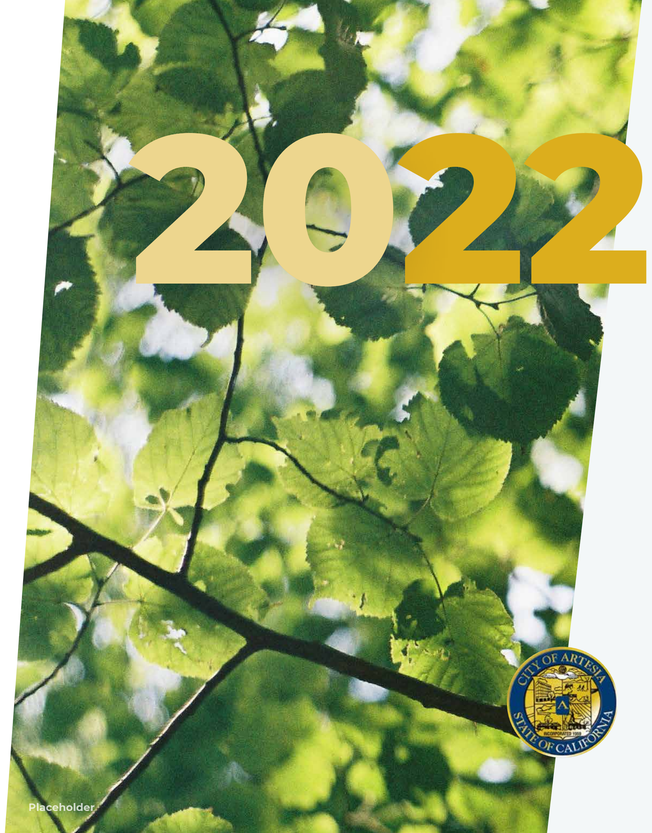
2022 Urban Forest Master Plan

CITY OF ARTESIA CALIFORNIA

BACK

COVER



Placeholder

2022

Urban Forest Management Plan

CITY OF ARTESIA
CALIFORNIA

To be without trees would, in the most literal way, to be without our roots.

Richard Mabey

2022 Urban Forest Master Plan

CITY OF ARTESIA CALIFORNIA

CITY OF ARTESIA
CALIFORNIA

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Finance Department
Public Works Department

Parks and Recreation Department
Planning Department

Consultants
CAL FIRE

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For in the true nature of things, if we rightly consider, every green tree is far more glorious than if it were made of gold and silver.

Martin Luther

Table of Contents

Executive Summary

Among streets dotted with a diverse population of more than 2,200 trees, the small city of Artesia offers more than affordability and good schools. Artesia also provides a welcome respite from urban fatigue within the greater Los Angeles metropolitan area. Trees and canopy not only improve the aesthetics of the community, but also provide valuable and critical services including improvements to air quality, carbon dioxide reductions, energy savings, health benefits, and educational enhancement. The community tree resource (public trees along streets, in parks, and at City facilities) and trees and woody shrubs on private property combine to make up the greater urban forest.

The Urban Forest Management Plan (UFMP) serves as a guide for managing, enhancing, and growing Artesia's urban forest and the community tree resource over the next 40 years. While the UFMP is primarily focused on the stewardship of the community tree resource, the plan also considers opportunities to expand the canopy on private property as the benefits of trees transcend property lines and greatly contribute to the City's livability and environmental quality.

In summary, the UFMP aims to address the following:

- Communicate community vision for Artesia's urban forest.
- Identify resiliency strategies to build a sustainable urban forest in the face of climate change.
- Recognize best management practices that promote tree health, maximized benefits, and community safety.
- Promote resiliency in the urban forest by improving species diversity, planting the right tree in the right place, and by managing pests and invasive species.
- Provide a 5-year work plan for all community trees, with projections for future maintenance for the next 40-years, including suggested maintenance cycles for ongoing maintenance.
- Establish baseline metrics and clear goals for urban forest managers.
- Adoption of the City's first tree ordinance will provide protections for all City trees and heritage trees on private property.
- Increase outreach to foster community engagement and advocacy for the urban forest.

Although the City does not currently have a dedicated urban forestry department, with assistance from contractors, the Maintenance Department's in-house team provides routine care for all 2,207 community trees. In turn, these trees provide more than $15,000 in benefits to the community annually (Table 1). Artesia also benefits from strong interdepartmental communication and coordination. The role of the Maintenance Department in the care of community trees is well understood and supported by all departments. Furthermore, all City departments are committed to building a vibrant and welcoming community, including through the enhancement of the urban forest.

Historically, tree planting in Artesia has mostly occurred because of leadership from a few engaged and passionate residents on the Beautification and Maintenance Commission. Artesia's tree-lined streets and the funding to plant community trees would not be possible without the initiative and drive of these individuals. To this day, tree planting is predicated on grant funding. However, thanks to partnerships with TreePeople and Los Angeles Conservation Corps, several recent grant acquisitions have provided the necessary resources for current planting projects.

Table 1. Urban Forest Benchmark

ARTESIA'S URBAN FOREST BENCHMARK VALUES		
COMMUNITY URBAN FOREST (PUBLIC TREE RESOURCE, 2021)		
Public trees	2,207	
Number of unique species	109	
Prevalence of top ten species	57.2%	
Species exceeding recommended 10%	2	
Stocking level*	62.4%	
Replacement value		$5.6 million
Available planting sites	1,328	
Carbon stored to date	543.6 tons	
ANNUAL BENEFITS (PUBLIC TREE RESOURCE)		
Total annual benefits		$15,206
Air quality benefits	0.5 tons	$9,716
Carbon benefits	29 tons	$4,952
Stormwater benefits	60,242 gallons	$528
TREE CANOPY COVER (PUBLIC AND PRIVATE TREE RESOURCE, 2020)		
Overall canopy cover	5.4%	
Canopy cover—public facilities	10.6%	

***Stocking level reflects the total number of possible planting sites that are currently planted with trees**

To date, Artesia does not have a tree ordinance and tree policy has historically been guided through City Council policies. While these policies have provided some direction for the care and maintenance of community trees, they are limited in scope and include outdated specifications for planting that are no longer recognized by industry standards. Adoption of a tree ordinance is essential to protecting community trees and encouraging the preservation of canopy on private property. The adoption of a tree ordinance will protect the community tree resource from damage due to harmful actions and illegal tree removals and will preserve large and mature trees on private property through a voluntary designation for heritage trees. These measures will further support increasing canopy cover from the current level of 5.4%.

Key stakeholders and partners provided input for the UFMP, including Los Angeles Conservation Corps, TreePeople, residents, and City departments that engage in the management, planning, or advocacy of trees. Feedback from stakeholders and a review of the existing urban forestry program guided the identification and development of short-term actions and long-range planning goals for the UFMP. The UFMP is a living document that provides suggestions for reasonable time frames for achieving goals. It is intended to be flexible and adaptive to opportunities and resource fluctuations.

The pillars for a sustainable urban forest that will provide direction for the UFMP for the next 40 years include:

- Grow and maintain a sustainable urban forest
- Preserve and protect the community tree resource
- Connect trees and canopy with the community

These pillars promote the preservation of the health, value, services, and sustainability of Artesia's urban forest. Goals are supported by comprehensive objectives and actions. Recognizing that community engagement is integral to success, the UFMP includes specific objectives for engaging the community and encourages partnership and collaboration. The timeline for each of the goals is reasonable and flexible and should be adjusted as necessary to take advantage of emerging opportunities and changes in funding and staffing resources.

Table 2 summarizes the pillars of the UFMP and the primary goals that support this vision for the Artesia's future urban forest:

Climate change is projected to cause temperature increases and fluctuations in precipitation patterns, which will severly impact the urban forest, both through declines in tree health and increased management costs. Yet, trees and the urban forest can be used as a tool to adapt to climate change. In recognition of the urban forests' role in mitigating the effects of climate change, in 2021 the USDA Forest Service published nine strategies to increase resilience in the urban forest and communities to climate change.

WATCH OUT!

Climate Change Resiliency Strategies

MANY OF THE GOALS IN THE UFMP SUPPORT GREATER CLIMATE CHANGE RESILIENCY STRATEGIES AND ARE INDICATED THROUGHOUT BY THIS SYMBOL:

PILLARS FOR A SUSTAINABLE URBAN FOREST

GROW AND MAINTAIN A SUSTAINABLE URBAN FOREST	
Adopt a comprehensive Tree Ordinance	
Reach 10% canopy cover by 2040	
Strive for equitable distribution of canopy cover	✓
Promote species diversity	✓
Increase tree planting on private property	✓

Table 2. Primary Goals and Objectives

PRESERVE AND PROTECT THE COMMUNITY TREE RESOURCE	
Become a Tree City USA	✓
Employ an ISA Certified Arborist	✓
Increase contractor oversight	✓
Stable and consistent funding	✓
Formulate a long-term tree planting program	✓
Distinguish City trees	
Update tree planting standards to be consistent with current industry standards and to save on planting costs	
Provide consistent and adequate maintenance to City trees	✓
Maintain tree inventory	✓

CONNECT TREES AND CANOPY WITH THE COMMUNITY	
Engage the community in urban forestry programming	✓
Continue existing partnerships and look for other connections with local tree advocacy groups	✓
Use trees to enhance community livability and aesthetics	✓
Increase access to greenspace	✓
Formalize safety and emergency response procedures	✓
Incorporate trees into other planning documents	
Use trees to support stormwater management systems wherever possible	✓
Plant trees in the rights-of-way where residents request trees	

Introduction

Before the arrival of the Spanish, in the late 1700s and early 1800s, the land that is now Artesia was part of a greater area called Tovaangar by the original inhabitants, the Tongva people (Greene and Curwen, 2019). Upon settlement, the indigenous people were displaced, and all of the existing landscape was altered either for farming or the built environment.

The City of Artesia was named for the numerous naturally occurring artesian wells that provided water to support colonization and agriculture. Starting in the 1860s, groundwater was tapped to flow to the land surface from the vast Los Angeles aquifers and provided Artesia with domestic water, and water for livestock and agriculture for several decades (Masters, 2013). Today, the water tower near 183rd street is the only remaining infrastructure associated with these historic artesian wells.

Until the 1960s, Artesia and surrounding Cerritos were known as Dairy Valley, as it was one of the leading milk-producing regions in the Country. The dairy business in the region was established by Dutch and Portuguese farmers in the early 20th Century (Sonksen, 2014). The community remained largely agricultural for nearly 80 years, until incorporation in 1959. An influx of residents after World War II initiated an increase in land prices and residential housing outcompeted agricultural lands (Artesia Chamber, 2021).

Known as a Los Angeles Gateway community, Artesia is located 20 miles south of the heart of Los Angeles and 20 miles from the Pacific Coast. Approximately 16,400 residents call the City home, including a diverse immigrant community (U.S. Census Bureau, 2020). The Artesia International and Cultural Shopping District attracts many community members and visitors with its vibrant enclave of restaurants, grocery stores, and clothiers. With easy access to nearby theme parks and recreational opportunities on the coast, Artesia is a popular destination.

History of the Urban Forest

Artesia experiences a local steppe climate with minimal rainfall (approximately 14-inches annually) and was once covered with coastal sage scrublands. Several tree species are native to this ecoregion and cottonwood, sycamore, willow, elderberry, walnut, ash, and oak once dotted the landscape. The artesian wells coupled with the rich soil made Artesia a promising place for agriculture, including a variety of fruit and nut trees.

Landscape materials, including trees, were brought in to provide greenspace in Artesia. Artesia's first Tree Planting and Removal Policy was created in 1996 and updated in 2012. In the past, residents living nearby were asked to vote by mail-in ballot on one of three trees to be planted in parkways. In 2009, the City approved an annual tree pruning schedule to promote proactive tree maintenance. Five districts were created to provide trees with proactive pruning every three years (The Artesian, 2009). The South Street Pedestrian, Bikeway, and Transit Improvement Project included the planting of rare palms (The Artesian, 2011).

Before 2017, tree contracts were managed by a consultant for the Maintenance Department and the Financial Department was responsible for managing the funding associated with contracted tree maintenance. Currently, the office of the City Manager works with contractors and manages the budget for the community trees.

Grant funding has been integral to community tree planting in Artesia since the 1990s. Fruit trees continue to be valued by the community. In partnership with TreePeople, the City distributed 224 fruit trees across the community during the 2019 Fruit Tree Giveaway with the broader goal of helping to remove carbon pollution from the atmosphere and improve air quality. Recently, Artesia received a tree planting grant to plant 325 new community trees as well as 675 fruit trees on private property. This tree planting campaign is funded by CAL FIRE through the Urban Forest Expansion Project.

TREE CITY USA

Tree City USA is a program by the Arbor Day Foundation that provides a framework for communities to develop their urban forests. The program emphasizes the benefits of trees, such as cooler neighborhoods, energy savings, and benefits to mental and physical health. Today, more than 3,600 communities in the country hold a Tree City USA designation. There are four main standards for Tree City USA recognition, which include:

- Maintaining a tree board or department
- Creating a community tree ordinance
- Spending at least $2 per capita on urban forestry
- Arbor Day proclamation and observance

Today, Artesia qualifies for two of these standards with the Public Works Department providing maintenance to all city trees and spending nearly $13 per capita on urban forestry. To obtain a Tree City USA designation, Artesia would have to adopt a community tree ordinance and have a formal proclamation of Arbor Day. A Tree City USA designation would be a significant step in bolstering the urban forest program by increasing community engagement and recognition among partners and decision-makers.

GOAL:

Become a Tree City USA

OBJECTIVES:

- ADOPT A TREE CARE ORDINANCE
- DESIGNATE THE PUBLIC WORKS DEPARTMENT AS THE HAVING THE LEGAL RESPONSIBILITY FOR THE CARE OF ALL CITY TREES
- OBSERVE AND HAVE A FORMAL PROCLAMATION OF ARBOR DAY
- APPLY FOR TREE CITY USA DESIGNATION

Placeholder

Benefits of Trees

Trees in the urban forest work continuously to mitigate the effects of urbanization and development and protect and enhance lives within the community in many ways. Healthy trees are vigorous, producing more leaf surface and canopy cover area each year. The amount and distribution of leaf surface area are the driving force behind the urban forest's ability to produce services for the community (Clark et al. 1997).

BENEFITS INCLUDE:

ENERGY SAVINGS

- Transpiration converts moisture to water vapor, thereby cooling the air by using solar energy that would otherwise result in heating of the air (Heisler, 1986; Ellison et al. 2017; Huang et al. 1990; Lyle, 1996).
- Producing shade for dwellings and hardscapes reduces the energy needed to cool the building with air conditioning (Akbari et al. 1997).

REDUCE URBAN HEAT ISLANDS

- Tree shade 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 surrounding locations (Akbari et al. 1997; McDonald et al. 2016).

ACADEMICS

- Studies cite positive correlations between exposure to nature and student success and negative correlations with lack of exposure to nature (Matsuoka, 2010).

AESTHETICS

Provide beauty in the urban landscape, privacy to homeowners, provide a sense of comfort & place and even contribute to increased property values (Thériault et al. 2001).

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 (itreetools.org). This open-source, 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 i-Tree Design (www.itreetools.org/design).

WILDLIFE PROTECTION

- Wooded streets potentially function as movement corridors, allowing certain species—particularly those feeding on the ground and breeding in trees or tree holes— to fare well by supporting alternative habitats for feeding and nesting (Fernandez-Juricic, 2000).
- Greater tree density improves outcomes for birds and bats (Threlfall et al. 2016).
- Trees and forest lands provide critical habitats (for foraging, nesting, spawning, etc.) for mammals, birds, fish, and other aquatic species. Trees can offer pollinators a valuable source of flowering plants. By including an array of flowering trees that provide pollen and nectar in the urban forest, bees are provided with additional food sources. Increasing tree species diversity and richness contributes to greater numbers of bird species among urban bird communities (Pena et al. 2017).
- Restoration of urban riparian corridors and their linkages to surrounding natural areas have facilitated the movement of wildlife and dispersal of flora (Dwyer et al. 1992). Usually, habitat creation and enhancement increase biodiversity and complement many other beneficial functions of the urban forest. These findings indicate an urgent need for conservation and restoration measures to improve landscape connectivity, which will reduce extinction rates.

IMPROVED HEALTH

- Exposure to nature, including trees, has a positive impact on human health and wellness through improvements in mental and physical health, including a lower incidence of depressive symptoms (Kuo and Sullivan, 2001; Sherer, 2003; Jennings et al. 2016).
- Reductions in ambient air temperatures from trees, could reduce health impacts related to heat waves (TreePeople 2020; EPA 2021).

CARBON DIOXIDE REDUCTION

- Trees and forests directly reduce CO_2 in the atmosphere through the growth and sequestration of CO_2 in woody and foliar biomass. Many chemical compounds in the Earth's atmosphere act as greenhouse gases that absorb and trap radient energy in the atmosphere, including carbon dioxide (CO_2).
- Indirectly, trees and forests reduce CO_2 by lowering the demand for energy and reducing CO_2 emissions from the consumption of natural gas and the generation of electric power. Reducing energy use has the bonus of reducing carbon dioxide (CO_2) emissions from fossil fuel power plants.

STORMWATER MANAGEMENT AND WATER QUALITY

- The tree canopy creates interception, which reduces and slows runoff during storm events (Xiao et al. 1998). In addition to catching stormwater, canopy interception lessens the impact of raindrops on barren soils. Root growth and decomposition increase the capacity and rate of soil infiltration by rainfall and snowmelt (McPherson et al. 2002). Each of these processes greatly reduces the flow and volume of stormwater runoff, avoiding erosion and preventing sediments and other pollutants from entering streams, rivers, and lakes, which is a source of pollution that threatens aquatic wildlife.

ECONOMIC ACTIVITY

- Research shows that trees promote better business by stimulating more frequent and extended shopping and willingness to pay more for goods (Wolf, 1999). In residential areas, trees have been shown to increase property value.

GREATER PUBLIC SAFETY

- Park-like surroundings increase neighborhood safety by relieving mental fatigue and feelings of violence and aggression that can occur as an outcome of fatigue (Planning the Urban Forest: Ecology, Economy, and Community Development, 2009).
- Residents who live near outdoor greenery tend to be more familiar with nearby neighbors, socialize more with them, and express greater feelings of community and safety than residents lacking nearby green spaces (Planning the Urban Forest: Ecology, Economy, and Community Development, 2009).
- When landscapes and trees are planted near their homes, domestic crimes are reduced by 25% (Kuo, 2001).
- Correlations have been found between increased tree coverage and decreased crime rates, even after adjusting for several other variables, such as median household income, level of education, and rented versus owner-occupied

AIR QUALITY IMPROVEMENTS

Trees protect and improve air quality by intercepting particulate matter (PM2.5), including dust, pollen, and smoke. The particulates are filtered and held in the tree canopy until precipitation rinses the particulates harmlessly to the ground.

- Trees absorb harmful gaseous pollutants like ozone (O3), nitrogen dioxide (NO2), and sulfur dioxide (SO2). Shade and transpiration reduce the formation of O3, which is created at higher temperatures. Scientists are now finding that some trees may absorb more volatile organic compounds (VOCs) than previously thought (Karl, 2010; Science Now, 2010). VOC s are carbon-based particles emitted from automobile exhaust, lawnmowers, and other human activities.
- Trees increase oxygen levels through photosynthesis

Trees are poems that the earth writes upon the sky.

Kahlil Gebran

Artesia's Tree Canopy and Community Tree Inventory

Artesia encompasses nearly 1,038 acres. Nearly 56 acres are covered by tree canopy, for an average canopy cover of 5.4%. Impervious surfaces (e.g., roads, parking lots, structures, etc.) make up 76.1% of the total land cover and 18.6% are pervious surfaces, such as bare ground, turf, or other low-lying vegetation. The community tree resource is estimated to provide 12.4 acres of the canopy (Artesia Community Tree Resource Analysis, 2021). Tree canopy extends beyond property lines and so do the benefits, which are enjoyed by the whole community. The more tree canopy, the more benefits to the community.

Geographic Distribution of Tree Canopy

Tree canopy is the layer of leaves, branches, and stems of trees and other woody plants that cover the ground when viewed from above. Understanding the location and extent of the tree canopy is critical to developing and implementing sound management strategies that will promote the smart growth and resiliency of Artesia's urban forest and the services that it provides to the community.

Zoomed in image of land cover

LAND COVER SUMMARY

Artesia encompasses approximately 1.6 square miles (1,037.7 acres). Currently, the overall canopy cover is 5.4% (Figure 1). Considering the current canopy cover (55.5 acres) and pervious surfaced areas that could support tree planting (excluding cemeteries, ball fields, etc.), Artesia could have a potential canopy cover of 21.7%.

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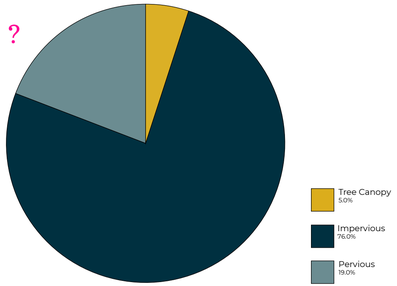


Figure 1. Land Cover Summary

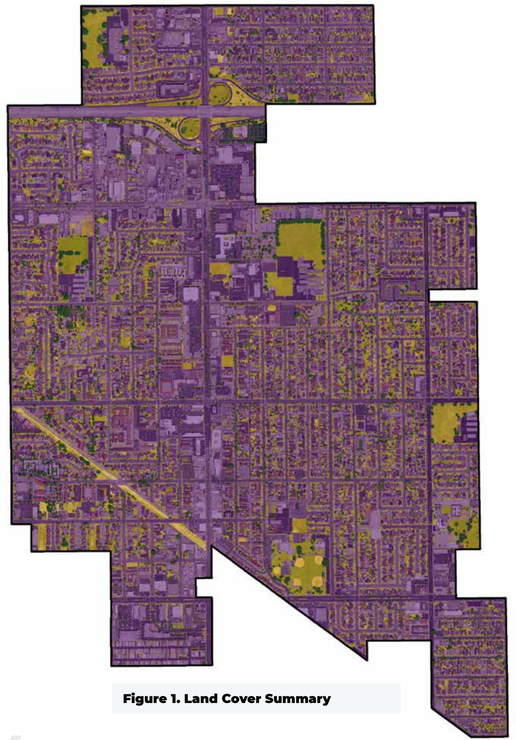
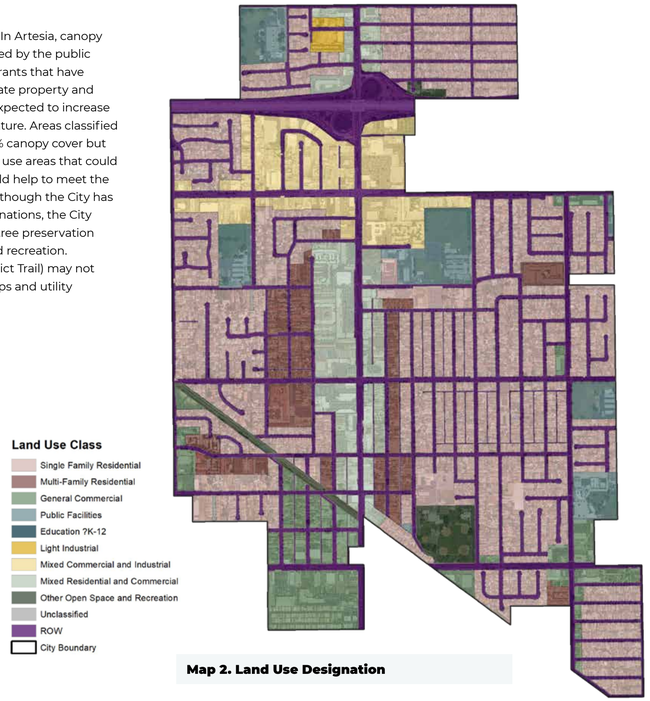


Figure 1. Land Cover Summary

TREE CANOPY BY LAND USE

Canopy cover can vary widely across different land use. In Artesia, canopy cover is highest in single-family residential areas, followed by the public rights-of-way (ROW) with 3.0% (Figure 2). With recent grants that have provided free trees for property owners to plant on private property and grants for street tree planting, both of these areas are expected to increase canopy cover as these trees and other existing trees mature. Areas classified as mixed commercial and industrial provide less than 1% canopy cover but there are nearly five acres within these designated land use areas that could potentially support additional tree plantings, which could help to meet the estimated potential canopy cover of 7.1% (Table 3). Even though the City has the potential to expand the canopy in all land use designations, the City likely has the greatest influence over tree planting and tree preservation within public facilities, ROW, and other open spaces and recreation. Although, the ROW and open space (i.e., Historical District Trail) may not support additional tree planting due to narrow park strips and utility easement restrictions.



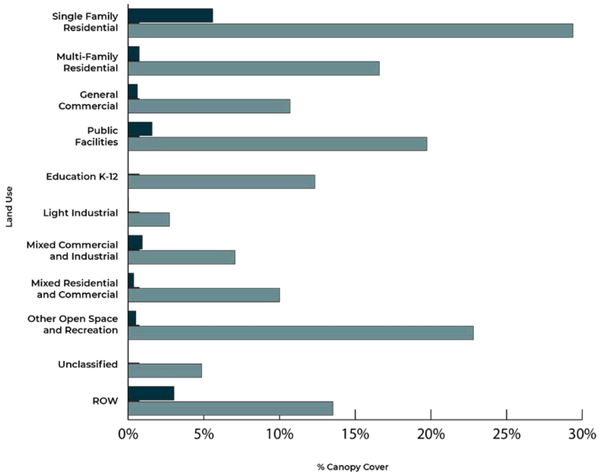
Map 2. Land Use Designation

Table 3. Tree Cover by Land Use

Land Use	Acres	Canopy Acres	Canopy %	Impervious Acres	Pervious Acres	Potential Canopy Cover %
Single Family Residential	415.26	23.21	5.59	293.30	98.82	29.38
Multi-Family Residential	58.17	3.04	0.73	45.93	9.20	16.59
General Commercial	70.53	2.52	0.61	60.91	7.08	10.69
Public Facilities	61.66	6.55	1.58	28.99	26.13	19.74
Education K-12*	0.00	0.00	0.00	0.00	0.00	12.34
Light Industrial	4.56	0.06	0.02	4.38	0.12	2.73
Mixed Commercial and Industrial	77.13	3.91	0.94	68.46	4.72	7.06
Mixed Residential and Commercial	71.81	1.53	0.37	63.36	6.94	10.01
Other Open Space and Recreation	23.20	2.11	0.51	8.32	12.76	22.81
Unclassified	0.71	0.00	0.00	0.67	0.04	4.86
ROW	254.71	12.58	3.03	215.42	26.71	13.53

Land classified as Education K–12 encompasses less than one hundredth of an acre and, therefore, is too small to register on the table.

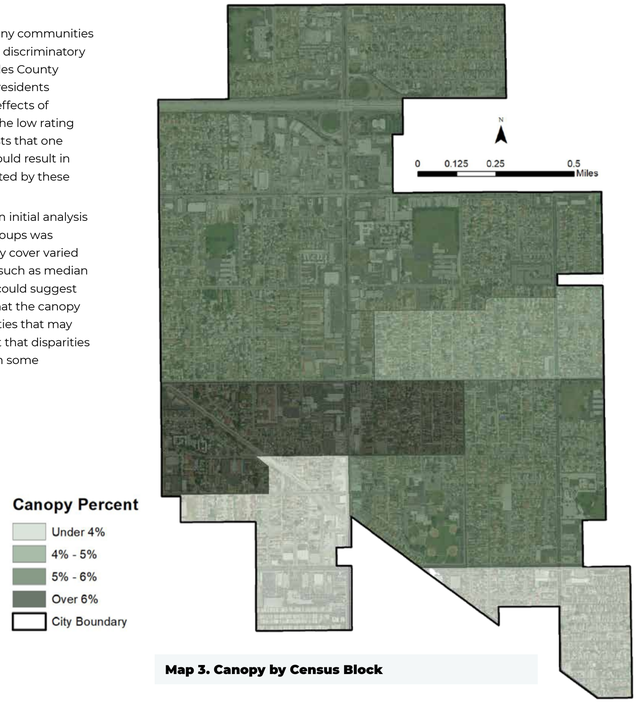
Figure 2. Existing and Potential Canopy Cover by Land Use



TREE CANOPY AND EQUITY

According to historic redlining maps, Artesia is one of many communities around the country that were disenfranchised by historic discriminatory housing policy (CalEPA). Redlining maps of the Los Angeles County indicate that Artesia was given a D rating, which limited residents in the 1940s from accessing home loans. The long-term effects of redlining are an area of active study, and the impacts of the low rating are mostly speculative at this time. Early research suggests that one impact of redlining is less access to greenspace, which could result in an inequitable distribution of canopy cover in areas affected by these discriminatory lending practices.

To assess the distribution of canopy cover and conduct an initial analysis of canopy equity, the canopy cover of 24 census Block Groups was explored. From this initial review, it was found that canopy cover varied very little among Block Groups and census data metrics such as median income and race had no obvious trends. These findings could suggest that the planting of trees has largely been equitable or that the canopy coverage is so low across the community and any inequities that may exist are likely difficult to observe. In fact, City staff report that disparities likely exist based on on-the-ground visual observations in some neighborhoods, particularly north of Artesia Boulevard.



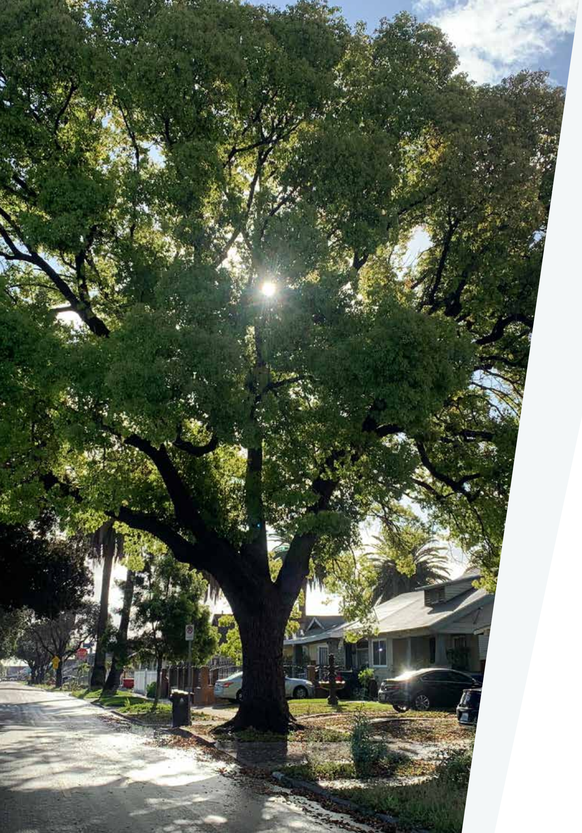
Map 3. Canopy by Census Block

GOAL:

Strive for equitable canopy distribution

OBJECTIVES:

- CONSIDER FURTHER EXPLORATION OF LAND COVER DATA USING THE PUBLIC RIGHTS-OF-WAY TO FURTHER EXPLORE POSSIBLE DISPARITIES IN DISTRIBUTION OF CANOPY COVER
- PROVIDE EDUCATION ON THE BENEFITS OF TREES TO ENCOURAGE RESIDENTS TO PLANT TREES ON PRIVATE PROPERTY
- INTEGRATE EQUITY PRINCIPALS INTO THE TREE ORDINANCE
- PRESERVE TREES WHENEVER POSSIBLE
- PROMOTE PLANTING TREES ON PRIVATE PROPERTY
- REPLACE TREES THAT HAVE BEEN REMOVED
- ENFORCE TREE PLANTING REQUIREMENTS FOR NEW CONSTRUCTION PROJECTS
- DESIGN SIDEWALKS TO ACCOMMODATE TREE WELLS
- EXPLORE MORE OPPORTUNITIES TO PROVIDE FREE OR INEXPENSIVE TREES TO PLANT ON PRIVATE PROPERTY



Canopy Goals and Canopy Potential

Land cover data (2021) identified nearly 170 acres where trees could be planted to augment the existing canopy. Of these potential planting acres, there are approximately 7,738 potential planting locations on both private and public property. Almost 22 acres are high or very high priority based on proximity to the existing canopy, distance to impervious surfaces, potential to reduce heat islands, areas with the greatest potential to influence floodplains, and slope. While it is important to prioritize planting in these areas, it is equally important to prioritize the preservation of existing trees, too. If Artesia were to plant trees to cover all of the potential planting areas, the overall average tree canopy could be increased to nearly 22%.

SETTING A CANOPY GOAL

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. While the tree canopy potential for Artesia is currently 21.7%, this value does not consider the potential for another land cover. Like much of Southern California, there is high demand for space. Redevelopment often results in higher density housing, which often restricts the available space for trees.

Considering the existing land cover and development pressures, a goal of 10% tree canopy cover by 2040 is recommended. This level of canopy is likely attainable and would nearly double the canopy level. Respondents to a 2021 community survey indicate strong support for increased canopy cover. The City planting within the rights-of-way alone will not get the community to this goal, it will require the commitment and support of the community. Steps to reach this 10% goal can be tailored to specific land use, such as residential. A determinant for actually reaching canopy goals is dependent on the willingness of the community to accomplish and sustain these goals. Therefore, community outreach around the importance of expanding tree canopy throughout the community will be integral to achieving this goal.

GOAL:

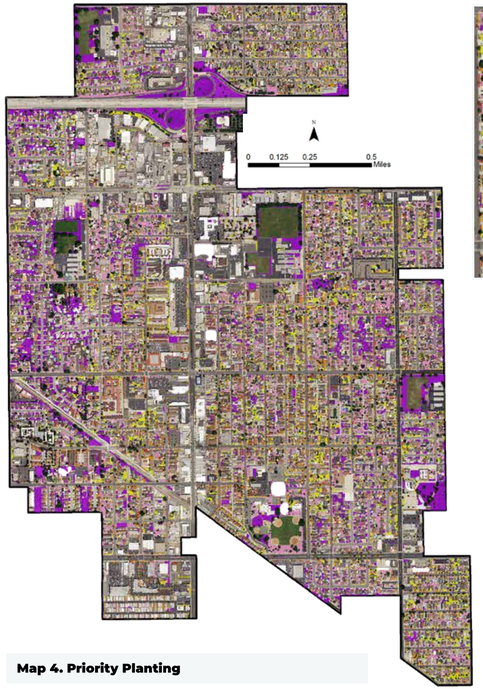
Reach 10% canopy cover by 2040

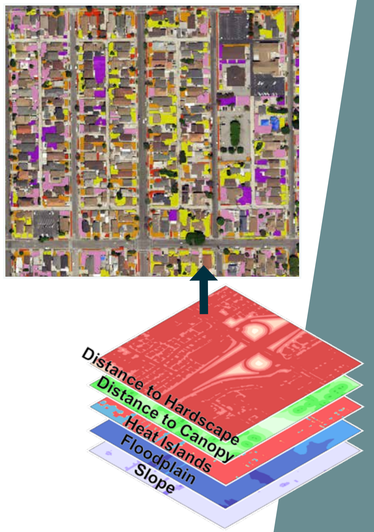
OBJECTIVES:

- DEFINE SUSTAINABLE ANNUAL PLANTING GOALS AND THE NECESSARY FUNDING REQUIRED TO ACHIEVE DESIRED LEVELS OF PLANTING ON PUBLIC PROPERTY
- INCREASE TREE CANOPY COVER ON PUBLIC PROPERTY
  - Review canopy cover within the ROW
    - Consider a streets shade goal to reduce the urban heat island effect
  - Plant new trees at all city parks to replace those that have been removed (per LA County Parks and Recreation Needs Assessment)
  - Incorporate more opportunities for trees in streetscapes, parking lots, seating areas, walkways, and near buildings (Artesia Boulevard Corridor Specific Plan)
- PROMOTE TREE PLANTING TO REACH COMMUNITY CANOPY GOALS
  - Encourage the expansion of the urban forest through tree plantings on private property
    - Consider private property behind the sidewalk in areas where parkways are too narrow for street trees (per Street Tree Program and Policy)
  - Expand the urban forest through extensive tree plantings on public property
- REVISIT THE CANOPY GOAL AFTER 2040
- MAINTAIN EXISTING CANOPY (PER GENERAL PLAN 2030)
- CONFIRM RISK LEVELS BEFORE REMOVING LARGE, MATURE TREES
  - Use new technologies to determine the extent of decay and potential risk of large, mature trees in high use areas (e.g., internal decay testing equipment)
  - Use safety zones to prevent targets
- TRACK TREE CANOPY CHANGES (PER LOS ANGELES COUNTY TREE CANOPY ASSESSMENT)
  - Conduct a land cover assessment every five years to evaluate progress on canopy cover goals.
- ADOPT A TREE ORDINANCE THAT PROMOTES THE PROTECTION OF BOTH CITY TREES AND LARGE TREES ON PRIVATE PROPERTY (I.E., HERITAGE TREE DESIGNATION)
  - Encourage the community to nominate trees for heritage tree designation to preserve large trees on private property
  - Emphasize protecting and preserving heritage trees as defined by the pending adoption of a tree ordinance

CANOPY POTENTIAL

The priority planting analysis considered site design and environmental factors, including proximity to hardscape, canopy fragmentation, soil permeability, slope, and soil erosion factors to prioritize planting sites on both public and private property for the greatest potential return on investment. Potential plantable areas can be determined by excluding pervious areas that are unsuitable for planting (e.g., agricultural fields and sports fields)and including impervious areas where trees could feasibly be added (parking lot islands, along sidewalks, and near road edges.)



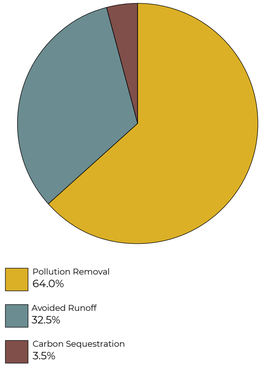


Map 4. Priority Planting

Community Tree Inventory

Community trees (publicly managed trees along streets, in parks, and at City facilities) play a critical role in Artesia. They provide numerous tangible and intangible benefits to residents, visitors, and neighboring communities. The community recognizes that community trees are a valued resource, a vital component of the urban infrastructure, and part of the City's identity.

Figure 3. Annual Benefits from Community Trees



INVENTORY STRUCTURE

Artesia's community tree inventory includes 2,207 trees and 1,328 available planting sites (2021). The following information characterizes Artesia's community tree inventory:

- The most common species are Mexican fan palm (*Washingtonia robusta*, 13.5%), followed by Australian willow (*Geijera parviflora*, 11.3%) and queen palm (*Syagrus romanzoffiana*, 5.9%).
- 42.3% of trees are less than 8-inches in diameter (DBH) and 3.1% of trees are larger than 24-inches in diameter, indicating an established age distribution.
- Community trees provide approximately 12.4 acres of canopy cover which accounts for 1.2% of total land area.
- The current stocking level is 62.4%, based on a total of 1,328 available planting sites, including 1,328 vacant sites and 2,207 existing trees.
- Replacement of all 2,207 community trees with trees of equivalent size, species, and condition, would cost over $5.6 million.
- Community trees have stored more than 543.6 tons of carbon (CO_2) in woody and foliar biomass to date.
- Annually, community trees provide cumulative benefits to the community totaling $15,206, an average of $6.89 per tree. These benefits include pollution removal ($9,716), gross carbon sequestration ($4,952), and avoided runoff ($538). These benefits do not include energy use benefits and other intangible benefits to the community.

A limitation of the annual benefits summary is that it does not fully account for all benefits provided by the community tree resource. Some benefits could not be included in the analysis such as reductions in energy use (electricity and natural gas) through shading and climate effects. Other benefits are intangible and/or difficult to quantify such as increases in property values and impacts on psychological and physical health, crime, and violence.

Empirical evidence of these benefits does exist (Wolf, 2007; Kaplan and Kaplan, 1989; Ulrich, 1986), but there is limited knowledge about the physical processes at work and the complex nature of interactions make quantification imprecise. Tree growth and mortality rates are highly variable. A true and full accounting of benefits and investments must consider variability among sites (e.g., tree species, growing conditions, maintenance practices) throughout the City, as well as variability in tree growth. In other words, trees are worth far more than one can ever quantify!

SPECIES DIVERSITY

There are 109 unique species in Artesia's community tree inventory which greatly exceeds the mean of 53 species reported by McPherson and Rowntree (1989) in their nationwide survey of street tree populations in 22 US cities. The three most predominant species (Mexican fan palm, Australian willow, and queen palm) represent 24.8% of the population.

Maintaining diversity in a community tree inventory is important. The dominance of any single species or genus can have detrimental consequences in the event of storms, drought, disease, pests, or other stressors that can severely affect a community tree resource and the flow of benefits and costs over time. Catastrophic pathogens, such as Dutch elm disease (*Ophiostoma ulmi*), emerald ash borer (*Agrilus planipennis*), Asian longhorn beetle (*Anoplophora glabripennis*), and sudden oak death (*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. In addition to these pests, there is a growing concern for polyphagous shot hole borer (PSHB) (*Euwallacea* spp.), a new pest complex that has devastated urban forests in Southern California due to its wide host range (Eskalen, 2015).

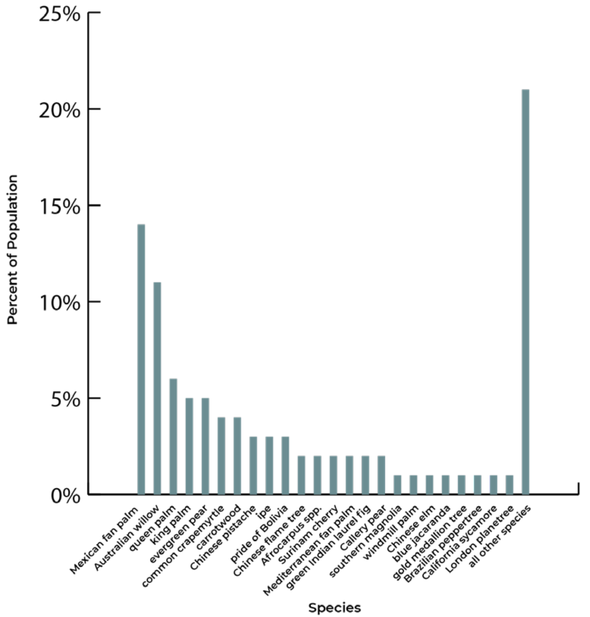
In light of significant pests and diseases, many cities are opting to increase diversity to improve resilience. The widely used 10-20-30 rule of thumb states that an urban tree population should consist of no more than 10% of any one species, 20% of any one genus, and 30% of any one family (Clark et al. 1997; Santamour, 1990). While this rule does ensure a minimum level of diversity, it may not encourage enough genetic diversity to adequately support resilience. Therefore the 10-20-30 rule should be considered a minimum goal. Managers should always strive to increase the range of representation among species and genera within an urban forest. Among Artesia's community tree population, Mexican fan palm (*Washingtonia robusta*) and Australian willow (*Geijera parvifolia*) exceed this well-accepted rule.

To increase species diversity and promote greater resilience in the overall resource, future tree planting should focus on increasing diversity and reducing reliance on overused species. As over predominant species are removed and replaced, new species should be introduced when possible. New species should be resistant to the known pest issues that currently pose a threat to the region. In addition, consideration should be given to species that withstand higher temperatures and periods of drought.

STOCKING LEVEL

The stocking level indicates how many planting sites within the community contain trees. With a stocking rate of 62.4%, Artesia has an opportunity to fill 1,328 vacant planting sites. Through current grants which have provided more than 700 trees, Artesia will be able to fill more than half of the vacant sites in the community within the next three years.

Figure 4. Most Prevalent Species



So many see trees as a nuisance, but native [trees] are critical to the ecology and very helpful to mitigate climate change in a long-term program, especially in suburban/urban areas.

Survey Respondent

GOAL:

Promote species diversity

OBJECTIVES:

- SET SPECIES DIVERSITY GOALS FOR THE COMMUNITY TREE RESOURCE
  - Reduce reliance on the most prevalent species, Mexican fan palm and Australian willow
  - At a minimum, pursue species diversity goals that meet the 10-20-30 rule, but strive for even greater diversity among general population
- AVOID PLANTING SPECIES OF TREES WITH SIMILAR VULNERABILITIES TO PESTS AND DISEASE AS CURRENT SPECIES
  - Stay up to date with potential pest and disease threats
  - Consider susceptibility to pests and disease during species selection
  - Diversify plantings at the genus level, as many pests threaten several species within a genus
  - Use pest resistant species and cultivars when available
- CONDUCT A RESOURCE ANALYSIS EVERY 5–10 YEARS TO MONITOR PROGRESS ON DIVERSITY GOALS
- PROMOTE SPECIES DIVERSITY ON PRIVATE PROPERTY
- REVISE THE MASTER STREET TREE LIST (INCLUDED IN THE APPENDICES OF BOTH THE 1996 AND 2012 TREE TRIMMING AND REMOVAL POLICY)
  - Consider prohibiting the planting of palms in the rights-of-way
  - Consider recommending fruit trees as non-street trees
  - Choose species with tolerance to the urban environment (even if this excludes natives)
  - Monitor species performance and periodically update the Master Street Tree List to include species that are performing well and exclude species that are performing poorly
  - Tie the climate change projections for Artesia (e.g., changes in temperature and precipitation) to the current climate of a comparable city and explore their species palette
    - Introduce tree species that are suitable for the current and predicted future climate
  - Communicate and coordinate with foresters in the region to share information on the greatest vulnerabilities and species that may be best adapted

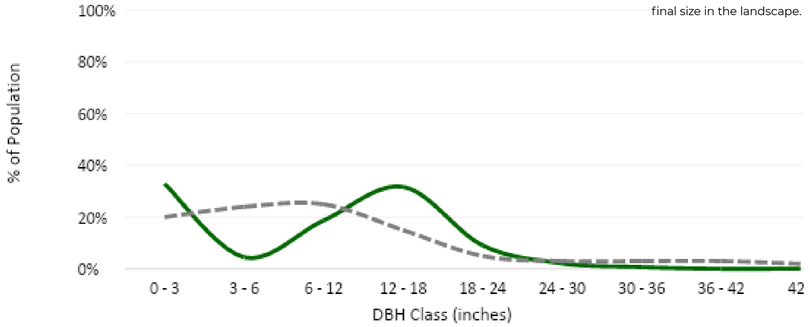
RELATIVE AGE DISTRIBUTION

The age distribution of the urban forest is a key indicator and driver of maintenance needs (Richards, 1982/83). The relative age distribution can be approximated by considering the DBH range of the overall inventory. Trees with smaller diameters tend to be younger. Palms do not increase in diameter over time, so they are not considered in this analysis. In palms, height more accurately correlates to age and mature height varies among palm species.

The age distribution of Artesia's community tree resource (excluding palms) shows a mostly established population with a large number of young, recently planted trees (Figure 5). Trees in the smaller diameter classes (8-inches or less in diameter) represent 42.3% of the overall inventory and 3.1% of trees are in the large diameter classes (>24-inches) (Figure 3). Trees less than three inches in diameter represent 32.9% of the overall population, indicating a recent increase in new tree planting.

A high proportion of young, large, and medium-maturing trees is a positive indication of the benefits provided by the urban forest since large shade trees typically provide more shade, pollutant uptake, carbon sequestration, and rainfall interception than small trees or palms. Planting enough trees to plan for the succession of trees that are mature and reaching the end of their life is important for maintaining the flow of benefits. The costs of maintenance can be reduced over time through training pruning. Training, defined as the selective pruning of small branches to influence the future shape and structure of a young tree, is critical at this stage to prevent costly structural issues and branch failures as these young trees mature into their final size in the landscape.

Figure 5. Community Tree Resource Relative Age Distribution (excluding palms)



GOAL:

Formulate a long-term tree planting program

OBJECTIVES:

- ESTABLISH A TREE FUND TO DIVERT MITIGATION FUNDS TO URBAN FOREST PROGRAMING, INCLUDING TREE PLANTING
  - Specify the purpose and use of tree funds
    - Tree planting
    - Tree maintenance
    - Purchase of property to preserve existing trees
    - Education and outreach materials about urban forestry
  - Identify a department responsible for managing the tree fund
- IDENTIFY POTENTIAL PLANTING SITES, INCLUDING SITES LOCATED IN FUTURE POCKET PARKS
- USE A TREE PLANTING PLAN AND PRIORITIZE TREE PLANTING AS PART OF ANNUAL MAINTENANCE
  - Prioritize tree planting where the incorporation of trees would optimize the benefits received (e.g., energy savings, heat island, water quality, and conservation of animal species)
  - Prioritize tree planting where the incorporation of trees would provide residents with more equal access to trees and the associated benefits (per Los Angeles County Tree Canopy Assessment)
  - Dedicate annual funding to tree planting
  - Continue exploring grant funding for planting activities
- CONTINUE TO PARTNER WITH LOS ANGELES CONSERVATION CORPS TO SUPPORT BEST PRACTICES IN TREE PLANTING AND POST-PLANTING CARE
  - Choose healthy, vigorous nursery stock
  - Provide newly planted trees with regular watering
  - Stake trees, when necessary, but ensure stakes are monitored and removed to prevent tree damage
  - Conduct training pruning once new trees are established, typically several years after planting

Trees are extremely beneficial to our physical and mental health, they lower temperature in cities (where there is already too much asphalt), reduce carbon in the atmosphere, produce oxygen, and beautify our environment.

Managing Partner

Urban Forest Operations

While the City does not have a formalized urban forestry division, the Public Works Department provides maintenance for all trees in parks, medians, and street trees within the public rights-of-way primarily through contracted services and a small in-house crew. While the parameters that define a City tree are well understood by City staff, residents frequently call the Public Works Department to inquire about whether the tree in front of their home is City-owned. There is an expectation for residents to water a tree, but this policy is likely not well known.

Services

The Public Works Department is responsible for the management of all 2,207 trees in parks, at City facilities, and along streets. The Public Works Department is also responsible for overseeing tree contracted services. The Pulic Works Department receives additional support from the office of the City Manager, including managing grant funding for trees, processing service requests for tree work, responding to resident inquiries regarding tree maintenance, corresponding with tree service vendors, coordinating grid pruning cycles (depending on available funding), and maintaining and updating a list of dead or dying trees through the inventory management software. Between the Public Works Department and staff from the office of the City Manager, approximately 10% of their time is on managing the care of City trees.

SMALL TREE PRUNING

Public Works Department staff prune trees less than 15-feet in height in parks and at City facilities, whereas all other maintenance activities (including pruning trees less than 15-feet in height in medians) are conducted by City contractors. With Maintenance Staff providing some maintenance to small trees there are likely some cost savings; however, structural pruning is an essential step in the life of a young tree. Training a young tree through structural pruning is both art and science and requires knowledge of how trees grow along with an understanding of the role the mature tree will play in the landscape. Young tree training can have a profound impact on the mature structure of the tree, the strength and stability of branch structure, safety, and tree longevity. While structural pruning can be taught and applied by discriminating maintenance staff, it should be guided by a Certified Arborist.

GOAL:

Distinguish City trees

OBJECTIVES:

- DEFINE WHAT IS CONSIDERED A “CITY TREE” IN A TREE ORDINANCE
- EXPLORE THE USE OF AN INTERACTIVE MAP ON THE CITY WEBSITE THAT ALLOWS FOR RESIDENTS TO LOOK UP THEIR ADDRESS TO SEE IF THEY HAVE A CITY TREE

DISTRICT TREE TRIMMING

Trees in residential areas of the community are trimmed every two to three years by a City contractor based upon Tree Trimming Districts. As of 2020, trees in medians are maintained by a separate median maintenance contractor. City Maintenance Staff review work that is done by the contractors to confirm that it has been completed.

Residents can view the Tree Trimming District Map on the City website and determine, based on the trimming schedule, when to expect regular maintenance. The Tree Trimming Districts were presumably established using major streets to define the boundaries. These obvious geographic boundaries allow residents to easily determine which District their property is located, but the majority of City trees are located within Districts 3 and 5, which creates a challenge for balancing annual tree maintenance budgets, as those costs go up and down depending on the year of the cycle.

SERVICE REQUESTS

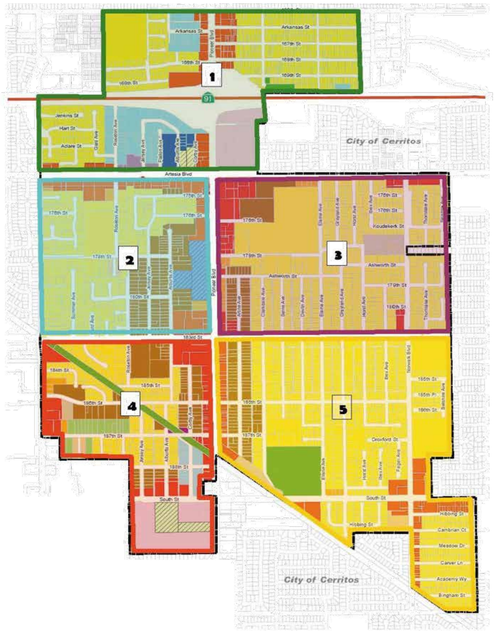
Residents can request tree maintenance services outside of the tree trimming cycle through the Request Tracker or by contacting City Hall. Once a service request is received, Mantenance Staff will review a request to determine if work is needed immediately or if it will be resolved during the District Tree Trimming Cycle. Additional tree maintenance services, such as clearance and visibility pruning, root pruning, planting, and removals are provided on an as-needed basis.

GOAL:

Employ an ISA Certified Arborist

OBJECTIVES:

- TRAIN MAINTENANCE STAFF MEMBER(S) TO INSPECT TREES AND REVIEW CONTRACTED TREE SERVICES TO ENSURE OPTIMAL CARE FOR CITY TREES
- ENCOURAGE EXISTING STAFF TO BECOME CERTIFIED ARBORISTS
- ALTERNATIVELY, HIRE A SECONDARY ON-CALL ARBORIST TO INSPECT OTHER TREE CONTRACTORS’ WORK AND TO PROVIDE MAINTENANCE RECOMMENDATIONS
- AMEND CONTRACTOR AGREEMENT TO REQUIRE ADHERENCE TO THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARDS AND CONTINUE TO HAVE A CERTIFIED ARBORIST ON STAFF
- ENGAGE IN PROFESSIONAL DEVELOPMENT



Map 5. Tree Maintenance Map

GOAL:

Provide consistent and adequate maintenance to City trees

OBJECTIVES:

- CONSIDER REMAPPING PRUNING DISTRICTS TO ALLOW FOR A MORE EVEN DISTRIBUTION OF TREES
- CONSIDER EXTENDING CURRENT 3-YEAR PRUNING CYCLE TO FOUR YEARS
  - Schedule more frequent proactive maintenance for “cycle buster” species that require more regular maintenance (e.g., palms and Tipu tipuana)
  - Provide education to residents on why more frequent pruning is often not beneficial and may be harmful in some cases.
- CONTINUE TO PROVIDE TREE TRIMMING DISTRICT MAP ON THE CITY WEBSITE ALONG WITH AN ESTIMATED MAINTENANCE SCHEDULE

REMOVALS AND STUMP GRINDING

When residents request the removal of dead trees, Public Works Department staff will cross-check that trees are actually dead prior to dispatching the City contractor for removal. In many instances trees requested for removal by residents are dormant.

DEBRIS AND LITTER MANAGEMENT

Debris generated from tree maintenance is diverted to local greenwaste facilities for composting. Leaf litter during the fall can be significant in areas with more trees. Residents can dispose of leaf litter and other tree debris through municipal waste. Regular street sweeping is important for managing the litter that accumulates in the street.

Diverting wood and other debris to greenwaste facilitates prevents trees that are removed from going into a landfill. However, this material is still undergoing decomposition in these facilities; releasing carbon into the atmosphere. To increase the duration of carbon storage in trees, there are state-wide efforts to increase the use of urban wood to produce lumber, biochar, mulch, and other products. While the City’s contractor does have a program to recycle some urban wood, other partnerships are needed to use the wood produced from Artesia’s trees to the highest possible use.

INVENTORY MANAGEMENT

The City contractor is responsible for maintaining the City tree inventory. Frequently attributes such as diameter and condition are not updated, and many species have not been identified. The inventory includes all City trees, but there have been some instances where a service request from a resident has prompted an investigation into whether a tree is a City tree and Maintenance Staff have found that the tree in question is a City tree, according to the County Assessor’s maps of the public rights-of-way.

TREE PROTECTION & PRESERVATION

Currently, no trees on private property are protected. If residents desire to remove street trees, residents must justify the removal and are responsible for the cost of removal and must pay to replant a tree elsewhere in the community, unless the tree is dead or dying. While this is the policy, these rules are not codified.

GOAL:

Maintain tree inventory

OBJECTIVES:

- REQUIRE CONTRACTORS TO MAINTAIN AN UP-TO-DATE TREE INVENTORY
  - Updates to tree condition and DBH as maintenance occurs
  - Assign a species to all trees
  - Add trees that were missed during original inventory collection as discovered
- USE THE INVENTORY TO TRACK THE STOCKING LEVELS
- MONITOR THE CONDITION OF TREES AND USE THIS DATA TO IDENTIFY HIGH PERFORMING OR MALADAPTED SPECIES TO GUIDE FUTURE PLANTING

GOAL:

Update tree planting standards to be consistent with current industry standards and to save on planting costs

OBJECTIVES:

- PLANT TREES IN ACCORDANCE WITH ANSI A300 AND ISA BEST MANAGEMENT PRACTICES
- REQUIRE CONTRACTORS TO CONDUCT ALL TREE WORK IN ACCORDANCE WITH ANSI A300, Z133, AND Z60.1
- ADOPT A TREE ORDINANCE
  - Define irrigation of street trees as a responsibility of adjacent property owners
- PLANT TREES IN SITES WITH ADEQUATE SOIL VOLUMES, TO ALLOW TREES TO REACH MATURE SIZE AND CANOPY SPREAD
- AVOID THE USE OF ROOT BARRIERS
- CONSIDER ALTERNATIVE SPECIES IF CONFLICTS WITH GRAY INFRASTRUCTURE ARE A CONCERN
  - Avoid planting species with high-water use
  - Plant drought tolerant species
- PROVIDE IRRIGATION TO TREES THAT ARE COMPLIANT WITH MWELO
- PROVIDE WATER TO TREES ESPECIALLY DURING PERIODS OF DROUGHT

TREE PLANTING

Tree planting is largely dependent on grant funding. Residents frequently call the Public Works Department to request trees, but funding is limited for tree planting and there is currently no process to keep a record of the request and coordinate the planting of tree at the address when funds do become available. Most of the trees planted in the parkways were planted as a result of grants that were acquired by the Beautification and Maintenance Commission. In fact, two grants are funding the planting of an additional 700 trees over the next two years. In 2021, 195 trees were planted as a result of these funds.

The standards for planting trees have been dictated by planting details included in both the City of Artesia Street Tree Program and Policy (1996) and the Tree Trimming and Tree Removal Policy (2012), which requires the preparing the planting site by scarifying and compacting the native soil, backfilling with a mix, adding a planting tablet, and installing root barrier and drain pipe. For trees planted in tree wells, in addition to other site preparation, an irrigation "bubbler" (a 36-inch long 6-inch drainpipe filled with clean pea gravel) must be installed vertically in the well. This additional site preparation is not consistent with current industry recommendations for tree planting and are time consuming, which results in higher costs for tree planting.

Root Barriers

In urban areas, trees frequently conflict with hardscapes. Heaving and cracked sidewalks cause concerns for public safety and are costly to mitigate and remediate these conflicts. In the 1970s, root barriers were developed as a potential solution to the problem (Randrup et al. 2001). Root barriers are a physical or chemical impediment intended to limit root growth to a specific area to avoid conflicts with surrounding infrastructure. There are three main classes of root barrier: traps, inhibitors, and deflectors (Coder 1998). Studies on root barriers have resulted in differing conclusions about their efficacy and usefulness in urban environments (Smiley, 2008; Gilman, 1996; Thompson, 2006).

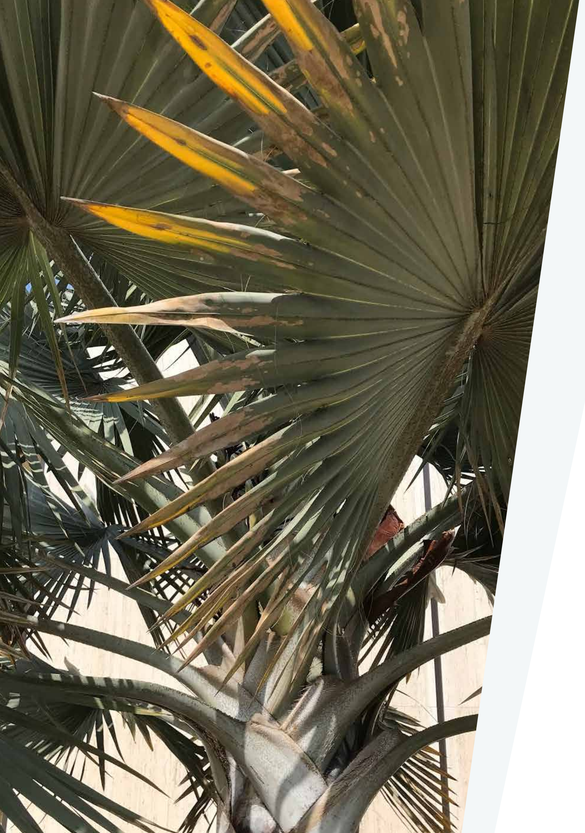
Both the 1996 and 2012 Tree Policies require the use of root barrier when trees are planted. City staff have subscribed to this policy and use root barrier in all plantings. Other municipalities in the region do not require the use of root barriers or any of the other measures required in Artesia's planting detail. Los Angeles Conservation Corps has observed that the long-term response of trees planted with root barrier and without root barrier are negligible. Considering the time and additional cost to install root barriers when planting new trees is ultimately not justified by the results and should be discontinued from use.

GOAL:

Plant trees in the rights-of-way where residents request trees

OBJECTIVES:

- DEVELOP AN ONLINE REQUEST FORM FOR RESIDENTS TO REQUEST A TREE BE PLANTED.
  - Update the inventory or another database to track tree planting requests.



COMMUNITY ENGAGEMENT

In late spring of 2021, the City promoted a City-wide tree planting campaign by inviting residents to a Tree Planting Kick-off Event to welcome new trees planted through grant funding. Over the years, the City has provided other opportunities to participate in urban forestry activities, including tree care events. Events are promoted through the City website, press releases, the City's social media platforms, and a digital publication of *The Artesian*.

GOAL:

Engage the community in urban forestry programming

OBJECTIVES:

- CONTINUE TO PROVIDE URBAN FORESTRY PROGRAMMING INFORMATION ON THE CITY WEBSITE
  - Provide a FAQ sheet
  - Publish articles and fact sheets about common pest issues on the website
  - Regularly update City events calendar
- CONTINUE TO DISSEMINATE TREE-RELATED STORIES AND INFORMATION THROUGH THE ARTESIAN
- CONSIDER TRANSLATING TREE INFORMATION MATERIALS INTO OTHER LANGUAGES, TO ALLOW FOR GREATER ACCESSIBILITY
- CONTINUE TO SPONSOR AND PROMOTE TREE-RELATED EVENTS, THE BENEFITS OF TREES, AND THE IMPORTANCE OF TREE CARE
- INCLUDE TREE-RELATED INFORMATION IN THE CITY'S SOCIAL MEDIA PRESENCE
- EXPLORE THE USE OF POP-UP EVENTS
- CATER OUTREACH AND ENGAGEMENT TO YOUTH
- PROMOTE STUDENT PARTICIPATION IN TREE RELATED EVENTS
  - Partner with schools to promote tree related activities
    - Promote the planting of trees on school propoerty
  - Coordinate Arbor Day events with local schools
  - Explore a drop-in program for youth that would engage youth in environmental education, including urban forestry topics

GOAL:

Increase contractor oversight

OBJECTIVES:

- REVISE CONTRACT TO INCLUDE ADHERENCE TO ANSI A300
  - Prohibit topping or any other practice that is considered unacceptable under the current ANSI A300 standards
- FOLLOW WORK PLAN SCHEDULES
- CONTINUE TO CONDUCT ROUTINE MAINTENANCE ON A CYCLE
  - Avoid pruning trees that are not in need of maintenance
  - Continue to schedule more frequent maintenance for palms
  - Use the inventory to track species that need more regular maintenance and use this information to schedule more frequent maintenance for these species
- CONSIDER HIRING AN ADDITIONAL CONTRACTOR TO PRESCRIBE MAINTENANCE AND REVIEW OTHER CONTRACTORS' WORK
  - Ensure trees are maintained to promote tree health and good structure
  - Inspect trees regularly to provide appropriate and timely care
- KEEP A RECORD OF MAINTENANCE NEEDS
  - Continue to identify trees in poor condition
  - Inspect large, mature trees regularly to provide proactive maintenance and sustain their benefits contributions
- ENCOURAGE INTERNAL STAFF TO BECOME CERTIFIED ARBORISTS
- TRAIN INTERNAL STAFF TO RECOGNIZE COMMON MAINTENANCE ISSUES

SAFETY AND RISK MANAGEMENT

The Public Works Department participate in trainings in the proper use of equipment and engage in safety tailgate trainings. Before performing any work, team members will participate in a jobsite briefing to identify any hazards and communicate the plan for completing the work.

INSPECTIONS

Between routine maintenance cycles, a lot can happen to a tree. Storm events can cause small branches to fail, or trees can become infested with pests or disease. It is important that trees are inspected annually between maintenance cycles to identify any heightened maintenance priorities and identify any signs or symptoms of pests and disease. Currently, there is no regular inspections of trees to proactively identify risk.

We need to increase the amount of trees in public areas, paying attention to the external factors like power lines, pipes, etc.

Managing Partner

EMERGENCY RESPONSE

In-house maintenance staff are responsible for responding to tree emergencies and are typically addressed within 24-hours. For tree-related emergencies that occur after-hours, residents can contact the Lakewood Sheriff's Department. After regular business hours or on weekends, on-call staff members will be dispatched to address the situation. In instances of very large trees, the City contractor may be dispatched to address the issue.

The City has an Emergency Operation Plan; however, it does not include any procedures or policies for managing tree and branch failures that result from storms or other events. If a catastrophic event were to occur, there are no mutual aid agreements in place with neighboring communities.

PEST MANAGEMENT

The City receives relatively frequent complaints about boxelder bugs. Boxelder bugs (*Boisea trivittatus*) are a seed-feeding species of insect that are not harmful to tree health but tend to congregate around or in homes. Boxelder (*Acer negundo*) is their primary host, but they are known to feed on other species of maples, ash, and fruit trees. When such complaints are received or any other concerns about tree pests, the City will dispatch the contractor to inspect the tree. If it is determined that a tree requires treatment, the Public Works Department will communicate to the resident the plan to address the issue. In the case of nuisance pests, like boxelder bugs, the City will communicate that the pest is not a concern for the tree's health and provide information on how to manage the pest through cultural control methods (i.e., cleaning debris, vacuuming, etc.).

INVASIVE SHOT HOLE BORERS AND FUSARIUM DIEBACK

The polyphagous shot hole borer and the Kuroshio shot hole borer (*Euwallacea sp.*) are invasive beetles introduced from Asia. They are involved in a disease called Fusarium dieback which is present in Southern California. The invasive shot hole borers were identified in Los Angeles County in 2012 and have spread to neighboring counties (Nobua-Behrmann, 2018). The invasive beetles feed on fungi that they carry into the heartwood tissues of the tree. Some of the introduced fungi are tree pathogens that disrupt the flow of water and nutrients. Sometimes staining and gummosis can be seen around beetle entry and exit wounds, and typically cankers have formed at these sites. The beetles feed on the fungus rather than tree tissues so systemic insecticides may not be effective (Umeda et al. 2016).

The damage causes branch dieback, and over time can kill the tree (Eskalen et al. 2017). These beetles have the potential to colonize healthy or stressed trees and have a large host range consisting of more than 260 plant species. All of Artesia's *Platanus* (planetrees) are susceptible, but this pest also feeds on *Cupaniopsis* (carrotwood), *Koelreuteria* (Chinese flame tree, golden rain tree), *Quercus* (oaks), and *Acer* (maples).

CITRUS GREENING

Similarly, citrus greening (*Candidatus liberibacter asiaticus*) is a bacterial disease spread by the Asian citrus psyllid. The disease causes bitter, hard fruit production, and is among the most concerning pests as it threatens the viability of California's citrus crop. While citrus species represent less than 1% of the community tree population, many residences in Artesia grow citrus trees. Due to quarantines in place to protect California's citrus crop, and the lack of effective treatments, infected trees must be destroyed and disposed of appropriately (Grafton-Cardwell et al. 2019). The result of citrus greening would be significant losses to the canopy and cultural history of Los Angeles County on both public and private property.

FUSARIUM WILT

Canary Island date palm wilt, caused by the fungus *Fusarium oxysporum f. sp. canariensis*, is established in California and has the potential to impact a small percentage of Artesia's palms (Hodel, 2019). In contrast, fusarium wilt of queen and Mexican fan palm (caused by *Fusarium oxysporum f. sp. palmarum*) is not present in California. Yet if introduced, it poses a significant threat to both of Artesia's abundantly planted palms: *Washingtonia robusta* (Mexican fan palm) and *Syagrus romanzoffiana* (queen palm). The common name of each disease is indicative of the species of palm they infect, but they overlap in their biology, the symptoms they cause, and control. In palms, *Fusarium* wilt rapidly kills trees by disrupting the water-conducting tissues. First, the pathogen attacks older leaves, the canopy looks thin and typically one side of a leaf desiccates and turns brown. Then the pathogen moves to other parts of the canopy. *Fusarium* wilt of palms is easily spread through wind transported spores but also persists in plant tissues and soil. Effective controls for fusarium wilts are lacking, but sanitation measures can help prevent these diseases (Downer et al. 2009; Elliot, 2010).

GOAL:

Formalize safety and emergency response procedures

OBJECTIVES:

- REGULARLY INSPECT TREES TO PROACTIVELY IDENTIFY POTENTIAL RISKS
- AMEND THE CITY'S EMERGENCY RESPONSE PLAN TO INCLUDE PROCEDURES FOR:
  - Tree debris storage and staging areas
  - Emergency communications
- PROVIDE TRAINING TO STAFF ON SAFETY AS IT RELATES TO EMERGENCY EVENTS AND THE DANGERS THAT MAY EXIST AS A RESULT OF TREE AND/OR BRANCH FAILURES
- CONTINUE TO CONDUCT JOBSITE BRIEFINGS BEFORE WORK BEGINS
- CONTINUE TO PROVIDE TRAINING ON PROPER HANDLING AND USE OF CHAINSAWS AND OTHER EQUIPMENT
- CONTINUE TO ENGAGE STAFF IN WEEKLY SAFETY TAILGATES AND KEEP RECORDS OF PARTICIPATION

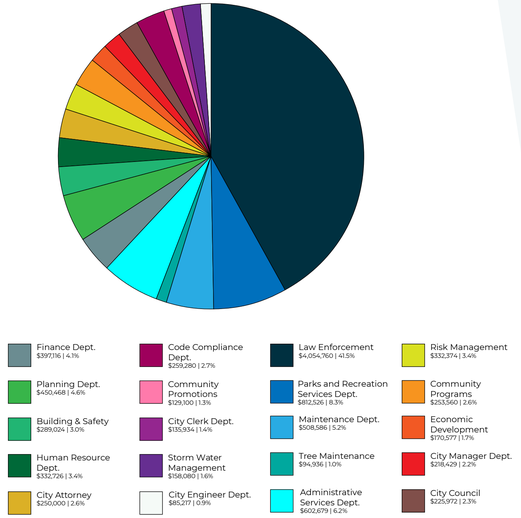
Funding

Currently, all funding for tree maintenance comes from the Gas Tax. The available funding can fluctuate based on travel volume (or gas sold). The Coronavirus Pandemic and associated public health measures reduced the demand and use of gas, and thus reduced the revenues from the Gas Tax. With state-led efforts to reduce carbon emissions through conversion to natural gas or electric powered vehicles, the Gas Tax is likely not going to be a stable revenue stream. Therefore, the funds allocated to tree maintenance are threatened. Furthermore, with the additional planting of trees through grants, even more, trees will require regular maintenance.

The annual budget for tree maintenance is approximately $95,000, which includes contract pruning, inspections, administration, infrastructure repairs, and liability. The annual investment in trees is less than 1% of the annual budget (Figure 6).

Artesia Town Center is a City-owned shopping center, which has several trees (mostly palm species) that are not included in the overall City-inventory and cannot be maintained through the gas tax and are otherwise maintained through Common Area Maintenance Fees (CAMF).

Figure 6. Fiscal Year 2020–2021 City Budget



GOAL:

Stable and consistent funding

OBJECTIVES:

- DIVIDE TREE TRIMMING DISTRICTS DOWN TO DISTRIBUTE TREES MORE EQUITABLY WITHIN TREE TRIMMING DISTRICTS AND BALANCE ANNUAL COSTS
- CONSIDER EXTENDED PRUNING CYCLES TO SPREAD COSTS OVER A LONGER PERIOD
- DEVELOP A TREE PLANTING PLAN TO OPTIMIZE AVAILABLE FUNDS FOR TREE PLANTING
- DIVERT FUNDS COLLECTED FROM VIOLATIONS OF A TREE ORDINANCE TO A TREE FUND THAT IS DEDICATED TO PLANTING TREES AND PROVIDING MAINTENANCE TO COMMUNITY TREES
- CONSIDER AN OVERLAY DISTRICT THAT CAN ONLY BE USED FOR URBAN FORESTRY PROGRAMMING
- CONSIDER FUNDING OPPORTUNITIES SIMILAR TO THE ADOPT-A-LIGHT PROGRAM AS SUGGESTED BY THE ARTESIA BOULEVARD CORRIDOR SPECIFIC PLAN

Urban Forest Partners

While awareness may vary, 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. Urban forest partners were asked to communicate their thoughts about management policy and priorities, the development process for the Urban Forest Management Plan (UFMP) included virtual interviews and electronic surveys.

The following summarizes the roles and responsibilities of urban forest partners in the management of Artesia's community tree resource and the urban forest and identifies numerous challenges and opportunities that were identified through this process:

INTERNAL PARTNERS

Community Development

The Community Development Department process applications for development, provide permits for development and promote compliance with City code and zoning ordinances. Although the Community Development Department primarily focuses on private property development, the Department also reviews encroachment permits for development within the rights-of-way in the City.

Challenges and Opportunities:

- Tree planting is not required in the City code with residential development.
- Infill development, while necessary, will increasingly limit available space for trees.
- Limited tree expertise among City staff, such as in identifying significant trees.
- Disenfranchised neighborhoods may have unequal distribution of tree canopy.

Parks and Recreation

The Parks and Recreation Department manages the City's park and recreation facilities which are home to a significant amount of City trees (which are managed by the Public Works Department). Together Parks and Recreation and Maintenance work to balance the desire to have trees and provide recreational space for community programming. If trees in parks or at recreation facilities require maintenance, Parks and Recreation contact the Public Works Department for service.

Challenges and Opportunities:

- Meeting the needs for recreational space programming.
- Appropriate species selection and site selection (e.g., avoiding selecting species with fruit/debris drops near ball fields and bleachers).
- Residents may not support trees being planted on City property adjacent to their private properties.
- Distinguishing which trees are City-owned trees.
- Obtaining community support for the urban forest program with competing priorities and programs.
- Educational programs in outdoor education or youth training with drop-in availability.
- Creating a plan for replacing trees as they become damaged, diseased, or reach the end of their lifespan.

GOAL:

Increase tree planting on private property

OBJECTIVES:

- CONSIDER PARTNERING WITH THE LOCAL UTILITY PROVIDER TO INCENTIVIZE THE PLANTING OF SHADE TREES TO REDUCE ENERGY COSTS
- CONTINUE TO PROACTIVELY MAINTAIN EXISTING TREES ON PUBLIC PROPERTY (PER LOS ANGELES COUNTY TREE CANOPY ASSESSMENT, 2020 LOCAL HAZARD MITIGATION PLAN)
- ENCOURAGE PRIVATE PROPERTY OWNERS TO MAINTAIN EXISTING TREES (2020 LOCAL HAZARD MITIGATION PLAN)
- CONSIDER PARTNERING WITH LOCAL SCHOOLS TO PRESERVE TREE CANOPY ON PRIVATE PROPERTY (2020 LOCAL HAZARD MITIGATION PLAN)
- EXPLORE MORE OPPORTUNITIES TO PROVIDE FREE OR INEXPENSIVE TREES TO PLANT ON PRIVATE PROPERTY
- PROMOTE THE ADOPT-A-TREE PROGRAM AND ASSOCIATED EVENTS
- PROVIDE EDUCATION ON THE BENEFITS OF TREES TO ENCOURAGE RESIDENTS TO PLANT TREES ON PRIVATE PROPERTY
- INCREASE AWARENESS ON HOW THE URBAN FOREST CAN HELP THE COMMUNITY FACE CHANGES IN CLIMATE

EXTERNAL PARTNERS

Los Angeles Conservation Corps

The Los Angeles Conservation Corps is a private nonprofit organization that has served Los Angeles County for 35 years. The organization's primary focus is to employ at-promise youth to improve hard and soft skills. The organization assists Corps members through a charter school and support services and case management to remove barriers to success.

In Artesia, the group has served sporadically as a contractor for tree planting projects for over a decade. Corps members assist in the planting of trees and providing maintenance for three years after planting, which includes conducting health assessments, replacing and removing stakes as needed, adjusting ties, minor pruning (clearance and addressing broken branches), and watering.

Challenges and Opportunities:

- Opposition to tree planting or unwillingness to care for street trees by some residents.
- City tree planting standards increase the difficulty, and cost of materials, and do not promote healthy tree growth (i.e., root barriers).
- Planting trees in the context of climate change and drought.
- Providing work and job training for corps members.
- Competition for funding among other programs.
- Improve inventory checks and updates to be more frequent.
- Establishing a replacement policy that considers the loss of canopy.
- Identifying and protecting historic trees on public and private property.

TreePeople

An environmental nonprofit group with a mission to support and inspire communities to take personal responsibility for the environment. The nonprofit has operated for more than 50 years and became a partner with the City through the CAL FIRE Grant. TreePeople partners with other communities with low canopy cover in the area.

Challenges and Opportunities:

- Due to the size of Artesia, the current land use patterns, and community priorities, available planting sites are limited for tree planting and canopy expansion.
- Implementing an urban forest management plan.
- No tree ordinance to protect and preserve existing trees and canopy.
- Expanding partnerships to explore alternate and sustainable funding sources for urban forest and tree care.
- Hosting outreach events, such as “Urban Forestry Day” to provide education and raise awareness of the urban forest (a successful event was held in partnership with TreePeople and the City of Los Angeles).
- Explore partnerships with local utility providers to provide free or low-cost trees.

Beautification and Maintenance Commission

The role of the Beautification and Maintenance Commission is to suggest ways to beautify the City. Projects that have contributed positively to the community aesthetics include planting vines on walls as a graffiti deterrent, building xeriscape gardens, and planting trees in the parkways. The Beautification and Maintenance Commission has had a key role in securing grant funding for the planting of trees in parkways. In the 1990s, the Commission secured funds for tree planting by soliciting funds through local news outlets, which established a Tree Fund. The Commission promoted an Adopt-a-Tree Program, where adoptees could submit $60 donations to the Tree Fund and then receive a plaque to display at their address to signify their contribution.

Challenges and Opportunities:

- Enforcing the planting of trees after construction is completed.
- A high proportion of rented properties with absent owners.
- Planting the right trees in the right places (i.e., avoiding planting trees under overhead utilities and in narrow parkways).
- Expanding the width of park strips to reduce conflicts with sidewalks and other hardscapes.
- Including requirements for tree planting by developers in the Tree Ordinance.
- A recommended species list to assist residents with selecting species for private property and to guide selection for any trees planted in the public rights-of-way.
- Require compliance with industry standards for tree care the Tree Ordinance

Youth Representatives

Youth community members value trees for the oxygen they produce, the shade they provide and enjoy the fruit from fruit trees. The youth supported the additional planting of trees along the streets of their neighborhoods.

Challenges and Opportunities:

- Provide information about trees and tree events through social media.
- Explore including tree planting as a part of park clean-up events.

Chamber of Commerce

The Artesia Chamber of Commerce was founded in 2010 with the mission to promote business growth and spur economic development in the City. The Chamber recognizes the benefits of trees, especially improvements to community aesthetics.

Challenges and Opportunities:

- Planting as many trees as possible in public areas, with careful attention to infrastructure such as overhead and underground utilities.
- Sustainable funding for maintenance.
- Providing incentives for planting trees on private property, whether residential, commercial, or both.
- Start a social media account to share information and news regarding the urban forest program.
- Identify clear criteria for determining whether a tree should be pruned or removed.

GOAL:

Use trees to enhance community livability and aesthetics

OBJECTIVES:

- PRIORITIZE PLANTING OF TREES IN AREAS WITH LESS CANOPY COVER
- DEVELOP POLICIES AROUND PARKING LOT SHADE
- PLANT TREES TO SHADE PARKING LOTS
- REQUIRE MINIMUM SHADE REQUIREMENTS FOR THE RECONSTRUCTION OR CONSTRUCTION OF PARKING LOTS
- CONSIDER PARKING LOT CANOPIES AS POTENTIAL COMMUNITY SOLAR LOCATIONS TO ALLOW FOR GREATER TREE PLANTING ON INDIVIDUAL PARCELS AND DECREASE CONFLICTS WITH STREET TREES
- INCORPORATE MEDIAN PLANTINGS WHEN POSSIBLE
- EMPHASIZE RETAINING AND INCORPORATING TREES IN DEVELOPMENT AND REDEVELOPMENT PROJECTS
- USE TREE PROTECTION ZONES DURING CONSTRUCTION
- DEVELOP STANDARDS FOR TREE PROTECTION FOR DEVELOPMENT AND REDEVELOPMENT PROJECTS.
- PLANT EVERGREEN AND DECIDUOUS TREES TO CREATE VISUAL INTEREST
- REPLACE STREET TREES AS NEEDED TO ACHIEVE THE DESIRED AESTHETIC
- PLANT TREES TO SHADE PUBLIC SPACES THAT HAVE A HIGH AMOUNT OF IMPERVIOUS SURFACES SUCH
- PLANT TREES TO SHADE PEDESTRIAN CORRIDORS AND IMPROVE WALKABILITY
- AS STREETSCAPES, PARKING LOTS, NEAR BUILDINGS, PLAZAS, AND OTHER SEATING AREAS
- USE ALTERNATIVE PLANTER DESIGNS TO ALLOW FOR MORE SPACE FOR TREE PLANTING
- USE ALTERNATIVE DESIGNS AND MATERIAL TO AVOID TREE REMOVAL OR ROOT PRUNING
- PROMOTE TUNNELING/BORING FOR UTILITY LINE INSTALLATION TO DECREASE TREE AND OVERHEAD UTILITY CONFLICTS
- SUPPORT TREE CANOPY TO INCREASE WILDLIFE HABITAT AND PROVIDE CORRIDORS THAT CONNECT GREENSPACES TO ALLOW FOR WILDLIFE MOVEMENT

Having a good amount of trees in a park makes it more welcoming and provides a comfortable place for recreation and gathering.

Managing Partner

Free Trees—City Plants

Some communities benefit from partnerships with the local utility provider to distribute free shade trees to the community with the purpose of reducing energy savings, sequestering carbon, and to assist in stormwater capture.

A local example of a successful free tree program is the Los Angeles City Plants program. Through the local non-profit, City Plants, the Los Angeles Department of Water and Power (LADWP) and City of Los Angeles distribute free trees to residents to reduce energy use and sequester carbon dioxide.

Southern California Edison

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

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 outlines requirements for vegetation management in utility easements. These requirements include clearance tolerances for trees and other vegetation growing in proximity to overhead utilities.

Many street trees located under power lines are too large for the site, requiring extreme pruning to maintain clearance. Trees located under utility lines must be directionally pruned by trained, authorized line clearance personnel. Selecting small-stature tree species that are utility-friendly for planting sites in utility right-of-way can minimize the need for these maintenance activities.

California Department of Forestry and Fire Protection (CALFIRE)

Under the authority of the Urban Forestry Act (PRC 4799.06–4799.12), the California Department of Forestry and Fire Protection's Urban & Community Forestry Program works to expand and improve the management of trees and related vegetation in communities throughout California.

The mission of the California Department of Forestry and Fire Protection's Urban Forestry Program is to lead the effort to advance the development of sustainable urban and community forests in California. Trees provide energy conservation, reduction of storm-water runoff, extend the life of surface streets, improve local air, soil, and water quality, reduce atmospheric carbon dioxide, improve public health, provide wildlife habitat and increase property values. In short, they improve the quality of life in our urban environments which, increasingly, is where Californians live, work, and play. The program also administers State and Federal grants throughout California communities to advance urban forestry efforts. (fire.ca.gov).

GOAL:

Continue existing partnerships and look for other connections with local tree advocacy groups

OBJECTIVES:

- CONTINUE TO LOOK FOR GRANT OPPORTUNITIES TO SUPPORT FUTURE PARTNERSHIPS
- CONSIDER ALLOCATING A LINE ITEM IN THE BUDGET TO SUPPORT CONTINUED TREE ESTABLISHMENT SERVICES PROVIDED BY LOS ANGELES CONSERVATION CORPS
- CONTINUED PARTNERSHIP WITH TREEPEOPLE TO PROVIDE EDUCATION AND OUTREACH
- EXPLORE POTENTIAL FOR FUTURE PARTNERSHIPS WITH LOCAL UTILITY PROVIDERS, SCHOOL DISTRICTS, OR OTHER ADVOCACY GROUPS.
  - Examples for potential utility collaborations:
    - Vouchers for City trees removed due to utility conflict
    - Subsidized planting/rebates on private property to reduce energy consumption
  - Examples for school districts:
    - Planting projects
    - Workshops

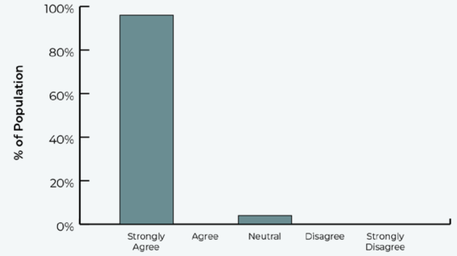
COMMUNITY OUTREACH

Three virtual meetings were held in 2022 on August 17th at noon, August 24th at 6:00 pm, and September 1st at 6:00 pm to increase public awareness and gain community perspective and input for the development of the Plan. The meetings were promoted through the City's website and social media. A recording of the presentation was shared on social media and viewers were encouraged to provide feedback through the online survey.

Online Survey

An online survey, available from August 2nd to December 13th, 2021, provided additional opportunities for public input into the UFMP development. The survey was available via a link on Artesia's website and promoted at community engagement events such as Movie in the Park and the Annual Winter Wonderland and Holiday Tree Lighting. The survey included a series of 10 questions about views on tree benefits, education and outreach, urban forestry operations, protection of trees on private property, and collaboration activities. In total, 25 people responded to the survey. Despite a low response rate to the survey (<1% of Artesia's total population), the opinions expressed in the survey can provide a rough idea of how the overall community feels. The following summarizes the data collected (see Appendix G for all comments received).

Figure 7. Trees are important to Artesia.



Approximately, 96% of respondents indicated that trees are important in Artesia (Figure 7).

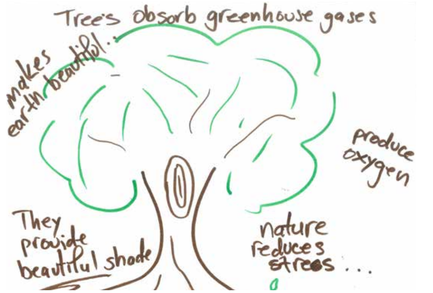
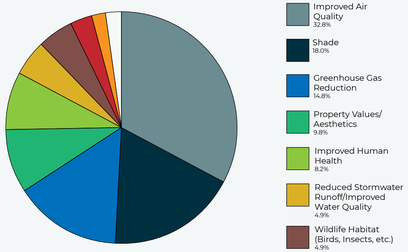
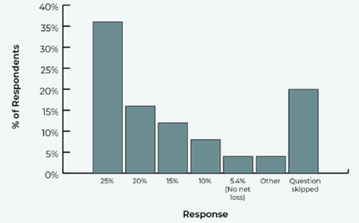


Figure 8. What benefits do you appreciate most from trees?



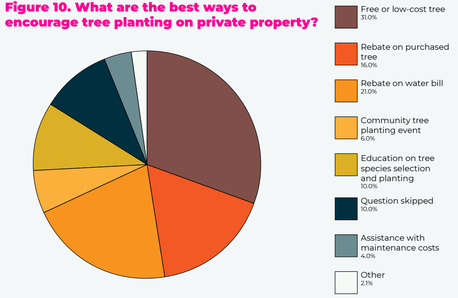
Respondents indicated that improvements in air quality, shade, and reduction in greenhouse gas emissions are the most appreciated benefits of trees (Figure 8).

Figure 9. What canopy goal do you support?



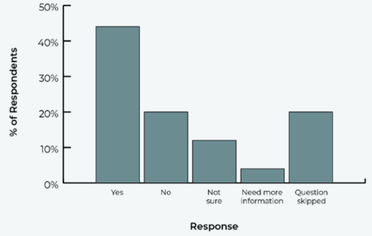
Artesia currently has a canopy cover of 5.4%. According to the report Biomass, Carbon Sequestration, and Avoided Emissions: Assessing the Role of Urban Trees in California, the Southern California Coast climate zone (from Santa Barbara south to the border with Mexico and from the coast to inland cities) was found to have an average canopy cover of 13.9% (Bjorkman et al. 2015). Based on this information, respondents were asked what canopy goal they would support. Approximately 36% indicated their support of a canopy goal of 25% (Figure 9).

Figure 10. What are the best ways to encourage tree planting on private property?



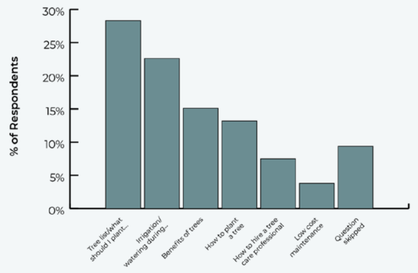
The survey asked respondents about the best ways to encourage tree planting on private property. Nearly 31% of respondents indicated "free or low-cost trees" as their preferred incentive for planting a tree on private property (Figure 10).

Figure 11. Would you support voluntary protection for "heritage trees" on private property?



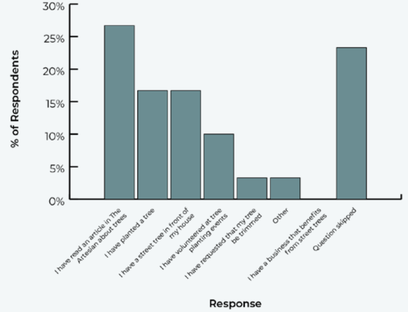
The designation of "heritage tree" is a common way to protect large and/or significant trees on private property in many communities. In some communities such designations are compulsory and in others, community members can request any tree to be considered for the designation as a "heritage tree". Among survey respondents, 44% indicated they would support a voluntary "heritage tree" designation (Figure 11). Nearly 16% of respondents indicated "not sure" or "need more information."

Figure 12. What topics of education and outreach interest you?



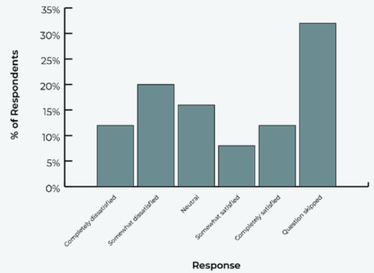
To understand which educational topics the community is interested in, the survey requested that respondents indicate their interests

Figure 13. Describe your interest/involvement with Artesia's community trees (City-managed trees in parks, on streets, and at City facilities).



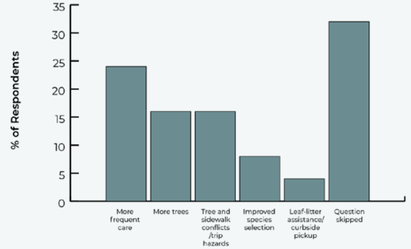
To better understand survey respondents' experiences with Artesia's community trees, respondents were asked to indicate their involvement with Artesia's community trees (City managed trees in parks, on streets, and at City facilities). Nearly 27% of respondents indicated having read an article in The Artesian about trees (Figure 13).

Figure 14. What is your level of satisfaction with the care provided for community trees?



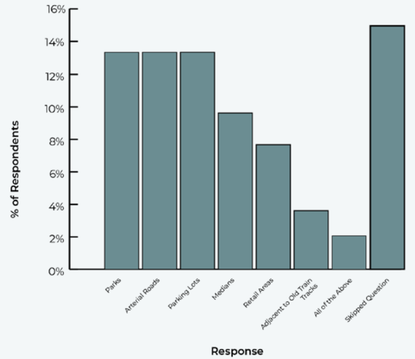
To help gauge public perception of Artesia's urban forestry operations, respondents were asked to indicate their level of satisfaction with the level of care provided to community trees. Nearly 32% of respondents indicated feeling somewhat or completely dissatisfied with the care of community trees (Figure 14). Alternatively, 20% of respondents indicated feeling somewhat or completely satisfied with the level of care for community trees.

Figure 15. Choose the one thing you believe would improve the care of community trees?



To explore opportunities for which the urban forestry program could improve, respondents were asked what one thing would improve the care of community trees. Nearly a quarter of respondents indicated "more frequent care" (Figure 15).

Figure 16. Where would you like to see more community trees planted?



The survey aimed to understand where community members would like to see more trees planted. More than 17% of respondents indicated parks, arterial roads, and parking lots as the preferred tree planting locations, respectively (Figure 16). The survey provided an opportunity for respondents to freely provide comments. Those who commented, most reiterated the importance of education (Appendix G).

We need to take better care of our recently planted trees, remove trees that are currently lifting sidewalks, and [make better] planting choices in the future.

Survey Respondent

Policies & Regulations

Urban forest management operations are influenced by and subject to regulations, policies, and guidance from federal, state, and local direction. The following section provides a summary of the regulatory and guiding policies explored during the development of this Plan. Additional regulations and policies may also apply.

STATE, COUNTY, AND CITY LAW

Endangered Species Act

Signed in 1973, the Endangered Species Act provides for the conservation of species that are endangered or threatened throughout all or within a significant portion of their range, as well as the conservation of the ecosystems on which they depend. The listing of a species as endangered makes it illegal to "take" (i.e., harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. Similar prohibitions usually extend to threatened species.

Migratory Bird Treaty Act (MBTA)

Passed by Congress in 1918, this Act defines that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird unless authorized under a permit issued by the Secretary of the Interior.

The Migratory Bird Treaty Act can impact forestry operations during times when birds are nesting, which may delay work to avoid violating the MBTA.

California Urban Forestry Act

Section 4799.06-4799.12 of the California Public Resources Code defines a chapter known as the California Urban Forestry Act. The Act defines trees as a "vital resource in the urban environment and as an important psychological link with nature for the urban dweller." The Act also enumerates the many environmental, energy, economic, and health benefits that urban forests provide to communities.

The purpose of the Act is to promote urban forest resources and minimize the decline of urban forests in the state of California. To this end, the Act facilitates the creation of permanent jobs related to urban forestry, encourages the coordination of state and local agencies, reduces, or eliminates tree loss, and prevents the introduction and spread of pests. The Act grants the authority to create agencies and mandates that urban forestry departments shall provide technical assistance to urban areas across many disciplines (while also recommending numerous funding tools to achieve these goals).

Model Water Efficient Landscape Ordinance (MWELO)

To promote the conservation and efficient use of water and to prevent the waste of water, a Model Water Efficient Landscape Ordinance (MWELO) (also referenced as Title 24, Part II CalGreen Building Code) was adopted in 2009 and later revised in 2015. The Ordinance requires increases in water efficiency standards for new and retrofitted landscapes through the use of more efficient irrigation systems, greywater usage, and onsite stormwater capture. It also limits the portion of landscapes that can be covered in turf.

California Global Warming Solutions Act

In 2006, the California Global Warming Solutions Act (Assembly Bill 32) was implemented to reduce greenhouse gas emissions. Through this Act, California was the first state in the nation to initiate long-term measures to help mitigate the effects of climate change through improved energy efficiency and renewable technology. California approached the goal to reduce emissions to 1990 levels by 2020 through direct regulations, market-based approaches, voluntary measures, policies, and programs. The 2015 update set targets to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030.

California Solar Shade Control Act

Passed in 1978, California's Solar Shade Control Act supported alternative energy devices, such as solar collectors, and required specific and limited controls on trees and shrubs. Revised in 2009, the Act restricted the placement of trees or shrubs that cast a shadow greater than ten percent of an adjacent existing solar collector's absorption area upon the solar collector surface at any one time between the hours of 10 a.m. and 2 p.m.

The Act exempts trees or shrubs that were:

- Planted before the installation of a solar collector
- Trees or shrubs on land dedicated to commercial crops
- Replacement trees or shrubs that were planted before the installation of a solar collector and subsequently died or were removed (for the protection of public health, safety, and the environment) after the installation of a solar collector
- Trees or shrubs are subject to City and county ordinance

Los Angeles Countywide Comprehensive Parks and Recreation Needs Assessment (2016)

The LA County Parks Needs Assessment summarized the park, infrastructure, and recreational needs and opportunities in Los Angeles County. The assessment identified the City of Artesia with a high need for parks, with less than the county average of three acres of parkland per 1,000 residents.

General Plan 2030

Policy Action CIR 2.1.5 supports Community Goal CIR 2 of the Circulation and Mobility Sub-element for the General Plan through the maintenance and replacement of street trees as needed to achieve the desired aesthetic and avoid conflict with the existing hardscape.

Policy Action OS 3.1.2 for Community Goal OS 3 requires adherence to the City Zoning Code for the installation of street trees.

Community Planning Principle SUS 4 of the Sustainability Element of the General Plan sites that trees contribute to clean water and air and improvements in public health and well-being.

Policy Action SUS 4.1.1 includes exploring the interest of the community in conducting an inventory of existing tree canopy cover, prioritization of planting sites within the City and striving to plant and maintain canopy coverage to support Community Goal SUS 4.

Policy Action SUS 4.1.2 encourages the use of native and drought-tolerant species of trees to support Community Goal SUS 4, which is to preserve, sustain and restore natural resources.

Policy Action SUS 4.1.3 encourages property owners to plant trees that are water efficient, provide habitat for wildlife, produce food, treat stormwater, and/or offer shade in support of Community Goal SUS 4.

Artesia Municipal Code

Title 5 Public welfare, Chapter 1 Public Nuisances, article 1. Nuisances Enumerated defines the City Council may define dead, decayed, diseased, or hazardous trees that are unattractive, a fire hazard, creates or promotes erosion, diminishes property values, or are a detriment to public health, safety, or welfare a public nuisance.

Title 6 Sanitation and Health, Chapter 7 Storm Water Management and Discharge Control allow the Director to provide a "Notice to Clean" for dead or dying trees found in or upon the sidewalk abutting or adjoining any parcel of land.

Title 9 Planning and Zoning, Chapter 1 Subdivisions, Article 7. Improvements require that subdividers plant trees in the parkway panels of streets and highways within or adjacent to a division of land and that the type, species, and location of such trees are subject to review and approval.

Title 9 Planning and Zoning, Chapter 2 Zoning, Article 4. Tentative Maps require that tentative maps show the approximate location of all trees standing within the boundaries of the proposed right-of-way.

Title 9 Planning and Zoning, Chapter 2 Zoning, Article 11. Off-Street Parking and Loading requires a specific number of trees to be planted per parking space, and that trees in these areas be regularly maintained, including pruning and fertilization and replacement of trees in the event of disease or death.

Title 9 Planning and Zoning, Chapter 2 Zoning, Article 15. Landscaping requires that landscaped areas be regularly maintained, including pruning and fertilization, but also replaced in the event of disease or death. The chapter also defines the size and landscape coverage requirements of landscaped areas. The chapter also adopts the California State Model Water Efficient Landscape Ordinance (MWELO).

Title 9 Planning and Zoning, Chapter 2 Zoning, Article 28. Single-Family Residential Zone (R-1) requires that Landscaping, including trees, must be maintained in a neat, clean, and healthy condition, which may include pruning, litter removal, fertilization, and regular watering.

Title 9 Planning and Zoning, Chapter 2 Zoning, Article 36. Standards and Criteria for Residential Condominiums require that trees over 6-inches in diameter be noted on the description of the property and boundary map for conditional use permits and that the project should be designed to maintain as many large trees as practical.

Artesia Boulevard Corridor Specific Plan

The Artesia Boulevard Corridor Specific Plan was initiated to guide growth and development along Artesia Boulevard to encourage economic revitalization and activities. As part of the development of the Artesia Boulevard Corridor Specific Plan, residents were surveyed and indicated that providing more shade trees is an important action for making the corridor more appealing overall. To meet this desire and reduce the heat island effect, the Artesia Boulevard Corridor Specific Plan recommends the use of shade trees to improve the walking environment along the corridor. To support this, the Plan suggests the incorporation of trees into streetscapes, parking lots, seating areas, accent walkways, and near buildings. Additionally, the Artesia Boulevard Corridor Specific Plan provides Design Standards for the use of trees for interior property lines abutting residentially zoned property, including for setbacks and step-backs.

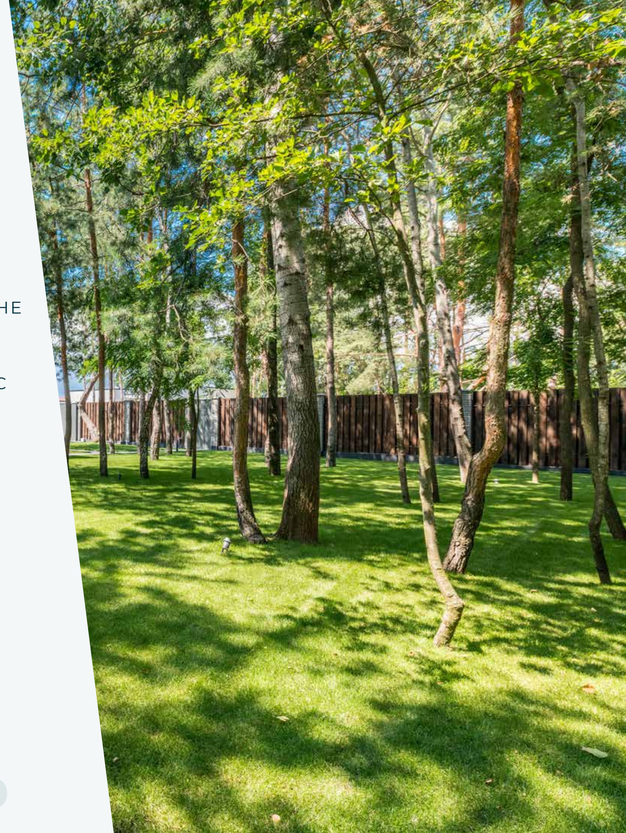
The Artesia Boulevard Corridor Specific Plan acknowledges the importance of conserving water resources and suggests the incorporation of drought tolerant species and the use of "saucers" or tree wells/basins to support water conservation. To support the planting of trees and other streetscape elements, the Plan suggests the use of the Adopt-a-Light Program, where local merchants, businesses, persons, or other entities purchase such fixtures and in return have a plaque with the name or logo affixed to such fixtures.

GOAL:

Increase access to greenspace

OBJECTIVES:

- INCREASE OPPORTUNITIES FOR COMMUNITY ACCESS AND EXPOSURE TO NATURAL ENVIRONMENTS IN AN URBANIZED AREA THROUGH TREE PLANTING AS DEFINED BY THE GENERAL PLAN 2030.
- USE TREES TO SHADE AND SOFTEN HARDSCAPE AREAS, SUCH AS PLAZA, PUBLIC SPACES, PARKING LOTS, NEAR BUILDINGS, AND OTHER PEDESTRIAN WALKWAYS AS SUGGESTED BY THE ARTESIA BOULEVARD CORRIDOR SPECIFIC PLAN AND THE DOWNTOWN DESIGN GUIDELINES.
- IDENTIFY AREAS THAT HAVE THE POTENTIAL TO BE CONVERTED INTO POCKET PARKS
- PARTNER WITH SCHOOLS TO PROVIDE TREE CANOPY IN SCHOOLYARDS



City of Artesia Local Hazard Mitigation Plan (LHMP) (2020)
To assess and reduce the natural cause risks to the City the LHMP was prepared. The LHMP identifies that drought and pests may cause street trees to suffer, which can impact human health, as street trees help to mitigate the effects of urban heat islands and Artesia is already at an elevated risk of extreme heat. The LHMP provides cost estimates for potential losses for various hazards, where the casualties for trees as a result of drought are projected to be estimated at a total loss of $1.4 million. To mitigate the risks posed to trees, Goal 3 includes implementing a program to maintain tree health on City trees and encouraging the school district and private landowners to maintain the health of trees on private property and incorporate species that are more resistant to drought.

Downtown Design Guidelines (2009)
To improve the Downtown area and create a pedestrian-friendly space, the design guidelines for private property focus on humanizing the pedestrian environment and parameters for development review. The guidelines suggest:

- Locate and space trees to allow for mature and long-term growth
- Include both evergreen and deciduous trees to create visual interest and provide shade
- Select species with minimal leaf litter and root intrusion.
- Use trees to provide color and contrast.
- Consider water requirements in species selection.
- Use trees to shade and soften hardscapes in plazas, paseos, and public spaces.

GOAL:

Incorporate trees into other planning documents

OBJECTIVES:

- INCLUDE TREES IN GUIDING DOCUMENTS
  - Cross-reference canopy goals
  - Recognize the urban forest in climate action plans and other carbon offset policies
    - Consider tracking tree plantings to estimate carbon reductions using USFS i-Tree tools
- RECOGNIZE THE IMPLICATIONS OF CLIMATE CHANGE AND HOW IT MAY AFFECT THE RESILIENCY OF THE URBAN FOREST

City of Artesia Sustainability Best Practice Activities
The City of Artesia Sustainability Best Practice Activities (2020) documents activities which the City has completed in 10 areas of sustainability. The City achieved silver recognition for planting 115 new trees since 2013.

Los Angeles County Tree Canopy Assessment
This Tree Canopy Assessment uses 2016 aerial imagery to estimate the current and potential tree canopy in Los Angeles County. When breaking down tree canopy by land use type, it showed that recreational areas have the highest canopy cover in the county whereas residential areas have the highest amount of tree canopy within the City. The Assessment found that the tree canopy is not equally distributed throughout Los Angeles County. Potential planting sites were prioritized by socioeconomic and public welfare variables to help guide future planting. The Assessment recommends strategic tree planting, preserving existing trees, and tracking tree canopy changes through time.

Los Angeles County Climate Action Plan (Updated 2020) (CCAP)
As a component of the Los Angeles County General Plan 2035, the CCAP builds upon existing and ongoing efforts and focuses on actions to reduce GHG emissions associated with community activities to reach carbon neutrality by 2045 in the County. The CCAP outlines a process for implementation and monitoring that integrate with existing sustainability efforts, which will yield co-benefits including improvement in air quality, public health, mobility, and resilience. The development of urban forests was among the original goals of the CCAP.

Los Angeles Flood Control District Safe Clean Water Program (SCW)
In 2018, Measure W was passed by voters, providing tax revenues dedicated to funding projects that increase stormwater capture, reduce reliance on imported water, clean water to reduce the volume of trash, and help eliminate contaminants. Revenue comes from a parcel tax, which is based on the amount of total impermeable area (buildings, sidewalks, driveways, asphalt, concrete, pavers, pool, and other constructed surfaces) on each parcel. Qualifying improvements on a property that treat and/or capture stormwater or urban runoff, such as tree planting, can result in a tax credit. As part of the SCW, municipalities can enter into fund Transfer Agreements. In 2020, Artesia entered into an agreement with Los Angeles County Flood Control District, which will provide Artesia with approximately $210,000 per year until 2024. Several programs have been funded through Measure W for the fiscal year 2021 through 2022.

LA County Parks and Recreation Needs Assessment (2016)
The LA County Parks and Recreation Need Assessment quantifies the need for parks and recreation resources in Los Angeles County and estimates the potential cost of that need. Based on the assessment, Artesia was determined to have a high park need and recommendations included planting new trees at all City parks to replace trees that have been removed. Replacement tree planting in parks began in 2018.

Tree Trimming and Tree Removal Policy (2012)
In 2012, the Beautification and Maintenance Commission presented a draft tree trimming and removal policy, to address the high volume of requests made by residents to trim or remove trees. Because many of these trees were considered to be in good condition, these trees were outside the scope of the established contracted tree maintenance services.

The Tree Removal and Tree Trimming Policy included the following:

- A statement on the importance of trees to the community.
- Defined responsibilities of the Beautification and Maintenance Commission.
- Established criteria for evaluating trimming and removal.
- Defined that the City is responsible for planting, pruning, maintaining, and removing City trees (trees in the rights-of-way).
- Guidelines for species selection and planting standards.

Street Tree Program and Policy (1996)
The City of Artesia Street Tree Program and Policy defines the benefits of trees and establishes circumstances where trees may be planted or removed and outline the proceedings for an appeal. The Policy also provides planting specifications and requirements for residential and commercial areas and states that planting is limited to species on the City of Artesia Master Tree Planting List. In instances where newly constructed streets restrict the parkway to less than 30 inches, the Policy recommends that trees be planted three feet behind the sidewalk in the yard area.

GOAL:

Use trees to support stormwater management systems wherever possible

OBJECTIVES:

- CONTINUE TO SEEK OPPORTUNITIES TO INCORPORATE TREES INTO STORMWATER MANAGEMENT SYSTEMS
  - Continue to expand sidewalks to incorporate tree wells
- IMPLEMENT “SAUCERS” OR TREE WELLS/BASINS TO SUPPORT WATER CONSERVATION (PER *ARTESIA BOULEVARD CORRIDOR SPECIFIC PLAN*)
- ENCOURAGE PRIVATE PROPERTY OWNERS TO PLANT TREES TO CAPTURE STORMWATER AND DECREASE THE CHANCES OF FLOODING DURING RAIN EVENTS
- UNDERSTAND THE IMPACTS SEA LEVEL RISE MAY HAVE ON THE COUNTY AND BE PREPARED AS A REGIONAL COLLABORATOR

[We need to] focus on education and long-term ecological benefits of trees.

Survey Respondent

Priority and Routine Maintenance

During inventory collection, trees were assigned a primary maintenance task (routine pruning, removal, and stump grinding). Table 4 and Figure 17 summarize maintenance needs for community trees across Artesia. Recommendations for maintenance needs are only as good as the data, therefore, regular inspection of all trees will provide the most accurate information on actual maintenance needs. Based on the inventory, 9 trees require removal, and an additional 16 are inspected as removal is recommended. Most trees require routine pruning maintenance, which should be addressed through a pruning cycle.

Figure 17. Priority Maintenance Tasks

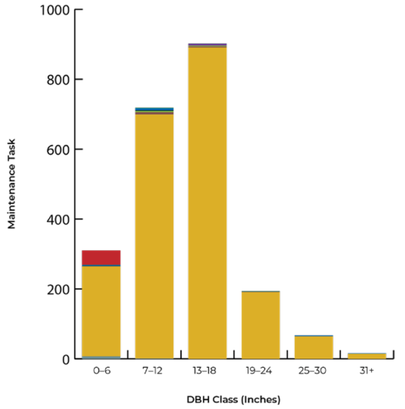


Table 4. Summary of Artesia's Tree Inventory Maintenance Needs

MAINTENANCE NEED										
Diameter Class (inches)	Small Tree Maintenance	Grid Routine Prune	Patrol Diseased or Declining	Removal Dead	Removal Diseased or Declining	Inspect Recommend Removal	Removal Poorly Structured	Stump Grind	Plant	Total
0–6	7	257	1	0	1	2	0	1	41	310
7–12	1	698	7	3	3	5	0	1	0	718
13–18	0	891	3	2	0	5	1	0	0	902
19 - 24	0	191	1	0	0	1	0	1	0	194
25 - 30	0	64	1	0	0	2	0	0	0	67
31 +	0	15	0	0	0	1	0	0	0	16
Activity Total(s)	8	2,116	13	5	4	16	1	3	41	2,207

Table 5. Suggested 4-Year Work Plan, Years 1–5

YEAR 1						YEAR 2					
ROUTINE TREE MAINTENANCE (EXCLUDING PALMS AND CYCLE BUSTERS)											
Tree trimming subdistrict	1a	2c	3c	4d	5a	Year 1 Total	1d	2a	3b	4c	5b	Year 2 Total
Number of trees	12	73	135	40	144	260	27	7	45	34	224	337
Subtotal ($)	$936	$5,694	$10,530	$3,120	$11,232	$20,280	$2,106	$546	$3,510	$2,652	$17,472	$26,286
PALM AND CYCLE BUSTER ROUTINE MAINTENANCE (TWO-YEAR CYCLE)												
Palm and cycle buster group	Palm and cycle buster group A					Year 1 Total	Palm and cycle buster group B					Year 2 Total
Number of trees						402						362
Subtotal ($)						$31,356						$28,236
Total annual cost ($)						$51,636						$54,522

YEAR 3						YEAR 4					
ROUTINE TREE MAINTENANCE (EXCLUDING PALMS AND CYCLE BUSTERS)											
Tree trimming subdistrict	1c	2b	3d	4a	5c	Year 3 Total	3a	4b	5d	1b	2d	Year 4 Total
Number of trees	26	12	152	21	58	269	61	47	155	43	46	352
Subtotal ($)	$2,028	$936	$11,856	$1,638	$4,524	$20,982	$4,758	$3,666	$12,090	$3,354	$3,588	$27,456
PALM AND CYCLE BUSTER ROUTINE MAINTENANCE (TWO-YEAR CYCLE)												
Palm and cycle buster group	Palm and cycle buster group A					Year 3 Total	Palm and cycle buster group B					Year 4 Total
Number of trees						402						362
Subtotal ($)						$31,356						$28,236
Total annual cost ($)						$52,338						$55,692

Routine Maintenance and 4-Year Work Plan

Currently, the City has provided routine care to trees on a three-year cycle using five tree trimming districts for group work. The tree trimming map was likely designed around major arterial roads to help residents easily identify which tree trimming district their address falls within and be able to look at the tree trimming schedule to approximate the time of service.

Most trees are pruned every three years, but palm species and some other fast-growing species (i.e., *Tipu tipuana*) are pruned more regularly, every one to two years.

The tree trimming districts as they are drawn currently have unequal distribution of trees and therefore annual maintenance costs fluctuate. In addition, pruning trees every three years can negatively affect tree health Using the existing tree trimming districts, but also dividing these districts into quarters, is a means to create greater uniformity in annual maintenance and improvements in tree health (Map 5: Suggested Routine Pruning 4-Year Cycle by Tree Trimming District Zones Map 5). As more trees are planted or removed, the number of trees in each tree trimming district will change, but with sub-districts, schedules can easily be modified to rebalance annual costs. Based on the current inventory, Table 5 provides a suggested work plan that identifies the number of trees and the estimated costs for annual maintenance.

To maximize available resources, the plan extends the current three-year cycle to a four-year cycle but has annual maintenance for palm species and two-year cycle busters for trees that require more frequent maintenance (i.e., *Tipu tipuana*).

Tree work plans provide a roadmap by designating annual work to efficiently prioritize the maintenance needs of all of the Tree Trimming District's trees. The suggested four-year work plan does not account for changes in priority maintenance needs.

In other words, if a tree is recommended for a routine prune during the initial inventory collection, but a service request and/or further inspection indicates a heightened maintenance priority, lesser priorities should be organized accordingly.

In years one through five, routine maintenance should follow the suggested 4-year work plan.

YEAR 5 TO YEAR 40

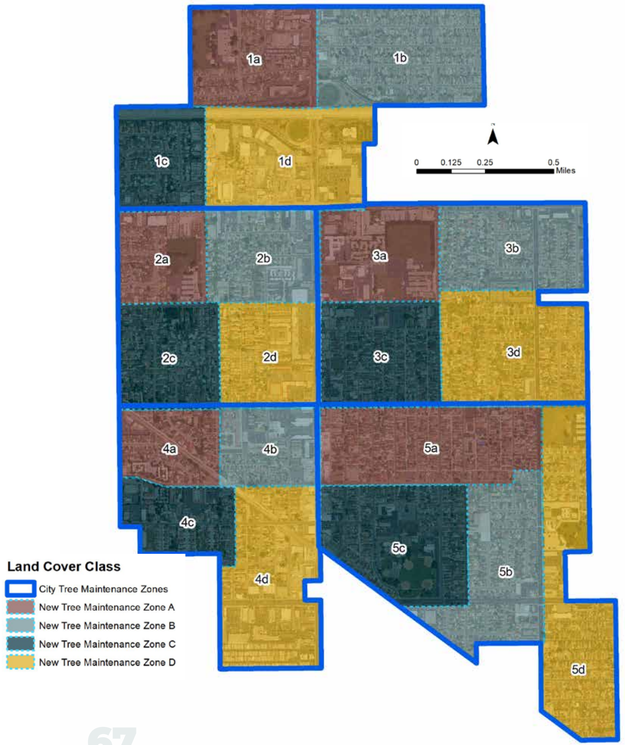
As trees are planted or if tree removals occur, the distribution of trees for each sub-tree trimming district will change. The work plan should be reevaluated every 5-years to redistribute annual maintenance to ensure annual tree maintenance budgets remain stable and there are no large differences in the required funding to complete maintenance.

Tree Planting Plan

The inventory determined that there are 1,328 available planting sites. Additionally, once the 9 trees that were recommended for removal are removed, the total available planting sites will be 1,337. The City received a grant to plant 708 trees in the public rights-of-way over the next three years, which will fill approximately 53% of available planting sites. In 2021, 195 trees were planted as a result of grant funding. To plant the remaining 435 available sites, Artesia will require additional grant funds to support planting efforts or provide annual funds. Based on the approximate cost to plant a tree ($254/tree), to fill the remaining vacant planting sites for years 4 through 8, nearly $30,000 would be required annually.

Table 6. 8-Year Planting Plan

Year	Number of Trees	$ Per Tree	Total Cost ($)
Year 1	217	217	116
Year 2			
Year 3			
Year 4			
Year 5			
Year 6			
Year 7			
Year 8			



We think addressing replacement of trees as they are removed is a good idea to help maintain tree inventory.

Managing Partner

Long-Term Goals

The goals and actions proposed for the Urban Forest Management Plan are organized by three focus areas:

- Grow and maintain a sustainable urban forest
- Preserve and protect the community tree resource
- Connect trees and canopy with the community

The three focus areas are supported by measurable goals and specific actions that will guide the growth of Artesia's urban forestry program for the next 50 years. Many goals and actions support more than one focus area and many also support larger climate resilience strategies.

For each action, the UFMP identifies a priority, a suggested timeframe for accomplishing the action, and an estimated cost range. Priority is identified as:

- High—An action that is critical to protecting existing community assets, reducing/managing risk, or requires minimal resources to accomplish
- Medium—An action that further aligns programming and resource improvements that have been identified as desirable by the community, partners, and/or urban forest managers, but that may require additional investment and financial resources over and above existing levels
- Low—A visionary action, represents an increase in current service levels, or requires significant investment

The estimated cost is categorized in the following ranges:

- $—Less than $25,000
- $$—$25,000–$100,000
- $$$—More than $100,000

GROW AND MAINTAIN A SUSTAINABLE URBAN FOREST

The urban forest provides numerous benefits to the community. The environmental, social, economic, and public health benefits provided by trees and canopy are directly related to the distribution of leaf surface and tree canopy. As trees mature, the benefits that are provided to the community increase. Tree planting is an important component of building canopy; however, trees take a long time to reach maturity and full growth potential. Therefore, the most sustainable means to promote growth and canopy expansion is by maintaining and preserving existing trees and tree canopy.

GOAL:

Adopt a comprehensive Tree Ordinance

OBJECTIVES:

- CONSIDER INCLUDING INDIVIDUALS FROM THE COMMUNITY IN THE REVIEW OF THE PROPOSED TREE ORDINANCE, SUCH AS REALTORS, DEVELOPERS, PLANNERS, NEIGHBORHOOD GROUPS, AND RESIDENTS
- ADOPT A TREE ORDINANCE
- PROVIDE EDUCATION TO THE COMMUNITY ON THE TREE ORDINANCE
  - Include an FAQ on the City website

COST:
$ LOW

PRIORITY:
HIGH

TARGET:
2022

GOAL:

Reach 10% canopy cover by 2040

OBJECTIVES:

- DEFINE SUSTAINABLE ANNUAL PLANTING GOALS AND THE NECESSARY FUNDING REQUIRED TO ACHIEVE DESIRED LEVELS OF PLANTING ON PUBLIC PROPERTY

- INCREASE TREE CANOPY COVER ON PUBLIC PROPERTY
  - Review canopy cover within the ROW
    - Consider a goal to reduce the urban heat island effect by increasing the shade provided by street trees.
  - Plant new trees at all City parks to replace those that have been removed (per LA County Parks and Recreation Needs Assessment)
  - Incorporate more opportunities for trees in streetscapes, parking lots, seating areas, walkways, and near buildings (Artesia Boulevard Corridor Specific Plan)

- PROMOTE TREE PLANTING TO REACH COMMUNITY CANOPY GOALS
  - Encourage the expansion of the urban forest through tree plantings on private property
    - Consider private property behind the sidewalk in areas where parkways are too narrow for street trees (per Street Tree Program and Policy)
  - Expand the urban forest through extensive tree plantings on public property

- REVISIT THE CANOPY GOAL BEFORE 2020

- MAINTAIN EXISTING CANOPY (PER GENERAL PLAN 2030)

- CONFIRM RISK LEVELS BEFORE REMOVING LARGE, MATURE TREES
  - Use new technologies to determine the extent of decay and potential risk of large, mature trees in high use areas (e.g., internal decay testing equipment)
  - Use safety zones to prevent targets

- TRACK TREE CANOPY CHANGES (PER LOS ANGELES COUNTY TREE CANOPY ASSESSMENT)
  - Conduct a land cover assessment every five years to evaluate progress on canopy cover goals.

- ADOPT A TREE ORDINANCE THAT PROMOTES THE PROTECTION OF BOTH CITY TREES AND LARGE TREES ON PRIVATE PROPERTY (I.E., HERITAGE TREE DESIGNATION)
  - Encourage the community to nominate trees for heritage tree designation to preserve large trees on private property
  - Emphasize protecting and preserving heritage trees as defined by the pending adoption of a tree ordinance

COST:
$–$$
LOW–MEDIUM

PRIORITY:
HIGH

TARGET:
ONGOING

GOAL:

Strive for equitable canopy distribution

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

OBJECTIVES:

- PROVIDE EDUCATION ON THE BENEFITS OF TREES TO ENCOURAGE RESIDENTS TO PLANT TREES ON PRIVATE PROPERTY
- INTEGRATE EQUITY PRINCIPLES INTO THE TREE ORDINANCE
- PRESERVE TREES WHENEVER POSSIBLE
- PROMOTE PLANTING TREES ON PRIVATE PROPERTY
- REPLACE TREES THAT HAVE BEEN REMOVED
- ENFORCE TREE PLANTING REQUIREMENTS FOR NEW CONSTRUCTION PROJECTS
- DESIGN SIDEWALKS TO ACCOMMODATE TREE WELLS
- EXPLORE MORE OPPORTUNITIES TO PROVIDE FREE OR INEXPENSIVE TREES TO PLANT ON PRIVATE PROPERTY

COST:
$–$$
LOW–MEDIUM

PRIORITY:
HIGH

TARGET:
ONGOING

GOAL:

Promote species diversity

Species diversity is important for retaining a healthy urban forest and reaping its benefits. With a more diverse urban tree population, not only does it make for a more interesting palette, but the urban forest will be less prone to disease and die off. Climate change is an important concern, and more diverse species composition will have a better chance of being resilient with the related challenges to come.

OBJECTIVES:

SET SPECIES DIVERSITY GOALS FOR THE COMMUNITY TREE RESOURCE

- Reduce reliance on the most prevalent species, Mexican fan palm and Australian willow
- At a minimum, pursue species diversity goals that meet the 10-20-30 rule, but strive for even greater diversity among genera

REVISE THE MASTER STREET TREE LIST (INCLUDED IN THE APPENDICES OF BOTH THE 1996 AND 2012 TREE TRIMMING AND REMOVAL POLICY)

- Consider prohibiting the planting of palms in the rights-of-way
- Consider recommending fruit trees as non-street trees
- Choose species with tolerance to the urban environment (even if this excludes natives)
- Monitor species performance and periodically update the Master Street Tree List to include species that are performing well and exclude species that are performing poorly
- Tie the climate change projections for Artesia (e.g., changes in temperature and precipitation) to the current climate of a comparable City and explore their species palette
    - Introduce tree species that are suitable for the current and predicted future climate
- Communicate and coordinate with foresters in the region to share information on the greatest vulnerabilities and species that may be best adapted

AVOID PLANTING SPECIES OF TREES WITH SIMILAR VULNERABILITIES TO PESTS AND DISEASE AS CURRENT SPECIES

- Stay up to date with potential pest and disease threats
- Consider susceptibility to pests and disease during species selection
- Diversify plantings at the genus level, as many pests threaten several species within a genus
- Use pest resistant species and cultivars when available

CONDUCT A RESOURCE ANALYSIS EVERY 5-10 YEARS TO MONITOR PROGRESS ON DIVERSITY GOALS

PROMOTE SPECIES DIVERSITY ON PRIVATE PROPERTY

COST:
$ LOW

PRIORITY:
HIGH

TARGET:
ONGOING

GOAL:

Increase tree planting on private property

Public space is limited in the City of Artesia, which is why private property is a focus for increasing tree canopy. Residents of Artesia are not always aware of the benefits of planting trees or whether trees in the right of way are property of the City. Education, outreach, and incentives for planting trees will further the goal to increase private property planting.

OBJECTIVES:

- EXPLORE PARTNERING WITH THE LOCAL UTILITY PROVIDER TO INCENTIVIZE THE PLANTING OF SHADE TREES TO REDUCE ENERGY COSTS
- CONTINUE TO PROACTIVELY MAINTAIN EXISTING TREES ON PUBLIC PROPERTY, INCLUDING RESIDENTIAL PARKWAYS (PER LOS ANGELES COUNTY TREE CANOPY ASSESSMENT, CITY OF ARTESIA LOCAL HAZARD MITIGATION PLAN)
- ENCOURAGE PRIVATE PROPERTY OWNERS TO MAINTAIN EXISTING TREES ON PRIVATE PROPERTY(2020 LOCAL HAZARD MITIGATION PLAN)
- CONSIDER PARTNERING WITH LOCAL SCHOOLS TO PRESERVE TREE CANOPY ON PRIVATE PROPERTY (2020 LOCAL HAZARD MITIGATION PLAN)
- EXPLORE MORE OPPORTUNITIES TO PROVIDE FREE OR INEXPENSIVE TREES TO PLANT ON PRIVATE PROPERTY
- PROMOTE THE ADOPT-A-TREE PROGRAM AND ASSOCIATED EVENTS
- PROVIDE EDUCATION ON THE BENEFITS OF TREES TO ENCOURAGE RESIDENTS TO PLANT TREES ON PRIVATE PROPERTY
  - Increase awareness of how the urban forest can help the community face changes in climate

COST:
$ LOW

PRIORITY:
MEDIUM

TARGET:
2022

PRESERVE AND PROTECT THE COMMUNITY TREE RESOURCE

The community tree resource is a publicly owned asset that provides critical benefits to health, economic, social, aesthetic, and quality of life for residents and visitors. The replacement value of the existing resource is nearly $5.6 million. Annually, the community tree resource provides nearly $15,206 in benefits to Artesia. Proactive and consistent management of this resource will ensure sustainability, safety, and a stable flow of benefits now and for future generations.

GOAL:

Become a Tree City USA

By meeting the standards to obtain a Tree City USA designation, Artesia would have a solid foundation on which to build the urban forest program. By maintaining a tree board or program, the City has staff to manage the urban forest program. By adopting a tree ordinance, the City will have a legal document to set tree program standards. Holding an Arbor Day event could potentially improve public relations, help the program gain more support from the community, and be an opportunity for a public tree planting event. Finally, a Tree City USA designation will recognize Artesia for taking steps for its urban forest among partners, external organizations, and neighboring communities.

OBJECTIVES:

- ADOPT A TREE ORDINANCE
- DESIGNATE THE PUBLIC WORKS DEPARTMENT AS THE HAVING THE LEGAL RESPONSIBILITY FOR THE CARE OF ALL CITY TREES
- OBSERVE AND HAVE A FORMAL PROCLAMATION OF ARBOR DAY
- APPLY FOR TREE CITY USA DESIGNATION

COST:
$ LOW

PRIORITY:
HIGH

TARGET:
2022–2023

GOAL:

Employ an ISA Certified Arborist

Having an ISA certified arborist within City staff would be very helpful in ensuring proper tree care is performed to industry standards. An ISA certification qualifies that an individual has been trained in the field of arboriculture and has the necessary education and/or experience to perform tree work and oversee contractors.

OBJECTIVES:

- TRAIN MAINTENANCE STAFF MEMBER(S) TO INSPECT TREES AND REVIEW CONTRACTED TREE SERVICES TO ENSURE OPTIMAL CARE FOR CITY TREES
- ENCOURAGE EXISTING STAFF TO BECOME CERTIFIED ARBORISTS
- ALTERNATIVELY, HIRE A SECONDARY ON-CALL ARBORIST TO INSPECT OTHER TREE CONTRACTORS' WORK AND TO PROVIDE MAINTENANCE RECOMMENDATIONS
- AMEND CONTRACTOR AGREEMENT TO REQUIRE ADHERENCE TO THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) STANDARDS, ISA BEST MANAGEMENT PRACTICES, AND TO HAVE A CERTIFIED ARBORIST ON STAFF
- ENGAGE IN PROFESSIONAL DEVELOPMENT

COST:
$–$$
LOW–MEDIUM

PRIORITY:
MEDIUM

TARGET:
2022–2025

GOAL:

Increase contractor oversight

Contractors can provide a valuable service for the City when internal staffing is limited, or maintenance needs are out of the scope of City staff. While external contractors are professionally trained, the work they perform may not always be justified. Without oversight by knowledgable City staff, there is potential for unnecessary work to be performed or the work that is performed is not within standards that the City will accept. The City can implement standards under ANSI A300 for contractors to follow, promote City staff to become Certified Arborists and explore other ways to increase contractor oversight.

OBJECTIVES:

- REVISE CONTRACT TO INCLUDE ADHERENCE TO ANSI A300
  - Prohibit improper pruning techniques
- FOLLOW WORK PLAN SCHEDULES
- CONTINUE TO CONDUCT ROUTINE MAINTENANCE ON A CYCLE
  - Avoid pruning trees that do not need maintenance
  - Continue to schedule more frequent maintenance for palms
  - Use the inventory to track species that need more regular maintenance and use this information to schedule more frequent maintenance for these species
- CONSIDER HIRING AN ADDITIONAL CONTRACTOR TO PRESCRIBE MAINTENANCE AND REVIEW OTHER CONTRACTORS' WORK
  - Ensure trees are maintained to promote tree health and good structure
  - Inspect trees regularly to provide appropriate and timely care
    - Keep a record of maintenance needs
    - Identify trees in poor condition
    - Inspect large, mature trees regularly to provide proactive maintenance and sustain their benefits and contributions
- ENCOURAGE INTERNAL STAFF TO BECOME CERTIFIED ARBORISTS
- TRAIN INTERNAL STAFF TO RECOGNIZE COMMON MAINTENANCE ISSUES

COST:
$ LOW

PRIORITY:
HIGH

TARGET:
2022

GOAL:

Provide consistent and adequate maintenance to City trees

Consistent, proactive maintenance of trees is vitally important for the overall health and resilience of the urban forest. With proactive maintenance, costly issues or hazards can be avoided. Currently, a 3-year pruning cycle is more than adequate to serve the urban forest and could be extended to a 4-year cycle. Certain tree species which require more frequent maintenance, or "cycle busters", can be given more attention and more proactive maintenance.

OBJECTIVES:

- CONSIDER REMAPPING PRUNING DISTRICTS TO ALLOW FOR A MORE EVEN DISTRIBUTION OF TREES
- CONSIDER EXTENDING THE CURRENT THREE-YEAR PRUNING CYCLE TO FOUR YEARS
  - Schedule more frequent proactive maintenance for "cycle buster" species that require more regular maintenance (e.g., palms and Tipu tipuana)
  - Provide education to residents on why more frequent pruning is not generally beneficial and may be harmful in some instances.
- CONTINUE TO PROVIDE TREE TRIMMING DISTRICT MAP ON THE CITY WEBSITE ALONG WITH AN ESTIMATED MAINTENANCE SCHEDULE

COST:
$$ MEDIUM

PRIORITY:
HIGH

TARGET:
2022–ONGOING

GOAL:

Stable and consistent funding

Stable and consistent funding is a key component to building and maintaining the urban forest going forward. The urban forest is a living resource that requires proper care and maintenance to provide the most optimal benefits throughout its lifespan. Sometimes, specific care is needed during certain stages of the life of a tree, such as with early structural pruning and training. By making strategic plans to care for trees during these periods, extra cost and maintenance can be avoided later when structural conflicts can arise.

OBJECTIVES:

- DIVIDE TREE TRIMMING DISTRICTS DOWN TO DISTRIBUTE TREES MORE EQUITABLY WITHIN TREE TRIMMING DISTRICTS AND BALANCE ANNUAL COSTS
- CONSIDER EXTENDED PRUNING CYCLES TO SPREAD COSTS OVER A LONGER PERIOD
- DEVELOP A TREE PLANTING PLAN TO OPTIMIZE AVAILABLE FUNDS FOR TREE PLANTING
- CONSIDER AN OVERLAY DISTRICT THAT CAN ONLY BE USED FOR URBAN FORESTRY PROGRAMMING
- CONTINUE TO EXPLORE AND PURSUE GRANT FUNDING OPPORTUNITIES

COST:
$$ MEDIUM

PRIORITY:
HIGH

TARGET:
2022–ONGOING

GOAL:

Formulate a long-term tree planting program

Trees are long-term investments, as are urban forests as a whole which require careful planning and preparation. The urban forest can be thought of as its living and breathing organism, which needs to be replenished through thoughtful and planned tree replacement. As trees take years, even decades to fully mature, long-term visioning is required to develop a long-term planting program.

OBJECTIVES:

- ESTABLISH A TREE FUND TO DIVERT MITIGATION FUNDS TO URBAN FOREST PROGRAMMING, INCLUDING TREE PLANTING

- IDENTIFY POTENTIAL PLANTING SITES, INCLUDING SITES LOCATED IN FUTURE POCKET PARKS

- USE A TREE PLANTING PLAN AND PRIORITIZE TREE PLANTING AS PART OF THE ANNUAL MAINTENANCE
  - Include watering and training pruning during establishment
  - Prioritize tree planting where the incorporation of trees would optimize the benefits received
  - Prioritize tree planting where the incorporation of trees would provide residents with more equal access to trees and the associated benefits
  - Dedicate annual funding to tree planting
  - Continue exploring grant funding for planting activities

- CONTINUE TO PARTNER WITH LOS ANGELES CONSERVATION CORPS TO SUPPORT BEST PRACTICES IN TREE PLANTING AND POST-PLANTING CARE
  - Choose healthy, vigorous nursery stock
  - Provide newly planted trees with regular watering
  - Stake trees, when necessary, but ensure stakes are monitored and removed to prevent tree damage
  - Conduct training pruning once new trees are established, typically several years after planting

COST:
$ LOW

PRIORITY:
MEDIUM

TARGET:
2022–ONGOING

GOAL:

Distinguish City trees

Clear parameters that define what constitutes a City tree are beneficial for residents to understand responsibilities for maintenance. Residents that know that a City tree is adjacent to their property and understand that routine care is the responsibility of the City will not try and perform maintenance themselves. With a tree ordinance that explicitly protects City trees, the City can convey a consistent message to ensure residents understand local regulations. With clear protections for City trees, residents will have greater awareness about their responsibility for watering trees adjacent to their property and reduce instances of improper pruning and illegal removal.

OBJECTIVES:

- ADOPT A TREE ORDINANCE
- DESIGNATE THE PUBLIC WORKS DEPARTMENT AS THE HAVING THE LEGAL RESPONSIBILITY FOR THE CARE OF ALL CITY TREES
- OBSERVE AND HAVE A FORMAL PROCLAMATION OF ARBOR DAY
- APPLY FOR TREE CITY USA DESIGNATION

COST:
$ LOW

PRIORITY:
HIGH

TARGET:
2022–2023

GOAL:

Maintain tree inventory

Having an updated inventory is important to effectively manage and maintain the urban forest. By having an updated inventory, urban forest managers can use current community tree resource conditions and the exact stocking level, including available planting sites, to maximize the growth and benefits of an urban forest.

OBJECTIVES:

- REQUIRE CONTRACTORS TO MAINTAIN AN UP-TO-DATE TREE INVENTORY
  - Updates to tree condition and DBH as maintenance occurs
  - Assign a species to all trees
- USE THE INVENTORY TO TRACK THE STOCKING LEVELS
- MONITOR THE CONDITION OF TREES AND USE THIS DATA TO IDENTIFY HIGH PERFORMING OR MALADAPTED SPECIES TO GUIDE FUTURE PLANTING

COST:
$$ MEDIUM

PRIORITY:
HIGH

TARGET:
ONGOING

GOAL:

Update tree planting standards to be consistent with current industry standards and to save on planting costs

Current tree planting standards add unnecessary cost, and difficulty to planting trees, and are not the best practices to promote healthy tree growth. By using ANSI A300 standards, the City would not have to spend time developing its own new standards or updating the existing standards. In addition, ANSI A300 standards are regularly updated, so as long as the City includes ANSI A300 in their tree ordinance as their current standards, they will remain up to date. Requiring contractors to follow ANSI A300, Z133, and Z60.1 will ensure tree maintenance follows industry standards.

OBJECTIVES:

- PLANT TREES IN ACCORDANCE WITH ANSI A300
- REQUIRE CONTRACTORS TO CONDUCT ALL TREE WORK IN ACCORDANCE WITH ANSI A300, Z133, AND Z60.1
- ADOPT A TREE ORDINANCE
  - Define irrigation of street trees as a responsibility of adjacent property owners
- PLANT TREES IN SITES WITH ADEQUATE SOIL VOLUMES, TO ALLOW TREES TO REACH MATURE SIZE AND CANOPY SPREAD

- AVOID THE USE OF ROOT BARRIERS
- CONSIDER ALTERNATIVE SPECIES IF CONFLICTS WITH GRAY INFRASTRUCTURE ARE A CONCERN
  - Avoid planting species with high-water use
  - Plant drought tolerant species
- PROVIDE IRRIGATION TO TREES THAT ARE COMPLIANT WITH MWELO
- PROVIDE WATER TO TREES EVEN DURING PERIODS OF DROUGHT

COST:
$ LOW

PRIORITY:
HIGH

TARGET:
2022

CONNECT TREES AND CANOPY WITH THE COMMUNITY

Trees greatly improve the aesthetics of any community and studies have shown they can greatly increase economic opportunities for businesses and enhance educational performance. Street trees that are regularly maintained experience better health and structure, which make trees safer. With safer trees and better-maintained trees, Artesia will greatly enhance the look and feel of the community and encourage greater economic development and use to improve and enhance other infrastructure.

GOAL:

Engage the community in urban forest programming

Community engagement is vital to an urban forest program. Without community support, there are limits to what a City can do to improve a community's urban forest. Community members often are the backbone of urban forests, whether it is through volunteerism, private planting, or support of local revenue measures that provide funding for tree-related programs. Through dedicated outreach, community events, educational programs, and more, the City can strive to increase community engagement.

OBJECTIVES:

- CONTINUE TO PROVIDE URBAN FORESTRY PROGRAMMING INFORMATION ON THE CITY WEBSITE
  - Provide a FAQ sheet
  - Publish articles and fact sheets about common pest issues on the website
  - Regularly update the City events calendar
  - Broadcast important urban forestry information through public service announcements on local radios, billboards, television, and other media
  - Provide materials in multiple different languages
- CONSIDER TRANSLATING TREE INFORMATION MATERIALS INTO OTHER LANGUAGES, TO ALLOW FOR GREATER ACCESSIBILITY
- CONTINUE TO SPONSOR AND PROMOTE TREE-RELATED EVENTS, THE BENEFITS OF TREES, AND THE IMPORTANCE OF TREE CARE
- INCLUDE TREE-RELATED INFORMATION IN THE CITY'S SOCIAL MEDIA PRESENCE
- EXPLORE THE USE OF POP-UP EVENTS
- CATER OUTREACH AND ENGAGEMENT WITH YOUTH
- PROMOTE STUDENT PARTICIPATION IN TREE-RELATED EVENTS
  - Partner with schools to promote tree related activities
  - Coordinate Arbor Day events with local schools
  - Explore a drop-in program for youth that would engage youth in environmental education, including urban forestry topics

COST:
$ LOW

PRIORITY:
MEDIUM

TARGET:
2022–2024

GOAL:

Continue existing partnerships and look for other connections with local tree advocacy groups

Existing partnerships with Los Angeles Conservation Corps and TreePeople have resulted in the acquisition of grant funding not only for tree planting but also for the completion of this UFMP. Further engagement and partnership with these groups will greatly benefit Artesia through an expanded network of tree partners and advocates for the urban forest.

OBJECTIVES:

- CONTINUE TO LOOK FOR GRANT OPPORTUNITIES TO SUPPORT FUTURE PARTNERSHIPS
- CONSIDER ALLOCATING A LINE ITEM IN THE BUDGET TO SUPPORT CONTINUED TREE ESTABLISHMENT SERVICES PROVIDED BY LOS ANGELES CONSERVATION CORPS
- CONTINUED PARTNERSHIP WITH TREEPEOPLE TO PROVIDE EDUCATION AND OUTREACH
- EXPLORE RELATIONSHIPS WITH LOCAL UTILITY PROVIDERS, SCHOOL DISTRICTS, OR OTHER ADVOCACY GROUPS

COST:
$ LOW

PRIORITY:
MEDIUM

TARGET:
ONGOING

GOAL:

Increase access to greenspace

Greenspace is not only important to human wellness, but also wildlife. Trees are one-way communities can adapt to climate change. Impervious surfaces, blacktops, and paved areas increase urban heat island effects and are not conducive to plant growth. Additionally, they increase stormwater runoff and are not aesthetically pleasing or beneficial to mood. By identifying areas to increase greenspace, the urban forest canopy can increase as well as provide more benefits to lessen the effects of climate change and enhance community wellbeing.

OBJECTIVES:

- INCREASE OPPORTUNITIES FOR COMMUNITY ACCESS AND EXPOSURE TO NATURAL ENVIRONMENTS IN AN URBANIZED AREA THROUGH TREE PLANTING AS DEFINED BY THE GENERAL PLAN 2030.
- USE TREES TO SHADE AND SOFTEN HARDSCAPE AREAS, SUCH AS PLAZAS, PUBLIC SPACES, PARKING LOTS, NEAR BUILDINGS, AND OTHER PEDESTRIAN WALKWAYS AS SUGGESTED BY THE ARTESIA BOULEVARD CORRIDOR SPECIFIC PLAN AND THE DOWNTOWN DESIGN GUIDELINES
- IDENTIFY AREAS THAT HAVE THE POTENTIAL TO BE CONVERTED INTO POCKET PARKS
- PARTNER WITH SCHOOLS TO PROVIDE TREE CANOPY IN SCHOOLYARDS

COST:
$$–$$$
MEDIUM–HIGH

PRIORITY:
MEDIUM

TARGET:
2025–2030

GOAL:

Use trees to enhance community livability and aesthetics

People's perception of trees is heavily affected by how they beautify a City or improve livability among streets and neighborhoods. When planted strategically along streets, corridors, and in parks, trees can enhance everyday life, improve mood, and increase property values. Trees have even been shown to increase test scores at schools.

OBJECTIVES:

- PRIORITIZE PLANTING OF TREES AND PRESERVATION OF EXISTING TREES IN AREAS WITH LESS CANOPY COVER
- DEVELOP POLICIES AROUND PARKING LOT SHADE.
  - Plant trees to shade parking lots (per Artesia Boulevard Corridor Specific Plan)
  - Require minimum shade requirements for the reconstruction or construction of parking lots
  - Consider parking lot canopies as potential community solar locations to allow for greater tree planting on individual parcels and decrease conflicts with street trees
- EMPHASIZE RETAINING AND INCORPORATING TREES IN DEVELOPMENT AND REDEVELOPMENT PROJECTS
  - Use tree protection zones during construction
- PLANT EVERGREEN AND DECIDUOUS TREES TO CREATE VISUAL INTEREST
- REPLACE STREET TREES AS NEEDED TO ACHIEVE THE DESIRED AESTHETIC

- PLANT TREES TO SHADE PUBLIC SPACES THAT HAVE A HIGH AMOUNT OF IMPERVIOUS SURFACES SUCH AS STREETSCAPES, PARKING LOTS, NEAR BUILDINGS, PLAZAS, AND OTHER SEATING AREAS
- PLANT TREES TO SHADE PEDESTRIAN CORRIDORS TO IMPROVE WALKABILITY
- INCORPORATE MEDIAN PLANTINGS WHEN POSSIBLE
- USE ALTERNATIVE PLANTER DESIGNS TO ALLOW FOR MORE SPACE FOR TREE PLANTING
- USE ALTERNATIVE DESIGNS AND MATERIALS TO AVOID TREE REMOVAL OR ROOT PRUNING
- PROMOTE TUNNELING/BORING FOR UTILITY LINE INSTALLATION TO DECREASE TREE AND OVERHEAD UTILITY CONFLICTS
- SUPPORT TREE CANOPY AND UNDERSTORY PLANT SPECIES (E.G., SHRUBS, PERENNIALS) TO INCREASE WILDLIFE HABITAT AND PROVIDE CORRIDORS THAT CONNECT GREENSPACES TO ALLOW FOR WILDLIFE MOVEMENT

COST:
$ LOW

PRIORITY:
MEDIUM

TARGET:
ONGOING

GOAL:

Formalize emergency response procedures

While trees are extremely beneficial, they present inherent risks when they are ingrained in an urban environment and its infrastructure. Major storm events, while perhaps infrequent, can inflict heavy damages, present hazards, and can result in losses for the urban forest when they do occur. Without proper planning set in place, management and emergency response will not be able to effectively take action when emergency events occur.

OBJECTIVES:

- DEVELOP AN EMERGENCY RESPONSE PLAN
  - Include procedures for:
    - Debris storage and staging areas
    - Emergency communications
    - Program in relief shifts
- PROVIDE TRAINING TO STAFF ON SAFETY AS IT RELATES TO EMERGENCY EVENTS AND THE DANGERS THAT MAY EXIST AS A RESULT OF A TREE AND/OR BRANCH FAILURES
  - Continue to conduct job site briefings prior to work.
  - Continue to provide training on proper handling and use of chainsaws and other equipment
  - Continue to engage staff in weekly safety tailgates and keep records of participation
- HAVE PREPAREDNESS PLANS AND FUNDING IN PLACE IN THE CASE OF DAMAGE TO TREES DURING EXTREME WEATHER EVENTS
- ESTABLISH MUTUAL AID AGREEMENTS WITH NEIGHBORING COMMUNITIES

COST:
$ LOW

PRIORITY:
HIGH

TARGET:
2023

GOAL:

Incorporate trees into other planning documents

Uniform policies reduce confusion between departments and community members and transcend departmental changes. The more documents that reference the UFMP and BMPs, the greater the recognition of the value of trees in the community, and the greater the commitment to protect this resource.

OBJECTIVES:

- INCLUDE TREES IN GUIDING DOCUMENTS
  - Cross-reference canopy goals
  - Recognize the urban forest in climate action plans and other carbon offset policies
  - Consider tracking tree plantings to estimate carbon reductions using USFS i-Tree tools
- RECOGNIZE THE IMPLICATIONS OF CLIMATE CHANGE AND HOW IT MAY AFFECT THE RESILIENCY OF THE URBAN FOREST

COST:
$ LOW

PRIORITY:
HIGH

TARGET:
2022–ONGOING

GOAL:

Use trees to support stormwater systems wherever possible

Stormwater infrastructure is used to divert and retain water for trees, reduce the volume and rate of runoff, and lessen the impacts of flooding. Permeable surfaces can be implemented, in areas prone to flooding or areas where tree establishment has been difficult due to limited soil volume. By incorporating trees into these systems wherever possible, trees can provide both cost savings and enhanced environmental benefits, as their leaves, bark, and roots work together to filter stormwater and slow water infiltration into the soil.

OBJECTIVES:

- CONTINUE TO SEEK OPPORTUNITIES TO INCORPORATE TREES INTO STORMWATER MANAGEMENT SYSTEMS
  - Continue to expand sidewalks to incorporate tree wells
- IMPLEMENT “SAUCERS” OR TREE WELLS/BASINS TO SUPPORT WATER CONSERVATION (PER ARTESIA BOULEVARD CORRIDOR SPECIFIC PLAN)
- ENCOURAGE PRIVATE PROPERTY OWNERS TO PLANT TREES TO CAPTURE STORMWATER AND DECREASE THE CHANCES OF FLOODING DURING RAIN EVENTS
- UNDERSTAND THE IMPACTS SEA LEVEL RISE MAY HAVE ON THE COUNTY AND BE PREPARED AS A REGIONAL COLLABORATOR

COST:
$$ MEDIUM

PRIORITY:
MEDIUM

TARGET:
ONGOING

GOAL:

Plant trees in the rights-of-ways where residents request trees

By actively responding to residents’ requests to plant trees, the urban forest program can build a rapport with community members and foster positive relations.

OBJECTIVES:

- DEVELOP AN ONLINE REQUEST FORM FOR RESIDENTS TO REQUEST A TREE BE PLANTED

COST:
$ LOW

PRIORITY:
MEDIUM

TARGET:
ONGOING

Resiliency Strategies

As climate change causes temperatures to rise and precipitation patterns to fluctuate from historical norms, existing trees must adapt or succumb to the changes in climate. Based on future climate projections, severe impacts on the urban forest are anticipated, including increased management costs and loss of canopy from declines in overall tree health. Despite anticipated negative outcomes for trees and the urban forest, the urban forest can be used as a tool to adapt to climate change.

In recognition of the urban forests' role in mitigating the effects of climate change, in 2021 the USDA Forest Service published nine strategies to increase resilience in the urban forest and communities to climate change, including the following (Janowiak et al. 2021):

- Activate social systems for equitable climate adaptation, urban forest, and human health outcomes
- Reduce the impact of human health threats and stressors using urban trees and forests
- Maintain or increase the extent of urban forests and vegetative cover
- Sustain or restore fundamental ecological functions of urban ecosystems
- Reduce the impact of physical and biological stressors on urban forests
- Enhance taxonomic, functional, and structural diversity
- Alter urban ecosystems toward new and expected conditions
- Promote mental and social health in response to climate change
- Promote human health co-benefits in nature-based climate adaptation

Strategy 1: Activate social systems for equitable climate adaptation, urban forest, and human health outcomes

An effective response to climate change will require collaboration. Strategy 1 highlights the importance of engaging the community and leadership as a means to help sustain the urban forest, respond to climate change, and invoke broader policy to meet environmental justice goals for the health of both trees and people.

The key adaptation methods or approaches include:

- Address socio-ecological systems in an early, comprehensive response.
- Integrate urban forestry in climate planning and policy.
- Address climate and health challenges of disadvantaged communities and vulnerable populations.

The following are examples of how urban forest management can activate social systems for equitable climate adaptation, urban forest, and human health outcomes:

- Engage the Community in the Urban Forest—When a community recognizes the many benefits provided by trees, supports the urban forest, and engages in activities related to trees, the community is more aware of their responsibility in the care of public and private trees and the resilience of the urban forest to climate change.
- Share Common Goals and Collaborate with Urban Forestry Partners—Partner with other green industry leaders, neighboring communities, regional groups, nonprofits, businesses, utility and state agencies, and other municipal agencies to work together to support the urban forest and climate change response efforts.
- Capitalize on Tree Planting Efforts to Address Climate Based Impacts—Communities of black, indigenous, and other people of color have been disadvantaged by racially motivated policies, like redlining. Early studies suggest that one of the impacts of such policies is fewer trees in areas where more of these groups live. Planting trees is hugely beneficial, but through the strategic planting of trees, not only can some of these disparities in canopy distribution be alleviated, but climate concerns can also be addressed.
- Create New and Expand Existing Urban Natural Areas—Promote greater species diversity, expand canopy cover and the urban forest through creating, restoring, and/or expanding the size of urban natural areas.

Strategy 2: Reduce the impact of human health threats and stressors using urban trees and forests.

The key adaptation methods or approaches include:

- Reduce extreme temperatures and heat exposure.
- Improve urban air quality conditions.
- Anticipate and reduce human health impacts of hazardous weather and disturbance events.

The following are examples of how urban forest management can be used to reduce the impacts of human health threats and stressors:

- Achieve Optimal Canopy Cover—The benefits of trees are directly attributed to their canopy. To optimize the benefits of the canopy, managers should seek to achieve optimal canopy cover and equitable distribution across a community. The use of accurate, high-resolution canopy data can approximate optimal canopy cover levels. By identifying canopy potential, managers can work with the community to set long-term canopy goals and promote the preservation of existing trees on private property and incentivize the planting of trees on private property.
- Reduce Urban Heat Islands –Urban heat islands contribute significantly to high temperatures in urban areas and can result in consequences to human health. Some of the effects of urban heat islands can be abated through the strategic planting of trees to shade hardscapes (e.g., parking lots, streets, and other impervious surfaces).
- Create "Green Screens"—Exhaust from cars and trucks are the main source of air pollution (California Office of Environmental Health Hazard Assessment, 2021). Communities adjacent to major roads and highways are heavily exposed to air pollutants and noise. Planting trees and creating "Green Screens" near major emissions sources (especially adjacent to high-speed transportation corridors) and selecting tree species with specific traits for particulate capture can result in improvements in air quality (Janowiak et al. 2021).
- Establish Plans and Funding Reserves in Case of Natural Disaster—A variety of consequences can result from severe weather events and climate changes. The ability to adapt and recover from damages to infrastructure, property, community health impacts, and environmental contamination is critical to our way of life (Carter et al. 2015). A disaster management plan is in place in the case of damage to trees during extreme weather events. The plan includes staff roles, contracts, response priorities, debris management, and a crisis communication plan. Staff is regularly trained and/or updated.

Strategy 3: Maintain or increase the extent of urban forests and vegetative cover.

A healthy urban forest is more able to withstand stresses, including the direct and indirect impacts of climate change. By increasing the extent of urban forests and canopy cover, the benefits they provide and the climate change mitigation functions they provide can be maximized.

The key adaptation methods or approaches include:

- Minimize forest loss and degradation.
- Maintain existing trees through proper care and maintenance.
- Restore and increase tree, forest, and vegetative cover.
- Sustain sites and ecosystems that provide high value across the landscape.

The following are examples of how urban forest management can support the maintenance and expansion of canopy cover:

- Provide Clear Guidance and Protections Through a Tree Ordinance—A tree ordinance provides enforceable guidance for adequate maintenance and protection of the canopy cover provided by significant trees on private property. With strong enforcement, the loss of individual trees will not result in significant losses to the overall canopy cover.
- Define and Protect Heritage Trees—Trees are long-lived organisms and mature trees provide the greatest benefits. Defining heritage trees as those trees that are especially significant to the community promotes their protection and recognizes the benefits of mature or unique trees, which can further promote canopy protection and enhancement.
- Protect Trees During Development and Redevelopment—According to the USDA Forest Service, it is estimated that 175,000 acres of urban forest were lost per year between 2009 to 2014 due to development. During the same period, pavement and other impervious surfaces grew by 167,000 acres each year (Janowiak et al. 2021). While space is limited in urban areas, redevelopment projects do not have to result in the loss of trees and tree canopy. By establishing tree protection measures and implementing protection requirements whenever construction occurs near trees, the loss of valuable canopy cover can be avoided. Further restrictions on the development and/or acquisition of land for preservation and/or creation of conservation easements on private land holdings can limit development and its effects on the urban forest.
- Follow a Comprehensive Tree Planting and Replacement Plan—With a comprehensive tree planting and replacement plan, the resources needed to plant trees and establish trees can be more efficiently used and strategically used to meet canopy goals and maximize potential benefits (i.e., planting large-stature trees where space allows, prioritizing growth and expansion of canopy to address canopy distribution inequities, planting trees at optimal distance and direction from building to offset carbon emissions from heating and cooling).
- Routinely Maintain Trees –When all community trees are proactively and systematically maintained on a cyclical basis, optimal tree health and condition are more easily achieved, which contributes to tree longevity and maximal benefits.
- Ensure Tree Care Meets Industry Standards—By ensuring that tree care is conducted by ISA certified arborists and meets industry standards, tree health is optimized. Improper pruning practices (e.g., "topping" or removing the tops of trees and reducing large branches to stubs) can be extremely detrimental to tree health and can lead to irreparable damage that can lead to trees to be prematurely removed.
- Establish and Use Irrigation to Combat Drought—All trees need water during times of drought. Droughts are occurring more frequently and for longer periods, which require planning to ensure that trees receive water during such periods. By installing efficient drip irrigation systems that are separate from turf irrigation or where not feasible, supplying water bags or scheduling hand watering trees will have some assurance that trees will receive adequate water.

- Plant Trees per Best Practices—By planting trees per best management practices and post-planting care are followed trees have improved long-term outcomes, which can reduce maintenance costs and maximize benefits.
- Set and Follow Minimum Soil Volume Requirements when Planting—In the urban environment, the soil is one of the most critical environmental factors that contributes to street tree health. Trees have extensive root systems that grow beyond the spread of the canopy and can be more than 6.5 feet into the ground (Day et al. 2010). If a tree is provided with an adequate amount of uncompacted soil, then the necessary water, mineral, nutrient, and oxygen requirements are more likely met and it will have a greater opportunity to grow for years to come and can reduce costs associated with maintenance (pruning) and infrastructure damage caused by trunk buttress flare and root expansion (Clark et al. 1997).
- Build Wildlife Habitat and Corridors—Strategically plant and/or preserve trees and tree canopy to connect with and/or bridge existing core canopy to promote ecosystem functionality and biodiversity and create wildlife habitats and corridors for the movement of birds, insects, and other animals.

Strategy 4: Sustain or restore fundamental ecological functions of urban ecosystems

Climate change is projected to and in many instances is already having negative impacts on the environment. In urban environments, trees are a critical component of the ecosystem. Trees have numerous properties that make them natural tools for mitigating many of the effects of climate change. By supporting trees, the health of urban ecosystems can be improved by lessening environmental degradation and reducing physical and emotional health incidents.

The key adaptation methods or approaches include:

- Maintain or restore soils and nutrient cycling in urban areas.
- Maintain or restore hydrologic processes in urban forests.
- Restore or maintain a fire in fire-adapted ecosystems.

The following are examples of how urban forest management can support urban ecosystems:

- Sequester and Store Carbon –Trees sequester carbon throughout their lifetimes and store it in woody biomass. These carbon sequestering capabilities suggest that urban trees could be incorporated into overall greenhouse gas emission reduction and/or storage strategies. To maximize such carbon sequestering benefits, trees should be retained as long as possible, and when a tree must be removed, to avoid the release of carbon back into the atmosphere from decomposition, utilize the woody biomass in the highest and best possible end-user to maximize carbon storage capacity.

Strategy 5: **Reduce the impact of physical and biological stressors on urban forests.**

Climate change presents many challenges to the health of trees, including variations in precipitation and extreme temperature shifts. With these changes, many trees that were once successful in a local area may no longer be suitable.

The key adaptation methods or approaches include:

- Reduce impacts from extreme rainfall and enhance water infiltration and storage.
- Reduce the risk of damage from extreme storms and wind.
- Reduce the risk of damage from wildfire.
- Maintain or improve the ability of forests to resist pests and pathogens.
- Prevent invasive plant establishment and remove existing invasive species.
- Manage herbivory to promote regeneration, growth, and form of desired species.

The following are examples of how urban forest management can reduce physical and biological stressors on urban forests:

- Establish and Maintain a GIS-Based Tree Inventory—Comprehensive, GIS-based, current inventory of all intensively managed public trees to guide management, with mechanisms in place to keep data current and available for use.
- Follow a Current and Comprehensive Urban Forest Master Plan—Having an urban forest master plan provides long-term management goals for increasing community safety and preserving and improving the health, value, and environmental benefits of the urban forest and can even support efforts in response to climate change.
- Monitor Tree Performance—The inventory indicates the condition of trees and is used to identify underperforming or maladapted tree species. Trees are continually monitored for the condition and test species anticipated to be adapted to the future climatic conditions are incorporated and monitored. Managers have a sense of species that either should be continued or phased out over time.
- Fully Staff and Adequately Fund Urban Forestry Programs—Establish stable funds to cover the costs of proactive and reactive tree maintenance as well as staffing, administration, and programming. Stable funds can allow for consistent staffing to meet daily workloads and ensure access to necessary equipment and vehicles needed so that the community receives a high level of service.
- Assess and Promptly Address Urban Forest Risks—Large, mature trees may be removed because they are perceived as a health or safety hazard, but the benefits these trees provide take hundreds of years to replace.

While it is true that wherever trees are present, there is some potential risk to people and property, many of these risks can be mitigated. In many instances, the removal of entire trees can be avoided, through proactive inspection and management.

- Follow an Integrated Pest Management Program—The use of Integrated Pest Management (IPM) protocols can effectively address pests and diseases (Wiseman and Raupp, 2016).
- Prepare for Wildfire—In recent years, wildfires have devastated many communities. With prolonged periods of drought and a changing climate, wildfire is likely to continue to be a threat to communities that neighbor the wildland urban interface. Developing wildfire preparedness plans is not only important for establishing community-wide evacuation protocols, but also can assist in wildfire mitigation strategies.
- Build Drought Tolerance—The tree species that make up the urban forest each have different requirements and are best adapted to certain environments. Drought tolerant and native trees are represented in the inventory to help managers minimize tree losses during and following droughts.

Strategy 6: **Enhance taxonomic, functional, and structural diversity.**

With highly mobile populations, the spread of pests and pathogens that can negatively affect tree and other plant health is an ever-growing concern. Pests and pathogens that are currently devastating tree populations in one part of the country now, can easily immigrate to other areas. By enhancing species diversity and stratifying the age of tree populations, communities can reduce the likelihood of severe losses in the canopy from pests, pathogens, or other stressors brought on by climate change.

The key adaptation methods or approaches include:

- Enhance age class and structural diversity in forests.
- Maintain or enhance the diversity of native species.
- Optimize and diversify tree species selection for multiple long-term benefits.
- Maintain or enhance genetic diversity.

The following are examples of how urban forest management can enhance taxonomic, functional, and structural diversity:

- Diversify the Population of Community Trees—Industry leaders suggest that no species should represent more than 10% of a population and no genus should represent more than 20% of a population (Clark et al. 1997; Santamour, 1990). Managers should consider diversity (i.e., species, genera, and family) when planting new and/or replacement trees to reduce vulnerabilities to pests and pathogens and reduce the likelihood of catastrophic losses to trees and tree canopy (Janowiak et al. 2021).
- Strive for an Ideal Aged Tree Population—An ideally aged tree resource allows managers to allocate annual maintenance costs uniformly over many years and assures continuity in overall tree canopy coverage and associated benefits. Striving to achieve an ideal age distribution ensures that there is a high proportion of young trees planted to offset establishment and age-related mortality as the percentage of older trees declines over time (Richards, 1982/83).
- Provide Adequate Funding and Resources for the Urban Forest—The community tree resource, just like other community infrastructure, requires consistent planning and maintenance. Climate change is likely to increase the frequency of reactionary maintenance. By providing stable funding for urban forestry, preventative maintenance can occur, which is frequently less costly than reactive maintenance and prolong the lifetimes of trees.

Strategy 7: Alter urban ecosystems toward new and expected conditions.

There is an entire field of research actively trying to understand the potential impacts of climate change. With climate change, local climate conditions are expected to shift. Models have been developed to project some of these changes and communities can evaluate these projections and begin planting trees that are anticipated to be more successful in future climatic conditions.

The key adaptation methods or approaches include:

- Favor or restore non-invasive species that are expected to be adapted to future conditions.
- Establish or encourage new species mixes.
- Introduced species, genotypes, and cultivars that are expected to be adapted to future conditions.
- Disfavor species that are distinctly maladapted.
- Move at-risk species to more suitable locations.
- Promptly revegetate and remediate sites after disturbance.
- Realign severely altered systems toward future conditions.

The following are examples of how urban forest management can support urban ecosystems:

- Apply Climate Change Projections to Species Selection—The current climate of a comparable City is known (Bastin et al. 2019) and managers make connections with colleagues in comparable cities and explore their species palettes. Experimental species are chosen based on climate projections, such as changes in temperature and precipitation. Strategies for climate adaptation include favoring species that are predicted to do well in climate models, encouraging new species mixes, and choosing species that are well adapted to weather events such as flooding, high winds, and other storm events (Janowiak et al. 2021).
- Remove and Replace Trees—Some species of trees are maladapted to the local climate or succumb to pressures brought on by climate change (e.g., saltwater intrusion, increased temperatures, etc.). Once species are identified to be unsuccessful, future plantings of the species should halt and existing trees be gradually phased out and removed.
- Fully Stock the Community Tree Resource—Municipalities are limited to planting trees in the public rights-of-way. If all vacant sites are tracked and as funding permits, planted with trees, then the contribution of public trees to overall canopy cover is maximized.

Strategy 8: Promote mental and social health in response to climate change.

Climate change is anticipated to severely impact human health and many health issues may exacerbate inequalities and disproportionately affect those with underlying health conditions.

The key adaptation methods or approaches include:

- Provide nature experiences to ease stress and support mental function.
- Encourage community and social cohesion to support climate response.

The following are examples of how urban forest management can promote mental and social health in response to climate change:

- Share Information, Ideas, and Resources—Collaborative planning is important for effective communication amongst partners to plan for and respond to climate change stressors. Together, managers can communicate and collaborate to address the urban forests' greatest vulnerabilities and select experimental species that may be best adapted to the future climate.
- Integrate Urban Forestry in Climate Planning and Policy—Trees have properties that make them especially useful in mitigating the effects of climate change. Wherever possible, policies and long-term planning for response to climate change should consider opportunities to support urban forestry programming.

Strategy 9: Promote human health co-benefits in nature-based climate adaptation.

Nature-based climate adaptation technologies, like trees, can not only mitigate the effects of climate change but also promote improvements in human health.

The key adaptation methods or approaches include:

- Co-design large-scale green infrastructure and build systems to promote health.
- Provide micro-scale nature experience to promote health and healing.

The following are examples of how urban forest management can promote human health co-benefits in nature-based climate adaptation:

- Considered Trees Essential Infrastructure—Before planting a tree, to avoid conflicts between trees and above or below ground utilities, provide adequate space for future growth of the tree (including space for the root systems) and consider future impacts of trees with lines of sight and other critical infrastructure. In many instances, structural pruning can mitigate conflicts with infrastructure and avoid premature removal.
- Incorporate Trees into Stormwater and Other Green Infrastructure—Trees filter and infiltrate stormwater, cleaning and moderating the amount of water for urban areas function in mind, urban forests can provide both cost savings and reduce pressures on engineered systems.

Large trees provide a canopy, which—if properly planned—can reduce overall temps within nearby radius.

Survey Respondent

Analysis of Sustainability Indicators

The Sustainability Indicators is a tool based on the Characteristics of Urban Forest Sustainability as defined in the 1997 Journal of Arboriculture article "A Model of Urban Forest Sustainability", which describes specific criteria that can be used in conjunction with measurable indicators to evaluate sustainability (Clark et al., 1997). The City of Artesia hires contractors for the proactive care of public trees, or trees planted in the rights-of-way throughout the community. Some minor issues and small tree maintenance are conducted by City staff.

To identify goals and areas where the urban forestry program can be improved, managers can regularly assess, evaluate, and indicate the current performance levels of the urban forest through the Sustainability Indicators. While the Sustainability Indicators is a useful tool for assessing the current status of an urban forest program, it does not necessarily provide a comprehensive review of all the areas in which a program could be improved. The Sustainability Indicators do provide an opportunity for managers to benchmark their current conditions and understand how they can be improved to meet industry recommendations and then establish performance measures to improve the effectiveness of their management approach (Kenney, et al 2011). The criteria for the Sustainability Indicators were used as a reference to assess the current urban forestry practices in the City and provided the framework for describing what current urban forest management looks like and steps to advance urban forest management. Overall, Artesia's urban forestry program is performing at a medium level and a detailed report of the results of the assessment can be found in Appendix I.

Table 7. Artesia Sustainability Indicators Scoreboard

INDICATORS OF A SUSTAINABLE URBAN FOREST		ASSESSED PERFORMANCE LEVEL		
		LOW	MEDIUM	HIGH
THE TREES	Urban Tree Canopy		X	
	Equitable Distribution		X	
	Size/Age Distribution		X	
	Condition of Public Trees—Streets, Parks			X
	Condition of Public Trees—Natural Areas		N/A	
	Trees on Private Property		X	
	Species Diversity		X	
	Suitability	X		
	Soil Volume	X		
THE PLAYERS	Neighborhood Action	X		
	Large Private & Institutional Landholder Involvement	X		
	Green Industry Involvement		X	
	City Department/Agency Cooperation		X	
	Funder Engagement		X	
	Utility Engagement	X		
	Developer Engagement		X	
	Public Awareness	X		
	Regional Collaboration		X	
THE MANAGEMENT APPROACH	Tree Inventory			X
	Canopy Assessment			X
	Management Plan			X
	Risk Management Program		X	
	Maintenance of Publicly-Owned Trees (ROWs)		X	
	Maintenance of Publicly-Owned Natural Areas		N/A	
	Planting Program	X		
	Tree Protection Policy	X		
	City Staffing and Equipment	X		
	Funding	X		
	Disaster Preparedness & Response		X	
	Communications		X	
TOTALS		10	14	4

The Trees

The Trees is an area where Artesia has a medium performance level.

In 2015, the TreePeople and the Center for Urban Resilience at Loyola Marymount University conducted a study of tree canopy for Los Angeles County and found that Artesia had an average of 8.3% canopy cover. A 2020 tree canopy and land cover assessment determined that the canopy cover is 5.4%. This suggests that the canopy has decreased by approximately 7.6% in the last five years. With a canopy goal of 10%, the community will have a greater incentive to preserve existing trees and encourage the planting of trees on private property to assist in canopy expansion.

A review of canopy cover by the census block group showed that canopy cover varies very little throughout the community. Yet, staff report that inequities in canopy cover likely exist. To address these disparities, planting and outreach are prioritized in neighborhoods with the greatest need for canopy.

Without adequate tree protections, a canopy goal, or a tree planting plan, is likely to continue to decrease. Like many California communities, development will keep competing for space for trees and other land uses. Potential pest and disease threats may also compromise some tree species. For these reasons, placing an emphasis on proactive pest management, filling vacant sites, and replacing community trees as they are removed are important and would increase the City's score in this area.

Artesia has a complete tree inventory that includes information on the species, diameter, and condition of the community tree resource. Through regular assessment of the population, managers can identify species that are well adapted to the local climate. The most abundant species, Mexican fan palm, and Australian willow both represent more than 10% of the population yet Mexican fan palms and other palm species do not provide the same level of benefits when compared to shade trees. To optimize available funding and maximize benefits, trees should be planted strategically, by identifying the largest statured shade tree possible that a site can accommodate and avoid planting less beneficial species, such as palms.

The Players

Among the categories, *The Players* is perhaps the area with the greatest opportunity for improvement.

Although Artesia currently lacks citizen-led urban forestry groups, many of the community trees were planted as a result of the efforts of the Beautification and Maintenance Commission. The community has benefited greatly from partnerships with CAL FIRE, the TreePeople, and Los Angeles Conservation Corps. Continuing these partnerships will be important for providing outreach and education and the promotion of urban forestry goals set by the Urban Forest Management Plan and the region.

A benefit of being a small City is that with fewer departments and shared responsibilities, there is strong interdepartmental communication. Other City departments have a strong understanding of the Public Works Department's role in the care of City trees and coordinate accordingly. Coordination and communication could be improved with local utility providers especially considering that some neighborhoods only have park strips on one side of the street, which coincidentally is also where the overhead utility lines are located. In addition, public awareness would benefit from initiatives that provide residents a way to understand whether or not trees near their property are community trees.

The Management Approach

The Management Approach is where the community has the strongest performance, with most criteria meeting the high-performance level. However, this category also has several items that were categorized as low performance. This dichotomy reflects that this is the area that requires the most attention, both to sustain the high-performance levels, but also to improve the areas of low performance.

With a complete GIS-based community tree inventory, a high-resolution tree canopy assessment, and a comprehensive planning document (with the adoption of this plan), managers have a strong understanding of the urban forest as it exists today. Maintaining the inventory and completing a land cover assessment every five years, along with a regular review of management goals will be critical to sustaining these high-performance levels.

The biggest weakness for Artesia is that it has not had an adopted Tree Ordinance and has relied on City Council policies from both 1996 and 2012 to govern the protection and preservation of the urban forest. While these City Council policies have been followed by City staff because the policies are not included in municipal code nor on the City website, residents are likely mostly unaware that such policies exist. In addition, these policies include planting standards that do not meet current industry standards and provide a list of species of trees that may not be appropriate for the local climate or resistant to emerging pests and diseases. The formal adoption of a Tree Preservation Ordinance will support staff in making decisions around tree care, provide a procedure for the review and issuance of removal, pruning, and planting permits, implement the use of tree protection measures for trees during construction, and define consequences for non-compliance.

Through the efforts of City staff, the Beautification and Maintenance Commission, and partnerships with the Los Angeles Conservation Corps and the TreePeople, tree planting has been accomplished through grant funding. Without consistent funding dedicated to tree planting, tree planting plans to prioritize planting trees to lessen the impacts of urban heat islands and to address inequities in canopy distribution throughout the community are largely unachievable. Furthermore, current funding levels are not able to support the long-term maintenance of trees that are currently being planted through grant funding (700 trees). Even without this recent influx in tree planting, the current funding levels for maintaining City trees are projected to fall short of what is required to maintain trees proactively and address risk.

The Maintenance Department is responsible for managing the care of all City trees. While most tasks are completed through contracted services, no City staff have formal training in arboriculture or are certified arborists, which presents a challenge with monitoring tree care contracts. Without this expertise, there is limited oversight over the services that the contractor is providing and what the contractor is recommending.

GOAL:

Adopt a comprehensive Tree Ordinance

OBJECTIVES:

- CONSIDER INCLUDING INDIVIDUALS FROM THE COMMUNITY IN THE REVIEW OF THE PROPOSED TREE ORDINANCE, SUCH AS REALTORS, DEVELOPERS, PLANNERS, NEIGHBORHOOD GROUPS, AND RESIDENTS
- ADOPT A TREE ORDINANCE
- PROVIDE EDUCATION TO THE COMMUNITY ON THE TREE ORDINANCE
  - Include an FAQ on the City website
  - Provide a summary of the ordinance on the City website

Conclusions

While Artesia's urban forestry program is in its infancy, the Maintenance Team has been successful at providing routine care to all community trees for more than ten years. The City benefits from departments that regularly interact and communicate with one another, and all are supportive of building a resilient and sustainable urban forest.

Tree City USA is an initiative of the Arbor Day Foundation to green urban areas through enhanced tree planting and care (Arbor Day Foundation, 2019). Currently, Artesia meets two of the four requirements of Tree City USA, and by adopting a Tree Ordinance and having a formal proclamation of Arbor Day, Artesia could be recognized as such, along with more than 160 other California communities, including neighboring Norwalk and Cerritos.

Although Artesia does not have a Tree Ordinance, it has had long-standing policies that have provided guidance for the regular care of City trees. By adopting a Tree Ordinance, not only will Artesia meet one of the requirements for Tree City USA, but it will codify the responsibilities for the care of City trees on the part of the City and residents, and further encourage the protection and preservation of the urban forest.

The Public Works Department has provided regular and routine care for all City trees for a decade through a small in-house crew and contractors. The biggest challenge for the Public Works Department is contractor oversight.

If the City had a certified arborist on staff or had a secondary contractor to provide inspections for trees, the Public Works Department would have the reassurance that community trees are provided the necessary maintenance and that maintenance is completed per industry standards.

Currently, the overall canopy cover is 5.4%. Considering a planting priority analysis, Artesia has the potential to support 21.7% canopy cover. This analysis does not consider other planned uses for available planting space or a reduction in hardscape, which could result in a reduction or an increase of available planting space. By adopting a goal of 10% by 2040, Artesia will have 20 years to effectively double canopy cover. A survey asked community members what canopy goal they would support, and the majority indicated a goal of 10% canopy cover or more to be favorable. After 20 years, Artesia can reassess the canopy goal and adjust accordingly. In the meantime, the urban forestry program can expand outreach to encourage the planting of trees on private property and the preservation of existing canopy through the addition of a voluntary "heritage tree" designation.

Existing partnerships with CAL FIRE, TreePeople, and the Los Angeles Conservation Corps have been vital to the success of the urban forestry program. Continued partnerships with these groups and other volunteer organizations and nonprofit groups will be invaluable for the facilitation of community engagement and to provide support for education and outreach event campaigns. Community support for the urban forest is critical for sustainable programming and the realization of long-term goals. Engaging community members through workshops, online resources, and volunteer projects build an educated community that sees value in protecting this resource for future generations.

The urban forest is a living resource subject to environmental and cultural stressors, including pests, disease, extreme weather and climate change, pollution, and accidental damage. While it is impractical to protect and preserve every tree, actions, and strategies that increase overall resilience can ensure that the community continues to receive a stable flow of benefits. Additionally, many of the goals in the UFMP support greater climate resilience.

Because the urban forest is a dynamic, growing, and ever-changing resource, it requires sound and proactive management to fully realize its maximum potential. Although the Public Works Department does not have a formal urban forestry team, the team cares greatly for Artesia's community trees and seeks to provide the best service possible to all residents. Understanding that the urban forest is a public asset that has the potential to increase in value and provide benefits, the Public Works Department, and its partners within the City and with external agencies are committed to enhancing the urban forestry program, the care of community trees, and the building of a resilient and sustainable urban forest.

A tree has roots in the soil yet reaches to the sky. It tells us that in order to aspire we need to be grounded an that no matter how high we go it is from our roots that we draw sustenance.

Wangari Maathai

Appendix A. Dictionary

ADAPTATION

An organism's ability to become better suited to the environment.

ADAPTIVE MANAGEMENT

A framework commonly used for resource planning and management, which follows the process of What do we have, What do we want, How do we get there, and How are we doing.

American National Standards Institute (ANSI)

A Federation of United States industry sectors (e.g., businesses, professional societies and trade associations, standards developers, government agencies, institutes, and consumer/labor interest groups) that coordinates the development of the voluntary consensus standards system.

AMERICAN PUBLIC WORKS ASSOCIATION (APWA)

An organization that supports professionals who operate, improve, or maintain public works infrastructure by advocating to increase awareness, and providing education, credentialing, as well as other professional development opportunities.

ARBORICULTURE

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

BEST MANAGEMENT PRACTICES (BMP)

Management practices and processes used when conducting forestry operations implemented to promote environmental integrity.

CAPITAL IMPROVEMENT PROJECTS (CIP)

Infrastructure projects and equipment purchases are identified by a government to maintain or improve public resources. Projects such as (1) constructing a facility, (2) expanding, renovating, replacing, or rehabilitating an existing facility, or (3) purchasing major equipment are identified, and then purchasing plans and development schedules are developed.

CLIMATE ACTION PLAN (CAP)

Government lead initiatives to decrease greenhouse gas emissions and prepare for the impacts of climate change.

CLIMATE CHANGE

A change in global or regional climate patterns is largely attributed to increased levels of greenhouse gases as a result of burning fossil fuels, occurring since the mid to late 20th century.

CLIMATE VULNERABILITY

The degree to which a system is susceptible to, or unable to cope with adverse effects of climate change.

COMMUNITY URBAN FOREST

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

DRIP LINE AREA

The area measured from the trunk of the tree outward to a point at the perimeter of the outermost branch structure of the tree.

DUTCH ELM DISEASE (DED)

A wilt disease of elm trees caused by plant pathogenic fungi. The disease is either spread by bark beetles or tree root grafts.

ENVIRONMENTAL VULNERABILITY

The tendency of the environment to respond either positively or negatively to changes in human and climatic conditions.

EMERALD ASH BORER (EAB)

The common name for *Agrilus planipennis*, is an emerald, greenwood boring beetle native to northeastern Asia and invasive to North America. It feeds on all species of ash.

GREEN INFRASTRUCTURE

The use of vegetation, soils, and other building materials to design infrastructure that manages stormwater in a way that emulates natural processes to capture and filter runoff.

GREEN ROOF

Building rooftops covered with vegetation to help capture stormwater and cool urban environments.

GREEN STREETS

Streetscapes that integrate green infrastructure which helps manage stormwater runoff.

GREENHOUSE GAS (GHG)

A gas that traps heat in Earth's atmosphere.

GEOGRAPHIC INFORMATION SYSTEM (GIS)

Computer-based tools designed to increase the organization and understanding of spatial or geographic data. Many different kinds of data can be displayed on one map for visualization and interpretation.

INTEGRATED PEST MANAGEMENT (IPM)

Using pest and environmental information to determine if pest control actions are warranted. Pest control methods (e.g., biological control, habitat manipulation, cultural control, plant resistance, and chemical control) are chosen based on economic and safety considerations.

I-TREE

A computer program with tools used to determine the costs and benefits of urban trees based on inventory data, operations costs, and other factors.

INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA)

An international nonprofit organization that supports professionals in the field of arboriculture by providing professional development opportunities, disseminating applicable research findings, and promoting the profession.

INVENTORIED TREES

Includes all public trees collected in the inventory as well as trees that have since been collected by City staff.

MAJOR MAINTENANCE

Includes major trimming or pruning or cabling, and any other similar act, which promotes the life, growth, health, or beauty of trees, except watering and minor pruning.

MAJOR TRIMMING AND PRUNING

The removal of branches of three inches in diameter or greater.

MIGRATORY BIRD TREATY ACT (MBTA)

A United States federal law was adopted to protect migratory birds. To promote the conservation and efficient use of water and to prevent the waste of water, a Model Water Efficient Landscape Ordinance (MWELO) (also referenced as Title 24, Part II CalGreen Building Code) was adopted in 2009 and later revised in 2015.

NATURAL AREA

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

OPEN SPACE

A defined area of undeveloped land that is open to the public. The land can include native or naturalized trees and vegetation.

PLANT HEALTH CARE (PHC)

A program that consists of (1) routinely monitoring landscape plant health and (2) individualized plant management recommendations to maintain or improve the vitality, appearance, and safety of trees and other plants.

PERMEABLE PAVEMENTS

Pavement that allows for water infiltration.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Equipment worn to enhance workplace safety and minimize the risk of physical hazards (e.g., gloves, hard hats, bodysuits, and foot, eye, or ear protection).

PRIVATE TREE

Any tree located on private property, including residential and commercial parcels.

PUBLIC TREE

Any tree located in the public ROW, City park, and/or City facility.

RESILIENCE

The ability to recover from or adjust to adversity or change.

RIGHT TREE RIGHT PLACE

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

STORMWATER INFRASTRUCTURE

STREET TREE

Any tree growing within the tree maintenance strip whether or not planted by the City.

STRUCTURAL AND TRAINING PRUNING

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

SUSTAINABILITY

Create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations (US EPA)

TREE

Any live woody plant having one or more well-defined perennial stems with a diameter at maturity of six inches or more measured at fifty-four inches above ground level (breast height).

TREE CANOPY

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

Tree Care Industry Association (TCIA)

A national trade association for arborists that provides education, training, and standards of tree care and safety.

TREE CITY USA

A program through the Arbor Day Foundation that advocates for green urban areas through enhanced tree planting and care

TREE IN PROXIMITY TO TRAILS/FACILITIES

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

TREE RISK ASSESSMENT QUALIFIED (TRAQ)

An International Society of Arboriculture qualification. Upon completion of this training, tree care professionals demonstrate proficiency in assessing tree risk.

URBAN FOREST

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

URBAN FOREST MANAGEMENT PLAN (UFMP)

A document that provides comprehensive information, recommendations, and timelines to guide the efficient and safe management of a City's tree canopy. The Plan uses an adaptive management model to provide reasoned and transparent calls to action from an inventory of existing resources.

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.

URBAN HEAT ISLAND EFFECT

An increase in temperatures in urban or metropolitan areas surrounding suburban and rural areas, largely associated with an increase in hardscape and impervious surfaces.

URBAN TREE CANOPY ASSESSMENT (UTC)

A document based on GIS mapping data that provides a birds-eye view of the entire urban forest and establishes a tree canopy baseline of known accuracy. The UTC helps managers understand the quantity and distribution of existing tree canopy, potential impacts of tree planting and removal, quantified annual benefits trees provide to the community, and benchmark canopy percent values.

WILDFIRE URBAN INTERFACE (WUI)

A transition zone where homes are located on the edge of fire-prone areas and are at an increased risk of personal injury or property damage resulting from a wildfire.

10-20-30 RULE

A well-accepted rule states that no species should represent more than 10%, no genus represents more than 20%, and no family should represent more than 30% of a population.

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Trees give peace to the souls of men.

Nora Waln

Appendix C. Industry Standards

ANSI Z133 Safety Standard, 2017

Reviews general safety, electrical hazards, use of vehicles and mobile equipment, portable power hand tools, hand tools and ladders, climbing, and work procedures.

ANSI A300

ANSI A300 standards represent the industry consensus on performing tree care operations. The standards can be used to prepare tree care contract specifications.

ANSI A300 PRUNING STANDARD—PART 1, 2017

ANSI A300 SOIL MANAGEMENT—PART 2, 2011

ANSI A300 SUPPORT SYSTEMS STANDARD—PART 3, 2013

ANSI A300 CONSTRUCTION MANAGEMENT STANDARD—PART 5, 2012

ANSI A300 TRANSPLANTING STANDARD—PART 6, 2012

ANSI A300 INTEGRATED VEGETATION MANAGEMENT STANDARD—PART 7,2012

ANSI A300 ROOT MANAGEMENT STANDARD—PART 8, 2013

ANSI A300 TREE RISK ASSESSMENT STANDARD A TREE FAILURE—PART 9, 2017

ANSI A300 INTEGRATED PEST MANAGEMENT—PART 10, 2016

Includes guidelines for implementing IPM programs, including standards for Integrated Pest Management, IPM Practices, tools and equipment, and definition.

Best Management Practices (BMPs)

Integrated Pest Management, Second Edition, P. Eric Wiseman and Michael J. Raupp, 2016

Provides a comprehensive overview of the basic definitions, concepts, and practices that pertain to landscape Integrated Pest Management (IPM). The publication provides specific information for designing, planning, and implementing an IPM program as part of a comprehensive Plant Health Care (PHC) management system, including topics such as:

- IPM Concepts and Definitions
- Action Thresholds
- Monitoring Tools and Techniques
- Preventive Tactics
- Control Tactics
- Documentation and Recordkeeping

INTEGRATED VEGETATION MANAGEMENT, SECOND EDITION, RANDALL H. MILLER, 2014

A guide to the selection and application of methods and techniques for vegetation control for electric rights-of-way projects and gas pipeline rights-of-way. Topics included: safety, site evaluations, action thresholds, evaluation, and selection of control methods, implementing control methods, monitoring treatment and quality assurance, environmental protection, tree pruning and removal, and a glossary of terms.

Managing Trees During Construction, Second Edition, Kelby Fite and E. Thomas Smiley, 2016

Describes tree conservation and preservation practices that help to protect selected trees throughout the construction planning and development process so that they will continue to provide benefits for decades after site disturbance, including the planning phase, design phase, pre-construction phase, construction phase, and post-construction phase.

ROOT MANAGEMENT, LARRY COSTELLO, GARY WATSON, AND TOM SMILEY, 2017

Recommended practices for inspecting, pruning and directing the roots of trees in urban environments to promote their longevity, while minimizing infrastructure conflicts.

SPECIAL COMPANION PUBLICATION TO THE ANSI A300 PART 8: TREE, SHRUB, AND OTHER WOODY PLANT MANAGEMENT–STANDARD PRACTICES (ROOT MANAGEMENT)

TREE PLANTING, SECOND EDITION, GARY WATSON, 2014

Provides processes for tree planting, including site and species selection, planting practices, post-planting pruning, and early tree care. Other topics included are the time of planting, nursery stock: types, selection, and handling, preparing the planting hole, planting practices, root loss and new root growth, redevelopment of root structure, pruning, palms, after planting, final inspection, and a glossary of terms.

TREE INVENTORIES, SECOND EDITION, JERRY BOND, 2013

Provides considerations for managing large numbers of trees considered as individuals rather than groups and serves as a guide for making informed decisions that align with inventory goals with needs and resources, including inventory goals and objectives, benefits and costs, types, work specifications, and maintaining inventory quality.

TREE RISK ASSESSMENT, SECOND EDITION, E. THOMAS SMILEY, NELDA MATHENY, AND SHARON LILLY, 2017

A guide for assessing tree risk as accurately and consistently as possible, to evaluate that risk and recommend measures that achieve an acceptable level of risk, including topics: risk assessment basics, levels, and scope of tree risk assessment, assessing targets, sites, and trees, tree risk categorization, risk mitigation: preventive and remedial actions, risk reporting, tree-related conflicts that can be a source of risk, loads on trees, structural defects and conditions that affect the likelihood of failure, response growth, description of selected types of advanced tree risk assessments.

TREE SHRUB FERTILIZATION, THIRD EDITION, E. THOMAS SMILEY, SHARON LILLY, AND PATRICK KELSEY, 2013

Aides in the selection and application of fertilizers for trees and shrubs, including Essential elements, determining goals and objectives of fertilization, soil testing, and plant analysis, fertilizer selection, timing, application, application area, rates, storage and handling of fertilizer, sample fertilizer contract for commercial/ municipal clients.

Soil Management, Bryant Scharenbroch, E. Thomas Smiley, and Wes Kocher, 2014

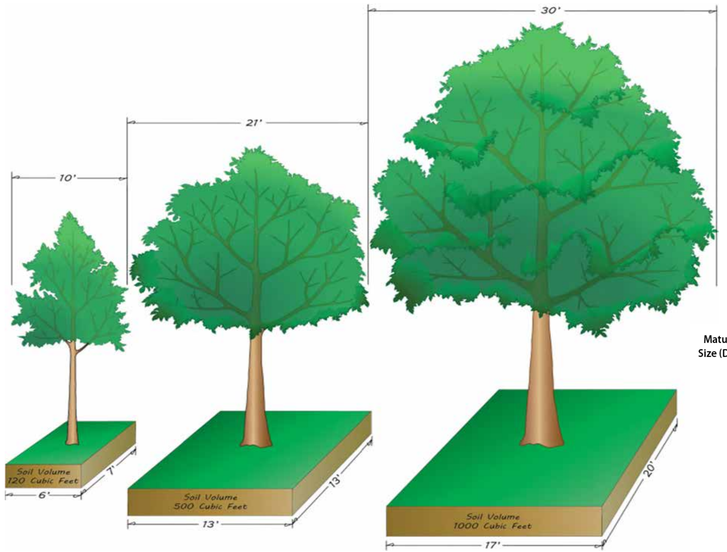
Focuses on the protection and restoration of soil quality that supports trees and shrubs in the urban environment, including goals of soil management, assessment, sampling, and analysis, modifications and amendments, tillage, conservation, and a glossary of terms.

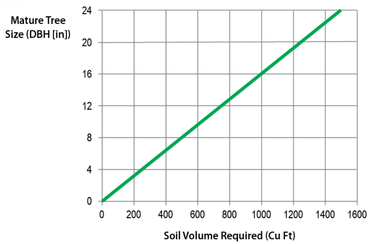
Utility Pruning of Trees, Geoffrey P. Kempter, 2004

Describes the current best practices in utility tree pruning based on scientific research and proven methodology for the safe and reliable delivery of utility services, while preventing unnecessary injury to trees. An overview of safety, tools, and equipment, pruning methods and practices, and emergency restoration are included.

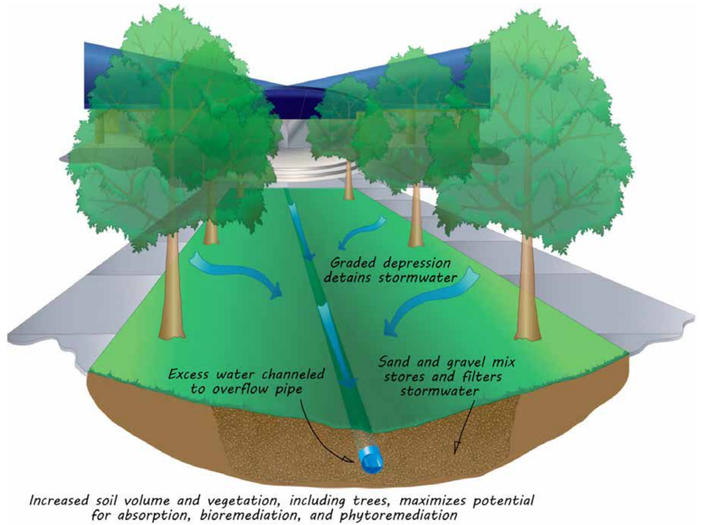
Appendix D. Soil Volume and Tree Stature

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).



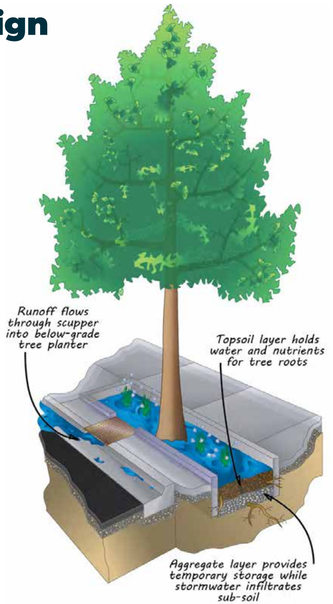


Appendix E. Alternative Planter Design

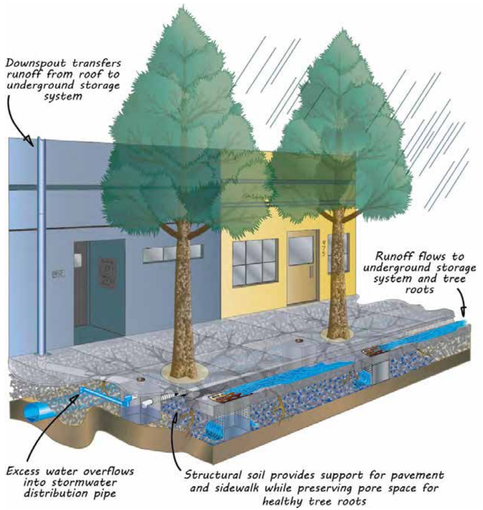


Increased soil volume and vegetation, including trees, maximizes potential for absorption, bioremediation, and phytoremediation

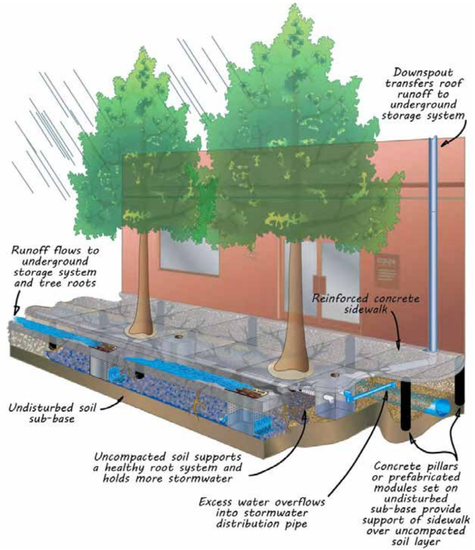
Above: *Bioswales are landscaped drainage areas with gently sloped sides designed to provide temporary storage while runoff infiltrates the soil. They reduce off-site runoff and trap pollutants and silt.*



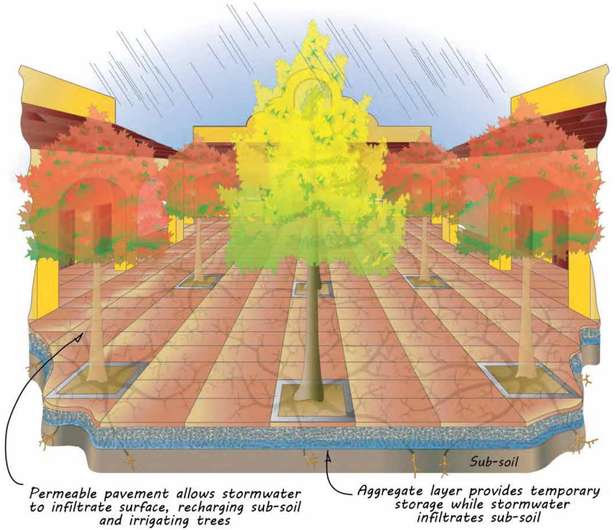
Above: *Stormwater tree pits are designed to collect runoff from streets, parking lots, and other impervious areas. Stormwater is directed into scuppers that flow into below-grade planters that then allow stormwater to infiltrate soils to supplement irrigation.*



Above: *Structural soil is a highly porous, engineered aggregate mix, designed for use under asphalt and concrete as a load-bearing and leveling layer. The created spaces allow for water infiltration and storage, in addition to root growth.*



Above: *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.*



Above: *Permeable pavements allow stormwater and oxygen to infiltrate the surface, promoting tree health and groundwater recharge.*

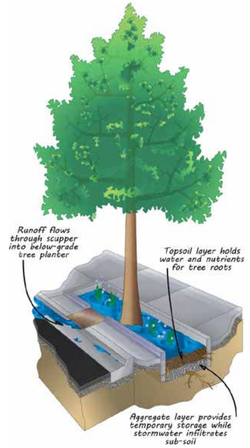
The tree is a slow, enduring force straining to win the sky.”

Antoine de Saint-Exupéry

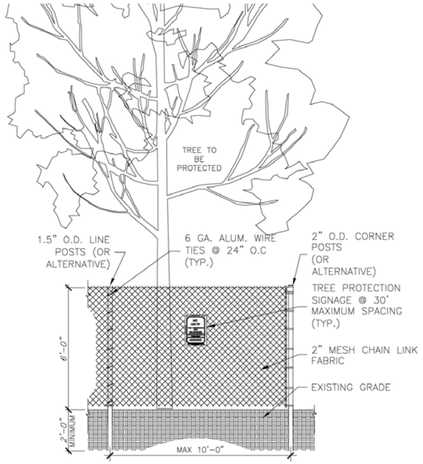
Appendix F. Tree Protection Zones

Tree Protection Zone—Example

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.

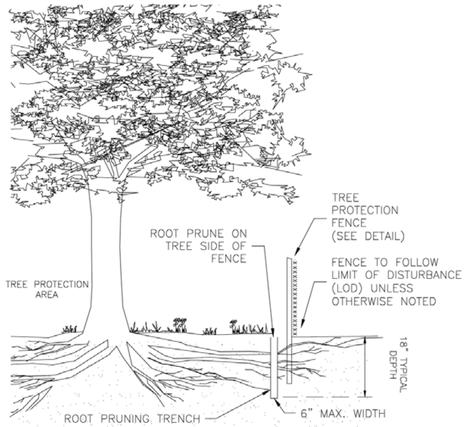


Bioswales are landscaped drainage areas with gently sloped sides designed to provide temporary storage while runoff infiltrates the soil. They reduce off-site runoff and trap pollutants and silt.



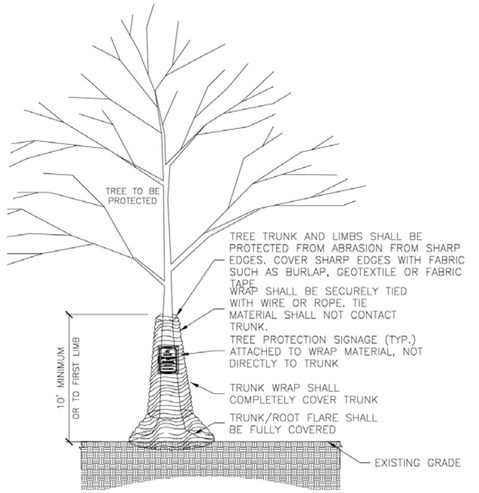
NOTES:
1. TREE PROTECTION FENCE SHALL BE INSTALLED PRIOR TO ANY SITE WORK, CLEARING OR DEMOLITION.
2. SUPER SILT FENCE MAY BE USED IN LIEU OF WELDED WIRE FOR TREE PROTECTION, PROVIDED IT IS INSTALLED AND MAINTAINED AS A TREE PROTECTION MEASURE AND IS POSTED WITH TREE PROTECTION SIGNS.
3. TREE PROTECTION FENCE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. REMOVE FENCE ONLY WITH APPROVAL AND AFTER ALL SITE WORK HAS BEEN COMPLETED.

1 / TP1 CHAIN LINK TREE PROTECTION FENCE (TYPICAL)
SCALE: NTS



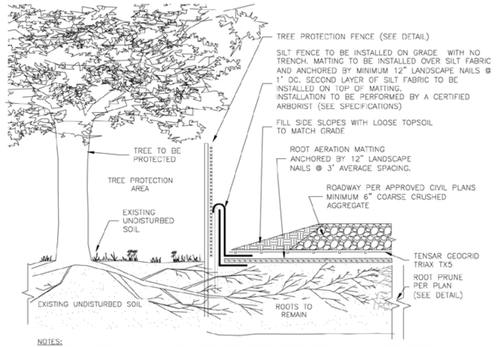
NOTES:
1. TREE PROTECTION AREA WILL BE DETERMINED AS PART OF THE PLAN REVIEW PROCESS. EXACT LOCATION, DEPTH AND METHODS OF ROOT PRUNING TO BE DETERMINED IN THE FIELD BY PROJECT ARBORIST.
2. EXACT LOCATION OF TREE PROTECTION AREAS SHALL BE STAKED OR FLAGGED PRIOR TO TRENCHING.
3. TRENCH SHOULD BE BACKFILLED IMMEDIATELY OR INCORPORATED WITH SILT FENCE INSTALLATION.
4. ROOTS SHOULD BE SEVERED BY TRENCHER, VIBRATORY PLOW OR APPROVED EQUIVALENT. ROOTS OVER 1.5" DIAMETER SHOULD BE CLEANLY CUT BY HAND. ROOT PRUNING ADJACENT TO SPECIMEN TREES MAY REQUIRE SOIL REMOVAL BY SUPERSONIC AIR TOOL TO MINIMIZE TREE AND ROOT IMPACTS.

2 / TP1 ROOT PRUNING (TYPICAL)
SCALE: NTS



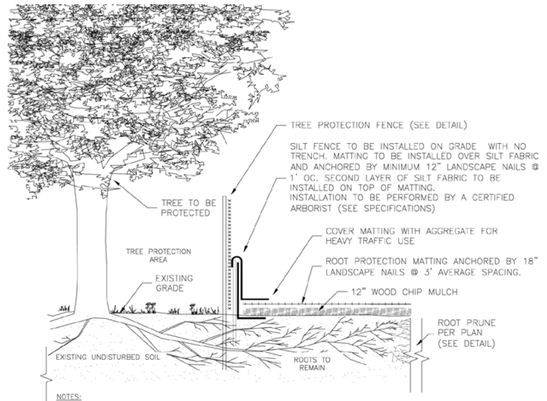
NOTES:
1. TRUNK WRAP MATERIAL SHALL BE DOUBLE SIDED GEOCOMPOSITE, GEONET CORE WITH NON-WOVEN COVERING (SUCH AS TENAX TENDRAIN 770/2) OR EQUIVALENT.
2. WRAP SHALL BE INSTALLED BY A CERTIFIED ARBORIST.
3. WRAP SHALL BE INSTALLED PRIOR TO ANY SITE WORK, CLEARING OR DEMOLITION.
4. WRAP SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. REMOVE WRAP ONLY WITH APPROVAL AND AFTER ALL SITE WORK HAS BEEN COMPLETED.
5. WRAP SHALL BE REMOVED PROMPTLY AFTER CONSTRUCTION.
6. MAJOR SCAFFOLD LIMBS MAY ALSO REQUIRE THIS PROTECTION AS DIRECTED BY THE PROJECT ARBORIST.

3 / TP1 TREE TRUNK & LIMB PROTECTION WRAP (TYP)
SCALE: NTS



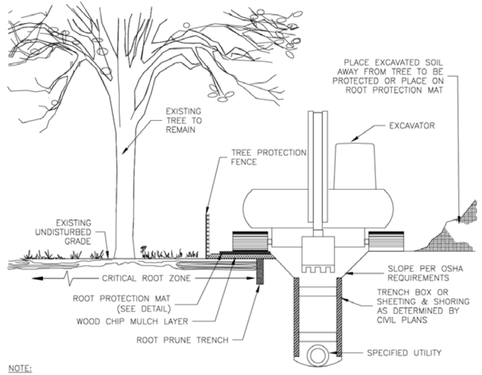
NOTES:
1. MATTING MATERIAL SHALL BE DOUBLE SIDED GEOCOMPOSITE, GEONET CORE WITH NON-WOVEN COVERING (SUCH AS TENAX TENDRAIN 770/2) OR APPROVED EQUIVALENT.
2. RAM SHALL BE ANCHORED BY 12" LANDSCAPE NAILS @ 3' AVERAGE SPACING.
3. RAM SHALL BE INSTALLED BY A CERTIFIED ARBORIST EXPERIENCED WITH THESE SYSTEMS.
4. ANY REQUIRED SITE PREPARATION/GRADING TO BE DONE USING SSAT TO MINIMIZE ROOT DAMAGE.
5. ALL ADJACENT WORK SHALL BE SUPERVISED BY CERTIFIED ARBORIST
6. GEOGRID SHALL BE TENSAR TRIAX TX5 OR APPROVED SUPERIOR.
7. AGGREGATE FILL SHALL BE TAPERED TO MATCH EXISTING GRADE WHOLLY ON RAM MATERIAL.
8. GEOGRID AND RAM PLACEMENTS SHALL BE OVERLAPPED BY 2'.
9. TOPSOIL MAY BE PLACED LOOSELY ON SIDE SLOPES AS REQUIRED TO MATCH GRADE. TOPSOIL SHALL NOT BE COMPACTED. RAM MUST EXTEND TO DAYLIGHT AND MAY BE TRIMMED AT FINAL TOE OF SLOPE.
10. SILT FENCE SHALL NOT BE TRENCHED AND MUST BE COORDINATED WITH ARBORIST FOR INSTALLATION.
11. EQUIPMENT/TRAFFIC SHALL NOT TRAVEL DIRECTLY ON RAM/GEOGRID. TRAFFIC MAY TRAVEL ON FINAL FILL ONLY.

4 / TP1 ROOT AERATION MATTING WITH GEOGRID FOR ROADWAY (TYP)
SCALE: NTS



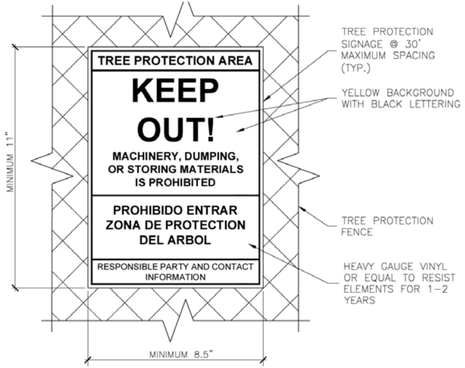
NOTES:
1. MATTING MATERIAL SHALL BE DOUBLE SIDED GEOCOMPOSITE, GEONET CORE WITH NON-WOVEN COVERING (SUCH AS TENAX TENDRAIN 770/2) OR APPROVED EQUIVALENT.
2. RPM SHALL BE INSTALLED BY A CERTIFIED ARBORIST.
3. TO BE USED FOR DESIGNATED TEMPORARY CONSTRUCTION ACCESS AND STOCKPILE AREAS.
4. MATTING SHALL BE PLACED ON 12" WOOD CHIP MULCH UNLESS OTHERWISE DIRECTED.
5. FOR HEAVY TRAFFIC AREAS, MATTING SHALL BE COVERED WITH 6-8" WELL GRADED CRUSHED AGGREGATE. ADDITIONAL LAYERS OF GEOTEXTILE MAY BE NEEDED.

5 / TP1 TEMPORARY ROOT PROTECTION MATTING (TYPICAL)
SCALE: NTS



NOTE:
1. EXACT RPM DIMENSIONS TO BE DETERMINED BY PROJECT ARBORIST
2. ARBORIST TO COORDINATE WITH SITE SUPERINTENDENT FOR PIPE LAYOUT, DEPTH,SIZE OF EQUIPMENT, WIDTH OF TRENCH, AND OVERDIG TO DETERMINE LOCATION AND LAYOUT OF TREE PROTECTION.
3. ARBORIST TO COORDINATE WITH SITE SUPERINTENDENT FOR OVERHEAD CLEARANCE ISSUES. MAY REQUIRE SELECT PRUNING OR TEMPORARY GUYING.
4. ARBORIST TO MONITOR BACK FILL AND RESTORATION ADJACENT TO PROTECTED TREES.

6 / TP1 TREE PROTECTION FOR UNDERGROUND UTILITY (TYP)
SCALE: NTS



NOTES:
1. SIGNS TO BE ATTACHED TO TREE PROTECTION FENCE OR POSTS AT READABLE LEVEL.
2. 30' MINIMUM SPACING AVERAGE ADJUSTED FOR MAXIMUM READABILITY.
3. MINIMUM ONE SIGN FOR SMALL TREE PROTECTION AREAS.
4. SIGNS MAY BE REMOVED FROM RESIDENTIAL LOTS UPON ISSUANCE OF USE AND OCCUPANCY.
5. SIGNS TO REMAIN ON NON RESIDENTIAL SITES FOR MAINTENANCE PERIOD.

7 / TP1 TREE PROTECTION AREA SIGN (TYPICAL)
SCALE: NTS

Construction Site Management

Preservation of existing mature trees before, during, and after new construction and redevelopment is beneficial for a number of reasons, including:

- To sustain both the function and value of existing trees and tree canopy.
- To promote public safety and reduce liability by carefully maintaining the health of the preserved tree.
- To contain costs associated with site restoration.
- To reduce or avoid soil compaction and degradation and preserve soil volume.
- To avoid physical injury to existing trees.
- To avoid root injury to trees.
- To protect soils and the hydraulic integrity of the entire site.
- To protect existing irrigation, utilities, and underground drainage.
- To prevent sediment-laden and/or polluted runoff from entering drainage systems and water bodies (streams, wetlands, lakes, bays).

Best Management Practices

PRE-CONSTRUCTION

- The Project Manager shall know and understand the development and building regulations concerning trees and vegetation in the area.
- The Project Manager shall ensure that irrigation and drainage systems are operable and adequate.
- The Project Manager shall ensure all temporary erosion sediment control measures are in place prior to groundbreaking.
- The Project Arborist will be responsible for decisions related to vegetation on site before, during, and after construction.
- The Project Arborist shall perform a site inventory of all existing trees to record the variety, location, size, and health of each tree. Site inventory includes determining size, species, numbers, and numbers of trees/plants on site.
- Trees that require removal or pruning to accommodate future structures and construction equipment should also be identified.
- The Project Arborist shall submit a Tree Protection Plan (TPP) that identifies all significant trees that will remain on the project site.
- The TPP will indicate the Tree Protection Zone (TPZ) for each tree as (at a minimum) the greater of: 6-feet, or by multiplying each tree's diameter at 4.5-feet above the existing grade (DBH) by a factor of one to determine the diameter, in feet, of the area above and below ground to be protected.
- The TPZ may exceed the Critical Root Zone (CRZ), which is not less than half the distance between the trunk and the outer edge of the tree's canopy, or drip line, but the TPZ may not be smaller than the CRZ.
- The TPP will contain the expected tree protection techniques that will be used in the project.
- The TPP will also list a timetable for project meetings with the Project Team including a pre-construction meeting and the schedule for the Project Arborist monitoring.
- Before approval of the TPP, the City shall collect an assurance device in the form of a deposit equal to the tree appraisal value of all protected trees as determined under the methods established by the Council of Trees & Landscape Appraisers Guide for Plant Appraisal (9th Edition or most current).

CONSTRUCTION SITE PREPARATION

- Staging areas for equipment shall be established far enough from existing trees to ensure adequate protection of the root zone.
- Entry and exit routes shall be established and fenced off with chain link or construction fencing. When planning routes, avoid utility access corridors.

- Irrigation and drainage systems shall be protected from damage unless plans call for the renovation of such systems.
- Before beginning construction activities, the Project Arborist will supervise and verify the following tree protection measures are in place and comply with the approved TPP:
- A 6-inch layer of coarse mulch or wood chips is to be installed within the TPZ of protected trees. Mulch shall be kept 12-inches away from the trunk.
- Trunks of trees shall be protected with a single wrap of Geocomposite. Geocomposite shall be double-sided, Geonet core with non-woven covering (such as Tenax Tendrain 770/2), or equivalent. Tree trunks will be protected with wrap.
- Trees that have been identified in the site inventory as posing a health or safety risk may be removed or pruned by no more than one-third, subject to approval of the required permit by the Planning Division. Pruning of existing limbs and roots shall only occur under the direction of the Project Arborist.
- A protective barrier shall be installed around the Tree Protection Zone (TPZ). The Fence shall be the construction of a 6-foot-high chain link. Posts shall be 2-inches in diameter, driven 2-feet into the ground. The distance between posts shall be not more than 10-feet. The enclosed area is the TPZ and shall have a warning sign displayed prominently at 20-foot (maximum) intervals along the fence. The warning sign shall be a minimum of 8.5-inches x 11-inches and clearly state the following: "WARNING—Tree Protection Zone". Fencing may be moved within the TPZ if authorized by the Project Arborist and City Staff but not closer than the drip line from the trunk of any tree.
- Movable barriers of chain link fencing secured to cement blocks may be substituted for "fixed" fencing if the Project Arborist and City Staff agree that the fencing will need to be moved to accommodate certain phases of construction. Moving TPZ fencing shall be prohibited without authorization from the Project Arborist and City Staff.
- Should temporary access into the TPZ be approved, an additional layer of approved tree matting shall be placed over the Critical Root Zone (CRZ).
- Tree Growth Regulators may be used as approved by the Project Arborist and City Staff. Paclobutrazol soil applied tree growth regulator (Cambistat® or equivalent) shall be applied to indicated trees by a qualified applicator. Applications shall follow the manufacturer's label and applicable laws. TGR reduces canopy growth and increases fibrous root system growth over 2 to 3-years. This can increase tolerance to drought, and stress and improve absorption of nutrients and moisture during the stress recovery period.

DURING CONSTRUCTION

During the construction phase, the Project Arborist should inspect the site regularly to ensure the TPP is being adhered to and report any conflicts or deviations to the City Planner or City Representative. The Project Arborist also needs to be available at the site to monitor construction activities that require encroachment within the TPZ, such as grading or trenching. It may also be necessary to have other key project team members available to monitor these activities.

The Project Arborist shall specify to construction personnel that the following conditions shall be avoided:

- Allowing runoff or spillage of damaging materials into the area below any tree canopy.
- Storing construction materials or portable toilets, stockpiling of soil, or parking or driving vehicles within the TPZ.
- Cutting, breaking, skinning, or bruising roots, branches, or trunks without first obtaining authorization from the Project Arborist.
- Allowing fires under and adjacent to trees.
- Discharging exhaust into foliage.
- Securing cable, chain, or rope to trees or shrubs.
- Trenching, digging, or otherwise excavating within the CRZ or TPZ of the tree(s) without first obtaining authorization from the Project Arborist.
- Applying soil sterilizers under pavement near existing trees.

The Project Arborist shall provide periodic inspections during construction. Four-week intervals should be sufficient to access and monitor the effectiveness of the TPP and to provide recommendations for any additional care or treatment. More frequent inspections may also be required based on the approved TPP.

The following activities should be observed and inspected by the Project Arborist during the construction phase to ensure compliance with the approved TPP:

- Only excavation by hand or compressed air shall be allowed within the TPZ of trees. Machine trenching shall not be allowed.
- To avoid injury to tree roots, when a trenching machine is being used outside of the TPZ of trees, and roots are encountered smaller than two inches, the wall of the trench adjacent to the trees shall be hand-trimmed, making clear, clean cuts through the roots. All damaged, torn, and cut roots shall be given a clean cut to remove ragged edges, which promote decay. Trenches shall be filled within 24-hours; where this is not possible, the side of the trench adjacent to the trees shall be kept shaded with four layers of dampened, untreated burlap, wetted as frequently as necessary to keep the burlap wet. Roots two inches or larger, when encountered, shall be reported immediately to the Project Arborist, who will decide whether the Contractor may cut the root as mentioned above or shall excavate by hand or with compressed air under the root. All exposed roots are to be protected with dampened burlap.
- Where possible, route pipes outside of the TPZ of a protected tree to avoid conflict with roots.
- Where it is not possible to reroute pipes or trenches, the contractor shall bore or tunnel beneath the TPZ of the tree. The boring shall take place not less than three feet below the surface of the soil to avoid encountering “feeder” roots. All boring equipment must be staged outside of the TPZ.
- All grade changes adjacent to the TPZ of a significant tree shall be supervised by the Project Arborist. Cuts or fills of soil adjacent to the TPZ will have a retaining wall system installed as approved by the Project Arborist and City Staff.
- Any damage due to construction activities shall be reported to the Project Arborist and City Staff within 6-hours so that remedial action can be taken.
- The Project Arborist shall be responsible for the preservation of the designated trees. Should the builder fail to follow the tree protection specifications, it shall be the responsibility of the Project Arborist to report the matter to City Staff as an issue of non-compliance.

Additionally, it is the responsibility of the Project Manager to ensure compliance with the following activities:

- Construction shall be monitored regularly to ensure compliance with specifications. Work shall be stopped if construction site management BMPs are not being followed by the contractor.
- Cement washout pits and chemical holding areas shall be located away from tree protection areas, streams, and wetlands.
- Contractor parking and material storage shall be limited to already impacted areas away from tree roots.
- Site offices and equipment shall not encroach into tree protection areas.
- Refueling and maintenance areas shall be kept away from trees, native soils, water bodies, and drainage systems. Fuel spills will not be tolerated on construction sites.
- To the extent possible, construction equipment shall be kept away from all on-site vegetation, especially those within designated protected areas.

POST-CONSTRUCTION

The post-construction phase does not end when the equipment leaves and the new tenants move in. Important follow-up monitoring of the protected trees will help ensure their survival and identify signs of early stress.

The applicant shall arrange with the Project Arborist for the long-term care and monitoring of preserved trees by complying with the following conditions:

- Complete post-construction tree maintenance, including pruning, mulching, fertilization, irrigation, and soil aeration where necessary.
- Remove, by hand, all soil and root protection material such as wood chips, gravel, and plywood.
- Provide for remediation of compacted soil by methods such as aeration or vertical mulching.
- In the absence of adequate rainfall, apply at least 1-inch of water per week in the CRZ by deep watering.
- Fertilize trees with slow-release phosphorus, potassium, calcium, magnesium, and other macro- and micro-nutrients as indicated by a soil test, but wait at least 1-year to apply any nitrogen.
- Fertilize lightly with slow-release nitrogen after 1-year, and then make annual light nitrogen applications for the next three to five years.
- Inspect trees annually for at least three to five years after construction to look for changes in condition and signs of insects or disease and to determine maintenance needs.
- Remove trees that are badly damaged or are in irreversible decline as determined by the Project Arborist and City Staff.
- Continue to protect not only the large, established trees on the site but also those newly planted in the landscape.
- Maintain TPP during the installation of new landscaping.
- Provide annual inspection reports to the City.
- Review TPP before the installation of landscaping and walkways/sidewalks.

Mitigating Tree and Infrastructure Conflicts

Conflicts may occur when tree roots grow adjacent to paving, foundations, sidewalks, or curbs (hardscape). Improper or careless extraction of these elements can cause severe injury to the roots and instability or even death of the trees. The following alternatives must first be considered before root pruning within the TPZ of a tree.

Removal of Pavement or Sidewalk

Removal of existing pavement over tree roots shall include the following precautions: break hardscape into manageable pieces with a jackhammer or pick and hand-load the pieces onto a loader. The loader must remain outside the TPZ on undisturbed pavement or off exposed roots. Do not remove base rock that has been exploited by established absorbing roots. Apply untreated wood chips over the exposed area within 1-hour, then wet the chips and base rock and keep moist until overlay surface is applied.

Replacement of Pavement or Sidewalk

An alternative to the severance of roots greater than two inches in diameter should be considered before cutting roots. If an alternative is not feasible, remove the sidewalk, as stated above, cut roots with a sharp, clean saw, as approved by the Project Manager or Project Arborist, and replace sidewalk using #3 dowels at the expansion joint if within 10 feet of a protected tree. Use wire mesh reinforcement if within 10 feet of the trunk of a tree.

Alternative Methods to Reduce Root Pruning

- Grinding a raised sidewalk edge.
- Ramping the walking surface over the roots or lifted slab with pliable paving.
- Routing the sidewalk around the tree roots.
- Install boardwalk, flexible paving, or rubberized sections.

NEW SIDEWALK OR DRIVEWAY DESIGN

New sidewalk or driveway design hould consider alternatives to conventional pavement and sidewalk materials. Substitute permeable materials for typical asphalt or concrete overlay, sub-base, or footings to consider are permeable paving materials (such as ECO-Stone or RIMA pavers), interlocking pavers, flexible paving, wooden walkways, and brick or flagstone walkways on sand foundations.

Avoid tree and infrastructure conflicts and associated costs by the following planting practices:

- Plant deep rooting trees that are proven to be non- or minimally invasive.
- Over soil that shrinks and swells, install a sidewalk with higher strength that has wire mesh and/or expansion slip joint dowel reinforcement.
- Fracture soil with an air spade and backfill with sand before planting to promote deep rooting and improved drainage.
- Install root barrier only along the hardscape area of the tree and allow roots to use open lawn or planter strip areas.
- Dedicate at least 10 feet of planting space for the growth of each new tree.
- Provide a dedicated irrigation system or zone for the tree so the trees do not have to compete and are not dependent on the turf and shrub irrigation.
- Avoid planting trees over underground drainage systems where root intrusion will impede function of the system.

ALTERNATIVE BASE COURSE MATERIALS

When designing hardscape areas near trees, the project architect or engineer should consider the use of recommended base course materials such as an engineered structural soil mix. An approved structural soil mix will allow a long-term, cost-effective tree and infrastructure compatibility that is particularly suited for the following types of development projects:

- Repair or replacement of sidewalk greater than 40 feet in length;
- Planting areas that are designed over structures or parking garages;
- Confined parking lot medians and islands or other specialized conditions as warranted.

Training

The Project Arborist should provide training to all construction personnel to ensure they understand all construction site BMPs.

The Construction Supervisor and Architect should have current training and education dealing with construction site management. This training should include topics regarding protecting trees and erosion control on construction sites.

Appendix G. Community Survey

Table 8. Optional. Please use this space for any additional comments about community trees in Artesia

We need to take better care of our recently planted trees, and remove trees that are currently lifting sidewalks and plant better choices in the future. Have tree planting training at local parks with free tree give away events for those that have taken the tree planting class or helped planting trees at local events.
Please get rid of palm trees and switch to something else. Also massive overgrown ficus on norwalk needs to go.
I believe that education on the long-term planning goals is key. So many see trees as nuisance but natives are critical to the ecology and very helpful to mitigate climate change in a long-term program, especially in suburban/urban areas. Please plant with permaculture in mind, high volume irrigation of course not sustainable in long term and so many practices can mitigate water loss from soil biome. Next please beneficial insect/bee/pollinator education for Artesians please !
Great survey. I think education of what a resident's role is when having a new tree is important and what our role would be.
Address how the street neighborhoods with only a sidewalk but no grass area between the sidewalk and street can have more trees? Will the trees be planted on front lawns? Will the city provide maintenance if planted on private property?
I had something to say but realized there was no point to it. If a person has a friend at city hall they get listened to. If not they get ignored.

Beautiful isles!
Beneath the
sunset skies tall,
silver-shafted
palm-trees rise,
between full
orange-trees that
shade the living
colonade.

William C. Bryant

Appendix H. Tree Permit for Regulated Tree Work

Appendix I. Indicators of a Sustainable Urban Forest and Gantt Chart

Table 9. The Trees

THE TREES				
INDICATORS OF A SUSTAINABLE URBAN FOREST	OVERALL OBJECTIVE OR INDUSTRY STANDARD	PERFORMANCE LEVELS		
		Low	Medium	High
Urban Tree Canopy	Achieve the desired tree canopy cover according to goals set for the entire City and neighborhoods. Alternatively, achieve 75% of the total canopy possible for the entire City and in each neighborhood.	Canopy is decreasing. -AND/OR- No canopy goals have been set.	Canopy is not dropping, but not on a trajectory to achieve the established goal.	Canopy goal is achieved, or well on the way to achievement.
Location of Canopy (Equitable Distribution)	Achieve low variation between tree canopy and equity factors City-wide by neighborhood. Ensure that the benefits of tree canopy are available to all, especially for those most affected by these benefits.	Tree planting and public outreach and education is not determined by tree canopy cover or benefits.	Tree planting and public outreach and education is focused on neighborhoods with low tree canopy.	Tree planting and public outreach and education is focused in neighborhoods with low tree canopy and a high need for tree benefits.
Age of Trees (Size and Age Distribution)	Establish a diverse-aged population of public trees across the entire City and for each neighborhood. Ideal standard: • 9-17" DBH: 30% • Over 24" DBH: 10%	No current information is available on size. -OR- Age distribution is not proportionally distributed across size classes at the City level.	Size classes are evenly distributed at the City level, though unevenly distributed at the neighborhood level.	Age distribution is generally aligned with the ideal standard diameter classes at the neighborhood level.
Condition of Publicly Owned Trees (trees managed intensively)	Possess a detailed understanding of tree condition and potential risk of all intensively managed, publicly owned trees. This information is used to direct maintenance actions.	No current information is available on tree condition or risk.	Information from a partial or sample or inventory is used to assess tree condition and risk.	Information from a current, GIS-based, 100% complete public tree inventory is used to indicate tree condition and risk.
Trees on Private Property	Possess a solid understanding of the extent, location and general condition of trees on private lands.	No data is available on private trees.	Current tree canopy assessment reflects basic information (location) of both public and private canopy combined.	Detailed information available on private trees. Ex. bottom-up sample-based assessment of trees.
Diversity	Establish a genetically diverse population of publicly owned trees across the entire City and for each neighborhood. Tree populations should be comprised of no more than 30% of any family, 20% of any genus, or 10% of any species.	No current information is available on species. -OR- Fewer than five species dominate the entire tree population City-wide.	No species represents more than 20% of the entire tree population City-wide.	No species represents more than 10% of the entire tree population City-wide.
Climate Resilience/Suitability	Establish a tree population suited to the urban environment and adapted to the overall region. Suitable species are gauged by exposure to imminent threats, considering the "Right Tree for the Right Place" concept and invasive species.	No current information is available on species suitability. -OR- Less than 50% of trees are considered suitable for the site.	50% to 75% of trees are considered suitable for the site.	More than 75% of trees are considered suitable for the site.
Space and Soil Volume	Establish minimum street tree soil volume requirements to ensure there is adequate space and soil for street trees to thrive. Minimum soil volumes by mature size: 1000 cubic feet for large trees; 600 cubic feet for medium trees; 300 cubic feet for small trees.	Minimum street tree soil volumes have not been established.	Minimum street tree soil volume has been established based on mature size of tree.	Minimum street tree soil volumes have been established and are required to be adhered to for all new street tree planting projects.

Table 10. The Players

THE PLAYERS				
INDICATORS OF A SUSTAINABLE URBAN FOREST	OVERALL OBJECTIVE OR INDUSTRY STANDARD	PERFORMANCE LEVELS		
		Low	Medium	High
Neighborhood Action	Citizens understand, cooperate, and participate in urban forest management at the neighborhood level. Urban forestry is a neighborhood-scale issue.	Little or no citizen involvement or neighborhood action.	Some active groups are engaged in advancing urban forestry activity, but with no unified set of goals or priorities.	The majority of all neighborhoods are organized, connected, and working towards a unified set of goals and priorities.
Large Private & Institutional Landholder Involvement	Large, private, and institutional landholders embrace City-wide goals and objectives through targeted resource management plans.	Large private land holders are unaware of issues and potential influence in the urban forest. No large private land management plans are currently in place.	Education materials and advice is available to large private landholders. Few large private landholders or institutions have management plans in place.	Clear and concise goals are established for large private land holders through direct education and assistance programs. Key landholders and institutions have management plans in place.
Green Industry Involvement	The green industry works together to advance City-wide urban forest goals and objectives. The City and its partners capitalize on local green industry expertise and innovation.	Little or no involvement from green industry leaders to advance local urban forestry goals.	Some partnerships are in place to advance local urban forestry goals, but more often for the short-term.	Long-term committed partnerships are working to advance local urban forestry goals.
City Department and Agency Cooperation	All City departments and agencies cooperate to advance City-wide urban forestry goals and objectives.	Conflicting goals and/or actions among City departments and agencies.	Informal teams among departments and agencies are communicating and implementing common goals on a project-specific basis.	Common goals and collaboration occur across all departments and agencies. City policy and actions are implemented by formal interdepartmental and interagency working teams on all City projects.
Funder Engagement	Local funders are engaged and invested in urban forestry initiatives. Funding is adequate to implement City-wide urban forest management plan.	Little or no funders are engaged in urban forestry initiatives.	Funders are engaged in urban forestry initiatives at minimal levels for short-term projects.	Multiple funders are fully engaged and active in urban forestry initiatives for short-term projects and long-term goals.
Utility Engagement	All utilities are aware of and vested in the urban forest and cooperates to advance City-wide urban forest goals and objectives.	Utilities and City agencies act independently of urban forestry efforts. No coordination exists.	Utilities and City agencies have engaged in dialogues about urban forestry efforts with respect to capital improvement and infrastructure projects.	Utilities, City agencies, and other stakeholders integrate and collaborate on all urban forestry efforts, including planning, site work, and outreach/education.
State Engagement	State departments/agencies are aware of and vested in the urban forest and cooperates to advance City-wide urban forest goals and objectives.	State departments/agencies and City agencies act independently of urban forestry efforts. No coordination exists.	State department/agencies and City agencies have engaged in dialogues about urban forestry efforts with respect to capital improvement and infrastructure projects.	State departments/agencies, City agencies, and other stakeholders integrate and collaborate on all urban forestry efforts, including planning, site work, and outreach/education.
Public Awareness	The general public understands the benefits of trees and advocates for the role and importance of the urban forest.	Trees are generally seen as a nuisance, and thus, a drain on City budgets and personal paychecks.	Trees are generally recognized as important and beneficial.	Trees are seen as valuable infrastructure and vital to the community's well-being. The urban forest is recognized for the unique environmental, economic, and social services its provides to the community.
Regional Collaboration	Neighboring communities and regional groups are actively cooperating and interacting to advance the region's stake in the City's urban forest.	Little or no interaction between neighboring communities and regional groups.	Neighboring communities and regional groups share similar goals and policy vehicles related to trees and the urban forest.	Regional urban forestry planning, coordination, and management is widespread.

Table 11. The Management

THE MANAGEMENT				
INDICATORS OF A SUSTAINABLE URBAN FOREST	OVERALL OBJECTIVE OR INDUSTRY STANDARD	PERFORMANCE LEVELS		
		Low	Medium	High
Tree Inventory	Comprehensive, GIS-based, current inventory of all intensively-managed public trees to guide management, with mechanisms in place to keep data current and available for use. Data allows for analysis of age distribution, condition, risk, diversity, and suitability.	No inventory or out-of-date inventory of publicly-owned trees.	Partial or sample-based inventory of publicly-owned trees, inconsistently updated.	Complete, GIS-based inventory of publicly-owned trees, updated on a regular, systematic basis.
Canopy Assessment	Accurate, high-resolution, and recent assessment of existing and potential City-wide tree canopy cover that is regularly updated and available for use across various departments, agencies, and/or disciplines.	No tree canopy assessment.	Sample-based canopy cover assessment, or dated (over 10 years old) high resolution canopy assessment.	High-resolution tree canopy assessment using aerial photographs or satellite imagery.
Management Plan	Existence and buy-in of a comprehensive urban forest management plan to achieve City-wide goals. Re-evaluation is conducted every 5 to 10 years.	No urban forest management plan exists.	A plan for the publicly-owned forest resource exists but is limited in scope, acceptance, and implementation.	A comprehensive plan for the publicly owned forest resource exists and is accepted and implemented.
Risk Management Program	All publicly-owned trees are managed for maximum public safety by way of maintaining a City-wide inventory, conducting proactive annual inspections, and eliminating hazards within a set timeframe based on risk level. Risk management program is outlined in the management plan.	Request-based, reactive system. The condition of publicly-owned trees is unknown.	There is some degree of risk abatement thanks to knowledge of condition of publicly-owned trees, though generally still managed as a request-based reactive system.	There is a complete tree inventory with risk assessment data and a risk abatement program in effect. Hazards are eliminated within a set time period depending on the level of risk.
Maintenance Program of Publicly-Owned Trees *(trees managed intensively)*	All intensively-managed, publicly-owned trees are well maintained for optimal health and condition in order to extend longevity and maximize benefits. A reasonable cyclical pruning program is in place, generally targeting 5-to-7-year cycles. The maintenance program is outlined in the management plan.	Request-based, reactive system. No systematic pruning program is in place for publicly-owned trees.	All publicly-owned trees are systematically maintained, but pruning cycle is inadequate.	All publicly-owned trees are proactively and systematically maintained and adequately pruned on a cyclical basis.
Maintenance Program of Publicly-Owned Natural Areas *(trees managed extensively)*	The ecological structure and function of all publicly-owned natural areas are protected and enhanced while accommodating public use where appropriate.	No natural areas management plans are in effect.	Only reactive management efforts to facilitate public use (risk abatement).	Management plans are in place for each publicly-owned natural area focused on managing ecological structure and function and facilitating public use.
Planting Program	Comprehensive and effective tree planting and establishment program is driven by canopy cover goals, equity considerations, and other priorities according to the plan. Tree planting and establishment is outlined in the management plan.	Tree establishment is ad hoc.	Tree establishment is consistently funded and occurs on an annual basis.	Tree establishment is directed by needs derived from a tree inventory and other community plans and is sufficient in meeting canopy cover objectives.
Tree Protection Policy	Comprehensive and regularly updated tree protection ordinance with enforcement ability is based on community goals. The benefits derived from trees on public and private property are ensured by the enforcement of existing policies.	No tree protection policy.	Policies are in place to protect trees, but the policies are not well-enforced or ineffective.	Protections policies ensure the safety of trees on public and private land. The policies are enforced and supported by significant deterrents and shared ownership of City goals.
City Staffing and Equipment	Adequate staff and access to the equipment and vehicles to implement the management plan. A high-level urban forester or planning professional, strong operations staff, and solid certified arborist technicians.	Insufficient staffing levels, insufficiently trained staff, and/or inadequate equipment and vehicle availability.	Certified arborists and professional urban foresters on staff have some professional development but are lacking adequate staff levels or adequate equipment.	Multi-disciplinary team within the urban forestry unit, including an urban forestry professional, operations manager, and arborist technicians. Vehicles and equipment are sufficient to complete required work.
Funding	Appropriate funding in place to fully implement both proactive and reactive needs based on a comprehensive urban forest management plan.	Funding comes from the public sector only and covers only reactive work.	Funding levels (public and private) generally cover mostly reactive work. Low levels of risk management and planting in place.	Dynamic, active funding from engaged private partners and adequate public funding are used to proactively manage and expand the urban forest.
Disaster Preparedness & Response	A disaster management plan is in place related to the City's urban forest. The plan includes staff roles, contracts, response priorities, debris management and a crisis communication plan. Staff are regularly trained and/or updated.	No disaster response plan is in place.	A disaster plan is in place, but pieces are missing and/or staff are not regularly trained or updated.	A robust disaster management plan is in place, regularly updated and staff is fully trained on roles and processes.
Communication	Effective avenues of two-way communication exist between the City departments and between City and its citizens. Messaging is consistent and coordinated, when feasible.	No avenues are in place. City departments and public determine on an ad-hoc basis the best messages and avenues to communicate.	Avenues are in place but used sporadically and without coordination or only on a one-way basis.	Avenues are in place for two-way communication, are well-used with targeted, coordinated messages.

Table 12. Gantt Chart

City of Artesia Urban Forest Management Plan												
Primary Goals	Cost	2022	2023	2024	2025	2026	2027–2037	2037–2047	2047–2057	Timeframe	Priority
Grow and maintain a sustainable urban forest											
Goal: Adopt a comprehensive Tree Ordinance	$									1 Year	High
Goal: Reach 10% canopy cover by 2040	$–$$									20 Years	High/Ongoing
Goal: Strive for equitable distribution of canopy cover	$–$$									Ongoing	High
Goal: Promote species diversity	$									Ongoing	High
Goal: Increase tree planting on private property	$									Ongoing	Medium
Preserve and protect the community tree resource											
Goal: Become a Tree City USA	$									Ongoing	High
Goal: Employ an ISA Certified Arborist	$–$$									1–5 Years	Medium
Goal: Increase contractor oversight	$									Ongoing	High
Goal: Stable and consistent funding	$$									Ongoing	High
Goal: Formulate a long-term tree planting program	$									Ongoing	Medium
Goal: Distinguish City trees	$									1 Year	High
Goal: Update tree planting standards to be consistent with current industry standards and to save on planting costs	$									Ongoing	High
Goal: Provide consistent and adequate maintenance to City trees	$									Ongoing	High
Goal: Maintain tree inventory	$$									Ongoing	High
Connect trees and canopy with the community											
Goal: Engage the community in urban forestry programming	$									Ongoing	High
Goal: Continue existing partnerships and look for other connections with local tree advocacy	$									Ongoing	Medium
Goal: Use trees to enhance community livability and aesthetics	$									Ongoing	Medium
Goal: Increase access to greenspace	$$–$$$									Ongoing	Medium
Goal: Formalize safety and emergency response procedures	$									1–2 Years	High
Goal: Incorporate trees into other planning documents	$									Ongoing	High
Goal: Use trees to support stormwater management systems wherever possible	$$									Ongoing	Medium
Goal: Plant trees in the rights-of-way where residents request trees	$									Ongoing	Medium
	$ = less than $25,000			$$ = $25,000–$100,000				$$$ = more than $100,000			

Appendix J. Photo Contest Credits