagation Fund.** This fund shall be used to propagate, purchase, plant, protect and maintain native oak trees. Uses of the fund include, but are not limited to, purchasing property to plant or protect native oak trees, propagating native oak trees from seed or container stock and maintaining existing and replacement native oak trees.
2. **Non-Native Tree Fund.** This fund shall be used to purchase, plant, irrigate and maintain non-native trees within Roseville. Uses of the fund include, but are not limited to, purchasing and propagating non-native trees from seed or container stock and maintaining existing and replacement non-native trees.

Tree Permit Checklist

The Tree Permit Checklist outlines the required steps and documentation for acquiring a Tree Permit under the Tree Preservation Code.

Design and Construction Standards

The following construction and design standards apply to development on public right-of-way and certain private work.

City of Roseville Design Standards

Roseville's Design Standards apply to and provide direction for the construction of public improvements, improvements to rights-of-way, and certain private work. With regard to trees, these standards apply to:

- **Grading Standards** (Section 11 and 111) prohibit activity within the Protected Zone of a Native Oak or Landmark Tree without approval of a Grading Permit. Section E, *Grading Near Trees,* defines the procedures necessary to protect the health of protected trees.
- **Sidewalk Design Standards (Section 7)** provide minimum standards for curb and sidewalk design.
- **Sidewalk Construction Standards (Section 71)** provide standards for street improvements, including curb, sidewalk, and median construction.

Parks Construction Standards

The Parks Construction Standards (PCS) provide minimum standards for the design and construction of park and streetscape projects in Roseville. The standards include a list of the City's preferred and recommended tree species (Section 1), planting specifications (Section 4), and planting and irrigation details (Section 6).

Sidewalk Repair Specifications

Roseville's Sidewalk Repair Specifications include requirements for root pruning to protect the structural integrity of the tree.

The specifications for sidewalk repair (Public Works) include specific requirements for work within the drip line of any tree. These requirements include specifications for root pruning and clearance pruning for equipment access, both of which must be performed under the direction of the City Arborist. Removal of any tree requires the approval of the Director of Parks and Recreation and the Engineer. The specifications also require the contractor to maintain irrigation to existing landscaping and to provide protection for trees and other landscaping not scheduled for removal.

Tree Care Standards

The following tree care standards apply to public trees in Roseville:

City of Roseville Tree Pruning Standards

The City of Roseville Tree Pruning Standards provides requirements for City staff and contractors who maintain public trees. The standards identify requirements and best management practices for tree pruning in accordance with current industry standards.

City of Roseville Tree Planting Standards

The City of Roseville Tree Planting Standards provides direction and minimum requirements for planting public trees in Roseville. These standards apply to City staff and contractors.

Community Outreach

Community outreach and education are an important component of the urban forestry program. The engagement of residents in issues relative to public trees ensures that the community has an appreciation for the value and benefits of the urban forest and an understanding of the program and resources that are required to support its vitality and sustainability.

Community outreach and public engagement are vital to a successful urban forestry program.

Currently, the urban forestry program supports public tree plantings and community celebrations for Earth Day and Arbor Day. Roseville Electric's Shade Tree Program offers a rebate to residents who plant private trees of specific species in locations where they will provide shade to a home. In addition, the website offers information about the benefits of shade trees to residential and commercial properties along with helpful details on how to plant and care for trees. Increased programming for outreach and education are an integral part of the Urban Forest Master Plan.

Stakeholders

The urban forest has an impact on every resident, visitor, property owner and business in Roseville. The benefits of the community's trees extend beyond the city limits and the responsibility for their care and protection is shared by many individuals, volunteers, nonprofit organizations, city departments, and tree care professionals. The engagement and contribution of urban forest stakeholders was integral to the development of the Urban Forest Master Plan.

CAL FIRE

Under the authority of the Urban Forestry Act (PRC 4799.06 - 4799.12), the California Department of Forestry and Fire Protection's Urban & Community Forestry Program works to expand and improve the management of trees and related vegetation in communities throughout California. The mission of CAL FIRE's Urban Forestry Program is to lead the effort to advance the development of sustainable urban and community forests in California. In support of this mission, the program administers grants, under Propositions 40 and 84, for projects, including tree planting, municipal tree inventories, management plans, urban forest educational efforts, and other innovative urban forestry projects that advance the urban forestry efforts of California communities.

Nonprofit Organizations

The contribution of volunteers and nonprofit groups to a successful urban forestry program cannot be overemphasized. Roseville is fortunate to have the support of two nonprofit organizations dedicated to the promotion and stewardship of the urban forest; the Sacramento Tree Foundation and the Roseville Urban Forest Foundation. These organizations provide critical support for outreach, advocacy, and public tree plantings, including oak mitigation projects.

Nonprofit organizations provide critical advocacy and volunteer support for the urban forest.

Roseville Urban Forest Foundation

Founded in 1995, the Roseville Urban Forest Foundation (RUFF) is a nonprofit community membership organization that serves the Roseville community. It is their mission "to promote an awareness of the value and benefits . . ." of trees in Roseville. The foundation partners with the City to provide education, training, and volunteer support for tree planting and oak mitigation projects. RUFF was the original administrator of the Shade Tree Program and their website includes helpful information about choosing, planting, and caring for trees, including how to go about hiring an arborist.

With the development of the Urban Forest Master Plan, the City hopes to grow this important partnership by identifying essential issues for advocacy, including information about the urban forest and the urban forestry program, along with specific goals for greater collaboration.

Sacramento Tree Foundation

The Sacramento Tree Foundation, founded in 1982, is a well-established and highly successful nonprofit organization that provides advocacy, education, and volunteer support throughout the Sacramento region.

The Tree Foundation provides leadership and support for regional and local urban forest issues. They provide educational seminars, workshops, and coordination for volunteer projects. Their robust website includes information about tree care, recommendations for species, and opportunities for volunteering.

The Tree Foundation's Seed to Seedling program is responsible for the planting of tens of thousands of oak seedlings from acorns. The curriculum, developed for 3rd and 4th grade students, teaches the basics of tree science and provides direction for students to plant and sprout oak seedlings from acorns.

In 2000, the Sacramento Tree Foundation initiated the formation of the Greenprint Initiative, a regional plan to grow the urban forest and

maximize the benefits of trees. The Tree Foundation is responsible for organizing the annual Greenprint Summit, where participants, including urban forestry professionals, researchers, educators, and individuals with an interest in trees, join together to discuss and plan the future of the urban forest.

Greenprint

Spearheaded by the Sacramento Tree Foundation and adopted by 22 cities including Roseville and six counties in the greater Sacramento region, the Greenprint Initiative is intended to complement the regional smart growth plan, Blueprint. The initiative outlines a plan for growing the urban forest. It identifies steps to enhance the quality of life in the region by expanding the urban forest and maximizing the benefits of trees, including:

- Doubling the region's tree canopy
- Planting 5 million trees
- Achieving a 35% average canopy cover in the region

Tree growth rings represent increasing levels of commitment and benchmarks for progress in the areas of management, policy, and community partnerships (Figure 8 and Table 2). The model encourages flexibility for communities to advance on an individual basis. Achieving the fourth growth ring is the ultimate goal. Currently the City of Roseville is completing the third growth ring. In 2012, the City of Roseville was honored with a Growing Greenprint award for taking a leadership role and evidencing a strong commitment to advancing the initiative.

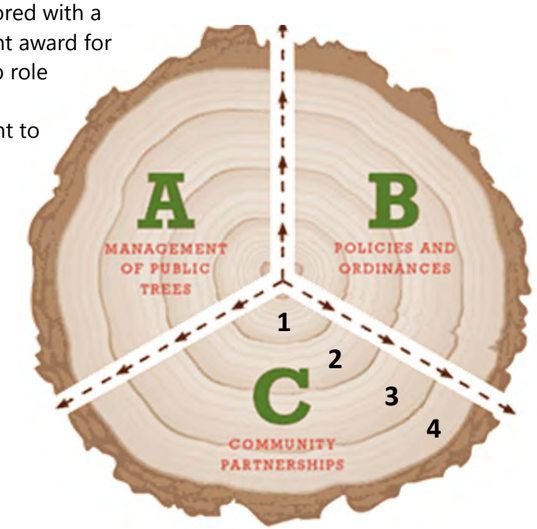


Figure 8 The elements of Greenprint are illustrated by growth rings, representing increasing levels of commitment and benchmarks for progress in management, policy, and community partnerships.

Table 2. Elements of Greenprint Growth Rings and Roseville's current Level of Attainment

Greenprint Growth Rings and Roseville's Attainment			
Growth Ring 1		Growth Ring 2	
Maintain public trees on an emergency basis	✓	Assign a liaison to the Greenprint Clearinghouse	
Become a Greenprint participant	✓	Conduct an urban forest value assessment	✓
		Convene interdepartmental urban forest stakeholder working group	
		Develop stage 1 of urban reforestation program	
Growth Ring 3		Growth Ring 4	
Develop stage 2 of urban reforestation program components		Form an urban forest department/hire an urban forest coordinator	✓
Adopt an urban forest master plan		Conduct biannual urban forest department evaluations	
Adopt staff education and certification guidelines		Publish a state of the urban forest report on 5-year intervals	

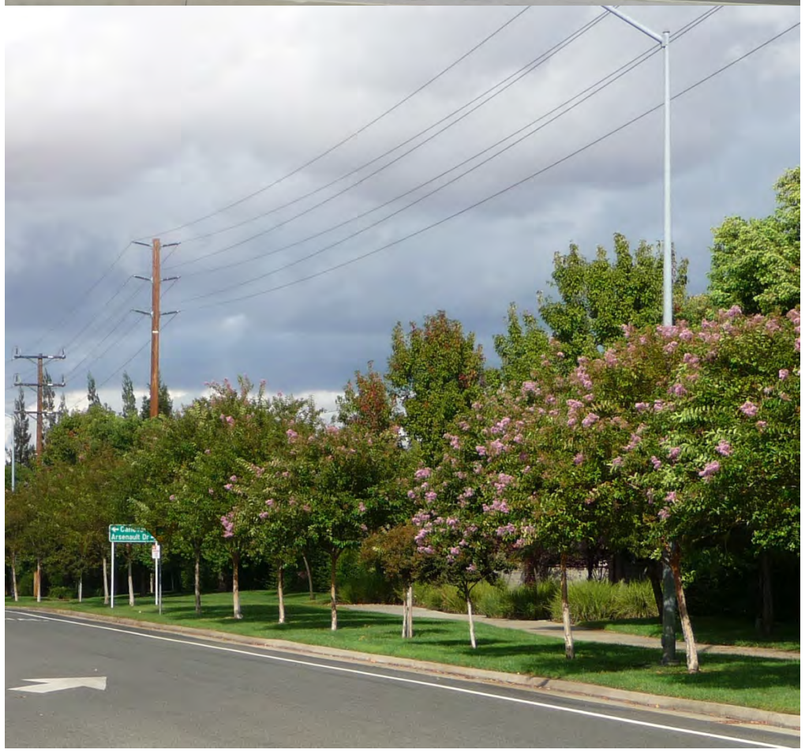
Dry Creek Conservancy

Organized in 1996, The Dry Creek Conservancy is a nonprofit organization that focuses on watershed conservation, restoration, and education in support of regional watersheds. They work with the City to monitor water quality, promote education and stewardship, and to restore streams and creeks for fish and wildlife habitat.

Roseville Coalition of Neighborhood Associations

Formed in 1993 by the Roseville Police Department, the Roseville Coalition of Neighborhood Associations (RCONA) represents 39 neighborhoods and encompasses all areas of the City. RCONA provides structure and a communications network to connect residents, property owners, businesses, and neighborhood groups. The purpose of RCONA includes engaging community participation in quality of life issues, facilitating communication within and between neighborhoods, and resolving social, physical, and economic issues and disparity throughout the community.

RCONA provides a vital opportunity to communicate with the community and increase advocacy and engagement for the urban forestry program and for achieving the goals of the master plan.



Electric Utilities

Tree versus utility conflicts are a common source of concern for electric providers. Trees that grow into power lines can cause electrical outages and fires. They can even conduct an electric shock to someone who comes into contact with a tree that is contacting a high-voltage line.

Trees that grow into power lines can cause electrical outages and fires. They can even conduct an electric shock to someone who comes into contact with a tree that is contacting a high-voltage line.

During plan development, Davey Resource Group contacted electric companies with utility assets (electric transmission and distribution lines) in Roseville. In addition to providing notification of the pending Urban Forest Master Plan, utility representatives were invited to participate in the planning process. The following companies provided input and suggestions for the Plan:

- Roseville Electric
- Pacific Gas and Electric
- Western Area Power Administration
- Sacramento Municipal Utility District

In California, all utility providers are subject to General Order 95; Rule 35 Vegetation Management (California Public Utilities Commission, revised 2012) and FAC-003-2 Transmission Vegetation Management (NERC) which outline requirements for vegetation management in utility easements. These requirements include clearance tolerances for trees and other vegetation growing in proximity to overhead utilities.

Trees located under utility lines should be directionally pruned by trained, authorized line clearance personnel only to provide clearance and/or reduce height. Selecting small-stature tree species that are utility friendly for planting sites in utility rights-of-way can minimize the need for these maintenance activities.

The City's Urban Forester cooperates fully with local utility agencies to facilitate vegetation management in utility corridors. Whenever possible, with the exception of emergency situations, utility agencies notify the Urban Forester when tree removal is required. In special cases, such as heritage oaks and other significant trees, the Urban Forester works with the utilities to develop preservation standards and special pruning requirements that preserve the tree(s), while fully complying with utility regulations.

Other Utilities

In addition to electrical utilities, there is a potential for urban trees to be in conflict with water, sewer, stormwater, and natural gas lines. To avoid these potential conflicts, the Urban Forester works with utility providers and managers to ensure that trees planted in proximity to utility easements are located properly to avoid conflicts and provide access for utility maintenance activities.

Internal Stakeholders

While it may not be their primary focus, many individuals and departments within the City share some level of responsibility for the community urban forest, including planning for, caring for, and/or affecting the policy of urban forest assets.

Davey Resource Group worked with the Urban Forester to identify City departments and individuals who have a stake in the management of Roseville's public trees. Stakeholders were invited to participate in an interview and discussion about their role and perspective for the urban forest as well as their views, concerns, and ideas for the Urban Forest Master Plan. Internal stakeholders who contributed to the planning process included representation from the following departments and divisions:

- *Building Maintenance*
- *City Manager's Office*
- *Environmental Utilities*
  - *Water Conservation*
- *Flood Plain Management*
- *IT/GIS*
- *Open Space*
- *Parks, Recreation & Libraries*
  - *Open Space*
  - *Park Maintenance*
  - *Park Development*
- *Planning*
- *Public Works*
  - *Alternative Transportation*
  - *Engineering*
  - *Stormwater/Flood Plain Management*
  - *Street Maintenance and Sidewalk Repair*
  - *Traffic Engineering*
- *Risk Management*
- *Roseville Electric*

Concerns, requests, and suggestions from all stakeholders were of primary concern and were provided full consideration in the development of the Urban Forest Master Plan.

Urban Tree Canopy Assessment

The amount and distribution of leaf surface area (tree canopy) is the driving force behind the urban forest's ability to produce benefits for the community (Clark et al, 1997). As canopy cover increases, so do the benefits contributed by leaf area. These benefits, which include energy savings, air quality, water quality, stormwater interception, aesthetic and other socio-economic benefits can be quantified for their value to the community.

The amount and distribution of leaf surface area (tree canopy) is the driving force behind the urban forest's ability to produce benefits for the community.

Understanding the location and extent of tree canopy is a critical key to developing and implementing sound management strategies that promote the smart growth and sustainability of Roseville's urban forest resource and the invaluable benefits it provides. To acquire this information, the City of Roseville contracted with Davey Resource Group (DRG) in August 2012 to conduct an Urban Tree Canopy (UTC) Assessment using high-resolution aerial imagery and remote sensing software[9]. The assessment resulted in GIS map detailing the location and extent of existing tree canopy (public and private) along with other primary landcover classifications, including impervious and pervious surfaces, bare soils, and water. The assessment identifies and summarizes the current overall landcover classification as:

- 15.7% Tree Canopy
- 46.2% Impervious Surfaces

Urban Tree Canopy and Geographic Information Systems (GIS)

Urban Tree Canopy is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. The UTC assessment does not distinguish between publicly-owned and privately-owned trees. Since trees provide benefits to the community that extend beyond property lines, the assessment includes all tree canopy within the borders of the community. To place tree canopy in context and better understand its relationship within the community, the assessment included other primary landcover classifications, including impervious surfaces, pervious surfaces, bare soils, and water.

As more communities focus attention on environmental sustainability, community forest management has become increasingly dependent on geographic information systems (GIS) for urban tree canopy mapping and analysis. Understanding the extent and location of existing canopy is key to identifying various types of community forest management opportunities, including:

- Future planting plans
- Stormwater management
- Water resource and quality management
- Impact & management of invasive species
- Benefit stream of preservation and sustainability
- Outreach and education

High resolution aerial imagery and infrared technology was used to remotely map tree canopy and land cover over the City limits (Figure 9). The results of the study provide a clear picture of the extent and distribution of urban tree canopy within the City of Roseville. The data developed during the assessment becomes an important part of the City's GIS database and provides a foundation for developing community goals and urban forest policies. The primary purpose of the assessment was to establish a benchmark value to measure the success of long-term management objectives over time.

High resolution aerial imagery and infra-red technology was used to map tree canopy and other land cover over Roseville.

With this data, managers can determine:

- Roseville's progress towards local and regional canopy goals.
- Changes in tree canopy over time and in relation to growth and development.
- The location and extent of canopy at virtually any level, including neighborhood, land use, zoning, parking lots and parcels.
- The location of available planting space and develop strategies to increase canopy in underserved areas.

The data, combined with existing and emerging urban forestry research and applications, can provide additional guidance for determining a balance between growth and preservation and aid in identifying and assessing urban forestry opportunities.

Figure 9. Assessing Land Cover through Remote Sensing. High resolution aerial imagery is used as the basis for identify existing land cover (Top). Infrared technology delineates living vegetation including tree canopy, low level vegetation, and turf areas (Middle). Remote sensing software is used to identify and map tree canopy, pervious and impervious surfaces, bare soil, and water bodies (Bottom)

[9] Methodology for the UTC Assessment is discussed in Appendix A

Land Cover Summary

The City of Roseville encompasses a total area of 41.9 square miles. This includes recent annexations of approximately 5.7 square miles (3,636 acres) of mostly undeveloped, agricultural lands (Reason Farms/Al Johnson Wildlife Area). This area was excluded from the assessment because it does not accurately reflect the urban character of the community. In addition, within the city limits is 0.75 square miles (480.6 acres) of railroad right-of-way (ROW) that was also excluded since it is unsuitable to sustain tree canopy. Consequently, the project area for the Urban Tree Canopy Assessment considered an overall area of 35.5 square miles (22,715.4 acres) (Map 1).

Excluding impervious surfaces (10,504 acres), open water (61 acres), and other unsuitable sites (64 acres), Roseville includes 16.6 square miles (10,629 acres) with the potential to support tree canopy. Using remote image sensing and GIS analysis, DRG determined that the following information characterizes land cover within the City of Roseville:

- 5.6 miles^2 (3,563 acres) of overall tree canopy, including trees and woody shrubs, was identified in the landcover assessment, an average tree canopy cover of 15.7%.
- Considering suitable planting sites on areas of existing pervious surface and bare soil (7,037 acres) and existing canopy (3,563 acres), the overall canopy potential for Roseville is 46.7%.
- 16.4 miles^2 (10,504 acres) of overall impervious surfaces, including roads and structures, was identified in the assessment, an average impervious surface cover of 46.2%.
- 13.1 miles^2 (8,366 acres) of overall pervious surfaces, including grass and low-lying vegetation, was identified in the assessment, an average pervious surface of 36.8%.
- 61 acres of open water was identified in the assessment, an overall average open water of 0.1%.
- 221 acres of bare soils was identified in the assessment, an average overall bare soil of 0.4%.
- 244 acres of tree canopy is in parks and golf courses, an average canopy cover of 20.8%.
- 699 acres of tree canopy is in open space areas, an average canopy cover of 27.6%.
- Roseville's urban forest annually sequesters 15,344 tons of carbon.

Roseville's urban forest improves air quality by annually removing 441.5 tons of pollutants, including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), and particulate matter (PM_{10}).

Environmental Benefits

The landcover data resulting from the UTC analysis was used with i-Tree Vue (i-Tree) to estimate the environmental benefits from Roseville's entire urban forest (public and private). While not as accurate as performing an i-Tree Eco study, which is based on actual sample data from the local project area, Vue uses state averages for pollution removal and carbon sequestration to provide broad estimates of these values.

Carbon Sequestration

Roseville's urban forest is currently storing 358,957 tons of Carbon (CO_2), valued at $7.5 million. **Annually, this resource sequesters an additional 15,344 tons of CO_2, valued at $298,071.**

Annual Air Quality Benefits

In addition to CO_2, Roseville's urban forest is improving air quality by annually removing 191.7 tons of pollutants, valued at more than $1.6 million (Figure 10), including:

- 158,790 pounds of ozone (O_3), valued at $810,799
- 132,588 pounds of particulate matter (PM_{10}), valued at $452,008
- 60,699 pounds of nitrogen dioxide (NO_2), valued at $309,934
- 20,406 pounds of sulfur dioxide (SO_2), valued at $25,508
- 10,966 pounds of carbon monoxide (CO), valued at $7,953

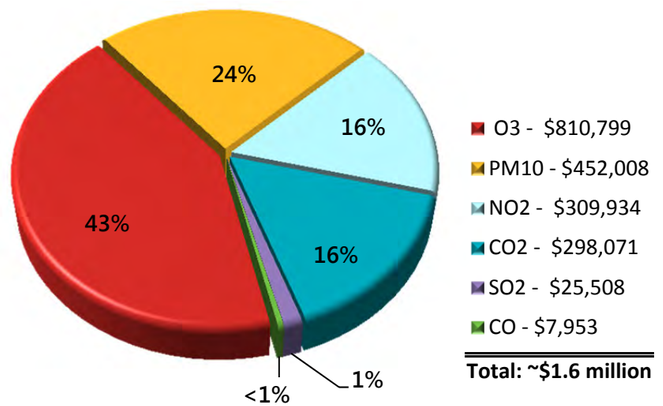


Figure 10. Annual environmental benefits from Roseville's overall tree canopy

Overall Land Cover Classification

Excluding railroad right-of-way, the Roseville project area encompasses a total of 35.5 square miles (22,715.4 acres). Land cover classification within the boundary includes the following (Figure 11):

- 15.7% – Canopy, 3,563.1 acres
- 46.2% – Impervious surfaces, 10,503.7 acres
- 36.8% – Pervious surfaces, 8,366.3 acres
- 0.3% – Open water, 61.3 acres
- 1% – Bare soil, 221.1 acres

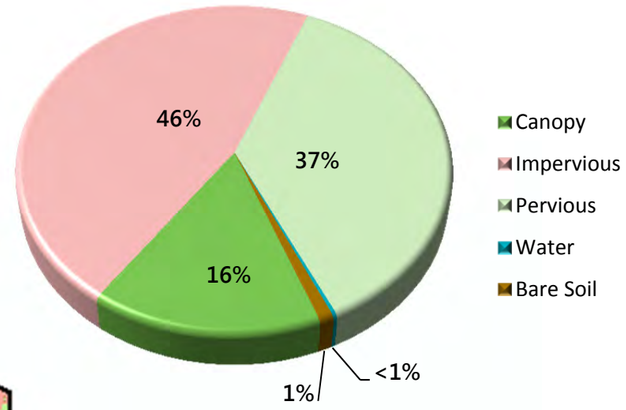


Figure 11. Overall land cover classification

We plant trees not for ourselves, but for future generations.

~ Caecilius Statius, 220-198 B. C.

Map 1. Roseville land cover

Tree Canopy by Land Use

Land use is a reflection of development patterns and the community's plan for growth in specific areas (Map 2). Canopy cover can vary significantly between different land uses. Parks and suburban residential areas typically have less impervious surface and are able to support a greater percent of tree canopy. Because they generally have a high proportion of impervious surface, industrial areas often have a lower percentage of tree canopy.

Land Use

Considering land use, Open Space has the highest average canopy cover at 26.5%, followed by Parks and Recreational (22.9%), and Medium Density Residential (18.3%). Industrial land use parcels have the lowest average canopy cover at 5% (Figure 12 and Table 3).

Table 3. Tree Canopy and Impervious Surface by Land Use

Land Use	Total Acres	Canopy	% Canopy	Impervious	% Impervious
Open Space	2215.53	587.71	**26.53%**	67.98	**3.07%**
Park and Recreational	1975.23	452.76	**22.92%**	160.99	**8.15%**
Medium Density Residential	754.81	137.84	**18.26%**	395.02	**52.33%**
Low Density Residential	9641.92	1709.87	**17.73%**	5195.25	**53.88%**
High Density Residential	629.00	98.38	**15.64%**	348.95	**55.48%**
Commercial	2735.98	269.27	**9.84%**	1854.00	**67.76%**
Public/Quasi-Public	1104.97	81.31	**7.36%**	475.42	**43.03%**
Industrial	2124.01	105.25	**4.96%**	918.88	**43.26%**
Total	**21181.45**	**3442.39**		**9416.49**	

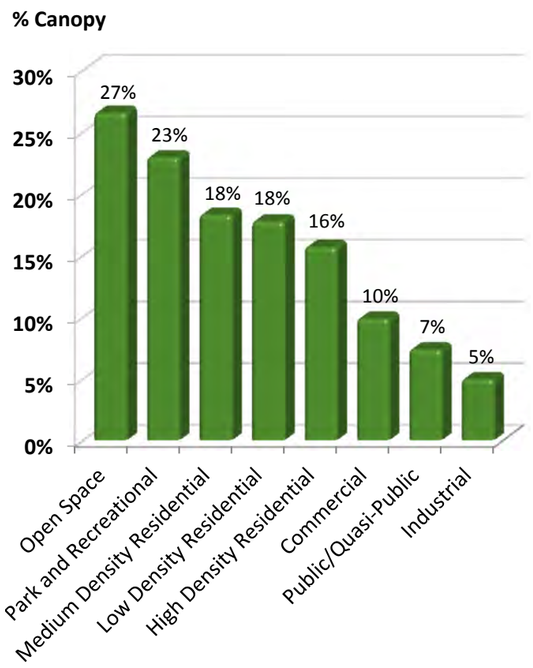
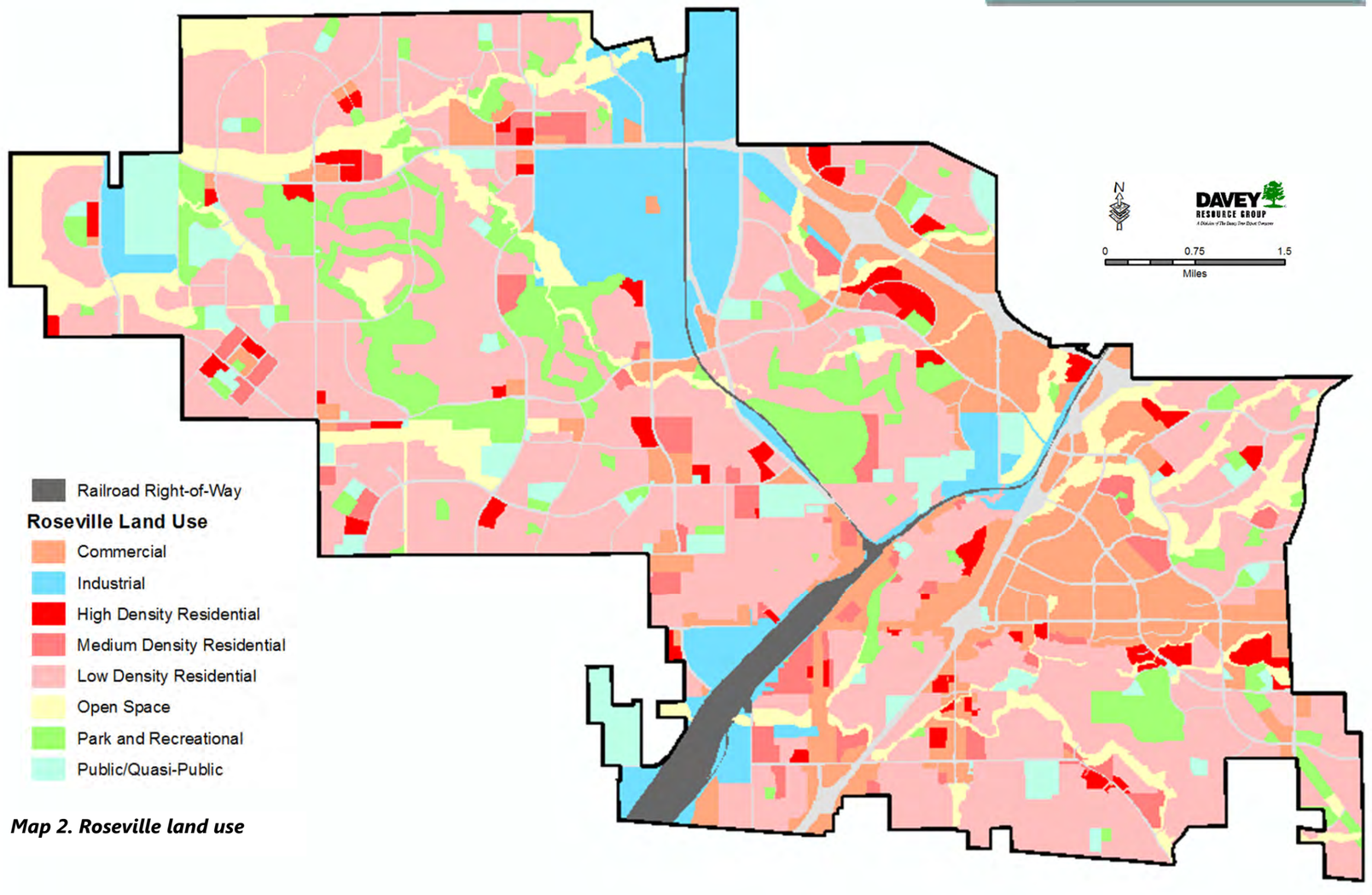


Figure 12. Canopy cover by Land Use



Map 2. Roseville land use

> ***"One of the main reasons I tell people this is one of the best places to live is the trees."***
>
> *~ Survey respondent*

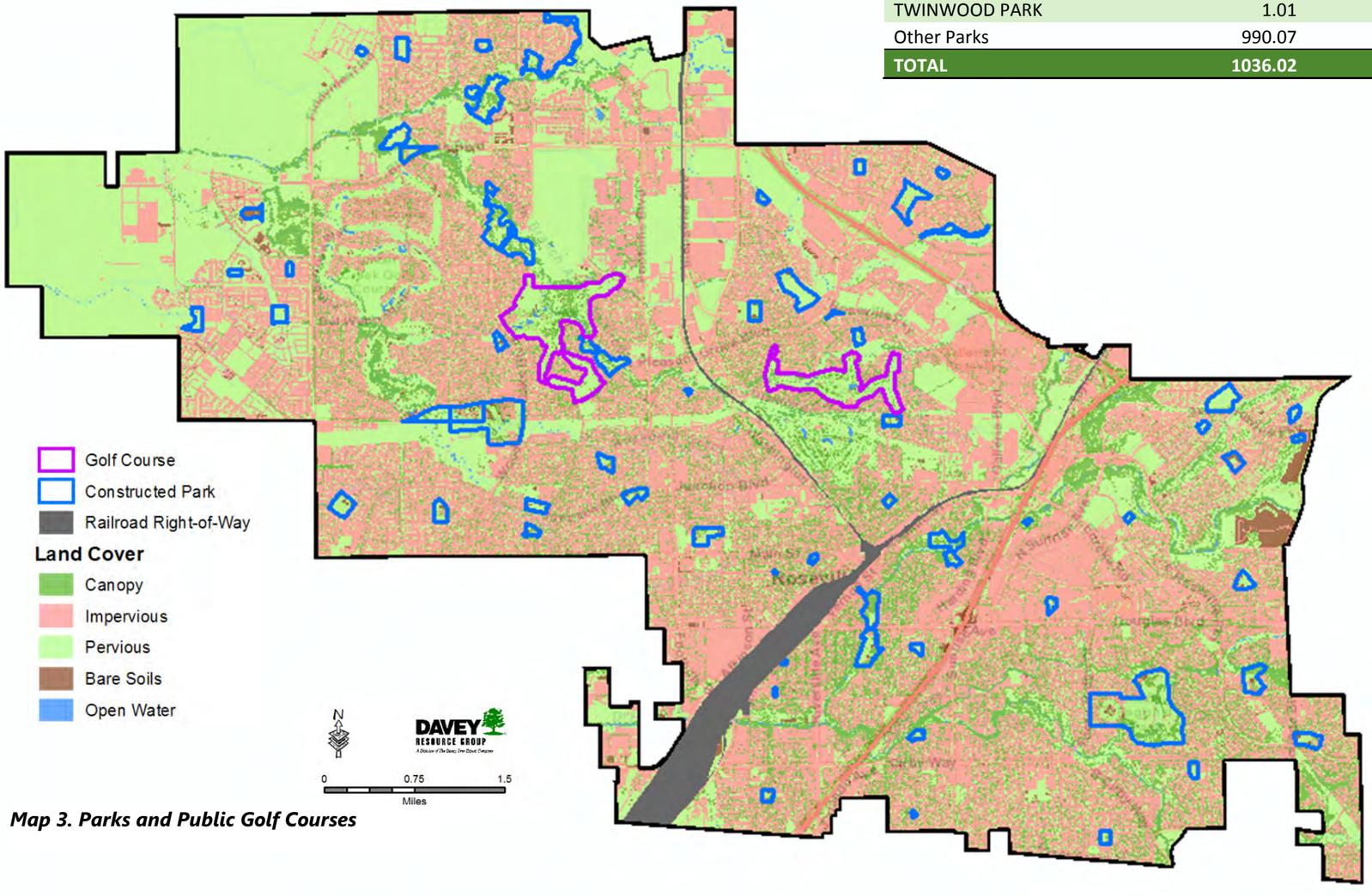
Parks and Public Golf Courses

Roseville's 63 parks encompass 1,036 acres and include 244 acres of tree canopy for an overall average canopy cover of 23.5% (Table 4). Roseville's largest park area, Woodcreek Oaks Golf Course (208 acres), has 47 acres of tree canopy and an average canopy cover of 22.8% (Map 3 and Appendix A, Table 6).

Kenwood Oaks Park (0.9 acres) has the highest canopy cover at 69%, followed by Woodbridge Park (2.9 acres) at 59.9% canopy cover, and Sculpture Park (0.8 acres) at 59.8% canopy cover.

Table 4. Roseville's Top Ten Parks by Greatest Overall Canopy Cover Average

Park Name	Park Acres	Canopy Acres	% Canopy
KENWOOD OAKS PARK	0.89	0.61	**68.54%**
WOODBRIDGE PARK	2.94	1.76	**59.86%**
SCULPTURE PARK	0.82	0.49	**59.76%**
ROYER PARK	14.76	8.53	**57.79%**
EASTWOOD PARK	4.07	2.29	**56.27%**
R.F. (RUBE) NELSON PARK	0.74	0.41	**55.41%**
WEBER PARK	1.90	1.01	**53.16%**
LINCOLN ESTATES PARK	5.22	2.77	**53.07%**
WILLIAM L. TAYLOR PARK	13.60	6.69	**49.19%**
TWINWOOD PARK	1.01	0.49	**48.51%**
Other Parks	990.07	218.66	-
TOTAL	**1036.02**	**243.71**	**23.52%**



Map 3. Parks and Public Golf Courses

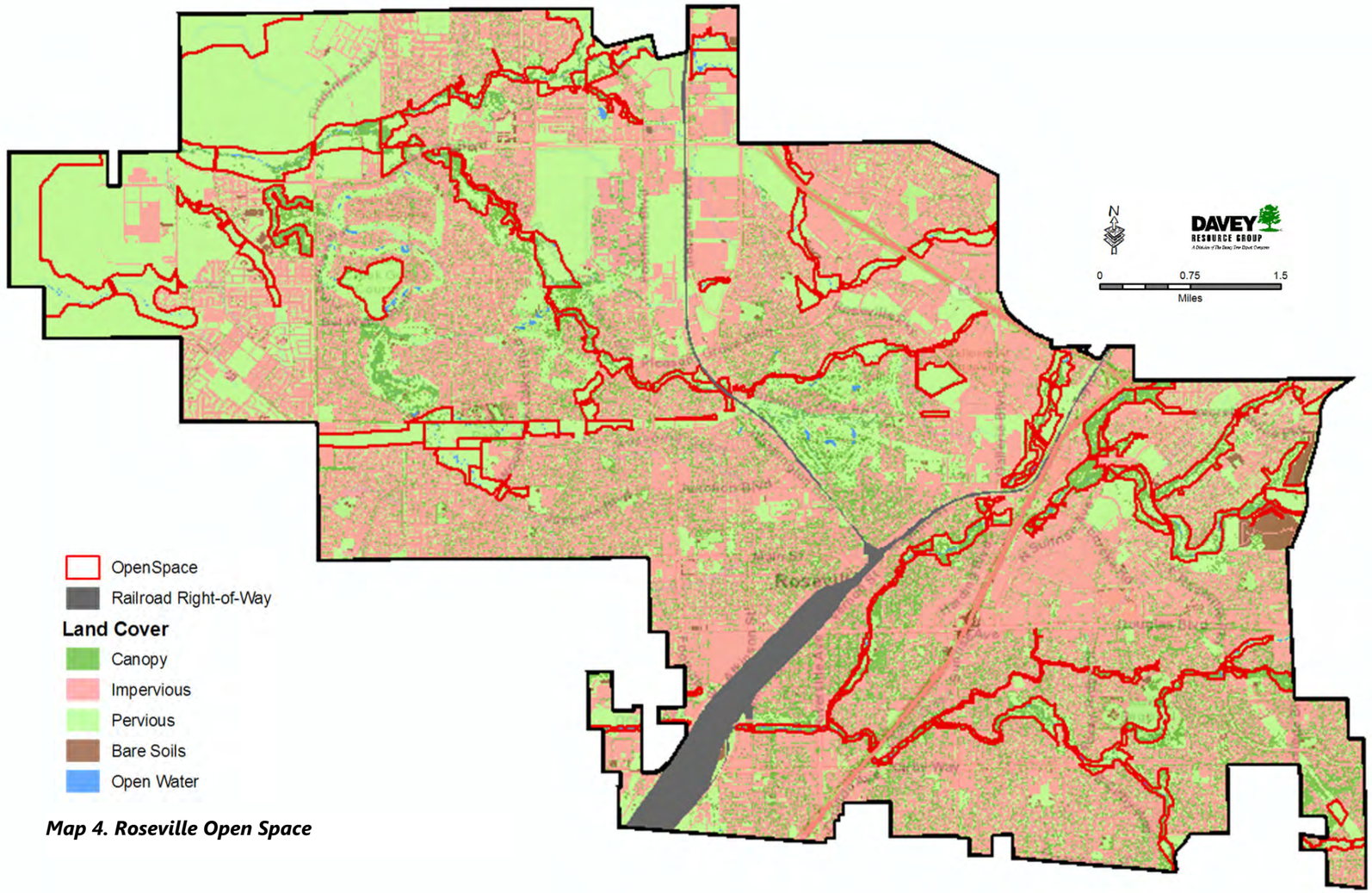
Open Space

Roseville enjoys approximately 4,275 acres of open space preserves, which include federally protected vernal pool preserves, oak woodlands, watershed and riparian areas, and greenbelts. The canopy assessment considered 2,533 acres of open space, including 699 acres of tree canopy and an average canopy cover of 27.6% (Map 4).

Roseville has nearly 700 acres of tree canopy in open space areas.

"I am new in the state and as I find myself becoming acquainted with the different areas around Sacramento, Roseville stands out to me for their use of urban forestry and for the beauty its trees bring. It makes Roseville an inviting place and makes a statement that the people who live there care. I want to live there."

~ Survey respondent



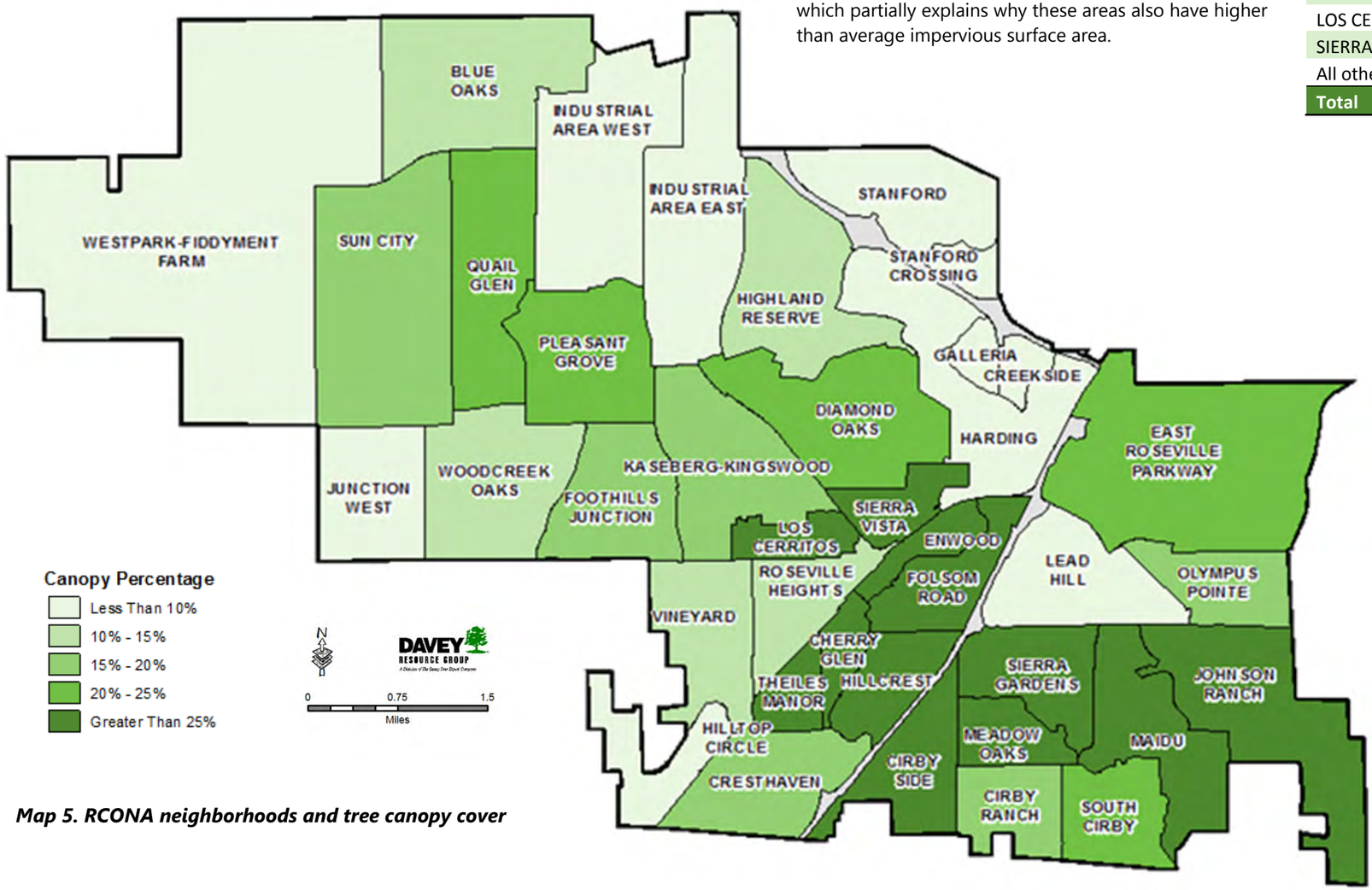
Map 4. Roseville Open Space

Roseville Coalition of Neighborhood Associations (RCONA)

The City of Roseville is divided into 39 neighborhoods, represented by the Roseville Coalition of Neighborhood Associations (RCONA) (Map 5). RCONA neighborhoods encompass all areas of the City with the exception of most rights-of-way along Interstate 80 and Highway 65 (SR 65). Excluding the railroad right-of-way, RCONA neighborhoods include 22,361 acres of land with 3,549 acres of canopy for an average canopy cover of 15.9% (Table 5).

The largest neighborhood, Westpark-Fiddyment Farm (3,337 acres), includes 129 acres of canopy for an average canopy cover of 3.4% and 602 acres of impervious surfaces (18%) (Appendix A, Table 7). This is a very new development with a lot of open space and preserve areas and many neighborhood parks. At this time, there are a number of very young trees that have been planted in both public and private space that have yet to develop substantial canopy. As these trees continue to mature, overall canopy cover can be expected to increase throughout the neighborhood. There are also a significant number of vacant lots (commercial and residential) that have yet to be developed. As these lots are developed, impervious surfaces will also increase.

Established in 1907, the Cherry Glen neighborhood (136 acres) has the highest average canopy cover of 37.6%, followed by Enwood (36% canopy cover), and Theiles Manor (36% canopy cover). These neighborhoods include some of the oldest, and largest, trees in Roseville. However, the planting strips (area between curb and sidewalk) that support many of these large trees are quite small (~5 feet wide), which partially explains why these areas also have higher than average impervious surface area.



Map 5. RCONA neighborhoods and tree canopy cover

Table 5. Top Ten RCONA Neighborhoods based on greatest canopy cover

RCONA NAME	RCONA Acres	Canopy Acres	% Canopy	Impervious	% Impervious
CHERRY GLEN	136.27	51.18	**37.56%**	72.00	**52.83%**
ENWOOD	152.08	54.76	**36.01%**	70.26	**46.20%**
THEILES MANOR	157.04	56.52	**35.99%**	71.87	**45.77%**
HILLCREST	284.94	93.06	**32.66%**	137.06	**48.10%**
JOHNSON RANCH	928.87	289.77	**31.20%**	446.13	**48.03%**
MEADOW OAKS	220.13	66.99	**30.43%**	122.45	**55.63%**
SIERRA VISTA	203.83	60.78	**29.82%**	99.00	**48.57%**
FOLSOM ROAD	333.78	98.28	**29.44%**	184.38	**55.24%**
LOS CERRITOS	165.80	45.02	**27.15%**	91.13	**54.96%**
SIERRA GARDENS	408.71	107.98	**26.42%**	227.58	**55.68%**
All others	19369.98	2624.28	--	9302.96	--
Total	**22361.44**	**3548.62**	**15.87%**	**10290.41**	**46.02%**

"As a recent transplant . . . I truly appreciate the beauty added by Roseville's trees. They are a huge asset and add immeasurable value to the city. I am so thankful to you for providing these trees for my family, especially my young children."

~ Survey respondent

Natural Resources Inventory

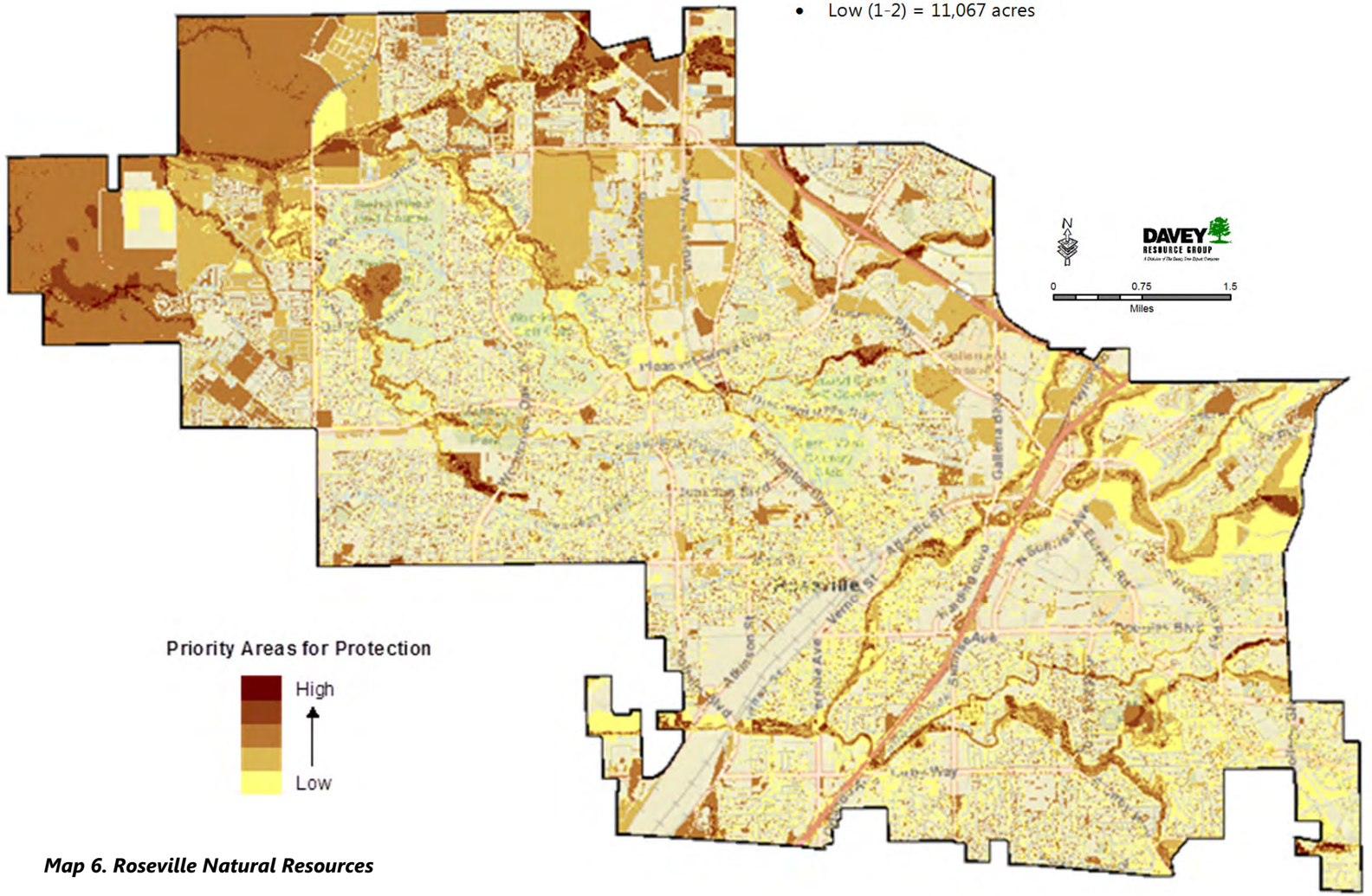
In addition to identifying priority planting sites, the UTC analysis included identification of natural resources and areas that should be prioritized for protection and preservation (Map 6).

Areas identified as canopy cover and pervious surfaces were used as a baseline study for the Natural Resource Inventory. To evaluate the quality of the resources and identify areas where multiple features intersect, and therefore, provide increased benefits, additional secondary source data were included in the analysis, including:

- Floodplains
- Soils
- Topography
- Riparian corridors
- Wetlands

Where multiple features intersect, the value of the resources increases. These higher scoring areas provide multiple functions and benefits and should be considered high priority for protection and preservation. Based on this analysis, the following summarizes the acres identified for protection:

- High (5-7) = 165 acres
- Medium (3-4) = 7,144 acres
- Low (1-2) = 11,067 acres



Map 6. Roseville Natural Resources

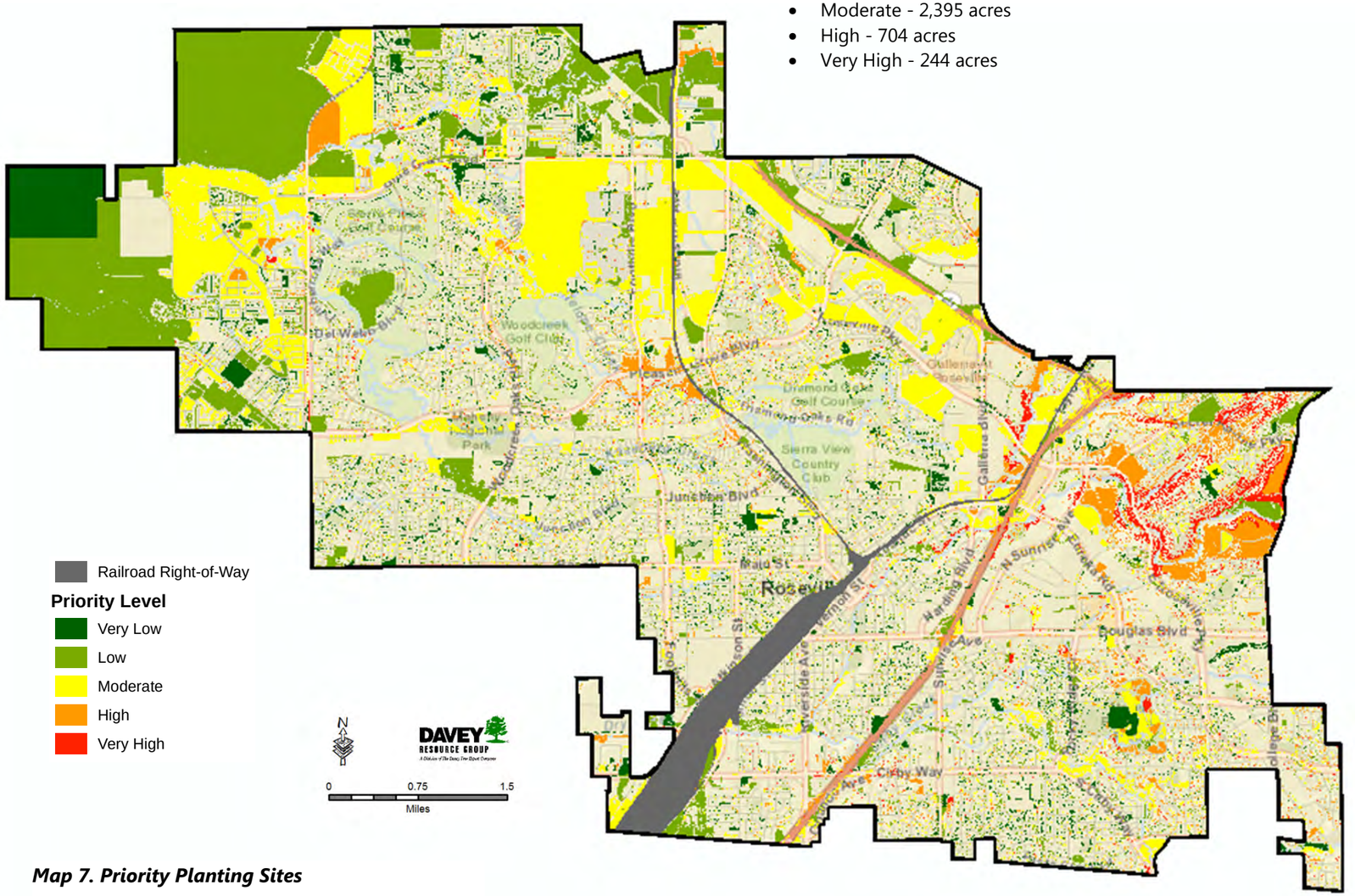
Priority Planting Sites

Some planting sites are more beneficial than others. Roseville's UTC analysis included consideration of environmental factors and natural resources to develop a planting priority for sites at greatest risk for soil loss or degradation.

To identify and prioritize risk, Davey assessed a number of environmental features, including existing canopy and land cover, soil permeability (where available), and slope. Each of these features was used to create individual grids that were assigned a value between 1 and 5, with the exception of soil which was assigned a value between 1 and 4. By overlaying these grid maps and adding the values at any given point, a priority planting scale was developed based on the level of risk (Map 7, Figure 13). Planting trees in areas of high and very high risk can reduce the risk of soil loss and degradation from storm and flood events.

The analysis identified the following acres of planting sites based on risk of erosion:

- Very Low - 888 acres
- Low - 2,807 acres
- Moderate - 2,395 acres
- High - 704 acres
- Very High - 244 acres



Map 7. Priority Planting Sites

Figure 13. Planting sites identified according to risk of soil loss or degradation (e.g., erosion).

Forest Fragmentation

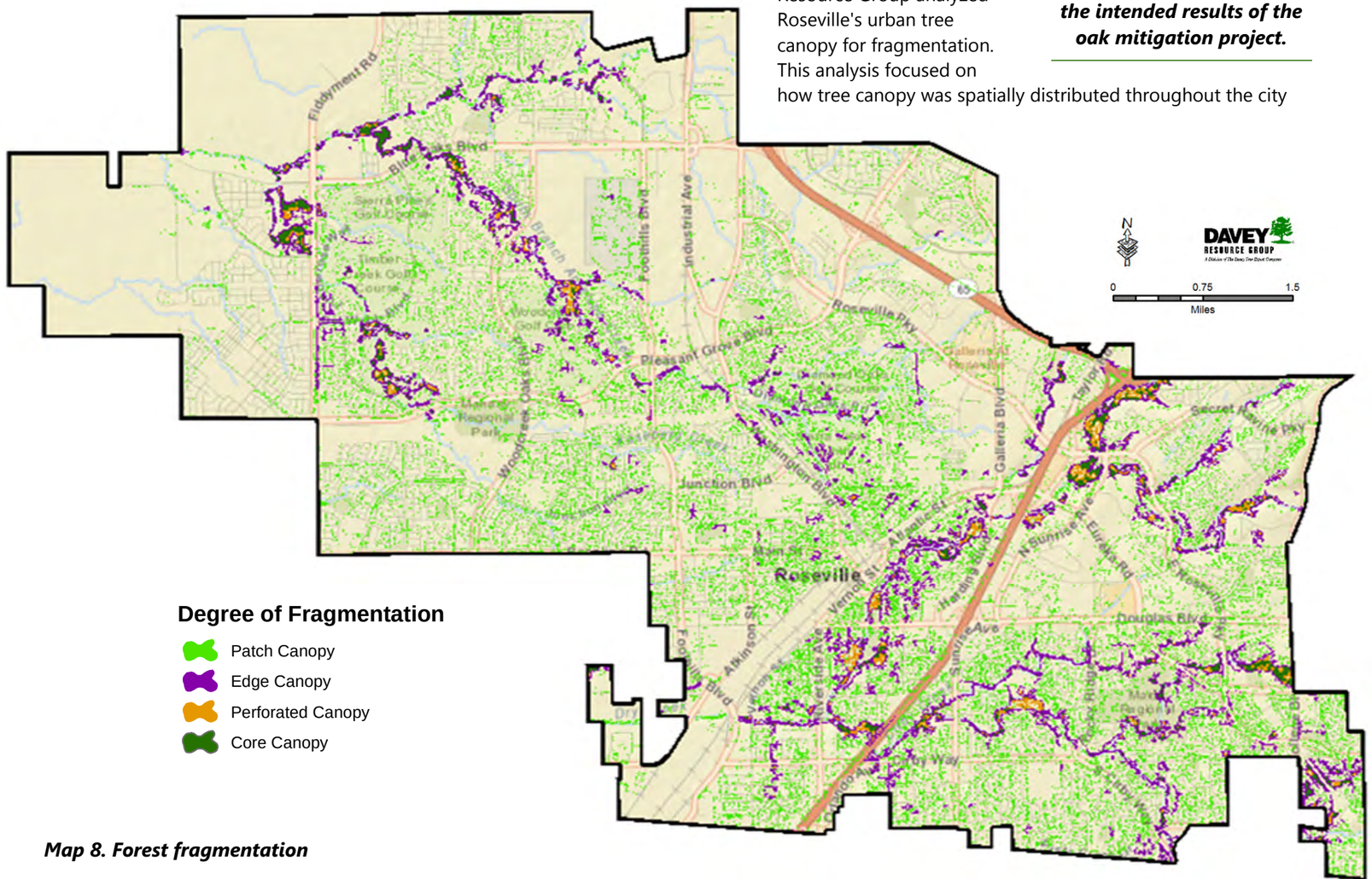
Forested areas provide numerous environmental and socioeconomic benefits to city residents, but the benefits to wildlife may not always be fully appreciated. The urban ecosystem is extremely complex and diverse; existing in a multitude of layers formed by small, functional ecosystems that together form a larger system. The overall health of the urban ecosystem depends heavily on the ability of the trees, plants, wildlife, insects, and humans to interact collectively as a whole. However, a key factor in declining urban health is urban buildup and sprawl, which can lead to the removal and/or decrease of canopy across a city. Often this effect causes canopies to succumb to forest fragmentation and leads to degradation of ecosystem health, which in turn leads to a decline in habitat quality and canopy connectivity. This decline results in changes and imbalance to microclimates and increases the risk and susceptibility to invasive species. Increasing the connectivity of the forest canopy is one of the intended results of the oak mitigation project.

The overall health of the urban ecosystem depends heavily on the ability of the trees, plants, wildlife, insects, and humans to interact collectively as a whole.

As a part of the UTC assessment, Davey Resource Group analyzed Roseville's urban tree canopy for fragmentation. This analysis focused on how tree canopy was spatially distributed throughout the city and provided an index displaying the degree of fragmentation (Map 8, Figure 14). Often, the health and diversity of the overall canopy can be greatly improved by creating linkages between multiple patches of forest. The analysis found that Roseville's urban forest includes the following:

Increasing the connectivity of forest canopy is one of the intended results of the oak mitigation project.

- 156 acres of Core Canopy. Tree canopy that exists within and relatively far from the forest/non-forest boundary (i.e., forested areas surrounded by more forested areas).
- 137 acres of Perforated Canopy. Tree canopy that defines the boundary between core forests and relatively small clearings (perforations) within the forest landscape.
- 938 acres of Edge Canopy. Tree canopy that defines the boundary between core forests and large non-forested land cover features. When large enough, edge canopy may appear to be unassociated with core forests.
- 2,338 acres of Patch Canopy. Tree canopy that comprises a small forested area that is surrounded by non-forested land cover.



Map 8. Forest fragmentation

Figure 14. Forest fragmentation is identified by canopy structure

Tree Canopy and Stormwater Management

Roseville is fortunate to enjoy a natural system of watersheds and wetlands within its open space preserves that contribute to stormwater management and preserve water quality.

According to Federal Clean Water Act regulations, municipalities must obtain a permit for managing their stormwater discharges into water bodies. Each city's program must identify the best management practices (BMPs) it will implement to reduce its pollutant discharge. Nationwide, non-point source pollution is one of the biggest contributors to poor water quality. Non-point source pollution occurs when stormwater deposits surface contaminants into surface or ground water. Preventing non-point source pollution and reducing stormwater runoff is becoming a serious environmental concern for many communities.

Trees and forests can be a natural, cost-efficient, and highly effective part of a stormwater management program (Figure 15). Many communities are turning to trees to help solve their stormwater issues in a less costly and more holistic manner. Engineered and natural stormwater systems that incorporate and take advantage of the natural benefits provided by trees and forests are providing to be more cost-effective and sustainable than traditional detention and treatment methods.

While there are many methods and construction designs available for integrating urban trees into stormwater management infrastructure, including pervious pavement systems, suspended sidewalks, structural soils, bioswales, and stormwater tree pits, some of these designs can be costly to implement. Preserving natural or engineered forest stands and existing trees before, during, and after development can reduce runoff from urban and suburban properties and effectively solve many stormwater issues before they become costly and/or detrimental to the surrounding environment.

Roseville is fortunate to enjoy a natural system of watersheds and wetlands within its open space preserves that contribute to stormwater management and preserve water quality. The City is situated primarily within two large watersheds, the Pleasant Grove Watershed and the Dry Creek Watershed. Wetland areas within these watersheds include intermittent drainage and creeks, vernal pools, marshes, seasonal wetlands and drainage swales.

Besides providing important habitat for fish (including salmon) and other wildlife, these watersheds also provide flood water storage and conveyance (Open Space Management Plan, 2011). While wetlands are not appropriate for sustaining tree growth due to their saturated soils, trees and forest canopy play a role in the protection of watersheds, stream, and creek preservation by helping to reduce stormwater flows, increasing soil capacity and infiltration, aiding in bioremediation and preventing erosion.

Roseville flood zones have an overall average canopy cover of 39.2% (Map 9).

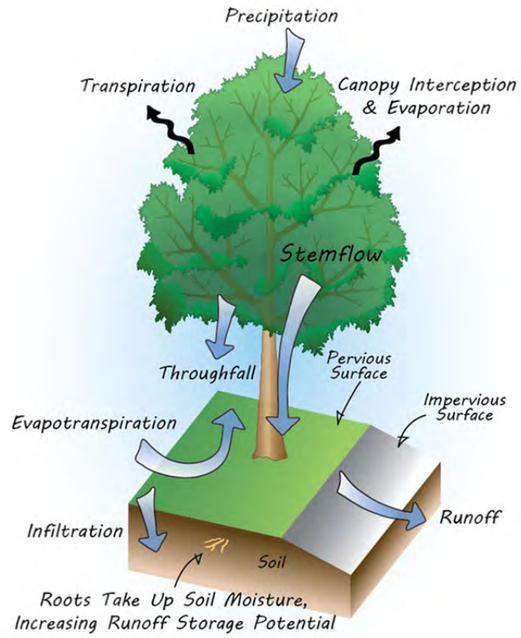
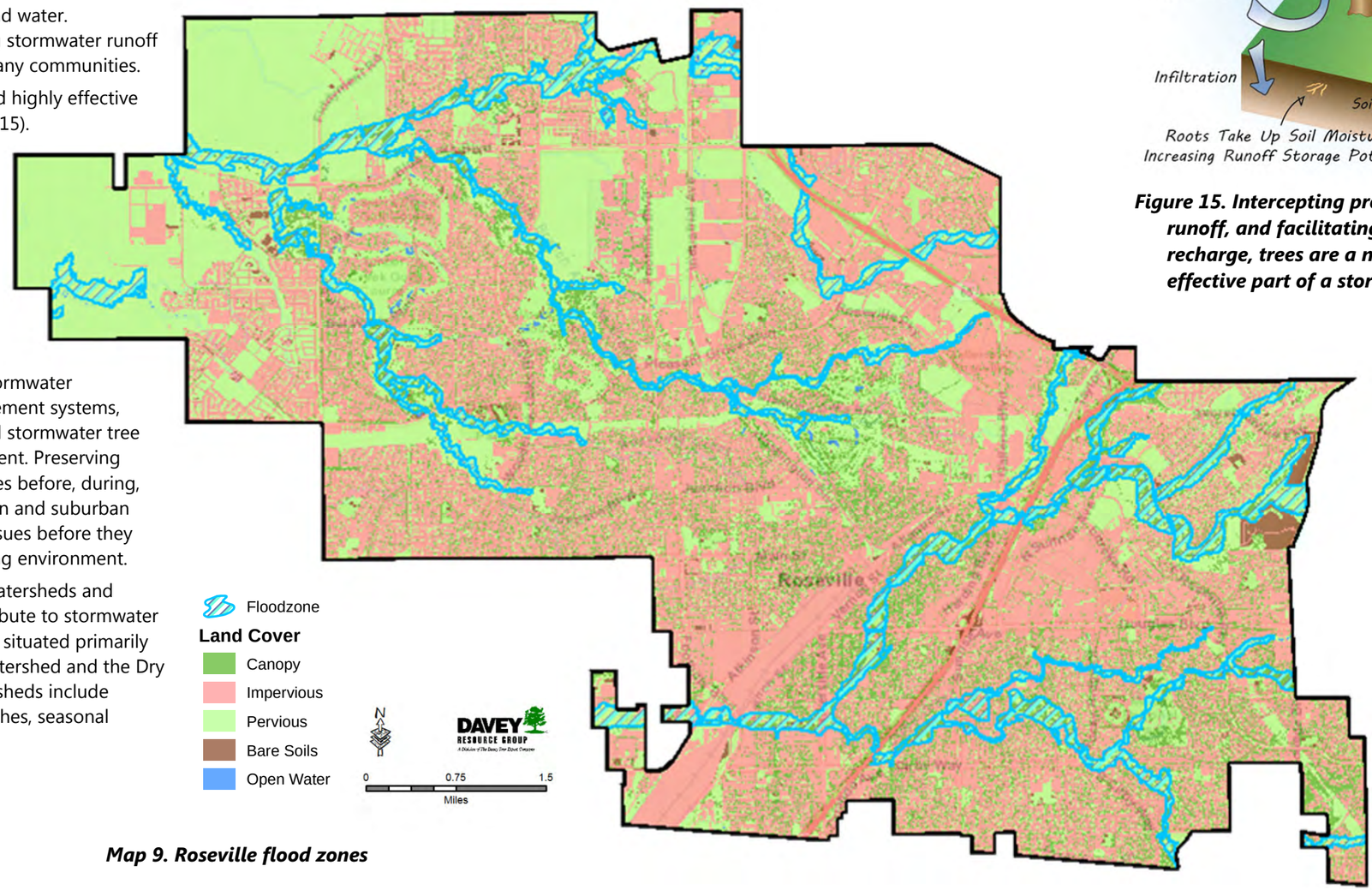


Figure 15. Intercepting precipitation, reducing runoff, and facilitating groundwater recharge, trees are a natural and cost effective part of a stormwater management



Map 9. Roseville flood zones

Growth and Urban Tree Canopy

From incorporation in 1909 to the turn of the century in 2000, the population of Roseville grew from about 2,600 residents to 79,921 residents. The current population is estimated at 122,060. That's an increase of nearly 53% in just 12 years.

The Greenprint Initiative has established an overall 35% canopy cover goal for the region. While this goal is likely attainable for Roseville, it will require the commitment and support of the community.

From 1993, which is when the first geocoded aerial imagery was available for analysis, until 2007, the population increased by 104% (52,000 to 107,097) (Figure 16). During that same time, impervious surfaces increased by 145% and tree canopy increased by 76%. So while tree canopy didn't increase as quickly as the population or the impervious surface, there is indication that trees were being planted and growing more quickly than they were being removed during this period.

From 2007 to 2010, the population continued to increase another 11% (107,097 to 118,788) and the impervious surface increased another 9.6% (43% to 47%). For the first time, at least since 1993, canopy cover fell by 2.7% from 15.8% to 15.4%. One factor that may have affected this trend is that the downturn in the overall economy slowed development after 2007, and while new streets were increased in areas of anticipated growth, development (residential and commercial) and landscaping, including tree planting, has not kept pace.

While continued growth and development is vital to the social and economic well-being and sustainability of the community, the growth and preservation of sufficient tree and forest canopy is equally vital to the continued livability and attractiveness of the community. Recognizing the vital function of trees and forests and enacting proactive preservation strategies is much more cost-effective then trying to rebuild a healthy, working urban forest. Smart growth involves consideration of natural resources, and an effective strategy aims to conserve, and increase, the overall level of tree canopy and associated benefits while supporting growth and development and respecting the rights of property owners to make decisions about their land.

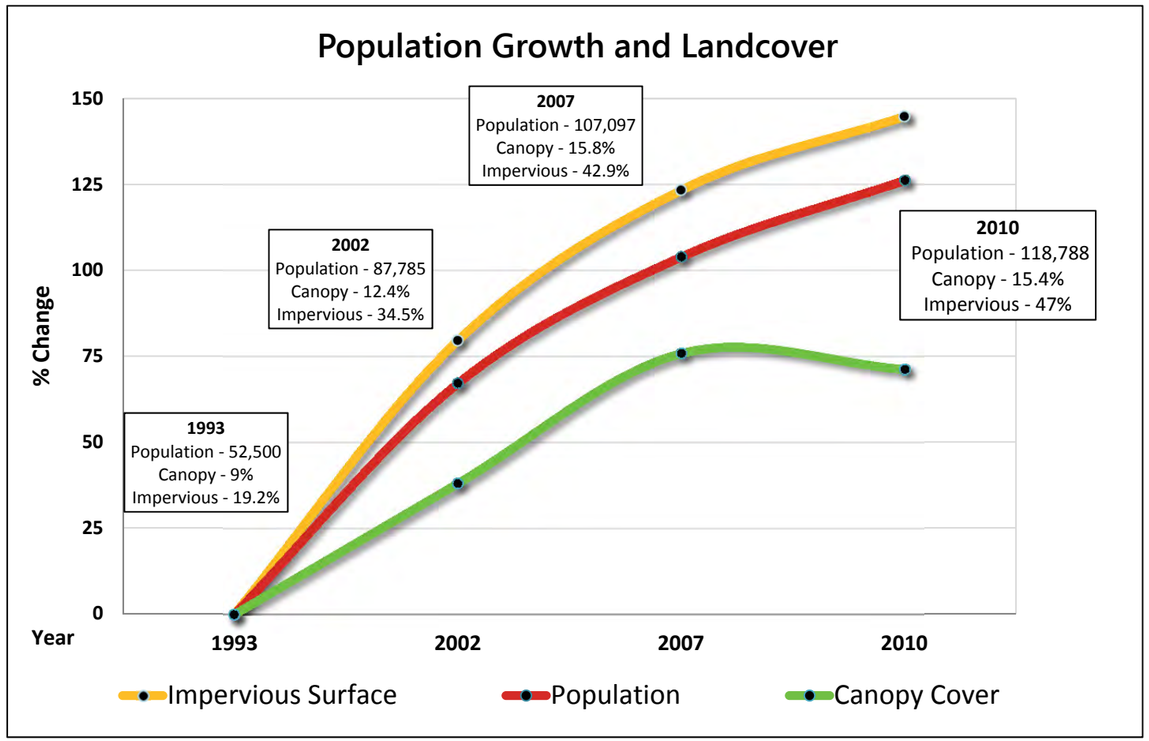


Figure 16. Population growth and landcover change since 1993

Canopy Goals and Tree Canopy Potential

To determine a reasonable canopy goal for the community, it is important to consider the potential for tree canopy. Roseville currently has 3,563 acres of tree canopy. To establish the potential for additional tree canopy, existing land cover and special features were analyzed to identify where more trees might be planted. Because some existing features and land cover do not support tree establishment, this analysis excluded the following areas:

- Impervious surfaces (10,504 acres), including roofs, shopping centers, roadways, and other incompatible hardscape surfaces.
- Open water (61 acres).
- Other unsuitable surfaces/areas (35 acres), including golf courses, cemeteries, recreational fields, vernal pools, wetlands, seasonal ponding areas, sites that are too small to support tree growth, and utility transmission clearance corridors.

Excluding these locations, the analysis found an additional 7,037 acres where trees could be planted to augment existing canopy. **If Roseville were to plant trees to cover all of this area, then the overall average tree canopy could be increased to 46.7%.**

Setting Canopy Goals

While the tree canopy potential for Roseville is currently 46.7%, this value does not consider the potential for other land cover. Roseville still includes land that is yet to be developed, including residential, commercial, and industrial parcels that will undoubtedly include structures, roadways, and parking facilities that will provide competition for trees and canopy cover.

Setting canopy goals is an important step in urban forest management and can help to ensure the quality of life and sustainability of a community. **The Greenprint Initiative has established an overall 35% canopy cover goal for the region. While this goal is likely attainable for Roseville, it will require the commitment and support of the community.**

Canopy goals can be broad based or specific to land use, but they should be determined based on the ability and willingness of the community to accomplish and sustain the goals. When setting canopy goals, a community should consider how trees and forests contribute to quality of life and how tree and forest canopy can help achieve environmental goals, including federal and local regulations for clean air, water, and stormwater runoff.

Canopy can be expanded and maintained through a variety of means, including preservation, conservation, and new tree plantings on public and private lands.

Conclusion

As a Tree City USA with a dedicated urban forestry program, the City of Roseville is well aware of the importance of trees and urban forests to the health and sustainability of their community. The City has assembled a strong foundation for an exceptional urban forestry program. Considering the support of two active nonprofit organizations that advocate for the urban forest and provide a robust volunteer base; a detailed inventory management system that tracks urban forest assets; an Urban Tree Canopy Assessment that includes GIS mapping of the location and extent of Roseville's entire tree canopy (public and private); a Resource Analysis that benchmarks the composition, benefits, value of the public tree resource; tree protection regulations that promote the preservation and protection of the community's trees; and a well-trained and dedicated Urban Forester, Roseville has the tools and information necessary to make meaningful and effective management choices.

Roseville has assembled a strong foundation for the support of an exceptional urban forestry program.

In addition to these tools, Roseville has planned for generous planting sites in many areas of the city (especially newer developments), including streetscapes, medians, parks, and open space areas. These larger sites allow ample room for trees and canopy to develop to their full potential. Furthermore, the existing tree population is relatively young and in good condition.

Altogether, Roseville is poised to enjoy increasing environmental benefits and socio-economic value from the community's urban forest. These benefits will continue to grow and support the community's vision for sustainability and a high quality of life. Considering that a healthy and vibrant urban forest is vital to supporting Roseville's expectations for the future (General Plan 2025), the community is fortunate to have a comprehensive plan for the preservation and management of this resource.

Because the urban forest is a dynamic, growing, and ever-changing resource it will require sound and proactive management to fully realize its maximum potential.

The UTC Assessment establishes a baseline for monitoring overall tree canopy cover throughout the community and augments the City's GIS database with a landcover layer that identifies the location and extent of existing canopy. This information provides a foundation for developing community goals and urban forest policies and establishes a benchmark for measuring the success of long-term planning objectives over time.

With an average overall canopy of 15.7%, there is quite a gap between Roseville's tree cover and the goal of the Greenprint Initiative for 35% canopy cover in the region. Community participation and support will be needed to reach this goal. While the UTC analysis determined that the current potential for tree canopy is 46.7%, there are a number of other considerations that should be taken into account. For instance, some of the acres identified as able to support tree growth are slated for development (residential and commercial) and will eventually represent a mixture of land cover that includes both hardscape (impervious surface) and tree canopy. It is also important to recognize that impervious surfaces and canopy cover can co-exist in many instances, and especially with appropriate design standards. Canopy that extends over hardscape features, including parking lots, streets, and structures can add to the overall amount of canopy cover and reduce the ratio between canopy cover and impervious surfaces. In addition, shade provided by tree canopy can demonstrably extend the life span of materials used in the construction of hardscape features (McPherson, et al, 2005).

Roseville has already taken considerable steps to develop additional tree canopy. Much of the community's urban forest is comprised of trees planted within the last 10-15 years. Many of these trees (41%) are very young, medium and large-stature trees with a DBH of less than 6 inches. As these trees mature, their increasing canopy will contribute to the overall existing tree cover.

Ultimately, protecting and growing the urban forest requires a commitment from the entire community. While growth and development are vital to the economic well-being of Roseville, preservation of the urban forest is equally important for ensuring that quality of life expectations are maintained. Adopting and enforcing proactive preservation objectives that compliment development goals and recognize the rights of property owners will ensure that Roseville remains a vibrant and attractive community.

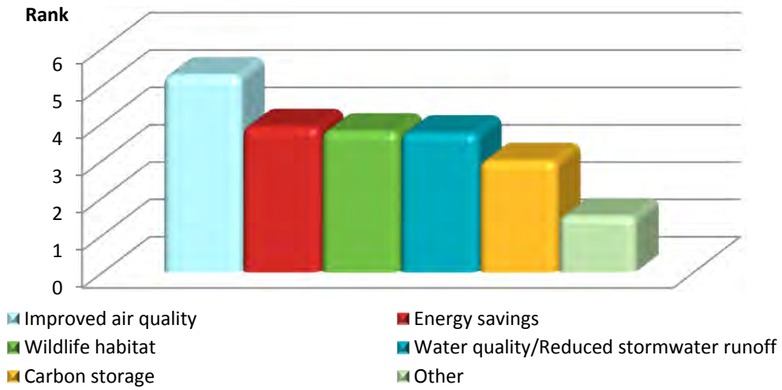


Figure 17. Environmental benefits most important to surveyed residents

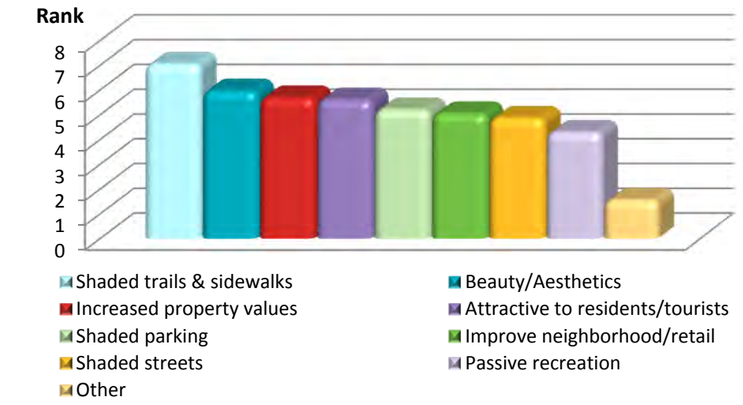


Figure 18. Aesthetic benefits most important to surveyed residents

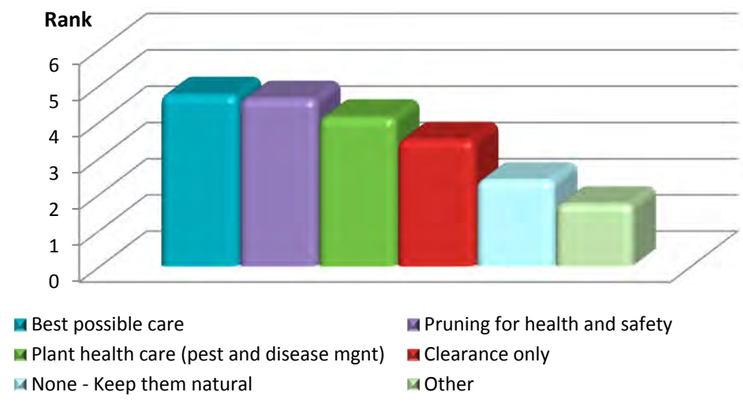


Figure 19. Respondent's expectations for public tree maintenance

WHAT DO WE WANT?

Community Participation

To better understand how the community values the benefits of the urban forest resource and to provide residents and other stakeholders an opportunity to express their views about management policy and priorities, the development process for the Urban Forest Master Plan included two public meetings and an online survey.

The public meetings and the online survey were promoted through a press release and on the City's social media sites (Facebook, Twitter), as well as by e-mail to interested residents on the City's database. The Press Tribune published an article notifying residents about the community meetings. A link to the survey and notice of the public meetings was promoted on the City's homepage, Parks & Recreation homepage, and the City's Library and Maidu Museum web pages. A flyer announcing the public meetings was posted at various locations.

Public Meetings

Public meetings were held on Thursday, October 11, 2012, from 6:30 to 8:00 p.m. at Martha Riley Community Library and on Tuesday, October 23, 2012, from 6:30 to 8:00 p.m. at the Maidu Community Center. Meetings included a presentation about the community's urban forest and current programming status.

Following the presentation attendees participated in a discussion and planning session to identify goals and objectives for the Urban Forest Master Plan. Attendees discussed expectations for public tree maintenance and locations where additional trees and trail systems are desirable. They also discussed what types of education and outreach they would like to see along with ways to incentivize tree preservation and planting on private property.

Online Survey

The online survey was available, via a link on the City's homepage, for more than six weeks beginning on October 17, 2012 and closing on December 3, 2012. The survey included a series of 21 questions, including questions about demographics, views about tree benefits, awareness of the urban forest program, expectations for public tree maintenance and planting, views on incentivizing tree preservation and planting on private property, and the preferred topics and methods for public education and outreach[10].

[10] For the complete survey and results, see Appendix C.

Eighty-seven percent (87%) of respondents "strongly agree" that public trees are important to the quality of life in Roseville. Ninety-three percent (93%) of respondents "agree" or "strongly agree" that Roseville needs more public trees. The most popular location for more trees is in parks (77%), followed by trails and bike paths (62%), open space areas (61%), and streetscapes (61%).

When asked to rank the environmental benefits of the urban forest, respondents expressed the greatest appreciation for air quality benefits, with 57% indicating that it is the most important benefit, followed energy savings, and wildlife habitat. The reduction to atmospheric carbon dioxide (CO_2) was ranked of least importance (Figure 17).

On average, respondents ranked shaded trails and sidewalks as the most important aesthetic benefit, followed by beauty and increased property values). The benefit to passive recreation was ranked as the least important aesthetic benefit (Figure 18).

Eighty percent (80%) of respondents "agree" or "strongly agree" that oak mitigation and reforestation of open space and natural resource areas are important to the residents of Roseville.

When asked to rank various options for the level of maintenance that public trees should receive, 49% of respondents indicated their preferred expectation is for trees to receive the best possible care to promote good health, strong structure, and clearance (Figure 19). Seventy-nine percent (79%) of respondents indicated that they are satisfied with the current level of maintenance provided to Roseville's public trees. Twelve percent (12%) are unsatisfied with the current level of care and 9% are unsure.

Respondents were asked to select the types of education and public outreach they would like to see offered by the urban forestry program. The most popular topic for education was tree care (68%) followed by tree planting (57%), interpretive trails and displays (54%), and tree pruning (52%).

When asked to identify the best ways to encourage tree planting and preservation on private property, 69% of respondents selected education and outreach as the best method, followed by reinstatement of the original Shade Tree Program[11] (61%), and the availability of free trees (60%).

[11] Originally, the Shade Tree Program was administered through a partnership between Roseville Electric and RUFF and included on-site planting support by an arborist. At the time, this program was not cost-effective, resulting in a change to the current rebate program.

Plan Goals and Objectives

Based upon review of the current urban forestry program and resources (What Do We Have?) and input from the community and other stakeholders, the UFMP identifies nine goals that represent what we want for the future of Roseville's community urban forest. The goals and objectives are intended to adequately manage the City's urban forest in a timely, cost-effective, and efficient manner. This includes the proactive identification of risk and mitigation strategies to promote public safety and reduce liability. In addition, the UFMP considers objectives for growing the current resource through tree planting and replacement programs that will ensure the future stability of the resource and the maximization of environmental, social, and economic benefits from trees and tree canopy. Finally, the UFMP recognizes that community engagement is integral to successfully achieving the goals and objectives for the future of Roseville's urban forest. Consequently, the UFMP includes well developed objectives for public engagement, outreach, and education.

A sustainable urban forest resource

This goal and the objectives that support it are intended to improve overall forest health (structure and composition), preserve and enhance existing tree canopy, and thereby provide the foundation for sustainability of the resource and maximization of the urban forest benefits over time.

Objectives for this goal include collecting data on public trees that are not currently in the inventory, optimizing pruning and maintenance cycles, and developing a tree planting and replacement plan.

Promote tree preservation and protection

This goal and supporting objectives will ensure an appropriate regulatory framework in support of the community's vision for the urban forest.

Objectives for this goal focus on amending and clarifying language in existing Municipal Code.

Increase outreach and education

This goal and supporting objectives supports the development of programs, activities, and materials that increase awareness and appreciation for the urban forest and trees in general.

Objectives for this goal include developing workshops, materials, and a website for urban forest outreach and education.

Develop and nurture relationships with community partners

This goal and the objectives that support it are intended to promote new relationships and strengthen existing ones with nonprofits, business groups, volunteer organizations, and individuals who share a vision and goals for Roseville's urban forest (public and private).

Objectives for this goal include fostering relationships and improving collaboration with volunteers, nonprofits, HOA's, and businesses.

Optimize community planning

This goal and supporting objectives will ensure that the vision for Roseville's community urban forest is aligned with existing plans, community values, and other long-range goals.

Objectives for this goal include preservation and expansion of tree canopy, increasing the effectiveness of parking lot shade requirements, and revising design and construction standards for planting sites.

Increase connectivity of tree canopy to improve opportunities for passive recreation, alternative transportation, and wildlife habitat

This goal and supporting objectives promotes connectivity of natural resources and appreciation for the urban forest by encouraging passive recreation (walking, hiking, and biking) and enjoyment of greenspace and wildlife through the development and maintenance of trails and trail systems across Roseville.

This goal supports the Circulation Element and the Open Space and Conservation Element of the General Plan 2025. Objectives include increasing connectivity of trails that interface with nature and wildlife and exploring opportunities to develop community gardens.

Optimize urban forestry programming

This goal and supporting objectives is intended to optimize the structure and organization of Roseville's urban forestry program and provides the necessary support for day-to-day operations and the implementation of the UFMP.

The objectives for this goal include interim optimizing the organizational structure for urban forestry operations, developing a training structure for in-house forestry staff, and exploring opportunities to reduce costs with efficiencies to scheduling and routing tree maintenance activities.

Optimize funding and identify new opportunities

This goal and supporting objectives is intended to identify and secure funding, both short-term and long-term (sustainable), for the establishment, preservation, and maintenance of public trees in Roseville. Possible sources include, but are not limited to: general fund, assessment districts, developer contributions, and other state, federal, and local sources.

The Parks and Recreation Element (General Plan 2025) supports planned funding for tree installation and urban forest management. Objectives for this goal include increasing revenue to the Tree Mitigation Fund, optimizing funding from assessment districts, and identifying and applying for available grant funding.

Review and measure attainment of the Urban Forest Master Plan

This goal and the objectives that support it will ensure that the UFMP remains current and representative of community goals and values and that it continues to be a dynamic and responsive tool for managing the community's urban forest resource.

The objectives for this goal include regular review of the UFMP for integration into work plans along with periodic analysis of canopy changes and benefits to assess changes in benchmark values.

HOW DO WE GET THERE?

The following section provides the details for each of the UFMP goals. Each goal is aligned with the guiding principle that it most closely supports. A complete listing of objectives is detailed for each goal along with a comprehensive set of specific actions that will guide urban forest managers and administrators towards achievement of the objective. A timeline illustrating the tentative target for each of the objectives and primary actions is included in Appendix B.

The UFMP identifies appropriate resources to adequately manage the community's urban forest and natural resources. The Plan is intended to be a dynamic tool that can and should be adjusted in response to available resources and changes in community expectations. In addition to serving as a day-to-day guide for planning and policy making, the UFMP should be reviewed regularly for progress and to ensure that the objectives and action strategies are integrated into the annual work plan.

Prior to Council consideration/approval of any recommended objective or action that would result in substantial ground disturbance, or construction of new facilities (such as bike trails, community gardens, or interpretive signage), the environmental effects of the action shall be subject to project level California Environmental Quality Act (CEQA) review.

Mission

The mission of the Parks, Recreation, and Libraries Department is: *To enhance lives and the community by providing exceptional experiences.*

Guiding Principles	Grow, maintain, preserve and enhance a sustainable urban forest	Optimize the environmental, social, economic, and public health benefits of trees and canopy	Align urban forest management policy with community expectations and cost efficiency
Goals	• A sustainable urban forest resource • Promote tree preservation and protection • Increase outreach and education • Develop and nurture relationships with community partners	• Optimize community planning • Increase connectivity of tree canopy to improve opportunities for passive recreation, alternative transportation, and wildlife habitat	• Optimize urban forestry programming • Optimize funding and identify new opportunities • Review and measure attainment of the UFMP
Primary Objectives	• Apply Tree Care Standards to all contractors and in-house crews engaged in tree care operations • Ensure all inventoried trees are on a regular pruning and maintenance cycle • Develop a tree planting and replacement plan • Increase species diversity and plant health in the public tree resource • Develop and present workshops and seminars that increase awareness and knowledge about trees and the urban forest • Develop outreach materials that communicate information about trees and the community urban forest • Foster relationships and facilitate collaboration with volunteers, nonprofits, HOAs, and businesses	• Preserve and expand existing tree canopy • Update existing planning documents to reference the UFMP • Increase effectiveness of Parking Lot Shade Requirements by adopting them as a City Ordinance • Adopt a Solar Shade Ordinance • Revise design and construction standards that apply to trees and planter sites • Participate in regional planning for the urban forest • Increase availability and connectivity of trails that interface with nature and wildlife	• Optimize the organizational structure for urban forestry operations • Develop an advanced training structure for in-house forestry staff • Develop a policy and identify responsibility for contract monitoring • Develop a policy and responsibility for keeping inventory data current • Develop a Risk Management Plan and policy for urban forest operations • Increase and optimize partnerships and collaborations with individuals, groups, and agencies who share urban forest goals and objectives • Identify and apply for available grant funding • Align UFMP goals and objectives with community expectations

Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: A sustainable urban forest resource

This goal is intended to improve overall forest health (structure and composition), preserve and enhance existing tree canopy, and thereby provide the foundation for sustainability of the resource and maximization of urban forest benefits over time.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Adopt most current industry standards for all contractors and in-house crews engaged in tree care operations. Current pruning and planting standards apply specifically to contractors engaged in tree care operations on public trees. The UFMP updates these standards and applies them to all individuals and agencies engaged in tree care operations affecting public trees in Roseville. **Actions:** A) City of Roseville Tree Pruning Standards should adhere to current industry standards and best management practices (BMPs). B) City of Roseville Tree Planting Standards should adhere to current industry standards and BMPs. C) The Urban Forester shall be responsible for maintaining and updating these standards in accordance with current industry standards and BMPs.	$ Low	1) Perform QA inspections & documentations on a routine basis. 2) Review COR standards & BMPs on an annual basis.	2014-2015 Annually
2. Continue to inventory public trees. With the exception of "natural areas," public trees should be inventoried and managed as a public asset to promote tree health, manage risk, and track maintenance needs and history. In the event of a natural or man-made disaster, an inventory of these assets can facilitate and support recuperation of damages. **Actions:** A) Collect an inventory of all public street trees, including "official city street trees" that are publicly managed but not located in a planter strip (~800). B) Inventory and maintain data on significant trees in open space areas, especially trees in open space boundary areas that interface with residential/commercial properties (~20,000). C) Inventory significant trees in open space located in proximity to trails and other accessible locations (~20,000). D) Identify maintenance and prioritize maintenance needs. E) Where applicable, identify risk and prioritize mitigation strategies.	$$$ High	1.) Complete tree inventory & assessment in EAM.	2014-2018
3. Ensure all inventoried trees are on a regular pruning and maintenance cycle. Because they are living and growing, urban trees need regular maintenance to maintain their value and manage risk. Deferring maintenance can result in greater expense. On a maintenance cycle, most issues can be addressed at relatively low costs. However, when untended, minor problems can evolve into very expensive structural issues and increase liability as trees mature. Over time, unresolved issues may become impossible to correct without causing greater harm. **Actions:** A) Incorporate trees in public golf courses into regular maintenance and pruning cycles. B) Incorporate trees at city facilities and parking lots into regular maintenance and pruning cycles. C) Incorporate significant trees and trees in proximity to trails and accessible open space areas into regular maintenance and pruning cycles (not currently in inventory).	$$$$ Very High	1.) Set pruning cycle based on maintenance and risk management needs.	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: A sustainable urban forest resource

This goal is intended to improve overall forest health (structure and composition), preserve and enhance existing tree canopy, and thereby provide the foundation for sustainability of the resource and maximization of urban forest benefits over time.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
3. Ensure all inventoried trees are on a pruning and maintenance cycle. *continued* **Actions:** D) Incorporate unfunded street trees (including those in assessment districts) into regular maintenance and pruning cycles. E) Incorporate "official city street trees" into regular maintenance and pruning cycles (not currently in inventory). F) Explore GIS coordination for routing and use of analytics for maintenance cycles (e.g., planning, scheduling, and routing).	$$$ High	1.) Set pruning cycle based on maintenance and risk management needs.	Ongoing
4. Improve management of oak woodlands in open space areas. Management of forest resources in open space areas promotes preservation and conservation of significant trees and forest stands for wildlife habitat, wetlands and water quality preservation, and stormwater management. Managing significant trees and trees in proximity to accessible areas and trails promotes tree health and public safety. This objective supports the Open Space and Conservation Element of the General Plan. **Actions:** A) Develop and implement a management policy for "natural areas". Management of natural areas should focus on habitat preservation, with minimal management of trees, to encourage succession and control of invasive species. B) Identify and delineate areas and locations where forest stands will be considered "natural areas" to be managed for habitat value and natural succession. C) Forests in natural areas should be managed as minimally as possible to preserve wildlife habitat, natural resource value, and creek integrity. D) Identify risk factors and mitigation measures and prioritize actions for large and mature oak trees in proximity to improvements and infrastructure, including trails and accessible areas, open space boundaries/interface areas, utilities, bridges, and culverts. E) Manage mature trees in proximity to trails and recreation areas for safety, risk management, and access. F) Provide support for habitat and riparian restoration in open space areas and creek corridors. G) Continue reforestation and mitigation of oak woodlands and riparian areas. H) Coordinate with stormwater/flood control managers to incorporate trees into stormwater and flood management strategies. I) Strategically plant trees to reduce stormwater runoff and stabilize soils. J) See UTC Assessment Priority Planting Sites and Natural Resources Inventory.	$-$$$ Low-High	1) Develop and implement management policies for natural areas. 2) Identify risk and mitigation measures for large trees in proximity to trails and set priorities. 3) Inventory significant trees on trails and adjacent to property boundaries that could create risk. 4) Plant trees to provide habitat and to restore oak woodlands.	2014-2018
5. Develop a tree inspection policy Ideally, every public tree should be observed periodically by an experienced certified arborist to identify health and structural issues. A relatively quick visual assessment can provide a great deal of information to the trained eye and allow for the identification of serious issues and risks, before problems become critical. This process can occur over a number of years, but it should be well-documented and organized by grids. Actions: A) Develop a tree inspection policy.	$ Low	1) Implement tree inspections policy in daily operations to properly manage high risk trees.	2014-2016

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: A sustainable urban forest resource

This goal is intended to improve overall forest health (structure and composition), preserve and enhance existing tree canopy, and thereby provide the foundation for sustainability of the resource and maximization of urban forest benefits over time.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
5. Develop a tree inspection policy. *continued* **Actions:** B) Identify and prioritize plant health care needs/requirements. C) Identify signs or symptoms of disease, pests, and abiotic disorders, including environmental stress (e.g., water management, soil conditions, and nutrient availability). D) Identify obvious signs of decline and/or failing structure. E) Identify and assess risk and potential risk. F) Identify wildlife habitat and nesting cavities of endangered and/or protected species. G) Identify risk factors and mitigation strategies for mature, over-mature, and declining trees. H) Maintain inventory data (TreeKeeper®7.7/Maximo).	$ Low	1.) Implement tree inspections policy in daily operations to properly manage high risk trees.	2014-2016
6. Develop a tree planting and replacement plan. Planting new trees and replacing those that are removed is critical to the sustainability of the community urban forest. Planning this process promotes a stable benefit stream and gradual replacement can reduce the impact of tree loss, especially in older neighborhoods where there is often a greater percentage of mature trees. Planning also ensures that the right tree is planted in the right place. **Actions:** A) Use GIS mapping data to identify and prioritize planting sites and to ensure coordination with planned improvements and construction. B) Classify and prioritize available planting sites based on: o Space and minimum planting setbacks o Soil characteristics o Irrigation infrastructure o Landscape objectives and tree density o Site constraints and existing infrastructure, including hardscape, utilities (overhead and underground), bridges, and culverts C) Place an emphasis on Right Tree Right Place. o Reducing hardscape and utility conflicts. o Matching tree species to soil and water conditions. o Matching tree species to planter size and intended use. D) Optimize shade and environmental benefits by planting large stature trees where feasible. E) Identify locations, neighborhoods, and other areas where tree planting will enhance overall canopy cover. F) Identify underserved neighborhoods, with lower than average tree canopy, where increasing canopy can provide greater benefits to the health, social, and economic environment of residents (supports the Circulation Element, General Plan 2025).	$ Low	1) Create GIS database for tree plantings and replacements and set planting priorities. 2) Set emphasis on right tree in the right place. 3) Enhance canopy cover in neighborhoods with low canopy cover as identified in UTC assessment. 4) Implement tree replacement ratio of 1:3. 5) Identify oak mitigation and reforestation areas in the open space areas. 6) Collaborate with nonprofit organizations and increase public outreach for plantings.	2014-2017

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: A sustainable urban forest resource

This goal is intended to improve overall forest health (structure and composition), preserve and enhance existing tree canopy, and thereby provide the foundation for sustainability of the resource and maximization of urban forest benefits over time.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
6. Develop a tree planting and replacement plan. *continued* **Actions:** G) Identify locations were tree planting will improve stormwater management and protect existing natural resources. o See Priority Planting Sites (UTC Assessment, Map 7) to identify locations where planting trees will help stabilize and protect against soil loss and/or degradation. o Coordinate with stormwater managers and GIS staff to combine stormwater management goals and priority planting sites for additional analysis and consideration. H) Identify opportunities to increase connectivity of forest stands (supports the Open Space and Conservation Element of the General Plan, Vegetation and Wildlife goals. I) Identify mature/over-mature trees that have reached the end of their lifespan and plan for their gradual replacement. o Over-mature trees in older, established neighborhoods. o Over-mature oaks in open space. J) At minimum, planting and replacement rates should be sufficient to support sustainability of the overall resource and environmental benefits. Ideally, planting rates will grow the resource, canopy cover, and associated benefits. o Set a replacement ratio of 1:3 for trees that are removed. K) Plan should specifically include oak mitigation planting in natural resource areas. L) Collaborate and partner with nonprofit and neighborhood groups (e.g., RCONA) for tree replacement and improvements to streetscapes. M) Consider that larger planning projects may qualify as mitigation strategies for meeting CEQA requirements.	$ Low	1) Create GIS database for tree plantings and replacements and set planting priorities. 2) Set emphasis on right tree in the right place. 3) Enhance canopy cover in neighborhoods with low canopy cover as identified in UTC assessment. 4) Implement tree replacement ratio of 1:3. 5) Identify oak mitigation and reforestation areas in the open space areas. 6) Collaborate with nonprofit organizations and increase public outreach for plantings.	2014-2017
7. Increase species diversity and plant health in the public tree resource. Species diversity in an urban forest is an indicator of the overall health and stability of the resource. Greater diversity promotes greater resistance to pests, disease, and environmental stresses. High reliance on one or a few key species can result in devastating loss within the resource and to the benefits afforded to the community in the event of a major pest or disease outbreak (e.g., emerald ash borer, Dutch elm disease). Climate change is expected to have a significant effect on all forests (including urban forests) through changes in temperatures (average, high, and low) and increases in pest and disease outbreaks. Some areas, particularly in northern and southern regions, are already experiencing these effects. Species that are marginal now, may experience either an advantage or a disadvantage from these changes. Increasing species diversity in the overall population will be critical to preparing for these changes and promoting sustainability of both tree canopy and benefits. **Actions:** A) Identify and maintain a broad palette of regionally compatible species (including native species). B) Reduce reliance on over-used species: o London planetree (*Platanus spp*.) o Coast redwood (*Sequoia sempervirens*) o Callery pear (*Pyrus calleryana*) o Crape myrtle (*Lagerstroemia indica*)	$ Low	1) Revise City Master Tree List in order to increase diversity of tree species. Emphasis needs to be on proven north-western tree species, disease resistant and native trees. 2) Implement diversity and planting plan with following emphasis: - No single species > 10% of tree the inventory - No single genus > 20% of the tree inventory - No single family >30% of the tree inventory	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

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Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: A sustainable urban forest resource

This goal is intended to improve overall forest health (structure and composition), preserve and enhance existing tree canopy, and thereby provide the foundation for sustainability of the resource and maximization of urban forest benefits over time.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
7. Increase species diversity and plant health in the public tree resource. *continued* **Actions:** C) Plan towards ideal diversity*: o No single species represents >10% of the resource. o No single genus represents >20% of the resource. o No single family represents >30% of the resource. * Not applicable to open space, natural areas where oak woodlands and other native species predominate in a natural setting. D) Select and plant tree species that do not have the same pest and stress vulnerabilities as the current species. E) Plant pest and disease resistant varieties when available. F) Coordinate with GIS staff for geostatistical analysis of species diversity within the City. G) Maintain trees in good health: o Proper training and pruning. o Integrated Pest Management (IPM). o Healthy environment (mulch, planter space, irrigation).	$ Low	1.) Revise City Master Tree List in order to increase diversity of tree species. Emphasis needs to be on proven north-western tree species, disease resistant and native trees. 2.) Implement diversity and planting plan with following emphasis: - No single species > 10% of tree the inventory - No single genus > 20% of the tree inventory - No single family >30% of the tree inventory	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

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Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: Promote tree preservation and protection

This goal is intended to ensure an appropriate regulatory framework in support of the community's urban forest vision.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Revise Roseville Municipal Code – Title 8 Parks and Recreation. Revise Roseville Municipal Code – Title 8 Parks and Recreation to clarify purpose and definitions. **Actions:** A) Chapter 8.04 Street Trees, Shrubs and Plants "Street Tree Ordinance" o Replace the word "Street" with "City" to reflect that the ordinance concerns all publicly owned trees on streets and medians, in parks, golf courses and open space areas, and at City facilities. B) 8.04.010 Purpose should be updated to reflect the current status and purpose of the code. Currently it reads like a place holder for an undeveloped code. C) 8.04.030 Definitions. The following definitions should be updated in the Definitions section: o "Master ~~street~~ Tree List" o "Official street trees" - Delete this definition as it will no longer apply. o Review and clarify the definition and purpose of "Street Tree" o Add a definition for "public tree" that replaces official city street trees and covers all public trees, including trees in open space.	$ Low	1) Revise municipal code - title 8, chapter 8.04, 8.04.010, 8.04.030 to clarify purpose and definitions of "Street Tree"	2014-2018
2. Revise and Amend Roseville Municipal Code – Title 19 Zoning. Title 19 currently applies only to native oaks. In addition to native oaks, Roseville has other significant trees of exceptional size, heritage, stature, and/or species that contribute invaluable benefits and character to the community. Extending protection to these trees will preserve these benefits and promote a sense of timelessness and permanence to the city and its residents. This strategy is supported by Implementation Measure 9 of the Land Use Element in the General Plan. **Actions:** A) Amend code to define protected trees to include significant and/or heritage trees other than native oaks. B) Amend purpose of code o Update Section 19.66.010 - Purpose A. Update this section to include specific known benefits of trees (e.g., stormwater management, protection for water resources, pollution removal/air quality benefits, carbon sequestration). o Amend to reflect a community policy of no net loss to overall canopy cover. C) Amend code to define protected trees to include significant and/or heritage trees other than native oaks. D) Define significant/heritage trees. E) For all situations that require the opinion of a highly trained arborist and where authority for tree removal is granted by the Planning Commission or the Planning Director, provide an opportunity for the City Urban Forester to review and submit a recommendation. F) Change all reference from the City Arborist to the City Urban Forester.	$ Low	1) Revise and amend section 19.66.10.	2014-2018

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Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: Promote tree preservation and protection

This goal is intended to ensure an appropriate regulatory framework in support of the community's urban forest vision.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
2. Revise and Amend Roseville Municipal Code – Title 19 Zoning *continued* **Actions:** G) Amend C. Exemptions (19.66.030); 1 - Update this statement as: 1. Trees damaged by thunderstorm, windstorm, flood, earthquake, fire or other natural cause and determined by a peace officer, acting in his or her official capacity, to present ~~a danger~~ an immediate danger to persons or property. Upon discovery of a condition to justifying removal, the officer or official making the determination shall immediately provide written notification of the condition and action taken to the Planning Director. 5. Consider amendment of this exclusion for significant/ heritage trees of a certain size: "A protected tree located on property developed with a single-family or two (2) family dwelling which has been granted occupancy." o This proposed amendment requires approval from the Planning Commission and City Council. 6. When a protected living tree presents a hazard to health and safety or structures due to its structural condition and location, the tree may be removed without any replacement or mitigation requirements. The hazardous condition of the tree must be determined by an arborist. The Planning Commission and/or Planning Director should consult the Urban Forester for review of the arborist's determination and consideration of the location of the protected tree prior to approving removal. H) Section 19.66.070 - Oak Tree Planting and Replacement Program This section allows for the replacement of trees on site based upon an inch for an inch replacement if the DBH of the removed trees. However, there is no consideration for the number of trees sustainable at the site of replacement or requirement to sustain replacement trees over time. Amend to apply these considerations: o Amend to include requirement of bond or other means to ensure establishment and long-term preservation of replacement trees. o If applicable, amend to include this option for instances when other significant/heritage trees must be removed.	$ Low	1) Revise and amend section 19.66.10.	2014-2018

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Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: Increase outreach and education

This goal is intended to support the development of programs, activities, and materials that increase community awareness and appreciation for the urban forest and trees in general.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Develop and maintain a website for Roseville's Urban Forest. The urban forestry webpage is the first place residents and others look to for information about trees and urban forest programming. It should be engaging, user-friendly, and a comprehensive resource for everything about trees in Roseville. **Actions:** A) Information and images that illustrate important information about the state of the urban forest and Roseville's canopy cover, including composition and benefits. B) Links and engaging articles for residents and property managers, including: o How to plant a tree o How to prune a tree o How to fertilize and mulch o How to irrigate o How to hire an arborist or tree care company C) Links to electric and natural gas utility websites that explain safety and Right Tree, Right Place concepts. D) Highlights and links to the City's tree protection regulations, requirements, policies, and necessary forms. E) A homeowner's list of recommended tree species for Roseville. F) Information and links to open space and natural resource topics. o Oak mitigation o Non-native and invasive species o Water quality and protection o Wildlife and habitat o Watershed and riparian resources G) Information about volunteer and donation opportunities. H) Information about incentives for planting and maintaining trees on private property. o Shade Tree Program o Links to information about carbon sequestration and credits for larger parcels. I) Links to nonprofits and regional, state, and national tree interests. o Roseville Urban Forest Foundation o Sacramento Tree Foundation o Greenprint - 5 Million Trees campaign - Greenprint Certified neighborhoods program o Arbor Day Foundation o California Urban Forests Council	$ Low	1) Update and increase information about the urban forestry program to the public on a regular basis.	2014-2016

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Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: Increase outreach and education

This goal is intended to support the development of programs, activities, and materials that increase community awareness and appreciation for the urban forest and trees in general.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
2. Develop and present workshops and seminars that increase awareness and knowledge about trees and the urban forest. Develop a dynamic presentation that highlights the value and benefits of trees and the urban forest. Develop hands-on workshops that teach the basics of arboriculture to residents and the best methods for caring for their trees. Make the presentation and workshops available to the community, schools, and neighborhood groups and for increasing awareness at community and council meetings. **Actions:** A) Develop a series of hands-on workshops that teach the basics of tree care (planting, pruning, mulching, fertilizing, etc.). B) Develop a presentation that explains the benefits of the urban forest and tree canopy to the community (environmental, social, and economic). C) Develop a workshop to train volunteers participating in oak mitigation. D) Develop a workshop that teaches the basics of irrigation practices and water conservation. E) Coordinate with GIS staff for analysis of demographics, consumer expenditures, and tapestry segmentation data to target the best audience and geographic areas for workshops, presentations, and training.	$ Low	1) Perform public outreach in the form of workshop and seminars to increase awareness and knowledge about trees and the urban forest.	Ongoing
3. Design and build interpretive trails. Design and build self-guided, interpretive trails and nature walks that illustrate the benefits of trees and specific species along with information about the surrounding environment, wildlife, and natural resources. Integrating passive recreation and education with the protection of wildlife and vegetation habitat areas supports the Open Space and Conservation Element of the General Plan. **Actions:** A) Determine the best locations for interpretive trails, considering use, accessibility, and educational opportunities (e.g., creek and riparian habitat, dead trees preserved for wildlife habitat, etc.). o Coordinate with GIS staff for analysis of site criteria and comparison of multiple site/location metrics. B) Collaborate with riparian and creek managers, open space managers, stormwater/flood control managers, and alternative transportation managers for a holistic approach to presenting the importance of the interconnectedness of the urban forest with the overall ecosystem, including: o Relationships between forest and creek quality and watershed protection (e.g., soil conservation, reduced runoff, bioremediation of pollutants, groundwater recharge). o Dangers of non-native and invasive plants. o Wildlife and habitat. C) Explore and integrate the use of smart phone and tablet applications that support GPS for self-guided tours, tree and urban forest information, games and scavenger hunts that facilitate learning.	$$ Medium	1) Use interpretive trails and nature walks to illustrate benefits of trees and integrate passive recreation and education.	2014-2020
4. Partner with Roseville Electric and Environmental Utilities to deliver tree and urban forest information to residents. With in-house utilities (Roseville Electric and the Environmental Utilities Department), the City has the opportunity to include educational and outreach materials along with billing information. The urban forestry program can use this opportunity to increase awareness and knowledge about trees and urban forestry issues.	$ Low	1) Collaborate with Roseville Electric and Environmental Utilities to provide education and public outreach about the urban forest to residents.	Ongoing

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Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: Increase outreach and education

This goal is intended to support the development of programs, activities, and materials that increase community awareness and appreciation for the urban forest and trees in general.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
4. Partner with Roseville Electric and Environmental Utilities to deliver tree and urban forest information to residents. *continued* **Actions:** A) Link sites together for education and outreach information. B) Include urban forest messages and important information with billing mailers. C) Partner on Shade Tree Program.	$ Low	2) Collaborate with Roseville Electric and Environmental Utilities to provide education and public outreach about the urban forest to residents.	Ongoing
5. Develop outreach materials that communicate information about trees and the community urban forest. Develop outreach materials (pamphlets, articles, etc.) that communicate specific topics about trees, the urban forest, and environmental benefits. **Actions:** A) Communicate basics of tree care, including planting, pruning, and irrigation. B) Communicate benefits of trees and tree canopy, including environmental, social, and economic. C) Communicate information about the community urban forest, including composition, health, and species diversity. D) Communicate information about oak mitigation (importance, vision, techniques). E) Present recommendations for tree species for private property. F) Partner with utilities, other city departments, nonprofits, and other groups to incorporate shared information and outreach goals when possible. Possible examples include: o Right Tree Right Place – Power line friendly tree species o Greenprint Certified Neighborhoods o Safety considerations related to trees near energized lines and underground utilities.	$-$$ Low-Medium	1) Distribute outreach materials to the public about urban forest benefits, tree care, pruning, planting, oak mitigation, and tree species selection.	2014-2016
6. Develop and deliver a State of the Urban Forest Report. Public support is critical to a successful and sustainable urban forest program. Keeping stakeholders well informed is the best way to generate support and engagement. A State of the Urban Forest Report is the perfect way to communicate progress and accomplishments toward UFMP goals and objectives. It is also an opportunity to communicate any challenges or issues that may be holding up the Plan. **Actions:** A) Update citizens on the overall condition of the community urban forest. B) Highlight services (e.g., number of trees pruned/replaced, service calls responded to, etc.). C) Update the community on progress towards canopy goals and trees planted (public and private). D) Update the community on accomplishment of UFMP objectives.	$ Low	1) Present State of the Urban Forest Report to update citizens on the condition of the urban forest, highlight services performed, number of trees planted, and progress towards canopy goals.	Biennial

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

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Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: Increase outreach and education

This goal is intended to support the development of programs, activities, and materials that increase community awareness and appreciation for the urban forest and trees in general.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
7. Complete an i-Tree Eco project. Complete an i-Tree Eco project to define the composition, health, and specific benefits of the overall urban forest (public and private tree). Sampling of the urban forest provides valuable information about the composition, health, and specific benefits (See i-Tree Vue results in Urban Tree Canopy Assessment). This information can be used to increase awareness about forest benefits, species diversity, benefits, and to develop pest or disease control strategies, if necessary. **Actions:** A) Identify opportunities and apply for grant funding for i-Tree Eco field sampling and analysis. B) Complete an i-Tree Eco project. C) Communicate the results. D) Integrate information with program resources.	$$$ High	1) Complete i-tree Eco project to define composition, health and specific benefits of the urban forest.	2014-2034

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Grow, maintain, preserve, and enhance a sustainable urban forest

Goal: Develop and nurture relationships with community partners

This goal is intended to promote new relationships and strengthen existing ones with nonprofits, business groups, volunteer organizations, and individuals who share a vision and goals for Roseville's urban forest (public and private).

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Foster relationships and facilitate collaboration with volunteers, nonprofits, HOAs, and businesses. Just as a healthy urban forest is vital to the health and well-being of the community, the support, partnership, and engagement of residents is critical to the growth, preservation, and sustainability of the urban forest. **Actions:** A) Enhance and build on existing relationships with nonprofit organizations. o Roseville Urban Forest Foundation (RUFF) o Sacramento Tree Foundation o Dry Creek Conservancy o RCONA o California ReLeaf o California Urban Forest Council (CAUFC) B) Identify and partner with groups, organizations, and individuals who share a vision and goals for a healthy and sustainable urban forest. C) Participate and support in regional groups and committees that share vision and goals for the urban forest.	$ Low	1) Enhance and build relationships with non-profit organizations. 2) Identify, partner with, and support regional groups, organizations, and committees that share the vision and goals of the urban forest.	Ongoing
2. Qualify and apply for Society of Municipal Arborists (SMA) Accreditation. SMA Accreditation formally recognizes urban and community forestry programs that implement excellent and comprehensive management practices. Building on the Arbor Day Foundation's Tree City USA designation, the SMA Accreditation incorporates additional professional standards important for managing municipal trees. **Actions:** A) Meet minimum standards for qualification for SMA Accreditation: o At least one ISA Certified Arborist on staff, with an ISA Certified Municipal Specialist preferred o A Local Forest Master Plan o Tree City USA status o A Tree City USA Growth Award within the past five years o Demonstrated preference to TCIA Accredited tree care companies when private arborists are contracted o Adherence to ANSI Z133.1 safety standards, and ANSI A300 tree care performance standards o A pledge of adherence to the SMA Code of Ethics and to promote SMA objectives B) Complete application for SMA Accreditation.	$ Low	1) Meet minimum requirements for SMA Accreditation. 2) Apply for SMA Accreditation	2014-2016

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

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Optimize the environmental, social, economic, and public health benefits of trees and canopy

Goal: Optimize community planning

This goal is intended to align the vision for Roseville's community urban forest with existing plans, community values, and other long-range goals.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Preserve and expand existing tree canopy. The primary source of environmental benefits from the urban forest is tree canopy. The more tree canopy, the greater the benefits to the community in energy savings, carbon reduction, and air and water quality. Roseville's tree canopy provides these critical environmental benefits that support and improve the quality of life for residents, visitors, and the entire region. Preserving and growing those benefits is of vital importance. **Actions:** A) Develop and adopt canopy goals for Roseville o Establish an overall canopy goal as well as individual goals for specific land use. o Consider canopy potential along with community values and vision (See UTC Assessment: Canopy Potential). B) Adopt a city policy of no net loss to the overall tree canopy. C) Identify parcels with high value canopy cover that are at risk for development and develop preservation strategies. D) Conduct urban tree canopy (UTC) analysis every ten (10) years to determine changes and progress towards community canopy goals. E) Develop outreach and incentives for increasing tree planting on residential and other private property (e.g., schools). o Coordinate with GIS staff to identify areas/population where outreach and incentives for tree planting will be most successful (e.g., demographics, consumer expenditure, lifestyle patterns. o Coordinate with GIS staff to develop visual aids (maps) to promote urban forest activities and benefits.	$-$$ Low-Medium	1) Develop and implement canopy goals for Roseville. 2) Develop and adopt city policy of no net loss to overall tree canopy. 3) Conduct UTC every 10 years to show canopy coverage increase. 4) Develop outreach and implement incentives for increasing tree planting on residential or other property (e.g., schools). 5) Develop canopy preservations policies.	2014-2020
2. Update existing planning documents to reference the UFMP. The Urban Forest Master Plan (UFMP) is complementary and supportive of the City's other long-range plans, including the General Plan. As planning documents are updated, they should be revised to reference the UFMP. The UFMP can serve as an important implementation measure to most elements in the General Plan and this should be reflected as revisions occur. **Actions:** A) Revise the Park and Recreation Master Plan to reference and recognize the UFMP. B) As revisions occur, recognize the value of the UFMP and the role of trees and tree canopy as implementation measures for goals identified in the various elements of the General Plan 2025: o For removal and reduction of air pollutants – Air Quality and Climate Change Element. o Open Space System, Vegetation and Wildlife (General Plan). o For Groundwater Recharge and Water Quality – Open Space and Conservation Element. o For the Parks and Recreation Element; including the policy for outreach and education. C) Insure that all specific plans reference the UFMP Tree Care Standards and include consideration for the establishment of public trees, including the construction of planting sites that support tree maturity.	$ Low	1) Revise the Parks & Recreation Master Plan to reference and recognize UFMP. 2) As revisions occur, recognize the value of the UFMP including the role of trees and tree canopy as implementation measures for goals of the General Plan 2025. 3) Ensure that all specific plans reference the current City Tree Care and Pruning standards as well as the City Master Tree List.	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

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Optimize the environmental, social, economic, and public health benefits of trees and canopy

Goal: Optimize community planning

This goal is intended to align the vision for Roseville's community urban forest with existing plans, community values, and other long-range goals.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
3. Increase effectiveness of Parking Lot Shade Requirements by adopting them as a City Ordinance. Forty-six percent (46%) of Roseville is covered by impervious surfaces, including streets, buildings, and parking lots. Shading parking lots can contribute greatly to reducing the overall heat island effect from these heat-absorbing surfaces. Additionally, shade reduces temperatures and emissions from parked vehicles, including nitrogen oxides (NOx) and hydrocarbons; precursors to ozone (O_3) formation that contribute to poor air quality. **Actions:** A) Adopt Parking Lot Shade Requirements as a city ordinance. B) Improve standards for species selection to ensure that canopy goals are reasonably attainable. C) Require that planting sites are designed and constructed to provide the soil space requirements that will reasonably support the mature size of the tree species intended for the site. D) Consider special provisions where physical constraints may prevent attainment of 50% shade (e.g., overhead utility corridors). o Use utility-friendly species that mature at the desirable height. E) Coordinate with GIS staff to use aerial imagery and canopy cover analysis to monitor compliance and achievement towards parking lot shade requirements.	$ Low	1) Adopt Parking lot shade requirements as city ordinance. 2) Improve standards for species selection. 3) Require that planting sites are designed and constructed to provide space and soil volume requirements to support the mature size of the tree species planned for the site. 4) Use aerial imagery and canopy cover to monitor compliance of parking lot shade requirements.	2014-2020
4. Adopt a Solar Shade Ordinance. As more developments and individuals implement solar collection devices into their energy use and management strategies, the potential for tree versus solar devices will continue to increase. To avoid and address conflict, the City should adopt a Solar Shade Ordinance to clarify policies and mitigation standards. **Actions:** A) Partner with Roseville Electric to develop and clarify policies for tree versus solar conflicts. B) Refer to California Solar Shade Control Act; Public Resources Code Section 25980-25986, 1978. C) Coordinate with GIS staff for mapping and analysis of potential/existing conflict (e.g., solar panel layer). D) Identify exemptions and exclusions.	$ Low	1) Develop and adopt solar shade ordinance to clarify policies for tree versus solar conflicts.	2014-2018
5. Revise design and construction standards that apply to trees and planter sites. To reach full potential (i.e., a trunk diameter, height, and canopy spread typical of the species) and to provide the greatest benefits to the community, a tree must have enough soil volume to support healthy root growth and structure (Appendix A, Soil Volume & Tree Stature). This is particularly important in parking lots and other paved areas where the temperatures of surrounding asphalt can inhibit the natural spread of roots beyond planter boundaries. In addition to planter design, species selection is critical (e.g., right tree, right place) to ensuring that a tree will perform its intended role and function in the landscape in balance with other infrastructure. **Actions:** A) Maintain current Master Tree List and Planting Standards in the Parks Construction Standards.	$ Low	1) Collaborate with other City Departments to implement and adopt UFMP tree planting and tree care standards and recommended tree species (Master Tree List). 2) Revise P&R construction standards to reflect UFMP tree care and planting standards and recommended tree species.	2014-2017

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Optimize the environmental, social, economic, and public health benefits of trees and canopy

Goal: Optimize community planning

This goal is intended to align the vision for Roseville's community urban forest with existing plans, community values, and other long-range goals.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
5. Revise design and construction standards that apply to trees and planter sites. *continued* **Actions:** B) Supplement Planter Design Standards with options for increasing soil volume where above ground area is restricted by impervious surfaces (Appendix A, Alternative Planter Designs). C) Supplement Planter Design Standards with additional options for incorporating trees into stormwater management (Appendix A, Alternative Planter Designs). o Stormwater tree pits and drainage plans o Interconnected tree pits o Bioswales D) Supplement planter and pavement design options to reduce conflicts between trees and infrastructure (Appendix A, Alternative Planter Designs). o Structural soils o Suspended pavement o Pervious pavement/rubberized pavers o Flexible (e.g., rubber) sidewalks E) Supplement Planter Construction Specifications with additional options for implementing urban trees into stormwater management (Appendix A, Alternative Planter Designs). o Stormwater tree pits and drainage plans o Inter-connected tree pits F) Coordinate with floodplain managers to ensure designs and specifications complement and meet the requirements of the State Water Resources Control Board and the City's Municipal Stormwater Permit. G) Amend Sidewalk Repair Specification: o Specify that clearance and root pruning shall comply with COR Pruning specifications. o Change City Arborist to Urban Forester and require his/her approval for tree removal. H) Where feasible, trees shall be placed on separate irrigation valves from shrubs, ground covers, and turf. I) Where possible, encourage and incentivize the use of recycled water systems (supports Public Facilities Element (General Plan 2025). J) In high-density, single-family developments, consider a greater buffer on the western side of homes to support shade trees and energy conservation. K) Periodically review industry standards, at least every ten years, for updates and revisions to design and construction options.	$ Low	3) Supplement and implement planter design standards for increased soil volume. 4) Supplement and implement planter and pavement design options to reduce conflicts between trees and infrastructure: - structural soils - suspended pavement - pervious pavements - rubberized sidewalks 5) Amend and implement sidewalk repair specifications to specify root pruning and implement rubberized or flexible sidewalks.	2014-2017
6. Participate in regional planning for the urban forest. Urban trees provide benefits beyond the community boundaries in which they grow. The benefits from Roseville's trees to air quality, carbon reduction, and water quality impact the environmental health of neighboring communities and the Sacramento Valley as well as playing a role in the network of trees and forests that support all life on earth.	$ Low	1) Continue to participate and endorse the Greenprint Initiative.	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Optimize the environmental, social, economic, and public health benefits of trees and canopy

Goal: Optimize community planning

This goal is intended to align the vision for Roseville's community urban forest with existing plans, community values, and other long-range goals.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
6. Participate in regional planning for the urban forest. *continued* **Actions:** A) Continue to endorse and participate in the Greenprint Initiative. B) Work with regional and state forestry groups to develop regional carbon sequestration goals. C) Work with regional forestry groups to develop (and update) fees and mechanisms for tree replacement (e.g., Roseville Municipal Code, Title 19, Zoning). D) Identify opportunities for tree planting projects that address CEQA mitigation requirements for development. E) Promote the importance of trees and urban forests in local and regional planning and policy development for addressing issues of air quality and climate change. o Supports AB32 California Global Warming Solutions Act	$ Low	2) Work with regional and state forestry groups to develop carbon sequestration goals and promote the importance of trees in planning and policy development for addressing issues of public health and air quality.	Ongoing
7. Supplement stormwater and flood control management strategies to recognize the value of trees and canopy. Trees and urban forests should be recognized as a part of a comprehensive approach to stormwater and flood management strategies in the community. Tree canopy provides a natural, cost-efficient, and effective contribution to these strategies in the following ways: ▪ Tree canopy intercepts stormwater and tree roots increase soil capacity and infiltration, reducing runoff and non-point source pollution. ▪ Tree roots stabilize soils on slopes and creek boundaries. ▪ Stormwater interception reduces load on wastewater treatment facilities during storms, contributing to storm surge capacity. **Actions:** A) Coordinate with floodplain managers to recognize the important contribution and value of trees and tree canopy in stormwater and flood control management plans and strategies. B) Coordinate with floodplain managers and GIS staff to analyze and model strategies to supplement stormwater and flood control management. C) Promote trees and canopy as an efficient and cost-effective part of the solution to managing stormwater. D) Encourage and promote the benefits of stormwater planting pits, swales, channels and other designs intended to capture and retain stormwater for use by urban trees (Appendix A, Alternative Planter Designs). E) Encourage use of structural soils and permeable pavements to boost soil capacity, infiltration, and recharge. F) Supplement design standards to support the construction of suspended sidewalks, curb drains, stormwater tree pits, and other designs that promote the temporary storage and infiltration of stormwater; especially in areas with a high percentage of impervious surface and where planter space is limited (e.g., commercial and downtown areas) (Appendix A, Alternative Planter Designs). G) Encourage development designs that support the State MS4 General Permit requirements that include provisions for matching the pre-development hydrograph for 85 percentile storm events with the post-development hydrograph, thereby reducing stormwater and channeling valuable water to support trees and other landscaping.	$ Low	1) Recognize the value of trees and tree canopy in stormwater and flood control management plans and strategies. 2) Supplement and implement design standards to support the construction of bioswales, curb drains, etc. 3) Encourage development designs that support the State MS4 General Permit requirements for 85 percentile storm events.	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Optimize the environmental, social, economic, and public health benefits of trees and canopy

Goal: Optimize community planning

This goal is intended to align the vision for Roseville's community urban forest with existing plans, community values, and other long-range goals.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
8. Reference City of Roseville Tree Planting Standards for construction and development projects. Where such planting standards and specifications are required, all development, construction, and repair projects should reference the City of Roseville Tree Planting Standards (Parks Construction Standards). **Actions:** A) City of Roseville Tree Planting Standards are located in the City of Roseville Parks Construction Standards, Section 4. B) The Urban Forester shall coordinate with electric, natural gas, and environmental utility providers and City planning and development departments to revise and update Tree Planting Standards as necessary.	$ Low	1) Reference City of Roseville Tree Planting Standards and Tree Pruning Standards in all development, construction and repair projects.	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

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Optimize the environmental, social, economic, and public health benefits of trees and canopy

Goal: Increase connectivity of tree canopy to improve opportunities for passive recreation, alternative transportation, and wildlife habitat

This goal is intended to promote a connectivity of natural resources and appreciation for the urban forest by encouraging passive recreation (walking, hiking, and biking) and enjoyment of greenspace and wildlife through the development and maintenance of trails and trail systems across Roseville.

This goal supports the Circulation Element and the Open Space and Conservation Element of the General Plan.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Increase availability and connectivity of trails that interface with nature and wildlife. Explore opportunities and locations along the urban-wildlife interface (e.g., open space, creeks, riparian areas, natural forest stands) where additional trails and trees will increase the connectivity of the existing trail system, forest canopy, understory, and wildlife habitat, and provide greater opportunity for passive recreation (e.g., biking, hiking, walking, jogging). **Actions:** A) Coordinate with Alternative Transportation Manager to identify locations and opportunities to improve connectivity in the existing trail system. B) Coordinate with GIS staff for modeling and site evaluation/selection to optimize connectivity and interface with nature and wildlife. o Combine analysis with priority planting sites layer. C) Identify locations where residents would like to see more nature and wildlife trails. D) Work with open space managers, alternative transportation managers, and park development planners to develop new trails and tree plantings that improve the connectivity of tree canopy, trails, and wildlife habitat. (See Natural Resources Inventory, Forest Fragmentation (Urban Tree Canopy Assessment, 2013).	$$ Medium	1) Identify locations and opportunities to improve connectivity in existing trail system. 2) Collaborate with planners to develop new trails.	Ongoing
2. Explore opportunities to develop community gardens. Community and neighborhood gardens provide an opportunity for recreation and socialization as well as a chance for residents to grow their own food. **Actions:** A) Explore locations and community support for neighborhood and community gardens. B) Coordinate with GIS staff to identify optimal locations for community gardens using site criteria and neighborhood demographic profiles.	$ Low	1) Identify community and neighborhood gardens to provide an opportunity for recreation, socialization, and fresh produce.	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize urban forestry programming

The goal is intended to optimize the structure and organization of Roseville's urban forestry program and provides the necessary support for day-to-day operations and the implementation of the Urban Forest Master Plan.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Increase resources and staffing structure for the urban forestry group. To provide the level of care and management necessary to protect and grow the public urban forest and the benefits provided by this resource, it will be necessary to increase resources along with the staffing structure of the urban forestry group. **Actions:** A) Increase resources in order to achieve future staffing model of Urban Forestry Group (refer to Appendix A, Figure 27, page 85). B) Operations should include a Senior Arborist/Urban Forestry Technician to assist the Urban Forester. Primary duties include: o Quality Assurance o Risk assessment/Risk management o Sidewalk repair inspections and recommendations for Public Works/Engineering o Arborist reports, recommendations, and assessments (interdepartmental) o Tree inventory data collection input/update o Tree inspections o Issuing service requests and work orders o Volunteer coordination/Public outreach o Oak Mitigation Plan coordination and implementation C) Operations should include Arborists to perform tree care operations throughout the city. Primary duties include: o Non-routine maintenance pruning o Emergency response o Plant Health Care (PHC) o Planting o Tree removals o Quality Assurance of field staff o Risk assessment o Oak mitigation implementation—planting, maintenance, irrigation D) Operation should include Tree Trimmers. Primary duties include: o Non-routine maintenance pruning o Emergency response o Plant Health Care (PHC) o Planting o Tree removals	$$$$ Very High	1) Increase resources and staffing structures for urban forestry group through additional positions, see UF staffing model (Appendix A, Figure 27, page 85).	Immediate
2. Optimize the organizational structure for urban forestry operations. Ultimately, the success of the Urban Forest Master Plan will require both the support of the community and strong leadership within the City. Roseville is fortunate to have a highly skilled, well-trained, and dedicated Urban Forester. Developing an organizational structure that optimizes tree care operations and establishes program authority, will provide the necessary foundation for realizing the community's urban forest vision and ensuring the protection of the public tree resource.	$$$-$$$$ High- Very High	1) Develop and implement the structure of the urban forestry staffing model to optimize urban forestry operations.	Immediate

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Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize urban forestry programming

The goal is intended to optimize the structure and organization of Roseville's urban forestry program and provides the necessary support for day-to-day operations and the implementation of the Urban Forest Master Plan.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
2. Optimize the organizational structure for urban forestry operations. *continued* **Actions:** A) Develop and implement an optimal organizational structure for urban forest operations (Appendix A, Figure 27, page 85). Designate the Urban Forester as responsible for the care and maintenance of all public trees.	$$$-$$$$ High-Very High	1) Develop and implement the structure of the urban forestry staffing model to optimize urban forestry operations (Appendix A, Figure 27, page 85)	Immediate
3. Develop an advanced training structure for in-house urban forestry staff. The Urban Forester shall develop and implement a training program and structure to advance and improve the skills and knowledge of staff engaged in advanced tree care operations, including climbing, aerial rescue, and advanced pruning and risk assessment procedures. **Actions:** A) In-house tree crews should be fully trained and certified for bucket work, climbing, and rescue. B) Training to be provided in-house, when possible by the Urban Forester, including: o ISA DVD o Training workshops o CEUS	$ Low	1) Develop and implement in-house certification and training program for urban forestry staff.	Ongoing
4. Develop a Risk Management Plan and policy for urban forestry operations. This strategy is intended to manage the public safety component of urban forestry operations. Managing the risk of trees (i.e., inspection, identification of risk factors, mitigation) along streets, trails, sidewalks, parks, golf courses, and open space trees adjacent to private property can significantly reduce the risk of entire tree or branch failure. **Actions:** A) Work with the Risk Management Department to identify objectives and action thresholds for tree risk management. B) Coordinate risk management objectives with a tree inspection program. C) Prioritize risk mitigation measures and coordinate with work plans. D) Identify risk assessment priorities, protocols, policy, and final authority for removals. E) Coordinate with GIS staff for geographic analysis of specific risk factors (e.g., disease/pest factors, others) and to identify areas of high/low risk. F) Add urban forest risk management policies to the City's Multi-Hazard Mitigation Plan.	$ Low	1) Develop and implement a Risk Management plan to properly identify, manage, and mitigate tree risk	2014-2016
5. Develop a Policy and Procedures Manual for the Urban Forestry Group. The Urban Forester should work with staff to develop a Policies and Procedures manual that outlines group operations and official policies and procedures that guide day-to-day urban forestry operations. **Actions:** A) Define the structure and organization of the urban forestry group. B) Define responsibilities of staff.	$ Low	1) Develop and implement a policy and procedures manual to define structure and organization of the UF group. 2) Define responsibilities of UF staff.	2014-2016

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Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize urban forestry programming

The goal is intended to optimize the structure and organization of Roseville's urban forestry program and provides the necessary support for day-to-day operations and the implementation of the Urban Forest Master Plan.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
5. Develop a Policy and Procedures Manual for the Urban Forestry Group. *continued* **Actions:** C) Outline and specify Best Management Practices (BMPs) and policies for tree care operations. D) Define responsibility and procedures for record keeping. E) Identify management strategies for trees in utility rights-of-way. o Coordinate with electric, natural gas, and environmental utilities managers. F) Define policies and procedures for tree removal. G) Identify policies and responsibilities for risk assessment and risk management. H) Ensure that Urban Forest policies and procedures are incorporated into other City standards and management plans.	$ Low	3) Outline and specify BMPS and policies for tree care operations, tree removals, risk assessment and risk management, management strategies for trees in PROW and UROW.	2014-2016
6. Develop an annual work plan. The Urban Forester should work with staff to develop an annual work plan. **Actions:** A) Develop a work plan to guide short-term management operations and objectives, including: o Pruning schedules for maintenance contract(s). o Tree planting and replacement plan. o Prioritize risk mitigation actions and tree removals. o Identify and prioritize trees for inspection/risk assessment. o Prioritize and revisit objectives and strategies identified by the Urban Forest Master Plan. B) Will occurs annually, with budget development. C) Refer to the UFMP to identify objectives for the current year.	$ Low	1) Develop and implement an annual work plan including pruning schedules, tree planting and tree replacement plan, risk mitigation and tree removal, risk assessment and plant healthcare.	Annually
7. Develop a vegetation management policy and standards for managing trees in utility easements. This strategy is intended to reduce, and wherever possible, eliminate conflicts between trees and utilities, including high voltage utilities (overhead and underground), high-pressure gas lines, and drainage, sewer, and water easements (including bridges and culverts). **Actions:** A) Optimize relationships between utility representatives/personnel and urban forestry staff. B) Work with utility providers/owners/managers to develop a management policy and standards for trees in trees in utility easements. o Adopt BMPs and industry standards (ANSI) for vegetation management and line clearance of trees in utility easements (public and private). C) Coordinate for an annual meeting between the Urban Forester and Roseville Electric managers to discuss issues, conflicts, and opportunities for collaboration o Optimally occurs during budget development period. D) Work with Roseville Electric to increase diversity in Shade Tree Program species selections. E) Work with utility providers/owners/managers to revise/update Roseville Tree Planting Standards (UFMP).	$ Low	1) Develop and implement vegetation management policy and standards.	2014-2018

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Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize urban forestry programming

The goal is intended to optimize the structure and organization of Roseville's urban forestry program and provides the necessary support for day-to-day operations and the implementation of the Urban Forest Master Plan.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
7. Develop a vegetation management policy and standards for managing trees in utility easements. *continued* **Actions:** F) Work with utility providers/owners/managers to revise/update Roseville Tree Pruning Standards (UFMP). G) Coordinate with applicable utility providers/owners/managers when planning planting projects in proximity to high voltage power lines, high-pressure gas lines, transmission easements, drainage, sewer, and water easements (including bridges and culverts).	$ Low	1) Develop and implement vegetation management policy and standards.	2014-2018
8. Develop a policy and identify responsibility for contract monitoring. Develop a policy and identify responsibility for quality control, quality assurance, and auditing of tree care operations that are performed by contracted staff. **Actions:** A) Urban forestry staff should regularly monitor contractors for quality control and assurance. B) Identify audit procedures for long-term contracts (e.g., pruning). C) Ensure compliance with contract specifications.	$ Low	1) Develop and implement policy for quality assurance for contracted tree care operations and compliance with tree care specifications.	2014-2016
9. Develop a basic arboriculture training program for select park staff. To supplement urban forestry staffing needs, the Urban Forester should work with the Park Superintendent and Managers to identify Park Department staff with an interest in tree care. The Urban Forester should develop and implement a training program to teach these individuals basic tree care skills, including small branch removal, young tree training, and risk identification. **Actions:** A) Develop and implement a training program for basic tree care skills. B) Identify Park staff with an interest in arboriculture. C) Mentor individuals who demonstrate an aptitude and interest for arboriculture and provide opportunities for advancement.	$ Low	1) Develop a basic arboriculture training program for staff.	Ongoing
10. Develop a policy and responsibility for keeping inventory data current (Treekeeper/Maximo/Arbor Access). Ideally, the inventory system should be accessible in the field so that tree information can be updated as maintenance and/or inspections are completed (e.g., tablet computers). **Actions:** A) Develop and integrate a program to allow for access of inventory data by supervisory staff in the field. B) Coordinate with GIS and Information Technology staff to evaluate how TreeKeeper, Maximo, Arbor Access, and other enterprise GIS tools and data can be used together optimally and where the system of record for tree information should be maintained. C) Explore applications for smartphones/tablets to allow for updates to occur simultaneously as maintenance and/or inspections are completed. o Coordinate with GIS staff to leverage existing mobile GIS research. o Build inventory data updates into trimming contracts.	$$ Medium	1) Develop and implement a policy and responsibility for keeping inventory data current (EAM/Maximo/Arbor Access).	2014-2016

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Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize urban forestry programming

The goal is intended to optimize the structure and organization of Roseville's urban forestry program and provides the necessary support for day-to-day operations and the implementation of the Urban Forest Master Plan.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
11. Work with GIS staff to explore analysis to improve scheduling and routing of maintenance activities/cycles and cost reduction. GIS analysis can provide valuable tools for routing and scheduling maintenance activities as well as identifying and tracking patterns for service requests, pest and disease signs and symptoms, and storm damage. **Actions:** A) Coordinate with City GIS staff to identify opportunities to improve planning, scheduling, and routing of maintenance activities to increase efficiency and reduce costs. B) Use GIS analytics to evaluate service request/work orders to identify areas of high maintenance concentration and to identify patterns related to disease, pests, or other specific maintenance issues.	$ Low	1) Increase efficiency and reduce costs of maintenance activities through improved scheduling and routing.	2014-2016 Ongoing

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Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize funding and identify new opportunities

This goal is intended to identify and secure funding, both short-term and long-term (sustainable), for the establishment, preservation, and maintenance of public trees in Roseville. Possible sources include, but are not limited to: general fund, assessment districts, developer contributions, and other state, federal, and local sources.

The Parks and Recreation Element (General Plan 2025) supports planned funding for tree installation and urban forest management.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Optimize funding from assessment districts (LLDs, CLDs). Funding for tree care is not equal among funding districts. While most districts are supporting a 5-year cycle, some districts are only able to support a longer pruning cycle, and others have no funding to create a regular pruning cycle. Additionally, in many existing funding districts, funding for tree maintenance is not specifically identified and must be justified as a portion of a broader category of maintenance issues that often include turf, lighting, and other features. As a consequence, tree care is not always adequately funded in every district. **Actions:** A) Develop and provide outreach and education to neighborhood associations about how public tree care is funded and how funding is allocated for maintenance. o Illustrate the benefits of the urban forest and the potential results and costs of deferred maintenance. B) Identify neighborhoods that are underfunded or unfunded and communicate to residents and neighborhood associations the costs and risks associated with deferring tree maintenance. C) Coordinate with GIS staff to analyze current funding and to support outreach and education to neighborhood associations. D) Work with residents in underfunded and unfunded neighborhoods to develop strategies that provide adequate funding for tree care. E) Coordinate outreach with other applicable City staff/departments to include consideration for other unfunded/underfunded maintenance activities, including general trail maintenance. F) Future development of funding districts should specifically consider the costs of tree care along with other maintenance activities, including: o Tree care requirements relative to species and number of public trees. o Resident expectations for the quality of tree care in the neighborhood.	$ Low	1) Increase funding in assessment districts that are underfunded or unfunded and develop strategies that provide adequate funding for tree care.	Ongoing
2. Increase funding for tree care from the Open Space Preserves Fund. The purpose of this fund is to maintain the quality of open space preserves. Because trees and forests are critical to this purpose, funds should be dedicated to support planting, maintenance, and risk management in these areas. **Actions:** A) Identify funding for the inventory of significant trees in opens space preserve areas, based on location and other risk factors, including: o Proximity to trails and other accessible areas. o Proximity to homes and other structures. B) Identify funding for mitigation measures to address risk factors for trees in open space preserves. C) Significant trees in open space preserves should be included in regular maintenance and pruning cycles to preserve tree health and structure and manage risk.	$$$ High	1) Allocate funding for mitigation measures to address tree risk in open space preserves and to maintain significant trees. 2) Identify funding for the inventory of significant trees, trees in proximity to trails and homes and other risk factors.	Ongoing

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Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize funding and identify new opportunities

This goal is intended to identify and secure funding, both short-term and long-term (sustainable), for the establishment, preservation, and maintenance of public trees in Roseville. Possible sources include, but are not limited to: general fund, assessment districts, developer contributions, and other state, federal, and local sources.

The Parks and Recreation Element (General Plan 2025) supports planned funding for tree installation and urban forest management.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
3. Optimize funding for trees and planting sites in projects funded by Capital Improvement Funds (CIP). Trees and landscaping are an integral part of most development and redevelopment projects. As such, adequate resources should be included for trees as well as for constructing planting sites that support mature tree development. As an added benefit, shade from trees can help to extend the lifespan of infrastructure, including paving materials for streets, parking lots, and trails. **Actions:** A) CIP funded projects (Municipal Code, Chapter 11.33) should include adequate consideration of trees and planter space, including the construction of planters and pavements that support mature tree development and tree health (e.g., suspended pavement, structural soils).	$$$ High	1) Include in CIP funded TSM projects adequate planter spaces and pavements that support mature tree development (e.g. suspended pavement, structural soil)	Ongoing
4. Optimize and increase revenue to the Tree Mitigation Fund. Explore new sources for growing the Tree Mitigation Fund. Coordinate with regional groups to identify best practices for tree replacement fees and mechanisms. **Actions:** A) Ensure available funding is dedicated specifically for tree care operations, including planting, replacement, and oak mitigation. B) Work with regional forestry groups to develop appropriate fees and mechanisms for tree replacement. o Perform in lieu fee comparison in the region and increase in lieu fee to reflect region wide fee structure. C) Identify options for additional sources of revenue: o Appraisal fees for vehicular accidents o Fines for damaging public trees o Other	$ Low	1) Ensure available funding is dedicated specifically for tree planting, replacement, and oak mitigation. 2) Develop and implement appropriate fees and mechanisms for tree replacement. 3) Perform in lieu fee comparison in the region and increase in lieu fee to reflect region wide fee structure.	Ongoing
5. Optimize support for urban forest operations from the General Fund. The general fund provides funding for the maintenance of public trees that are outside of assessment districts, including many parks, city facilities, and open space areas. Trees are important to the quality of life in Roseville and public trees are a valuable asset to the community. Maintaining tree health, preserving environmental benefits, and managing risk is an essential public service which should be adequately reflected in the allocation of funding. **Actions:** A) The care and the preservation of public trees as a community asset should be funded, in part, by general funds that are intended to support essential public services. B) Identify general funds for managing public trees not in assessment districts, including pruning and risk management. C) Demonstrate and report the need and justification for funding the care and maintenance of public trees, including: o Annual work plan (pruning cycles, PHC, training, etc.) o Risk mitigation plan o Urban Forest Master Plan objectives	$$$ High	1) Allocate general funds to manage trees not in assessment districts, including pruning and risk management.	Ongoing

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Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize funding and identify new opportunities

This goal is intended to identify and secure funding, both short-term and long-term (sustainable), for the establishment, preservation, and maintenance of public trees in Roseville. Possible sources include, but are not limited to: general fund, assessment districts, developer contributions, and other state, federal, and local sources.

The Parks and Recreation Element (General Plan 2025) supports planned funding for tree installation and urban forest management.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
6. Increase funding for tree care from Facilities Fees. Facilities Fees provide for funding of maintenance at funded facilities, including wastewater plant, water treatment plant, fire and police stations, Roseville Electric facilities, other city facilities and parking lots. Trees at these facilities are in the inventory system, but are not currently funded for regular maintenance. **Actions:** A) Identify funding for the maintenance of trees at city facilities. B) Trees located at city facilities should be included in regular maintenance and pruning cycles to preserve health and structure and manage risk.	$ Low	1) Allocate funding for the maintenance of trees at city facilities.	Ongoing
7. Explore funding from the Bike Trail Fund to support maintenance and risk management of trees adjacent to bike trails. Public trees are an integral part of the City's trail system. Providing shade to reduce temperatures and exposure in addition to their aesthetic contribution, trees add incomparable value to this system. Their presence encourages the use of alternative transportation (e.g., walking, cycling), in support of the Circulation Element (General Plan 2025). As such, care and maintenance of trees in proximity to bike trails should be funded, in part, through the Bike Trail Fund. **Actions:** A) To the extent that additional funding sources are identified and in consideration of other trail maintenance needs, explore Bike Trail Funding for maintenance, pruning, and risk management of trees in proximity to bike trails. B) Maintain trees in proximity to bike trails to provide clearance, shade, and risk management for pedestrian and bicycle traffic.	$$$ High	1) Allocate Bike trail funding to manage trees for maintenance, pruning and risk management in proximity to bike trails.	Ongoing
8. Explore funding for risk management of public trees An important part of managing public trees is identification and mitigation of risk factors that may develop over the life and maturation of each tree. **Actions:** A) Identify funding for tree inspection and risk assessment for trees located outside of assessment districts, including trees in open space areas. B) Explore opportunities for risk management funding to mitigate the risk of branch or entire tree failure in older over-mature trees located in areas not funded through assessment fees.	$$$ High	1) Allocate funding for tree inspections, risk assessment and risk management.	Ongoing

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Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize funding and identify new opportunities

This objective is intended to identify and secure funding, both short-term and long-term (sustainable), for the establishment, preservation, and maintenance of public trees in Roseville. Possible sources include, but are not limited to: general fund, assessment districts, developer contributions, and other state, federal, and local sources.

The Parks and Recreation Element (General Plan 2025) supports planned funding for tree installation and urban forest management.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
9. Explore opportunities to create a Park and Landscape District. Explore the opportunity and level of community support for an overall Park and Landscape District to provide dedicated funding for public tree care throughout the City, including park and street trees not currently funded by existing assessment districts. **Actions:** A) Develop public outreach materials and presentations that communicate the importance and value of the urban forest and clearly articulate maintenance needs and costs, as well as shortcomings in current funding mechanisms. o Coordinate outreach with other applicable City staff/departments to include consideration for other unfunded/underfunded maintenance activities, including general trail maintenance. B) Explore community support for an overall assessment district to support the urban forest and public landscapes.	$ Low	1) Develop public outreach material and presentations and explore community support for an overall assessment district to support the urban forest.	2014-2024
10. Identify and apply for available grant funding. The City of Roseville has the program essentials and a strong foundation to support an exceptional urban forest and urban forest management program, including an inventory of resources, an Urban Tree Canopy Assessment, an Urban Forest Master Plan, community support, a dedicated Urban Forester, and a regional and state presence. These qualifications warrant top consideration for available grant funding to support the realization of the strategies and implementation measures identified in the UFMP. **Actions:** A) Identify grant opportunities, including regional, state, national, special interest, and others, that may support urban forest program development and the objectives and strategies identified by the UFMP. B) Apply for all grants that support community needs, urban forest programming and/or the implementation of objectives and strategies identified by the UFMP.	$ Low	1) Apply for regional, state, or federal grant opportunities to support the urban forestry program and the local community.	Ongoing
11. Increase and optimize partnerships and collaborations with individuals, groups, and agencies who share urban forest goals and objectives. Optimize existing partnerships and relationships with individuals, groups, agencies, and others who value trees and the urban forest. Identify and cultivate groups who share a vision for a healthy community, a sustainable environment, a high quality of life, and/or trees. **Actions:** A) Nurture existing relationships with individuals, non-profits, regional groups, government agencies, and others who share a vision and goal for a robust urban forest. B) Identify individuals and groups with shared vision and goals aligned with a healthy and well-maintained urban forest. C) Collaborate on projects with outcomes that meet shared goals and objectives for the urban forest and the UFMP.	$ Low	1) Identify and collaborate with nonprofits, regional groups, government agencies, and internal stakeholders to promote urban forest goals and tree advocacy.	Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Align urban forest management policy with community expectations and cost efficiency

Goal: Optimize funding and identify new opportunities

This objective is intended to identify and secure funding, both short-term and long-term (sustainable), for the establishment, preservation, and maintenance of public trees in Roseville. Possible sources include, but are not limited to: general fund, assessment districts, developer contributions, and other state, federal, and local sources.

The Parks and Recreation Element (General Plan 2025) supports planned funding for tree installation and urban forest management.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
11. Increase and optimize partnerships and collaborations with individuals, groups, and agencies who share urban forest goals and objectives. *continued* **Actions:** D) Partner with Roseville Electric to combine contracts for tree pruning and plant health care for maximum savings and greater competitiveness. E) Identify and grow relationships with health care organizations for collaboration on projects and programs that promote public health and increase physical activity (e.g., development of trails, opportunities for passive recreation, increased walkability, Safe Streets, etc.). F) Collaborate with alternative transportation planners and others to increase trail construction, including planting trees, especially those that increase the connectivity of the existing trail system and promote greater opportunities for passive recreation and alternative transportation (e.g., biking, walking). G) Collaborate with nonprofit organizations to develop charity events that generate advocacy and funding in support of the community urban forest (e.g., concerts, auctions, dinners, etc.).	$ Low	1.) Identify and collaborate with nonprofits, regional groups, government agencies, and internal stakeholders to promote urban forest goals and tree advocacy.	Ongoing
12. Explore urban wood utilization programs. Explore opportunities to recycle trees that are removed from the community urban forest. Teaming up with woodworkers and turners, cabinet makers, furniture makers, and other craftsman to reuse urban wood when possible can reduce the need to chip and dispose of green waste and provide the raw material for recycled crafts and furniture. **Actions:** A) Collaborate with community woodworkers and craftsman to explore needs and uses for recycled urban wood.	$ Low	1) Explore needs and uses for recycled urban wood. 2) Reduce chipping and green waste.	2014-2016

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Align urban forest management policy with community expectations and cost efficiency

Goal: Review and Measure Attainment of the UFMP

This goal is intended to ensure that the Urban Forest Master Plan remains current and representative of community goals and values and that it continues to be a dynamic and responsive tool for managing the community's urban forest resources.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
1. Annually, review the UFMP and the attainment status of goals and objectives. The UFMP is intended to be an active tool that can and should be adjusted in response to available resources and changes in community expectations. In addition to serving as a day-to-day guide for planning and policy making, the Urban Forest Master Plan should be reviewed annually for progress and integration of objectives into the annual work plan. **Actions:** A) Review UFMP annually and adjust targets as necessary. B) Integrate current objectives and actions into the annual work plan. C) Review objectives and actions for attainment status and update the Objectives, Actions, and Targets table (Appendix B).	$ Low	1) Review UFMP annually to adjust targets. 2) Integrate current objectives and actions into the annual work plan. 3) Review objectives and actions for attainment status and update Appendix B: Objectives, Actions, & Targets (page 86).	Annually
2. Align UFMP objectives and strategies with community expectations. Perhaps the greatest measurement of success for the UFMP will be its level of success in meeting community expectations for the care and preservation of the urban forest resource. **Actions:** A) Periodically review the UFMP for alignment with community values and expectations for the urban forest. B) Community satisfaction can be measured though surveys as well as evidenced by public support for realizing the Plan's objectives and actions. C) Community satisfaction can also be gauged by the level of engagement and support for urban forest programs, workshops, and issues.	$ Low	1) Periodically review UFMP for alignment with community values and expectations for the urban forest.	Ongoing
3. Complete a resource analysis (i-Tree Streets) every 5 years. With current tree inventory data (TreeKeeper®7.7, Maximo), Roseville can quickly and easily complete an updated resource analysis to quantify the updated environmental benefits and benefit versus investment ratio for the community's urban forest. Since benefits will increase with additional trees planted and as the urban forest matures, it is recommended that a resource analysis be completed every 5 years. **Actions:** A) Use i-Tree Streets to calculate the current composition, benefits, and benefit versus investment ratio of the community urban forest. B) Review changes and improvements to benefits, composition, and benefit versus investment ratio. C) Consider results with periodic review and alignment of UFMP goals, objectives, and actions. D) Report changes and progress in the State of the Urban Forest Report.	$ Low	1) Use resource analysis to calculate current composition, benefits, value of the urban forest, and return of investment and compare changes of prior analyses to show improvement and progress. 2) Check alignment with UFMP goals, objectives, and targets. 3) Present information in the State of the Urban Forest Report.	2019, 2024, 2029, 2034, 2039

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.

Align urban forest management policy with community expectations and cost efficiency

Goal: Review and Measure Attainment of the UFMP

This goal is intended to ensure that the Urban Forest Master Plan remains current and representative of community goals and values and that it continues to be a dynamic and responsive tool for managing the community's urban forest resources.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
4. Complete a canopy analysis every 10 years. Now that a baseline tree canopy cover analysis has been completed, overall canopy and canopy cover by neighborhood, land-use, and other boundaries can be measured periodically for change over time and attainment with community canopy goals. Canopy analysis should be completed every 10 years **Actions:** A) Use i-Tree Canopy or remote sensing (aerial imagery) to map the extent and location of tree canopy in Roseville. B) Review changes and improvements to overall canopy cover, land use, neighborhoods, etc. C) Consider results with periodic review and alignment of UFMP goals, objectives, and actions. D) Report changes in the State of the Urban Forest Report.	$-$$ Low-Medium	1) Use urban tree canopy analysis to show changes, progress and improvement in urban tree canopy cover and check alignment with UFMP. 2) Check alignment with UFMP goals, objectives and targets. 3) Present information in the State of the Urban Forest Report.	2024, 2034

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

*Targets are tentative and dependent upon available resources. Costs are based on general estimates.


LOWE'S

Roseville's Urban Forest Benchmark Values

Community Urban Forest (Public Tree Resource)

Inventoried Trees (2014)	42,000
Open Space Trees (estimated)	80,000-100,000
Replacement Value (2010)	$77.5 million

Species Diversity (Inventoried Trees)

Total number of unique species	160
Prevalence of top ten species	61%
Species exceeding recommended 10%	2

Benefits (Inventoried Trees, 2010)

Total Annual Benefit	$3.2 million
Annual Per Tree Benefit	$83
Annual Per Capita Benefit	$29

Urban Tree Canopy Cover (Public and Private, 2012)

Overall Canopy Cover	15.7%
Canopy Cover – Open Space	27.6%
Impervious Surfaces	46.2%

Canopy Benefits (Public and Private, 2012)

Overall carbon storage	$7.5 million
Annual Air Quality Benefits	$1.6 million

HOW ARE WE DOING?

Monitoring and Measuring Results

With appropriate care and planning, the urban forest is an asset that has the potential to increase in value over time. Considering that 41% of the public tree population is comprised of very young, medium and large stature trees, Roseville is well positioned to realize this potential. As these young trees mature and their leaf surface and canopy grows, so too will the overall benefits and value of the community's urban forest. The guiding principles, goals, and objectives of the UFMP are intended to support this process in an appropriate manner that provides for the sustainable stewardship of public trees with consideration for cost efficiency and community values. The UFMP includes goals and objectives for measuring the success of planning strategies over time.

Perhaps the greatest measurement of success for the Plan will be its level of success in meeting community expectations for the care and preservation of the urban forest resource.

Annual Review

The UFMP is an active tool that will guide management and planning decisions over the next 25 years. The goals, objections, and actions will be reviewed yearly for progress and integration into the annual work plan. The Plan presents a long-range vision and target dates are intended to be flexible in response to emerging opportunities, available resources, and changes in community expectations.

Resource Analysis

With up-to-date tree inventory data (TreeKeeper®7.7, Maximo, and Arbor Access), Roseville can quickly and easily complete an updated resource analysis. Comparison of the updated structure, benefits, worth, and benefit vs. investment values can be measured against the benchmarks set by the 2010 analysis to demonstrate progress and improvements to health (condition), species diversity, benefits, and overall resource value. An objective of the UFMP is to complete this analysis every 5 years to illustrate progress and success towards UFMP goals.

Canopy Analysis

With a baseline tree canopy and land cover analysis (UTC Assessment, 2012) changes to the extent and location of tree canopy can be monitored over time. Using GIS analysis, the City can measure and illustrate changes in overall land cover as well as by neighborhood and land-use. This information can be used to inform canopy goals and monitor attainment. The UFMP intends to update the canopy and land cover analysis on a 10 year basis.

i-Tree Eco

An i-Tree Eco project provides a more complete picture of the overall urban forest (public and private trees). Using complete inventory data or randomly sampled plots, i-Tree Eco considers local hourly air quality and weather data to quantify the structure of the urban forest along with the environmental benefits. Understanding age and species diversity can help the community plan for storm events and climate fluctuations as well as pest and disease outbreaks. An action item for the UFMP calls for urban forest managers to identify and apply for grant funding to complete an i-Tree Eco project within the next 10 years.

State of the Urban Forest Report

The UFMP calls for the City's Urban Forester to deliver a State of the Urban Forest Report every 5 years. This report, which includes updates on canopy change, numbers of trees planted and removed, and changes to the overall community urban forest (e.g., structure, benefits, and value) will serve as a performance report to stakeholders and an opportunity for engagement. The report is also an opportunity to highlight the successful attainment of UFMP objectives as well as to inform stakeholders about any issues or stumbling blocks.

Community Satisfaction

The results of the UFMP will be measurable in improvements to efficiency and reductions in unit costs for maintenance activities. Attainment of the goals and objectives will support better tree health, greater longevity, and a reduction of tree failures. However, perhaps the greatest measurement of success for the UFMP will be its level of success in meeting community expectations for the care and preservation of the urban forest resource. Community satisfactions can be measured through surveys as well as evidenced by public support for realizing the goals and objectives of the Plan. Community satisfaction can also be gauged by the level of engagement and support for urban forest programs.


2 HOUR
PARKING
PARK
PARALLEL
HISTORIC
US
40
ROUTE
TOM GAMAR
NO BICYCLING
SKATEBOARDING
ROLLERBLADES

APPENDICES

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Tables

Table 6. Roseville Parks and Average Canopy Cover

Park Name	Park Acres	Canopy Acres	% Canopy
ADAM V. BAQUERA PARK	2.67	0.73	27.34%
ALDO PINESCHI SR. PARK	4.03	0.18	4.47%
BEAR DOG PARK	18.39	1.70	9.24%
BILL SANTUCCI PARK	11.98	1.27	10.60%
BLUE OAKS PARK	42.55	19.50	45.83%
BUD NICHOLS PARK (W-52)	7.99	0.00	0.00%
BULJAN PARK	7.96	2.10	26.38%
C. DOULTON BURNER PARK	2.52	0.13	5.16%
CAMBRIA PARK	3.00	0.43	14.33%
CENTRAL PARK	20.35	0.17	0.84%
CRESTHAVEN PARK	4.09	1.82	44.50%
CRESTMONT PARK	4.97	1.57	31.59%
DAVID URIBE PARK	4.00	0.29	7.25%
DEL STEPHENSON PARK	2.61	0.19	7.28%
DIAMOND OAKS GOLF COURSE	120.55	23.98	19.89%
DIAMOND OAKS PARK	6.55	1.78	27.18%
DR. PAUL J. DUGAN PARK	22.09	4.47	20.24%
EASTWOOD PARK	4.07	2.29	56.27%
FRED FESTERSEN PARK (W-55)	8.39	0.01	0.12%
GARBOLINO PARK	3.05	1.11	36.39%
GEORGE GOTO PARK	7.68	0.07	0.91%
H.C. ELLIOT PARK	8.64	2.26	26.16%
HILLSBOROUGH PARK	10.76	3.11	28.90%
JAMES A. HALL PARK	4.34	1.19	27.42%
JAMES W. WANISH PARK	7.30	2.45	33.56%
JOHN PICHES PARK	1.98	0.60	30.30%
JOHNSON POOL	0.48	0.03	6.25%
KASEBERG PARK	12.56	3.71	29.54%
KENWOOD OAKS PARK	0.89	0.61	68.54%
LEONARD "DUKE" DAVIS PARK	4.13	0.59	14.29%
LINCOLN ESTATES PARK	5.22	2.77	53.07%
MAHANY PARK	79.53	10.93	13.74%
MAIDU REGIONAL PARK	148.12	38.87	26.24%
MARCO DOG PARK	3.97	0.68	17.13%
MARK WHITE PARK	0.77	0.27	35.06%
MEL HAMEL PARK	9.02	0.38	4.21%
MELBA AND WILLIAM "AL" ERVEN PARK	7.76	0.72	9.28%
MISTY WOOD PARK	19.55	9.05	46.29%
NORM FRATIS PARK	6.31	0.03	0.48%
OLYMPUS PARK	8.00	1.64	20.50%
PAUL LUNARDI PARK	8.06	0.72	8.93%
R.F. (RUBE) NELSON PARK	0.74	0.41	55.41%
RAY E. LOCKRIDGE PARK	15.03	5.99	39.85%
ROBERT L. DOYLE PARK	5.05	0.86	17.03%
ROYER PARK	14.76	8.53	57.79%
SAUGSTAD PARK	18.88	7.07	37.45%
SCULPTURE PARK	0.82	0.49	59.76%
SHIRLEY FERRETTI PARK	0.21	0.08	38.10%
SILVERADO OAKS PARK	6.35	2.91	45.83%
SSP 48	2.10	0.70	33.33%
SUMMERHILL PARK	2.90	0.40	13.79%
SYLVIA BESANA PARK	4.49	0.26	5.79%
TOWN SQUARE	1.11	0.51	45.95%
TWINWOOD PARK	1.01	0.49	48.51%
VENCIL BROWN PARK	23.77	0.64	2.69%
VETERANS MEMORIAL PARK	7.86	2.43	30.92%
VETERANS MEMORIAL PARK NORTH	12.57	1.06	8.43%
WEBER PARK	1.90	1.01	53.16%
WILLARD DIETRICH PARK	4.56	0.67	14.69%
WILLIAM "BILL" HUGHES PARK	30.48	8.99	29.49%
WILLIAM L. TAYLOR PARK	13.60	6.69	49.19%
WOODBRIDGE PARK	2.94	1.76	59.86%
WOODCREEK OAKS GOLF COURSE	208.01	47.36	22.77%
TOTAL	**1036.02**	**243.71**	**23.52%**

Table 7. RCONA Neighborhoods Showing Canopy Cover and Impervious Surface

RCONA NAME	RCONA Acres	Canopy Acres	% Canopy	Impervious Acres	% Impervious
BLUE OAKS	901.68	127.51	14.14%	409.49	45.41%
CHERRY GLEN	136.27	51.18	37.56%	72.00	52.83%
CIRBY RANCH	315.76	53.01	16.79%	196.12	62.11%
CIRBY SIDE	415.25	105.68	25.45%	244.53	58.89%
CREEKSIDE	92.80	6.91	7.45%	79.07	85.21%
CRESTHAVEN	481.35	95.99	19.94%	288.28	59.89%
DIAMOND OAKS	764.34	181.44	23.74%	230.73	30.19%
EAST ROSEVILLE PARKWAY	1434.16	291.86	20.35%	542.04	37.79%
ENWOOD	152.08	54.76	36.01%	70.26	46.20%
FOLSOM ROAD	333.78	98.28	29.44%	184.38	55.24%
FOOTHILLS JUNCTION	525.54	100.30	19.09%	336.77	64.08%
GALLERIA	94.46	8.67	9.18%	78.63	83.24%
HARDING	766.54	60.47	7.89%	336.20	43.86%
HIGHLAND RESERVE	729.79	88.23	12.09%	408.28	55.94%
HILLCREST	284.94	93.06	32.66%	137.06	48.10%
HILLTOP CIRCLE	197.85	21.46	10.85%	85.56	43.24%
INDUSTRIAL AREA EAST	897.05	28.40	3.17%	438.12	48.84%
INDUSTRIAL AREA WEST	933.15	76.95	8.25%	302.97	32.47%
JOHNSON RANCH	928.87	289.77	31.20%	446.13	48.03%
JUNCTION WEST	503.27	48.67	9.67%	303.99	60.40%
KASEBERG-KINGSWOOD	663.11	110.56	16.67%	383.33	57.81%
LEAD HILL	541.20	49.91	9.22%	437.09	80.76%
LOS CERRITOS	165.80	45.02	27.15%	91.13	54.96%
MAIDU	584.32	150.55	25.77%	240.90	41.23%
MEADOW OAKS	220.13	66.99	30.43%	122.45	55.63%
OLYMPUS POINTE	345.39	60.31	17.46%	206.27	59.72%
PLEASANT GROVE	612.94	139.29	22.72%	239.07	39.00%
QUAIL GLEN	674.37	142.48	21.13%	384.72	57.05%
ROSEVILLE HEIGHTS	195.52	48.81	24.96%	115.94	59.30%
SIERRA GARDENS	408.71	107.98	26.42%	227.58	55.68%
SIERRA VISTA	203.83	60.78	29.82%	99.00	48.57%
SOUTH CIRBY	364.36	87.46	24.00%	213.38	58.56%
STANFORD	564.10	38.11	6.76%	376.93	66.82%
STANFORD CROSSING	101.95	8.06	7.91%	82.95	81.36%
SUN CITY	1185.96	216.66	18.27%	545.45	45.99%
THEILES MANOR	157.04	56.52	35.99%	71.87	45.77%
VINEYARD	453.43	58.08	12.81%	323.17	71.27%
WESTPARK-FIDDYMENT FARM	3337.16	128.57	3.85%	601.63	18.03%
WOODCREEK OAKS	693.21	89.88	12.97%	336.94	48.61%
TOTAL	**22361.44**	**3548.62**	**15.87%**	**10290.41**	**46.02%**

Urban Tree Canopy Assessment Methodology

The following methodology and source data were used by Davey Resource Group in the assessment of Roseville's urban tree canopy:

Image Analysis

With advanced GIS and remote sensing software capabilities, in addition to advances in image acquisition, a top-down canopy assessment approach using remote sensing data is recommended to quantify the extent of tree canopy. Davey utilized an object based image analysis (OBIA) semi-automated feature extraction method to process and analyze current high resolution color infrared (CIR) aerial imagery, remotely-sensed data to identify tree canopy cover and land cover classifications. The use of imagery analysis is cost-effective and provides a highly accurate approach to assessing the City of Roseville's existing tree canopy coverage, which supports responsible tree management, facilitates community forestry goal-setting, improves urban resource planning of healthier and more sustainable urban environments.

Davey acquired ancillary GIS data and high resolution aerial imagery from the City of Roseville. In addition, National Agricultural Imagery Program (NAIP) 4-band imagery acquired by the United States Department of Agriculture (USDA) in 2010 was also obtained. The NAIP, administered by the USDA's Farm Service Agency, acquired the imagery at a one-meter ground sample distance (GSD) with a horizontal accuracy that matched within six meters of photo identifiable ground control points (www.fsa.usda.gov). Acquired during the agricultural growing season (or leaf on), NAIP imagery provided the base layer for the object based image analysis.

To assist in the extraction and editing process, DRG utilized WorldView 2 satellite imagery from July 2011. This imagery was able to provide the ability for a better extraction of some land cover features, most notably bare soils. Since the WorldView 2 imagery was the most current, it was used during the QC process to update any new features that were not extracted using the 2010 NAIP Imagery. The initial land cover extractions were not preformed from this data because the 2010 NAIP resolution was better.

Advanced image analysis method was used to classify, or separate, the land cover layers from the overall imagery. The semi-automated extraction process was completed using Feature Analyst®, an extension of ArcGIS®. Feature Analyst ® uses an object-oriented approach to cluster together objects with similar spectral (i.e. color) and spatial/contextual (e.g., texture, size, shape, pattern, and spatial association) characteristics. The land cover results of the extraction process was post-processed and clipped to each project boundary prior to the manual editing process in order to create smaller manageable and more efficient file sizes. Secondary source data, high resolution aerial imagery provided by the City of Roseville, and custom ArcGIS® tools were used to aid in the final manual editing, quality checking and quality assurance processes (QA/QC). The manual QA/QC process was implemented to identify, define, and correct any misclassifications or omission errors in the final land cover layer.

Manual Imagery Verification and Quality Control Tactics

Determining the accuracy of spatial data is of high importance to DRG and our clients. To achieve the best possible result, DRG manually edits and conducts thorough quality assurance and quality control checks on all urban tree canopy and land cover layers. A QA/QC process was completed using ArcGIS® to identify, clean, and correct any misclassification or topology errors in the final land cover dataset. The initial land cover layer extractions were edited at a 1:1250 quality control scale in the urban areas and at a 1:2500 scale for rural areas utilizing the most current high resolution aerial imagery to aid in the quality control process to assure that the automated mapping and data analysis performed by GIS specialists accurately reflects the true nature and extent of the landscape.

To test for accuracy, random plot locations were generated throughout the City of Roseville AOI and verified to ensure that the data meets the client standards. Random points were compared with the 2010 NAIP high resolution imagery (reference image) and other high resolution aerial imagery available to determine the accuracy of the final land cover layer. Points were classified as either correct or incorrect. Misclassifications were examined, then recorded with the correct land cover in a classification matrix.

To assess accuracy among individual land cover classes, a statistical metric called the Kappa coefficient (KHAT) was derived from the classification matrix within an Excel spreadsheet (Table 8). This metric was chosen because it represents the data more precisely (rather than using an overall accuracy percentage of correct land cover classifications) because it partly accounts for chance, or variance, among random sample sets. The Kappa does not yield a result in percentages but rather in terms of agreement with values ranging from zero to one. Although definitive ranges of the Kappa have not been established, it has been generally accepted that a value of 0.80 or higher results in very good agreement between layers and is considered statistically significant. Davey uses this statistic to measure agreement between the aerial imagery and extracted land cover.

Table 8. Land Cover Extraction Error Matrix and Statistics

	Classification Data							
Reference Data	Classes	Pervious	Canopy	Impervious	Water	Bare Soils	Row Total	Producer's Accuracy	Errors of Omission
	Pervious	329	1	9	0	0	339	97.05%	2.95%
	Canopy	9	150	5	0	0	164	91.46%	8.54%
	Impervious	8	3	468	0	0	479	97.70%	2.30%
	Water	1	0	0	4	0	5	80.00%	20.00%
	Bare Soils	0	0	3	0	10	13	76.92%	23.08%
	Column Total	347	154	485	4	10	1000		
	User's Accuracy	94.81%	97.40%	96.49%	100.00%	100.00%			
	Errors of Commission	5.19%	2.60%	3.51%	0.00%	0.00%			

N =	1000
Part A =	961
Part B =	375354
Khat =	0.9375646

Overall Accuracy 96.10%

*K-hat (Kappa coefficient) is a statistical metric used to assess the amount of agreement.
(i.e. A value of 1 equals complete agreement while 0 equals complete disagreement)

**K-hat is a better determinant of accuracy because it accounts for chance or randomness.

Measuring Existing Land Cover and UTC

After completing the accuracy assessment, the final comprehensive land cover dataset will be processed in ArcGIS® to measure the existing urban tree canopy cover for the City of Roseville. Using the data provided by the City, further analyses was conducted with a statistical summary of the area and existing percent of canopy cover for geographic boundaries such as land use, zoning, parks, rights-of-way, watersheds, neighborhoods, and other management areas. Area and percentages of canopy cover were calculated for the AOI, each land use category, and other geographic boundaries.

Soil Volume and Tree Stature

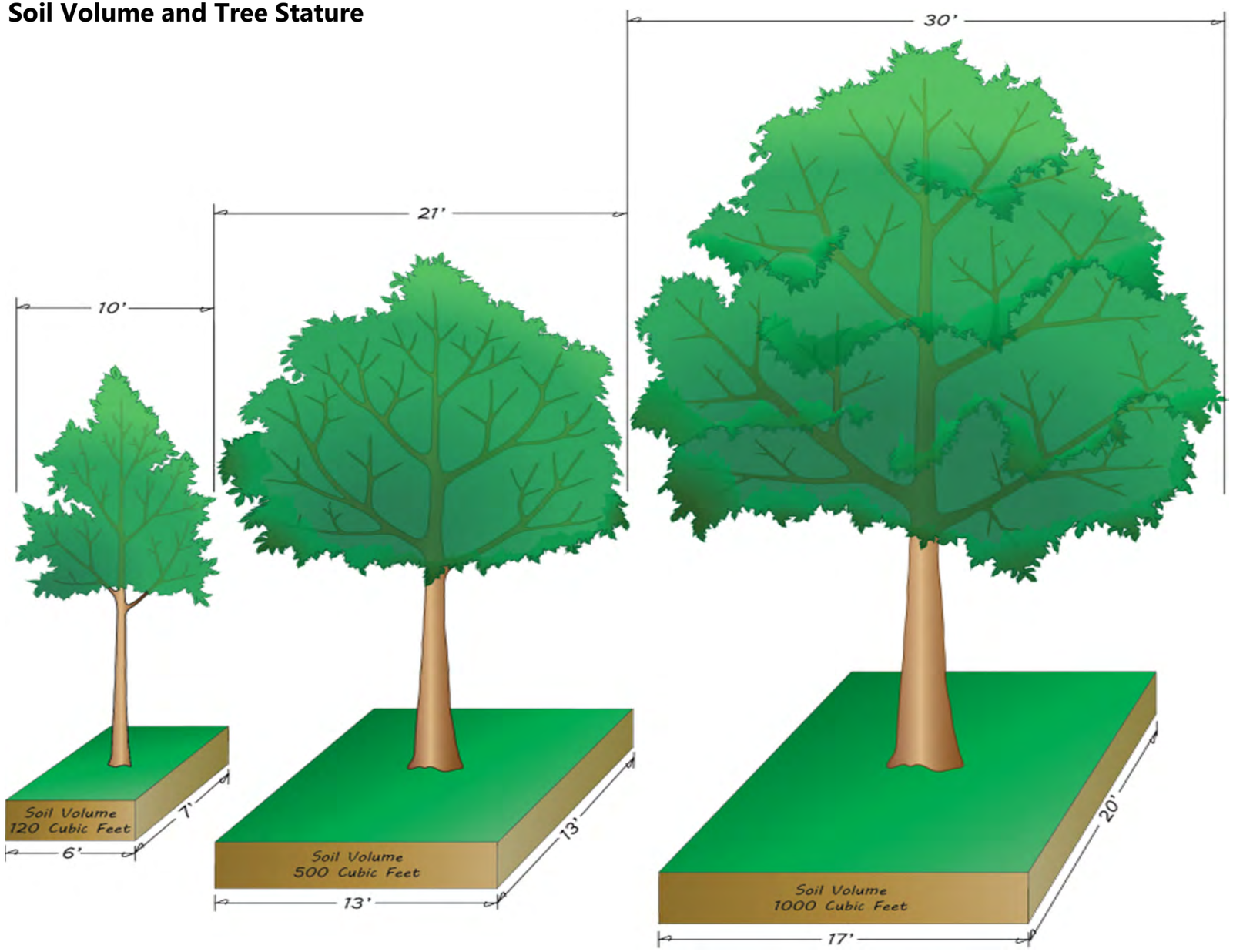

Figure 20. Tree growth is limited by soil volume. Larger stature trees require larger volumes of uncompacted soil to reach mature size and canopy spread (Casey Trees, 2008).

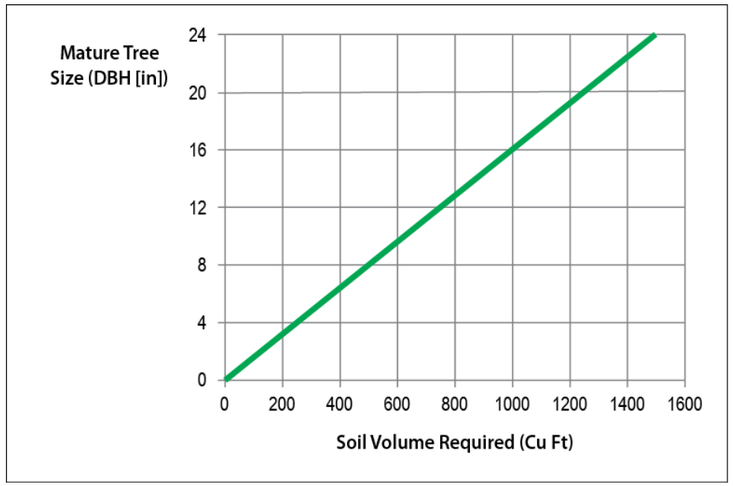

Figure 21. General relationships between soil volume requirements and mature tree size (James Urban, various sources, 1992)

Alternative Planter Designs

The following Alternative Planter Designs represent options that may be considered for increasing root zone below grade and to reduce the runoff of stormwater. These alternatives are intended to be conceptual in nature and should not be considered as standards for design purposes.

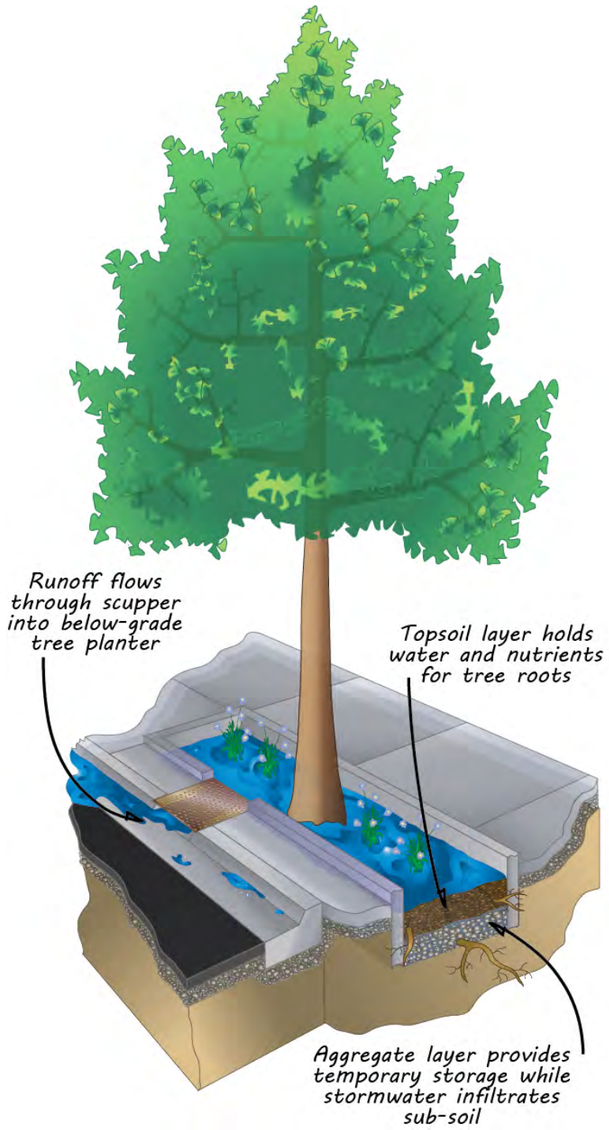

Figure 22. Stormwater tree pits are designed to collect runoff from streets, parking lots, and other impervious areas. Stormwater is directed into scuppers that flow into below-grade planters that then allow stormwater to infiltrate soils to supplement irrigation.

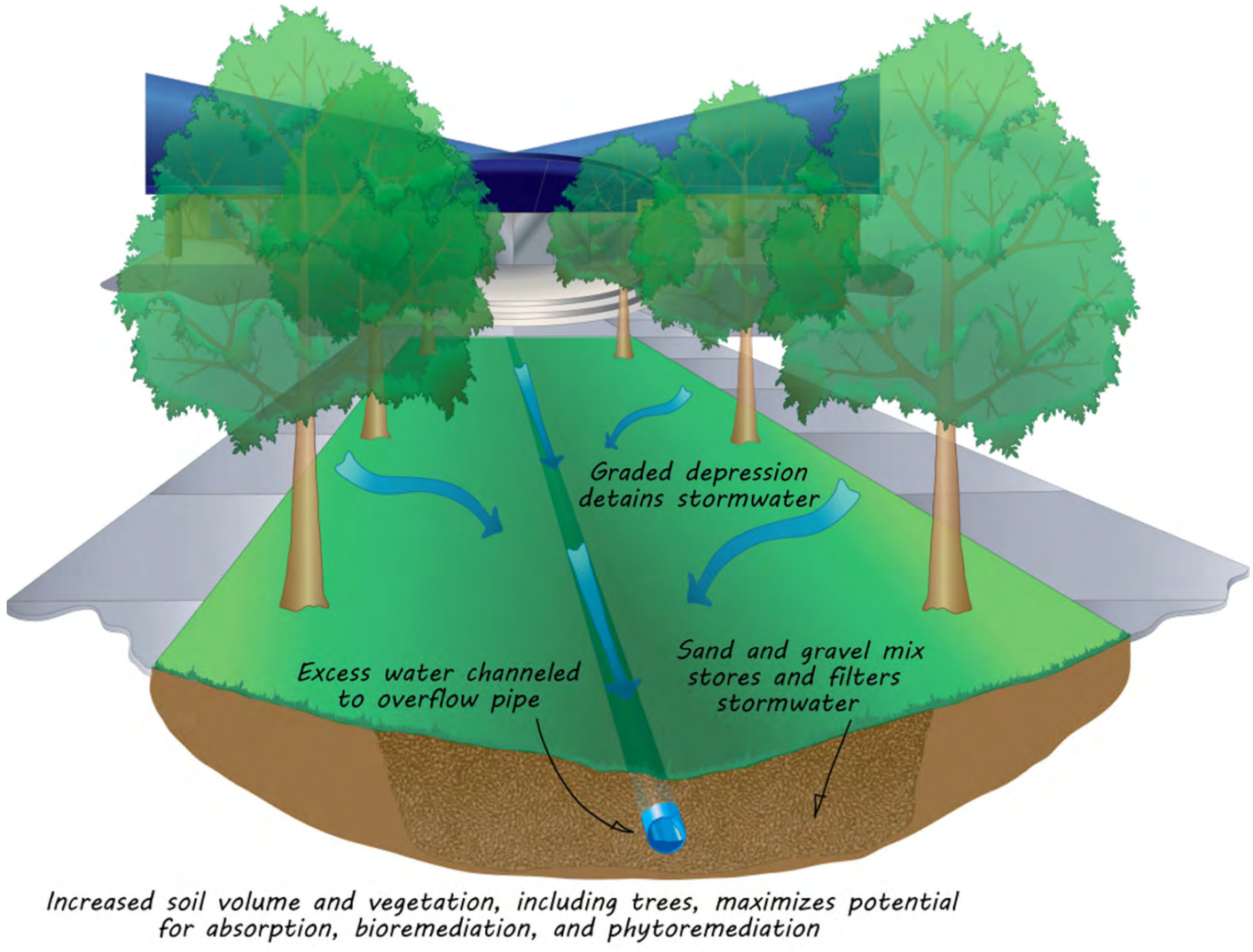

Figure 23. Bioswales are landscaped drainage areas with gently sloped sides designed to provide temporary storage while runoff infiltrates the soil. They reduce off-site runoff and trap pollutants and silt.

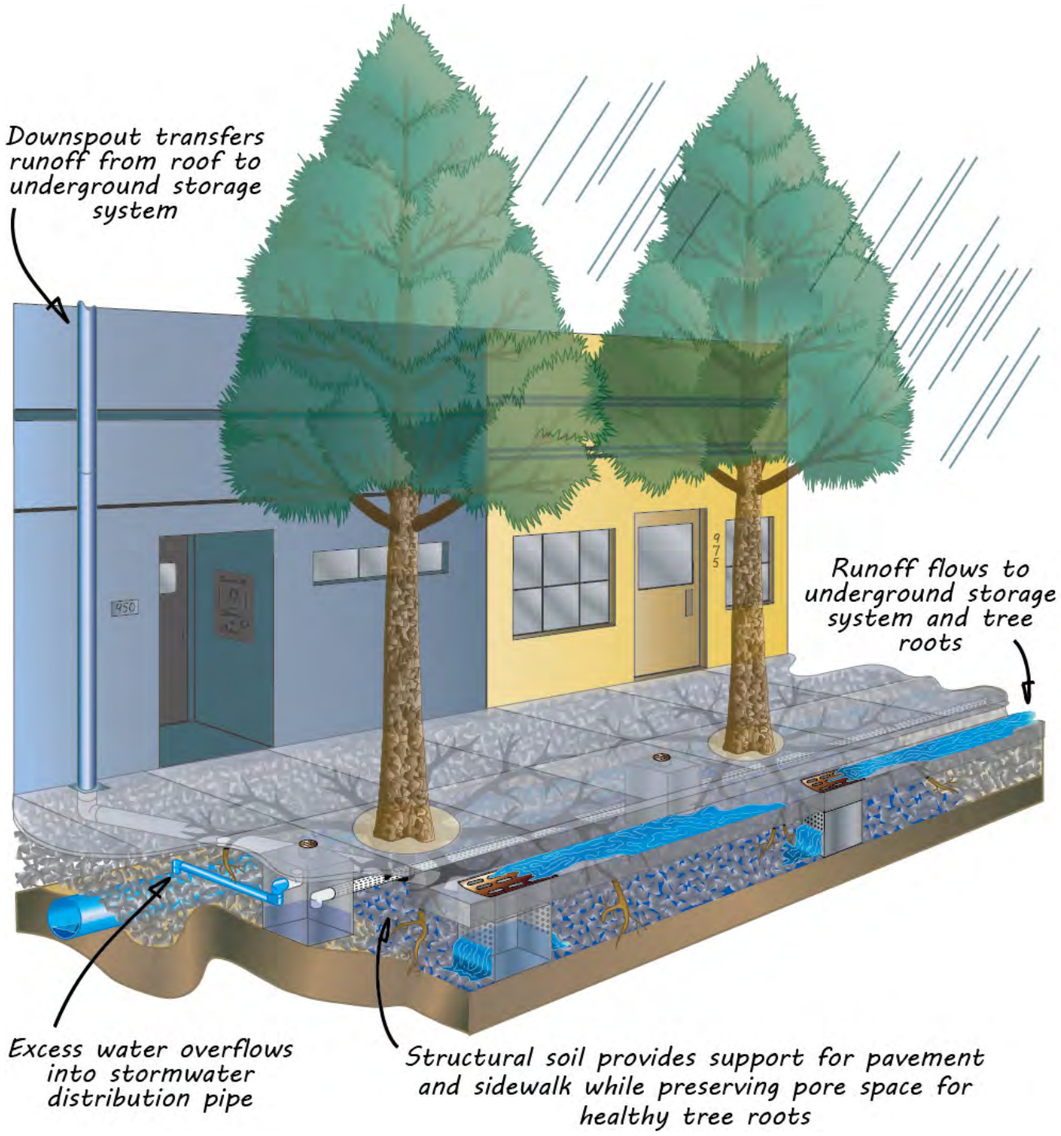

Figure 24. Structural soil is a highly porous, engineered aggregate mix, designed for use under asphalt and concrete as a load-bearing and leveling layer. Poor spaces allow for water infiltration and storage and also root growth.

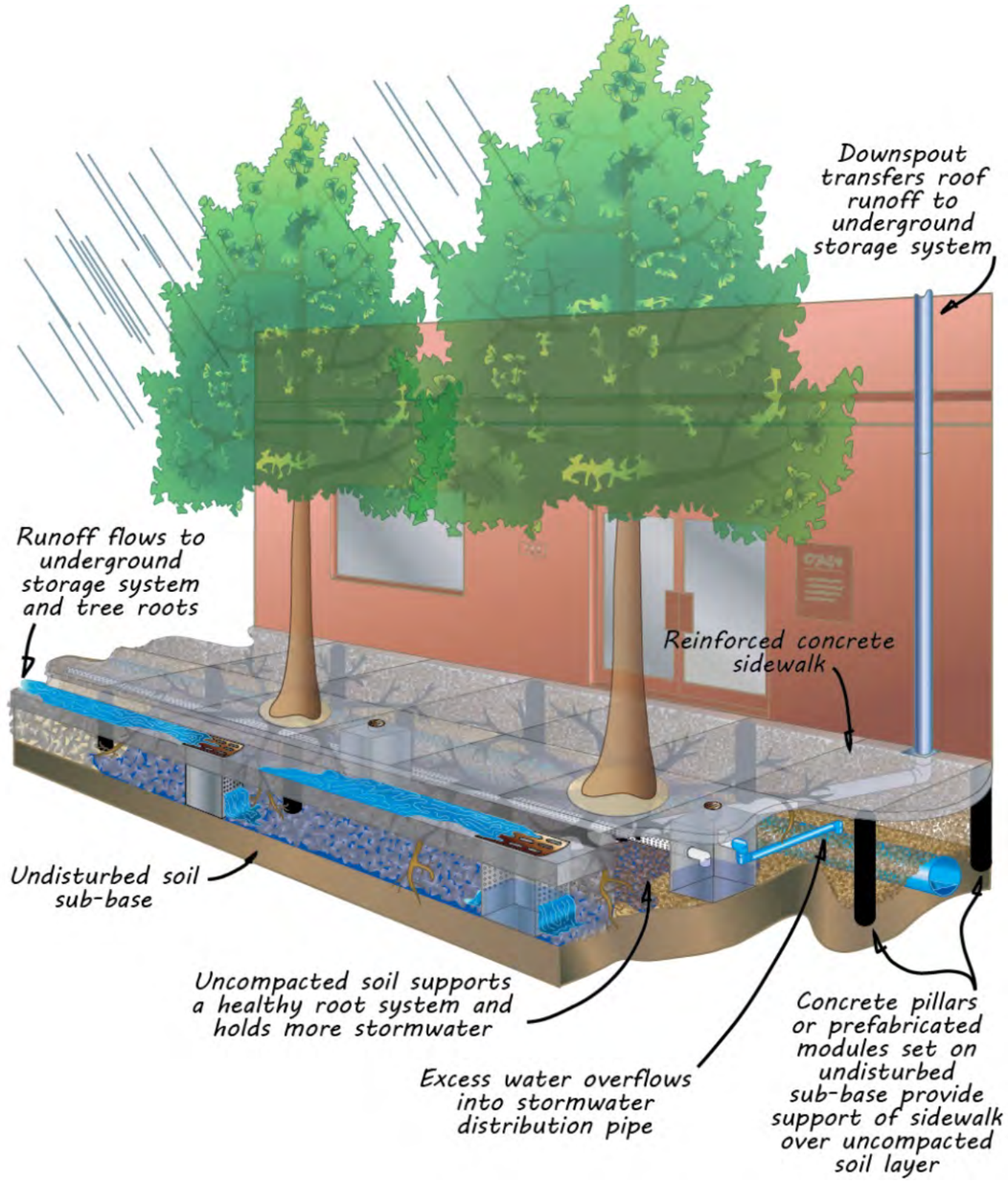

Figure 25. Suspended sidewalks use pillars or structured cell systems to support reinforced concrete, increasing the volume of uncompacted soil in subsurface planting areas and enhancing both root growth and stormwater storage.

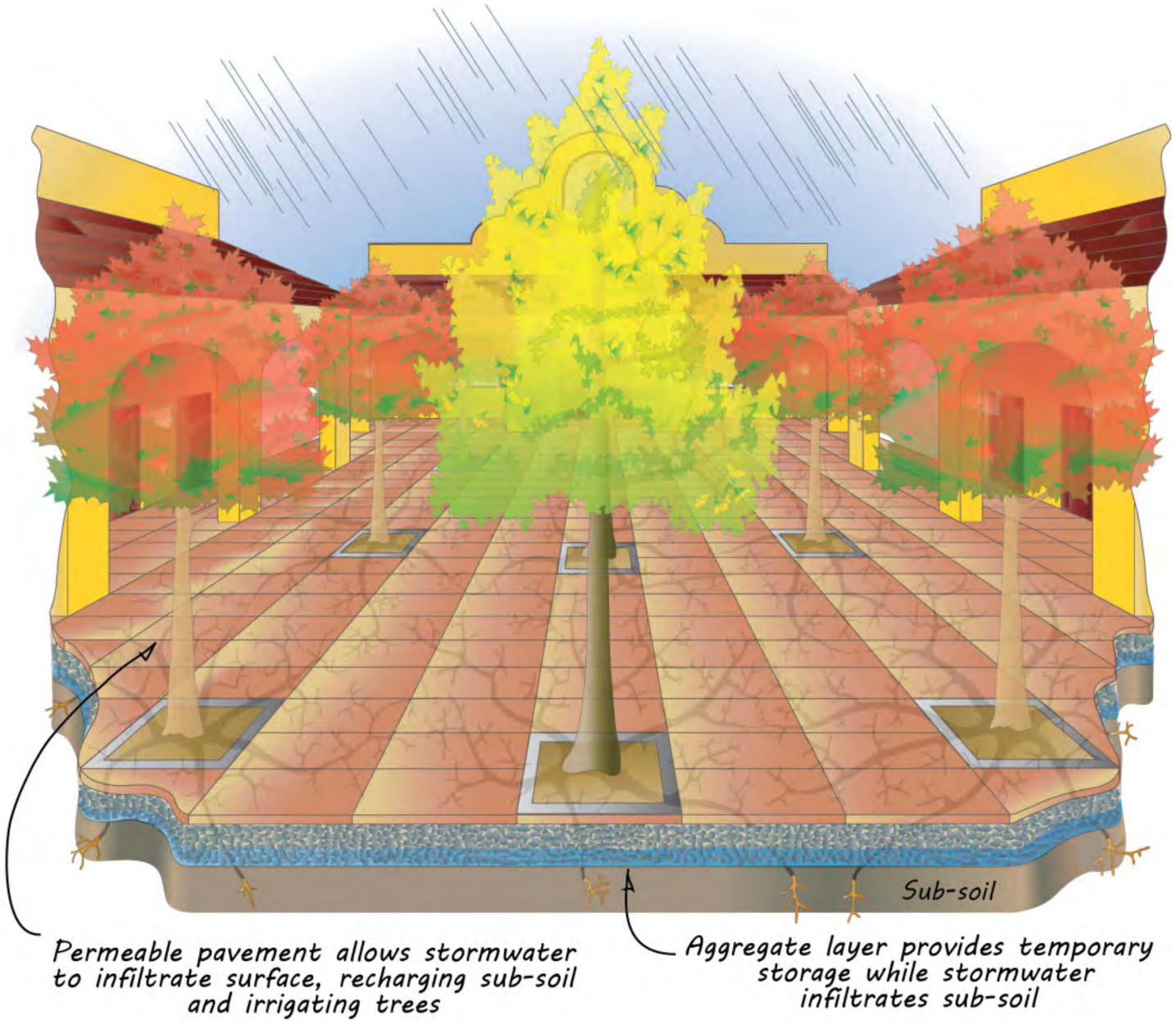

Figure 26. Pervious pavements allow stormwater and oxygen to infiltrate the surface, promoting tree health and groundwater recharge.

Urban Forestry Staffing Model

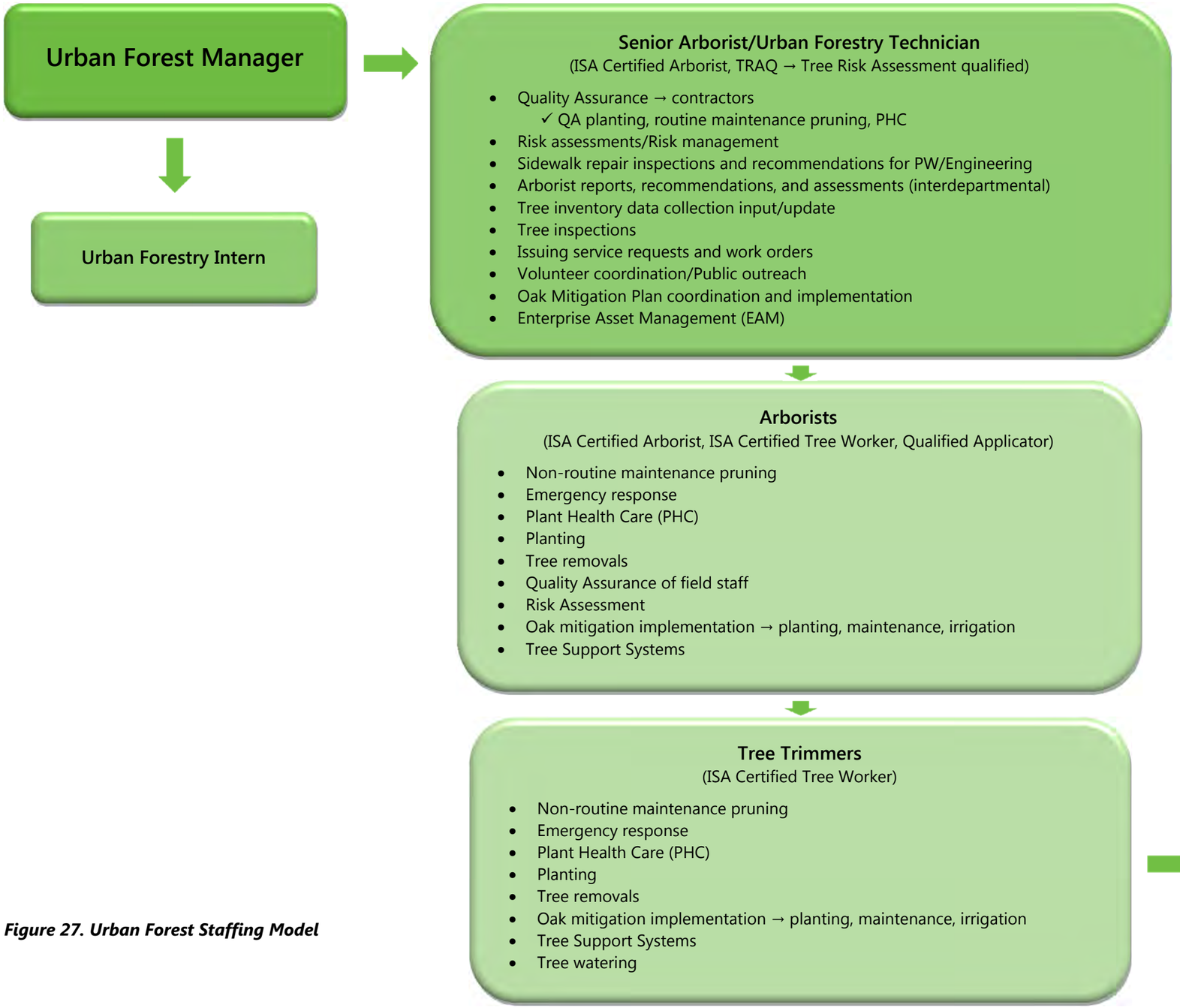

Figure 27. Urban Forest Staffing Model

B. Objectives, Actions, and Targets

City of Roseville Urban Forest Master Plan – Objectives, Actions, and Targets

Goals, Objectives, and Actions*	Estimated Cost	Target (Year) 2014	2015	2016	2017	2018 5 year	2023 10 year	2028 15 year	2033 20 year	2038 25 year	Date of Completion
Goal: A sustainable urban forest resource											
1. Adopt most current industry standards to all contractors and in-house crews engaged in tree care operations.	$ Low										Ongoing
2. Continue to inventory public trees.	$$$ High										
A) Inventory 'official city street trees'.											
B) Inventory significant trees on open space boundaries.											
C) Inventory significant trees in proximity to trails/accessible areas.											
3. Ensure all inventoried trees are on a regular pruning and maintenance cycle.	$$$$ Very High										
A) Golf course trees											
B) City facilities/parking lots											
C) Open space											
D) Unfunded street trees											
E) 'Official city street trees'											
4. Improve management of oak woodlands in open space areas.	$-$$$ Low-High										
A) Develop management plan for 'natural areas'.											
B) Identify/delineate “natural areas”											
5. Develop a tree inspection policy.	$ Low										
6. Develop a tree planting and replacement plan.	$ Low										
7. Increase species diversity and plant health in the public tree resource.	$ Low										Ongoing
Goal: Promote tree preservation and protection											
1. Revise Roseville Municipal Code – Title 8 Parks and Recreation.	$ Low										
2. Revise and Amend Roseville Municipal Code – Title 19 Zoning.	$ Low										
Goal: Increase Outreach and Education											
1. Develop and maintain a website for Roseville's Urban Forest.	$ Low										
2. Develop and present workshops and seminars that increase awareness and knowledge about trees and the urban forest.	$ Low										Ongoing
3. Design and build interpretive trails.	$$ Medium										
4. Partner with Roseville Electric and Environmental to deliver tree and urban forest information to residents.	$ Low										Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (> $100,000)

* Only Actions that result in a deliverable are listed – refer to the UFMP How Do We Get There? for details and methods of measurement

City of Roseville Urban Forest Master Plan – Objectives, Actions, and Targets

Goals, Objectives, and Actions*	Estimated Cost	Target (Year) 2014	2015	2016	2017	2018 5 year	2023 10 year	2028 15 year	2033 20 year	2038 25 year	Date of Completion
5. Develop outreach materials that communicate information about trees and the community urban forest.	$-$$ Low-Medium										
6. Develop and deliver a State of the Urban Forest Report.	$ Low										Every 5 years
7. Complete an i-Tree Eco project.	$$$ High										
Goal: Develop and nurture relationships with community partners											
1. Foster relationships and facilitate collaboration with volunteers, nonprofits, HOAs, and businesses.	$ Low										Ongoing
2. Quality and apply for Society of Municipal Arborist (SMA) Accreditation.	$ Low										
Goal: Optimize community planning											
1. Preserve and expand existing tree canopy.	$-$$ Low-Medium										Ongoing
A) Develop and adopt canopy goals for Roseville.											
D) Conduct an urban tree canopy analysis every ten (10) years.											
2. Update existing planning documents to reference the UFMP.	$ Low										Ongoing
3. Increase effectiveness of Parking Lot Shade Requirements by adopting them as a City ordinance.	$ Low										
4. Adopt a Solar Shade Ordinance.	$ Low										
5. Revise design and construction standards that apply to trees and planter sites.	$ Low										
B) Supplement Planter Design Standards to increase soil volume.											
C) Supplement Planter Design Standards to incorporate stormwater management.											
D) Supplement planter and pavement design options to reduce infrastructure conflicts.											
E) Supplement Planter Construction Specifications to include options for stormwater management.											
G) Amend Sidewalk Repair Specifications.											
K) Review and revise standards at least every ten (10) years.											
6. Participate in regional planning for the urban forest.	$ Low										Ongoing
B) Work with regional/state groups to develop carbon sequestration goals.											
C) Work with regional groups to update fees and mechanisms for tree replacement (e.g., Municipal Code, Title 19 Zoning).											

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

* Only Actions that result in a deliverable are listed – refer to the UFMP How Do We Get There? for details and methods of measurement

City of Roseville Urban Forest Master Plan – Objectives, Actions, and Targets

Goals, Objectives, and Actions*	Estimated Cost	Target (Year) 2014	2015	2016	2017	2018 5 year	2023 10 year	2028 15 year	2033 20 year	2038 25 year	Date of Completion
7. Supplement stormwater and flood control management strategies to recognize the value of tree and canopy.	$ Low										Ongoing
8. Reference City of Roseville Tree Planting Standards for construction and development projects.	$ Low										Ongoing
B) Coordinate with utility providers and City planning departments to revise and update Tree Planting Standards.											Ongoing
Goal: Increase connectivity of tree canopy to improve opportunities for passive recreation, alternative transportation, and wildlife habitat											
1. Increase availability and connectivity of trails that interface with nature and wildlife.	$$ Medium										Ongoing
2. Explore opportunities to develop community gardens.	$ Low										Ongoing
Goal: Optimize urban forestry programming											
1. Increase resources and staffing structure for urban forestry group.	$$$$ Very High										
2. Optimize the organizational structure for urban forestry operations	$$$-$$$$ High-Very High										
3. Develop an advance training structure for in-house forestry staff.	$ Low										Ongoing
4. Develop a Risk Management Plan and policy for urban forest operations.	$ Low										
5. Develop a Policy and Procedures Manual for the Urban Forestry Group.	$ Low										
6. Develop an annual work plan.	$ Low										Annually
7. Develop a vegetation management policy and standards for managing trees in utility easements.	$ Low										
C) Meet Annually with Roseville Electric managers.											Annually
D) Increase species diversity in Shade Tree Program.											
E) Revise/update Tree Planting Standards											
F) Revise/update Tree Pruning Standards											
8. Develop a policy and identify responsibility for contract monitoring.	$ Low										
9. Develop a basic arboriculture training program for select park staff.	$ Low										Ongoing
10. Develop a policy and responsibility for keeping inventory data current.	$$ Medium										
11. Work with GIS staff to explore analysis to improve scheduling and routing of maintenance activities/cycles and cost reduction.	$ Low										

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

* Only Actions that result in a deliverable are listed – refer to the UFMP How Do We Get There? for details and methods of measurement

City of Roseville Urban Forest Master Plan – Objectives, Actions, and Targets

Goals, Objectives, and Actions*	Estimated Cost	Target (Year) 2014	2015	2016	2017	2018 5 year	2023 10 year	2028 15 year	2033 20 year	2038 25 year	Date of Completion
Goal: Optimize funding and identify new opportunities											
1. Optimize funding from assessment districts (LLDs, CLDs).	$ Low										Ongoing
A) Develop and provide outreach and education.											
F) Future development of funding districts should specifically consider the cost of tree care.											Ongoing
2. Increase funding for tree care from the Open Space Preserves Fund.	$$$ High										Ongoing
3. Optimize funding for trees and planing sites in projects funded by Capital Improvement Funds (CIP).	$$$ High										Ongoing
4. Optimize and increase revenue to the Tree Mitigation Fund.	$ Low										Ongoing
B) Work with regional forestry groups to develop appropriate fees and mechanisms for tree replacement.											
5. Optimize support for urban forest operations from the General Fund.	$$$ High										Ongoing
6. Increase funding for tree care from Facilities Fees.	$ Low										Ongoing
7. Explore funding from the Bike Trail Fund to support maintenance and risk management of trees adjacent to bike trails.	$$$ High										Ongoing
8. Explore funding for risk management of public trees.	$$$ High										Ongoing
9. Explore opportunities to create a Park and Landscape District.	$ Low										
10. Identify and apply for available grant funding.	$ Low										Ongoing
11. Increase and optimize partnerships and collaborations with individuals, groups, and agencies who share urban forest goals and objectives.	$ Low										Ongoing
D) Partner with Roseville Electric to combine tree pruning contracts for cost savings.											Ongoing
12. Explore urban wood utilization programs.	$ Low										Ongoing
Review and Measure Attainment of Urban Forest Master Plan											
1. Annually, review the UFMP and the attainment status of objectives and strategies.	$ Low										Annually
A) Review UFMP and adjust milestones as necessary.											Annually
B) Integrate current strategies and implementation measures into the annual work plan.											Annually
C) Update this table.											Annually
2. Align UFMP objectives and strategies with community expectations.	$ Low										Ongoing

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

* Only Actions that result in a deliverable are listed – refer to the UFMP How Do We Get There? for details and methods of measurement

City of Roseville Urban Forest Master Plan – Objectives, Actions, and Targets

Goals, Objectives, and Actions*	Estimated Cost	Target (Year) 2014	2015	2016	2017	2018 5 year	2023 10 year	2028 15 year	2033 20 year	2038 25 year	Date of Completion
3. Complete a resource analysis (i-Tree Streets) every 5 years.	$ Low					■	■	■	■	■	Every 5 years
D) Report change in the State of the Urban Forest Report.			■		■	■	■	■	■	■	Biennially
4. Complete a canopy analysis every 10 years.	$-$$ Low-Medium						■			■	Every 10 years
D) Report change in the State of the Urban Forest Report.			■		■	■	■	■	■	■	Biennially

$ Low ($0-$25,000) $$ Medium ($25,000-$50,000) $$$ High ($50,000-$100,000) $$$$ Very High (>$100,000)

* Only Actions that result in a deliverable are listed – refer to the UFMP How Do We Get There? for details and methods of measurement

C. Online Survey

Roseville's Community Urban Forest: Planning Our Future

Introduction:

The City of Roseville's community (publicly-owned) urban forest consists of trees in parks, streetscapes, golf courses, medians, open space areas and creeks, and native oak woodlands.

A recent (2010) tree inventory of Roseville's community urban forest identified nearly 39,000 trees in parks, golf courses, medians and streetscapes. An analysis of these trees showed that they provided more than 3.2 million dollars worth of annual benefits to our community, including benefits to air and water quality, energy savings, carbon storage, clean drinking water, creating and enhancing wildlife habitat, as well as socio-economic benefits such as recreational and aesthetic use. To replace these trees with trees of similar size and species would cost more than 77.5 million dollars. Trees in open space areas have not been inventoried yet but an additional 80,000-100,000 trees are estimated in these natural resource areas.

Community trees are publicly-owned assets which provide important and valuable benefits. With proper care, the value and benefits will increase over time. In order to manage this valuable resource sustainably, long-term strategic planning is needed. As a responsible steward of the community's urban forest the City of Roseville is working with Davey Resource Group to develop a long-term urban forest master plan to promote sustainable management. Urban forest management includes safe and healthy trees through proper care and cost efficient maintenance, tree preservation, regeneration and reforestation, as well as maximizing urban forest benefits and providing public outreach.

Roseville's urban forest is an important part of our community and enhances the quality of life for residents that live here as well as to those who come visit, work, play and shop in our City.

As a resident, you are an important stakeholder in the community urban forest and your opinion matters!

We encourage you to complete this short survey to help us understand how Roseville residents view public trees and to identify which urban forest management services and benefits are most important to you.

Your feedback will help us write a comprehensive master plan that recognizes community values and manages the community forest sustainably by protecting, preserving, and enhancing Roseville's urban forest to improve the quality of life in our community and by providing memorable and exceptional experiences.

This master plan is made possible through a grant from CalFire.

The Benefits of Urban Tree Canopy:

Trees and urban forests work 24/7 to mitigate the effects of urbanization and development and to protect and enhance life and the community within Roseville. Trees have long been appreciated for their contributions of shade and beauty to our landscapes. Now, science and technology has made it possible to quantify the environmental benefits to:

- Cleaner air and water
- energy savings
- carbon dioxide reduction
- property values
- socio-economics
- wildlife habitat

The following statements reflect the level of annual benefits currently provided by Roseville's public trees. Please rate these benefits according to their level of importance to you.

1. Roseville's public trees improve air quality by filtering pollutants such as dust, ash, pollen, and smoke. How important is this benefit?

Answer Options	Response Percent	Response Count
Very important	92.7%	**279**
Somewhat important	6.3%	**19**
Not important	0.7%	**2**
Not sure	0.3%	**1**
answered question		**301**
skipped question		**0**

2. By shading, reducing wind speeds, and lowering the outside air temperature, Roseville's public trees reduce energy use (electricity and natural gas). How important is this benefit?

Answer Options	Response Percent	Response Count
Very important	89.4%	269
Somewhat important	9.6%	29
Not important	0.7%	2
I'm not sure	0.3%	1
answered question		301
skipped question		0

3. Since carbon is necessary for tree growth, trees absorb excess carbon from the air. Because of this process, trees are a major source of carbon storage for our planet, helping to lower carbon dioxide levels in the atmosphere. How important is this benefit?

Answer Options	Response Percent	Response Count
Very important	83.7%	252
Somewhat important	14.0%	42
Not important	2.3%	7
I'm not sure	0.0%	0
answered question		301
skipped question		0

4. Trees and urban forests increase property values by 7-10% and have a profound effect on psychological health and well-being. For instance, trees in retail locations have been shown to influence shoppers buying habits, causing a greater willingness to shop and increased spending. The estimated aesthetic and socio-economic benefit of Roseville's public trees is more than $2.5 million per year. How important is this benefit?

Answer Options	Response Percent	Response Count
Very important	70.4%	212
Somewhat important	25.6%	77
Not important	2.7%	8
I'm not sure	1.3%	4
answered question		301
skipped question		0

5. By reducing the flow of stormwater runoff and the pollutants that are carried with it, urban trees protect the water quality of creeks, rivers, lakes and other bodies. Roseville's public trees intercept more than 18 million gallons of stormwater each year. How important is this benefit?

Answer Options	Response Percent	Response Count
Very important	86.4%	260
Somewhat important	11.6%	35
Not important	1.3%	4
I'm not sure	0.7%	2
answered question		301
skipped question		0

6. Understanding which benefits are most appreciated by residents can help guide long-term management strategies. Please rank (1-6) the following ENVIRONMENTAL benefits in order of their value to you. (i.e., 1 = most valuable and 6 = least valuable):

Answer Options	1 - Most Important	2	3	4	5	6 - Least Important	Rating Average	Response Count
Improved air quality	170	73	29	16	6	2	5.28	296
Energy savings	46	76	65	37	69	8	3.90	301
Protects water quality/Reduced stormwater runoff	18	57	93	88	36	4	3.73	296
Carbon storage	7	28	56	90	103	16	2.99	300
Wildlife habitat	46	61	54	63	74	3	3.78	301
Other	9	4	1	2	6	123	1.51	145
Other (please specify)								55

6. Understanding which benefits are most appreciated by residents can help guide long-term management strategies. Please rank (1-6) the following ENVIRONMENTAL benefits in order of their value to you. (i.e., 1 = most valuable and 6 = least valuable): *continued*

answered question	**301**
skipped question	**0**

Other:

- Aesthetic/socio-economic benefits (12)
- beautification (6)
- Added value to our city and property value (3)
- n/a (3)
- none (3)
- psychological health (2)
- Beauty and shade are actually more of a 2 or 3 but I need something for five
- cooling of temperature
- Creates a pleasing landscape
- decoration
- I moved here because of all the Oaks trees I would not like to see them removed just to be replaced by another type of tree, I mean why would you do that? The Oaks are beautiful!
- I think you covered it.
- it just relaxes you in your residence as you view the old oaks or shade trees in the older parts of Roseville, it does wonders for your lungs your breathing
- It's hard to rank these but I think all are very important!
- Looks attractive
- Mental and physical health
- nicer world
- no
- Preservation of local dendrology
- Preserve greenscape canopy
- preserve native species
- provides compost from leaf debris
- provides jobs/work for tree trimmers/landscape designers
- Quality of life
- recreation
- shade for hot outdoor activities
- shade for when I'm out running!
- Shade in the hot summers here!
- shade!
- Simply aesthetic - a tree-filled landscape is prettier than one with only shrubs, annuals, & turf
- the beauty and peacre that it gives me to see and smell them!
- Trees make me happy! They are so beautiful!

7. Understanding which benefits are most appreciated by residents can help guide long-term management strategies. Please rank (1-8) the following AESTHETIC and/or SOCIOECONOMIC benefits in order of their value to you. (i.e., 1 = most valuable and 8 = least valuable):

Answer Options	1 - Most Important	2	3	4	5	6	7	8	9 - Least Important	Rating Average	Response Count
Attractive to residents and tourists	42	39	36	38	38	41	32	25	8	5.61	**299**
Beauty/Aesthetics	46	43	41	45	45	32	26	18	3	5.97	**299**
Shaded trails, sidewalks, and bike trails	81	69	52	32	26	20	17	1	0	7.05	**298**
Shaded parking	21	27	41	48	41	46	31	35	5	5.21	**295**
Improve retail areas and neighborhoods	10	33	36	40	44	43	48	29	3	5.05	**286**
Increased property values	58	35	34	36	28	34	30	38	6	5.70	**299**
Passive recreation	10	22	30	29	26	38	68	59	12	4.31	**294**
Shaded streets	22	31	29	30	47	39	40	55	6	4.87	**299**
Other	3	1	0	1	2	0	3	22	96	1.56	**128**
Other (please specify)											**20**
									answered question		**301**
									skipped question		**0**

7. Understanding which benefits are most appreciated by residents can help guide long-term management strategies. Please rank (1-8) the following AESTHETIC and/or SOCIOECONOMIC benefits in order of their value to you. (i.e., 1 = most valuable and 8 = least valuable): *continued*

Other:

- N/A (3)
- none (3)
- cooling of temperature
- educational - learn different tree types & habitats
- I think you covered it.
- makes me happy
- Nature is important
- no
- Our family is constantly outside, we depend on trees.
- preserve native trees
- provides shade for homes
- Shaded local playgrounds
- Shaded parks
- the health benefits, and lower air conditioning bills in our hot summers
- Wind breaks

8. What is your current awareness of the City's urban forest program? Please check all that apply.

Answer Options	Response Percent	Response Count
I was not aware that the City has an urban forest program	55.9%	**165**
I have visited the City's webpage for information about public trees and/or the urban forest	28.5%	**84**
I have heard about tree care or urban forestry in Roseville on the radio	5.1%	**15**
I have seen a program about tree care or urban forestry in Roseville's on television	4.1%	**12**
I have read a newspaper article that discussed public trees and/or Roseville's urban forest	17.6%	**52**
I have seen an article about the community urban forest in Roseville's Recreation Guide	12.2%	**36**
I am a member of the Roseville Urban Forest Foundation	1.7%	**5**
I am a member of the Sacramento Tree Foundation	3.1%	**9**
I have attended an Arbor Day event in Roseville	8.8%	**26**
I have attended a workshop or seminar about trees that was sponsored by the City of Roseville	10.2%	**30**
I have participated in a public tree planting in Roseville	10.2%	**30**
answered question		**295**
skipped question		**6**

9. Optional. Use this space to provide additional comments on the benefits of Roseville's public trees.

	Response Count
	58
answered question	**58**
skipped question	**243**

Comments:

- Also important is that the trees planted need lots of water to grow... I see so many baby trees around the city that have been small for a long time, they likely aren't getting enough water!
- As a recent transplant from West Sacramento, I truly appreciate the beauty added by Roseville's trees. They are a huge asset (no pun intended) and add immeasurable value to the city. I am so thankful to you for providing these trees for my family- especially my young children.
- Considering question 1, don't forget that trees also produce pollen and release chemicals that combine with ozone to make it nastier. :-)
- continue to plant new trees and stop cutting down mature trees (e.g., Civic Center parking lot). Park and Rec. use correct hydrants to fill trucks that water trees, stop using old hydrants that cause disruption to clean water in older neighborhoods.
- Don't plant any trees with sap for shade in parking lots. City of Roseville and businesses should check trees on a regular basis. I see many covered with disease and bugs that drip sticky residues.
- During new construction, STOP the lying of cunstruction that they will protect the trees on the construction site. Example was the oaks at the apts on Washington/Junction. They pulled them and killed them thru neglect in a large clump visible to all. City didnt do a damn thing after multiple calls by several groups and locals after promicing they would look into it. Lies and smoke.
- Encourage track developments to use local native plants for streetscapes.
- Excited to hear about this program, inform many of it, and even get my family involved! Thank you!
- Fruit Tree in public area or Park?
- How can we help
- I am new in the state and as I find myself becoming acquainted with the different areas around Sacramento, Roseville stands out to me for their use of urban forestry and for the beauty its trees bring. It makes Roseville an inviting place and makes a statement that the people who live there care. I want to live there!
- I am so glad I atteneded the meeting on the Urban forest as I had no idea the city was interested in the importance of trees!

9. Optional. Use this space to provide additional comments on the benefits of Roseville's public trees. *continued*
I am very concerned that this program is coming down from the UN Agenda 21/sustainable development program via the federal and state governments. The city trees have long been a attractive feature of Roseville - I am concerned that all of this interference will unnecessarily cost taxt payers a lot more money. The parks department does not need an outside consulting firm to tell them what to do - they should have the skills to diagnose, treat and replace trees as needed. I am very concerned about this approach.
I have attended tree planting with the Sacramento Tree Foundation outside of Roseville
I have taken colloege courses that toaught me about the improtance of trees.
I have utilized the tree program and think it is great !!
I hope trees are valied and protected by a strong enforcable tree ordinance which has a 1st priority of PRESERVING existing mature trees, and not simply allowing developers to pay fees or plant seedlings to "pay" trees any they want to cut.
I just relocated from the Bay Area and purchased a new home this summer. My husband and I are really pleased with out surroundings, the future planned development, and how well this city is planned and managed. Keep up the great work!
I live across from Royer Park and condsider the tree coverage there a valuable resource.
I live near the open space that is close to junction elementary school and I noticed there is a little creek in the middle of the open space. I wish there are big trees that will be planted near the creek. I think it will be cheaper to maintain because water irrigation will not be needed since it's going to be near a body of water. Wildlife will surely enjoy it.
I love how many trees Roseville has, but incorporating more trees that change colors with the seasons would make it even more beautiful! :)
I love the trees in Roseville! It is what makes this city beautiful. I think we need to take as much advantage as possible to plant and provide more trees for the beauty and especially for the air quality.
I love the trees in the older parts of Roseville. I love the size and color. They are beautiful and provide magnificent shade. I would love to see more trees planted near the soccer fields. It can be unbearably hot in the summer watching games. I noticed a park in Rocklin has planted trees between fields and on the outsides of the soccer fields to provide shade for spectators. I don't think this would be a difficult thing to do, especially a large parks like Maidu and Veterans. Thank you.
I love trees and the benefit they provide as a natural resource vital to help sustain life, including providing a natural habitat for wildlife.
I Read about this survey on the city of Roseville's twitter. I absolutely love the trees in Roseville. They were a factor in us moving here 3 years ago. We were sad when 4 young maples on market Street were killed. The careless lawn maintenance contractors hit the lower sections of the trunks with their weedwackers which killed them and never replaced them. They were really nice 16 foot tall maples. I actually bought one and planted it in my backyard I liked them so much.
I think owners of rental properties don't seem to care. any excuse like the roots are damaging my plumbing lines is not that common a dentriment. people with out a sense of history of an area of our city or no conscious of the environmental impacts these disappearing trees will leave. Also heard developers will pay the fines (20-30,000$) just to build their site with no interpherence from roooted 500 year old beautiful oaks.
I think that it's a great idea to plant more trees as long as it's cost effective!
I would like to see greater incentives for residents to plant and maintain trees.
I would like to see more trees planted on the periphery of the Fairgrounds to mitigate, however futilely, for the racetrack and since so many visitors to Roseville go to the fairgrounds for one reason or another. I live in an older neighborhood and I would like to see more trees planted in the strip between the road and sidewalk, providing more shade and a canopy for the myriad birds I see. Thanks for listening!
It is important to the health and well being of Roseville residents to have open space areas with trees where the areas are left un-touched for the wildlife and for places to retreat to for residents to experience nature. I hope that the walking trail at Maidu Park is left the way it is and that the open space areas in Maidu along the walking trail are never plowed under to build additional ball parks or soccer fields. We are very lucky to have such a gem right in our own backyards!
It would be great to see more large trees planted - London Plane, Oak, etc, and fewer of the small-but-quick-growing trees like Crape Myrtle & that not-really-fruitless plum (the purple tree that makes a stupid mess on sidewalks & lawns). Maybe intersperse the various species, rather than going for the mass-planting effect ? Less uniformity or even numbers & spacing, a more naturalistic approach. Or how about an urban orchard in one of the parks? Sort of like a community garden, but fruit trees and berry bushes instead...
It's also important to use trees that don't use too much water. Way too many palm trees in neighborhoods, which suck up water.
makes Roseviile look good and keep temperatures down.
More trees. And, more Roses...ROSEVILLE!!!
new to the city, but chose to live in old Roseville largely because of the beauty of the trees. looking forward to planting a tree in our yard this coming spring
One of the things I love about Roseville is that it has a lot of trees. Despite the temperature during summertime, it helps keep it cool.
Please do not remove old large shade providing trees unless absolutely positively necessary (Royer Park)
Proper care is Important. The lawn edging at the base of several maple trees on Market Street has caused damage to the trees. Some have died and been removed.
Roseville is lucky to have significant, relatively intact oak woodland habitat. Protection, enhancement and restoration of this resource is critical. Education on how and why these areas are important and how to best live in harmony with them must be improved.
Roseville needs more strong, healthy strategically positioned urban trees!
Roseville/Rocklin resident
Thank you for what is done in the City of Roseville to preserve trees.
Thank you, City of Roseville, for caring about our environment in this progressive, eco-friendly effort.
The beauty of the Oaks is what caused me to move to Roseville in 2009. This was my first home and I am in my fifties, so to me that just shows how nice it is to seem as we are still in the country and not living in the city
The community trees are so beneficial to everyone and the environment in general. There are areas in the city that could use more trees. For example the area of medians on Blue Oaks Blvd between Foothills and Woodcreek Oaks. Spots like these could be utilized for more beneficial tree placement.
The trees in our community are so valuable. While driving down Douglas Boulevard or East Roseville Parkway, I take a deep breath, enjoy the trees, and it makes me appreciate living in Roseville.
This weekend was my first time on the Miner's Ravine Trail, I am very very impressed!
Trees are my favorite plant. Even like them with no leaves as their "bones" provide a different type of beauty. They add so much to our surroundings and pleasure of being outside. We are delighted that so many new trees have been planted in the big preserve between Sun City and Crocker Ranch area in anticipation of losing some of the older oak trees. Urban forests are important for this time in our lives when so many trees have been cut down or lost and not replaced. We've happy Roseville has such a program! Thanks.
Trees must be properly maintained in order for them to provide benefits. Otherwise they can become a liability. Roseville must make proper tree maintenance a high priority for its urban forest.
Trees planted in 4' LS strips between curb and sidewalk are a waste. I appreciate having public trees. The tree ordinance should require fast growing trees inwith big canopies in parking lots. Trees like thoe at home depot on Fairway are useless. Even after 10 years.
Trees reduce the temperature in adjacent areas as well as increase the property value of homes. Planting more in shopping centers, along sidewalks and medians would increase the aesthetics and I believe bring in more customers who want to shop and spend time in a well-planned area.
trees, trees, trees. we need more trees everywhere. there can never be enough trees!!!
Um, I would just like to add that we really like it when you use goats for keeping the weeds down. It's really neat.
Use more native trees, grasses, & shrubs.
We need to avoid LIQUID AMBER trees-they are a blight---we need drought tolerant trees and less grass (ie Eureka Rd BetweenDouglas and Sierra College--too much grass-wastes water and maintenance is too costly)
Would like to see a greater variety of trees grouped in a given area, rather that a long line of the same speciaes. I don't thinks it's healthy to have a lot of the same tree because of the greater liklihood of the spread of pests or disease.
You didn't mention/ask about being a Tree City USA. Wouldn't it be interesting to know how much marketing appeal or recognition it holds and if it influences perceptions or behavior about Roseville's urban forest and programming?

Understanding Community Values:

Understanding how residents view and value public trees and knowing which benefits and services are most appreciated by residents will help us determine where to focus available resources. Please select your response to each of the following statements:

10. Public trees are important to the quality of life in Roseville.

Answer Options	Response Percent	Response Count
Strongly Agree	86.9%	**252**
Agree	12.4%	**36**
Disagree	0.3%	**1**
Strongly Disagree	0.3%	**1**
Not sure	0.0%	**0**
answered question		**290**
skipped question		**11**

11. Roseville needs more public trees.

Answer Options	Response Percent	Response Count
Strongly agree	55.5%	**161**
Agree	37.9%	**110**
Disagree	1.7%	**5**
Strongly disagree	0.0%	**0**
Not sure	4.8%	**14**
answered question		**290**
skipped question		**11**

12. I am satisfied with the current level of maintenance provided for Roseville's public trees.

Answer Options	Response Percent	Response Count
Strongly agree	18.3%	**53**
Agree	60.7%	**176**
Disagree	10.3%	**30**
Strongly disagree	2.1%	**6**
Not sure	8.6%	**25**
answered question		**290**
skipped question		**11**

13. Where would you like to see more public trees planted? Please check as many as apply.

Answer Options	Response Percent	Response Count
Parks	76.6%	**222**
Landscapes	53.1%	**154**
Open space and natural resource areas	61.4%	**178**
Streetscapes	60.7%	**176**
Golf courses	10.0%	**29**
Downtown	43.1%	**125**
Trails and bike paths	61.7%	**179**
Roseville has enough public trees	2.4%	**7**
Other	11.0%	**32**
Other (please specify)		**40**
answered question		**290**
skipped question		**11**

Other:

- Parking lots (8)
- Playgrounds (3)
- Creeks and Rivers (2)

13. Where would you like to see more public trees planted? Please check as many as apply. *continued*
all areas they can be planted & grow, plant them
Any Barren medians on the street
at schools and work places
Can dead trees be removed from the open space areas? Besides looking awful, they are a fire hazard.
Dog Parks
Especially at playgrounds that become too hot to use in summer unless they are shaded.
Every square meter of Roseville
EVERYWHERE!
Fountains/mall/creekside area
Free tree planting programs for residents with hot, open yards.
I live next to an open space that borders Sierra College Blvd. Currently this area is an ugly dirt patch with dry weeds. It would nice for this area to have trees. This would reduce traffic noise and would also would like pretty as motorists drive on Sierra College.
I live on the new fiddeyment ranch area where parcel f49 school is being currently built. My home backs up to the open farm land that is proposed to be a Sac State Extention and I've seen your plans where you will be adding open space behind my home. I am really excited and it would be great for the city to start planting trees there to have the open space and bike trail in the meantime.
In parks and open areas yet to be devloped.
Lots that developers have cleared, and then abandoned
Mahaney Park needs trees to shade it so that families can enjoy it in summer afternoons like Royer Park.
MAIDU SOCCER FIELDS
More trees are always welcome. Not sure where is necessary
more,more, more
Need sizable trees in new parks. No more wasted money downtown.
Neighborhoods in the strip between roads and sidewalks
Not familiar enough to answer
On personal properties, parking lots, they aesthetically improve any man made structure they are near.
Open Space
Parking lots and public walk ways
Parking lots in retail establishments
Schools
sidewalks and medians need to have trees and shrubs in the design

14. What level of maintenance do residents expect for public trees? Please rank the following options according to your preference (1 = Best Strategy; 6 = Least Preferred)

Answer Options	1 - Best Strategy	2	3	4	5	6 - Least preferred	N/A	Rating Average	Response Count
None - Keep them natural	24	9	14	24	146	65	4	4.61	**286**
Best possible care (clearance, structure, health)	141	36	37	47	23	3	1	2.25	**288**
Clearance only (over streets and sidewalks)	17	51	54	117	30	16	2	3.49	**287**
Pruning for health and safety	64	109	77	28	8	3	0	2.36	**289**
Plant health care (pest and disease management)	32	80	102	44	22	6	2	2.87	**288**
Other	4	2	1	3	7	43	56	5.27	**116**
Other (please specify)									**16**
							answered question		**290**
							skipped question		**11**

Other:

a combination of above
Basically, just not letting them die.
health and clearance but leave also many thick natural forests for wildlife
I think you covered it.
In WestPark & Fiddyment Farm areas, we pay extra assessments, should have best care possible.
Keep the aphids off the trees.
Natural only in open spaces!
none
older trees in neighborhoods need more attention
only prune trees when absolutely needed! the trees should come first!
Please minimize use of chemicals.
Pruning for health/safety and pest management
Sufficient water to keep,alive,,,,,Rocky Ridge for example
These are all important - my checks are only because your requiring them to move onThe parks superintendant and his staff should have the knowledge to evaluate the trees for the above situations. ev
Those in open space should be kept as natural as possible.

15. Oak mitigation and reforestation in open space and natural resource areas are important to the residents of Roseville. Please indicate your agreement.

Answer Options	Response Percent	Response Count
Strongly agree	54.1%	**157**
Agree	26.2%	**76**
Not sure	16.2%	**47**
Disagree	2.4%	**7**
Strongly disagree	1.0%	**3**
answered question		**290**
skipped question		**11**

16. What types of education and public outreach would residents like to see offered by the urban forestry program? Please check all that apply.

Answer Options	Response Percent	Response Count
Seminars and workshops	38.3%	**111**
Interpretive trails and displays	53.8%	**156**
Species information	46.6%	**135**
Tree care	67.6%	**196**
Tree planting	56.6%	**164**
Tree pruning	51.7%	**150**
Guided nature walks	43.1%	**125**
Other	4.8%	**14**
Other (please specify)		**16**
answered question		**290**
skipped question		**11**

Other:

- assistance in planting trees on private property
- consultations
- Facebook updates & info
- I don't think these are necessary
- I resent the word "forestry." These are "city trees"
- in referance to oak mitigation, its discouraging to see mono crops of live oaks with no associate species in the greenbelt
- include tree importance in our city schools.
- low cost tree sales
- mailed information for those residents interested to keep cost down
- school and after-school programs for kids
- School field trips
- School programs
- seed2seedling in schools
- SIGN guided nature walks
- Taught in the class room and maybe special events for everyone to participate.
- Use the City web page for care, planting, pruning, maintenance guides; info source.

17. What are the best ways to encourage tree planting and preservation on private property? Please select as many as apply.

Answer Options	Response Percent	Response Count
Education and outreach	69.0%	**200**
Reinstate Shade Tree Program	61.4%	**178**
I like the current rebate program	23.4%	**68**
Information about how to hire a professional tree care company	23.4%	**68**
Require tree care companies to have a certified arborist on staff	19.7%	**57**
Free trees	59.7%	**173**
Other	3.4%	**10**
Other (please specify)		**17**
answered question		**290**
skipped question		**11**

17. What are the best ways to encourage tree planting and preservation on private property? Please select as many as apply. *continued*
Other:
An incentive program similar to Cash For Grass
Data on the City's web page for 3rd party professionals, or "links" would be helpful.
Education about how to care for existing trees - like my ailing oaks
Events for people to particiapate in as families planting together.
Have local volunteer organizations help out such as Keyclub at Roseville High school.
Help with planting, from full job for seniors to diagrams available everywhere.
help with tree care!
I am not aware of current rebate program?
I believe people don't understand the value of trees, education and outreach done effectively
I don't know what the shade tree program or the rebate program is, so I could not comment on those options.
join with the hoa's to better tree care and replacement
Let residents know where to get free/discounted trees and which do best in this area
let the public know the benefits of trees through visual aids
Not very knowledgable about this section. Sorry.
Rebate program? Didn't know there was one! Also providing info. such as on this site as to the MANY benefits of trees so homeowners will plant more (PSAs; newspapers; at local plant nurseries). You can skip utility bill inserts, no one reads them.
Those that have oak trees on private property should be required to care for them!
We loved getting our shade tree rebates. It was very helpful for us to select trees that we felt confident would grow healthy and strong in our area. Thanks to the rebate program we love our beautiful trees in our yard! Right now they are a gorgeous cranberry red - priceless beauty.

18. Optional. Please use this space for any additional comments about the value of public trees.	
	Response Count
	37
answered question	**37**
skipped question	**264**
Comments:	
Although these are very important issues, costs should be minimized & resources should be allocated toward outreach & training volunteers (e.g. high school students, nonprofit group members). That's a win-win situation.	
An improperly planted tree will only live for about 3 years. Rebates and free trees without and educational component encourage poor planting which will need to be redone in another 3 years. If you want long term success the following are necessary: education for home and business owners, and a requirement for all professional tree care companies practicing in Roseville to meet certain minimum criteria such as having an ISA Certified Arborist on staff.	
As highlighted by questions 12 and 14 my concern is long term care - be it sidewalks that get pushed up or storm damage, a responsible program will ensure long term care of trees is available so more costly damages or maintenance isn't required.	
Children and youth programs would be very beneficial in the long run.	
Commented under question #16.	
I am very concerned that this program is coming down from the UN Agenda 21/sustainable development program via the federal and state governments. The city trees have long been an attractive feature of Roseville - I am concerned that all of this interference will unnecessarily cost tax payers a lot more money. The parks department does not need an outside consulting firm to tell them what to do - they should have the skills to diagnose, treat and replace trees as needed. I am very concerned about this approach.	
I believe that education and outreach is another "best way" particularly for children and teenagers	
I didn't know the Shade Tree Program was gone!	
I love trees in my neighborhood though several rental property owners seem to think them as a nuisance. Not sure if this is due to the owners wish or tree health issues but I think people could be educated more on the value if trees for their neighborhood property values, the energy savings from shade, clean air and lower temperature benefits	
I moved from a very popular and busy metropolis. there was an emphasis on open park acres and acres.whenever a city makes a commitment to old oaks, water-creeks, or small lakes to jog by during your lunch hour, take kids on weekend bike rides, or lovers walking, the community gets a higher ranking for citizens looking for a community to"hanker down" in. This includes our natural oaks and new trees. I have prefered living in a neighborhood of older trees because of my health concerns, and will not even try to move to the new "apartment communities" because the pollution is not absorbed by the foliage from trees, but is harmful over years , to each of us.	
I personally need help hiring a tree professional for trees on my property. I know they need help, but not sure where to start.	
I think the city should require a ratio of X number of trees for every x square foot of black asphalt. I feel "heat island" affect is a real issue here in Roseville.	
I think this is AWESOME! Roseville is so beautiful and I would like my children to grow up seeing the beauty of it all.	
I would like the city to utilize any open/barren areas and medians to plant more trees.	
I would like to see more public trees. I would also like to see that trees not be planted to close to street signs.	
I would like to see the rail road/city along church street beautify that area	
It would be fun if you do a re-forsestation of an open space to have it be a kid-friendly day. I would love to show up on Arbor day or something with my 5 year old, and get a little tree for us to plant somewhere that she can watch grow as she does. Then on every arbor day, we could go to that "forest".area and help clean up or whatever needs to be done to keep "her tree" healthy and happy. we have done this with a plant in our yard, but we don't need any more trees, and I would love for her to have an area of the community she feels is her contribution, and continued contribution. maybe the city does that already, i have little kids so not sure if you do or not	
Many developers do a poor job planting trees. Most trees are not planted correctly and died shortly after the house our property is sold. The trees in the parking lot of my work are still very tiny. The reason is because there is not top soil. They will either have to have trees at a certain size after so many years or provide shade structure.	
More trees are always good, whether wild & free in our nature areas or watered & pruned in landscapes.	
no	
Oh wow....I think invaluable would be the best way to put any tree. They do so many things for this city (for the earth, if we really think about it). One tree can provide habitat for hundreds, even thousands, of different organisms. All of which have their place in this world, and a home in those trees.	
One of the main reasons I tell people this is one of the best places to live is the trees.	
Planting groves of new oak trees in what used to be a beautiful meadow in Maidu Park was not an ideal choice. This attempt to add more trees to the park actually ruined the aesthetics of a pretty open space area. Now it looks unsightly and very unatural.	

18. Optional. Please use this space for any additional comments about the value of public trees. *continued*

Please clear the thicket at the norh end of Foothills Blvd to open access to Pleasant Grove Creek.
Rocky Ridge was planted with trees and neglected for years. Even the water system didn't seem sufficient and damaged trees not replaced and no new trees till recently. Please provide better maintenance for what we have already.
Some people may not understand "oak mitigation" or the historical treatment of oak trees in West Placer County.
Suggestion: add a tree/shade value calculator to the website so homeowners and non-residential property owners and managers can calculate the dollar cost saving and/or benefits to their property based on the current trees they have (species, health, size and location) and if they were to plant more.
Thank you for your efforts in making our community great! Viva la trees!
Thanks - we love living in Roseville - and the parks and libraries are the main reason.
Thanks for keeping Roseville beautiful! Hope my feedback has helped!
There cannot be enough trees in Roseville! I am always picturing more trees when I am out and about. I am particularly "fond" of trees for their " air purifying" and wildlife -harboring aspects. Thank you for your work, and may you get funding to increase our urban forest even more! Let's be Sacramento's rival in that department!
Trees are soooo important to our city, for all reasons you have on your survey. For the environment, nature, waterways, and people. Roseville must be commended on their interest of trees for their city. Being a bird and nature watcher I love trees and hope they increase in numbers in our city, which I have lived in for 23 years!
trees rock!!
Very important!
We can never have enough of trees.
What would an area (home, street, shopping center, etc.) look like without trees and with trees? To answer this question and get the point across, provide the public with visual aids, in addition to telling residents what they could save on energy consumption by planting trees that add shade.

Please tell us a little bit about YOU.

19. Gender?

Answer Options	Response Percent	Response Count
Male	30.4%	**88**
Female	66.4%	**192**
Prefer not to answer	3.1%	**9**
	answered question	**289**
	skipped question	**12**

20. Age Group?

Answer Options	Response Percent	Response Count
Under 18	3.1%	9
18 to 25	10.1%	29
26 to 35	26.5%	76
36 to 45	23.3%	67
46 to 55	16.4%	47
56+	20.6%	59
	answered question	**287**
	skipped question	**14**

21. What is your current involvement with Roseville's urban forest? (Choose all that apply)

Answer Options	Response Percent	Response Count
I am a resident of Roseville	84.1%	243
I am a frequent visitor to Roseville	15.2%	44
I own a business in Roseville	5.2%	15
I appreciate public trees	67.8%	196
I have planted public trees as a volunteer	13.8%	40
I help care for a public tree adjacent to my property	6.2%	18
I have donated money to a non-profit foundation in support of public trees	10.7%	31
None of the above	2.4%	7
Other	4.5%	13
Other (please specify)		18
	answered question	**289**
	skipped question	**12**

21. What is your current involvement with Roseville's urban forest? (Choose all that apply) *continued*
Other:
environmentalist
Fruit Tree in my bad yard
I am moving to Roseville in about three months.
I come up 5-6 days a week to walk my dogs in a beautiful area. I only encounter 1 city dog poop station. More are needed because it looks like I'm the only one that picks up after my dogs!
I have a 300+ year old Valley Oak tree in my backyard
I have utilized the shade tree program as well as the current rebate program and also planted several trees on my own property
I look forward to getting clarification of why this seems so important at this time.
I own a three trees
I participated in the free shade tree program in Sacramento County when I was a resident in South Sacramento. I found the workshop very informative and educational.
I planted free share trees in 2009. I love them.
I run Roseville's trails almost everyday, and am thankful for every tree I pass.
I spend a lot of time riding on bike trails in Roseville.
I work in the city of Roseville
I've planted 14 trees on my property (track home in Roseville) and they worth every dime. They make an area look and feel so much nicer. People don't realize the wonderful impact that healthy trees have on an area. I'm a network engineer who works in an office all day. I really appreciate living in such a beautiful city for the times I get to spend outside/driving.
Participated in an urban forest project to raise awareness of urban forestry and to raise funds for its support.
Roseville family since 1915
Tree pruning and maintenance using our landscape company.
work in roseville