City of Citrus Heights

Urban Forest Master Plan

A component of the Citrus Heights Urban Greening Strategy (CHUGS)

2015

City of Citrus Heights

Urban Forest Master Plan

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A special thank you to residents who provided comment and participated in public meetings.

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Davey Resource Group, a Division of The Davey Tree Expert Company, completed the Urban Forest Resource Analysis (iTree Streets), the Urban Tree Canopy Assessment, and prepared this Urban Forest Master Plan in collaboration with City staff and stakeholder representatives.

Foothill Associates

Foothill Associates completed the evaluation of City codes related to landscaping and developed the plant palette and planting guidelines as well as the water-efficient landscape ordinance.

Photos

City of Citrus Heights

Images of America: Citrus Heights

Sunrise Recreation & Park District

Davey Resource Group

The Citrus Heights Urban Greening Strategy was made possible through a grant from the California Strategic Growth Council

Scope & Purpose

As a component of the Citrus Heights Urban Greening Strategy (CHUGS), the Urban Forest Master Plan (UFMP) provides a framework for the long-term care, preservation, and expansion of the community's public trees. The UFMP recognizes the significance of environmental and socioeconomic benefits from urban 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 UFMP aims to:

- Increase sustainability and resiliency in the publicly-owned community tree resource
- Promote drought tolerant plants and water efficient landscapes
- Provide maintenance and planting standards that support health, longevity, and safety of the community urban forest
- Simplify and clarify tree preservation ordinances
- Identify and prioritize forest improvement needs
- Establish benchmarks for the community urban forest
- Identify opportunities to increase outreach and education

The UFMP identifies long- and short-term goals to manage and enhance the community urban forest and to preserve and increase canopy cover across the community (public and private). The Plan is intended to remain flexible, allowing the community to explore the recommended actions over time and as funding and resources permit.

While the Plan recognizes the significant contribution and benefits of private trees to the overall well-being and livability of the community, it focuses primarily on city-maintained public trees on streets and at city facilities. The Plan has no jurisdiction over public trees growing in parks and managed by the Sunrise Recreation & Park District.

Executive Summary

The community urban forest in Citrus Heights includes nearly 28,000 public trees. These trees provide numerous tangible and intangible benefits to residents, visitors, and neighboring communities including cleaner air and water, energy savings, wildlife habitat, and social and economic benefits. The City of Citrus Heights manages public trees on streets and at city facilities. The Sunrise Recreation & Park District (SRPD) manages trees in parks. While the Urban Forest Master Plan (UFMP) applies specifically to those public trees that are managed by the City, it includes strategies for increasing canopy cover on both public and private property across the community.

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, 1988) and provides a good conceptual framework for the process of improving urban forest management.

The plan development process involved a comprehensive review and assessment of the existing urban forest, including:

- A canopy assessment that mapped the extent and location of tree canopy (public and private) across the community
- A community tree resource analysis that assessed the composition, benefits, and value of the public tree resource.

The process explored community values, including those expressed by the General Plan, community design standards, existing regulations, and policies that provide protection and preservation measures for the urban forest.

Current service levels and funding for both in-house and contracted staff were evaluated. Internal and external stakeholders, who play a role in the planning, design, care, and advocacy of the urban forest provided valuable insight and input for the UFMP. These included City maintenance staff, SRPD, community planners, utility providers, nonprofit organizations, and residents.

What Do We Have?

Following incorporation in 1997, Citrus Heights adopted the County's Tree Preservation and Protection Ordinance. Intended to preserve the quality of life, history, and character of the community, the ordinance was modified slightly in 2006, to provide protection and mitigation measures for heritage and significant trees in the face of ongoing development.

In 2013, the City was awarded grant funding from the California Strategic Growth Council to develop the Citrus Heights Urban Greening Strategy (CHUGS). The strategy includes the development of an urban forest master plan, a water efficient landscape ordinance, and guidelines for selecting and using native and drought tolerant plant species. CHUGS supports the General Plan and the Greenhouse Gas Reduction Plan (2011) to reduce GHG emissions to 10-15% below 2005 levels by 2020 and to increase carbon sequestration and storage through tree planting and urban forest enhancements.

In support of the UFMP, the City collected an inventory of the public tree resource in 2013. This information was used to establish baseline values that define the composition, value, and benefits of the existing community forest (Urban Forest Resource Analysis, 2015). An Urban Tree Canopy Assessment (2015) used high-resolution aerial imagery to develop a GIS map layer and baseline

values for the extent and location of existing canopy cover (public and private) across Citrus Heights.

The resource and canopy assessments determined that Citrus Heights has an overall canopy cover of 25% (2,280 acres). The community (public-owned) tree resource is providing nearly $2 million in annual benefits, including energy savings, air quality improvements, carbon sequestration, stormwater runoff reduction, and social and economic advantages. The replacement value of this resource is nearly $101 million.

Through purposeful stewardship and planning, the urban forest will continue to provide a stable stream of vital benefits to support health and quality of life in Citrus Heights.

What Do We Want?

CHUGS intends to provide support for the future health, well-being, and sustainability of the community by preserving and enhancing natural resources and improving the overall resilience of the urban forest in response to water conservation and climate fluctuations. The UFMP is predicated on three guiding principles:

- Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community
- Incorporate urban greening principles into the City's regulations and daily activities
- Expand outreach, education, and engagement

How Do We Get There?

In support of the guiding principles, the UFMP identifies six goals:

- Develop and maintain a sustainable, healthy, and safe community tree resource
- Preserve and expand tree canopy on public and private property
- Establish comprehensive, user-friendly regulations and policies
- Optimize community planning to consider trees as an integral component
- Optimize funding and identify new opportunities
- Increase outreach, education, and resident engagement

Each of these goals is supported by a comprehensive list of measurable objectives and strategies.

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 in meeting community expectations for the care and preservation of the community tree resource.

Citrus Heights Urban Forest Benchmark Values

Community Trees (Public Tree Resource)	
City Trees	22,428
Park Trees	5,566
Replacement Value	$101 million
Species Diversity	
Total Number of Unique Species	177
Prevalence of Top Ten Species	65%
Species Exceeding Recommended 10%	2
Benefits from Community Trees	
Total Annual Benefit	$2 million
Annual per Tree Benefit	$70
Urban Tree Canopy Cover	
Overall Tree Canopy	25%
City Trees	236 acres
Park Trees	94 acres
Private Trees	1,948 acres
Carbon Storage (overall)	$5.5 million
Annual Air Quality Benefits (overall)	$654,750

Introduction

Urban trees play an essential role in Citrus Heights, providing critical benefits that support the environmental and economic health of the community. Research demonstrates that healthy urban trees improve the local environment and lessen the impact resulting from urbanization and industry. 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 Citrus Heights a more enjoyable place to live, work, and play.

Recognizing the value of public trees and landscaping, the City contracted with Davey Resource Group and Foothill Associates to develop the Citrus Heights Urban Greening Strategy (CHUGS). The goal of CHUGS is to incorporate urban greening principles into City policies and operations and to develop a more sustainable urban forest. The strategy includes an Urban Forest Master Plan, a Water Efficient Landscape Ordinance, Native and Drought Tolerant Landscape Guidelines, and a plant palette.

An Urban Forest Resource Analysis (2015) defined the structure, benefits, and value of the existing community urban forest and an Urban Tree Canopy Assessment (2015) mapped the location of existing tree canopy (public and private) across the community (Map 1). Together, these documents establish benchmarks for measuring the success of urban forest management strategies over time.

Community

Located in Sacramento County and just northeast of the City of Sacramento, the more than 85,000 residents of Citrus Heights enjoy an average annual temperature of 61ºF (45ºF in winter months and 76ºF in the summer). Precipitation is approximately 22 inches per year, the majority of which falls during the winter months with little or no rainfall during the summer. Fog is also very common during the winter months.

The community has a long history dating back to the 1800s and the Gold Rush Days. While it was still predominantly rural in the 1960s, it became a regional retail destination in the 1970s with the opening of the Sunrise Mall and Birdcage Walk shopping centers. In 1997, Citrus Heights became an independent City after existing nearly a century as an unincorporated area.

Mission

The City of Citrus Heights is committed to providing high quality, economical, responsive city services to our community.

Vision

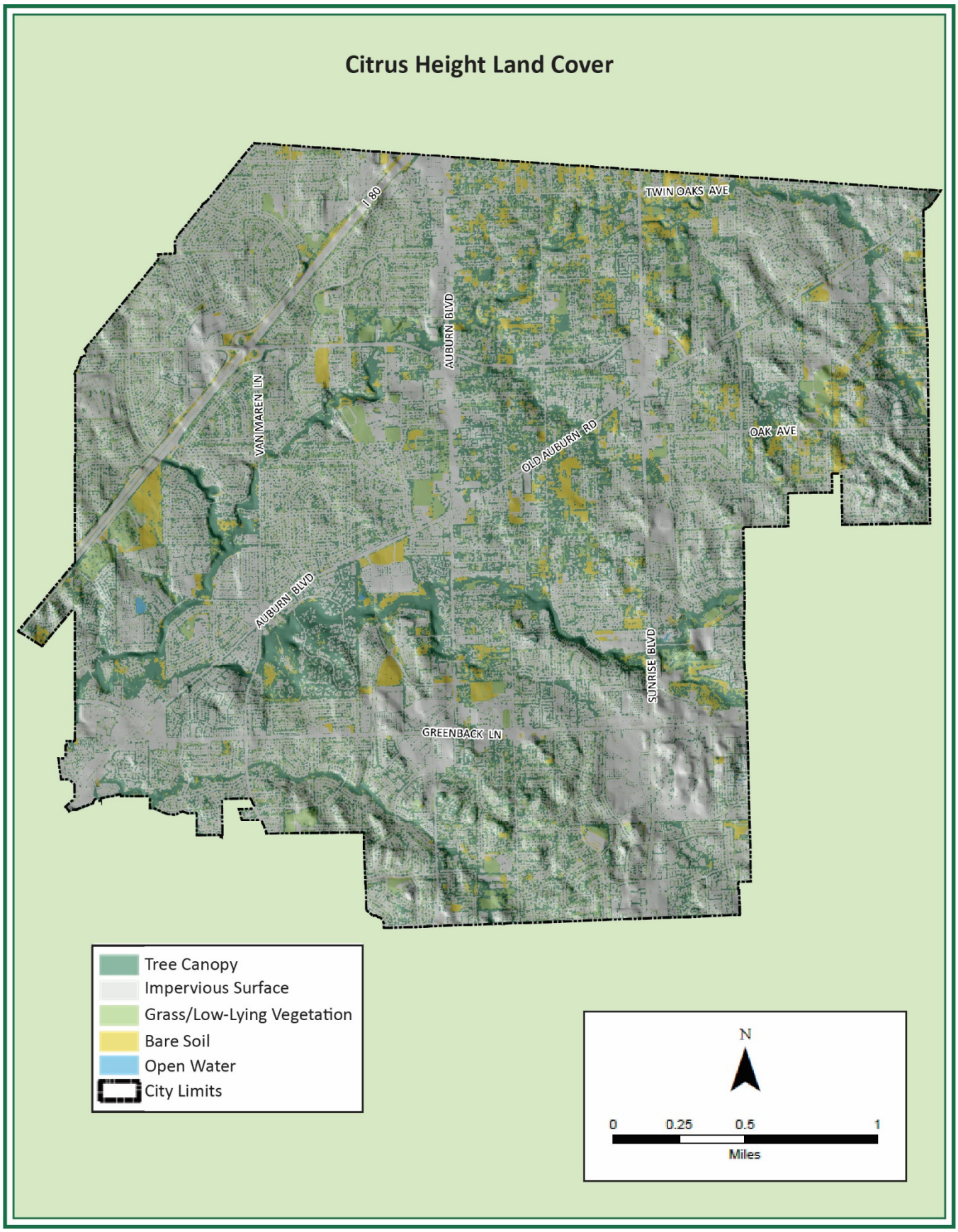
Citrus Heights will be a city with active community involvement, quality neighborhoods, thriving businesses, and innovative government.

Guiding Principles

Three guiding principles provide the foundation for the Urban Forest Master Plan:

- Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community
- Incorporate urban greening principles into the City's regulations and daily activities
- Expand outreach, education, and engagement

This plan outlines goals, both long- and short-term, in support of these guiding principles and provides objectives for their accomplishment.



Map 1. Land Cover in Citrus Heights

Benefits of Urban Trees and Canopy Cover

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 (e.g. 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 through a reaction of sunlight and gases such as those emitted from cars. In fact, scientists are now finding that some trees may absorb more volatile organic compounds (VOCs) than previously thought (Karl et al, 2010). VOCs 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 help increase oxygen levels.

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.

Annually, the community urban forest in Citrus Heights sequesters 1,474 tons of CO_2 valued at $22,110.

~Citrus Heights Urban Forest Resource Analysis, 2015

Definitions

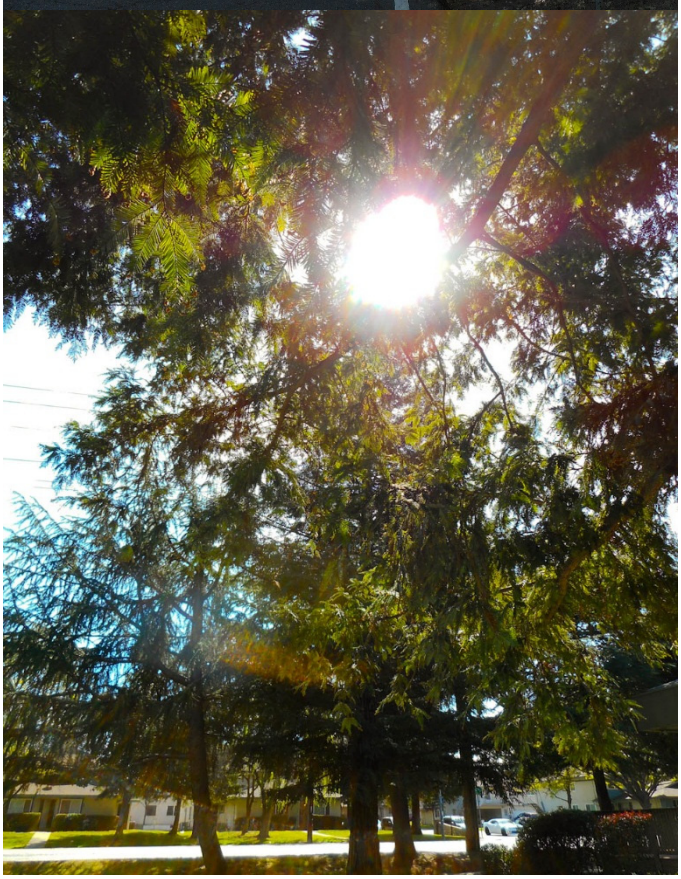
Urban Forest: The collection of privately owned and publicly owned trees and woody shrubs that grow within an urban area.

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.



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). In turn, reducing energy needs has the bonus of reducing carbon dioxide (CO2) emissions from fossil fuel power plants, which is the primary greenhouse gas emitted through human activity.

Blue oak, which represents 4.5% of the public tree population, provides the highest annual per tree energy savings of $19.90.

~Citrus Heights Urban Forest Resource Analysis, 2015

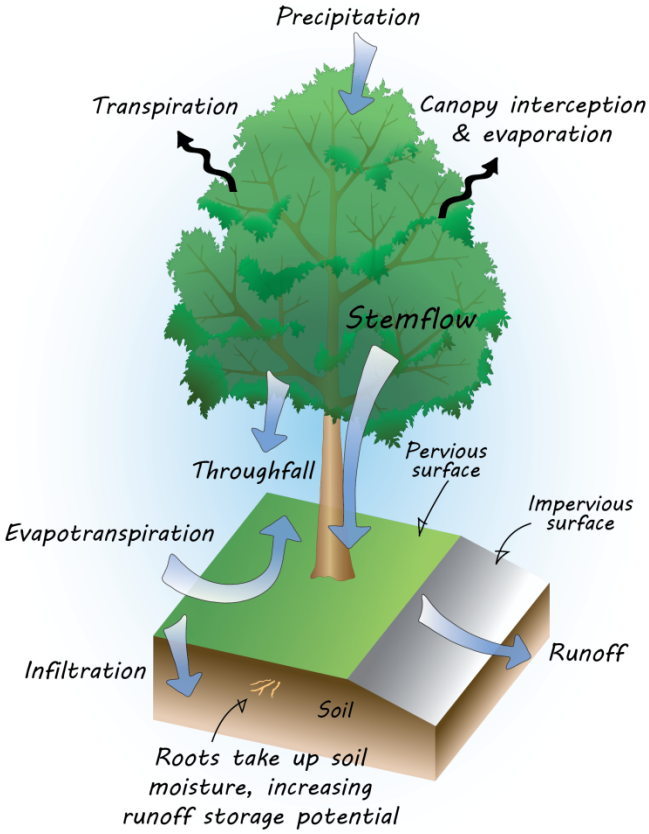
Water Quality

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

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

Urban stormwater runoff is a major source of pollution for surface waters and riparian areas, threatening aquatic and other wildlife as well as human populations. Requirements for storm-water management are becoming more stringent and costly. Reducing runoff through the incorporation of urban trees in stormwater management planning can reduce the cost of stormwater management, including the expense of constructing new facilities necessary to detain and control stormwater, as well as the cost of water treatment to remove sediment and other pollutants.

Trees intercept rainfall in their canopy, which acts as a mini-reservoir (Xiao et al, 1998). During storm events, this interception reduces and thus slows runoff. In addition to catching stormwater, canopy interception lessens the impact of raindrops on barren soils. Tree roots can also increase the capacity and rate of soil infiltration. Using a container experiment, Bartens et al. found a 27-fold increase in infiltration rates of compacted subsoil compared to unplanted controls (2008). Each of these processes, rainfall interception and increased soil infiltration, greatly reduce the flow and volume of stormwater runoff, avoiding erosion and preventing sediments and other pollutants from entering streams, rivers, lakes, and the Bay. In addition, trees shading streams can alleviate lethal water temperature increases for certain fish, caused by climate change.



Aesthetic, Habitat, Socioeconomic, and Health Benefits

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
- A reduction in violent crime
- Creation of a sense of place and history
- Human health
- Reduced illness and reliance on medication and quicker recovery from injury or illness

Some of these benefits are easier captured such as the effect of trees on home values. These benefits can be calculated based on home sales prices of properties where individual trees and forests are located.

However, other 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; Park et al, 2007; Troy et al, 2012; Ulrich, 1986). Reason being that there is limited knowledge about the physical processes at work, and their interactions make quantification difficult. Exposure to nature, including trees, has a positive impact on human health, such as increased worker productivity, higher test scores, reduced symptoms of ADD, faster recovery times following surgery, and positive impact on babies' birth weight. 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).

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).

In addition, trees and forestlands provide critical habitat (foraging, nesting, spawning, etc.) for mammals, birds, and fish and other aquatic species, along with limitless opportunities for recreation, offering a healthful respite from the pressures of work and everyday stress.

Trees play an essential role in the community, providing numerous tangible and intangible benefits to residents, visitors, neighboring communities, and wildlife.

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.

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

i-Tree Design

Calculate My Tree Benefits

What Do We Have?

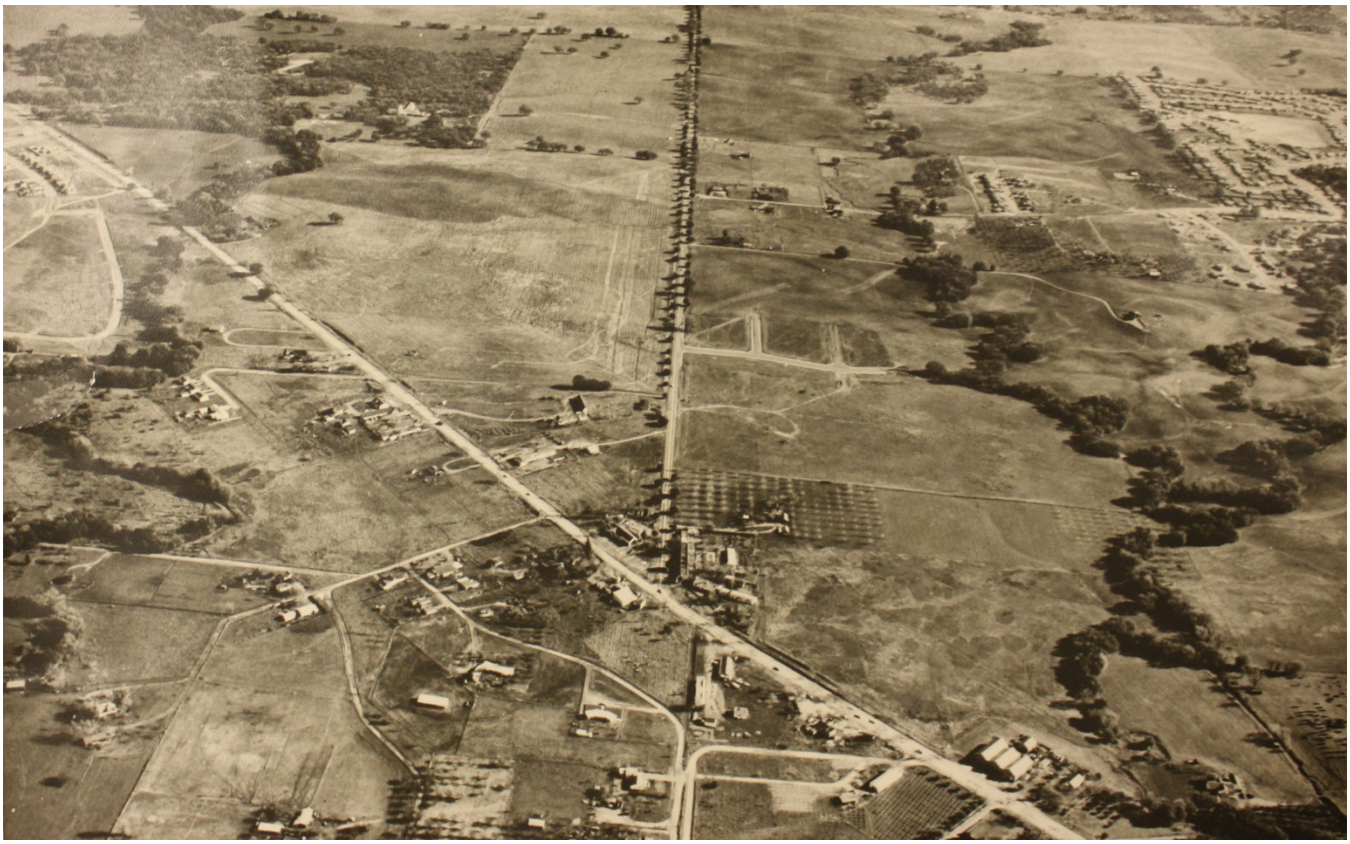
History of Urban Forestry in Citrus Heights

Soon after incorporation in 1997, Citrus Heights adopted the County's Tree Preservation and Protection Ordinance (1981) with some minor revisions. While the ordinance recognizes an individual's rights to develop private property, it aims to preserve as many trees as possible and to promote the health, safety, and general welfare, and the preservation of the significant historical and heritage value of the region. The ordinance was modified slightly along with updates to the Zoning Code in 2006.

While the City manages public trees located along streets and at public facilities, the Sunrise Recreation & Park District (SRPD) manages the trees that grow in parks. As a special district under the County of Sacramento, SRPD was founded in the 1950s after a land grant was made available by Fred and Julia Rusch to create more green space and parks. This land eventually became Rusch Park.

Over time, more land was acquired and SRPD grew in size. For more than 60 years, the District's recreation facilities have served the residents of Antelope, Citrus Heights, and Foothill Farms and administers hundreds of programs for families and businesses. Currently, SRPD manages 315 acres and 20 parks within Citrus Heights.

The General Plan (August, 2011) addresses state requirements and contains goals, policies, and actions that represent the City's approach for realizing the community's vision for its future. It serves as a long-term policy guide for the physical, economic, social, and environmental growth of the community. Many topics within the General Plan, including Neighborhoods, Streetscapes and Gateways, Transportation and Mobility, Biological Resources, and Climate Change, are supported and enhanced by trees and canopy cover.



Aerial photo (1958) shows open land at Auburn Boulevard and the intersection of Greenback Land, which stopped at Auburn Boulevard (Images of America: Citrus Heights)

Citrus Heights has shown a continued commitment to enhancing and preserving its urban forest. In 2006, the City endorsed the regional Greenprint Initiative. This initiative, introduced by the Sacramento Tree Foundation in 2000, is intended to complement the regional smart growth plan, Blueprint. Greenprint, which has been adopted by 22 cities and six counties, outlines a plan to enhance the quality of life in the region by growing 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

In 2014, the City was honored with a Tree Hero Award by the Sacramento Tree Foundation. The award recognizes the City's ongoing investment in promoting tree canopy and efforts to encourage residents to plant and care for trees, as well as the success of individual projects including the installment of an Oak Woodland Demonstration Area at the Stock Ranch Nature Preserve and the planting of trees at various locations throughout the City.

In September 2013, the City received an Urban Greening Planning Grant from the California Strategic Growth Council. The grant, intended to help "preserve, enhance, increase or establish community green areas such as urban forests" supported the development of the Citrus Heights Urban Greening Strategy (CHUGS). CHUGS is a long-range, comprehensive strategy to develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits urban trees provide to the community. To lay the groundwork for CHUGS, the City collected an inventory of public trees in 2013, including species, size, condition, and location.

To further refine the focus of CHUGS and to develop the goals, objectives, and policies that will support this vision, the City contracted with Davey Resource Group (DRG) and Foothill Associates in 2015 to develop an Urban Forest Master Plan (UFMP), a Water Efficient Landscape Ordinance, a Species Palette, and Landscape Guidelines for selecting and using native and drought tolerant plants.

To provide a foundation for the UFMP and establish benchmarks for measuring future progress, DRG completed an Urban Forest Resource Analysis (2015) that defines the current structure, benefits, and value of the community urban forest. This report, based on the inventory data collected by the City, considered all public trees, including those that are managed by SRPD. An Urban Tree Canopy Assessment (DRG, 2015) mapped the location and extent of tree canopy across the community, including trees on private property. The assessment included the development of a GIS layer that can be combined with existing data and geographic statistics to inform urban forest management policies and to explore the relationship of tree canopy with environmental, social, and economic factors.

Aerial photo (1976), same location as opposite page, showing new homes and the beginnings of an urban forest being constructed on what was originally farmland (Images of America: Citrus Heights)

Community Urban Forest Resource

Citrus Heights' community urban forest includes 27,994 public trees on streets, in parks, and at City facilities. To replace these trees with trees of similar size, species, and condition would cost nearly $101 million.

Composition

Understanding the structure, composition, and condition of an urban forest resource is essential to developing effective management strategies. The Urban Forest Resource Analysis (2015) found the following characteristics define the community urban forest in Citrus Heights:

- 22,428 (80.1%) of community trees are city-maintained (i.e., on streets and at City facilities.
- 5,566 (19.9%) of community trees are park trees managed by the Sunrise Recreation & Park District.
- Overall, the inventory includes more than 175 unique species.
- The top ten species represent 65% of the overall population (Figure 1).
- The predominant species are valley oak (*Quercus lobata*, 24%), Interior live oak (*Quercus wislizeni*, 13%), and crapemyrtle (*Lagerstroemia indica*, 5%).
- The resource has an established, nearly ideal age distribution with 43% of trees measuring 6 inches in diameter (DBH[1]) or less and 8% measuring greater than 24 inches DBH.
- 75% of trees are in good condition, 10% are in fair condition, and 7% are in poor condition.
- Community trees are providing approximately 330 acres of canopy cover.
- To date, community trees have sequestered 30,995 tons of carbon (CO_2).

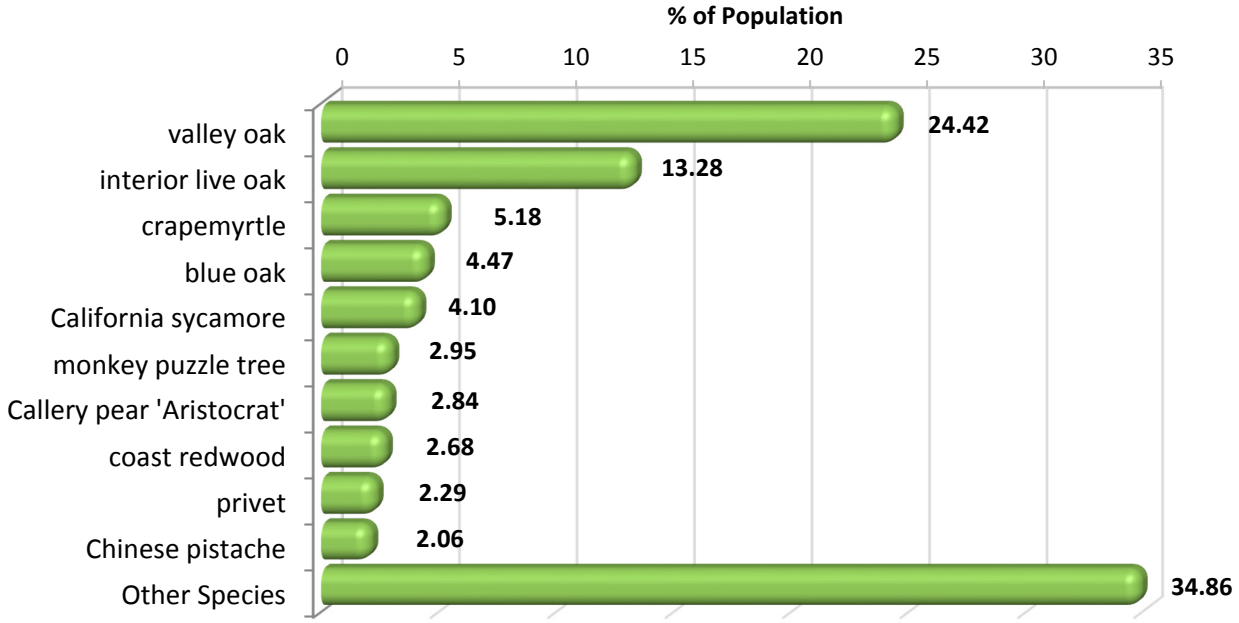


Figure 1. Species distribution in the community urban forest

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

Benefits

Based on the current composition, community trees provide nearly $2 million in benefits each year, an average of $70 per tree (Figure 2). These benefits include:

- Reduction in the use of electricity and natural gas through shading and climate effects, valued at $274,695.
- Additional sequestration of 2,297 tons of CO_2, valued at $34,450.
- The removal and avoidance of 15.5 tons of air pollutants, including nitrogen dioxide (NO_2), ozone (0_3), sulfur dioxide (SO_2), and small particulate matter (PM_{10}); an overall value of $217,905.
- Interception of 19.5 million gallons of stormwater, valued at $152,323.
- Benefits to property value, aesthetics, socioeconomics, and health are more than $1.2 million annually.

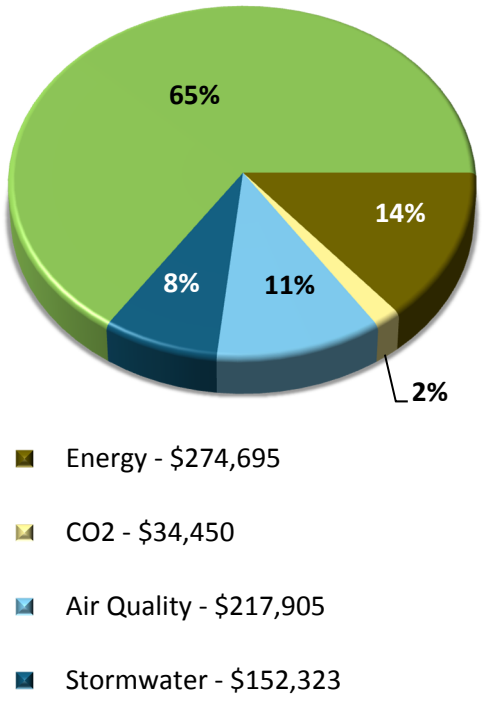


Figure 3. Annual benefits from the community urban forest

Benefit versus Investment Ratio

When the annual investment of $420,570 ($15/tree), from both the City and SRPD, for maintenance of all community trees is considered, the annual net benefit (benefits minus investment) to the community is more than $1.5 million (Figure 3). In other words, for every $1 invested in community trees, Citrus Heights receives $4.67 in benefits.

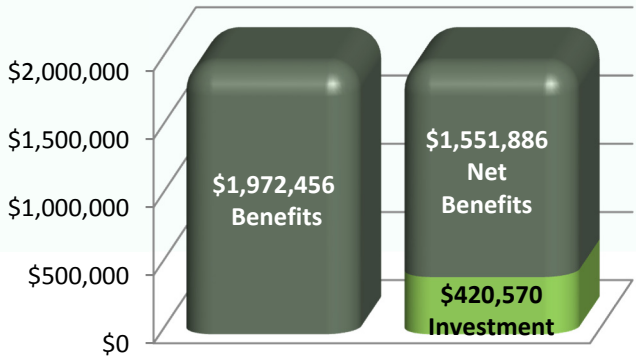


Figure 2. Benefit versus investment ratio

Maximizing Benefits

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.

Annual benefits are based on the composition (size of trees, number of trees, condition, and species) of the current inventory. Maximizing the use of available planting space by gradually increasing the stocking level will increase the overall benefits over time. Where space allows, every effort should be made to plant large-stature species as greater canopy cover and density are the key drivers of environmental benefits.

In addition to filling vacant planting sites, it is important to plan for the replacement of existing mature trees and species that are being phased out of the inventory.

Sustainability

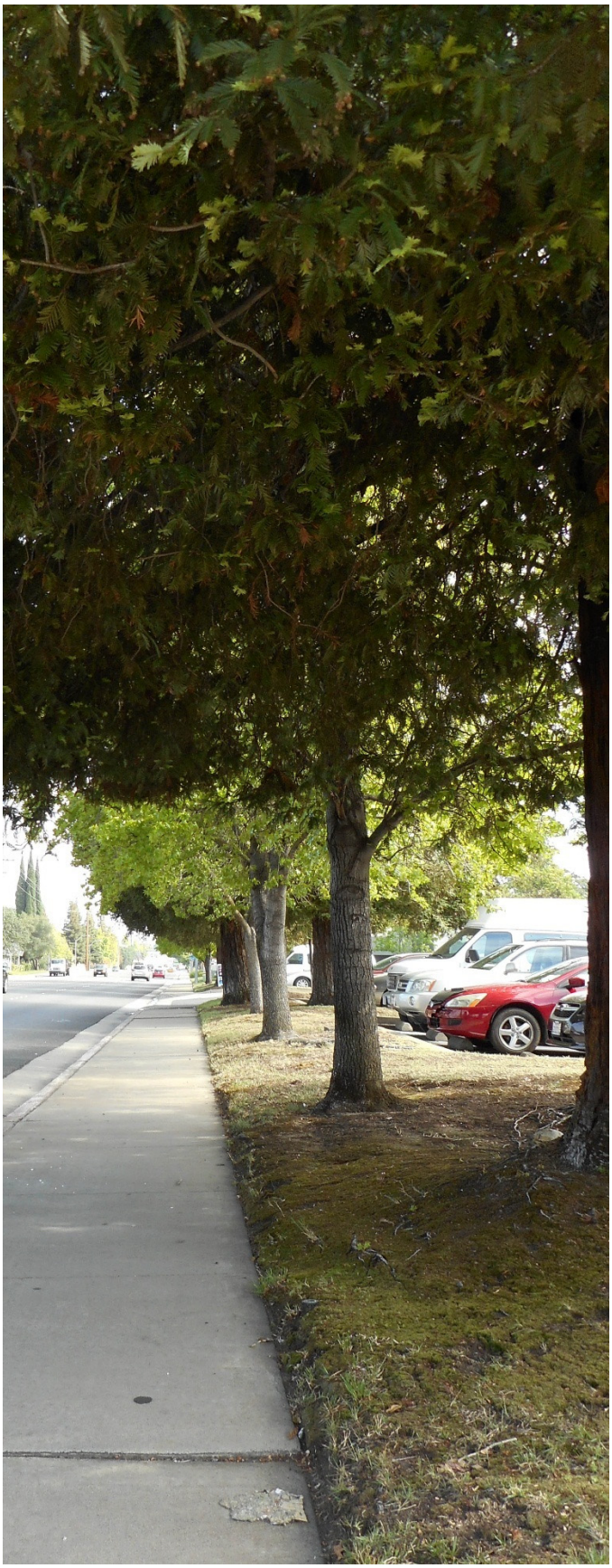
A sustainable urban forest is more resilient to pests, disease, and climate fluctuations, and as a result, healthier and more cost effective. As urban forests evolve over time, managers revise species recommendations based on past performance and emerging prospects. Because trees are relatively long-lived organisms, urban forests like Citrus Heights' are often a combination of well-adapted, high-performance species mixed with some species that may have proved less desirable. Proactive urban forest managers often phase underperforming species off the plant palette in favor of established performers, and promising new cultivars. In some cases less desirable species are identified and systematically, strategically removed as they reach the end of their useful lives.

Planting native and adapted species is a good strategy for building a sustainable urban forest. The urban environment presents many challenges to tree health, including restricted planting sites, poor and compacted soils, pollution, and water

limitations. Selecting the appropriate species can help control maintenance costs, reduce damage to infrastructure, and manage the need for pest and disease control measures. A diverse population can significantly increase overall performance and resiliency in the urban forest. While it may seem reasonable to rely heavily on native species, it is important to recognize that no species is native to the urban environment. Selecting the "right tree for the right spot" requires consideration of multiple factors, including site and soil characteristics, irrigation infrastructure, landscape objectives, and tree density.

A diverse population can help to minimize detrimental consequences in the event of storms, drought, disease, pests, or other stressors that can severely affect an urban forest and the flow of benefits and costs over time. Catastrophic pathogens, such as Dutch elm disease (*Ophiostoma ulmi*), emerald ash borer (*Agrilus planipennis*), Asian longhorned beetle (*Anoplophora glabripennis*), and sudden oak death (SOD) (*Phytophthora ramorum*) are some examples of unexpected, devastating, and costly pests and pathogens that highlight the importance of diversity and the balanced distribution of species and genera.

There is a widely accepted rule that no single species should represent greater than 10% of the total population, and no single genus more than 20% (Clark et al, 1997). At the species level, both valley oak (*Quercus lobata*, 24%) and interior live oak (*Quercus wislizeni*, 13%) exceed this standard. At the genus level, representation of *Quercus* (46.4%) is more than twice what is recommended for the overall community tree resource. While these important native species should continue to dominate parks and natural areas, their use in the street tree resource should be limited to recommended standards in order to promote greater overall diversity.



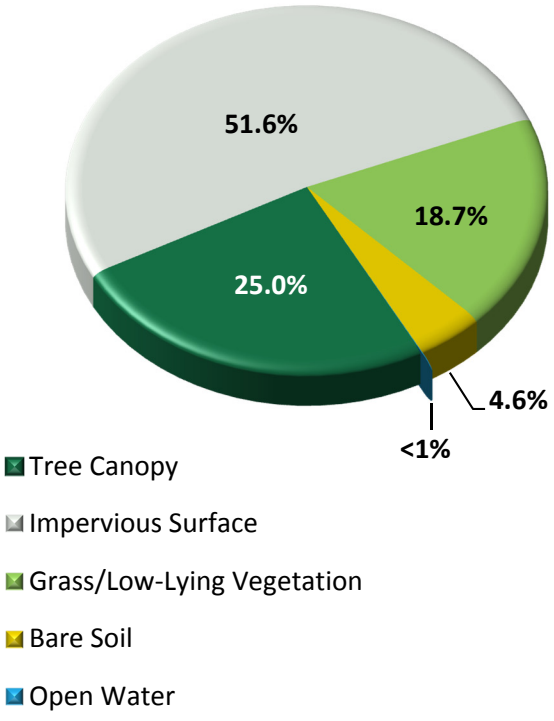


Figure 4. Overall land cover in Citrus Heights

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.

Tree Canopy is the layer of leaves, branches, and stems of trees that cover the ground when viewed from above. 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 Citrus Heights' urban forest resource and the invaluable benefits it provides. To acquire this information, DRG conducted an Urban Tree Canopy (UTC) Assessment (2015) using high-resolution aerial imagery, infrared technology, and remote sensing software.

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. The results of the study provide a clear picture of the extent and distribution of urban tree canopy within Citrus Heights.

Land Cover Summary

The City of Citrus Heights encompasses a total area of 14.4 square miles. Excluding impervious surfaces (4,702 acres), open water (4 acres), and other unsuitable sites (300 acres), Citrus Heights includes 6.4 square miles (4,100 acres) with the potential to support tree canopy. The following

information characterizes land cover within the City:

- 3.6 miles^2 (2,278 acres) of overall tree canopy, including trees and woody shrubs, an overall average tree canopy cover of 25% (Figure 4).
- Considering suitable planting sites on areas of existing pervious surface and bare soil (1,823 acres) and the existing canopy (2,278 acres), the canopy potential for Citrus Heights is 45%.
- 7.4 miles^2 (4,702 acres) of overall impervious surfaces, including roads, parking lots, and structures, an average of 51.6%.
- 2.7 miles^2 (1,706 acres) of overall pervious surfaces, including grass and low-lying vegetation, an average of 18.7%.
- 417 acres of bare soils, an average of 4.6%.
- 3.9 acres of open water, an overall average of 0.04%.
- 157 acres of tree canopy in SRPD parks and open space areas, an average canopy cover of 49.7%.
- 19 acres of tree canopy is on school campuses, an average canopy cover of 11.3%.
- 566 acres of tree canopy along creeks and in floodplains, an average canopy cover of 62.9%.

Environmental Benefits

Citrus Heights' landcover data was used with i-Tree Canopy (v6.1) to estimate the environmental benefits from the entire urban forest (public and private). Trees in Citrus Heights are providing air quality and stormwater benefits worth more than $2.6 million annually (Figure 5) by:

- Removing 78 tons of air pollutants, including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), and particulate matter (PM_{10})
- Reducing stormwater runoff by more than 243 million gallons, valued at nearly $2 million

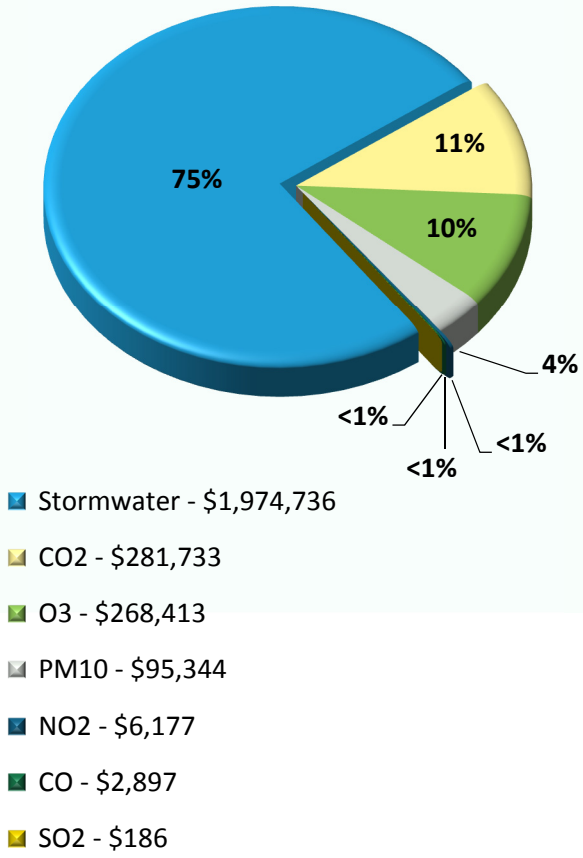
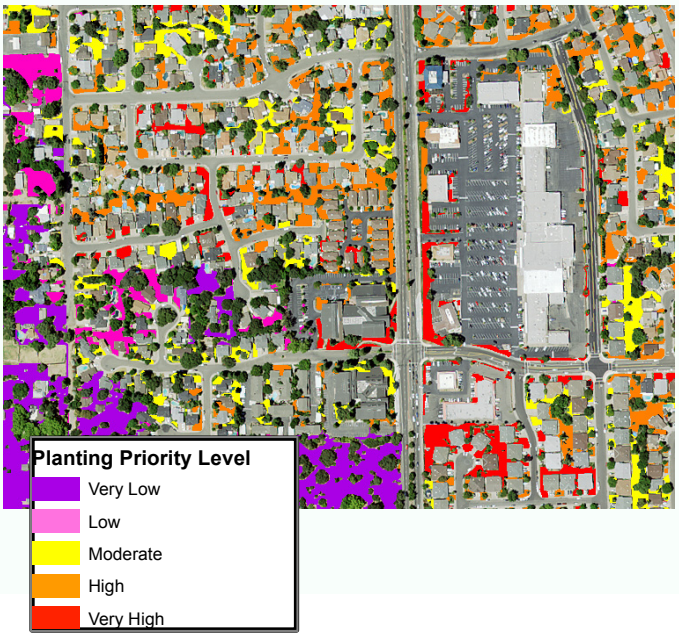


Figure 5. Annual benefits from tree canopy (public and private)

- Citrus Heights' urban forest is currently storing 287,630 tons of carbon (CO_2) in its biomass, valued at more than $5.5 million
- Annually, this resource removes (sequesters) an additional 14,550 tons of CO_2, valued at $281,733

In addition to defining and mapping existing land cover, the UTC assessment identified and prioritized planting sites based on risk potential for stormwater runoff, urban heat island effects, and environmental sensitivity.



Planting priorities identified near Copperwood Square

Definitions

City tree: Any tree along in the public right-of-way along streets or around public facilities. These trees are managed by the City.

Park Tree: Any tree that is within Citrus Heights' park boundaries. These trees are managed by the Sunrise Recreation & Park District.

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

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

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.

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

Management Considerations for Tree Canopy

The results and data from the UTC Assessment become an important part of the City's GIS database and provide a foundation for developing community goals and urban forest policies. The assessment establishes benchmark values to measure the success of long-term management goals over time. 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
- Preservation of benefit stream and sustainability
- Outreach and education

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. With this data, managers can determine:

- Progress towards local and regional canopy goals
- Compliance with parking lot shade 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 strategies to increase canopy in underserved areas.

Economic Development versus Urban Tree Canopy

Although Citrus Heights remained unincorporated until 1997, the community of more than 85,000

residents has an established commitment to preserving trees and other natural resources. While continued growth and development is vital to the social and economic well-being and sustainability of the community, the conservation of sufficient trees canopy is equally vital to the continued livability and attractiveness of the community. Recognizing this, the City has made efforts to protect significant and historical trees while still encouraging growth.

With a current tree canopy cover of 25%, Citrus Heights compares quite favorably to other communities in the region (Figure 6), but falls short of the 35% regional canopy goal set by the Greenprint Initiative. A continued proactive stance on tree preservation and mitigation will protect existing canopy. Appropriate management of the community tree resource along with outreach, education, and incentives that encourage greater tree planting on private property will promote canopy expansion.

Citrus Heights enjoys enviable canopy cover when many communities across the country are finding themselves in the position of having to reestablish their urban forests after significant loss of canopy begins to take a toll on quality of life issues. Recognizing the vital function of trees and urban forests and adopting proactive preservation strategies is much more cost-effective then trying to rebuild a healthy, working urban forest. Smart growth requires consideration of natural resources, and an effective strategy aims to conserve 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.

Canopy Goals and Tree Canopy Potential

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 Citrus Heights, it will require the commitment and support of the community.

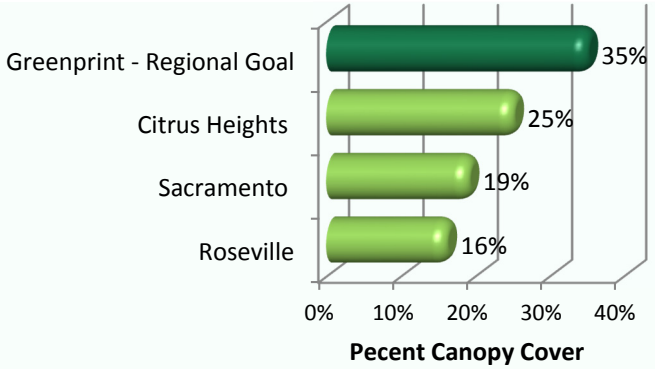


Figure 6. Regional comparison of tree canopy to the Greenprint goal of 35% (Roseville Urban Tree Canopy Assessment, 2013; City of Sacramento, 2015)

To determine a reasonable canopy goal for the community, it is important to consider the potential for tree canopy. Excluding impervious surfaces (e.g., roads, parking lots, buildings) (4,702 acres), open water (3.9 acres), and other areas that are unsuitable for tree establishment (e.g., recreation fields, utility corridors, cemeteries) (300 acres), the canopy potential for Citrus Heights is 45%. This value does not consider the potential for other land cover on parcels that are subject to development or redevelopment, including residential, commercial, and industrial parcels that may include structures, roadways, and parking facilities that would provide competition for trees and canopy cover.

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 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.

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

The Urban Forest Program

The City's General Services Department is responsible for the care and management of 22,428 city-maintained trees along streets and at public facilities. Current urban forestry operations include:

- Inspection of ROW trees
- Pruning
- Tree removal
- Service requests
- Emergency response
- Tree planting

Tree Care and Maintenance

The Facilities & Landscape Manager is responsible for managing the maintenance of public facilities and landscapes, including city-maintained trees. The City has two maintenance crews, supervised by Construction and Maintenance Inspectors who, among other responsibilities, oversee the maintenance of public trees. An on-call arborist provides professional and technical support for trees within the public right-of-way as well as privately-owned trees growing adjacent to the right-of-way where there is a potential to impact public property (e.g., limb or tree failure). The arborist provides annual and/or biannual windshield inspection and reporting of trees growing along city-maintained streets and right-of-ways, along with individual tree inspections and tree maintenance upon request.

Most landscape maintenance, including small tree maintenance is completed through contracted services. However, for larger trees, the City relies on the on-call arborist.

While nearly all park trees are managed by the Sunrise Recreation & Park District (SRPD), the City has authority for the protection and preservation of native oak trees. When a protected tree must be removed, SRPD coordinates with the City for permits and mitigation.

Inspection and Pruning Cycles

Each arterial street tree is inspected at least every 6 months via a windshield survey. Right-of-way trees and trees in select public areas are also inspected annually on foot. Depending upon age and location some trees are inspected on a more frequent and/or more thoroughly as necessary. Tree maintenance operations are scheduled based upon these inspections. Most trees are maintained on an as needed basis or when a service request is received. Some trees, including those planted in 2003 on Sunrise Boulevard, are trimmed on a 3-year cycle. Trees and locations that are prone to storm damage are maintained on an annual basis.

Tree Planting and Replacement

While some new trees are planted through initiatives such as those of the Sacramento Tree Foundation, most recent street tree plantings have occurred as a result of Capital Improvement Projects (CIP) where trees are installed by landscape maintenance contractors and/or subcontractors. When protected oaks are removed in parks, SRPD works with the City to replace them.

Emergency Response

While there is no one-size-fits-all solution to dealing with emergency events such as major storm damage, the City receives all emergency calls and then makes a determination on how to best deal with the situation in the most effective and efficient manner. When possible, City crews respond to emergencies, but dependent upon the situation, response may include contracted staff and/or a combination of in-house (supervisory) and contracted (labor) personnel.

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.

The City's in-house staff receive some specialized training, however there is no urban forester or arborist on staff. Instead, the City relies primarily on the knowledge and skills of contracted services and requires that the on-call arborist to be highly trained in basic and advanced arboricultural skills.

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.

Currently, the annual City budget for urban forestry services is $180,000 ($8.03/tree), approximately 0.3% of the overall municipal budget (Figure 7). This includes inspection, pruning, removal, and new tree planting as well as response to service requests and emergencies. Annual tree maintenance cost ($75,000) are funded through stormwater-related revenue (1/3) and from gas tax (2/3). CIP projects are funded by fees, grants, and Measure A. On-call arborist services cost an additional $10,000 annually, funded from stormwater-related revenue as well as gas tax at a 1:1 ratio. The Tree Mitigation Fund provides $25,000 annually for Heritage Oak Tree Maintenance Services.

The maintenance of park trees, which are managed by SRPD is funded through residential taxes (collected by the county) and user fees for rentals, events, swim lessons etc.

Tree Mitigation Fund

The Tree Mitigation Fund is supported by fees generated by the removal of protected trees as a result of development and construction projects. The current fee is $298 per inch in diameter (DBH). The fee is applicable when mitigation measures (i.e., tree replacement) cannot be achieved on site. Mitigation fees are deposited into one, or both, of the following funds as determined by the Community and Economic Director:

Native Oak Tree Propagation Fund

This fund is intended to finance the propagation, purchase, planting, protection, and maintenance of native oak trees. Uses include purchase of property to plant or protect native oak trees, propagation of native oak trees from seed or container stock, and maintenance of native oak trees.

Non-Native Tree Fund

This fund is intended to be used to purchase, plant, irrigate, and maintain non-native trees within the City. Uses include purchase and propagation of non-native trees from seed or container stock, and maintenance of non-native trees.

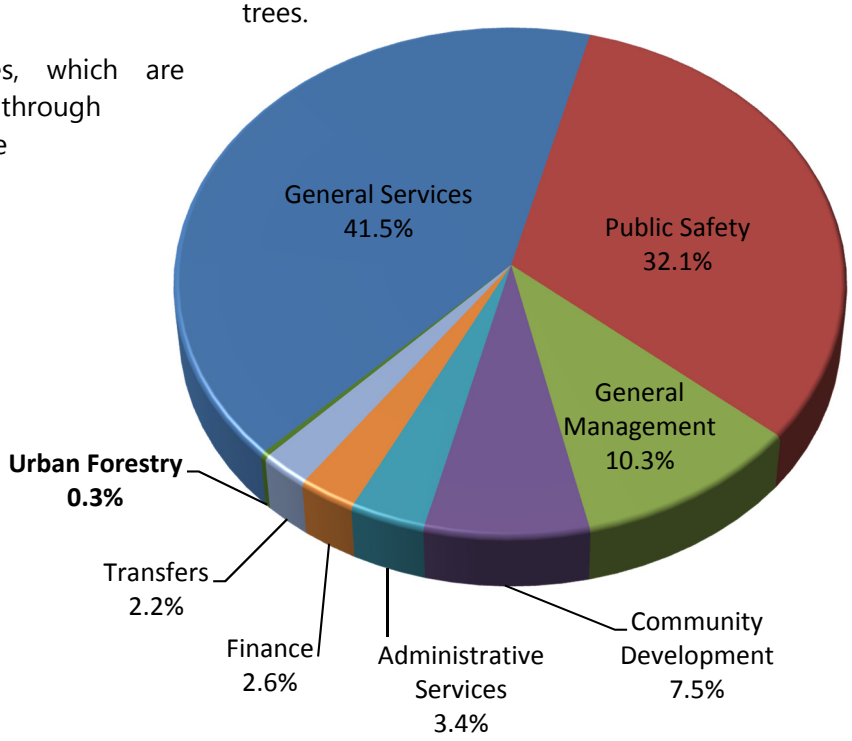


Figure 7. Urban forestry is a very small part (0.3%) of Citrus Heights' annual expenditures (Citrus Heights, 2014).

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 public trees and provide the regulatory framework for the protection and preservation of the urban forest assets as well as the enforcement options.

The development of the UFMP included a comprehensive review of existing policies, development and construction standards, ordinances and other regulations that apply to the urban forest. Three overarching documents influence and/or are supported by the UFMP:

- **General Plan**
- **Greenhouse Gas Reduction Plan**
- **Citrus Heights Municipal Code.**

This section summarizes the critical aspects of these documents as they relate to the urban forest.

General Plan

The General Plan serves as the long-term policy guide for the physical, economic, and environmental growth of the City, and is the City's statement of its vision for the future. It is the most important policy and planning document in the City and is used by virtually every department. 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 General Plan topics and their relationship to the urban forest and urban forest management:

Community Development

The **Neighborhoods** component aims to help enhance the City's character and quality of life by improving neighborhoods. Soon after the City's incorporation, 11 neighborhood associations were created to communicate with local officials and to assist residents. The associations have

worked on issues such as crime prevention and traffic calming projects to maintain and enhance the best qualities of their neighborhoods.

Urban forestry supports this component as vegetation has been proven to reduce crime (Troy et al, 2012) and traffic accidents (Mok et al, 2006) making trees an important part of City planning. In addition, street trees play a vital role in walkable neighborhoods and trail connectivity, promoting a more inviting environment with shade, heat reduction, and aesthetics. And 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.

The **Rural Residential Areas** component focuses on maintaining the character of older neighborhoods while facilitating new development within the City. Many of these neighborhoods retain a rural quality with overall larger lots, large front yards, narrow streets without sidewalks, and natural features like creeks. Mature trees and canopy cover play an important role in establishing the history and permanence of these areas and their preservation ensures that the character and charm is maintained.

The **Sunrise MarketPlace** component describes the vision for and the City's efforts to enhance and promote the Sunrise MarketPlace Property-based Business Improvement District.

Evidence shows that trees enhance commercial districts to the degree that patrons will travel longer distances to shop and spend more money in business districts with aesthetically pleasing greenery (Wolf, 2005).

The **Streetscapes and Gateways** component describes the goal to create clear boundaries to neighboring communities. This section of the General Plan lays out strategies to create distinctive gateways to the City that will help identify and promote its character and values. Attractive trees and landscaping are important components to these boundaries that define the City's identity and enhance visitor's and residents' experience.

The **Transportation and Mobility** component recognizes the important role roadways play for travel by car, walking, bicycling, and transit. 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, roadside vegetation improvements have been found to reduce the number of car crashes as drivers naturally slow down on tree-lined streets (Mok et al, 2006).

Resource Conservation

The **Biological Resources** component describes Citrus Heights' biotic habitats, including Urban, Annual Grassland, Interior Live Oak Woodland, and Valley Foothill Riparian, and establishes that several plant and animal species within these habitats have a "special status" designation. The General Plan recognizes that citizens play a big role in protecting the valuable natural features and that balance between development of the area and conservation of its natural resources is needed.

In addition to an integral role in these habitats, trees can help offset impacts from development by reducing stormwater runoff, absorbing and removing pollutants from soil and air, shading water bodies to mitigate temperature increases which can be detrimental to aquatic life (Roth et al, 2010), and other ecosystem services.

The **Energy Conservation** component is intended to increase the use of active and passive solar design, renovations to increase insulation and weatherization, orientation, and landscaping to reduce energy use in both new and existing structures. Trees provide evaporative cooling and shade which reduce the urban heat island as well as energy use of buildings.

Community Health

The **Climate Change** component recognizes that while climate change is a global issue, every jurisdiction plays a role in the solution. Citrus Heights is committed to helping reduce greenhouse gas (GHG) emissions and enhance community-wide sustainability. The City has

adopted a Greenhouse Gas Reduction Plan (GGRP) in response to state legislation AB 32 Executive Order S-3-05, the California Air Resources Board's guidance through the Climate Change Scoping Plan, and smart growth planning principles. The City's GHG reduction goals and policies relate to land use, transportation, energy and water conservation, waste reduction and increasing green infrastructure.

Trees sequester and store carbon from the atmosphere, provide evaporative cooling to the environment, and reduce energy consumption from air conditioning by providing shade to buildings. Incorporating trees into urban planning can help reduce GHG levels in and around Citrus Heights. In addition, species choice and landscape design can greatly influence the need for watering which is especially important when water is scarce. Citrus Heights recognizes this and is working on developing suitable ordinances and landscapes for the City.

The **Parks and Recreation** component is intended to ensure ample and appropriate parks and recreation facilities while building greener infrastructure and promoting the development of a healthy community. Trees are a vital component of parks for their aesthetic value as well as their cooling effects from shade and evaporation.

The **Utilities** component aims to facilitate a safe and abundant water supply by applying and promoting water conservation practices. Adopting a landscape ordinance for new development and developing water conservation educational programs to promote water-efficient retrofits and landscaping are action items of the utility component. Planting native, water-efficient tree species contributes to these goals.

Greenhouse Gas Reduction Plan

In 2011, the City adopted a community-wide GHG emissions reduction target of 10-15% below 2005 levels by 2020.

The GGRP addresses major sources of GHG emissions within the community and outlines various strategies to meet GHG reduction goals and to inspire residents and businesses to participate. The Plan demonstrates response and compliance with California's GHG reduction legislation and regulatory guidance. A primary function of the GGRP is to "improve the overall quality of life in the community by promoting smart growth and mobility principles that better connect the community, reduce air pollution and urban heat island effects, and encourage healthy lifestyles."

The City recognizes that trees and canopy are integral to this process, providing valuable ecosystem services to the community to alleviate the urban heat island effect, contribute to stormwater management, improve public health, and reduce energy use. The GGRP incorporates urban forest strategies that reduce GHG emissions and remove and store carbon from the atmosphere.

Municipal Code

Citrus Heights Municipal Code includes three sections relative to trees and canopy:

- **106.39 Tree Preservation and Protection**
- **90.633 Tree Trimming**
- **106.34 Landscaping Standards.**

The following is a summary of Municipal Code relative to trees, canopy, and urban forest management:

Citrus Heights Municipal Code - Chapter 106.39 Tree Preservation and Protection

This chapter establishes rules and regulations relating to the protection, preservation, and maintenance of native oak trees, habitat values of oak woodlands, trees of historic or cultural significance, groves and stands of mature trees, and mature trees in general that are associated with proposals for development.

Trees excluded from this protection are willow (*Salix* spp.), fruit trees, eucalyptus (*Eucalyptus* spp.), alder (*Alnus* spp.), cottonwood (*Populus* spp.), pine (*Pinus* spp.), catalpa (*Catalpa* spp.), fruitless mulberry (*Morus* spp.), and palm (*Acoelorrhaphe* spp.).

While there are exceptions, **tree permits** are generally required for relocating, removing, cutting-down, pruning, or other acts that cause the destruction of a protected tree. This includes any grading, paving, or other ground-disturbing activity within the protected zone of a protected tree or anything that would change the soil moisture content within the protected zone.

Citrus Heights Municipal Code – Section 90.633 Tree Trimming

This section protects street trees from being pruned without a permit.

Municipal Code 106.34-Landscaping Standards

This chapter focuses on requirements for landscaping with the goal to enhance the appearance of development, provide shade, reduce heat and glare, control soil erosion, conserve water, screen potentially incompatible land uses, enhance the quality of neighborhoods, improve air quality, and improve pedestrian and vehicular traffic and safety. It defines the documents required for specific application and project types and outlines landscape standards for each project, including minimum area of landscaping, landscaping for parking lots, landscaping in subdivisions, plant selection, and care. With regards to trees and canopy, these standards include:

- Interior parking lot landscaping
- Residential Subdivisions
- Landscape Standards
- Maintenance of Landscape Areas

Community Outreach

Community outreach and education are an important component of the urban forestry program. The engagement of residents with 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.

Currently, Citrus Heights uses numerous avenues to promote urban forestry. The City is involved with Greenprint workshops put on by the Sacramento Tree Foundation, it distributes flyers including those about the tree inventory. , and develops publications such as 'Connections', REACH Out, and the Citrus Heights Messenger. The City's website is also used to distribute information about urban forestry-related topics including the development of CHUGS. In addition, there is a designated booth at special events such as Sunday FunDay and Antelope Crossing Spooktacular. Increased programming for outreach and education are an integral part of the Urban Forest Master Plan.

The engagement of residents with 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.

Stakeholders

The urban forest has an impact on every resident, visitor, property owner and business in Citrus Heights. 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.

Sunrise Recreation & Park District

Sunrise Recreation & Park District was founded in the 1950s following a land grant from Fred and Julia Rusch to create more green space and parks. This land later became Rusch Park in Citrus Heights. Over the years, more land was acquired and SRPD grew in size. Today, SRPD manages over 490 acres of land and 42 parks within 27 square miles in the communities of Citrus Heights, Antelope, and Foothill Farms.

Nearly all parks within Citrus Heights are managed by SRPD. The City of Citrus Heights and SRPD have a history of collaboration on tree related operations within the City.

Utilities

Electric and Gas Utilities

Tree and 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.

During plan development, Davey Resource Group contacted Pacific Gas & Electric (PG&E) and Sacramento Municipal Utility District (SMUD) as electric and gas providers in Citrus Heights. In addition to providing notification of the pending Urban Forest Master Plan, utility representatives were invited to participate in the planning process.

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.

Sacramento Area Sewer District

The City of Citrus Heights is located within the Sacramento Area Sewer District (SASD). Formed in 1978, SASD owns, operates, and maintains thousands of miles of sewer pipes and serves more than 1 million people, including residential, commercial, and industrial customers. SASD serves the Cities of Rancho Cordova, Elk Grove, and Folsom, portions of the Cities of Sacramento and Folsom, as well as unincorporated areas in Sacramento County.

While SASD has little involvement with landscaping, they stipulate that "in areas where District main lines are less than 10 feet deep, neither trees nor deep-rooted shrubs shall be placed within the easement. In areas where the collector or trunk main lines are greater than 10 feet deep, shrubs and certain non-deep-rooted trees may be placed within the sewer easement with approval of the District." The District also provides a list of trees considered to have less intrusive roots and slower growth.

Water Districts

The Citrus Heights Urban Greening Strategy (CHUGS) includes the development of a Water Efficient Landscape Ordinance and Guidelines for Selecting and Using Native & Drought Tolerant Species (including a species palette).

For consideration in the UFMP and other CHUGS components, DRG solicited input from the Citrus Heights Water District, California American Water Company, and Sacramento Suburban Water District.

Sunrise Marketplace

The Sunrise Marketplace is a property based improvement district (PBID) established in 1999. Business owners united to create a ten-block business improvement district with hundreds of stores, services, and restaurants. Owners agreed to pay additional taxes on their property to fund improvements and support the viability and growth of the business corridor. Renewed in 2014, the Sunrise Marketplace PBID aims to create a vibrant destination that is clean, safe, attractive, fun, and entertaining while providing leadership to guide, and manage the area. Sunrise Marketplace partners with the City, the Citrus Heights Police Department, Sac Metro Fire Department, Citrus Heights Chamber of Commerce, Citrus Heights Rotary, SACOG, Regional Transit, and others.

While the Sunrise Marketplace PBID falls under the Citrus Heights' city ordinance, it does not have guidelines or strategies for vegetation management on its property and little control over the landscapes of property owners.

San Juan Unified School District

In addition to the benefits of trees and canopy to test scores, ADD/ADHD, shade, and general well-being, schools often provide ideal locations for increasing tree canopy. Besides being a great place to plant trees, schools can also provide an opportunity for children to learn about the benefits of trees and develop a connection with the natural world.

Stewardship

Sacramento Tree Foundation

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

Greenprint Initiative

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.

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.

Representatives from the Planning Division and the General Services Department participated and contributed to the planning process through interviews and discussions about their roles and perspectives for the urban forest as well as their views, concerns, and ideas for the UFMP.

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.

Conclusion

With an enviable canopy cover of 25%, a relatively young community urban forest in good condition, and a General Services Division that is dedicated to the care and management of public trees, Citrus Heights is in a good position to realize their vision for a sustainable urban forest that provides optimal environmental and socioeconomic benefits. Through CHUGS, the City has assembled a strong foundation and the tools necessary for making meaningful and effective management decisions over the next 25 years, including:

- Current inventory of city-managed trees
- Urban Forest Resource Analysis,
- Urban Tree Canopy Assessment and GIS canopy layer
- An update to ordinances that address landscaping, irrigation, and tree preservation

This information establishes a baseline for monitoring progress towards tree canopy goals and benchmarks for measuring the long-term success of UFMP.

Challenges and opportunities

The community forest is a dynamic, growing, and ever-changing resource that requires ongoing, proactive management to support tree health and safety and fully realize its maximum potential. Anticipating challenges and recognizing opportunities is key to implementing strategies in a timely and efficient manner. Over the next 25 years, Citrus Heights will likely face a number of critical challenges and opportunities affecting the urban forest.

Because trees are always growing and responding to their environment, they require maintenance to address structural issues. Unlike natural forests, urban forests require regular care and maintenance to ensure strong branch structure, provide clearance for visibility and travel, promote safety, and reduce the risks of tree and branch failure. At times, urban trees require management for pests and disease to preserve their value in the landscape.

Timely and proactive care can help control and reduce the overall cost of maintaining an urban forest, improve longevity of individual trees, and preserve the existing benefits that come from mature trees.

Of primary concern for all California urban forests is sustainability in the face of ongoing drought, emerging pests, and climate change. To improve resiliency in the community tree resource, Citrus Heights should:

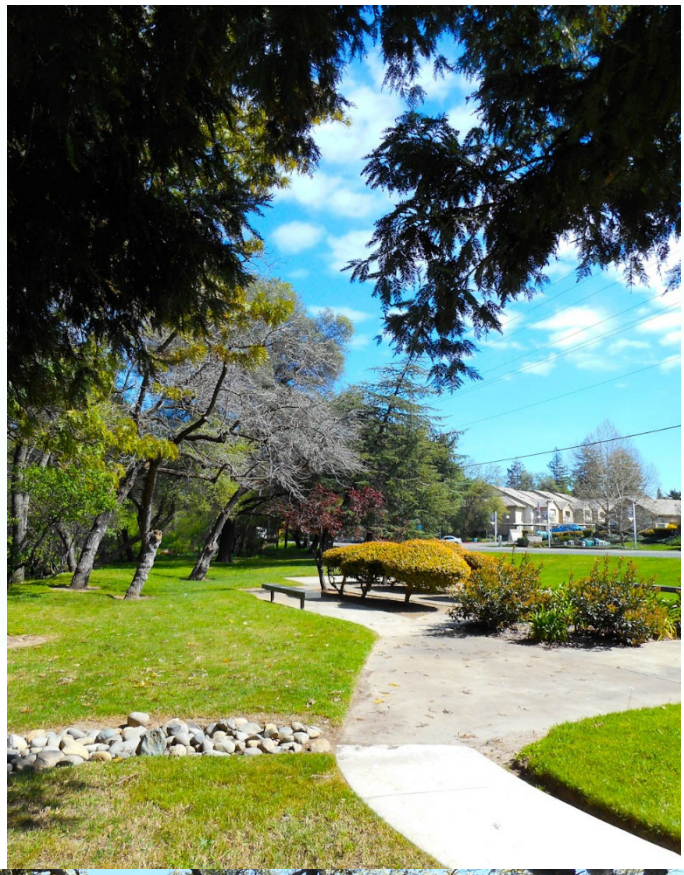
- Place emphasis on drought resistant and low-water use species for new tree planting and replacements.
- Plan for and promote greater species diversity in the street tree inventory.
- Ensure structural pruning for young trees to promote strong branch attachments.
- Inspect and maintain every city-managed tree on a minimum 7-year cycle.
- Maintain and update the inventory database, including tracking tree growth and condition during regular pruning cycles.

To reach an overall canopy cover of 35% as encouraged by the Greenprint Initiative, Citrus Heights will need to add an additional 900 acres of tree cover. To put this in perspective, if we assume each new tree will provide an average canopy that is 50 feet wide at maturity, the community will need to plant an additional 19,800 trees to reach this goal. While some new trees can be planted on city streets and in parks, the majority of new canopy will need to come from private trees. Outreach, public engagement, and collaboration will be crucial to achieving canopy goals.

To ensure adequate care and maintenance cycles, the City will need to optimize funding from existing sources including the Tree Mitigation Fund, as well as researching and applying for grant funding and other new resources. The UFMP recommends exploring the creation of landscape districts for new developments and neighborhoods that desire enhancements to their urban forest.

Ultimately, protecting and growing the urban forest requires a commitment from the entire community. Resident engagement and volunteer collaboration are integral to the success of the UFMP and the urban forestry program. Increasing outreach and public education will help generate support and enthusiasm for growing tree canopy and maintaining the community tree resource for maximum benefits and sustainability. It will be important to nurture relationships with volunteer groups, including the Sacramento Tree Foundation and neighborhood groups, to augment City resources and coordinate outreach efforts.

Altogether, Citrus Heights is poised to enjoy ongoing environmental and socioeconomic benefits from community trees. The UFMP ensures that these benefits will continue and that Citrus Heights will remain a vibrant, healthy, and attractive community.



What Do We Want?

Community Meeting

The first public meeting was held on Tuesday, March 31, 2015, from 6:00 to 8:00 p.m. at the Citrus Heights Civic Center. The meeting began with a presentation about the Urban Greening Strategy and its goals, the community's tree resource, and an overview of the development process for the Urban Forest Master Plan and the Landscape and Irrigation Guidelines. Following the presentation attendees participated in a discussion and planning session to identify goals and objectives for the Urban Forest Master Plan.

Attendees discussed a number of concerns including:

- Preservation of canopy and trees
- Effective outreach and education
- Incorporation of urban greening principles into City regulations and operations

During the meeting, participants were asked to answer questions based on what they found to be most important (green), what they were opposed to/found least important (red), and what they were indifferent about (yellow) (Figures 10-13).

When asked what benefits from the community urban forest are most values by residents, 38% of the votes favored benefits to property value, followed by 25% for wildlife habitat and air quality, respectively. Fifty percent found economics/tourism/ retail to be least important, followed by public health.

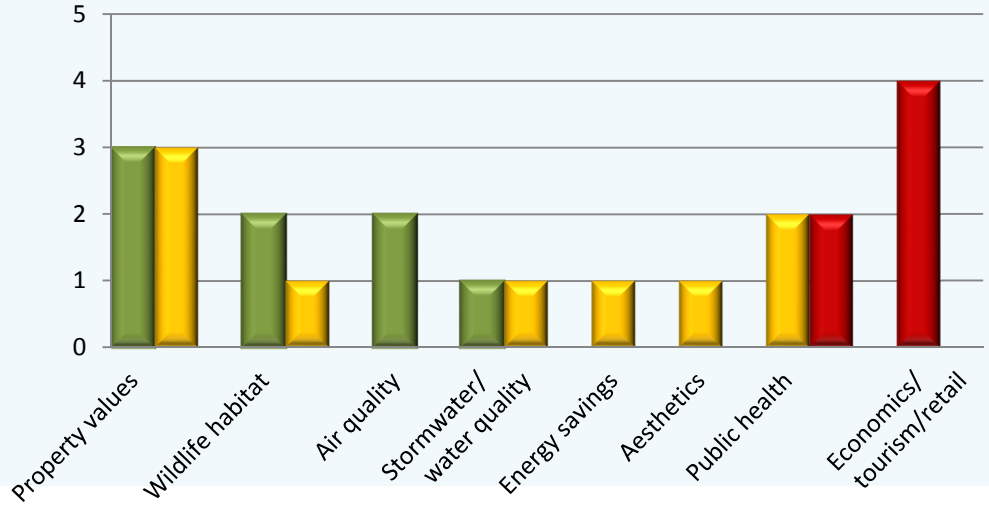


Figure 8. Voting results for benefits the community forest is most valued for.

When asked what level of public-tree care residents expected, 57% chose management for clearance and infrastructure conflicts, followed by 43% for optimal care. Management for aesthetic only was least important.

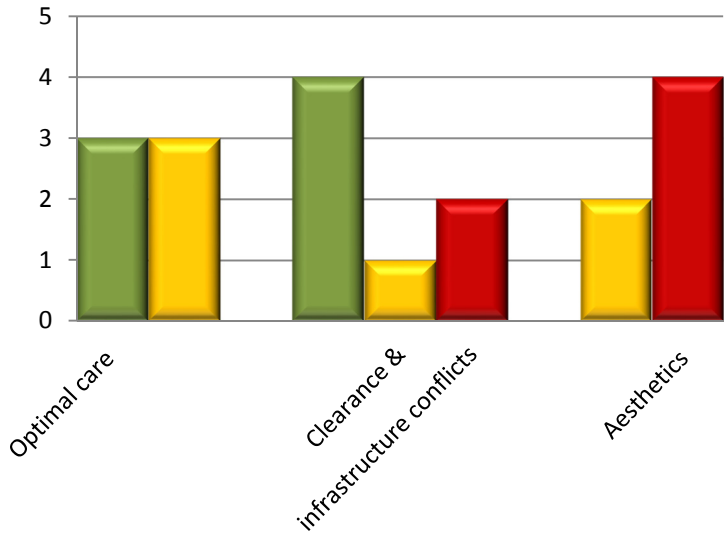


Figure 9. Voting results for public tree care residents expect.

When asked where residents would like to see additional tree plantings, 75% chose along streets while 25% chose school campuses; schools were also voted least important by 32% of voters.

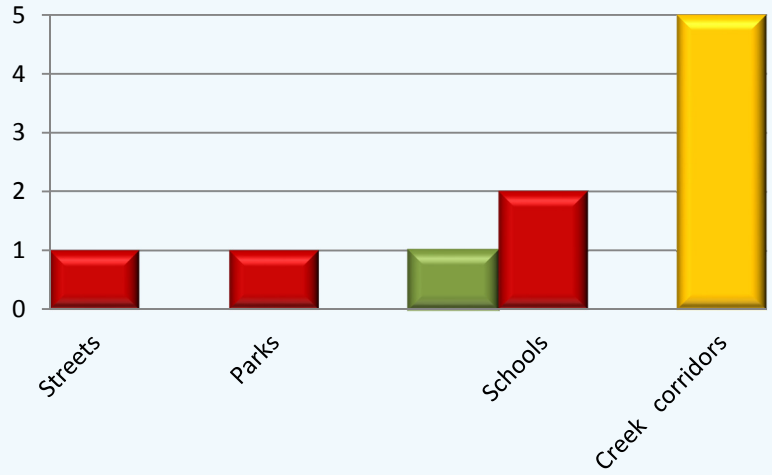


Figure 10. Voting results for where residents would like to see additional tree plantings.

When asked what education opportunities residents would like to explore, 25% chose outreach to encourage tree plantings on private Property and community tree planting events, respectively; planting education/workshops were also voted least important by 32%.

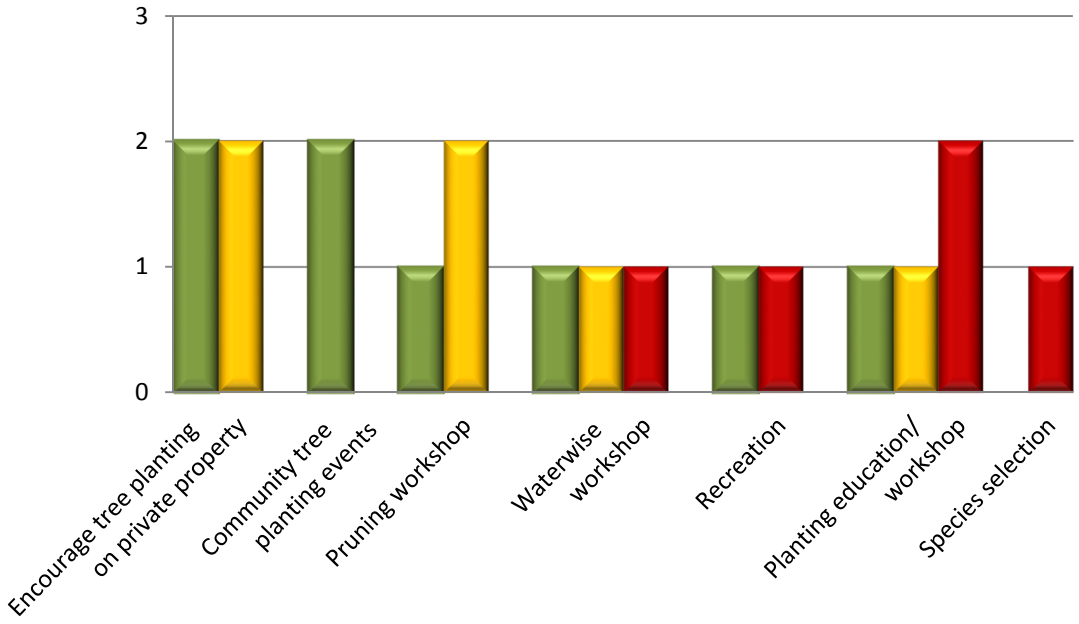


Figure 11. Voting results for opportunities residents would like to explore.

In addition, topics such as including trees in traffic planning, incentives for converting turf on private property, and cityscapes to reflect current ordinances were discussed.

They also discussed what types of education andoutreach they would like to see along with ways to incentivize tree preservation and planting on private property.

Goals and Objectives

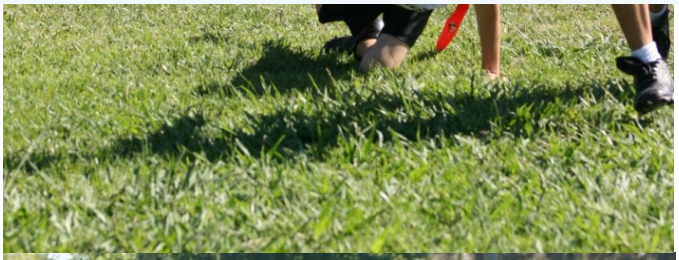
Based upon review of the current urban forestry program and resources (What Do We Have?), and input from the community and other stakeholders, the UFMP identifies six goals that satisfy the guiding principles and represent what we want for the future of the community urban forest in Citrus Heights. These goals and the objectives that support them are intended to optimally manage the City's community forest in an efficient, cost-effective, sustainable, and safe manner.

Guiding Principles

Three guiding principles provide the foundation for the Urban Forest Master Plan:

- Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community
- Incorporate urban greening principles into the City's regulations and daily activities
- Expand outreach, education, and engagement

The UFMP identifies six goals in support of these guiding principles:



Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource

This goal and the objectives that support it are intended to improve the overall health and resiliency of the community urban forest, preserve existing benefits, and provide a strong foundation for sustainability of the resource and the benefits from public trees.

Objectives for this goal include ensuring that all public trees are cared for on a regular basis and in accordance with current industry standards and best management practices. Other objectives include developing a comprehensive tree planting and replacement plan that uses available space to the greatest advantage and provides

consideration for species diversity, drought tolerance, and low-water use landscapes, as well as strategies for keeping inventory data current.

Goal 2 – Preserve and expand tree canopy on public and private property

Recognizing that the primary source of environmental benefits from the urban forest is tree canopy, this goal is focused on increasing tree canopy cover across Citrus Heights on both public and private property.

The objectives that support this goal include the adoption of and overall canopy goal of 35% in accordance with the Greenprint Initiative, optimizing the stocking level of the public tree resource, and identifying and implementing strategies (and incentives) for increasing trees on private property.

Goal 3 – Establish comprehensive, user-friendly regulations and policies

This goal ensures an appropriate regulatory framework in support of the community's vision for the urban forest.

Objectives include revisions to Title 106 of the Municipal Code to promote consistency and clarity, as well as accordance with current state regulations, industry standards, and best management practices. Other objectives for this goal include revisions to design and construction standards for tree planting sites to provide additional options for increasing soil volume for large shade trees.

Goal 4 – Optimize community planning to consider trees as an integral component of community infrastructure

This goal promotes recognition of the contribution and value of trees as a component of urban infrastructure and aims to ensure the appropriate incorporation of trees and landscapes into development and reconstruction projects as well as into the overarching plans and guiding documents that communicate the vision or our community.

Objectives for this goal include ensuring that trees are an important and integral component of development and redevelopment projects, updating existing planning documents to reference the UFMP and CHUGS policy documents, and City participation with regional urban forestry groups and objectives.

Goal 5 – Optimize funding and identify new opportunities

This goal aims to identify and secure necessary funding (short-term and long-term) for the establishment, preservation, and maintenance of the community urban forest and overall canopy cover.

Objectives include identifying and applying for available grant funding, increased collaboration with groups who share an interest in the urban forest, and optimizing support for public tree care from existing sources.

Goal 6 – Increase outreach, education, and resident engagement

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

Objectives include developing workshops, presentations, and other materials to communicate the value and benefits of trees and canopy, and maintaining a comprehensive and dynamic website for sharing valuable information about tree care, landscaping with drought tolerant and low water-use plants, and proper irrigation.

Professional Services

An urban forest is an integral part of the City of Citrus Heights' infrastructure. Trees contribute to increased quality of life for our community and residents. Urban trees also provide privacy, lower air temperature through shade, save energy by reducing cooling costs, reduce air pollution, and increase property values.

Trees may also negatively impact the City if tree roots cause damage to other infrastructure such as sidewalks and sewer systems or if falling limbs cause property damage or serious bodily injuries. The City of Citrus Heights places a high emphasis on protecting its citizens and their property from damage and therefore partners with experts in the field of arboriculture to reduce the risk of injury to the public and damage to property by implementing a systematic approach to maintain, inspect, preserve, and enhance the urban forest.

All experts have been chosen because of their specific knowledge and experience. All experts are well qualified to identify risk factors and implement corrective measures to mitigate and/or eliminate hazards. Because they are in the best position to manage risks arising from their services, the City requires that all experts shall assume liability for their services and agree to indemnify, defend and hold harmless the City for all claims, lawsuits, injuries, and damages, which result from the performance of their work. The City requires all experts to obtain insurance satisfactory to the City and to name the City as an additional insured on their policy.

How Do We Get There?

The following section provides the details for each of the UFMP guiding principles. Goals are aligned with the guiding principle they most closely support. A complete listing of objectives is detailed for each goal along with a comprehensive set of specific strategies that will guide urban forest managers and administrators towards achievement of the objective.

The UFMP identifies appropriate resources to adequately manage the community's urban forest and natural resources. In addition to short-term goals and actions, the Plan provides long-range goals that are intended to be accomplished as resources permit. 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 strategies are integrated into the annual work plan. A timeline illustrating the objectives and priorities is included in Appendix B.

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource

This goal is intended to improve the overall health and resiliency of the community urban forest, preserve existing benefits, and thereby provide the foundation for sustainability of the resource and maximization of benefits over time.

Objectives:	Priority:
1.1 Ensure that all public tree care adheres to current industry standards and best management practices (BMPs). The Tree Care Industry Association (TCIA) and the International Society of Arboriculture (ISA) team with government agencies, tree care companies, and green industry organizations to develop and maintain comprehensive standards approved by the American National Standards Institute (ANSI). The ANSI A300 Series applies to tree care operations and ANSI Z133 safety requirements apply to employers and employees engaged in arboricultural operations. The ISA Best Management Practices Series compliments these standards. The City of Citrus Heights applies these standards, which are based on current science, to ensure the highest level of tree care and thereby promoting health and longevity, reducing the risk of tree failure and minimizing liability. Strategies: A. All work must conform to the current industry standards and BMPs. The General Services Division shall maintain a copy of these standards on file. These standards include: ▪ American National Standards Institute (ANSI) A300 Series, for Tree Care Operations- Standard Practices for Tree Pruning ▪ ANSI Z133.1 Safety Requirements for Arboricultural Operations ▪ International Society of Arboriculture (ISA) Best Management Practices for Tree Pruning, Cabling, Fertilization, Tree Planting, Integrated Pest Management ▪ California Occupational Safety and Health Administration (OSHA)	High Ongoing

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource

Objectives:	Priority:
1.1 Ensure that all public tree care adheres to current industry standards and Best Management Practices (BMPs). ***Continued***	
B. Tree pruning in utility corridors shall adhere to ANSI A300 Integrated Vegetation Management – Part 7 ▪ Work with utility providers and contractors to develop a management policy and standards to tree in utility easements ▪ Optimize partnership between utility representatives and forestry staff	High Ongoing
C. Train in-house and contracted staff to understand the City's overall objectives for care of the urban forest.	
Cost:	$ Low
1.2 Ensure that tree care operations comply with federal and state wildlife protection requirements.	
Urban trees provide shelter and homes for many bird and wildlife species. Federal and state regulations protect endangered and migratory species and nearly all common wild birds in the U.S. Forestry operations should provide adequate consideration to the protection of these species and their habitat.	High Ongoing
Strategies: A. Require training of in-house and contracted staff. ▪ Awareness of federal and state wildlife protection requirements ▪ Inspection and identification of wildlife and active nest sites	
Cost:	$ Low
1.3 Ensure that all city-maintained trees are on a regular pruning cycle.	
A cyclical pruning program ensures that all community trees are inspected and pruned a minimum of every 7 years, promoting the preservation of tree health, longevity, structure, and risk management.	
Strategies: A. Maintain trees on primary arterials on a 3-year cycle B. Maintain all city-maintained trees on a minimum 7-year cycle C. Maintain young and newly planted trees on a training schedule to optimize structure and reduce future pruning needs. ▪ 2-4 year cycle dependent upon species and growth rates D. Utilize GIS data to develop optimal routing and cycles	High Ongoing
Cost:	$$$$ Very High

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource

Objectives:	Priority:
1.4 Develop a comprehensive tree planting and replacement plan for the community urban forest. Planting new trees where space is available and replacing those that are removed supports the sustainability of the community urban forest. Planning this process promotes a stable benefit stream and helps to ensure that the right tree is planted in the right place. Strategies: A. Classify and prioritize available planting sites based on: ▪ Space and minimum planting setbacks ▪ Soil characteristics ▪ Irrigation infrastructure ▪ Landscape objectives and tree density ▪ Site constraints and existing infrastructure, including hardscape, utilities (overhead and underground), bridges, and culverts B. Increase diversity in the street tree resource (not applicable to open space, natural areas, oak woodlands, and riparian areas). ▪ Follow prescribed standards for 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 ▪ Reduce reliance on over-used species ▪ Limit oak (Quercus) species in the street tree inventory C. Identify and maintain a broad palette of regionally compatible species. ▪ Include selection of native and drought tolerant species – See CHUGS Landscape Guidelines (2015) ▪ Includes species/varieties with varied pest/disease vulnerability (i.e., avoid planting species that are susceptible to know pests and disease) D. Place emphasis on Right Tree Right Place: ▪ Reducing hardscape and utility conflicts ▪ Matching tree species to soil and water conditions ▪ Matching tree species to planter size and intended use E. Place emphasis on drought tolerant low-water-use species and landscapes. F. Optimize shade and environmental benefits by planting large-stature species where feasible. G. Coordinate with SRPD to optimize tree planting in parks. H. Identify mature/over-mature trees that have reached the end of their useful lifespan and plan for their gradual replacement.	Medium 2016/17

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource

Objectives:	Priority:
1.4 Develop a comprehensive tree planting and replacement plan for the community urban forest. *Continued*	
I. At minimum, set planting and replacement rates to support sustainability in the overall resource along with environmental benefits. ▪ Ideal planting rates should grow canopy/benefits over time J. Coordinate with utility providers to ensure species compatibility in utility easements and ROW. ▪ Identify utility friendly species based on application K. Utilize GIS data for developing optimal planting strategies. ▪ Prioritize planting sites/areas to ensure coordination with planned improvements and construction ▪ Identify locations, neighborhoods, and other areas where tree planting will enhance the overall canopy cover and connectivity of forest stands ▪ Identify underserved (under-treed) neighborhoods, with lower than average tree canopy, where increasing canopy can provide greater benefits to the health, social, and economic environment of residents ▪ geostatistical analysis of species diversity ▪ Environmental sensitivity/stormwater risk (See UTC Assessment, 2015) ▪ Coordinate with stormwater managers and environmental planners ▪ Mitigating Heat Island (See UTC Assessment, 2015) ▪ Increasing tree canopy in under-treed neighborhoods L. Consider that larger planting projects may qualify as mitigation projects for meeting CEQA requirements.	Medium 2017/18
Cost:	$$ Medium
1.5 Develop and implement 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 and/or be integrated into the maintenance cycle. Regardless, the policy and actions that result should be well documented. Strategies: A. Inspect high-risk and mature trees to record changes and proactively address age and structural-related issues/mitigation needs.	High Ongoing

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource

Objectives:	Priority:
1.5 Develop and implement a tree inspection policy. *Continued*	
B. Inspect and document tree inspection in conjunction with regularly scheduled maintenance (i.e., pruning cycles). ▪ Identify potential risk factors ▪ Schedule follow-up inspections where necessary ▪ Identify signs or symptoms of disease, pests, and abiotic disorders, including environmental stress (e.g., water management, soil conditions, and nutrient availability) ▪ Identify and prioritize plant health care and structural mitigation needs	High Ongoing
C. Train maintenance staff to recognize hazardous and unsafe conditions in trees.	
Cost:	$$ Medium
1.6 Develop a Risk Management Plan and policy for urban forestry operations.	
This objective is intended to manage the public safety component of community forestry. Managing the risk of trees (i.e., inspection, identification of risk factors, and mitigation) can significantly reduce the likelihood and liability of entire tree or branch failure. Strategies: A. Work with Risk Management Department to identify objectives and action thresholds for tree risk management. ▪ Include criteria for removal versus other methods of risk mitigation, including cabling, bracing, and limiting exposure and relocating target(s). ▪ Require indemnity clause and adequate insurance for all professional services contracts. B. Coordinate risk management objectives with a tree inspection program. C. Identify risk assessment priorities, protocols, policy, and final authority for removals.	High 2016/17
Cost:	$ Low
1.7 Develop a policy and responsibility for keeping inventory data current.	
As with other public assets, maintaining up-to-date information is crucial to work planning, budget development, and risk management. Managing data with asset management software provides managers and staff with the tools and information they need to make timely and informed decisions. Strategies: A. Develop and integrate a program to allow for access of inventory data by staff in the field. B. Explore applications for smartphones/tablets to allow for updates to occur simultaneously as maintenance and/or inspections are completed.	High 2016/17

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource

Objectives:	Priority:
1.7 Develop a policy and responsibility for keeping inventory data current. ***Continued***	
C. Update tree inventory data in conjunction with maintenance operations (e.g., cyclical trimming/pruning operations and inspections): ▪ Confirm species ▪ Update DBH ▪ Update condition rating ▪ Update special maintenance needs and/or request for follow –up (inspection, IPM, etc.)	High 2016/17
Cost:	$ Low

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 2 – Preserve and expand tree canopy on public and private property

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, air and water quality, and socioeconomics. Citrus Heights' tree canopy provides these critical 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. This goal is intended to increase canopy cover across Citrus Heights on both public and private property.

Objectives:	Priority:
2.1 Adopt an overall canopy goal of 35%. The Urban Tree Canopy Assessment (2015) mapped the location and extent of tree cover across Citrus Heights, establishing a baseline value of 25% overall average canopy across the community. In 2006, the City endorsed the regional Greenprint Initiative. This initiative, introduced by the Sacramento Tree Foundation in 2000, is intended to complement the regional smart growth plan, Blueprint. Greenprint, which has been adopted by 22 cities and six counties, outlines a plan to enhance the quality of life in the region by growing 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 Strategies: A. Adopt an overall canopy goal of 35%, consistent with the regional Greenprint goal for tree cover. B. Identify and implement more specific goals based on land use: ▪ Residential ▪ Commercial ▪ Parks/Open Space C. Engage the community in progress towards canopy goals. Cost:	High 2016 $$ Medium
2.2 Optimize stocking level for the community urban forest. This objective maximizes the canopy potential and benefits of the community tree resource by ensuring that trees are planted in all available public planting sites and that as failing trees are removed, they are replaced in a timely manner. Strategies: A. Ensure that planting plans use all-available public planting sites ▪ Coordinate with SRPD to identify available sites and increase stocking level in the park tree resource ▪ Replace trees consistent with the City's tree mitigation requirements ▪ Identify optimal species for vacant sites and include new tree planting in annual work plans Cost:	Medium Ongoing $$ Medium

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 2 – Preserve and expand tree canopy on public and private property

Objectives:	Priority:
2.3 Identify and implement strategies to increase tree planting on private property. To reach an overall canopy cover of 35%, Citrus Heights needs an additional 900 acres of tree cover. While some additional trees can be planted on city streets and parks, the majority of new canopy will need to come from private trees. Outreach, public engagement, and collaboration will be crucial to achieving canopy goals. Strategies: A. Explore incentives for planting trees on private property. ▪ Free or low-cost trees ▪ Water rebates B. Coordinate with San Juan School District to identify planting opportunities on school properties. C. Utilize GIS data to identify areas and populations where outreach and incentives for tree planting will be most successful: ▪ Demographics, consumer expenditure, lifestyle, etc. D. Utilize GIS data to develop visual aids (maps) to promote/communicate urban forest activities and benefits.	Medium Ongoing
Cost:	$-$$$ Low-High
2.4 Improve species selection and tree care on private property. Planting the right tree in the right spot goes a long way to ensuring that trees produce the greatest benefits (shade, environmental, aesthetic), reach maturity, and are long-lived. Native and adapted trees are often less susceptible to pests and disease and more resilient during periods of drought and climate fluctuations. Helping residents select the best tree species promotes greater canopy cover and increased environmental benefits. Strategies: A. Provide information on species and their needs via the City's website B. Work with local retailers and nurseries to improve availability and knowledge of native and drought tolerant species	Medium Ongoing
Cost:	$ Low

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Develop a more sustainable urban forest by improving conditions for urban trees and optimizing the environmental, economical, and social benefits trees provide to the community

Goal 2 – Preserve and expand tree canopy on public and private property

Objectives:	Priority:
2.5 Collaborate with nonprofits and volunteer groups to facilitate neighborhood tree planting in under-treed areas. The GIS tree canopy layer can be used to identify neighborhoods and other locations with less trees. Working with neighborhood groups, nonprofits, and volunteers can increase awareness and participation in community tree planting efforts to expand canopy in under-treed locations. Strategies: A. Collaborate and partner with nonprofit and neighborhood groups for tree replacement and improvements to streetscapes. B. Utilize GIS data to optimize strategies for outreach and engagement: ▪ Environmental sensitivity/stormwater risk (See UTC Assessment, 2015) ▪ Mitigating Heat Island (See UTC Assessment, 2015) ▪ Increasing tree canopy in under-treed neighborhoods	Medium Ongoing
Cost:	$-$$ Low/Medium
2.6 Conduct a tree canopy assessment every 10 years. With a baseline tree canopy assessment (2015), Citrus Height can monitor and illustrate changes to the extent and location of tree canopy over time. Using GIS analysis, the City can measure changes in overall land cover as well as by neighborhood and zoning. This information can be used to inform canopy goals and monitor attainment. Strategies: A. Option 1— i-Tree Canopy or other point sampling methodology for estimating change ▪ Low cost ▪ Reliably accurate assessment of overall gain/loss of canopy cover and other land cover classifications ▪ Can be used to measure change at neighborhood or land use levels dependent upon number of sample points and acceptable rate of error B. Option 2— Remote sensing/GIS mapping of extent and location of canopy ▪ Greater detail ▪ Updates GIS map with exact location and extent of canopy ▪ Can be used to examine gain/loss at any level	Low 2025
Cost:	$-$$$ Low-High

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Incorporate urban greening principles into the City's regulations and daily activities

Goal 3 – Establish comprehensive, user-friendly regulations and policies

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

Objectives:	Priority:
3.1 Explore the addition of a city arborist or urban forester position (part-time or full-time) to city staff. Arborists and urban foresters with municipal credentials are trained and knowledgeable about the biology of trees and the specific needs of trees that grow in urban locations. They are uniquely qualified to ensure that tree care operations are performed properly and in accordance with industry standards, thereby promoting tree health and longevity, reducing the risk of tree failure, and minimizing liability. Strategies: A. Reporting to the Facilities and Landscape Manager. B. Responsibilities to include: ▪ Manage the urban forest and oversee operations ▪ Implementation of the UFMP ▪ Development of annual work plan and budget ▪ Leadership for outreach and education ▪ Provide in-house staff training in basic arboriculture ▪ Provide tree inspections/risk assessment ▪ Provide point of contact for residents, volunteers, and nonprofit organizations ▪ Provide technical support for in-house staff (e.g., planners, engineers, community development) ▪ Administration and monitoring of urban forestry contracts ▪ Development and delivery of outreach material, seminars, workshops, and website content ▪ Develop and deliver State of the Urban Forest Report ▪ Apply for and maintain Tree City USA status	Medium 2016-2021
Cost:	$$$ High
3.2 Revise Municipal Code - Title 106 - Zoning Code. In addition to the development of the UFMP, the Citrus Heights Urban Greening Strategy (CHUGS) included a complete review of Municipal Codes affecting landscaping, tree preservation, and landscape water use. The recommendations from this review reflect current industry standards and state regulations. Strategies: A. Revise Municipal Code – Title 106 – Zoning Code consistent with CHUGS recommendations.	High 2015/2016
Cost:	$ Low

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Incorporate urban greening principles into the City's regulations and daily activities

Goal 3 – Establish comprehensive, user-friendly regulations and policies

Objectives:	Priority:
3.3 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 ensure that a tree will perform its intended role and function in the landscape in balance with other infrastructure. Finding adequate planter space for medium and large-stature trees can be a challenge in urban areas where space for large trees is often limited by hardscape. Developers and City planners should consider using planter designs that increase soil volume below grade when surface area is restricted by impervious surface. See Appendix A. Soil Volume & Tree Stature and Alternative Planter Designs. Strategies: A. Provide options for increasing uncompacted soil volume below grade and hardscape (See Appendix A). ▪ Suspended sidewalks ▪ Pervious surfaces ▪ Structural soils ▪ Flexible (e.g., rubber) sidewalks and pavements B. Ensure all landscape designs and planting plans incorporate and consider existing infrastructure above, at, and below grade (e.g., utilities, hardscape, lighting, solar, etc.)	Medium 2016/17
Cost:	$$ Medium
3.4 Provide basic arboriculture training to landscape maintenance personnel. Provide basic arboriculture training for maintenance staff involved in tree care, including mall branch removal, young tree training, and risk identification. Strategies: A. Training and structural pruning of young trees B. Tree staking and maintenance of support system C. Basics of tree inspection and recognizing hazardous conditions.	High Ongoing
Cost:	$-$$ Low/Medium

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Incorporate urban greening principles into the City's regulations and daily activities

Goal 3 – Establish comprehensive, user-friendly regulations and policies

Objectives:	Priority:
3.5 Review goals and objectives for the UFMP and incorporate into annual work plans. 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 UFMP should be reviewed annually for progress and integration of objectives into the annual work plan. Strategies: A. Review UFMP annually and adjust targets as necessary. B. Integrate current objectives and strategies into the annual work plan. C. Review objectives and strategies for attainment status and update the Timeline for Objectives and Strategies (Appendix B).	High Annual
Cost:	$-$$$$ Low – Very High

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Incorporate urban greening principles into the City's regulations and daily activities

Goal 4 – Optimize community planning to consider trees as an integral component of community infrastructure

This goal is intended to promote recognition of the contribution and value of trees as a component of urban infrastructure and to ensure the appropriate incorporation of trees and landscapes in development and reconstruction projects as well as into the overarching plans and guiding documents that communicate the vision or our community.

Objectives:	Priority:
4.1 Ensure that trees are an important and integral component in new development and redevelopment projects. 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. Strategies: A. Incorporate trees into City planned projects. ▪ Include consideration for the multiple and beneficial functions of trees (e.g. for stormwater management, shade, aesthetic, walkability, etc.). B. Incorporate trees into traffic/mobility planning: ▪ Traffic circles ▪ Traffic calming (e.g., landscaped speed control islands) C. Develop clear and consistent guidelines to identify and preserve significant trees ▪ Identify parcels with high canopy cover that may be at risk of development and develop specific preservation and mitigation strategies to prevent significant loss of mature tree canopy. D. Ensure that tree planting sites are adequately constructed to support the mature growth of trees. E. Ensure that new and redeveloped landscapes adhere to the Water Efficient Landscape Ordinance.	High Ongoing
Cost:	$-$$$$ Low - Very High
4.2 Update existing planning documents to reference the UFMP and CHUGS policy documents. The UFMP is an important planning document for the City of Citrus Heights. It is complementary and supportive of both the GHGP and the General Plan. As revisions occur to community and specific plans and Special Planning Areas, those plans should be amended to recognize and remain consistent with the UFMP. Strategies: A. As revisions occur, coordinate strategic planning documents with Urban Forest Master Plan (2015) and Water Efficient Landscape Ordinance (2015). B. Ensure that new and revised specific plans and Special Planning Areas reference the UFMP and Water Efficient Landscape Ordinance and Guidelines	High Ongoing

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Incorporate urban greening principles into the City's regulations and daily activities

Goal 4 – Optimize community planning to consider trees as an integral component of community infrastructure

Objectives:	Priority:
4.2 Update existing planning documents to reference the UFMP and CHUGS policy documents. *Continued* C. As revisions occur, update the General Plan to recognize the role of trees and canopy as strategies that support and compliment the various components of the General Plan: ▪ Air Quality and Climate Change o Removal and reduction of air pollutants o Carbon sequestration o Mediation of urban heat island	High Ongoing
Cost:	$ Low
4.3 Participate in regional planning for the urban forest. The Sacramento Region has a rich history in urban forestry. Collaboration with neighboring foresters, regional boards, the Sacramento Tree Foundation and the Greenprint Initiative provides opportunities for partnership and cooperation, and a broader scope for managing and promoting benefits from the urban forest. Strategies: A. Continue to endorse and support the Greenprint Initiative. ▪ Participate in Greenprint Summit B. 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 ▪ Support AB32 California Global Warming Solutions Act C. Participate and collaborate with California Urban Forests Council and regional boards. ▪ Collaborate with regional foresters and forestry groups to develop/update fees and mechanisms for tree preservation and mitigation	Medium Ongoing
Cost:	$ Low

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Incorporate urban greening principles into the City's regulations and daily activities

Goal 4 – Optimize community planning to consider trees as an integral component of community infrastructure

Objectives:	Priority:
4.4 Apply for and maintain Tree City USA status. The National Arbor Day's Tree City USA program recognizes communities for excellence in urban forestry. Benefits include increased public awareness and engagement. Strategies: A. Identify a Tree Board or Department. B. Maintain the Tree Ordinance. C. Calculate the annual Community Forestry Program Budget. (The requirement is at least 2$ per capita. Citrus Heights' current rate is $2.11.). D. Celebrate Arbor Day and issue a Proclamation.	Medium 2016/17
Cost:	$ Low

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Incorporate urban greening principles into the City's regulations and daily activities

Goal 5 – 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 and canopy in Citrus Heights.

Objectives:	Priority:
5.1 Identify and apply for available grant funding. Grant funding for urban forestry operations is often available at national, state, and regional levels. Funding from grants can provide opportunities and support for critical components and urban forest projects of various size. Matching grants can help to maximize the value of existing resources. Strategies: 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 grants that support community needs, urban forest programming and/or the implementation of objectives and strategies identified by the UFMP.	High Ongoing
Cost:	$-$$$ Low - High
5.2 Increase and optimize partnerships and collaborations with individuals, groups, and agencies who share urban forest goals. Collaboration with organizations and individuals who share a concern for a healthy urban forest can maximize the benefits from available funding sources through partnerships and alliances that capitalize on shared goals and vision. Strategies: A. Nurture existing relationships with individuals, HOAs non-profits, business groups regional groups, government agencies, and others who share a vision and goal for a robust urban forest. B. Identify individuals and groups with shared vision and goals aligned with a healthy and well-maintained urban forest. C. Collaborate on projects with outcomes that meet shared goals and objectives for the urban forest and the UFMP.	High Ongoing
Cost:	$-$$ Low-Medium
5.3 Optimize support for urban forestry operations from existing sources. Citrus Heights' public trees provide substantial benefits to the community, contributing to the beauty, health, quality of life, and livability of our City. Engaging and educating community leaders about the value, benefits, and return on investment for managing the urban forest is crucial for securing adequate funding and resources necessary for the maintenance and preservation of community trees.	High Ongoing

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Incorporate urban greening principles into the City's regulations and daily activities

Goal 5 – Optimize funding and identify new opportunities

Objectives:	Priority:
5.3 Optimize support for urban forestry operations from existing sources. ***Continued***	

Strategies:

A. Optimize funding from existing sources:
   - Stormwater Management Fund
   - Gas tax
   - Tree Mitigation Fund

B. Demonstrate and report the need and justification for funding the care and maintenance of public trees, including:
   - Annual work plan
   - Risk mitigation plan
   - UFMP objectives

C. Optimize funding for tree planting and planting site construction in CIP projects
   - CIP funded projects 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).

D. Optimize revenue to the Tree Mitigation Fund and dedicate funding specifically for urban forestry operations.
   - Tree Mitigation funds shall be dedicated specifically for urban forestry related operations and projects and shall be prioritized as follows:
     1. New and replacement tree planting on public property, including parks and oak mitigation projects
     2. Development of educational/outreach materials that support urban forestry, canopy expansion, and private tree planting/care
     3. Subsidize tree planting on private property (e.g., purchase trees for homeowners, rebates for tree planting)
     4. Urban forestry staffing and maintenance of community tree resource
   - Work with regional forestry groups to develop appropriate fees and mechanisms for tree replacement.
   - Identify options for additional sources of revenue:
     - Appraisal fees for vehicular accidents
     - Fines for damaging public trees
     - Other

E. Explore landscape assessment districts
   - New development
   - Overall Landscape District

High
Ongoing

Cost: $-$$$$ Low – Very High

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Expand outreach, education, and engagement

Goal 6 – Increase outreach, education, and resident engagement

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:	Priority:
6.1 Maintain a comprehensive and dynamic website for CHUGS. The urban forestry webpage is the first place residents and others look to for information about community trees, Tree Preservation requirements, and tree care information. It should be engaging, user-friendly, and a comprehensive resource for everything about trees in Citrus Heights. Strategies: A. Optimize the visibility and applicability of the CHUGS website. ▪ Develop and market branding for CHUGS B. Highlights and links to the City's tree protection regulations, requirements, policies, and necessary forms. C. Provide information and images that illustrate important information about the state of the urban forest, canopy cover, community trees, including: ▪ Urban Forest Master Plan ▪ Urban Tree Canopy Assessment ▪ Urban Forest Resource Analysis D. Provide active links to important educational topics and engaging articles for residents and property owners ▪ Landscape Guidelines "A guide to selecting and using native and drought tolerant plant species" ▪ Electric and natural gas utility websites that explain safety and Right Tree, Right Place concepts o Utility-friendly species for planting near overhead conductors ▪ How to o Plant a tree o Prune a tree o Fertilize and mulch o Irrigate o Hire an arborist or tree care company o Know when a tree removal is really necessary o Safety E. A homeowner's list of recommended tree species for Citrus Heights. F. Information and links to open space and natural resource topics. ▪ Oak mitigation ▪ Non-native and invasive species ▪ Water quality and protection ▪ Wildlife and habitat ▪ Watershed and riparian resources	High Ongoing

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Expand outreach, education, and engagement

Goal 6 – Increase outreach, education, and resident engagement

Objectives:	Priority:
6.1 Maintain a comprehensive and dynamic website for CHUGS. *Continued*	
G. Information about volunteer and donation opportunities. H. Information about incentives for planting and maintaining trees on private property. ▪ Links to information about carbon sequestration and credits for larger parcels. ▪ Convert turf to water-wise landscapes. I. Links to nonprofits and regional, state, and national tree interests. ▪ Sacramento Tree Foundation ▪ Greenprint o 5 Million Trees campaign o Greenprint Certified neighborhoods program ▪ Arbor Day Foundation ▪ California Urban Forests Council	High Ongoing
Cost:	$-$$ Low - Medium
6.2 Develop and present workshops and seminars that increase awareness and knowledge about trees and the urban forest. Develop dynamic presentations that highlight the value and benefits of trees and tree canopy. Develop hands-on workshops for the community that teach the basics of tree care and the best methods for caring for trees. Make the presentations and workshops available to the community, schools, and neighborhood groups and for increasing awareness at community and council meetings. Strategies: A. Develop a series of hands-on workshops that teach the basics of tree care (planting, pruning, mulching, fertilizing, watering, etc.). B. Develop a presentation that explains the benefits of the urban forest and tree canopy to the community (environmental, social, and economic). C. Develop a workshop that teaches the basics of irrigation practices and water conservation. ▪ Design and application of water efficient landscapes and irrigation systems D. Collaborate with schools to deliver workshops that encourage engagement and connection with trees and nature ▪ Tree planting	Medium 2015-2020
Cost:	$-$$ Low-Medium
6.3 Develop outreach materials that communicate key information about trees and the urban forest. Develop outreach materials (pamphlets, articles, etc.) that communicate specific topics about trees, canopy, the urban forest, and environmental benefits.	Medium Ongoing

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

Expand outreach, education, and engagement

Goal 6 – Increase outreach, education, and resident engagement

Objectives:	Priority:
6.3 Develop outreach materials that communicate key information about trees and the urban forest. *Continued*	
Strategies: A. Place an emphasis on electronic and downloadable materials B. Communicate basics of tree care, including planting, and pruning. C. Communicate water-wise information: ▪ Proper watering on private and commercial property. ▪ Proper watering for trees and plants and watering trees during drought ▪ Species selection & Landscape Guidelines D. Communicate benefits of trees and tree canopy, including environmental, social, and economic. E. Communicate information about the community urban forest, including composition, health, and species diversity. F. Partner with utilities, other city departments, nonprofits, and other groups to incorporate shared information and outreach goals when possible. Possible examples include: ▪ Right Tree Right Place – Power line friendly tree species ▪ Greenprint Certified Neighborhoods ▪ Safety considerations for trees near energized lines and underground utilities. G. Educate commercial property owners about the potential benefits of trees and vegetation to their business: ▪ Greater willingness to travel to green business/commercial districts ▪ Higher spending in aesthetically pleasing districts H. Increase use of media for outreach (e.g. Facebook, twitter)	Medium Ongoing
Cost:	$-$$ Low - Medium
6.4 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. Providing a State of the Community Forest Report every 5 years is the perfect way to communicate progress and accomplishments toward UFMP objectives. It is also an opportunity to communicate any challenges or issues that may be holding up the Plan. Strategies: A. Update residents 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 goals.	Low 2020
Cost:	$ Low

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

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 43% of the public tree population is comprised of young trees (≤6" DBH), many of them medium and large-stature species, Citrus Heights 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 strategies for measuring the success of these strategies over time.

Annual Review

The UFMP is an active tool that will guide management and planning decisions over the next 25 years. The goals, objections, and strategies should 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 inventory data, Citrus Heights can quickly and easily complete an updated resource analysis. Comparison of the updated composition, benefits, value, and benefit vs. investment can be measured against the benchmarks set by the 2015 analysis to demonstrate progress and improvements to health (condition), species diversity, benefits, and overall resource value. A resource analysis should be completed approximately every five years.

Canopy Analysis

With a baseline tree canopy and land cover analysis (Urban Tree Canopy Assessment, 2015) changes to the extent and location of tree canopy can be monitored over time. With updated analysis, the City can measure change and progress towards canopy goals in overall land cover as well as by neighborhood and zoning. The UFMP includes an objective to update the canopy assessment every 10 years and provides two options for calculating progress towards canopy goals:

Option 1— i-Tree Canopy

For a quick and inexpensive measure of overall canopy and land cover change, DRG recommends using i-Tree Canopy. This methodology uses random point sampling to provide an overall estimate of the percentage of tree canopy across Citrus Heights and by neighborhood or zoning. It can also be used to examine the relationship between tree canopy and other land cover classifications. **However, unlike remote sensing, this methodology does not produce a GIS map of the actual location or extent of tree canopy.**

Option 2— Remote Sensing/GIS mapping

With advanced GIS and remote sensing software, a top-down canopy assessment approach is recommended as the best method to quantify the extent and location of tree canopy. With complete land cover analysis and an updated GIS canopy layer, the City can more easily and precisely assess progress by seeing where canopy has been gained and/or lost through analysis at any level of detail (e.g., neighborhood, parcel, land use).

State of the Urban Forest Report

The UFMP calls for the City 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 goals 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 strategies 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 strategies of the Plan. Community satisfaction can also be gauged by the level of engagement and support for urban forest programs.

Citrus Heights Urban Forest Benchmark Values

Community Trees (Public Tree Resource)	
City Trees	22,428
Park Trees	5,566
Replacement Value	$101 million
Species Diversity	
Total Number of Unique Species	177
Prevalence of Top Ten Species	65%
Species Exceeding Recommended 10%	2
Benefits from Community Trees	
Total Annual Benefit	$2 million
Annual per Tree Benefit	$70
Urban Tree Canopy Cover	
Overall Tree Canopy	25%
City Trees	236 acres
Park Trees	94 acres
Private Trees	1,948 acres
Carbon Storage (overall)	$5.5 million
Annual Air Quality Benefits (overall)	$654,750

Appendices

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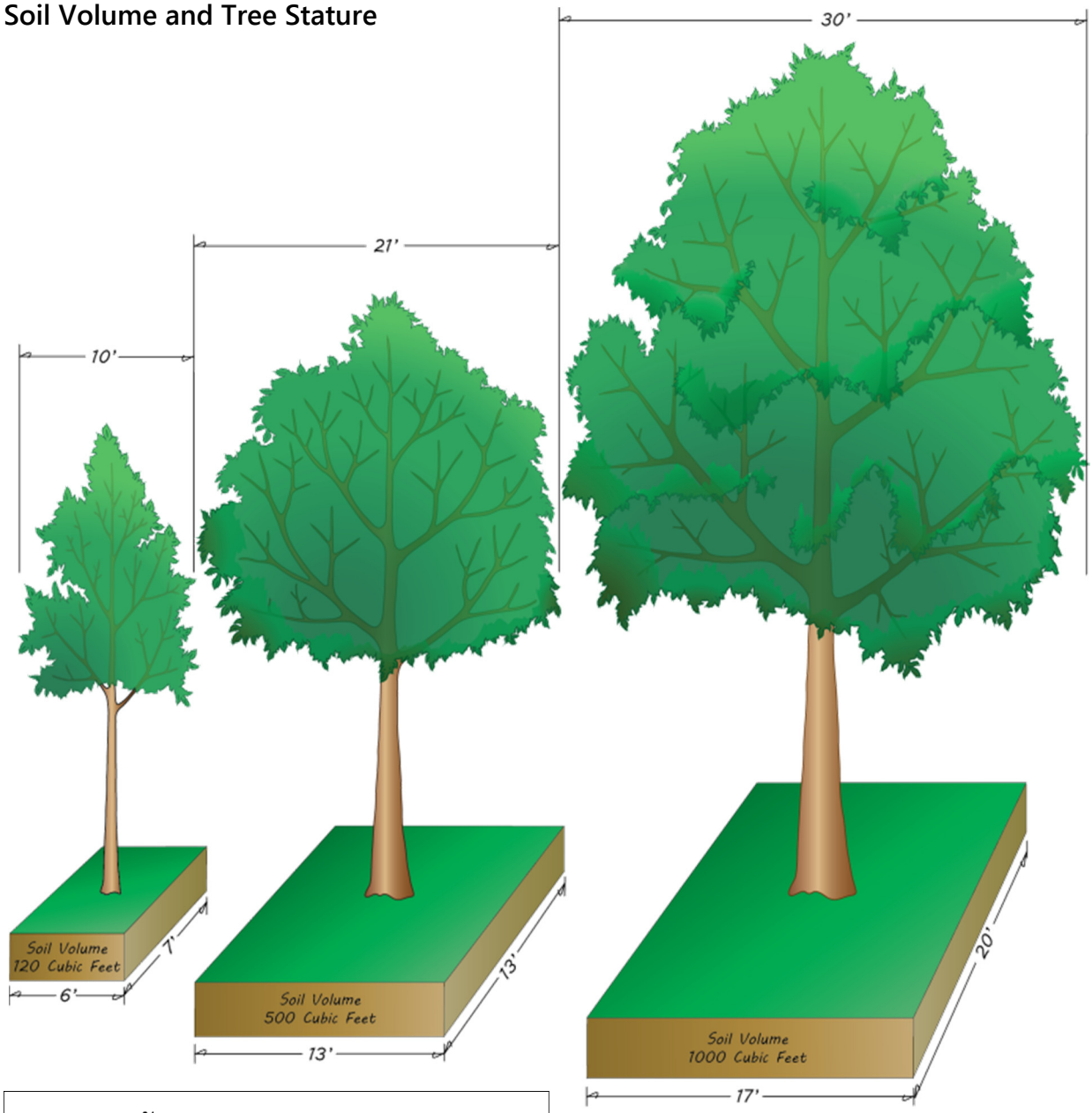
Soil Volume and Tree Stature



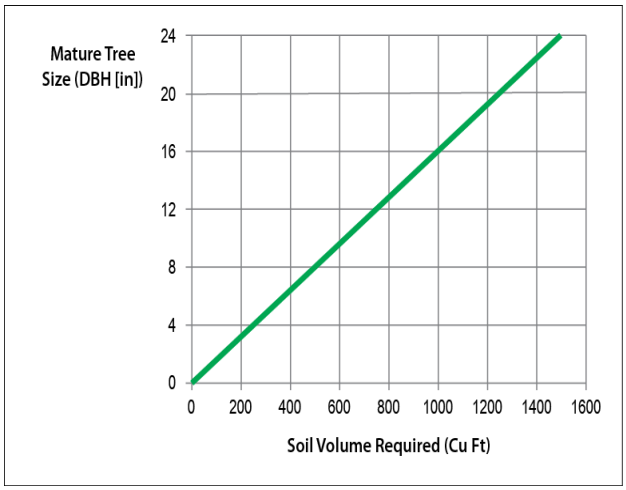


Figure 12. Tree growth is limited by soil volume. Larger stature trees require larger volumes of uncompacted soil to reach mature size and canopy spread (Casey Trees, 2008).

Alternative Planter Designs

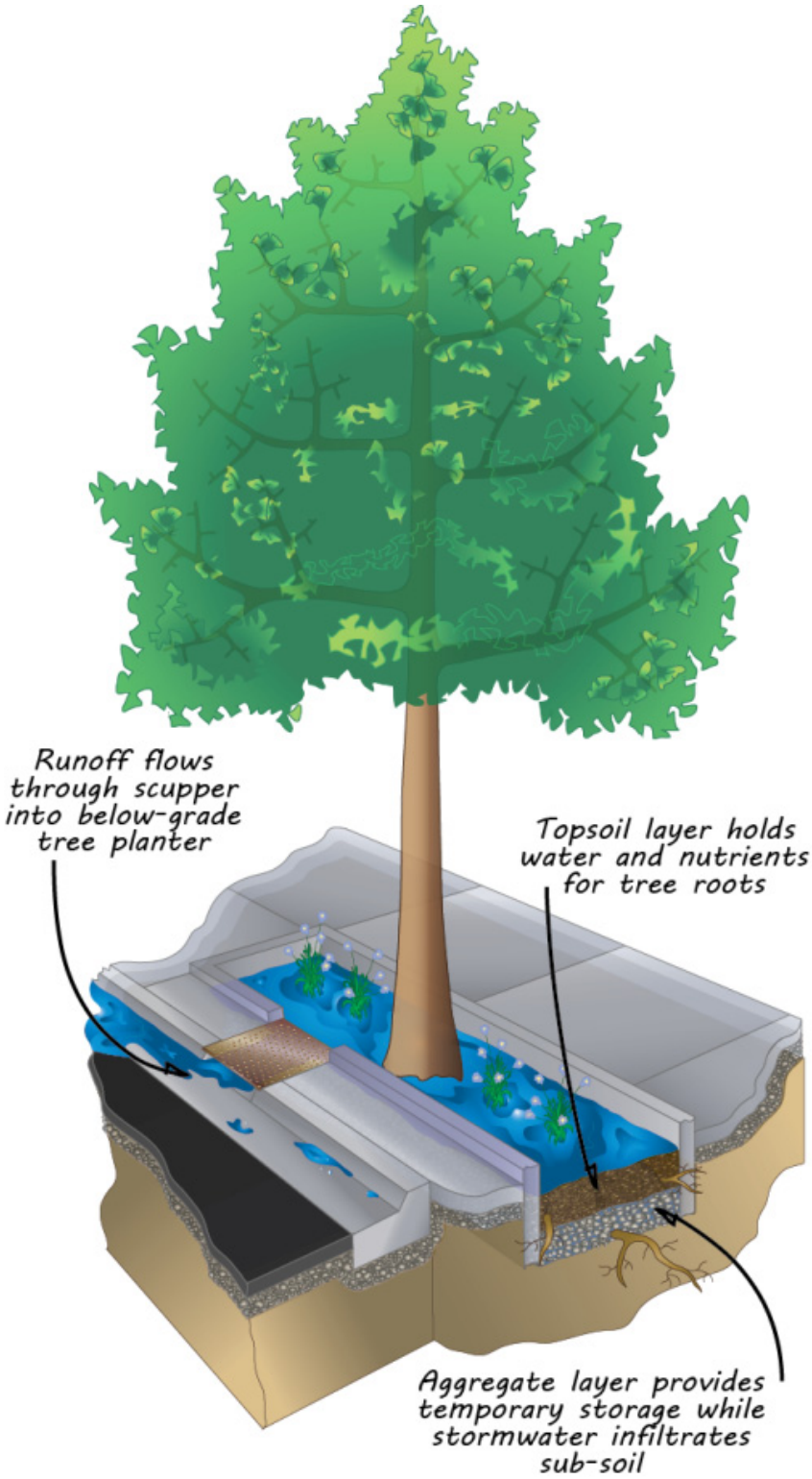


Figure 13. Stormwater tree pits are designed to collect runoff from streets, parking lots, and other impervious areas. Stormwater is directed into scuppers that flow into below-grade planters that then allow stormwater to infiltrate soils to supplement irrigation.

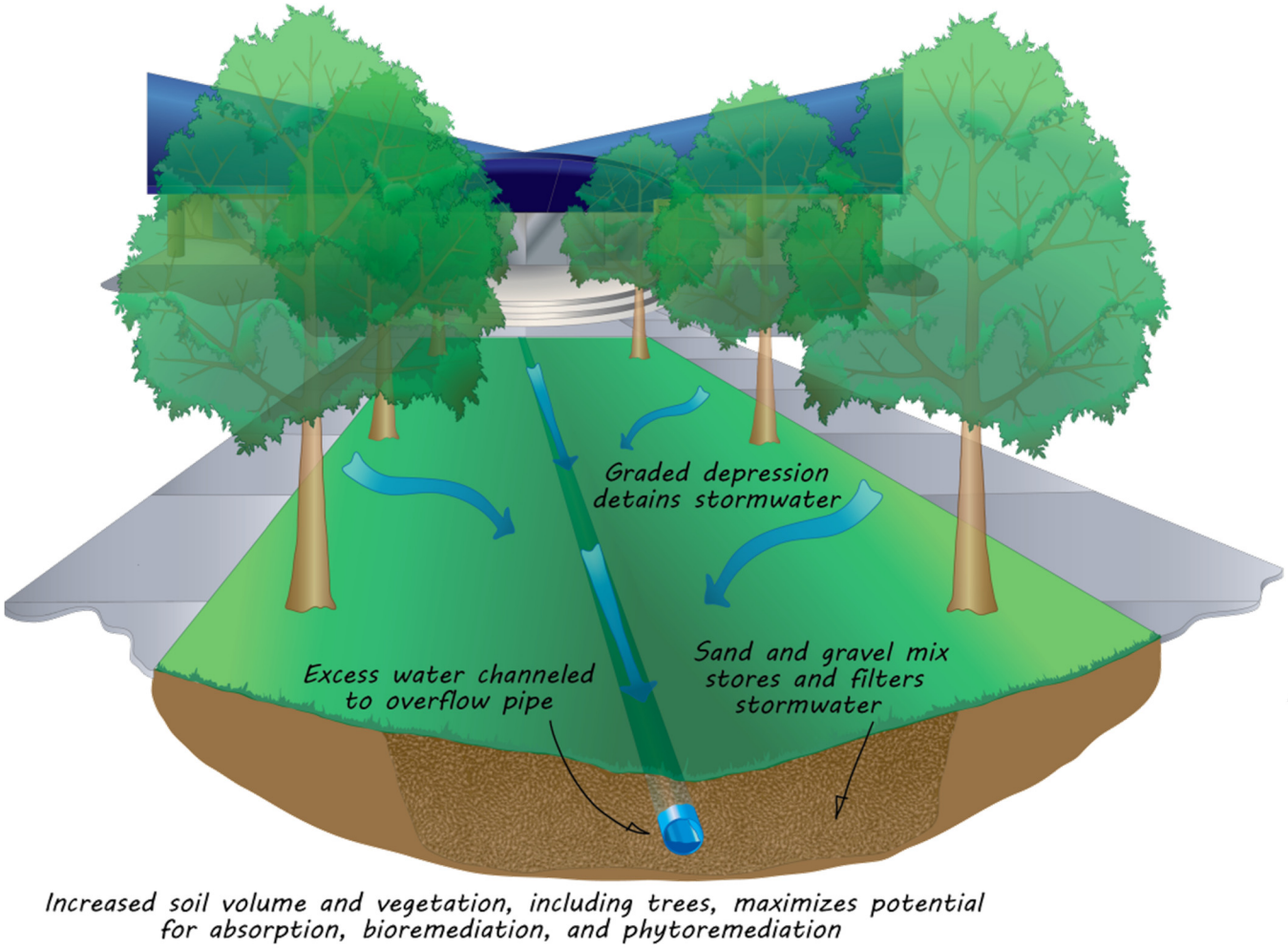


Figure 14. Bioswales are landscaped drainage areas with gently sloped sides designed to provide temporary storage while runoff infiltrates the soil. They reduce off-site runoff and trap pollutants and silt.

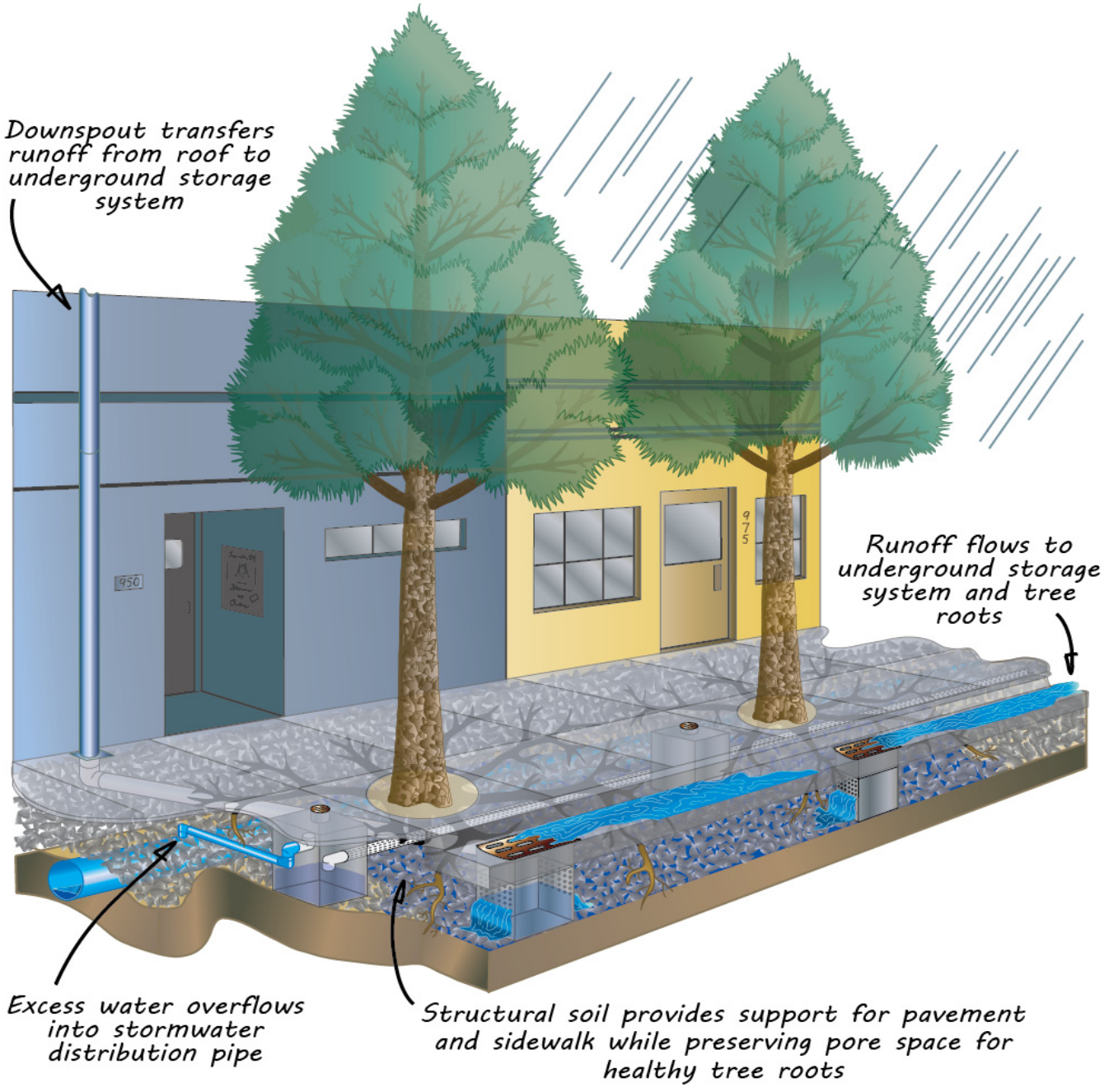


Figure 15. Structural soil is a highly porous, engineered aggregate mix, designed for use under asphalt and concrete as a load-bearing and leveling layer. Pore spaces allow for water infiltration and storage and also root growth.

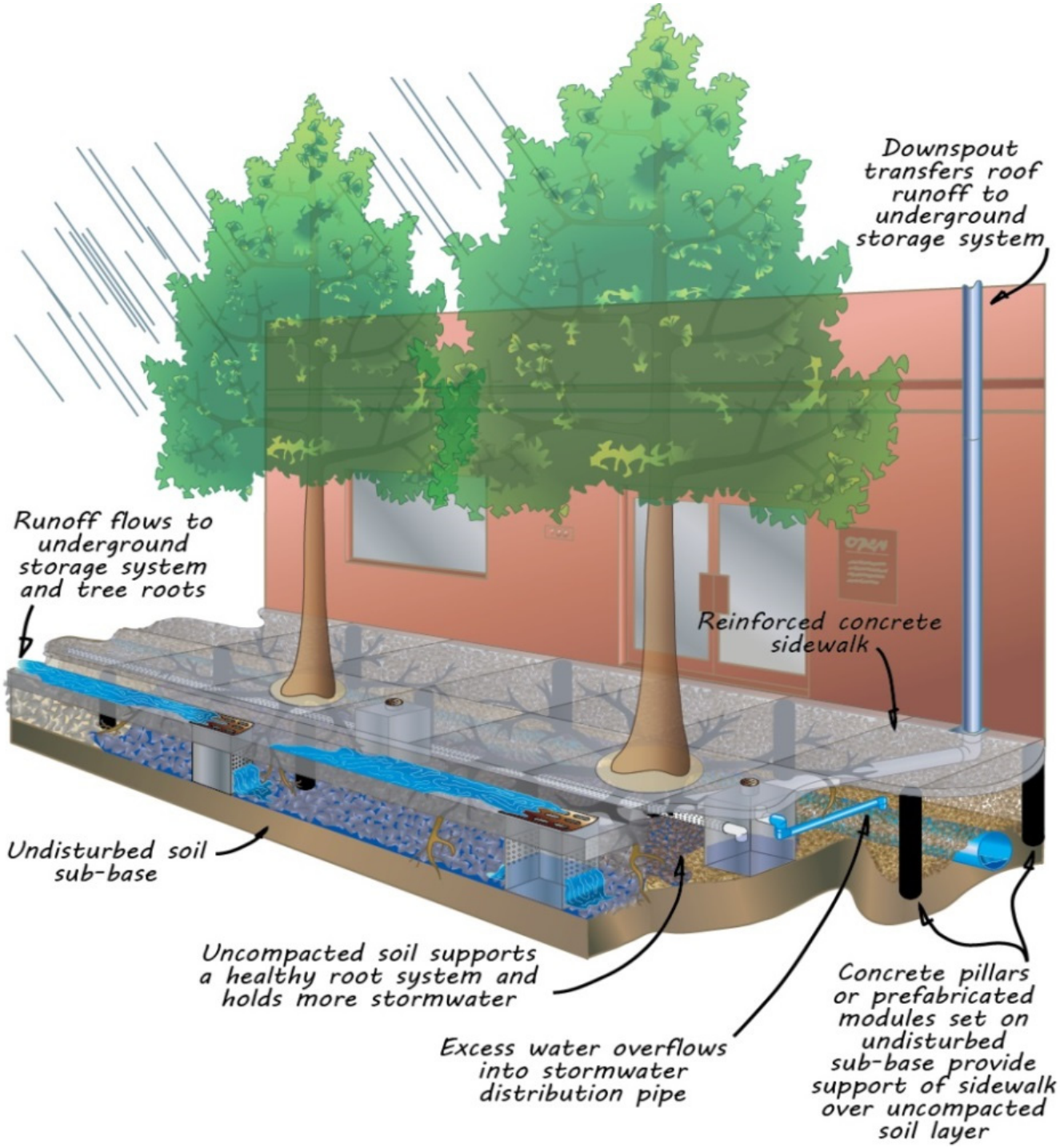


Figure 16. Suspended sidewalks use pillars or structured cell systems to support reinforced concrete, increasing the volume of uncompacted soil in subsurface planting areas and enhancing both root growth and stormwater storage.

B. Timeline for Objectives and Strategies

City of Citrus Heights Urban Forest Master Plan – Timeline for Objectives and Strategies

Objectives and strategies of the UFMP*	Estimated Cost	Target for Completion: 2016	2017	2018	2019	2020	2025	2030	2035	2040	2045	2050	Date of Completion	Priority
Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource														
1.1 Ensure that all public tree care adheres to current industry standards and best management practices.	$												Ongoing	High
A. All work must conform to the current industry standards and BMPs. The General Services Division shall maintain a copy of these standards on file														
B. Tree pruning in utility corridors shall adhere to ANSI A300 Integrated Vegetation Management – Part 7														
▪ Work with utility providers and contractors to develop a management policy and standards to tree in utility easements														
▪ Optimize partnership between utility representatives and forestry staff														
C. Train in-house and contracted staff to understand the City's overall objectives for care of the urban forest.														
1.2 Ensure that tree care operations comply with federal and state wildlife protection requirement.	$												Ongoing	High
A. Require training of in-house and contracted staff														
1.3 Ensure that all city-maintained trees are on a regular pruning cycle.	$$$$												Ongoing	High
A. Maintain trees on primary arterials on a 3-year cycle														
B. Maintain all city-maintained trees on a minimum 7-year cycle														
C. Maintain young and newly planted trees on a training schedule to optimize structure and reduce future pruning needs														
D. Utilize GIS data to develop optimal routing and cycles														
1.4 Develop a comprehensive tree planting and replacement plan for the community urban forest.	$$												2017/18	Medium
A. Classify and prioritize available planting sites														
G. Coordinate with SRPD to optimize tree planting in parks														
H. Identify mature/over-mature trees that have reached the end of their useful lifespan and plan for their gradual replacement														
J. Coordinate with utility providers to ensure species compatibility in utility easements and ROW														
K. Utilize GIS data for developing optimal planting strategies														

$ Low ($0-$5,000) $$ Medium ($5,000-$20,000) $$$ High ($20,000-$100,000) $$$$ Very High (>$100,000)

* Only strategies that result in a deliverable are listed – refer to the UFMP "How Do We Get There" for additional information.

City of Citrus Heights Urban Forest Master Plan – Timeline for Objectives and Strategies

Objectives and strategies of the UFMP*	Estimated Cost	Target for Completion: 2016	2017	2018	2019	2020	2025	2030	2035	2040	2045	2050	Date of Completion	Priority
Goal 1 – Develop and maintain a sustainable, healthy, and safe community tree resource														
1.5 Develop and implement a tree inspection policy.	$$												Ongoing	High
A. Inspect high-risk and mature trees to record changes and proactively address age and structural-related issues/mitigation needs														
B. Inspect and document tree inspection in conjunction with regularly scheduled maintenance (i.e., pruning cycles)														
C. Train maintenance staff to recognize hazardous and unsafe conditions in trees														
1.6 Develop a Risk Management Plan and policy for urban forestry operations.	$												2016/17	High
A. Work with Risk Management Department to identify objectives and action thresholds for tree risk management														
1.7 Develop a policy and responsibility for keeping inventory data current.	$												2016/17	High
A. Develop and integrate a program to allow for access of inventory data by staff in the field														
B. Explore applications for smartphones/tablets to allow for updates to occur simultaneously as maintenance and/or inspections are completed														
C. Update tree inventory data in conjunction with maintenance operations														
Goal 2 – Preserve and expand tree canopy on public and private property														
2.1 Adopt an overall canopy goal of 35%.	$$												2016	High
A. Adopt an overall canopy goal of 35%, consistent with the regional Greenprint goal for tree cover														
B. Identify and implement more specific goals based on land use														
C. Engage the community in progress towards canopy goals														
2.2 Optimize stocking level for the community urban forest	$$												Ongoing	Medium
A. Ensure that planting plans use all-available public planting sites														
▪ Coordinate with SRPD to identify available sites and increase stocking level in the park tree resource														
▪ Identify optimal species for vacant sites and include new tree planting in annual work plans														

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City of Citrus Heights Urban Forest Master Plan – Timeline for Objectives and Strategies

Objectives and strategies of the UFMP*	Estimated Cost	Target for Completion	Date of Completion	Priority
		2016 2017 2018 2019 2020 2025 2030 2035 2040 2045 2050		
Goal 2 – Preserve and expand tree canopy on public and private property				
2.3 Identify and implement strategies to increase tree planting on private property.	$-$$$		Ongoing	Medium
A. Explore incentives for planting trees on private property				
B. Coordinate with San Juan School District to identify planting opportunities on school properties				
C. Utilize GIS data to identify areas and populations where outreach and incentives for tree planting will be most successful				
D. Utilize GIS data to develop visual aids (maps) to promote/ communicate urban forest activities and benefits				
2.4 Improve species selection and tree care on private property.	$		Ongoing	Medium
A. Provide information on species and their needs via the City's website				
B. Work with local retailers and nurseries to improve availability and knowledge of native and drought tolerant species				
2.5 Collaborate with nonprofits and volunteer groups to facilitate neighborhood tree planting in under-treed areas.	$-$$		Ongoing	Medium
A. Collaborate and partner with nonprofit and neighborhood groups for tree replacement and improvements to streetscapes				
B. Utilize GIS data to optimize strategies for outreach and engagement				
2.6 Conduct a tree canopy assessment every 10 years.	$-$$$		2025	Low
A. Option 1 — i-Tree Canopy or other point sampling methodology for estimating change				
B. Option 2— Remote sensing/mapping of extent and location of canopy				
Goal 3 – Establish comprehensive, user-friendly regulations and policies				
3.1 Explore the addition of a city arborist or urban forester position (part-time or full-time) to city staff.	$$$		2016/21	Medium
3.2 Revise Municipal Code - Title 106 - Zoning Code	$		2015/16	High
B. Revise Municipal Code – Title 106 – Zoning Code consistent with CHUGS recommendations				
3.3 Revise design and construction standards that apply to trees and planter sites.	$$		2016/17	Medium
A. Provide options for increasing uncompacted soil volume below grade and hardscape (See Appendix A)				

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City of Citrus Heights Urban Forest Master Plan – Timeline for Objectives and Strategies

Objectives and strategies of the UFMP*	Estimated Cost	Target for Completion: 2016	2017	2018	2019	2020	2025	2030	2035	2040	2045	2050	Date of Completion	Priority
Goal 3 – Establish comprehensive, user-friendly regulations and policies														
3.4 Provide basic arboriculture training to landscape maintenance personnel.	$-$$												Ongoing	High
A. Training and structural pruning of young trees														
B. Tree staking and maintenance of support system														
C. Basics of tree inspection and recognizing hazardous conditions														
3.5 Review goals and objectives for the UFMP and incorporate into annual work plans.	$-$$$$												Annual	High
A. Review UFMP annually and adjust targets as necessary														
B. Integrate current objectives and strategies into the annual work plan														
C. Review objectives and strategies for attainment status and update the Timeline for Objectives and Strategies (Appendix B)														
Goal 4 – Optimize community planning to consider trees as an integral component of community infrastructure														
4.1 Ensure that trees are an important and integral component in new development and redevelopment projects.	$-$$$$												Ongoing	High
A. Incorporate trees into City planned projects														
B. Incorporate trees into traffic/mobility planning														
C. Develop clear and consistent guidelines to identify and preserve significant trees														
4.2 Update existing planning documents to reference the UFMP and CHUGS policy documents.	$												2015/16	High
A. As revisions occur, coordinate strategic planning documents with Urban Forest Master Plan (2015) and Water Efficient Landscape Ordinance (2015)														
B. Ensure that new and revised specific plans and Special Planning Areas reference the UFMP and Water Efficient Landscape Ordinance and Guidelines														
C. As revisions occur, update the General Plan to recognize the role of trees and canopy as strategies that support and compliment the various components of the General Plan														
4.3 Participate in regional planning for the urban forest.	$												Ongoing	Medium
A. Continue to endorse and support the Greenprint Initiative														
B. 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														
C. Participate and collaborate with California Urban Forests Council and regional boards														

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City of Citrus Heights Urban Forest Master Plan – Timeline for Objectives and Strategies

Objectives and strategies of the UFMP*	Estimated Cost	Target for Completion: 2016	2017	2018	2019	2020	2025	2030	2035	2040	2045	2050	Date of Completion	Priority
Goal 4 – Optimize community planning to consider trees as an integral component of community infrastructure														
4.4 Apply for and maintain Tree City USA status.	$												2016/17	Medium
A. Identify a Tree Board or Department														
B. Calculate the annual Community Forestry Program Budget. (The requirement is at least 2$ per capita														
C. Celebrate Arbor Day and issue a Proclamation														
Goal 5 – Optimize funding and identify new opportunities														
5.1 Identify and apply for available grant funding.	$-$$$												Ongoing	High
A. Identify grant opportunities, including regional, state, national, special interest, and others, that may support urban forest program development and the objectives and strategies identified by the UFMP														
B. Apply for grants that support community needs, urban forest programming and/or the implementation of objectives and strategies identified by the UFMP														
5.2 Increase and optimize partnerships and collaborations with individuals, groups, and agencies who share urban forest goals.	$-$$												Ongoing	High
A. Nurture existing relationships with individuals, HOAs non-profits, business groups 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														
5.3 Optimize support for urban forestry operations from existing sources.	$-$$$$												Ongoing	High
A. Optimize funding from existing sources														
B. Demonstrate and report the need and justification for funding the care and maintenance of public trees														
C. Optimize funding for tree planting and planting site construction in CIP projects														
D. Optimize revenue to the Tree Mitigation Fund and dedicate funding specifically for urban forestry operations														
E. Explore landscape assessment districts														

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City of Citrus Heights Urban Forest Master Plan – Timeline for Objectives and Strategies

Objectives and strategies of the UFMP*	Estimated Cost	Target for Completion: 2016	2017	2018	2019	2020	2025	2030	2035	2040	2045	2050	Date of Completion	Priority
Goal 6 – Increase outreach, education, and resident engagement														
6.1 Maintain a comprehensive and dynamic website for CHUGS.	$-$$												Ongoing	High
6.2 Develop and present workshops and seminars that increase awareness and knowledge about trees and the urban forest.	$-$$												2015-2020	Medium
A. Develop a series of hands-on workshops that teach the basics of tree care (planting, pruning, mulching, fertilizing, watering, 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 that teaches the basics of irrigation practices and water conservation														
D. Collaborate with schools to deliver workshops that encourage engagement and connection with trees and nature														
6.3 Develop outreach materials that communicate key information about trees and the urban forest.	$-$$												Ongoing	Medium
6.4 Develop and deliver a State of the Urban Forest Report.	$-$$$												Every 5 years	Low

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