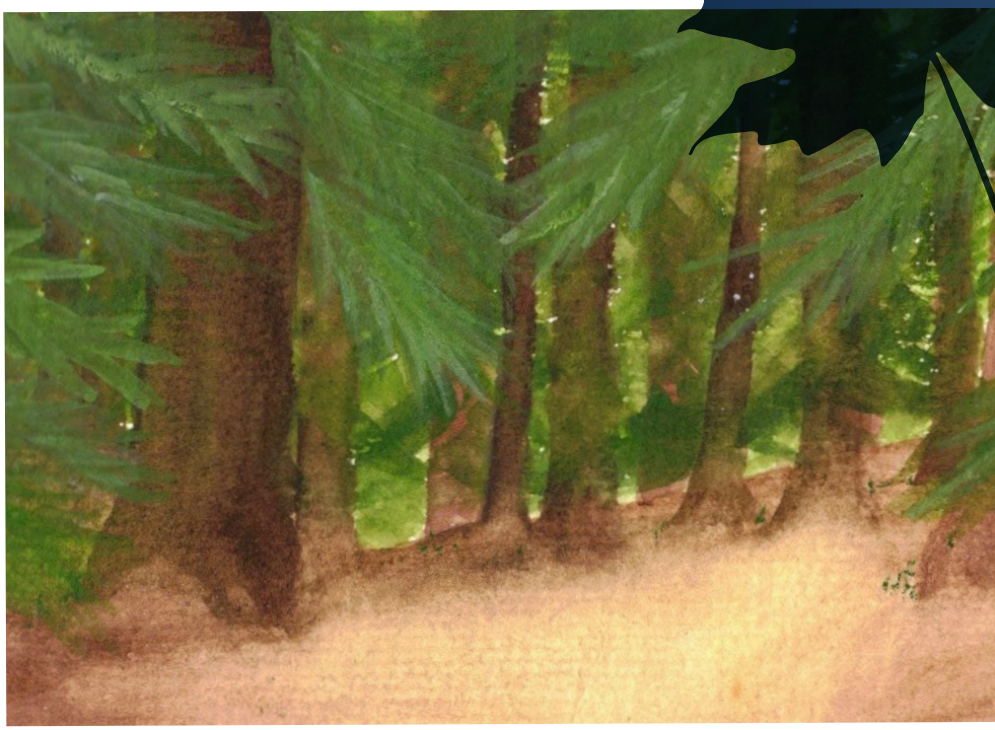
Garden Grove

CALIFORNIA





URBAN FOREST MANAGEMENT PLAN

2020

“LANDSCAPES OF GREAT WONDER AND BEAUTY LIE UNDER OUR FEET AND ALL AROUND US. THEY ARE DISCOVERED IN TUNNELS IN THE GROUND, THE HEART OF FLOWERS, THE HOLLOWS OF TREES, FRESH WATER PONDS, SEAWEED JUNGLES BETWEEN TIDES, AND EVEN DROPS OF WATER.”

WALT DISNEY





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"I SPEAK FOR THE TREES, FOR TREES HAVE NO TONGUES."

DR. SEUSS, THE LORAX



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City of Garden Grove
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Tree Art Contest

As part of the development of the UFMP, the city of Garden Grove organized the "Tree Art Contest," an art and photo contest for youth. The city partnered with Garden Grove Unified School District and the Boys and Girls Club to provide outreach for the art contest. It was featured as part of the "2nd Annual Art in the Park" event. The city created the contest to highlight the different ways that Garden Grove residents appreciate and celebrate the city's urban forest. A total of 12 photograph entries and 85 pieces of artwork were submitted to the city's tree art contest. Many of the photos and artworks are included throughout this document.


TREE
ART
CONTEST
THE HOME DEPOT
Klein





• Scope and Purpose

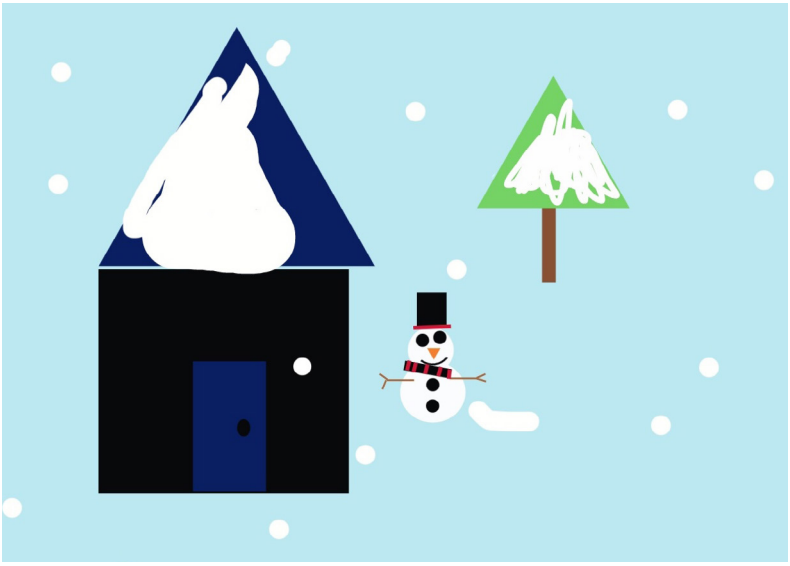
The purpose of the Urban Forest Management Plan (UFMP) is to provide a guide for managing, enhancing, and growing Garden Grove's community tree resource over the next 40 years. Community, or city, trees are publicly managed trees along streets (public rights-of-way), in city parks, and on city-owned facilities. The UFMP includes goals for long-range planning to promote sustainability, species diversity, and greater canopy cover. The UFMP also provides some consideration for private trees because they contribute significantly to Garden Grove's livability and environmental quality.

The UFMP aims to:

- Identify best management practices that support tree health, benefits, and community safety.
- Increase the health and resiliency of the urban forest by improving species diversity, and by managing pests and invasive species.
- Develop a cohesive organizational structure to facilitate collaboration for managing the urban forest.
- Nurture an environment of stewardship for the urban forest among city staff, community organizations, residents, and businesses.
- Identify baseline metrics and clear goals for urban forest managers.
- Promote community engagement and advocacy for the urban forest.

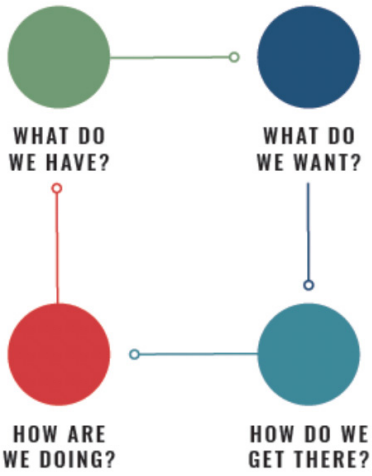
The UFMP provides specific goals and actions for managing community trees, preserving, and increasing canopy cover, and improving community outreach. The UFMP includes both long and short-term actions in support of these ends.



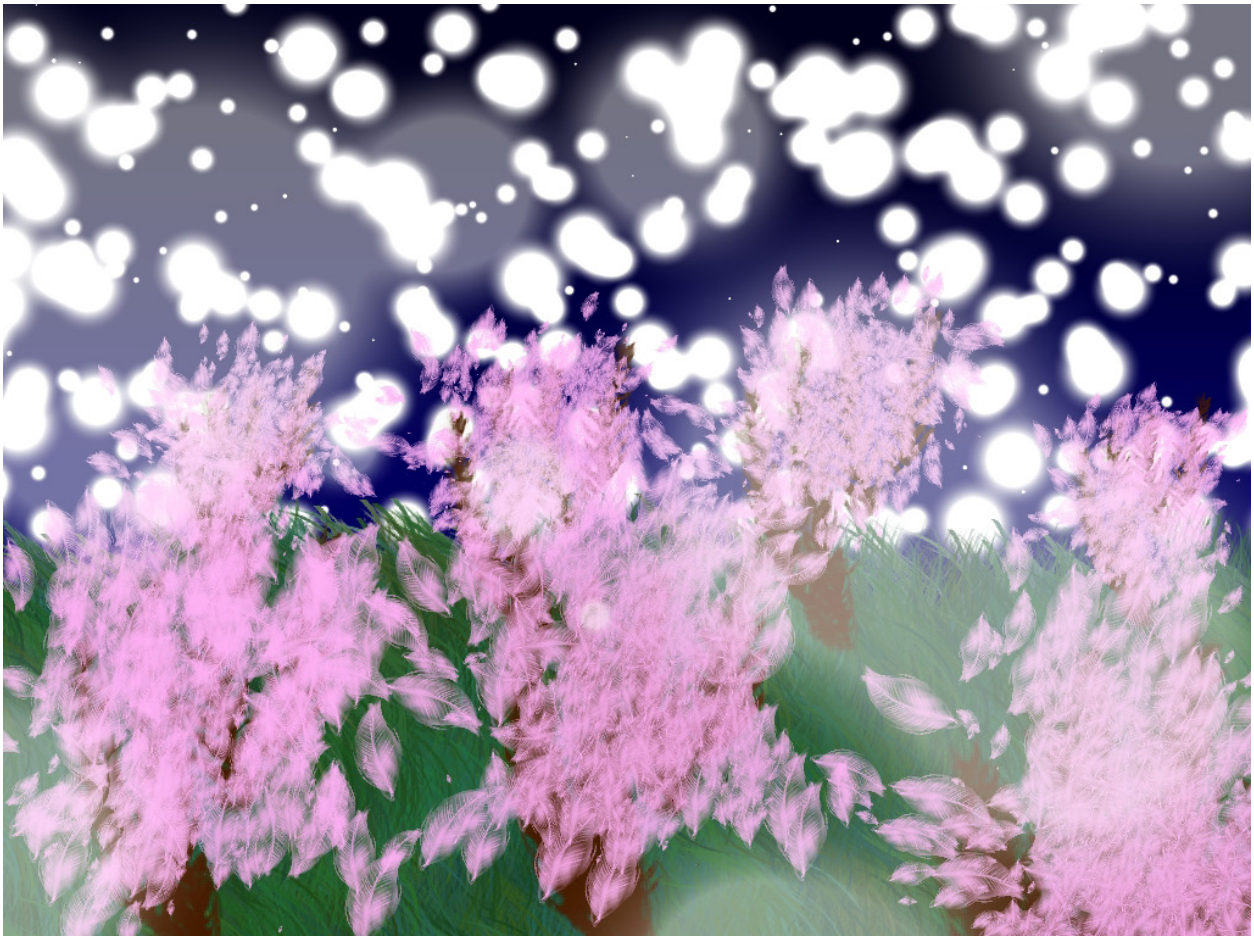


• Executive Summary

Garden Grove's community urban forest includes 17,210 public-managed trees along streets, parkways, and medians, in city parks and open space, and at city-owned facilities. Along with their aesthetic contribution, these trees provide valuable and critical services to the community including benefits to air quality, water quality, stormwater management, energy savings, wildlife habitat, and socioeconomics. The Urban Forest Management Plan (UFMP) serves as a road map that identifies long- and short-term management goals to effectively preserve and enhance the environmental benefits provided by this critical infrastructure.



The UFMP's structure is based on the understanding of What we have, What we want, How we get there, and How we are doing. This structure, known as **adaptive management**, is commonly used for resource planning and management (Miller, 1988) and provides a conceptual framework for the process of improving urban forest management.



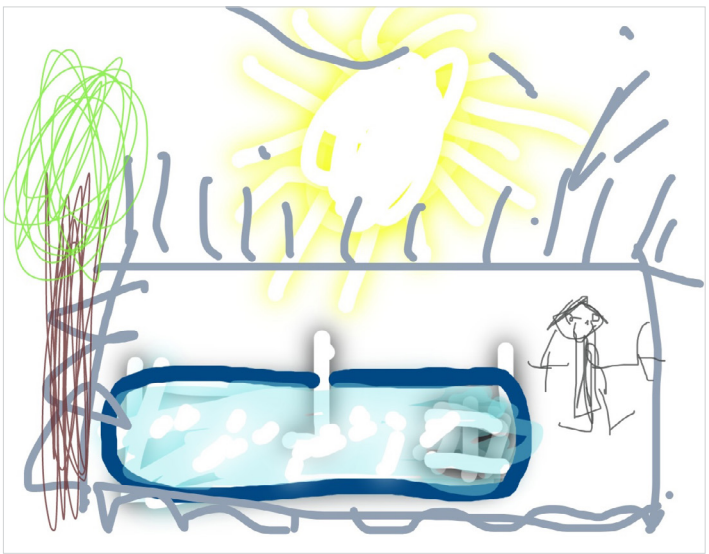
What do we have?

The UFMP development process included a comprehensive review and assessment of the existing urban forest resource, including canopy cover, composition of the community urban forest, environmental benefits, and value. As of January 2020, the city's Public Works Department, Trees Services Division, manages a total of 17,210 community trees. Annually, Garden Grove's community trees provide environmental benefits to the community valued at $125,795, an average $7.31 per tree. Over half of the environmental benefits are attributed to pollution removal at $74,381, with carbon sequestration at $45,426, and avoided stormwater runoff at $5,987 (Garden Grove Urban Forest Resource Analysis, 2020). These conservative estimations are for only community trees and do not include the benefits from trees located on private property. Ongoing research continues to affirm that trees and natural systems are critical to the health and well-being of human communities. However, many of these benefits are intrinsic and can be difficult to quantify.

A Tree Canopy Assessment of the city (2019) found an average of 7.9% tree canopy and 72.9% impervious surface across the community. Tree canopy (public and private) was mapped to benchmark the extent and distribution in a Geographic Information Survey (GIS) layer that can be explored with other data, including demographics and land use, to analyze relationships and track change over time.

The planning process explored community values and vision, including those expressed in guiding documents, including Garden Grove's General Plan, Active Streets Master Plan, Active Downtown Plan, city ordinance, state law, and other regulatory and policy documents. The process also evaluated funding and current service levels, including programs coordinated by city departments that play a role in managing or planning for the urban forest. In addition to the Trees and Streets Division, many internal and external stakeholders play a role in the planning, design, care, and advocacy of the urban forest. Stakeholders include city departments, utility providers, and community members. Each of these stakeholders played a role and provided input for the development of this plan.

Title 11 of the Garden Grove Municipal Code regulates protection of public trees from harmful pollutants, electrical conflicts, and construction. The Trees and Streets Division works with other city departments to protect, preserve, and manage community trees. The Trees Division is responsible for planting trees, pruning for clearance and visibility, addressing service requests, and emergency response. Regular maintenance, including crown cleaning and structural pruning, along with large tree removals is contracted.





Since the recession in 2008, City budget cuts have reduced staff in the Trees Division and impacted tree planting efforts for new and replacement trees. Many mature trees have been removed over time and replanting has been limited due to insufficient resources (staff and funding) as well as concerns for long-term maintenance costs and planting space. However, with renewed interest in the sustainability and benefits of the urban forest, planting has increased in recent years from approximately 50 trees to 520 trees per year. The review process identified opportunities and challenges facing the Garden Grove's urban forest, most notably, infrastructure conflicts and a maturing community tree resource that will require more frequent maintenance as trees age. Additionally, opportunities exist to facilitate greater interdepartmental communication, particularly around resolution of conflicts between trees and other infrastructure.

With established benchmarks and an appreciation for the value of the urban forest, along with continued support from city leadership, Garden Grove has a strong foundation for protecting and enhancing the urban forest and ensuring that the community continues to benefit from this critical natural resource.

Garden Grove's Urban Forest Benchmark Values

Community Urban Forest (Public Tree Resource)

Public trees (2019)	17,210 trees

Species Diversity (Public Trees, 2019)

Total number of unique species	234
Prevalence of top ten species	61.0%
Species exceeding recommended 10%	1

Urban Tree Canopy Cover (Public and Private, 2019)

Overall canopy cover	7.9%
Impervious surfaces	72.7%
Canopy cover – Parks and Open Space	16.9%

Canopy Benefits[1] (Public, 2019)

Carbon stored to date	6,235 tons	$1.1 million
Annual carbon benefits	266 tons	$45,426
Annual air quality benefits	10,086 pounds	$74,381
Annual stormwater benefits	670,038 gallons	$5,897

[1] These are a subset of the quantifiable benefits trees provide and do not account for energy savings, benefits to wildlife, property values, and contributions to public health and welfare.

What do we want?

The UFMP planning process engaged City staff and community members to better understand their vision and ideas for the future of Garden Grove's urban forest. Stakeholders indicated the following topics were important considerations for the UFMP:

- Provide adequate care for right-of-way trees, including regular inspection, young tree care, and maintenance to address public safety.
- Increase the average tree canopy cover to 15%.
- Update language in the Municipal Code and other policies relating to street trees, including enhanced protections and improvements to clarity.
- Create a comprehensive tree planting plan, including a plan to revitalize landscaping in transition areas throughout the city.
- Restore irrigation to community trees.
- Increase the level of community engagement.
- Address existing and future conflicts with grey infrastructure.
- Provide adequate resources, including funding, to realize community goals for the urban forest.

How do we get there?

The UFMP identifies goals, objectives, and actions to ensure that the community's vision is realized in the future urban forest. Initiatives include following industry standards and best management practices in the care and maintenance of community trees, optimizing operations and funding, facilitating greater interdepartmental coordination, and enhancing community outreach and partnerships.

Goals and existing policies are consolidated into four areas of focus:

- Comprehensive and efficient tree care operations
- Practices and policies related to the community tree resource
- Environmental, social, and economic benefits of trees
- Community outreach and collaboration

Each goal is supported by comprehensive objectives and actions.

How are we doing?

The long-term success of the Urban Forest Management Plan (UFMP) will be measured through the realization of plan goals and demonstrated through increased value and environmental services from the urban forest. The UFMP identifies methods of measurement, priorities, potential partners, and estimated costs for each objective. Since the UFMP is intended to be a dynamic tool, it can and should be updated in response to available resources and opportunities. One of the greatest measures of success for the UFMP will be its level of achievement in meeting community expectations for the care and preservation of Garden Grove's urban forest.

Focus	Goals and Existing Policies	Objectives
Comprehensive and efficient tree care operations	**Goal 1: Plan for trees before planting.** **Goal 2: Support tree health and good structure.** **Goal 3: Repurpose woody materials wherever possible.** **Existing Policy 1: Understand the structure and composition of Garden Grove's community tree resource.**	• Set emphasis on the Right Tree in the Right Place. • Develop planter improvement and design strategies for mitigating conflicts and increasing soil volume. • Ensure community trees are maintained according to industry standards to promote tree health, longevity, and public safety. • Establish a risk management policy. • Employ multiple tools and strategies to prevent and/or manage pests and pathogens. • Identify a wood reutilization policy. • Maintain a tree inventory that can be used to manage the community tree resource.
Practices and policies related to the community tree resource	**Goal 4: Increase uniformity between City policies, documents, and departments.** **Goal 5: Recognize trees as essential green infrastructure.** **Existing Policy 2: Promote a culture of safety.**	• Communicate and coordinate with other city departments. • Unify guiding documents to transcend departmental changes, promote consistency, and shared vision. • Plan for trees to limit future grey infrastructure conflicts. • Create and enforce policies that protect trees. • Implement policies and procedures that make that tree work as safe as possible. • Encourage employees to engage in professional development.
Environmental, social, and economic benefits of trees	**Goal 6: Promote tree preservation and protection.** **Goal 7: Enhance community aesthetics.** **Goal 8: Expand and diversify tree canopy to increase the environmental benefits received by the community.** **Existing Policy 3: Encourage the establishment of trees through efficient and sustainable irrigation solutions.**	• Revise and amend Municipal Code to promote the protection of community trees. • Monitor contractor services. • Optimize the Trees Division to address maintenance needs. • Monitor for pests and pathogens. • Encourage the expansion of the urban forest through tree plantings on public property. • Encourage the expansion of the urban forest through tree plantings on private property. • Reach 15% tree canopy cover by 2040. • Promote species diversity to build a more sustainable community tree resource. • Promote the efficient use of tree planting funds. • Support established and mature trees. • Establish a more water-wise urban forest. • Ensure trees receive adequate water.
Community outreach and collaboration	**Goal 9: Celebrate the importance of urban trees.** **Goal 10: Support community engagement and stewardship of the urban forest.**	• Re-establish the Tree City USA designation. • Promote the Urban Forest Management Plan. • Update the website for the Trees & Flood Control Section on the city Website. • Encourage community involvement and stewardship for the urban forest. • Encourage the expansion of the urban forest through tree plantings on both public and private property. • Support the formation of a community-led tree advocacy group.

• Introduction

Garden Grove, the "City of Youth and Ambition", is home to nearly 177,000 people (Southern California Association of Governments, 2018). Originally, the area was coastal sage scrub land, and then transformed from a small farming community featuring chili peppers, oranges, walnuts, and strawberries, to an urban center. Garden Grove is a community that celebrates its agricultural history. The Strawberry Festival is an annual event in Garden Grove. This festival was first celebrated in 1958 and features community events, local vendors, artisans, and festival rides. The Strawberry Festival is the largest municipal event held in California and the second largest west of the Mississippi River. In addition, the Strawberry Festival provides charitable funding to many local organizations (Garden Grove Strawberry Festival, 2020).

The city was named by its founder, Alonzo Cook. Although the city's name was initially criticized for the absence of trees, soon after, orange groves and diverse trees were planted. Cook's vision to "make it appropriate by planting trees and making it beautiful" was realized (Amor, 1921). Garden Grove's prominent landmark is the Christ Cathedral (formerly known as Crystal Cathedral) located on a 34-acre campus featuring buildings designed by Philip Johnson (cathedral), Richard Neutra (13-story Tower of Hope), and Richard Meier (Cultural Center). Garden Grove is neighbor to the Disneyland Resort, and home to Walt Disney's garage animation studio, which was moved from Los Angeles to the historic Stanley Ranch (Haire, 2015).

Garden Grove experiences a local steppe climate with minimal rainfall (~13 inches annually). According to Sperling's Best Places to Live, Garden Grove has a comfort index of 9.3 (10 being the best), with 275 days of sunshine, average summer highs of 83.3°F, and average winter lows of 46.3°F (2019).

Community

Garden Grove is located in Northern Orange County, situated in the Los Angeles metropolitan area, 34 miles southeast of Los Angeles and due south of the Disneyland Resort. State Route 22, the Garden Grove Freeway, passes through the city in an East-West direction. Garden Grove is a diverse community with numerous local amenities and recreational opportunities nearby such as, beaches, regional parks, and ecological reserves (AreaVibes, 2020).

GARDEN GROVE HISTORY

The Tongva, Juaneño, and Luiseño tribes were the first known people to call the area that is now Garden Grove "home" (Middlebrook, 2020). These hunter gatherers were thought to have displaced or assimilated with people already present in Southern California an estimated 3,500 years before Spanish colonization. The Spanish encouraged colonization and assimilation with the tribes, which ultimately led to their collapse (Sutton, 2009).

1700s

The area of Garden Grove was explored in 1769 during the expedition of Gaspar de Portola and was originally part of the Spanish land grant, Rancho Los Nietos in 1784.

1800s

Among the first to settle the area that is present-day Garden Grove, Abel Stearns, purchased Rancho Las Bolsas and in 1868 began to subdivide the land (City of Garden Grove, 1986). Later, in 1874, Alonzo Cook purchased 160 acres and officially settled the city and began a small farming community, naming the town Garden Grove. The population was around 200 people in 1889 (City of Garden Grove, n.d.).

1900s

Up until the arrival of the railroad in 1905, the community remained small. The railway contributed to the boom of agricultural crops, with the ability to transport chilis, oranges, walnuts, and strawberries across the country. The early 1900s gave rise to many citrus associations, including Garden Grove Citrus, a packing house at Garden Grove, as well as historical figures that advanced citrus production (Amor, 1921).

In 1916, after heavy torrential rains, the Santa Ana River and Santiago Creek overflowed and flooded the city. As a result of the flooding, several people died, miles of railroad tracks were destroyed and trees were uprooted (Tortolano, 2015).

The Long Beach earthquake in 1933 was a 6.4 magnitude earthquake and one of Southern California's deadliest earthquakes. It resulted in the destruction of many older sections and buildings of the city, yet some of the original historic buildings that remained along Main Street are in the Stanley Ranch.

After World War II, the city experienced another population boom when servicemen from nearby Southern California Military Bases settled into surrounding communities to look for work and start families. Following the end of WWII, the Korean War, and the fall of Saigon many Vietnamese, Chinese, and Koreans immigrated to the city, contributing greatly to the local culture. The city of Garden Grove was incorporated in 1956 with a population of 44,000 (City of Garden Grove, n.d.).

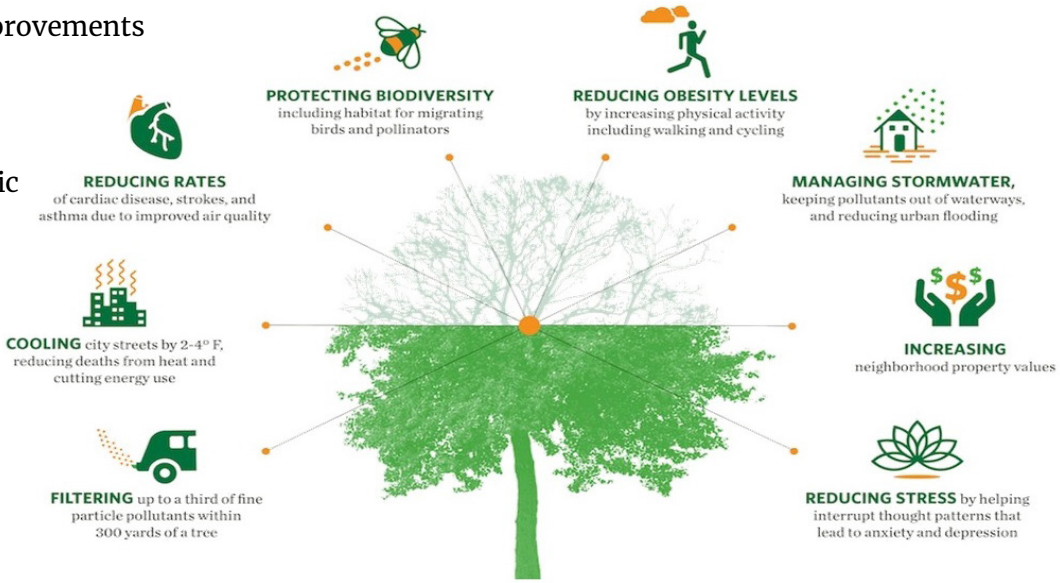
2000s

Current economic trends show that Garden Grove has continued to prosper. The community has had increases in employment, retail sales, building improvements, and building permits that have accommodated new developments including hotel high-rises and residences (Southern California Association of Governments, 2018). Homeownership in Garden Grove is above average for Orange County and although built out, redevelopment and improvements occur regularly.

Tree and Canopy Benefits

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

- Air quality improvements
- Carbon dioxide reductions
- Water quality improvements
- Energy savings
- Health, aesthetic, and socioeconomic benefits
- Wildlife



The Benefits of Urban Trees. THE NATURE CONSERVANCY

AIR QUALITY

Trees improve air quality in five fundamental ways:

- Lessening particulate matter (e.g., dust and smoke)
- Absorbing gaseous pollutants
- Providing shade and transpiring
- Reducing power plant emissions by decreasing energy demand among buildings
- Increasing oxygen levels through photosynthesis

Trees protect and improve air quality by intercepting particulate matter (PM_{10}) 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 (O_3), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Shade and transpiration reduce the formation of O_3, 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; McPherson and Simpson, 2010). VOCs are carbon-based particles emitted from automobile exhaust, lawnmowers, and other human activities.

CARBON DIOXIDE REDUCTION

As environmental awareness increases, governments are paying more attention to the effects of **greenhouse gas (GHG)** emissions and concerns about climate change. As energy from the sun (sunlight) strikes the Earth's surface, it is reflected into space as infrared radiation (heat). Greenhouse gases absorb some of this infrared radiation and trap this heat in the atmosphere, increasing the temperature of the Earth's surface. Many chemical compounds in the Earth's atmosphere act as GHGs, including methane (CH_4), nitrous oxide (N_2O), carbon dioxide (CO_2), water vapor, and human-made gases/aerosols. As GHGs increase, the amount of energy radiated back into space is reduced and more heat is trapped in the atmosphere. An increase in the average temperature of the earth can result in changes in weather, sea levels, and land use patterns, as well as localized changes that impact the suitability of some trees and other plant species to a specific region. In the last 150 years, since large-scale industrialization began, the levels of some GHGs, including CO_2, have increased by 25% (US Energy Information Administration, 2018).

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

- Directly, by reducing CO_2 in the atmosphere through growth and sequestration of CO_2 in woody and foliar biomass.
- Indirectly, by lowering the demand for energy and reducing CO_2 emissions from the consumption of natural gas and the generation of electric power.

STORMWATER MANAGEMENT AND WATER QUALITY

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

- Interception
- Increased soil capacity and infiltration rate
- Reduction in soil erosion

Trees intercept rainfall in their canopy, which acts as a mini-reservoir. During storm events, this interception reduces and slows runoff. In addition to catching stormwater, canopy interception lessens the impact of raindrops on barren soils. Root growth and decomposition increase the capacity and rate of soil infiltration by rainfall and snowmelt (Xiao et al. 1998). Each of these processes reduces the flow and volume of stormwater runoff, avoiding erosion and preventing sediments and other pollutants from entering streams, rivers, and lakes. Urban stormwater runoff is a major source of pollution for surface waters and riparian areas, threatening aquatic and other wildlife as well as human populations. Requirements for stormwater management are becoming more stringent and costly. Reducing runoff and incorporating urban trees in stormwater management planning have the added benefit of reducing the cost of stormwater management, including the expense of constructing new facilities necessary to detain and control stormwater as well as the cost of treatment to remove sediment and other pollutants (McKeand and Vaughn, 2013).

ENERGY SAVINGS

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

- Producing shade for dwellings and hardscapes reduces the energy needed to cool the building with air conditioning (Akbari et al. 1997).
- Tree canopies engage in evapotranspiration, which leads to the release of water vapor from tree canopies and cools the air (Lyle, 1996).
- Trees in dense arrangements may reduce mean wind speed and solar radiation below the top of the tree canopy by up to ~90% compared to open areas (Heisler and DeWalle, 1988).

A **heat island** is an urban area or metropolitan area that is significantly warmer than its surrounding rural areas due to human activities.

Trees reduce energy use in summer by cooling the surrounding areas. Shade from trees reduces the amount of radiant energy absorbed and stored by hardscapes and other impervious surfaces, thereby reducing the **heat island effect**, a term that describes the increase in urban temperatures in relation to surrounding locations. Transpiration releases water vapor from tree canopies, which cools the surrounding area. Evapotranspiration, alone or in combination with shading, can help reduce peak summer temperatures (Huang et al. 1990). The energy saving potential of trees and other landscape vegetation can mitigate urban heat islands directly by shading heat-absorbing surfaces, and indirectly through evapotranspiration cooling (McPherson, 1994). Individual trees through transpiration have a cooling effect equivalent to two average household central air-conditioning units per day or 70kWh for every 200L of water transpired (Ellison et al. 2017). Studies on the heat island effect show that temperature differences of more than 9°F (5°C) have been observed between city centers without adequate canopy cover and more vegetated suburban areas (Akbari et al. 1997).

Trees also reduce energy use in winter by mitigating heat loss, where they can reduce wind speeds by up to 50% and influence the movement of warm air and pollutants along streets and out of urban canyons. **Urban canyons** are streets flanked by dense blocks of buildings, affecting local conditions, such as temperature, wind, and air quality. By reducing air movement into buildings and against conductive surfaces (e.g., glass and metal siding), trees reduce conductive heat loss from buildings, translating into potential annual heating savings of 25% (Heisler, 1986).

Three trees properly placed around the home can save $100–$250 annually in energy costs. Shade from trees significantly mitigates the urban heat island effect—tree canopies provide surface temperature reductions on wall and roof surfaces of buildings ranging from 20–45°F and temperatures inside parked cars can be reduced by 45°F. Reducing energy use has the added bonus of reducing carbon dioxide (CO_2) emissions from fossil fuel power plants.

HEALTH BENEFITS

Exposure to nature, including trees, has a positive impact on human health and wellness through improvements in mental and physical health, reductions in crime, and academic success (University of Washington, 2018; University of Illinois, 2018).

A study of individuals living in 28 identical high-rise apartment units found residents who live near green spaces had a stronger sense of community and improved mental health, coped better with stress and hardship, and managed problems more effectively than those living away from green space (Kuo and Sullivan, 2001). In a greener environment, people report fewer health complaints (including improved mental health) and more often rate themselves as being in good health (Sherer, 2003). Other research has revealed lower incidence of depressive symptoms in neighborhoods with greater access to green space (Jennings and Gaither, 2015).

Trees shade impervious surfaces and prevent the sun's rays from hitting them, thus reducing heat storage and later release, which contribute to the urban heat island effect. Tall trees that create a large shaded area are more useful than short vegetation. Trees also contribute to cooler temperatures through transpiration, increasing latent heat storage (the sun's energy converts water from its liquid to vapor form) rather than increasing air temperature (sensible heat). According to a study conducted by the Nature Conservancy, it is estimated that trees have the potential to reduce summer maximum air temperatures by 0.9–3.6° F. Trees help to address public health concerns for both heat and air quality. Globally, an annual investment of $100 million in planting and maintenance costs would give an additional 77 million people a 1° C (1.8° F) reduction in maximum temperatures on hot days (McDonald et al. 2016).

Several studies have examined the relationship between urban forests and crime rates. 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). Research shows that the greener a building's surroundings are, the fewer total crimes. This is true for both property crimes and violent crimes. Landscape vegetation around buildings can mitigate irritability, inattentiveness, and decreased control over impulses, all of which are well-established psychological precursors to violence.

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, 2003). Public housing residents reported 25% fewer domestic crimes when landscapes and trees were planted near their homes (Kuo, 2001). Two studies (one in New Haven, CT and the other in Baltimore City and County, MD) found a correlation between increased tree coverage and decreased crime rates, even after adjusting for a number of other variables, such as median household income, level of education, and rented versus owner-occupied housing in the neighborhoods that were studied (Gilstad-Hayden et al. 2015; Troy et al. 2012).

A 2010 study investigated the effects of exposure to green space at school on the academic success of students at 101 public high schools in southern Michigan (Matsuoka, 2010). The study found a positive correlation between exposure to nature and student success measured by standardized testing, graduation rate, percentage of students planning to go to college, and the rate of criminal behavior. This trend persisted after controlling for factors such as socioeconomic status, race, or ethnicity. Conversely, views of buildings and landscapes that lacked natural features were negatively associated with student performance.

WILDLIFE HABITAT

Trees provide important habitat for birds, insects (including bees), and other animal species. Their greatest contributions include:

- Preservation and optimization of wildlife habitat
- Natural corridors for increased movement and dispersal

Furthermore, trees and forest lands provide critical habitat (for foraging, nesting, spawning, etc.) for mammals, birds, fish, and other aquatic species. Tree foliage, sap, flowers, and fruits can provide food sources that support wildlife. Urban forests contain an array of flowering trees which produce pollen and nectar food sources for pollinators. Trees also support a variety of invertebrate species that are fed upon by other wildlife. Increasing tree species diversity and richness contributes to greater numbers of bird species among urban bird communities (Pena et al. 2017). In addition to greater tree diversity, understory vegetation, the retention of large trees improves outcomes for both birds and bats by increasing opportunities to find adequate food and habitat (Threlfall et al. 2016).

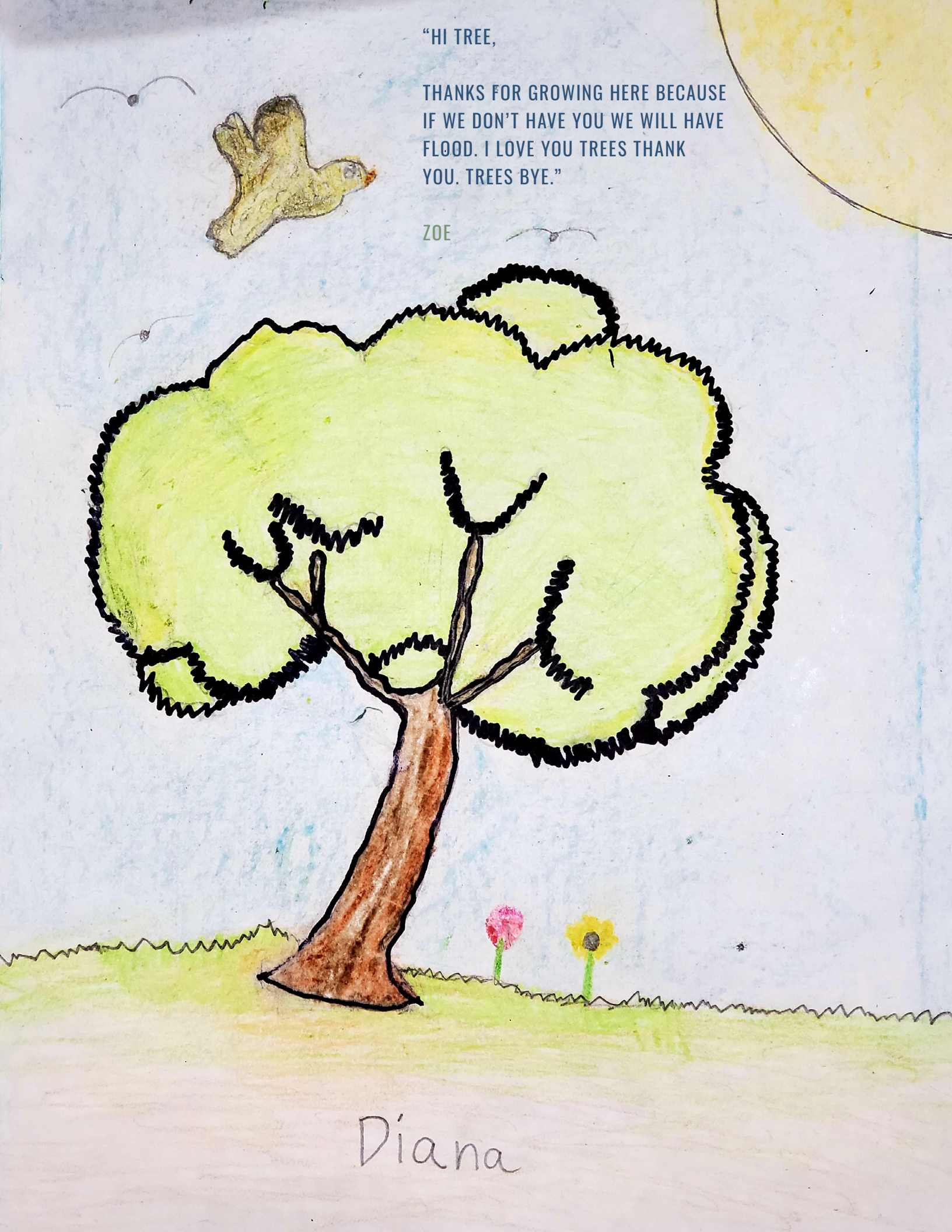
Wooded streets potentially function as movement corridors, allowing certain species—particularly those feeding on the ground and breeding in trees or tree holes—to fare well by supporting an alternative habitat for feeding and nesting (Fernandez-Juricic, 2001). Restoration of urban riparian corridors and their linkages to surrounding natural areas has facilitated the movement of wildlife and dispersal of flora (Dwyer et al. 1992). Usually habitat creation and enhancement increase biodiversity and complement 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 and help maintain ecosystem services (Haddad et al. 2015).

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 the free web-based tool, *i-Tree Design* (www.itreetools.org/design).






“HI TREE,
THANKS FOR GROWING HERE BECAUSE IF WE DON’T HAVE YOU WE WILL HAVE FLOOD. I LOVE YOU TREES THANK YOU. TREES BYE.”
ZOE
Diana

• What do we have?

History of the Urban Forest

Shortly before being introduced in Garden Grove, eucalyptus trees were brought to San Francisco, California in 1853. Eucalyptus were quickly sought by other communities for their potential as a lumber crop and border for agricultural lands and during the 1860s, the first urban and plantation trees were planted in Garden Grove. The Hill Plantation was established, in what is present day Garden Grove, as an experiment with 308 Sideroxylon trees, resulting in 28,240 board feet of lumber (Sellers, 1910).

The population growth was extraordinary in the 1950s, when World War II servicemen and their families settled in Garden Grove after the war (City of Garden Grove, n.d.). During initial development, grey infrastructure (i.e., infrastructure constructed of concrete and metal) was established with little consideration for the future growth of street trees, which have contributed to conflicts between existing infrastructure and trees. The city's first tree ordinance was adopted in 1961. In the 1990s, the first community tree inventory was collected and a Memorial Tree Program was established. Garden Grove was recognized by the Arbor Day Foundation and received the *Tree City USA Growth Award* from 1998–2009 for their innovative programs and projects aimed to enhance the urban forest. Currently, Garden Grove meets all of the Tree City USA standards and could apply for recognition. The standards are met because the Trees Division is responsible for the care of community trees, the city follows a Tree Ordinance, the city spends more than $2 per capita on the urban forest each year, and the city website has an Arbor Day proclamation.

When compared to other municipalities in Orange County, Garden Grove has one of the better funded urban forestry programs and is slightly less than average for the number of trees per 100 residents (17 trees per 100 residents, as compared to an average of 22 trees per 100 residents) (Orange County's Grand Jury, 2019).





The Valencia oranges are a remnant of some of the oldest planted trees in Garden Grove. URBAN FOREST FACT

Historic eucalyptus and original Valencia oranges can still be found along roadsides and in neighborhoods throughout the community. Other notable trees within the community include remnant coast live oaks at Village Green Park and the "Eureka" walnut at Stanley Ranch. Ongoing revitalization projects have the potential to increase tree canopy, notably the incorporation of trees along bike paths and other pedestrian corridors as well as transition zones and entrances to the city. In conjunction with the development of the UFMP, the planting of 363 trees will occur along the former Pacific Electric Railway easement.

Garden Grove's Trees Division was established prior to the late 1970s. While the city does not have, and has not historically had, a City Arborist or Urban Forester, Trees Division staff are dedicated to the maintenance of community trees. Since 2018, the Trees Division has prioritized planting approximately 520 community trees each year.
They also provide post-planting care such as watering, mulching, and tree supports.

The Stanley Ranch

Edward G. Ware settled on forty acres north of Garden Grove in 1876 and built the historic Stanley house in 1891. Ware farmed at the Stanley Ranch, which is located at the heart of Garden Grove (Amor, 1921) and grew many different crops and developed advanced horticultural skills. He is known as the first person to grow Valencia oranges in Garden Grove, but was also interested in Navel orange and walnut trees. His work on tree crops earned him recognition as the "best authority on walnuts in the state of California". The original "Eureka" walnut still stands at the Stanley Ranch (SeeCalifornia, n.d.). This tree is of historical significance because attention from a prominent nurseryman was placed on its propagation. As a result, it became the seed source for all "Eureka" walnuts, "Prolific" nut, and "Earhart" disease-resistant walnuts planted throughout Southern California during this time (Amor, 1921). Today, the Garden Grove Historical Society manages the Stanley Ranch Museum and Historical Village (SeeCalifornia, n.d.).



The "Eureka" walnut leafing out at Stanley Ranch

Urban Forest Resource

An urban forest is defined as the collection of privately-owned and publicly-owned trees and woody shrubs that grow within an urban area. Garden Grove's urban forest resources include the overall tree canopy cover, which consists of both private and public-owned trees. The community urban forest is a subset of the urban forest comprised of the public-owned trees on streets, in City parks, and at City-owned facilities. A summary of the composition and value of these resources follows.

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 tree canopy is critical to developing and implementing sound management strategies that will promote the smart growth and resilience of Garden Grove's urban forest and the invaluable services it provides. A tree canopy assessment examines tree cover (public and private) from a bird's-eye-view and includes consideration of tree canopy along with other primary land cover, including impervious surface, low-lying vegetation, bare soils, and water. Garden Grove's Tree Canopy Assessment (2019) provides managers with information to better understand canopy cover in relation to other geospatial data, including:

- Distribution of tree canopy within the community
- Geopolitical patterns in canopy distribution

The analysis did not distinguish between trees on public and private property since the benefits of trees extend beyond property lines. The information can be used by urban forest managers to explore tree canopy in conjunction with other available metrics, including geography, land use, and community demographics. The data also establishes a baseline for assessing future change.

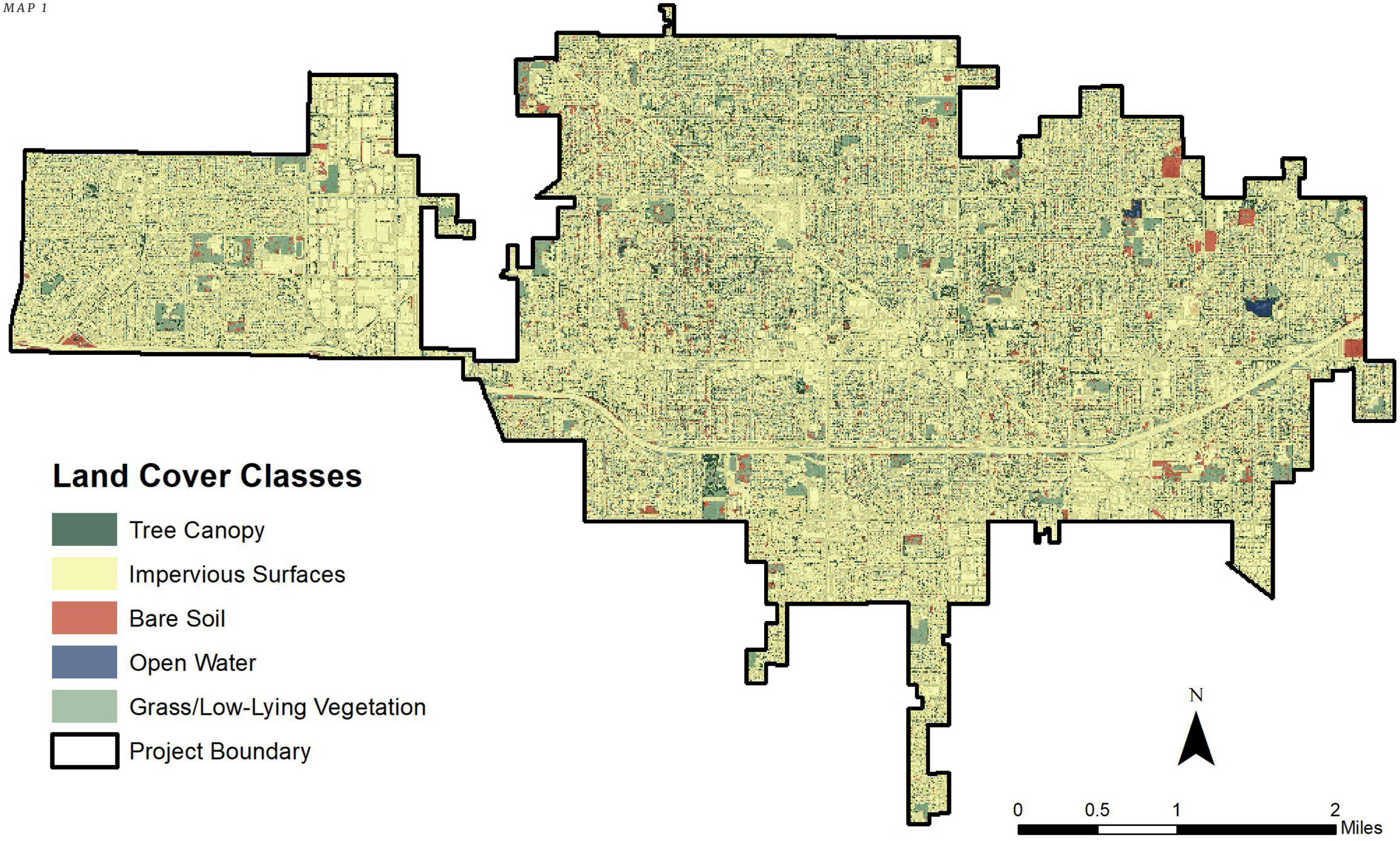
Land Cover Summary

Tree Canopy by Land Use

Garden Grove encompasses 18 square miles (11,472 acres). Excluding impervious surface (8,337.9 acres) and open water (11.6 acres), Garden Grove contains approximately 3.5 square miles (2,215 acres) some of the land could provide potential planting opportunities. The following characterizes land cover in Garden Grove:

- 907 acres (7.9%) of tree canopy, including trees and shrubs
- 27 acres of tree canopy in parks, an average 16.9% canopy cover
- 36.5 acres of tree canopy in Garden Grove schools, with an average 4.8% canopy cover
- 8,337.9 acres (72.7%) of impervious surface, including roads and structures

MAP 1


Land Cover Classes
Tree Canopy
Impervious Surfaces
Bare Soil
Open Water
Grass/Low-Lying Vegetation
Project Boundary
N
0
0.5
1
2
Miles











"REVERSING DEFORESTATION IS COMPLICATED; PLANTING A TREE IS SIMPLE."

MARTIN O'MALLEY



Tree Canopy by Parks

Garden Grove has 21 parks (160.2 acres) and the Tree Canopy Assessment identified over 27 acres of tree canopy and an average canopy cover of 16.9% in the parks. Parks could provide opportunities for adding additional large-stature shade trees to increase overall canopy cover and benefits for the community.

TABLE 1: Canopy Cover in Garden Groves's Top Ten Largest Parks

Park Name	Acres	Canopy Acres	Canopy %	Impervious Acres	Grass/ Low-lying Veg. Acres	Bare Soil Acres	Open Water Acres
Garden Grove Park	27.23	4.61	16.94	4.18	16.82	1.62	0.00
Haster Basin Recreation Area[2]	22.61	3.52	15.57	5.25	5.35	0.25	8.24
Chapman Sports Complex	15.31	0.39	2.57	4.03	10.05	0.84	0.00
Hare School Park	12.38	0.90	7.30	1.26	8.54	1.66	0.00
Edgar Park	11.85	1.67	14.13	0.61	9.33	0.23	0.00
West Haven Park	10.00	0.54	5.44	1.47	6.01	1.99	0.00
Lake School Park	8.95	0.44	4.93	0.79	6.63	1.09	0.00
West Grove Park	6.99	1.42	20.24	0.59	4.96	0.01	0.00
Magnolia Memorial Park Cemetery	6.26	1.52	24.19	0.79	2.94	1.00	0.00
Village Green Park	5.45	0.77	14.10	0.70	3.94	0.05	0.00
All Other Parks	33.16	11.23	33.87	8.20	13.09	0.31	0.32
All Parks Total	**160.20**	**27.02**	**16.87%**	**27.88**	**87.66**	**9.04**	**8.56**

[2] Haster Basin is a County Park

Tree Canopy by Schools

The Tree Canopy Assessment found that Garden Grove's 56 schools encompass 764.3 acres and have an average canopy cover of 4.8%. As the average tree canopy in Garden Grove's schools is below the average canopy cover throughout the rest of the community, the city could explore ways to partner with schools to increase canopy cover. Students benefit when school properties have ample tree canopy cover. Access to green infrastructure has been shown to heighten student performance by increasing attention spans and reducing stress levels. Furthermore, tree canopy has been shown to increase activity levels and reduced the risk of physical and mental health illnesses (Li and Sullivan, 2016)

TABLE 2: Canopy Cover by Type of School in Garden Grove

School Type	Acres	Canopy Acres	Canopy %	Impervious Acres	Grass/ Low-lying Veg. Acres	Bare Soil Acres	Open Water Acres
Elementary	364.73	21.21	5.81	161.37	147.13	34.99	0.00
Intermediate	152.42	6.94	4.55	53.14	84.29	8.03	0.00
High	184.26	5.62	3.05	98.35	57.17	23.13	0.00
Special Education	9.64	0.27	2.77	2.87	5.16	1.34	0.00
Religious School	12.86	1.22	9.47	10.02	1.34	0.28	0.00
Adult Education	40.43	1.28	3.16	22.13	12.80	4.24	0.00
All Schools Total	**764.34**	**36.53**	**4.80%**	**347.88**	**307.89**	**72.00**	**0.00**

Tree Canopy by Zoning

Zoning reflects the community's plan for growth in specific areas. Zoned areas encompass 8,905.4 acres and tree canopy varies from 1.8% (Heavy Commercial) to 13.7% (Civic Center) canopy cover. Examining tree canopy cover by land use zones can provide additional perspective on where to target new tree plantings.

TABLE 3: Canopy Cover by Zoning

Zone	Acres	Canopy Acres	Canopy %	Impervious Acres	Grass/ Low-lying Veg. Acres	Bare Soil Acres	Open Water Acres
Adaptive Reuse Zone	60.66	2.10	3.46	56.19	2.20	0.17	0.00
Brookhurst/Chapman Specific Plan	9.36	0.16	1.67	8.66	0.54	0.00	0.00
Civic Center	118.53	16.21	13.67	81.97	17.08	2.94	0.32
Community Center	106.51	12.30	11.55	77.73	15.19	1.29	0.00
Garden Grove Blvd Mixed Use	194.75	10.28	5.28	167.33	15.33	1.82	0.00
Harbor Corridor	74.25	5.00	6.74	63.71	4.09	1.46	0.00
Heavy Commercial Zone	25.54	0.46	1.79	22.86	0.70	1.53	0.00
Industrial Park Zone	154.05	5.35	3.47	142.27	3.64	2.78	0.00
Limited Industrial Zone	143.51	3.75	2.61	134.33	3.97	1.45	0.00
Limited Multiple Residential Zone	86.74	7.87	9.08	59.23	15.66	3.98	0.00
Multiple-Family Residential	809.17	65.31	8.07	638.42	95.44	10.01	0.00
Neighborhood Commercial	266.09	11.50	4.32	242.74	9.82	2.03	0.00
Neighborhood Mixed Use Zone	128.76	6.74	5.24	115.25	6.49	0.28	0.00
Office Professional Zone	30.71	2.28	3.46	24.86	3.03	0.54	0.00
Open Space Zone	1,008.78	64.46	6.39	473.82	378.17	81.02	11.31
Planned Unit Development	1,095.39	89.44	8.17	899.25	76.18	30.52	0.00
Railroad Zone	11.74	0.70	6.00	10.97	0.07	0.00	0.00
Single-Family Residential Zone	4,567.55	439.88	9.63	2,928.81	997.39	201.47	0.00
Transportation Corridor Zone	13.29	0.48	3.58	10.82	0.63	1.36	0.00
All Zones Total	**8,905.39**	**744.27**	**8.36%**	**6,159.22**	**1,645.62**	**344.65**	**11.63**

"TREES WERE HERE BEFORE HUMANS. THEY ARE WORTH EVERY PENNY IMAGINABLE."

GARDEN GROVE COMMUNITY MEMBER



COMMUNITY TREE RESOURCE

Community trees (publicly managed trees along streets, in parks, and at city-owned facilities) play a vital role in Garden Grove. They provide numerous tangible and intangible benefits to residents, visitors, and neighboring communities.

Structure

A structural analysis is the first step toward understanding the benefits provided by community trees, as well as their management needs. In 2019, Garden Grove's community tree resource currently includes 17,210 trees and 234 unique species or varieties along streets and in parks[3]. The following information characterizes Garden Grove's community tree resource:

- *Lagerstroemia indica* (common crapemyrtle, 13.6%) is the most common species, followed by *Lophostemon confertus* (vinegartree, 9.2%), and *Cupaniopsis anacardioides* (carrotwood, 8.2%).
- 14.1% of the population are less than 6 inches in diameter (DBH), 67.0% are between 6 and 18 inches in diameter, and 18.8% are larger than 18 inches in diameter.
- 92.2% of community trees are in fair condition.
- Community trees provide an estimated 139.2 acres of tree canopy cover, 1.5% of total land area.
- Replacement of the 17,210 community trees with trees of equivalent size, species, and condition, would cost more than $62.7 million.

Urban forest managers can identify species in the community tree inventory that have performed well based on their relative performance and age distribution.

Species Diversity

Maintaining species diversity in a community tree resource is essential. If a single species or genus dominates the composition of the tree resource, there can be detrimental consequences in the event of storms, drought, disease, pests, or other stressors. Catastrophic pathogens, such as Dutch elm disease (*Ophiostoma ulmi*), Emerald ash borer (*Agrilus planipennis*), Asian longhorned 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 growing concern for polyphagous shot hole borer (PSHB) (*Euwallacea* sp.), a new pest that has devastated urban forests in Southern California due to its wide host range, including *Persea americana* (avocado) and *Acer negundo* (boxelder) (Eskalen, 2015).

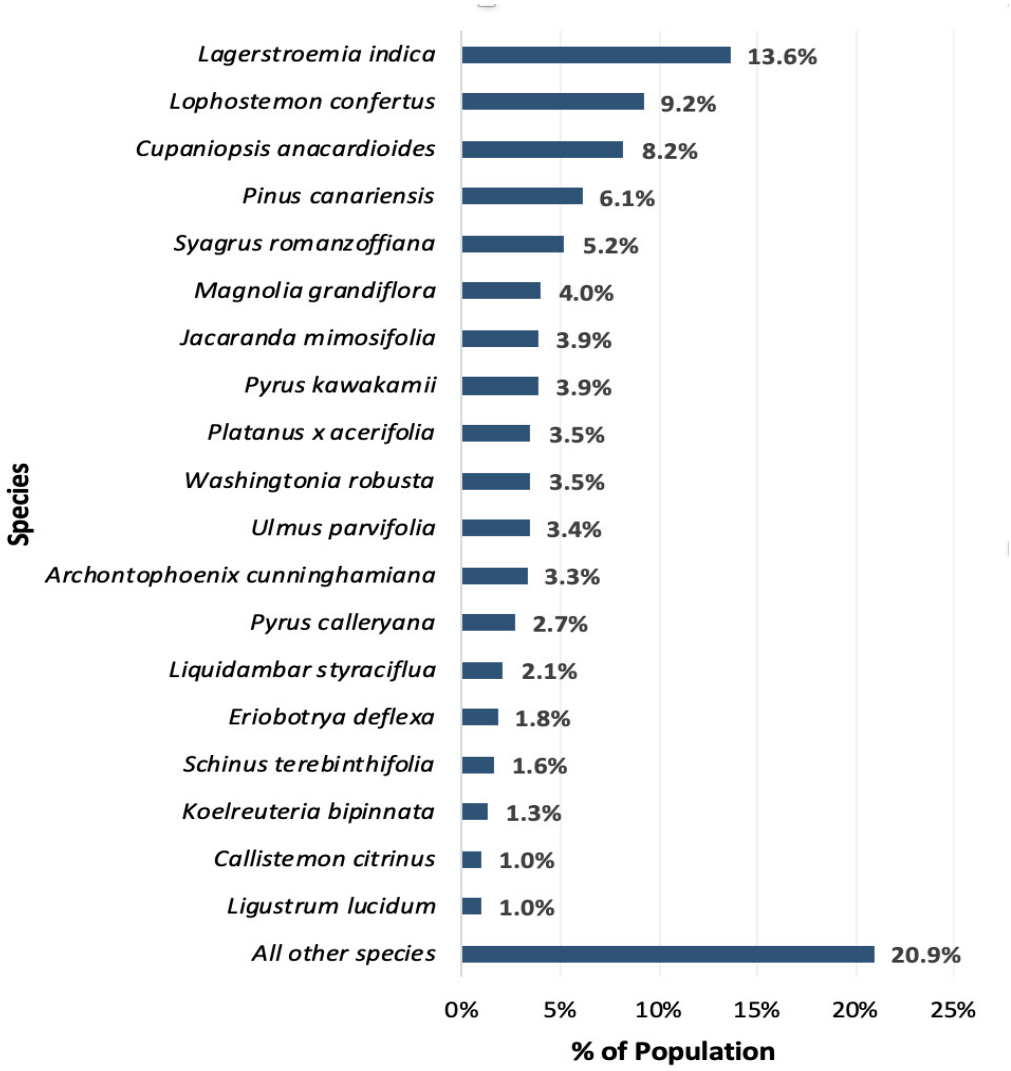
In light of significant pests and diseases, many cities are opting to increase diversity to improve resilience. The widely used 10-20-30 rule of thumb states that an urban tree population should consist of no more than 10% of any one species, 20% of any one genus, and 30% of any one family (Clark et 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.

[3] Garden Grove Urban Forest Resource Analysis (2020)

Managers should always strive to increase the range of representation among species and genera within an urban forest. Among Garden Grove's community tree population, Lagerstroemia indica (common crapemyrtle) exceeds this well accepted rule and none of the genera exceed the 20% rule.

The most prevalent species in Garden Grove is *Lagerstroemia indica* (common crapemyrtle, 13.6%), followed by *Lophostemon confertus* (vinegartree, 9.2%), and *Cupaniopsis anacardioides* (carrotwood, 8.2%) (Figure 1). All together, these three species represent 31.0% of the overall population.

FIGURE 1: MOST PREVALENT SPECIES IN GARDEN GROVE



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.

Age Distribution

The distribution of individual tree ages within a tree population influences present and future costs as well as the flow of benefits. The age distribution of Garden Grove's community tree resource (excluding palms) reveals an established and mature population with 2,942 trees, nearly 18.8%, greater than 18-inches in diameter. Managers can gain a better understanding of the specific risks that individual mature trees pose with regular inspection and risk assessment.

Trees greater than 24 inches diameter require more regular inspections and routine maintenance as they mature. When trees reach mature stature, they provide the greatest benefits. However, mature trees should be regularly assessed for health and risk factors as they approach or reach the end of their natural lifespan. They may have higher maintenance needs or require removal to reduce risk and liability. Garden Grove has 1,225 mature trees (7.8%) that require more regular inspections.

Trees between 6 and 18 inches in diameter indicate that there are young, large and medium-stature tree species. This age group is a positive indicator for future benefits from the urban forest, since large shade trees typically provide more shade, pollutant uptake, carbon sequestration, and rainfall interception than small trees. In Garden Grove, this is also a reflection of the mature, small-statured species represented in the inventory. The 10,468 trees are 6–18 inches in diameter and represent nearly 67% of the population in Garden Grove and require routine, structural pruning.

Trees below 6 inches in diameter indicate young trees and new tree plantings. 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. In Garden Grove, 2,209 trees are below 6 inches and represent 14.1% of the population.

Canopy from Public Trees

Garden Grove covers an area of 14.7 square miles (9,408). *i-Tree Eco* estimates that community trees provide 0.2 square miles (139.2 acres) of canopy cover, or 1.5% of the total land area.

Benefit Versus Investment

The benefits provided by the urban forest are dependent upon the species, age (size), and condition of the tree population. The urban forest is the one component of urban infrastructure that has the potential to increase in value over time and with proper care. As tree canopy cover increases, so do the benefits afforded by leaf area. To date, community trees have stored 6,235 tons of carbon (CO_2) in woody and foliar biomass valued at nearly $1.1 million.

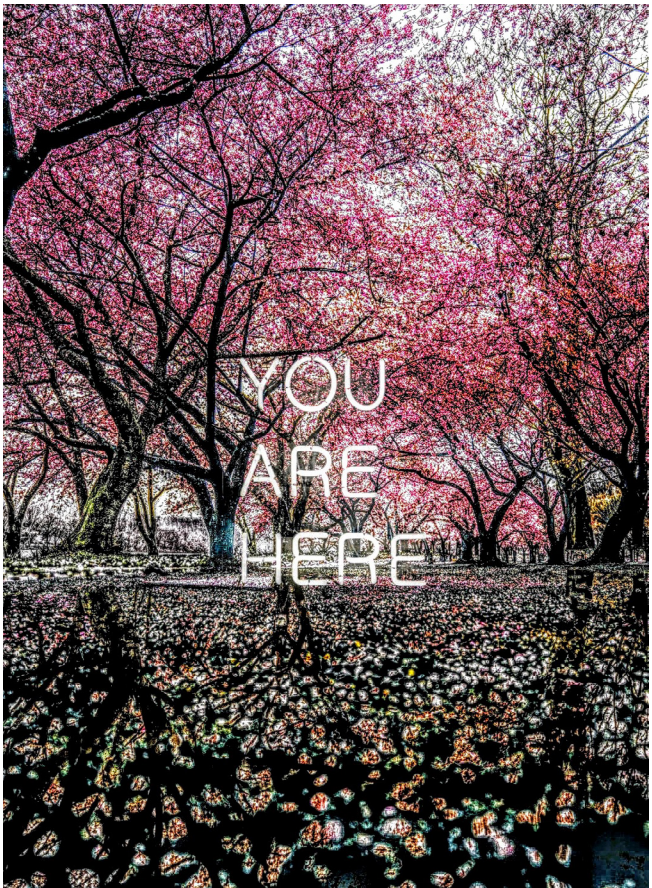
Annually, Garden Grove's 17,210 community trees provide cumulative environmental benefits at an average value of $7.31 per tree, for a total value of $125,795. These annual environmental benefits include:

- $5,987 in intercepted stormwater (670,038 gallons), an average benefit of $0.35 per tree

- $74,381 in air quality improvements (10,086 pounds of particulates removed), an average of $4.32 per tree
- $45,426 in sequestered atmospheric carbon (266 tons), an average of $2.64 per tree

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. Furthermore, some 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 what one can ever quantify!

Considering the estimated annual budget, currently just over $1.1 million is invested in the community tree resource, the annual net benefit (benefits minus investment) to the community is -$1 million. In other words, for every $1 invested in community trees, the community receives $0.11 in benefits. It is important to note that this is value is an underestimation of the benefits provided by the community tree resource as many benefits were unable to be included in this report. Benefits provided by electricity and natural gas reductions through shading and climate effects were not calculated. Other benefits, such as the role community trees play in increasing property values, contributing to aesthetic and socioeconomic benefits, and helping Garden Grove meet State emission reductions are not quantifiable.



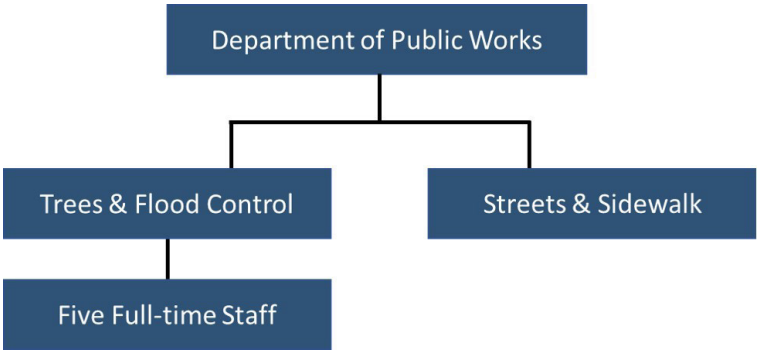
"TO BE ABLE TO WALK UNDER THE BRANCHES OF A TREE THAT YOU HAVE PLANTED IS REALLY TO FEEL YOU HAVE ARRIVED WITH YOUR GARDEN."

MIRABEL OSLER

Trees Division Operations

Under the Department of Public Works, the Trees and Streets Division is responsible for the management of all trees within the public rights-of-way, parks, and public places, along with the maintenance of catch basins. The Section's primary responsibility is the maintenance of 17,210 community trees. Approximately 10% to 25% of staff time is devoted to cleaning and inspecting catch basins, removing weeds, and repairing fences. While the focus of responsibilities can vary, depending upon seasonal changes and rainfall (localized flooding is not uncommon), the Trees and Streets Division performs the following services:

- Maintaining community trees, including clearance and visibility pruning.
- Responding to service requests to address hanging branches and other public safety concerns.
- Removal of trees and stumps.
- Tree planting.
- Maintaining the community tree inventory data.
- Tree inspection and risk identification.
- Design review.
- Contract monitoring (grid pruning and large tree removal).
- Emergency response.
- Flood control.



Currently, the Trees and Streets Division employs five full-time staff members, one of which is acting foreman. Ideally, the Trees Division would have two tree crews using two aerial lifts, two brush trucks and one flatbed that will move between the crews. Because the section is short-staffed, occasionally maintenance activities are conducted on weekends to address open service requests, budget permitting. To assist in the staff shortages, part-time, Public Works Trainees (staff members limited to 1,500 hours per year) are used to supplement the labor. However, trainees are restricted to three days of work and are often unexperienced in tree maintenance. In addition, part-time staff do not possess commercial driver's licenses (CDLs), therefore cannot drive aerial lift trucks or brush trucks. While part-time staff are trained on the proper handling and operation of equipment and are provided the opportunity to acquire their CDLs through the city, these employees often transition to other positions within the city or seek employment elsewhere. Decreases in staffing levels began in the 1990s and subsequent budget cuts have resulted in numerous full-time positions going unfilled.

Although currently none of the Trees Division staff are certified arborists or hold other professional tree care licenses, all staff participate in safety trainings conducted by a licensed safety consultant whom holds classes throughout the year. Manufacturer representatives provide training on the safe operation and proper use of all equipment.

To further instill a culture of safety, all staff participate in weekly "tailgates" and records of participation are kept for each staff member. All equipment, including heavy-duty vehicles, chippers, and climbing gear are inspected daily.

TREE MAINTENANCE

Approximately 85% of the tree trimming is performed through contracts, which maintain 5,100 community trees annually through grid pruning on a 3 to 4-year cycle (some palms and elms are on a 2-year cycle). They also provide pruning for clearance, enhanced structure, or to remove dead/diseased areas following American National Standards Institute (ANSI) A300 tree care operation standards as well as Municipal Code specifications. Grid pruning is based on district cycles, which allows for predictable scheduled maintenance. Due to recent increases in the number of tree removals, grids in recent years have been partially completed and not on a predictable schedule. Consequentially, the increased demand for removals has resulted in budget constraints, reducing the capacity for tree trimming and other maintenance operations (approximately $10,000 per month is currently being spent on removals).

Contractors are also used to prune around utility lines, remove large trees, and remove trees in areas that are difficult to access or require the use of cranes. In addition, approximately 95% of stump grinds are contracted. Wood debris disposal costs are included in contracted pruning and removals. Wood debris generated by in-house crews are temporarily stored in a green waste pile at the Public Works Corporate Yard. Later, they are transferred to the city waste management center and composted.

Clearance and Visibility

The Public Works Department receives complaints about tree clearance issues on private property on a regular basis. In these instances, the Trees Division follows the standard of clearance that is required by the Municipal Code. First, staff determine the actions needed to eliminate the obstruction, then use written notification(s) to alert the private property owner. If the clearance issue is not resolved upon re-inspection, city staff resolve the issue at the owner's expense. Any trees that conflict with overhead utilities are addressed by Edison, the local energy company.

Service Requests

Community members can request maintenance by phone or online, and then requests are funneled to the corresponding Department. Each year, the Trees and Streets Division addresses approximately 1,200 service requests from community members. Typically, the Trees Division performs a visual inspection and contacts the community member to discuss possible solutions within 2-5 days. Most requests are for tree maintenance, storm damage mitigation, inquiries about the Adopt-a-Tree and Memorial Tree programs, as well as root pruning.

Contract Monitoring

The Trees Division follows Standard Operating Procedures for Public Works staff, *Trimming of City Trees and Specifications for Street Tree Maintenance* to maintain consistency in city-performed or contracted tree removals, stump removals, replacements, and trimming. These standards are used to evaluate the needs of individual trees for maintenance. Contracted operations are monitored by the Trees Division to ensure compliance. Some residents request

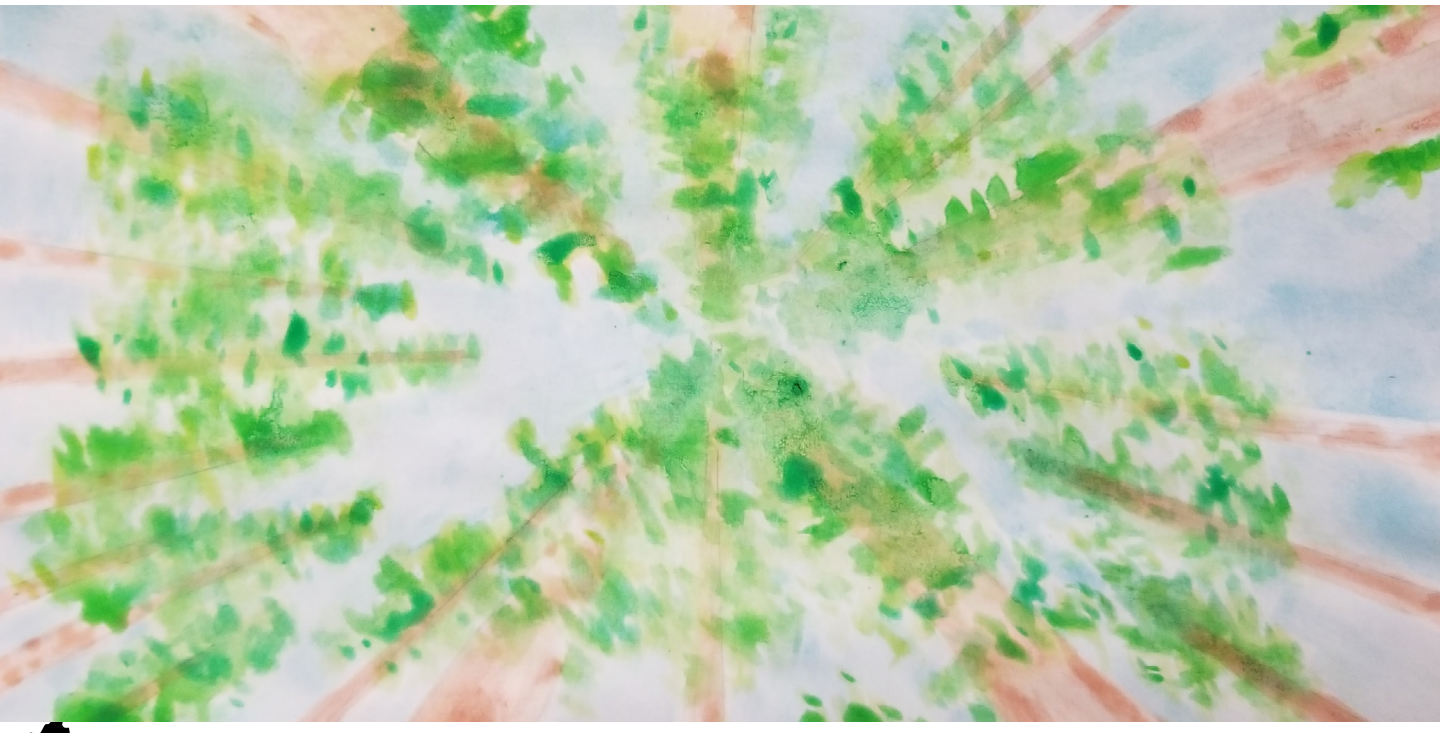
annual pruning of their city trees, which is not always conducive to tree health. Therefore, each tree is inspected and evaluated based on the *Specifications for Street Tree Maintenance*. Funding and public safety are also considered prior to conducting any maintenance activities. The American National Standards Institute (ANSI) provides industry standards (A300 Series) for tree care operations and the International Society of Arboriculture (ISA) publishes Best Management Practices for tree care activities.

Tree Inspection

Tree inspections occur as part of the procedure for evaluating service requests. In addition, city staff are encouraged to report any concerns observed while conducting other maintenance tasks and the Trees Division Manager conducts follow up visual inspections on such reports as needed. While the Trees Division maintains good communication with Risk Management to investigate tree-related claims against the city, currently there is no formal policy for tree inspection. A formalized policy can better ensure that all trees receive regular inspection, proactively identify concerns, and help to minimize risk and manage liability. Ideally, inspection would occur in conjunction with pruning cycles.

Maintaining Tree Inventory Data

The city uses an internal computerized inventory system to keep track of community trees, their location, species, historic maintenance, and trimming schedule. Vacant sites are also included in the inventory. Currently, the 2002 inventory is updated when maintenance occurs, but removals are not included as part of updates. Relying on a user-friendly tree inventory software and updating the inventory to include tree removals would help managers better understand the resource and determine a planting plan. If urban forest managers are looking for a more accurate benefit versus investment analysis, information on the tree aspect and distance from buildings should be included in the inventory and used to estimate the energy savings provided by community trees.



TREE REMOVAL

Garden Grove has an aging urban forest. Often, trees are not being replaced as quickly as they are removed. Preserving a healthy community tree is ideal, yet there are situations where a tree should be removed. Valid reasons for tree removal may include, but are not limited to:

- Concern for public safety
- Poor health, including disease and/or decay
- Structural issues that cannot be corrected
- Inappropriate species

All trees are inspected by staff and evaluated for removal on a case by case basis. Where a resident has requested a tree removal, staff is responsible for determining the merit of such a request.

Currently, the *Council Policy for Tree Removal* applies to situations where community trees are deemed undesirable and the existing criteria for removal is not met. In these cases, citizens have the right to initiate a petition process. Under this policy, tree removal(s) are permitted when the required number (%) of adjacent property owners sign the petition (as determined by the number of trees subject to removal). If a petition is approved, the removal and replacement is contracted by the city and the costs are incurred by the property owner. It is not uncommon for trees to be removed illegally, without request or permission.

Trees and Streets Division staff are responsible for the removal of most trees, including stump grinding. Where trees are very large and/or complicated, tree removal is performed by a contractor.

TREE PLANTING

Between 2005 and 2017, the city planted approximately 40 to 50 trees annually, largely in response to the Adopt-a-Tree program. While the 2005-2010 Strategic Plan called for a robust tree planting plan, funding was limited due to the 2008 recession. Street and sidewalk standards pose additional challenges for tree planting. Space is often limited by the narrow width of existing park strips (many <3 feet). In some cases, tree wells are required and sidewalks must allow adequate clearance under the American Disabilities Act (ADA) standards. Tree grates can help to increase clearance, but they are expensive and require ongoing maintenance. Since 2018, under new leadership in the Trees and Streets Division, tree planting has increased significantly. Currently, the Trees Division plants around 520 trees each year. For each new tree, the city ensures there is adequate funding for ongoing maintenance and requires an agreement with the adjacent property owner to provide ongoing irrigation.

All newly planted trees are staked for the first two years, primarily to protect against vandalism or damage, and irrigated for the first year to facilitate establishment. Mulch is used to retain moisture and mortality rates are generally low (<5%). Young trees are pruned annually for the first 3 years to promote good structure.

The current street tree planting list includes 11 species and references the California Polytechnic State University Tree Selection Guide, a resource that provides information related to tree suitability for numerous species (California Polytechnic State University, n.d.). Garden Grove's climate is conducive for a broad range of tree species and managers are consistently adding to the list to increase diversity and resiliency in the urban forest.

Right Tree Right Place

The practice of installing the optimal species for a particular planting site is known as the **Right Tree Right Place**. This philosophy considers the effects of trees as they grow on existing and planned utilities, existing landscape, and other infrastructure. Factors to consider include, planter size, soil characteristics, water needs, as well as the intended role and characteristics of the species. By considering the long-term consequences of planting a particular tree in a particular place, conflicts and premature removal of trees can be avoided.

Proper consideration for species selection and planting location has not always been provided. Some species were planted heavily at different periods in the history of Garden Grove's urban forestry program. A few of these species are costly to maintain, some are poorly suited to the local climate, and others drop unwanted debris. Furthermore, the Garden Grove weed and abatement ordinance charges the property owner with cleanup of the right-of-way. As a result, some members of the public have developed a negative perception of trees.

Pyrus kawakamii (evergreen pear), and *Cupaniopsis anacardioides* (carrotwood) are examples of high maintenance trees that were planted historically and are quite abundant. These species are prone to heaving sidewalks, and dropping nuisance fruit, which create a tripping hazard for pedestrians. Palm tree fronds can also create considerable debris. In addition to conflicts with hardscape, poor branch structure is typical for evergreen pear, making them more susceptible to branch failure in wind events. With prolonged periods of drought, pests and storm events have exacerbated the maintenance needs for these species.

Many streets have overhead utilities in the right-of-way. Due to federal and state regulations, utilities must maintain clearance around high-voltage power lines. As a result, medium and large-stature trees that were planted below power lines are often heavily pruned and poorly structured. In many cases, these trees are eventually removed. Current policies focus on planting small stature trees that are more utility friendly.

Unsuitable planting locations have resulted in conflicts with overhead utilities and heaving sidewalks. The purple orchid tree also sometimes called *Bauhinia variegata* (mountain ebony) and *Ulmus parvifolia* (Chinese elm) are examples of species planted in spaces too small when considering their mature stature. In some cases, this has resulted in the premature removal of trees. In other cases, canopy growth has been prohibited, or the lack of adequate space has resulted in extensive root and/or basal suckering that requires extra maintenance (e.g., Chinese elm).

When streets are narrow or parcel space is limited, trees often compete with hardscape and the demand for parking space. Furthermore, many homes in Garden Grove house extended families and the need for additional parking can significantly reduce space for trees. Municipal Code (Title 9 Land Use) specifies that maximum lot coverage by impervious surfaces shall not exceed 50% of the gross land area. Enforcement for this requirement is dependent upon a resident complaint, Code Enforcement proactive city-wide canvasing

of neighborhoods, and proposed improvements reviewed by the city. Additionally, many planting sites for street trees have been paved over. To increase opportunities for street trees, tree wells may be reclaimed through the removal of concrete where appropriate and where ADA compliance allows.

Going forward, the city is committed to planting tree species that are more appropriate for the region and in sites where trees are less likely to conflict with utilities and hardscape. Trees Division staff are actively seeking tree species that are well suited to the local climate to maximize additional benefits of choosing the right tree for the right place. To further maximize benefits from the urban forest, the city can provide guidance to homeowners and a suggested tree species list.

Adopt-a-Tree and Memorial Tree Programs

The Adopt-a-Tree program allows residents to adopt a parkway tree from the city in order to promote community beautification. Parkways trees are purchased by residents at a subsidized cost and planted by City staff.

Garden Grove's Memorial Tree program records date back to 1990 but may have been established before then. This long-lived program allows residents to plant a community tree in honor, or in memory of, loved ones. Community members request the location and type of tree and purchase the tree at a subsidized cost. The Memorial Tree is planted by city staff, and staff prioritize Memorial Tree replacements if removals occur. To date, there are 73 Memorial Trees. Combined, both programs have resulted in the planting of 300 trees.

"HOW BEAUTIFUL IT IS LOOKING OUT AND SEEING GREEN TREES VERSUS BUILDING STRUCTURES."

GARDEN GROVE COMMUNITY MEMBER





Trees and Sewer Lines

Residents with old, cracked sewer pipes often experience issues when tree roots exploit cracks in search of water. In some cases, this results in sewage back-ups into homes. The Garden Grove Trees Division coordinates with the Sanitation Division to ensure new tree plantings are not installed over sewer or water laterals. Typically, there are approximately 25 service requests about tree roots blocking sewer lines each year. The Trees Division requires images or video of the damage before allowing for the removal of a healthy city tree that has roots growing into sewage pipes. Tree root intrusion into the sewer lateral typically results in tree removal rather than root pruning, or using chemicals to clear the pipes, as these methods have had limited success in the past. When unprofessional root pruning occurs, trees are at risk of falling over.

Homeowners are responsible for replacing the sewer line and Public works will assess the tree removal priority and schedule the removal accordingly. Stronger protections need to be in place to prevent the removal of otherwise healthy trees. Furthermore, policies should be developed to prevent unprofessional root pruning. While the tree roots can exacerbate the problem, in all cases trees are taking advantage of already corrupted lines, which need to be replaced.

When looking at public infrastructure, conflicts arise regularly because the sewer mains are located 4 feet directly below street trees and tree wells. Policies should also be in place to address the movement of sewer mains into the street during large renovation projects.

ROOT PRUNING

When root space is limited, trees can heave sidewalks and conflict with other hardscape, creating a need for repairs. In some cases, trees that are in poor condition or that have continually caused conflicts are removed. When possible, the Trees Division coordinates with the Streets Division to root prune a tree prior to making repairs. The Trees Division does not have equipment for root pruning or trenching, and therefore contracts root pruning work. When root pruning is conducted, policy is to prune one side of the tree only, up to one time every three years. This process can destabilize a tree and create a hazard, especially if a large portion of the root zone is severed or if the pruning alters the tree's weight balance. Following industry standards and best management practices for root pruning can help to ensure a positive outcome.

IRRIGATION

In response to previous drought, watering in medians was suspended. Many trees suffered as a result. Drought restrictions have since been relaxed but remain an ongoing concern for California. Irrigation has not been restored to many trees in landscaped medians and rights-of-way and continues to be suspended in medians where streets are undergoing renovation. The city is working to reconstruct irrigation systems for median and street trees. These projects follow Municipal Code, which is in accordance with Model Water Efficient Landscape Ordinance (MWELO). Split systems that water trees separately from other vegetation (and turf) are preferred as irrigation can be minimized during drought conditions to focus on preserving trees. Trees are a long-term investment that provide valuable benefits to the community. Unlike turf and other vegetation, when trees are damaged or killed by drought, it can take 15 years or more to reestablish a new tree.

Parks are watered on a regular schedule, but despite consistent watering, existing irrigation does not always support tree health and has resulted in tree losses. Drought tolerant trees are not incorporated into parks due to a watering regime that is focused on turf. Tree species that are able to tolerate a higher watering frequency are typically chosen for park plantings. Moving forward more drought tolerant species could be incorporated by modifying irrigation to accommodate tree plantings and incorporating more natural/nontraditional park space. Trees Division and Parks staff are exploring the value of smart controllers for irrigation. Currently, residents are responsible for watering street trees adjacent to their property and must adhere to the city of Garden Grove's Water Conservation Ordinance (Chapter 14.40).

Redevelopment projects require water efficiency reporting, and in some cases trees or vegetated areas are being incorporated into stormwater management systems. Currently, the Trees Division is only involved in projects that go to public hearing and involve a relevant scope of work.



New Trees Need Water

Newly planted trees need to be watered more often than mature trees; two to four times per week in the summer depending on the soil type (sandy soils require more frequent watering than clay soils). Every time a newly planted tree is watered, it should receive 10-20 gallons of water depending on the size of the root ball. The Trees Division purchases "water bags" and uses their water truck to ensure proper watering of newly planted trees.

EMERGENCY RESPONSE

Garden Grove has a city-wide Emergency Operations Plan (Risk Management Professionals, 2009), which is administered through the city Manager and the Emergency On-Call team (EOC). Although there is currently no regular training on emergency response, there is a manual, which can be referred to by staff. The manual is generally only used during extreme emergencies, such as an earthquake. During a storm or other emergency response event, the Water Department handles all emergency calls. The Water Department evaluates emergency requests and dispatches standby staff from the Trees and Streets Division. Trees Division staff are responsible for clearing trees and debris in the rights-of-way and coordination with tree contractors as needed.





DESIGN REVIEW

Planning Services coordinates with the Trees Division to review development plans for projects in the city. The Trees Division provides recommendations for tree species and placement prior to approval. All development projects that require an entitlement or public hearing are sent to Public Works, Environmental, to receive design review.

FLOOD CONTROL

Localized flooding from the Santa Ana River and overflow stormwater drainage has occurred in Garden Grove (Orange County, n.d.). In addition to tree maintenance, approximately 10-25% (depending on the season and precipitation) of the Trees and Streets Division is dedicated to cleaning and inspecting catch basins, weed abatement, fencing repairs, stenciling, and homeless encampment clean-up.

Incorporation of trees into stormwater management plans can reduce the flow and volume of water entering these systems. With the reduced demand on these systems, the overall cost of stormwater management is also reduced. In some new developments or redevelopment projects currently underway in Garden Grove, there is greater opportunity to incorporate trees into stormwater management systems through expanded use of bioswales and larger setbacks in designs. In recognition of the benefits that trees can have on reducing the demand on stormwater management systems, the Trees and Streets Division has provided resources to Engineering to retrofit existing systems with additional trees.

COMMUNITY ENGAGEMENT AND OUTREACH

The city provides web-based resources to share information about tree care operations and the state of the urban forest. The site provides residents information on the city's Trees Division, resource links, and opportunities for engagement. Garden Grove bases their planting recommendations on California Polytechnic State University's website, which can be accessed through a link provided on the city of Garden Grove's website. A brief history of Community Forestry in Garden Grove is included, along with an overview of the Adopt-a-Tree program. The community is encouraged to engage in California's Arbor Day Commemoration and tree planting activities. In the future, the Trees Division anticipates coordinating with GGTV3 to broadcast information to the community about local tree planting activities. City staff have identified public outreach as a way to engage and educate the community about the urban forest, incorporating educational materials about the benefits of trees, tree care, and tree selection to the city website.





"TREES PROVIDE A SENSE A PEACE AS WE BALANCE OUR DAILY RUSH-RUSH LIVES WITH THE SERENE BEAUTY OF NATURE. "

GARDEN GROVE COMMUNITY MEMBER

PEST MANAGEMENT

Currently, pest management operations are not a substantial part of the Trees Division's activities. The contracting arborists provide a list detailing trees in the pruning cycle that are diseased, but this list is not considered in annual maintenance. Major arterials are regularly inspected and additional inspections occur during service calls. If other sporadic pests and pathogens are causing damage to established trees, treatments may be warranted. Insecticidal soaps are used if thrips infestations on *Laurus nobilis* (sweet bay laurel) or *Pyrus* spp. (ornamental pears) become problematic. In 2016, a treatment was applied for a suspected borer infestation of *Platanus x acerifolia* (London planetree) along Garden Grove Blvd. Moving forward, it will be important to first identify the pests and pathogens causing damage in order to (1) document their range, and (2) use management practices developed for the targeted pest/pathogen.

As pests and diseases are an ongoing threat to all forests, the city of Garden Grove should also continue to monitor for threatening invasive species, as well as common pests and diseases, that may cause damage to established trees. Pest management is especially critical as Garden Grove is part of a large urban center, with highly mobile human populations. This, coupled with the current changes in climate, increases the possibility of pest introductions and makes the community vulnerable to novel pests and diseases.

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 polyphagous shot hole borer was confirmed in Orange County on trees in the city of Orange in 2013 and Santa Ana in 2015 (Eskalen, 2015, 2019). The related Kuroshio shot hole borer has also been documented in Orange County. The invasive beetles feed on fungi that they carry into 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. An estimated 119 of Garden Grove's landscape trees such as *Cupaniopsis* (carrotwood), *Platanus* (planetrees), *Koelreuteria* (Chinese flame tree, golden rain tree), *Quercus* (oaks), and *Acer* (maples) are at risk to polyphagous shot hole borer.

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 public tree population, many residences in Garden Grove 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 canopy and cultural history of Orange County on both public and private property.

Granulate ambrosia beetle

The **granulate ambrosia beetle** (*Xylosandrus crassiusculus*) is also a pest of concern for Garden Grove. While the pest has not yet been detected in California, it has spread to multiple states since it was first detected in South Carolina in the 1970s. This beetle feeds on heartwood tissues. Secondary cankers can also form on the bark where beetle entrance and exit wounds occur. The ambrosia beetle has the potential to colonize healthy or stressed trees (Atkinson et al. 2000) and has a large hardwood host range. Several of the known hosts are widely planted in Garden Grove including *Lagerstroemia indica* (crapemyrtle), *Ulmus parvifolia* (Chinese elm), *Magnolia* spp. (magnolia), and *Liquidambar styraciflua* (sweetgum) (Cole, 2008).

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 Garden Grove'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 Garden Grove's abundantly planted palms: *Syagrus romanzoffiana* (queen palm) and *Washingtonia robusta* (Mexican fan 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).

Fire blight

Fire blight is a bacterial disease that can result in limb dieback or tree death (Teviotdale, 2011). *Pyrus kawakamii* (evergreen pear) and *Eriobotrya deflexa* (bronze loquat) each represent >1% of the community trees in Garden Grove and are all vulnerable to fire blight (*Erwinia amylovora*). To avoid the spread of the disease, managers should plant resistant trees and use proper sanitation while pruning or removing infected trees.

Emerald ash borer

Another pest of concern is **emerald ash borer** (*Agrilus planipennis*), which has rapidly and consistently spread throughout the eastern United States. All species of ash are susceptible to emerald ash borer, including those present in Garden Grove: *Fraxinus velutina* (velvet ash), *Fraxinus velutina* 'Modesto' (Modesto ash), *Fraxinus uhdei* (Shamel ash), and *Fraxinus angustifolia* (narrow-leafed ash). To date, this pest has killed hundreds of millions of ash trees (Emerald Ash Borer Information Network, 2019).

FUNDING

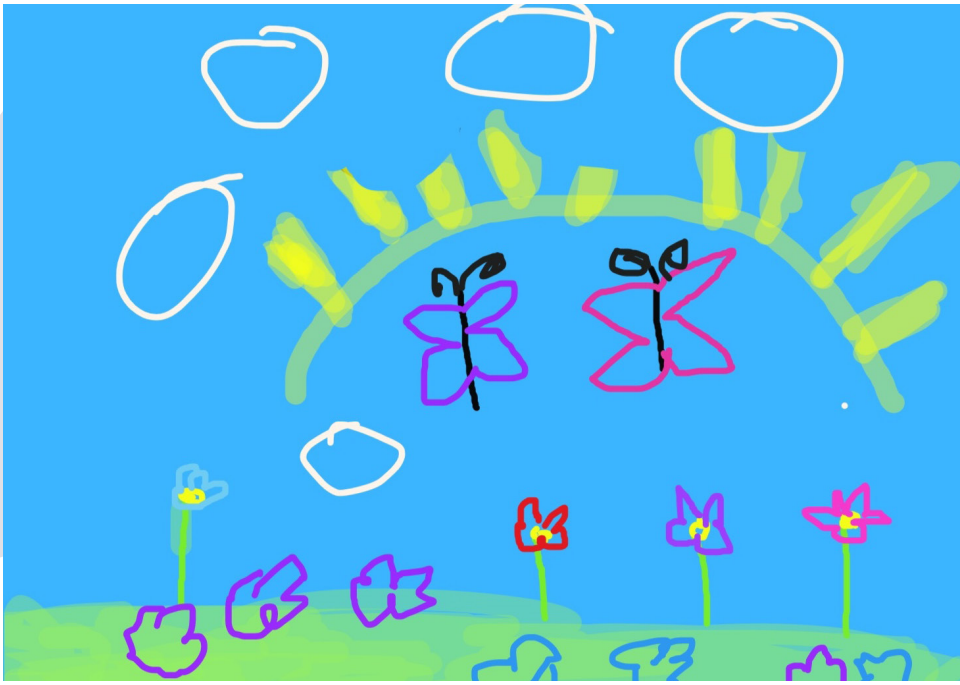
Stable and predictable funding is critical to effective and efficient management of the urban forest. Trees are living organisms that constantly grow and change over time. They also respond to a number of factors that affect tree health and structure, including nutrition, available water, pests, disease, wind, and humidity. While it might seem like most changes to trees take a long time to occur, some specific maintenance is critical at certain stages of life. For instance, young trees benefit greatly from early structural pruning and training. Minor, simple corrections can be applied at a low cost when a tree is young. However, if left unattended, they can evolve into very expensive structural issues and increased liability as trees mature (at which point it may be impossible to correct the issue without causing greater harm). Over-mature trees often require more frequent inspection and removal of dead or dying limbs to reduce the risk of unexpected failure. A stable budget allows urban forest managers to program the necessary tree care at the appropriate life stage when it is most beneficial and cost effective. Currently, the average annual cost to maintain a community tree in Garden Grove is $66 (Garden Grove Urban Forest Resource Analysis, 2020).

TABLE 4: Investments in the Community Tree Resource in Garden Grove

Investments	Total ($)	$/tree	$/capita
Purchasing Trees & Planting	4,688	0.27	0.03
Pruning	440,000	25.57	2.53
Stump Removal & Disposal	120,000	6.97	0.69
Pest and Disease Control	23,007	1.34	0.13
Repair/Mitigation of Infrastructure Damage	450,000	26.15	2.58
Litigation and Settlements	100,000	5.81	0.57
Total Investments	**$1,137,695**	**$66.11**	**$6.53**

"LOOK DEEP INTO NATURE AND YOU WILL UNDERSTAND EVERYTHING BETTER."

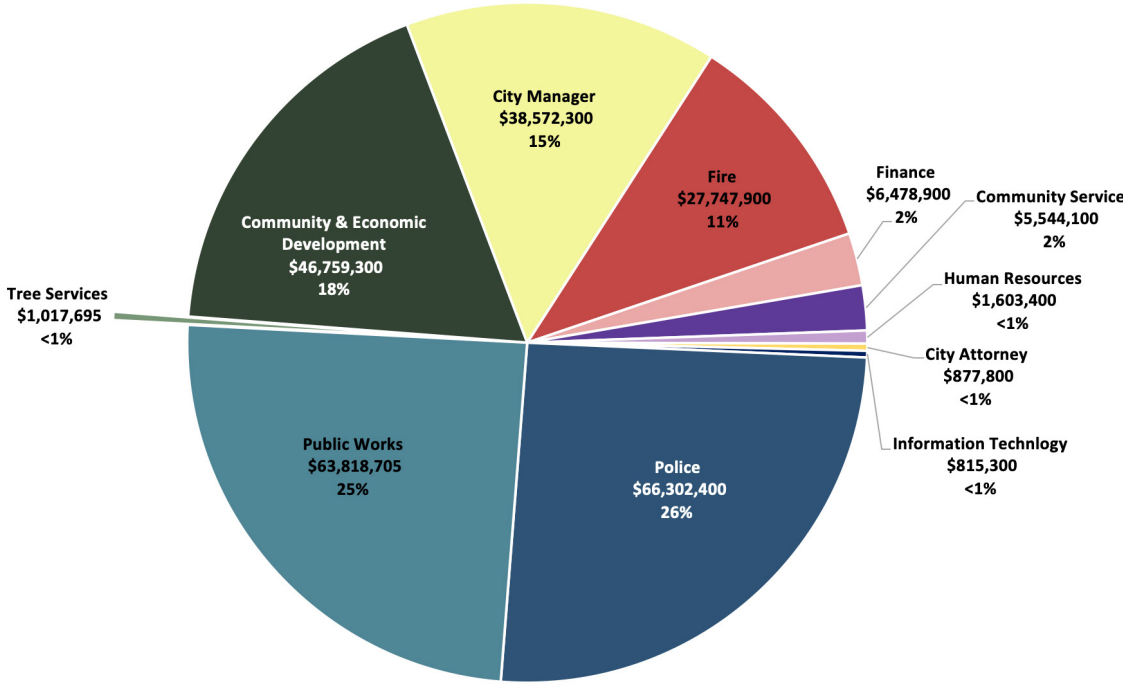
ALBERT EINSTEIN



Summary of Annual Funding

The average annual budget for Garden Grove's Trees and Streets Division is $1.15 million (based on budgetary records from 2005-2018). The Trees and Streets Division receives a round 1.2% of the General Fund and $150,000 of additional funding comes from the Gas Tax (Figure 2). Approximately 37%, or $420,000 of the annual budget (including all Gas Tax funds) is dedicated to contracted services. Approximately 46% of budget, or $530,000, is used to care for community trees (tree planting, maintenance, and service requests). A small proportion of funding is used to rent, purchase, or repair necessary equipment.

FIGURE 2: General Fund Annual Budget







Internal Partners

While the maintenance of community trees is primarily the responsibility of the Trees Division, a number of internal departments and teams share responsibilities for tree management, regulation, advocacy, and planning. The Urban Forest Management Plan (UFMP) process included engagement with internal stakeholders to identify challenges and opportunities to increase support and efficiency for urban forestry operations and programming.

COMMUNITY AND ECONOMIC DEVELOPMENT: PLANNING SERVICES

The Planning Division is primarily responsible for enforcing zoning ordinances and reviewing and inspecting projects on private property. While there is no Municipal Code that protects trees on private property, the Planning Division works with developers who are responsible for the planting and maintenance of public trees adjacent to construction sites.

Existing challenges and opportunities include:

- Trees are not prioritized in new developments and are often one of the first things to be cut when budgets are tight.
- The development process includes irrigation and maintenance requirements. Despite this, it is not uncommon for trees to be removed over time, and possibly due to attrition, following completion of the project. Replacement is mandatory unless the city grants an exception.
- The Trees Division has an opportunity to participate when trees are incorporated. Developers contact Public Works Department for information on the type of trees to plant and root barrier to install in the public rights-of-way. After planting the trees, they become the responsibility for the city to maintain.

Trees should be recognized as essential infrastructure. The benefits they provide to the community are critical to human health and well-being. The development process should include standards and specifications for planter site construction, planting/installation, and ongoing maintenance in accordance with ANSI Standards and ISA Best Management Practices. Review and input from the Trees Division should continue to be incorporated into plan development checklists.

COMMUNITY AND ECONOMIC DEVELOPMENT: CODE ENFORCEMENT

Code Enforcement is responsible for investigating concerns regarding compliance with the Municipal Code. The city owns the community trees in the park strip or easements and has responsibility for their maintenance. Residents can request tree maintenance but are not allowed to alter or plant trees in the easement without permission. Despite these regulations, challenges exist, including:

- Illegal pruning that devalues and harms public trees.
- Illegal tree plantings in the public right-of-way (an estimated 7%) which can exacerbate problems with infrastructure if the wrong tree is planted in the space.

Revisions to the tree protection ordinance (11.32.040) would improve clarity, codify the tree removal and replacement policy, and define penalties for violations. Trees that are required as part of a development agreement should be maintained to promote the desired intent (e.g., shade, aesthetics, etc.) and if trees are devalued and cannot be rehabilitated and/or die, replacement of trees, in accordance to the design code, should be required.

PUBLIC WORKS: SANITARY DISTRICT

The Garden Grove Sanitary District maintains and improves infrastructure related to the publicly owned wastewater. The Department provides service to the city's sewer lines, manholes, and lift stations. Tree Services coordinates with the Sanitary District to reduce and avoid conflicts with wastewater infrastructure. Challenges and opportunities include:

- Trees may conflict with sewer lines when they are planted too close to a main or lateral line, when roots cause uplifting and damage to lines, and when roots intrude into sewer lines and cause a blockage.
- Unclear, inconsistent policies for resolving and avoiding tree and infrastructure conflicts, including root pruning.

Tree planting and planning projects should be sure to include coordination between the Sanitary District and Tree Services to avoid conflicts with sewer laterals and mains. When tree conflicts arise, the Sanitary District should work closely with Tree Services to identify the best solution (e.g., root pruning, tree removal, etc.).

PUBLIC WORKS: WATER SERVICES DIVISION

The Water Services Division provides services that allow for safe drinking water and promotes water conservation. Water regulations are the responsibility of this Division. The Trees Division works with Water Services when there are infrastructure conflicts. Challenges and opportunities that were identified include:

- Water mains are often located underneath park strips or pedestrian rights-of-way, making it impossible to plant a tree without the anticipation of conflict.
- Trees may conflict with water lines when they are planted too close to a main or lateral line, when roots cause uplifting, damage, and water leaks.

Street reconstruction and improvement projects should include moving water lines from planter strips to underneath the street when possible. Tree planting and planning projects should be sure to include coordination between the Water Services Division and Tree Services to avoid conflicts with water laterals and mains. When tree conflicts arise, the Water Services Division should work closely with Tree Services to identify the best solution (e.g., root pruning, tree removal, etc.).

PUBLIC WORKS DIVISION: STREETS/ASPHALT

The Streets/Asphalt Division is responsible for maintaining Garden Grove's streets, sidewalks, curbs and gutters. When trees damage hardscapes, the Streets/Asphalt Division communicates with the Trees Division to mitigate the damage. Challenges and opportunities include:

- Some tree species are more prone to infrastructure conflicts. Planting the right tree in the right place can reduce conflicts including raised sidewalks and streets.
- Root pruning should follow ANSI Standards and ISA Best Management Practices.

COMMUNITY SERVICES: PARKS AND FACILITIES

Parks and Facilities provides attractive greenspaces, recreational opportunities, and programming to enhance the well-being of residents. Parks staff provide some maintenance to park trees, including trimming of low-hanging limbs. Challenges and opportunities include:

- Parks staff are aware that mowing or weed whacking too closely to the trunk can damage trees. Continue to ensure that new hires are properly trained to avoid damaging trees.
- Mulch rings around trees can reduce the need for string trimming, help control weeds, improve conditions for tree roots by promoting infiltration and retention of water, and increase soil organics and fauna.
- Vandalization of trees in parks, including the inappropriate use of tree stakes (i.e., attaching objects to them or hanging/pulling on them).
- Parks staff should be informed and trained to identify hazardous conditions in trees. Staff should notify Tree Services for an appropriate risk assessment.

Parks and Facilities should continue to coordinate with Tree Services to ensure that trees are maintained for health and safety. Formalize and document training to ensure that parks maintenance staff are aware of common tree hazards and the importance of avoiding damage to tree trunks and major limbs. Coordinate with Parks and Facilities for tree design and installation in parks. Use mulch rings where appropriate to promote tree health and protection.

FINANCE: RISK MANAGEMENT

The Trees Division works closely with Risk Management to address claims related to trees. Approximately 30% of city claims are related to trees, including trip and fall injuries resulting from sidewalks uplifted by tree roots, bodily injury and property damage due to falling tree limbs, property damage due to tree trimming activities, and damage to sewer systems due to tree roots. Challenges and opportunities include:

- Planting the appropriate tree species for the available space (Right Tree Right Place) can help to reduce infrastructure conflicts (e.g., uplifted sidewalks).

- Develop a risk management policy for community trees, including inspections, risk assessment, and thresholds for action and mitigation.

Planting the right tree in the right place is a first step for improving the health and safety of the urban forest. Regular inspection and maintenance of community trees helps to ensure good structure and long-term health, as well as proactive management of risk and liability.

External Partners

SOUTHERN CALIFORNIA EDISON

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

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. Tree Services currently prioritizes tree planting on the south and west sides of streets to avoid conflicts with power lines which are generally on the north and east sides.

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)



Policy and Regulation

The development of Garden Grove's Urban Forest Management Plan (UFMP) included a comprehensive review of city policies, development and construction standards, ordinances and other regulations that apply to the urban forest. The following provides a summary of the review process and key findings.

FEDERAL AND STATE 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 to) that species. Similar prohibitions usually extend to threatened species.

Migratory Bird Treaty Act

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 or 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 in order 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 (through the reduction/control of pests/disease), and is intended to prevent 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

To promote the conservation and efficient use of water and to prevent waste, a Model Water Efficient Landscape Ordinance (MWELO) 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 prior to the installation of a solar collector
- Trees or shrubs on land dedicated to commercial agricultural crops
- Replacement trees or shrubs that were planted prior to 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 subject to City and county ordinance

Public Park Preservation Act

The Public Park Preservation Act of 1971 ensures that any public parkland converted to non-recreational uses is replaced to serve the same community.

Quimby Act of 1975

The Quimby Act aims to offset the impact of development by requiring developers building in parcels of land intended for parks/recreational use to set aside land, donate conservation easements, or pay fees for park improvements.

GARDEN GROVE MUNICIPAL CODE

The Garden Grove Municipal Code has seven Titles that pertain to trees including Title 5, Title 6, Title 8, Title 9, Title 10, Title 11, and Title 18.

Title 5: Business Operation Taxes, Permits, and Regulations

Recognizes tree related professions in the list of service-related business activities.

Title 6: Health and Sanitation

Defines "rubbish" to include tree trimmings.



Title 8: Peace, Safety, and Morals

Prohibits damaging, or chaining/fastening any object to trees in the public right-of-way.

Title 9: Land Use

Provides minimum setbacks and dimensions for landscape zones in transportation corridors. Prohibits trees from inhibiting standard visibility parameters on public and private property. Includes design specifications and exceptions for the use of trees as screening in residential areas. Requires water use compliance with MWELO.

Encourages trees when consistent with other provisions. Prohibits the use of artificial trees as substitutes for live trees even in conjunction with artificial turf. Requires tree stakes to be used in accordance with standards maintained by the city.

Defines requirements for landscape maintenance, including, removal of dead, decayed, diseased or hazardous trees, weeds and debris constituting unsightly appearance, dangerous to public safety and welfare, or detrimental to neighboring properties or property values. Defines the minimum standard of maintenance for vacant, unoccupied, or abandoned buildings.

Provides development standards and tree requirements and for public areas. Defines landscape requirements for pedestrian plazas. Prohibits the removal of trees in designs for outdoor dining areas. Requires the use of trees in unpaved areas. Provides the minimum number of trees to meet standards for parking lot landscaping and street setbacks. Prohibits trees under certain building features and requires the use of root barricades in landscape planters.

Requires the use of trees in mixed use land use designations. Explains parkway tree fees and requires developers to set aside land, pay fees, or both in order to uphold the designated parkland per capita ratio. Allows for review and modification of proposed development sites, plans to meet the minimum standards in regard to the size and species of trees. Outlines the use of trees in landscapes, including, location, use of root barriers, tree staking, visibility, site requirements, and street trees.

Title 10: Vehicles and Traffic

Provides minimum clearance heights for trees over streets and near signs and signals. Requires any accidents that damage utilities, including trees, to be reported. Allows City Traffic Engineers to require the alteration or removal of a tree, hedge, or shrub causing an obstruction. Requires the consideration of existing right-of-way infrastructure, including trees, in development plans.

Title 11: Public Property

Provides definitions for park, private street or vehicular thoroughfare, public places, public thoroughfares, and trees and shrubs. Defines acts that require written permission by the city Manager.

Prohibits dead, decayed, diseased, infested, or hazardous trees on private property that create an unsightly appearance or are dangerous to public safety and welfare. Designates property owners responsible for any unsafe or nuisance trees and authorizes the city Manager to require property owners to correct or remove unsafe or nuisance trees.

Outlines protections for public trees, prohibits (1) pouring substances, or releasing pollutants such as chemicals, fumes, or vapors (and the associated heat) that may be injurious to trees in public spaces, and (2) leaking gas pipes or mains within the root zone of trees.

Gives the City Manager the authority to review and issue permits for construction projects within the city limits. Requires the protection of trees during construction.

Restricts contact between electrical wires and trees or shrubs unless the wires protected by approved methods. Requires the owner or contractor to assume full responsibility for the removal, replacement, repair, or alteration of trees along a public highway that are damaged from moving buildings or objects. Deems the owner or contractor of structures adjacent to public trees responsible for protecting non-city structures during tree operations.

Allows the City Manager, or a person they designate, to enforce compliance of the regulations in this chapter without interference. The violator is to assume full responsibility for the removal, replacement, repair, or alteration of such trees. Defines the responsibilities of City Council regarding tree code.

Title 14: Water

Provides water conservation measures that apply on a mandatory basis, including but not limited to: limiting watering hours, watering duration, prohibiting watering or irrigating in a manner which causes or allows water to flow or runoff onto adjacent hardscapes, watering within 48 hours after measurable rainfall, and irrigation of landscape outside of newly constructed home and buildings must comply with regulations established by the California Building Standards Commission and the Department of Housing and Community Development.

Title 18: Building Codes and Regulations

Designates trees and shrubs as recyclable/reusable materials.

GARDEN GROVE GENERAL PLAN

Chapter 1: Introduction

The Garden Grove General Plan is a document consisting of 11 elements (Land Use, Community Design, Economic Development, Circulation, Infrastructure, Noise, Air Quality, Parks, Recreation, and Open Space, Conservation, Safety, and Housing) adopted by the city Council. For each element, the plan provides goals, policies, and an implementation program. It provides visions for Garden Grove's desired land use types, their distribution, and development density; community character goals; future infrastructure needs; public safety needs.

Chapter 2: Land Use Element

Explores ways to enhance and support the character of the city by requiring landscaping in certain residential developments as well as enhancing and supporting current open space and streetscape plantings.

Chapter 3: Community Design Element

In order to uphold the unique attributes of regions within the city, this element recommends using landscape trees to improve the aesthetics and quality of life as well as decrease the urban warming effect. This element focuses on recommendations for the following:

(1) Private outdoor spaces: Use street tree plantings to help uphold the theme of the neighborhood, enhance residential areas without plantings.

(2) Pathways: Encourage making pathways pedestrian friendly by striving for wide walkways with plantings with double rows of canopy trees, and trees between sidewalks and streets in either tree wells or parkways.

(3) Corridors: Strive to continually enhance corridors by putting in streetscape and median plantings where they do not exist, incorporating trees specific to the district area. Recommends developing a residential street tree planting and replacement program, while installing proper irrigation systems and planting water-wise species to promote comfortable and safe corridors.

(4) Main districts: Enhance streetscapes, advocate for the authenticity of the main districts (e.g., maintaining the sycamore trees on Main street by planting sycamores or a similar type of tree).

(5) Entries: Clearly designate entries into and within the city with distinct landscaping that promotes the character and cultural heritage of the area.

Chapter 4: Economic Development Element

Recommends improving upon streetscapes, as this can attract development and create distinct, and therefore more memorable, districts within the city.

Chapter 5: Circulation Element

Advocates for attractive landscaping along existing and future roadways, within medians, and along sound walls.

Chapter 6: Infrastructure Element

Aims to meet the water systems needs of the city by recommending the implementation of drought tolerant landscaping.

Chapter 7: Noise Element

Aims to minimize noise impacts along streets through sound dampening measures such as the installation of landscaping and berms.

Chapter 8: Air Quality Element

Proposes a residential shade tree program that would provide trees to residents, as well as an urban forest plan to help in planting additional trees citywide, to reduce energy consumption.

Chapter 9: Parks, Recreation, and Open Space Element

Aims to provide ample open space (a goal of 5 acres for every 1,000 people) through preservation and expansion. It also calls for visually appealing landscaping along corridors and diverse landscaping throughout Garden Grove in order to promote ecosystem services and support the well-being of the community.

Chapter 10: Conservation Element

Identifies Garden Grove's existing trees as components of biological habitat in the city and gives examples of trees with significant cultural or historic value (e.g., Stone Pines located on the south side of Chapman, walnuts at Stanley Ranch). Promotes water conservation through the use of drought tolerant and native plants. Identifies that a tree-planting program emphasizing appropriate, water efficient trees will aid in their energy goals. Protect and improve water quality designing and constructing facilities and landscaping to minimize the volumes of pollutants and maximize pest resistance.

Chapter 11: Safety Element

Encourages crime reduction through deliberate site design, including landscape design.

Chapter 12: Housing Element

Recommends open space such as yards and landscaping in communities to increase quality of life.







Orange County's Urban Forest Grand Jury Report

The Orange County Grand Jury recognized a disparity amongst the urban forests within the county and disconnect where cities in California do not place the same importance on maintaining a robust urban forest as they do other infrastructure. As a result, tree canopy is declining even despite the benefits trees provide. The 2018–2019 Grand Jury report recognizes that urban forests benefit residents by improving environmental conditions, public health, and economic stability of the community, and they enumerate upon the positive effects of trees in this report. Therefore, the Grand Jury recommends all communities in Orange County maintain or develop aggressive urban forest programs.

To further investigate the state of Orange County's urban forest, the Grand Jury (1) performed a literature review, (2) sent out requests for data from each city, and (3) compared the extent of community tree canopy to the population within each community. They found:

- Many reasons for the decline in tree canopy, and provide considerations on tree selection, placement, and management to promote increased longevity of street trees.
- Tree related financial liabilities are minimal, and the benefits of trees are not quantified or recognized.
- Urban forestry funding varies by city, but many cities in Orange County have a small in-house crew and contract tree work.

In relation to other cities in Orange County, Garden Grove is among the top funded urban forestry programs and falls in the middle for the ratio of trees per resident.

GARDEN GROVE PARKS, RECREATION, AND FACILITIES MASTER PLAN

The *Parks, Recreation, & Facilities Master Plan* is a document that guides the future development and redevelopment of Garden Grove's parks, facilities, and services. During the plan development process, community members' highest priority request was more trails for walking, hiking, and bicycling in Garden Grove. Trees are important to improving the character and usage of parks and park facilities by increasing shading and helping mitigate the effects of the urban heat island. Furthermore, tree plantings around pedestrian and bike trails provide barriers that lessen the impact of adjacent cityscapes (e.g., traffic, noise, and air pollution) and increase the overall aesthetics. In addition, tree planting was identified as a way to improve the parks system. A number of park facilities were identified for renovation, as such they were designated to plant a specified number of trees. The cost of providing additional trees to each of the identified parks was estimated, and some funding sources were mentioned as ways to generate additional funding for parks and facilities improvements.

GARDEN GROVE ACTIVE STREETS MASTER PLAN

The *Active Streets Master Plan* envisions creating a network of green infrastructure throughout Garden Grove to make walking and biking in the community easier and more desirable. Garden Grove residents identified five main factors that would foster a more pedestrian-friendly community, including the incorporation of shade trees. Tree plantings around pedestrian and bike trails provide barriers that lessen the impact of adjacent roads and increase the aesthetics. Tree canopies can also improve the character and usage of trials by increasing shading and helping mitigate the effects of the urban heat island. The vision of pedestrian and bike facility infrastructure proposed in the plan incorporates shade trees.

TREE CARE FOR BIRDS AND OTHER WILDLIFE: BEST MANAGEMENT PRACTICES IN CALIFORNIA

Tree Care for Birds and Other Wildlife aims to provide information on tree care practices that result in minimal impact to wildlife and abide by wildlife protection laws (Donohue et al. 2018). Knowledge about the wildlife, and their nesting and feeding activities is important consideration when managing trees to reduce impact on wildlife. The following actions are best management practices to avoid wildlife encounters and minimize disturbance:

- Be aware of wildlife in the area.
- Train tree workers to be prepared for encountering wildlife.
- Assess habitat quality and determine the breeding season of local wildlife.
- Consult or provide wildlife-trained arborist or wildlife biologist when encounters are likely, or with questions on how to best work in the case of encountering wildlife.
- Conduct pre-work inspections to identify any wildlife or active nests present at the work site.
- Leave nests, eggs, or young in trees.
- Respond to emergencies.

- Minimize disturbances by taking nest status, distance from nest, temperature, duration of project, and proper tool selection (e.g., hand tools) into consideration.
- Schedule inspections in rare situations where permission is needed to remove a tree with an active nest.

The document also provides plant management techniques that can increase habitat quality for wildlife, including:

- Follow best management practices for tree establishment, care, and removal.
- Maintain mature trees.
- Use pest control tactics that minimize the risk to non-target organisms.
- Increase species, age, and spatial diversity of trees.
- Integrate shrubs and groundcovers.
- Plant native species of trees, shrubs, and groundcovers.
- When public safety allows, leave some dead, dying, or declining trees.
- Trim mature trees to reduce risk, but maintain material when possible to provide habitat.
- Use existing trees to increase habitat (girdling, creating snags or cavities).
- Incorporate nest boxes and tree parts into landscapes.

RE:IMAGINE GARDEN GROVE

Re:Imagine Garden Grove was a 2015 initiative to engage the community in the visioning process using online platforms including a "MindMixer" and survey. The community indicated that tree canopy and walkable streets are important. The energy and ideas from *Re:Imagine Garden Grove* initiated the creation of the *Active Downtown Plan*.

ACTIVE DOWNTOWN PLAN

Garden Grove's *Active Downtown Plan* aims to create a more walkable and bike-able downtown area. The plan acknowledges that street trees play a key role in pedestrian-friendly environments and calls for engineering projects such as curb extensions and bulb-outs to increase the amount of space available for street infrastructure, including trees. The *Active Downtown Plan* identifies funding sources that would help meet the goals for the downtown area. It mentions one funding source, the *California Natural Resources Agency for Urban Greening Grant Program*, focused on urban greening to help expand tree canopy and the associated carbon sequestration and energy reduction benefits.

Conclusion

Garden Grove has a strong foundation to build a robust urban forestry program, considering an existing maintenance program (3 to 4-year cycle); a dedicated and established Trees Division; a detailed tree inventory and inventory management system that tracks urban forest assets; a Land Cover Assessment that includes GIS mapping of the location and extent of Garden Grove's entire tree canopy (public and private); and a Resource Analysis that benchmarks the composition, benefits, value of the community tree resource. While Tree City USA status is currently lapsed, Garden Grove meets all of the requirements (and more) to reclaim that status.

The Trees and Streets Division is responsible for the maintenance of 17,210 trees in parks, medians, city-owned facilities, and the public rights-of-way. In addition, the section is also responsible for maintaining flood control infrastructure and emergency response. Despite budget cuts and staff reductions, staff have managed to maintain timely customer service and support for new tree plantings. Going forward, it is likely that additional staffing and funding will be needed to support canopy growth and ongoing maintenance for new trees and a more proactive maintenance approach.

Trees are living organisms, constantly changing and adapting to their environment and increasing in size over time. Because of this, trees have specific needs at various life stages, including training for proper structure when they are young and increased monitoring and proactive risk management when they become mature. In recent years, there has been a greater need for tree removals, which has reduced the capacity for tree trimming and other maintenance operations. US municipalities with similar populations strive to meet a 5 to 7-year maintenance cycle (Sustainable Urban Forest Indicators). Extending the current maintenance cycle (3–4 years) could allow for additional tree planting and maintenance, as well as more proactive approach to training and structural pruning for young trees. Young tree training is especially important for species that will develop into large-stature trees. Training provides an opportunity to address structural issues when trees are small. Removing undesirable branches when they are small is better for the tree and also more cost-efficient. Smaller cuts heal more quickly, require less time and safety considerations for tree crews, and reduce the need for debris disposal. The benefits of providing training pruning now, will result in trees with better structure and reduced costs for maintenance in the future.

While it is important to maintain trees for as long as possible, inevitably trees decline and die. To reduce waste and increase the post-life value of larger trees, the city should continue to partner with contractors and explore developing a wood utilization program to reuse woody materials whenever possible. For trees that do not meet appropriate standards for upcycling, the city should process wood chips for use by the Trees Division and for use in residential and business landscapes.

Although existing infrastructure limits available planting space and planter size, it is important to recognize that impervious surfaces and canopy cover can co-exist in many instances, especially with appropriate design standards. Canopy that extends over hardscape features, including parking lots, streets, and structures can add to the overall amount of canopy cover and reduce the ratio between canopy cover and impervious surfaces. While historical planting of some species in inappropriate sites has resulted in conflicts with hardscape and other infrastructure and contributed to high maintenance costs, when the right tree species are planted in the right place, the shade provided by tree canopy can

demonstrably extend the lifespan of materials used in the construction of hardscape features (McPherson and Muchnick, 2005).

Currently, there are 12,172 available planting sites for community trees identified in the inventory. Community members expressed a desire for additional tree planting and higher canopy. While the simple solution would be to fill all available planting sites, it is important to have a robust planting plan guided by the principles of Right Tree Right Place. A plan that increases species diversity and reduces reliance on overrepresented tree species, with a focus on community aesthetics will ensure that community vision for the future urban forest is realized. New and redevelopment projects should emphasize that trees are essential. Preserving existing trees, including during drought, and providing appropriate care to maximize their value and useful life is important for the protection of this natural resource and the benefits provided to the economy and quality of life in Garden Grove. Updating the tree ordinance to reflect current policies will ensure the consistent application of permits and the tree removal process along with providing clarity for tree protection.

The Land Cover Assessment conducted in 2019 revealed that the city has 7.9% tree canopy cover. While the canopy cover is comparatively lower than the average canopy cover across the Southern California Coast Climate Region, there are many opportunities for expansion of canopy across the community. Community members indicated support for setting a goal of 15% canopy cover. Preservation and expansion of existing canopy cover requires proactive and adequate replacement of new trees when trees are removed due to failing health or structure or as a result of development. To meet long-term canopy goals, ongoing planting efforts should continue to focus on ensuring that available sites in the public rights-of-way are planted with the right tree in the right place. Additional investment, support for education (e.g., tree care, species selection), and incentives for trees on private property will be integral to overall canopy growth. It is evident that many Garden Grove residents appreciate trees and value their contribution to the community.



• What do we want?

To better understand how the community values the benefits of the urban forest resource and to provide residents and other stakeholders an opportunity to express their views about management policy and priorities, the Urban Forest Management Plan (UFMP) development process included an electronic stakeholder survey, in-person interviews, a community meeting, and community outreach events.

Managing 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. City partners were invited to participate in an interview and discussion about their role and perspective for the urban forest as well as their views, concerns, and ideas for the plan. The input from the surveys and meetings will provide vision and direction for managing community trees.

STAKEHOLDER INTERVIEWS

Ten stakeholders were identified by city staff as valuable contacts for the development process of the plan. Stakeholders include staff from the city of Garden Grove's Public Works Department (Administration, Environmental Services, Streets Divisions), Community and Economic Development Department (Administration, Real Property, and Planning Services Divisions), Community Services Department (Parks and Facilities), and Finance Department (Risk Management). In-person interviews were conducted to allow for a more nuanced and in-depth discussion of the urban forest and the urban forest management. These interviews provided important information about the current function of the Trees Division program and potential for improvement. Concerns, requests, and suggestions from all stakeholders were of primary interest and were provided full consideration in the development of the plan.

Managing Partners

- Public Works Department
  - o Administration
  - o Environmental Services
  - o Streets Divisions
- Community and Economic Development Department
  - o Administration
  - o Real Property
  - o Planning and Services Divisions
- Community Services Department
  - o Parks and Facilities
- Finance Department
  - o Risk Managment

The following were key points raised during the stakeholder interviews:

1. The community's trees are aging and trees are being removed more quickly than they are being replaced.
2. Updating street tree ordinances and incorporating a street tree removal and replacement policy that reflects the community's goals in the Municipal Code is needed.
3. Competing utility easements restrict the space available for planting trees. Notably, the water mains are in the right-of-way, directly under street trees. The existing tree wells are small, only allowing for the addition of small stature trees along streets.
4. A comprehensive tree planting list is needed to allow for sufficient diversity and help plan for Right Tree Right Place practices.
5. Irrigation was cut off to community trees as a result of the drought, and trees would benefit from irrigation upgrades and restorations to smart controllers.
6. Concern surrounding public safety in regard to sidewalks lifting and creating tripping hazards and failing branches in maturing trees.
7. A strong desire to have an active and engaged community group whose goal is to preserve and protect the urban forest.
8. A need for more education opportunities for the public regarding the care of trees planted in the public right-of-way within residential areas. Not all homeowners realize their responsibility to care for these trees; as a result, not all trees are receiving adequate care.
9. Trees are primarily valued for environmental benefits, specifically shade and air quality improvement. They are also valued for their aesthetics and privacy screening. To this end, managing partners expressed a desire to use trees in landscaping that revitalize transitions and City entrances.
10. Some departments view trees as a hindrance to development, or a complication to the maintenance of other infrastructure.
11. Formalize the tree inventory to help improve management, identify planting locations, and more accurately assess the costs and benefits of public trees.





Community Engagement

A community meeting was held on Tuesday, February 18th, 2020, from 6:00 p.m. to 8:00 p.m. at the Community Meeting Center. It was advertised through social media, city emails, the city website, and city newsletters. Press releases were disseminated to traditional, electronic, and ethnic media. It was also attended by 15 community members, two City Council members, and five city staff members, and therefore does not reflect the opinions of the community as a whole.

The meeting included an interactive presentation about the community's urban forest and current program status. During the presentation, attendees provided input to poll questions as well as discussion, which contributed to the identification of goals and objectives for the UFMP. Attendees were asked to provide their input on various urban forest topic areas, including benefits of urban trees, canopy cover goals, tree planting, tree care, tree removal and replacement policies, protections for healthy community trees, preferred methods of outreach/engagement, and educational topics for outreach.

Overall, attendees thought trees improved the quality of life in Garden Grove and most valued benefits to air quality. Participants supported tree planting regardless of the location, favored setting a canopy goal of 15% and an increased level of services for community tree care. Although split on opinions about the current Council Policy for Tree Removal, they supported stronger standards for issuing tree removal permits. If community tree removals occur, they supported required replacement plantings, contributions to a Tree Fund, and fines for illegal removals. Participants expressed an interest in species selection and the benefits provided by trees and as topics for future educational programming and preferred a variety of outreach methods.

In addition, attendees voluntarily expressed a desire for an increase in funding for urban forestry in Garden Grove with the vision of increasing habitat for wildlife, providing more shade, and addressing climate change. An emphasis was also placed on engaging youth and partnering with schools to enhance the urban forest.

An informational booth was set up in Garden Grove parks to give community members an opportunity to engage in planning for the future urban forest. DRG and City staff provided information about Garden Grove's urban forest and access to the online community survey. The booth was set up on November 22nd, 2020 at Haster Basin and Garden Grove Parks, and on November 23rd, 2020 at Village Green and Eastgate Parks. The event was advertised through social media, city emails, the city website, and in city newsletters.





Online Community Survey

In addition to the in-person community engagement, an online survey was available on the city website. The survey included the same questions that were asked at the community meeting and made available at the informational booth. Responses were collected from February 4th to November 30th, 2020 and a total of 306 people responded to the survey. For complete survey and results, see Appendix H.

The majority of respondents indicated that they appreciate trees for improving air quality and providing wildlife habitat. (Figure 3) Overwhelmingly, respondents felt that trees are important to the quality of life in Garden Grove and the community would benefit from the incorporation of more trees. Respondents indicated a preference for tree planting along streets and in parks, but also supported planting in all other areas. (Figure 4) When asked what canopy goal Garden Grove should adopt, 74% of respondents preferred 15% canopy cover.

There was not a clear consensus as to whether or not respondents supported the petition process for the removal of otherwise healthy public trees. Most participants felt that additional public tree protections should be included in the future tree protection policy (Figure 5). In addition, 77% of participants supported mitigation measures when a public tree is removed through tree replacement or a contribution to a tree fund.

Most participants are aware of the city's Trees Division and would prefer an increased level of tree care. Tree selection, basic pruning, and watering were the educational topics of most interest to participants. Overall, 70% of respondents prefer web based educational materials.

FIGURE 3: Environmental Benefits Valued by Residents of Garden Grove

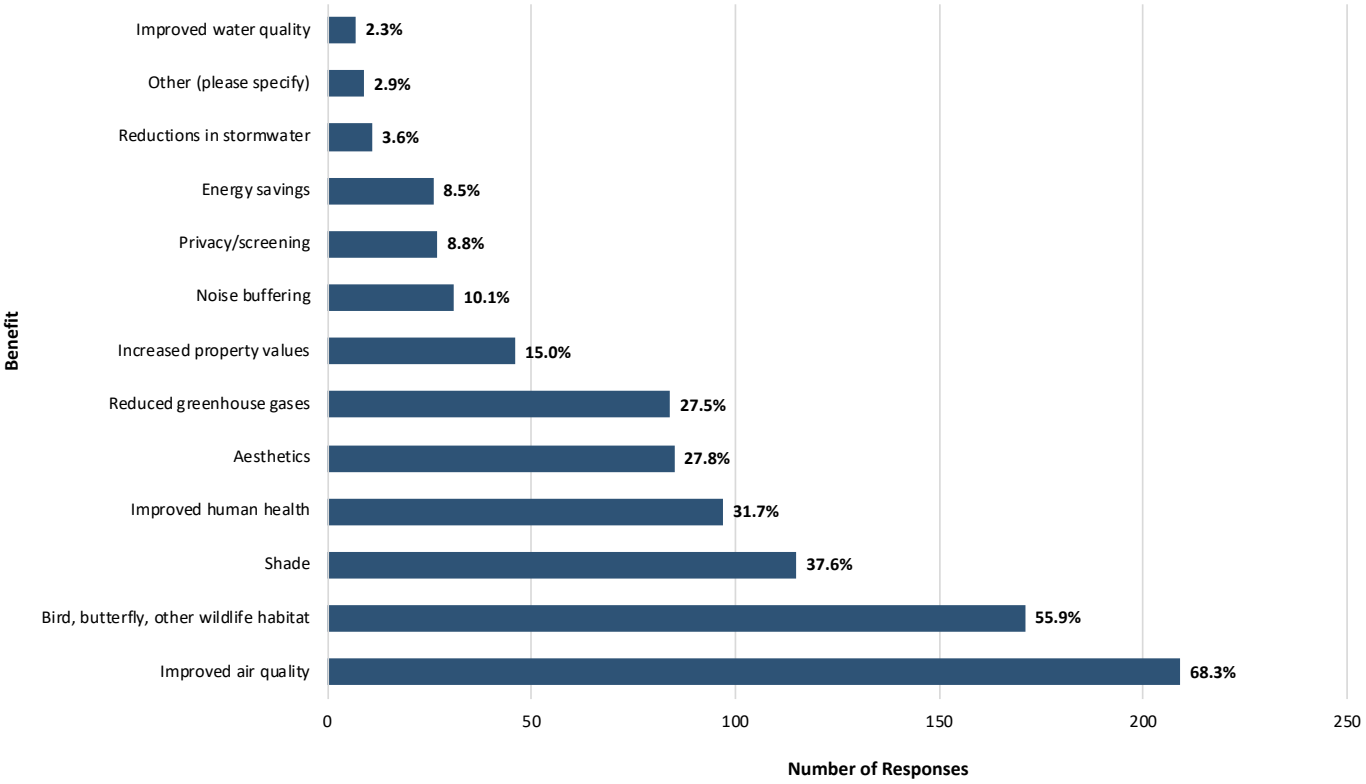


FIGURE 4: Locations where Residents Encourage Tree Planting

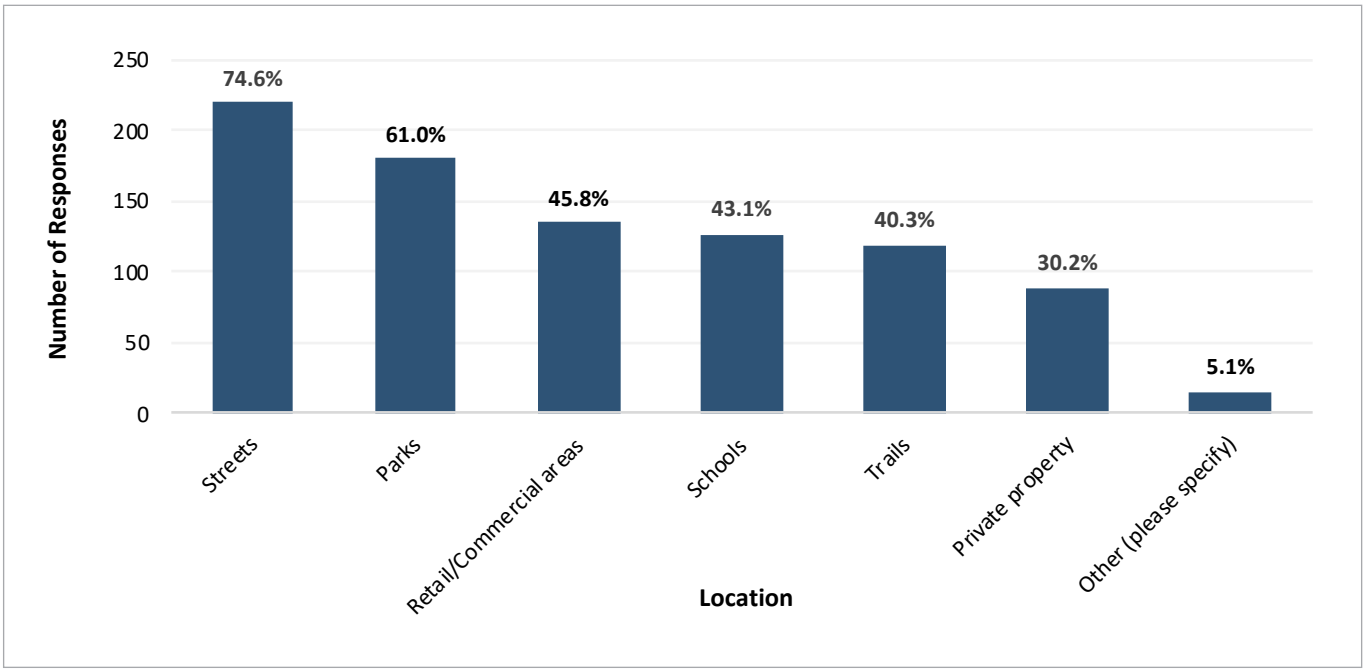
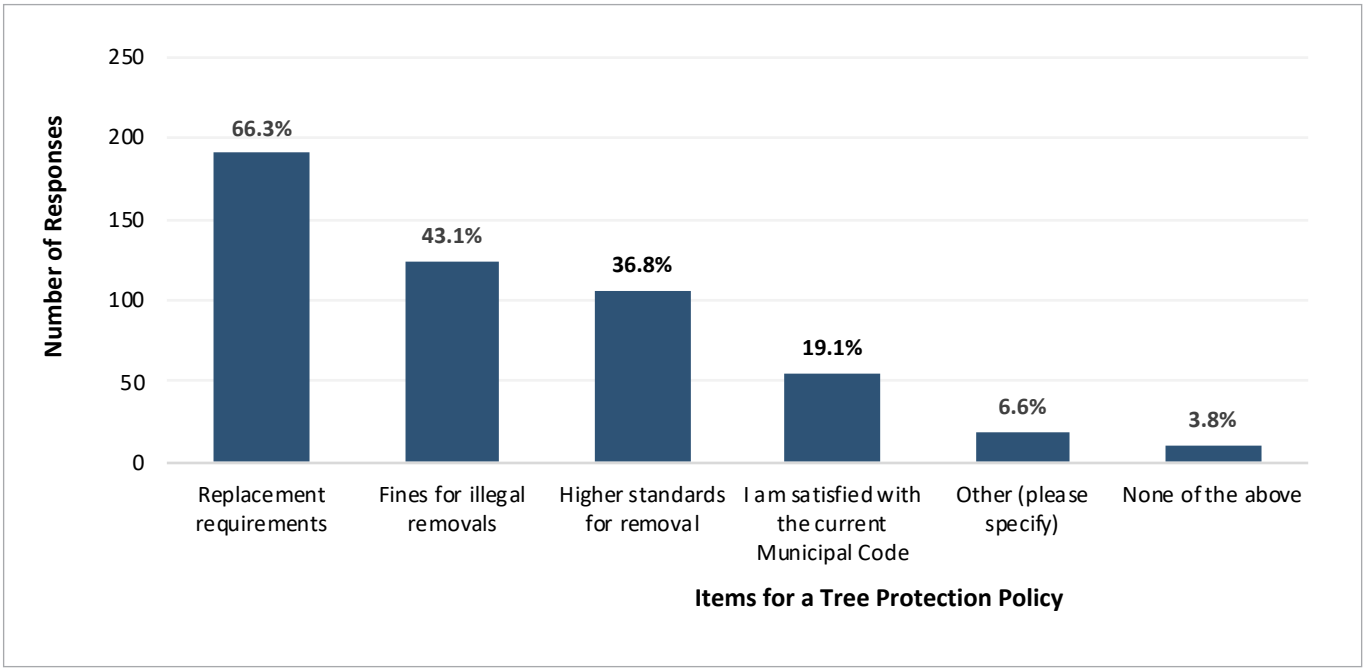


FIGURE 5: Items to Include in a Tree Protection Policy



Plan Goals and Actions

Based upon a review of the current Trees Division program, resources, and collaborative input from the community and other stakeholders, the UFMP identifies 10 goals and 3 existing policies that support and represent what Garden Grove residents, stakeholders, and staff want for the future of the urban forest. These goals, and the strategies that support them, are intended to optimize the management of the city's community forest in an efficient, cost-effective, sustainable, and safe manner. The UFMP identifies 4 major areas of focus:

1. Comprehensive and efficient tree care operations
2. Practices and policies related to the community tree resource
3. Environmental, social, and economic benefits of trees
4. Community outreach and collaboration

FOCUS AREA: COMPREHENSIVE AND EFFICIENT TREE CARE OPERATIONS

This focus area aims to increase cost-efficiency for managing the resource through efficient record keeping and planning. The urban forest provides numerous benefits to the community. Although it might be tempting to plant as many trees as possible, it is important to grow and enhance the urban forest in a sustainable manner so that trees are planted, but also maintained throughout their lifetimes.

Goal 1: Plan for trees before planting.

When proper consideration is given to planting trees, future removals are potentially avoided. Selecting the right tree for the right place increases the ability for a tree to reach maturity and ensure that it has ample space for canopy and root growth.

Objectives for this goal include selecting an appropriate tree species for the planting site and revising design and construction standards for planting sites.

Goal 2: Support tree health and good structure.

When trees are well-maintained throughout their lifetimes, the risks they pose to the public are reduced. Promoting tree health and good structure decreases the chances of having hazardous trees in the community and helps prevent tree conflicts with utilities.

Objectives for this goal involve providing proactive management of the community tree resource that aligns with industry standards.

Goal 3: Repurpose woody materials resulting from tree removals.

Using woody materials that result from tree removals reduces waste and allows managers to recover value from felled community trees. Repurposing woody material into wood products and mulch can provide revenue and prevent the need to purchase wood mulch used to care for the urban forest.

Objectives for this goal include developing a wood utilization program.

Existing Policy 1: Maintain a tree inventory that can be used to manage the community tree resource.

Striving to obtain information on all existing trees and vacant sites present in the urban forest can enhance staff's ability to determine and prioritize tree care and tree planting. As a result, maintenance can be done in a more efficient manner.

Objectives for this goal focus on optimizing the use of the community tree inventory for use in pruning/maintenance cycles and tree planting/replacement plans.

FOCUS AREA: PRACTICES AND POLICIES RELATED TO THE COMMUNITY TREE RESOURCE

This focus area aims to optimize tree-related city programming to allow managers to meet and exceed community expectations. Best management practices for tree maintenance should transcend all Departments as these standards promote tree health and safety. Because tree maintenance can be dangerous, the city is always looking for opportunities to improve the safety of staff responsible for caring for trees.

Goal 4: Increase uniformity between City policies, documents, and departments.

Inconsistencies across city policies, documents, and departments can create confusion between departments and the community. Policy uniformity promotes strong and efficient policy that aligns with community expectations.

Objectives for this goal include furthering communication among city departments and unifying guiding documents.

Goal 5: Recognize trees as green infrastructure.

Trees are essential infrastructure that need to be planned for during design, similar to other utilities. Considering trees as a green infrastructure aims to ensure their longevity through the planning and implementation of comprehensive designs.

Objectives for this goal include planning for the right tree in the right place and creating policies to limit conflicts between trees and grey infrastructure.

Existing Policy 2: Encourage a culture of safety.

When all city staff share core values and behaviors that promote safety related to trees, everyone, including the community, is safer.

Objectives for this goal are to continue prioritizing safety.

FOCUS AREA: ENVIRONMENTAL, SOCIAL, AND ECONOMIC BENEFITS OF TREES

This focus area aims to preserve and enhance the existing tree canopy thereby maintaining the numerous benefits provided by the urban forest. 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.

Goal 6: Promote tree preservation and protection.

It is important to promote the protection of community trees. In addition to updating the current tree protections, the Municipal Code should be periodically reviewed and revised to refine and identify requirements to support the urban forest and canopy cover goals.

Objectives for this goal focus on amending and clarifying language in existing Municipal Code and optimization of management practices.

Goal 7: Enhance community aesthetics.

With close proximity to nearby tourist attractions, Garden Grove has a tremendous economic opportunity. Research has shown that shopping areas with trees and shade encourage greater economic activity. The urban forest provides an opportunity for Garden Grove to enhance community aesthetics and economic opportunities.

Objectives for this goal include strategically growing the tree canopy on public and private property to support the community's character and beautify the city.

Goal 8: Expand and diversify tree canopy to increase the environmental benefits received by the entire community.

The Southern California Coast climate zone has 13.9% canopy cover and Garden Grove's current canopy cover is 7.9%. Through a community survey and community meetings, community members supported increasing canopy cover with a goal of 15% canopy cover.

Objectives for this goal include increasing the canopy cover in Garden Grove with a diverse palate of species.

Existing Policy 3: Encourage the establishment of trees through efficient and sustainable irrigation solutions.

Water is critical for tree health. All trees, especially newly planted trees, need some level of water to thrive. Identifying efficient and cost-effective means for watering trees makes the urban forest more sustainable.

Objectives for this goal are to ensure the urban forest receives adequate water in the most sustainable way.

FOCUS AREA: COMMUNITY OUTREACH AND COLLABORATION

This focus area aims to foster a greater connection between the urban forest and the community. The urban forest is more likely to be preserved, maintained, and promoted by an engaged community that understands the benefits it provides.

Goal 9: Celebrate the importance of urban trees.

Community designations and events surrounding the urban forest build awareness and excitement that ultimately encourages community members to help build upon existing canopy.

Objectives for this goal focus on re-establishing the Tree City USA designation.

Goal 10: Support community engagement and stewardship of the urban forest.

Although the city is not directly responsible for the care of trees on private property, all trees are an important component of the urban forest. Education and outreach to encourage best management practices for trees on private property should be done to support the wellness and benefits of the urban forest. Building partnerships with community organizations gives the urban forest a voice, greater capacity to care for trees, and a broader audience. Partners can help plant, maintain, and advocate for the urban forest.

Objectives for this goal include developing materials for urban forest outreach and education and providing opportunities for the community to become involved.

"IF A TREE DIES, PLANT ANOTHER IN ITS PLACE."

CAROLUS LINNAEUS



• How do we get there?

The goals and existing policies and actions proposed by the Urban Forest Management Plan (UFMP) are organized by focus areas:

1. Comprehensive and efficient tree care operations
2. Practices and policies related to the community tree resource
3. Environmental, social, and economic benefits of trees
4. Community outreach and collaboration

Each area of focus is supported by measurable goals and specific actions that are intended to guide Garden Grove's urban forest programming over the next 40 years, providing the foundation for annual work plans and budget forecasts. Many goals and actions support more than one focus area.

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

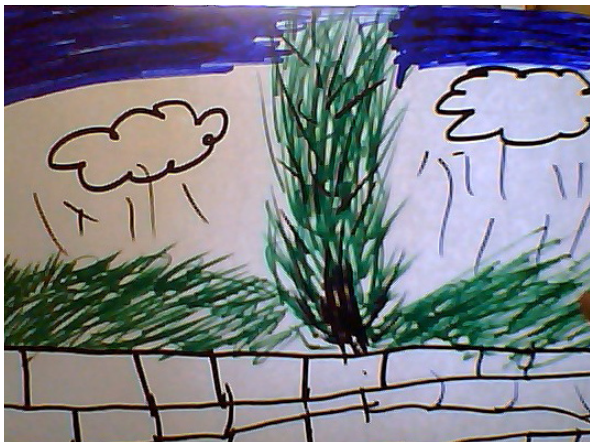
- High: An action that is critical to protecting existing community assets, reducing/ managing risk, or requires minimal resources to accomplish
- Medium: An action that further aligns programming and resource improvements that have been identified as desirable by the community, partners, and/or urban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

The UFMP is intended to be a dynamic tool that can and should be adjusted in response to accomplishments, new information and changes in community expectations, and available resources. In addition to serving as a day-to-day guide for planning and policy making, the UFMP should be reviewed regularly for progress and to ensure that the actions and sub actions are integrated into the annual work plan.

With appropriate care and planning, the urban forest is an asset that has the potential to increase in value over time. As young trees mature and their leaf surface and canopies grow, so too will the overall benefits and value from the community's urban forest. The objectives and strategies of the UFMP are intended to support this process in an appropriate manner that encourages the sustainable stewardship of community trees with consideration for safety, cost efficiency, and community values. The UFMP includes strategies for measuring the success of the UFMP over time.







"AS OF NOVEMBER 2019, THE COMMUNITY TREE INVENTORY INCLUDES 17,210 TREES AND 234 DIFFERENT SPECIES OR VARIETIES."

URBAN FOREST FACT

Focus	Goals and Existing Policies	Objectives
Comprehensive and efficient tree care operations	**Goal 1: Plan for trees before planting.** **Goal 2: Support tree health and good structure.** **Goal 3: Repurpose woody materials wherever possible.** **Existing Policy 1: Understand the structure and composition of Garden Grove's community tree resource.**	• **Set emphasis on the Right Tree in the Right Place.** • **Develop planter improvement and design strategies for mitigating conflicts and increasing soil volume.** • **Ensure community trees are maintained according to industry standards to promote tree health, longevity, and public safety.** • **Establish a risk management policy.** • **Employ multiple tools and strategies to prevent and/or manage pests and pathogens.** • **Identify a wood reutilization policy.** • **Maintain a tree inventory that can be used to manage the community tree resource.**
Practices and policies related to the community tree resource	**Goal 4: Increase uniformity between City policies, documents, and departments.** **Goal 5: Recognize trees as essential green infrastructure.** **Existing Policy 2: Promote a culture of safety.**	• **Communicate and coordinate with other city departments.** • **Unify guiding documents to transcend departmental changes, promote consistency, and shared vision.** • **Plan for trees to limit future grey infrastructure conflicts.** • **Create and enforce policies that protect trees.** • **Implement policies and procedures that make that tree work as safe as possible.** • **Encourage employees to engage in professional development.**
Environmental, social, and economic benefits of trees	**Goal 6: Promote tree preservation and protection.** **Goal 7: Enhance community aesthetics.** **Goal 8: Expand and diversify tree canopy to increase the environmental benefits received by the community.** **Existing Policy 3: Encourage the establishment of trees through efficient and sustainable irrigation solutions.**	• **Revise and amend Municipal Code to promote the protection of community trees.** • **Monitor contractor services.** • **Optimize the Trees Division to address maintenance needs.** • **Monitor for pests and pathogens.** • **Encourage the expansion of the urban forest through tree plantings on public property.** • **Encourage the expansion of the urban forest through tree plantings on private property.** • **Reach 15% tree canopy cover by 2040.** • **Promote species diversity to build a more sustainable community tree resource.** • **Promote the efficient use of tree planting funds.** • **Support established and mature trees.** • **Establish a more water-wise urban forest.** • **Ensure trees receive adequate water.**
Community outreach and collaboration	**Goal 9: Celebrate the importance of urban trees.** **Goal 10: Support community engagement and stewardship of the urban forest.**	• **Re-establish the Tree City USA designation.** • **Promote the Urban Forest Management Plan.** • **Update the website for the Trees & Flood Control Section on the city Website.** • **Encourage community involvement and stewardship for the urban forest.** • **Encourage the expansion of the urban forest through tree plantings on both public and private property.** • **Support the formation of a community-led tree advocacy group.**



GOAL 1: PLAN FOR TREES BEFORE PLANTING.

PERFORMANCE MEASURE:

Greater health and longevity of individual trees, as measured through condition and reduced mortality/tree removals and maintenance.

RATIONALE:

Trees take a long time to grow and are a long-term investment. If a tree is planted in a space that is too small or too large or is not well-suited for the local climate and soil conditions, the potential benefits that the tree could have provided to the community are reduced.

RISK:

Planting maladapted species or planting trees in inadequate spaces (e.g., space or soil volume limitations, compacted or poor-quality soils) can result in premature death.

BENEFIT:

Fewer removal of trees and maximized community benefit.

I. OBJECTIVE:

Set emphasis on the right tree in the right place.

ACTIONS:

- Revise/expand the city-approved tree planting list to include:
  a. Species that can thrive in new developments.
     i. Species that tolerate heavy clay soils.
     ii. Species that tolerate irrigation challenges.
  b. Native and well-adapted tree species.
     i. Species that mitigate flooding issues.
     ii. Species with minimal leaf drop and litter creation.
     iii. Species and varieties that are pest and disease resistant and avoid planting species with similar vulnerabilities to existing trees.
  c. Define sites the trees are most suitable for:
     i. Rights-of-way
     ii. Parks/lawns
     iii. Near/under utilities
     iv. Parking lots
     v. Flood zones
- Publish the city-approved tree planting list on the city website to promote the planting of appropriate tree species on private property.
- Update the tree planting list every five years to add new varieties and species of nursery stock and to discontinue the use of species susceptible to invasive pests and those that are currently over-represented.
- Reduce hardscape and utility conflicts.
  a. Provide recommendations for small stature tree species that can be planted under utility lines to prevent future conflicts.

b. Avoid planting species of trees that have historically resulted in hardscape damage or whose debris create a slipping hazard.

c. Coordinate with the Sanitary District to avoid and/or to identify solutions for conflicts with sewer laterals and mains. (e.g., root pruning, tree removal, etc.)

- Match tree species to soil and water conditions.
- Match tree species to planter size and intended use.
- Consider mature crown spread.

  a. Optimize shade and environmental benefits by planting large stature trees where feasible.

- Consider the annual cost of maintenance prior to planting a tree.

COST: $

TIME FRAME: Ongoing



II. OBJECTIVE:

Develop planter improvement and design strategies for mitigating conflicts and increasing soil volume.

ACTIONS:

- Identify planting sites that require improvements and create a plan for planting site improvements.

  a. Prioritize expanding vacant sites for new tree plantings.

  b. Identify existing significant trees, or trees in good condition, that are in tree wells that will not accommodate the mature size of the tree species. Consider expansion of the tree well to accommodate the growing tree and root zone.

  c. Modify planters to increase soil volume during maintenance projects.

  d. Incorporate the use of mulch to improve water retention and soil quality over time.

  e. Continue to meet American's with Disabilities Act (ADA) requirements and state code.

- Detour walkways around trees, ramping over roots, and grinding down displaced sidewalk panels to reduce tripping hazards without causing undue harm to critical roots.
- Implement alternative planter designs when feasible. (See Appendix G.)
- Explore alternative sidewalk designs to allow space and air under the concrete for trees and compliance with ADA and avoid tree removal (See Appendix G), such as:

  a. Crushed granite

  b. Gravel sub-base and other structural soils

  c. Other structural cells (Strata Cells or Silva Cells)

  d. Interlocking concrete paver products

  e. Flexipave, a system similar to rubber sidewalks

  f. Alternative tree grate structures

  g. Polygrate, a recycled plastic form of tree grate

COST: $-$$

TIME FRAME: 1–5 Years

GOAL 2: SUPPORT TREE HEALTH AND GOOD STRUCTURE.

PERFORMANCE MEASURE:

Reduction in removals and claims against the city.

RATIONALE:

When the minimum level of care is met for all community trees, the potential for all the trees to reach maturity increase and the benefits provided by those trees also increases as trees mature.

RISK:

The community tree resource and the greater urban forest could suffer significant losses to tree canopy cover as a result of removals or from pest infestations due to lack of maintenance.

BENEFIT:

Regular maintenance and inspection of the community tree resource promotes better tree health and structure, which reduces the number of removals, branch and tree failures as a result of poor structure, and increases the benefits provided to the community.

I. OBJECTIVE:

Ensure community trees are maintained according to industry standards to promote tree health, longevity, and public safety.

ACTIONS:

- Continue to coordinate with Parks and Facilities.
  a. Formalize and document training on risk management.
  b. Avoid damage to tree trunks and major limbs.
     i. Use mulch rings where appropriate to promote tree health and protection.
  c. Review designs for installation of trees in parks.
- Educate community members about their responsibilities for the care of public trees.
- *Update Standard Operating Procedures for Public Works Department Staff – Trimming of City Trees* to ensure compliance with current ANSI and BMPs.
- Update Specifications for Street Tree Maintenance to ensure compliance with current ANSI and BMPs.
- Consider requiring professional licensing for tree care companies operating within city limits.
- Maintain trees after planting.
  a. Mulch around trees.
  b. Remove stakes and ties after initial establishment.
  c. Avoid mowing or string trimming within two feet of trunks of trees to avoid damage to the root collar and cambium.
- Follow integrated pest management practices.

COST: $

TIME FRAME: Ongoing

II. OBJECTIVE:

Establish a risk management policy.

ACTIONS:

- Work with Risk Management to set risk tolerance thresholds for trees where the risk cannot be mitigated.
    a. Consider having a Certified Arborist with a Tree Risk Assessment Qualified (TRAQ) certification assess risk and recommend mitigation measures.
- Coordinate inspection of all trees with pruning cycles.
    a. Update inventory accordingly.
- Train staff on how to complete limited visual assessments.
    a. Familiarize staff on tree defects and conditions that affect likelihood of failure.
    b. Establish a reporting protocol for staff to report recognized and observed hazards.
- Implement mitigation options based on level of risk and conditions present.
    a. Removals should be prioritized and performed as soon as possible.
    b. Consider moving targets (e.g., tables, benches, etc.) to reduce risk.
    c. Consider diverting use around trees identified as at-risk.
    d. Install structural support systems where recommended.
    e. Retain and monitor trees identified for moderate- to low-risk.

COST: $

TIME FRAME: 1–5 Years

III. OBJECTIVE:

Employ multiple tools and strategies to prevent and/or manage pests and pathogens.

ACTIONS:

- Promote species diversity throughout the community.
- Inspect trees for pests and pathogens as grid pruning and other maintenance occurs.
    a. Locate diagnostic facilities that can identify unknown pests or pathogens.
- Continue to participate in training on existing and potential pests and pathogens.
- Continue to obtain current information on emergent and existing pests and pathogens.
- Identify procedures and protocols to be followed in the case of an introduced pest or pathogen.
    a. Use management practices developed for the targeted pest/pathogen.
- Prevent the movement of felled tree materials that may be harboring pests or pathogens.
- Distribute information on polyphagous shot hole borer and other pests through the Public Works website.
    a. Flexipave, a system similar to rubber sidewalks.
    b. Alternative tree grate structures.
    c. Polygrate, a recycled plastic form of tree grate.

COST: $

TIME FRAME: Ongoing

GOAL 3: REPURPOSE WOODY MATERIALS WHENEVER POSSIBLE.

PERFORMANCE MEASURE:

Reduced amount of woody material entering the waste management center.

RATIONALE:

Tree removals result in woody materials that are composted at the city waste management center. Alternatively, woody materials can be repurposed into wood products and wood mulch.

RISK:

Tree removals generate a substantial amount of woody material that could be treated as waste.

BENEFIT:

Repurposing felled trees is one way to recover the costs of removal and divert woody material from the landfill.



OBJECTIVE:

Identify a wood reutilization policy.

ACTIONS:

- Identify wood utilization needs.
- Continue to partner with contracting arborists to recycle/reuse wood from large removals.
- Expand partnerships.
- Explore generating wood chips from tree removals.
  a. Use wood chips in tree plantings and park maintenance projects.
  b. Provide the community with an opportunity to pick up wood chips for landscaping needs.
- Plan for wood waste material storage.
  a. Determine the capacity for wood mulch storage in the Public Works yard.
  b. Explore partnerships for wood mulch storage.

COST: $

TIME FRAME: 5–10 Years

EXISTING POLICY 1: UNDERSTAND THE STRUCTURE AND COMPOSITION OF GARDEN GROVE'S COMMUNITY TREE RESOURCE.

PERFORMANCE MEASURE:

Known duration between maintenance activities for every tree in the inventory.

RATIONALE:

Trees are an asset valued by the community. A high level of standard coupled with an up to date inventory allows staff to identify and track maintenance needs and provide excellent customer service. Additionally, an inventory can be used to quantify the ecosystem services provided by public trees.

RISK:

A lack of understanding of the age, structure, benefits, and maintenance needs of public trees makes the community tree resource vulnerable to loss of canopy cover. It also creates challenges in responding to pests and could increase the costs of managing such threats.

BENEFIT:

A better understanding of the public tree resource enables Trees Division staff to prioritize tasks, improve efficiency, and better plan for and manage pests. Ultimately, trees in the urban forest and the community are better served.

OBJECTIVE:

Maintain a tree inventory that can be used to manage the community tree resource.

ACTIONS:

- Update inventory of all trees in parks, open space, trails, City-owned facilities, and public rights-of-way.
    a. Consider redistributing funds to proactive maintenance rather than retroactive.
    b. Determine which vacant sites are potential tree planting sites to assist in planning for future plantings.
- Regularly update the inventory as tree work occurs.
    a. Include updates on tree removals as they occur.
- Obtain information on tree aspect and distance from buildings and update the benefit investment analysis to better understand the benefits provided by the public tree resource.
    a. Consider the use of a tree inventory management software.

COST: $

TIME FRAME: Ongoing

GOAL 4: INCREASE UNIFORMITY BETWEEN CITY POLICIES, DOCUMENTS, AND DEPARTMENTS.

PERFORMANCE MEASURE:

Number of policies, documents, and departments that cross reference the UFMP and BMPs for tree care.

RATIONALE:

Having a uniform policy reduces confusion between departments and community members and transcends departmental changes.

RISK:

When policies have inconsistencies, setting a high standard of care is difficult.

BENEFIT:

Uniformity promotes a strong and efficient policy that aligns with community expectations.

I. OBJECTIVE:

Communicate and coordinate with other city departments.

ACTIONS:

- Share the UFMP among city departments following completion to increase transparency by communicating best management practices for tree care to alleviate current and future conflicts with hardscape and other city infrastructure.
- Communicate internally and facilitate discussions with Public Works to develop policies for tree-related infrastructure damage.
- Participate in cross-training activities to create understanding of other departmental roles.
- Increase communication between city departments to increase enforcement of tree protection in the public right of way and new developments.
- Explore new tree protection policies enforced by the city.

COST: $

TIME FRAME: Ongoing

II. OBJECTIVE:

Unify guiding documents to transcend departmental changes, promote consistency, and shared vision.

ACTIONS:

- Ensure that UFMP goals are considered in all overarching planning and visionary documents as revisions and updates occur.
- General Plan as it is revised.
- Promote trees as an essential tool for City initiatives to decrease heat island effects, capture and reduce stormwater, increase the lifespan of hardscape, improve air quality, buffer the urban landscape, revitalize the aesthetics, and improve public health.
    a. Incorporate trees into stormwater management systems, including in bioswales to improve stormwater capture.
    b. Retrofit existing stormwater management systems with trees wherever possible.

COST: $

TIME FRAME: Ongoing





GOAL 5: RECOGNIZE TREES AS GREEN INFRASTRUCTURE.

PERFORMANCE MEASURE:

Reduced number of removals and conflicts reported between trees and other utilities.

RATIONALE:

Designating trees as green infrastructure communicates that they are a key element in cityscapes, as is expected for other infrastructure.

RISK:

Trees and other utility conflicts may result in undesirable pruning or tree removals that could have been avoided through alternative design solutions and repairs.

BENEFIT:

Planning for trees limits the need to mitigate conflicts between trees and other utilities and promotes tree longevity.

I. OBJECTIVE:

Plan for trees to limit future grey infrastructure conflicts.

ACTIONS:

- As the General Plan or other long-term planning documents are revised consider impacts on trees.
- Consider amending clearance and visibility standards to allow for more planting and avoid excessive pruning of young or newly established trees.
- Use root barriers to reduce root and sidewalk conflicts.
- Use best management practices for root pruning to decrease the likelihood of recurrence in tree-sidewalk conflicts.
- Develop tree removal policies around conflicts with sewer and water lines.
- Develop policies to move sewer mains from the rights-of-way to the street during redevelopment projects.
- Move water lines from planter strips to underneath the street when possible during street reconstruction and improvement projects.
- Coordinate with the Water Services Division during tree planting and planning projects to avoid conflict with water laterals and mains.

COST: $

TIME FRAME: 10 Years

II. OBJECTIVE:

Create and enforce policies that protect trees.

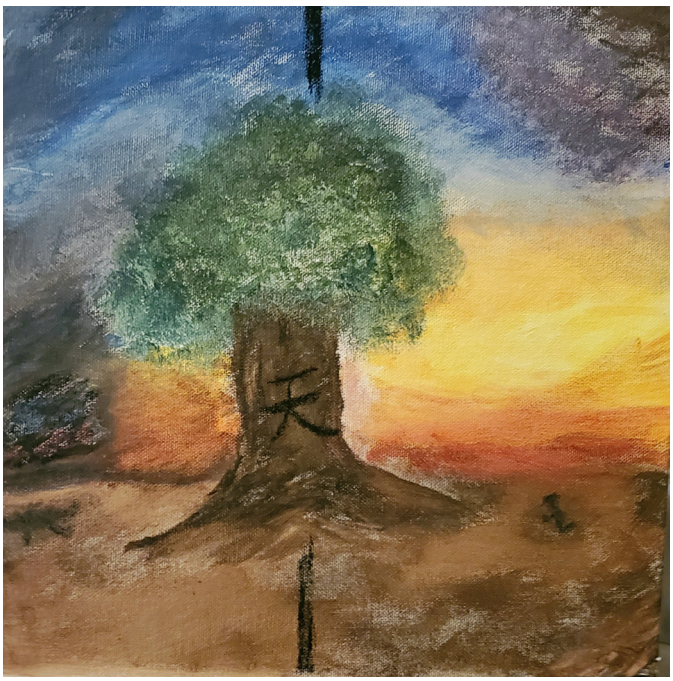
ACTIONS:

- Create a policy to move water mains from the rights-of-way into the street during significant street reconstruction projects.
- Require developers to maintain trees to promote the desired intent. (e.g., shade, aesthetics, etc.)
- Enforce the replacement of trees, in accordance with design code, that have been devalued and cannot be rehabilitated or have died.
- Include requirements on permit applications for planting, removal, trimming or cutting trees.
- Update the cost of the permit to better reflect the cost of tree planting and removal.
- Consider a general fee for tree removal applications.
- Enforce protections of trees in place.
- Develop methods to decrease vandalism to trees.
    a. Provide bike racks.
    b. Implement signage to indicate bikes cannot be locked to trees.

COST: $

TIME FRAME: 1–5 Years





EXISTING POLICY 2: ENCOURAGE A CULTURE OF SAFETY.

PERFORMANCE MEASURE:

Reduction in accidents and claims against the city.

RATIONALE:

Promoting a culture of safety results in reduced workplace accidents, less down-time, and greater productivity. With every staff member engaging in safe behaviors, everyone (even the community) is safer.

RISK:

Tree work is dangerous, this risk is exacerbated when unsafe practices are used, or there is a lack of understanding of safety policies.

BENEFIT:

Fewer accidents and claims against the city, resulting from improved public safety.

I. OBJECTIVE:

Implement policies and procedures that make that tree work as safe as possible.

ACTIONS:

- Provide updated materials in safety trainings.
- Consider the city becoming a member of the Tree Care Industry Association (TCIA).
- Provide training for staff to help recognize/ report hazards, along with basic pruning/proper maintenance.
- Review City of Garden Grove Emergency Operations Plan for tree work safety, including defining responsibilities, standardizing debris management, and use of contractor services.

COST: $

TIME FRAME: 1–5 Years

II. OBJECTIVE:

Encourage employees to engage in professional development.

ACTIONS:

- Promote, support and incentivize employee ISA Certified Arborist credentials and other professional development opportunities.

COST: $

TIME FRAME: Ongoing









GOAL 6: PROMOTE TREE PRESERVATION AND PROTECTION.

PERFORMANCE MEASURE:

Reduction in removals and no-net loss in tree canopy cover.

RATIONALE:

Trees take a long time to grow. Preserving and protecting existing trees ensures that the stream of benefits provided by community trees is not lost or disrupted and has the opportunity to increase the stream of benefits.

RISK:

Loss of tree canopy cover and associated environmental benefits.

BENEFIT:

Preservation of community trees ensures the environmental benefits are sustained and trees that have been preserved and protected have the potential to provide even more benefits to the community over the course of their lifetimes.

I. OBJECTIVE:

Revise and amend Municipal Code to promote the protection of community trees.

ACTIONS:

- Establish the following criteria that must be met in order for the removal and replacement of a City tree as requested by a resident:
  a. City tree root damage/intrusion into a sewer lateral that is verified in writing by a licensed plumber.
  b. Excavation of the sewer lateral demonstrates damage/intrusion by city tree roots, and cannot be resolved by root pruning, the Public Works tree inspector shall determine if the tree will be removed.
  c. An unhealthy, poor structured and/or severely damaged tree, as determined by the Public Works tree inspector.
  d. Require the replacement of a tree that has been removed.
  e. When a site is not suitable for a replacement tree, require a mitigation fee to fund the planting of tree elsewhere in the community.
- Amend Municipal Code to formalize the Council Policy No. 700-05 on Street Tree Removal.
- Amend the following in the current policy:
  a. Define "adjacent property owner."
  b. Define "mitigation" to include tree replacement or payment of fees.
- Update injury of a tree to include further actions. (i.e., nails, wires, chain, rope, etc.)
- Include considerations for new trees in project developments.
- Include considerations for existing trees during new project developments.
  a. Review design plans to preserve healthy, large, and established trees where feasible.
  b. Provide a final inspection for tree plantings in developments to review location/species and record/approve any changes from the plan.
  c. Require the use of tree protection zones (TPZ) when trees are recommended for preservation.
  d. Include maintenance requirements for properties/developments that:
     i. Require trees be maintained to promote the desired intent. (e.g., shade, aesthetics, etc.)
     ii. Requires replacement of trees that are devalued (and cannot be rehabilitated) and/or are dead.
- Consider protections for significant trees. (e.g., large size, unique species, historical or cultural significance, large native trees)
- Implement enforcements
  a. When street trees maintained by developers are unduly removed.
     i. Add requirements for tree retention.
  b. When trees on private property are not maintained to City standards.

i. Provide guidelines for expected maintenance and upkeep of right-of-way trees.

ii. Determine penalties for ordinance violations.

- Add Clarification to the Design Code
  a. Incorporate review and input from the Trees and Streets Division into the plan development processes.
  b. Refer to a species recommendation list
  c. Update visibility (and tree pruning/clearance) standards.
  d. Include standards and specifications for planter site construction, planting/installation, and ongoing maintenance in accordance with ANSI Standards and ISA Best Management Practices in development agreements.
- Coordinate with the Engineering and Planning Departments to review site plans and make recommendations to avoid planting trees where infrastructure conflicts may arise.

COST: $

TIME FRAME: 1–5 Years

II. OBJECTIVE:

Monitor contractor services.

ACTIONS:

- At a minimum, schedule 5- to 7-year pruning cycles.
  a. Consider the use of cycle busters.
  b. Avoid pruning trees that do not require maintenance.
  c. Consider the use of structural/training pruning for young trees to promote good structure.
- Evaluate agreements to ensure compliance with ANSI A300 and Z133.
- Inspect and update inventory data.

COST: $

TIME FRAME: Ongoing

III. OBJECTIVE:

Optimize the Trees Division's ability to address maintenance needs.

ACTIONS:

- Evaluate the optimal level of resources needed to achieve desired levels of service
  a. Staffing
    i. Consider reinstating the foreman position
    ii. Identify positions for which ISA Certification is a requirement
  b. Funding
    i. Explore alternative long- and short-term funding opportunities
    ii. Explore grants (e.g., CalFire, California Natural Resources Agency)

COST: $-$$ TIME FRAME: Ongoing

IV. OBJECTIVE:

Monitor for pests and pathogens.

ACTIONS:

- Visually inspect trees for pests and pathogens.
- Identify pests and pathogens before applying treatments.
- Continue to participate in training on existing and potential pests and pathogens.

COST: $

TIME FRAME: Ongoing

GOAL 7: ENHANCE COMMUNITY AESTHETICS.

PERFORMANCE MEASURE:

Enhanced aesthetics through urban tree plantings on public and private property[4].

RATIONALE:

Aesthetically pleasing environments, with sufficient canopy cover, are valued and result in increased activity, tourism, and instill a sense of pride.

RISK:

Removals or a lack of planted trees, both of which could have been avoided through alternative design.

BENEFIT:

Aesthetically pleasing atmospheres foster livelier and more engaged communities.

I. OBJECTIVE:

Encourage the expansion of the urban forest through tree plantings on public property.

ACTIONS:

- Consider the annual cost of maintenance of trees prior to planting.
- Enhance transitions between Garden Grove and the Anaheim resort area.
- Identify and adapt plantings to the kind of tree valued by different cultural neighborhoods within the city.
- Use street tree plantings to align with the theme of the neighborhood or district area (per *Garden Grove General Plan*).
- Use street tree plantings to support the *Garden Grove Active Streets Master Plan and Active Downtown Plan.*
    a. Provide a network of green infrastructure.
    b. Foster pedestrian friendly environments.
- Use trees in landscaping to decrease noise levels along corridors (per *Garden Grove General Plan*).
- Plant large stature shade trees where space allows, especially in parks.
- Work to improve the park system through increased tree plantings (per *Garden Grove Parks, Recreation, & Facilities Master Plan*).
- Explore the use of median plantings.
    a. Prioritize median plantings with existing irrigation infrastructure.
    b. Consider median plantings in new developments or areas undergoing significant reconstruction.
- Use engineering projects such as curb extensions and bulb-outs to increase the amount of space available for street trees (per *Active Downtown Garden Grove*).

COST: $

TIME FRAME: Ongoing

[4] Aesthetics can be measured through community values, perceived safety, or activity and tourism levels (Active Living Research, 2015; McMahon, 2020).

II. OBJECTIVE:

Encourage the expansion of the urban forest through tree plantings on private property.

ACTIONS:

- Promote tree planting on private property.
    a. Provide property owners the recommended species list to encourage the planting of appropriate species.
- Encourage the use of pervious surfaces on private property to allow more water to percolate and gas/air exchange .
- Collaborate with private schools and the School District to improve forestry practices on school property.

COST: $

TIME FRAME: Ongoing





"ALONE WITH MYSELF THE TREES BEND TO CARESS ME THE SHADE HUGS MY HEART."

CANDY POLGAR

GOAL 8: EXPAND AND DIVERSIFY TREE CANOPY TO INCREASE THE ENVIRONMENTAL BENEFITS RECEIVED BY THE COMMUNITY.

PERFORMANCE MEASURE:

Increased tree canopy and promote a diverse composition of tree species.

RATIONALE:

The benefits that the urban forest provides is directly related to the amount of tree canopy cover and leaf surface area.

RISK:

Reduction or stagnation of tree canopy cover may result in fewer benefits.

BENEFIT:

Expanded tree canopy increases the benefits provided by trees, and greater species diversity makes the urban forest more resilient.

I. OBJECTIVE:

Reach 15% tree canopy cover by 2040.

ACTIONS:

- Conduct a Planting Priority Analysis to identify areas which could support additional tree plantings on both public and private property.
  a. Develop a planting plan based on the areas identified in the Planting Priority Analysis as high and very high priority.
- Promote equitable distribution of canopy throughout the community.
  a. Evaluate distribution of tree canopy by socioeconomics, including median income, race, and education.
  b. Prioritize tree planting in areas with lower than average canopy cover (as identified by Tree Canopy Assessment).
  c. Explore opportunities to provide free or low-cost trees for planting on private property in areas of need.
- Use strategic tree plantings to reduce energy consumption and mitigate the heat island effect (per *Garden Grove General Plan and Parks, Recreation, & Facilities Master Plan*).
- Consider incentivizing tree plantings on private property.

COST: $

TIME FRAME: Ongoing

II. OBJECTIVE:

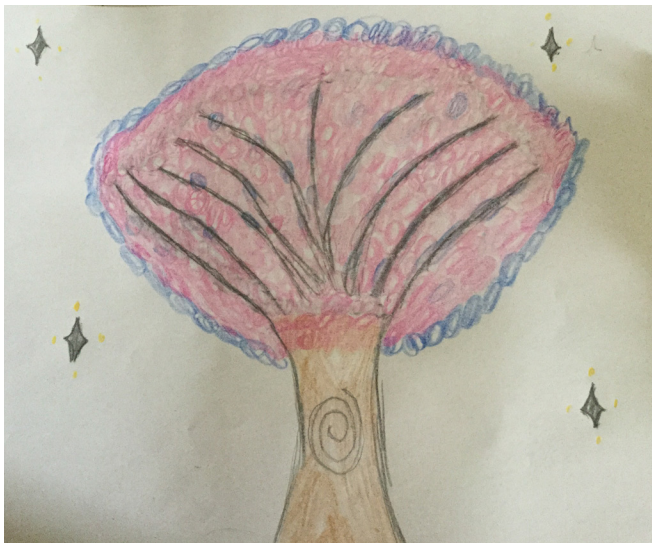
Promote species diversity to build a more sustainable community tree resource.

ACTIONS:

- Revise tree recommendation list to include a broader range of species diversity.
- Evaluate the inventory for high-performing trees with adequate age distribution for use in future plantings.
- Diversify plantings throughout Garden Grove to avoid monocultures and encourage greater pest resistance.
    a. Include multiple species along main corridors.
    b. In areas where a uniform row of trees is desired, select a variety of trees with similar stature and form.
    c. Use alternative design elements to provide a cohesive character.
- Avoid planting species of trees with similar vulnerabilities to pests and disease as current species.
- Use pest and disease resistant species when available.
- At a minimum, pursue species diversity goals that meet the 10-20-30 rule, but strive for even greater diversity among genera.
- Conduct a resource analysis of community trees every five years to review the composition of public trees and quantify the benefits that they provide.

COST: $

TIME FRAME: Ongoing





EXISTING POLICY 3: ENCOURAGE THE ESTABLISHMENT OF TREES THROUGH EFFICIENT AND SUSTAINABLE IRRIGATION SOLUTIONS.

PERFORMANCE MEASURE:

High tree establishment rates and minimal tree losses following periods of drought.

RATIONALE:

Trees need water to survive and efficient cost-effective watering solutions will help to ensure that young trees get established without being cost prohibitive.

RISK:

Increased mortality rates in young trees and stressed trees.

BENEFIT:

Reduced tree mortality rates and reduced labor and water costs.

I. OBJECTIVE:

Promote the efficient use of tree planting funds.

ACTIONS:

- Plan for planting succession for desirable and underutilized species.
- Decrease or cease planting of undesirable and under-performing species.
- Consider conducting a planting priority analysis to determine potential planting sites that provide the maximum benefit.
    a. Identify planting sites that would have the greatest impact of reducing urban heat islands and stormwater runoff.
    b. Identify planting sites that would provide more equitable distribution of tree canopy cover.
- Determine a planting plan with potential tree planting sites to guide and prioritize new tree plantings.
    a. Prioritize available planting sites based on:
        i. Trees that have been removed
        ii. Space and minimum planting setbacks
        iii. Soil characteristics
        iv. Irrigation infrastructure
        v. Landscape goals and tree density
        vi. Revitalization of transition zones
        vii. Site constraints
        viii. Annual maintenance costs
    b. Set replacement ratios for the replacement of trees removed in the rights-of-way.

COST: $

TIME FRAME: Ongoing

II. OBJECTIVE:

Support established and mature trees.

ACTIONS:

- Provide regular maintenance of established and mature trees.
- Inspect trees for structural problems.
- Provide proactive pruning.
- Develop planting plans for succession.

COST: $

TIME FRAME: Ongoing

III. OBJECTIVE:

Establish a more water-wise urban forest.

ACTIONS:

- Choose species suited to the local climate.
- Incorporate native species into planting palettes.
- Use drought tolerant and water efficient species (per *Garden Grove General Plan and Active Streets Master Plan*).
- Consider increasing the space allotted for non-traditional parks, similar to the well-received butterfly gardens.
    a. Consider incorporating "demonstration gardens" to show residents drought tolerant options.
- Continue to use "water bags" and other efficient systems to water trees.
- Collaborate with Parks Department to align the proper amount of water for turf and trees present in the Parks.

COST: $

TIME FRAME: Ongoing

IV. OBJECTIVE:

Ensure trees receive adequate water.

ACTIONS:

- Continue to provide water to help establish new tree plantings.
- Restore irrigation to trees in areas where irrigation was cut-off due to drought.
- Refurbish irrigation to medians.
- Use watering bags if irrigation is not possible.
- Implement smart controllers for irrigation.
- Design irrigation to split the watering of trees and other vegetation.
- Provide educational materials about the importance of watering trees, even during periods of drought.

COST: $-$$

TIME FRAME: 10 Years



Focus Area: Community outreach and collaboration

GOAL 9: CELEBRATE THE IMPORTANCE OF URBAN TREES.

PERFORMANCE MEASURE:

Recognition as a Tree City USA and Arbor Day activities/celebrations.

RATIONALE:

Observing and recognizing the benefits provided by the urban forest encourages community engagement and promotes appreciation for trees.

RISK:

When community members are unaware of the benefits of the urban forest, people are likely going to be less supportive of programming and the resources needed to care for it.

BENEFIT:

Community awareness and appreciation of the urban forest promotes support for the necessary resources to maintain it.

"BETWEEN EVERY TWO PINE TREES THERE IS A DOOR LEADING TO A NEW WAY OF LIFE."

JOHN MUIR

OBJECTIVE:

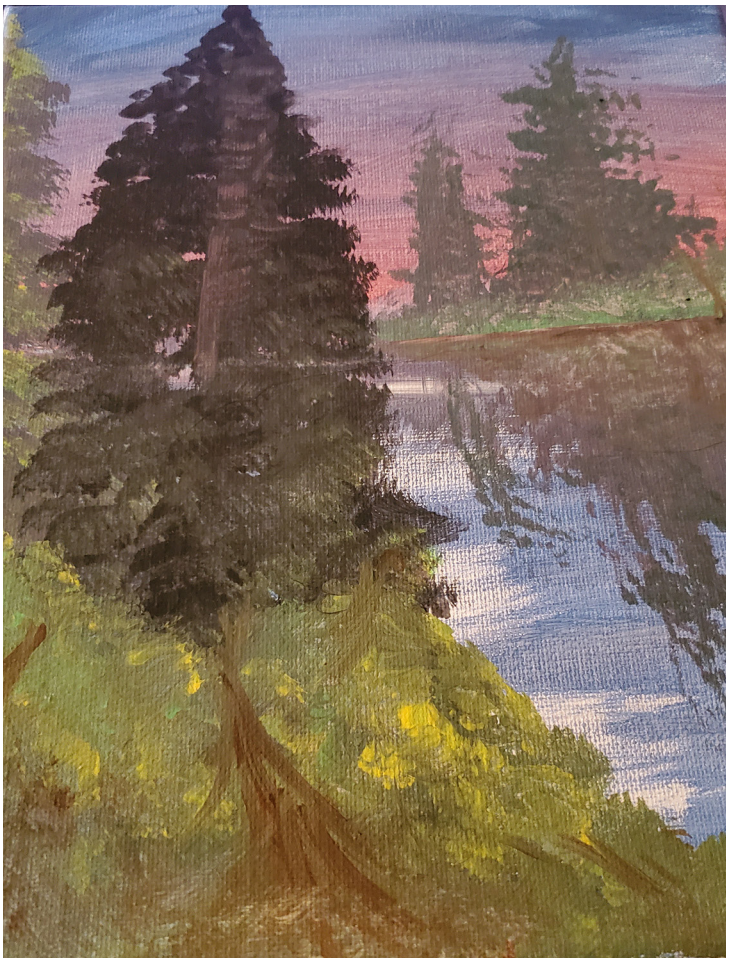
Re-establish the Tree City USA designation.

ACTIONS:

- Continue to meet all requirements to become a Tree City USA.
  a. Create Tree Board or Department.
  b. Continue to follow the Tree Ordinance.
  c. Continue to spend more than $2/capita on the urban forestry department.
  d. Continue to provide information about Arbor Day on the city website.
- Have a formal proclamation at Annual Arbor Day Celebration.

COST: $

TIME FRAME: 1 Year









GOAL 10: SUPPORT COMMUNITY ENGAGEMENT AND STEWARDSHIP OF THE URBAN FOREST.

PERFORMANCE MEASURE:

Participation in forestry programming.

RATIONALE:

An educated and engaged community is more likely to support and advocate for the urban forest.

RISK:

Apathy towards the urban forest may result in loss in benefits provided by the urban forest to the community.

BENEFIT:

A community that supports the urban forest protects the urban forest and therefore the benefits that it provides to the city.

I. OBJECTIVE:

Promote the Urban Forest Management Plan.

ACTIONS:

- Distribute the UFMP through the city website and through social media.
- Annually review and report on progress made on UFMP goals. Adjust targets to continue to align with:
  a. Community values and expectations of the urban forest
  b. Funding availability
  c. City goals, policies, and actions
- Publish a State of the Urban Forest Report beginning at year one and then every two to five years to report progress and challenges of the UFMP.

COST: $

TIME FRAME: Ongoing

II. OBJECTIVE:

Update the web page for the Trees and Flood Control Section on the city website.

ACTIONS:

- Provide important tree-related information in multiple languages.
- Provide city-approved tree planting list.
- Add information on the Memorial Tree Program to the city website.
- Summarize maintenance responsibilities of adjacent property owners for city-planted trees.
  a. Provide links for proper tree-care resources.
     i. How to plant a tree
     ii. How to prune a tree
     iii. How to fertilize and mulch
     iv. How to irrigate
     v. How to hire an arborist or tree care company
- Share the UFMP through the website.
- Communicate the benefits of trees and tree canopy including environmental, social, and economic.

COST: $

TIME FRAME: 1 Year

III. OBJECTIVE:

Encourage community involvement and stewardship for the urban forest.

ACTIONS:

- Explore partnering with local schools, service groups (Kiwanis Club, Rotary Club, etc.), or nonprofits (Orange County Coastkeeper) to develop a volunteer forester program.
- Consider a program for citizens to sponsor trees in nontraditional parks.
- Consider partnering with a local nonprofit.
- Consider creating a community-led committee to advocate for the urban forest.
    a. Outline the roles and responsibilities of a community lead committee.
    b. Include youth through an ambassador's program.

COST: $

TIME FRAME: Ongoing

IV. OBJECTIVE:

Encourage the expansion of the urban forest through tree plantings on both public and private property.

ACTIONS:

- Identify preferred species of trees to encourage tree plantings in different cultural neighborhoods within the city.
- Facilitate tree plantings with community groups on private property and in parks.
- Coordinate with schools to promote tree plantings on school campuses.
- Enhance the transition between Garden Grove and Anaheim resort area.
- Plant large stature shade trees where space allows, especially in parks.
- Expand tree plantings in center medians.
    a. Prioritize median plantings with existing irrigation infrastructure.
    b. Consider median plantings in new developments or areas undergoing significant reconstruction.

COST: $

TIME FRAME: Ongoing

V. OBJECTIVE:

Support the formation of a community-led tree ad-hoc committee.

ACTIONS:

- Work with community members to create an ad-hoc committee for the urban forest that meets on a temporary basis for a specific purpose. (e.g., Tree Planting Event, Urban Forest Management Plan Update, etc.)
    a. Outline the roles and responsibilities of the ad-hoc committee.
    b. Explore potential roles for youth, including an ambassador's program.
- Explore partnering with local schools, service groups (Kiwanis Club, Rotary Club, etc.), or nonprofits (Orange County Coastkeeper) to develop a volunteer forester program.

COST: $

TIME FRAME: 10 Years

• How are we doing?

With appropriate care and planning, the urban forest is an asset that has the potential to increase in value over time. As young trees mature and their leaf surface and canopy grow, so too will the overall benefits and value from the community's urban forest. The objectives and strategies of the Urban Forest Management Plan (UFMP) are intended to support this process in an appropriate manner that encourages the sustainable stewardship of community trees with consideration for safety, cost efficiency, and community values. The UFMP includes strategies for measuring the success of the UFMP over time.

Monitoring and Measuring Results

Through talking with community partners and those within the urban forestry program, a set of goals were created to meet the strong demand for protecting and enhancing the urban forest, as stated in the community vision. The success of these goals is largely dependent on creating objectives and strategies to meet the targets outlined in the UFMP as well as monitor the progress of these action steps.

ANNUAL PLAN REVIEW

The UFMP is an active tool that will guide management and planning decisions over the next 40 years. Its goals and actions will be reviewed annually for progress and integration into an internal work plan. The UFMP presents a long-range vision and target dates are intended to be flexible in response to emerging opportunities, available resources, and changes in community expectations. Therefore, each year, specific areas of focus should be identified, which can inform budget and time requirements for Urban Forest Managers.

RESOURCE ANALYSIS

With a Resource Analysis, Garden Grove can identify quantitatively the value of the composition of public trees, the annual benefit provided to the community, replacement value, and benefit versus investment ratios. With this information, Garden Grove can improve health (condition), species diversity, annual benefits, and overall resource value of its tree resource. When a resource analysis is conducted every five years, the city can illustrate progress and success towards the UFMP goals. A five-year Resource Analysis review is a possible way to monitor progress on efforts to increase diversity through a list of tree species appropriate for a variety of different spaces and landscapes.

CANOPY ANALYSIS

With the recent Tree Canopy Assessment, Garden Grove has a baseline tree canopy for the entire urban forest, which allows for continued monitoring of trends in the canopy cover on private property.

COMMUNITY SATISFACTION

The UFMP results will be measurable through increased benefits and value in the community tree resource and the preservation and eventual increase in canopy cover over time. Attainment of the objectives and strategies will support better tree health, greater longevity, and a reduction in tree failures. However, one of the greatest measurements of success for the UFMP will be its ability to meet community expectations for the care and preservation of the community tree resource. Community satisfaction can be measured through surveys and will be evidenced by public support for realizing the objectives of the plan. Community satisfaction can also be measured by the level of engagement and support for forestry programs.

REPORTING

Completion of this UFMP is the first step towards achieving the vision for Garden Grove's urban forest. Continual monitoring, analysis, and revisions will help forest managers keep stakeholders informed and engaged. By organizing data into specific components (for example, Urban Forest Reports, Community Satisfaction Surveys), it will be possible to revise specific areas of weakness and buttress areas of strength. Revisions to the UFMP should occur with major events, such as newly discovered pests or diseases, or significant policy and regulation changes. A complete formal revision should occur in unison with major municipal projects, such as the comprehensive Management Plan. It is important to remember that the Garden Grove Urban Forest Management Plan is a "living document" that should adapt to new conditions.

STATE OF THE COMMUNITY FOREST REPORT

The purpose of the report is to provide structural and functional information about the urban forest (including the municipal forest) and recommend strategies for its proactive management, protection, and growth.






I went to the forest to go
to lose my mind and find my soul
- John Muir

Appendix A: Terms and Definitions

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 identified by a government in order 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.

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.

EMERALD ASH BORER (EAB)

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

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, excepting 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 adopted to protect migratory birds.

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 in order to maintain, or improve, the vitality, appearance, and safety of trees and other plants.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Equipment worn to enhance workplace safety and minimize the risk to 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 right-of-way, city park, and/or city facility.

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.

STREET TREE

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

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.

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 CANOPY ASSESSMENT

A document based off of 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.

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- and publicly-owned trees and woody shrubs that grow within an urban area.

URBAN FOREST MANAGEMENT PLAN (UFMP)

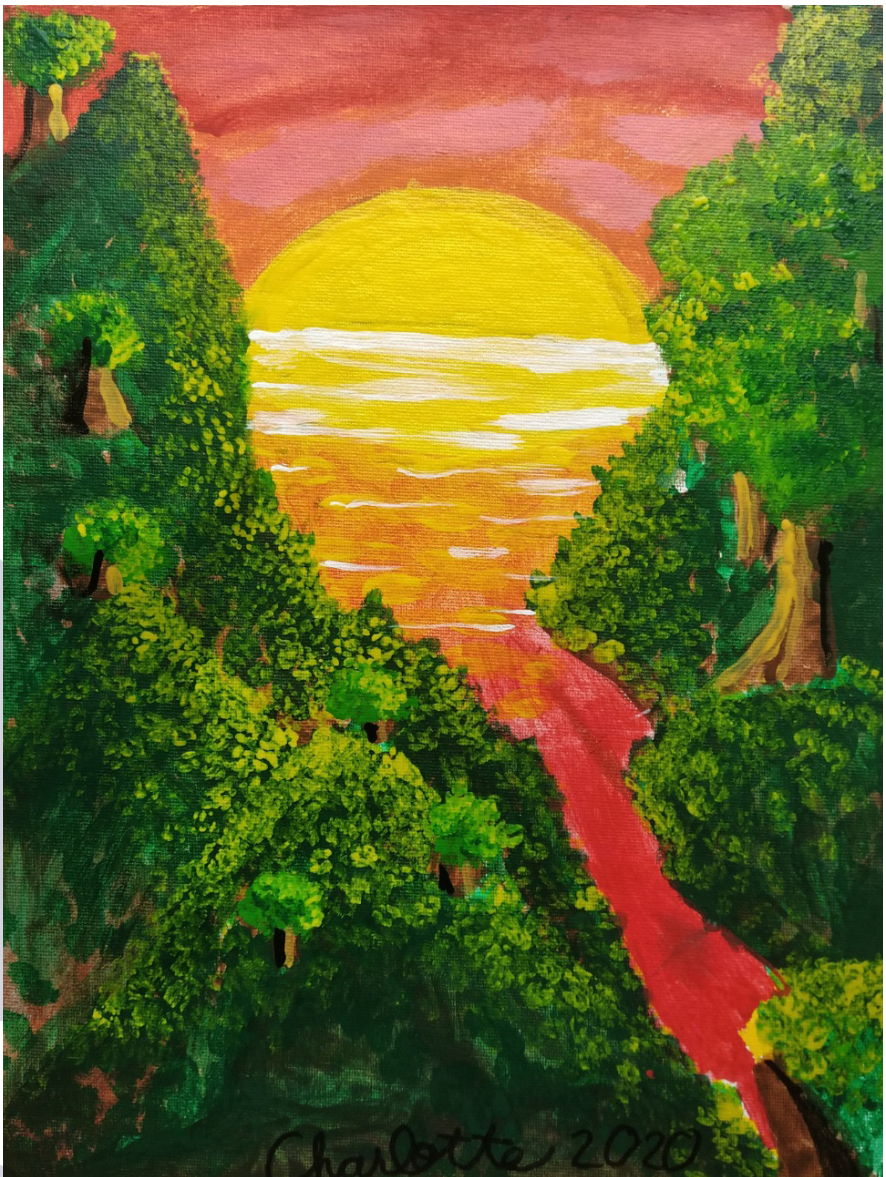
A document that provides a comprehensive information, recommendations, and timelines to guide for the efficient and safe management of a city's tree canopy. The plan uses adaptive management model to provide reasoned and transparent calls to action from an inventory of existing resources.

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.

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.













“FORESTS ARE THE LUNGS OF OUR LAND, PURIFYING THE AIR AND GIVING FRESH STRENGTH TO OUR PEOPLE.”

FRANKLIN D. ROOSEVELT

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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 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 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 to 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 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 plan 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 support 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.



“EVERYTHING THAT MADE THAT GIANT TREE IS ALREADY CONTAINED INSIDE THIS TINY LITTLE SEED. ALL IT NEEDS IS SOME TIME, A LITTLE BIT OF SUNSHINE AND RAIN, AND VOILÁ!”

FLIK, A BUG’S LIFE



Appendix D: Tree Removal Checklist

GARDEN GROVE

CITY OF GARDEN GROVE PUBLIC WORKS DEPARTMENT
11222 ACACIA PARKWAY, GARDEN GROVE, CA 92840
TREES & STREETS DIVISION (714) 741-5000 | ggcity.org

Tree Removal Request

Permit #_____

INSTRUCTIONS AND INFORMATION

1. The City of Garden Grove Municipal Code Title 11 Public Property regulates the removal of a publicly owned trees. Valid reasons for tree removal may include, but are not limited to the list in the request justification below.

2. If your removal request is denied and you want to pursue the removal of an otherwise healthy right-of-way tree, then the Council Policy for resident petition for street tree removal and replacement shall be followed.

3. Trees Division and/or designated City staff may inspect the tree(s). By requesting a removal, you are consenting to an on-site inspection.

PROJECT INFORMATION

Tree Site Address:_____ Submittal Date:_____

Owner Name:_____ Phone #:_____

Mailing Address:_____ City:_____ State/Zip:_____

Applicant Name:_____ Phone #:_____

Mailing Address:_____ City:_____ State/Zip:_____

Email (Optional):_____

REQUEST JUSTIFICATION

Mark the reason for your tree removal request:

- ☐ Concern for public safety
- ☐ Poor health, including disease and/or decay
- ☐ Structural issues that cannot be corrected
- ☐ Inappropriate species
- ☐ Other, please justify:_____

Arborist Report (attach if available) Yes: ◯ No: ◯

REQUEST DETAILS

State the number of trees and species requested for removal

Species:_____ Number:_____

Species:_____ Number:_____

Signature of Applicant: _____ Printed Name: _____

FOR DEPARTMENT OF PUBLIC WORKS USE ONLY

Approval Signature:_____ Date:_____

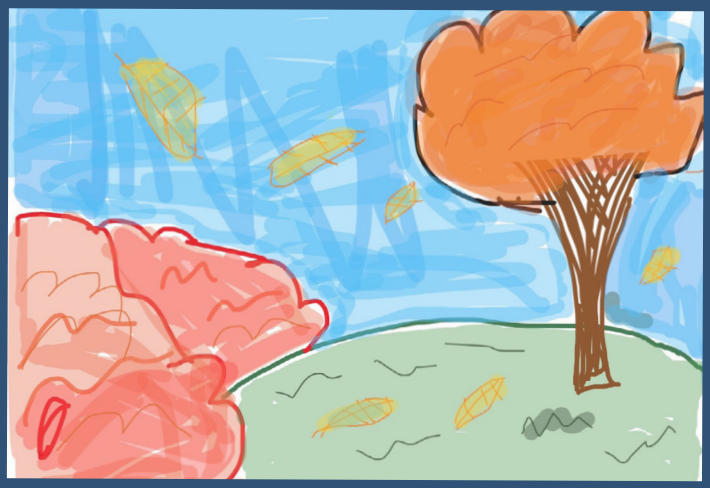
Approval Signature:_____ Date:_____

Time:_____ **Fee:$**_____ Save Form | Reset Form | Print Form

APPROVAL STAMP







“THERE IS A NEED TO EDUCATE AND EMPOWER THE PUBLIC ABOUT URBAN FORESTRY.”

GARDEN GROVE MANAGING PARTNER


HAPPINESS
PITY
TRUST
CORAGE
ENVY
JOY
EMPATHY
DESPAIR
HOPE
HATE
LOVE
PRIDE
FEAR

Appendix E: Tree Protection in Construction Zones

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 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 in order 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 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 on 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.
- Prior to 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 renovation of such systems.
- Prior to 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 construction of 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 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 form 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 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, 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 on a regular basis 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 run off 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. Inspections that are more frequent 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.
- In order 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 2-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 2-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 3-feet below the surface of the soil in order 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 protection 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 released 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 3 to 5-years.
- Inspect trees annually for at least 3 to 5-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 prior to 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 2-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 should 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:

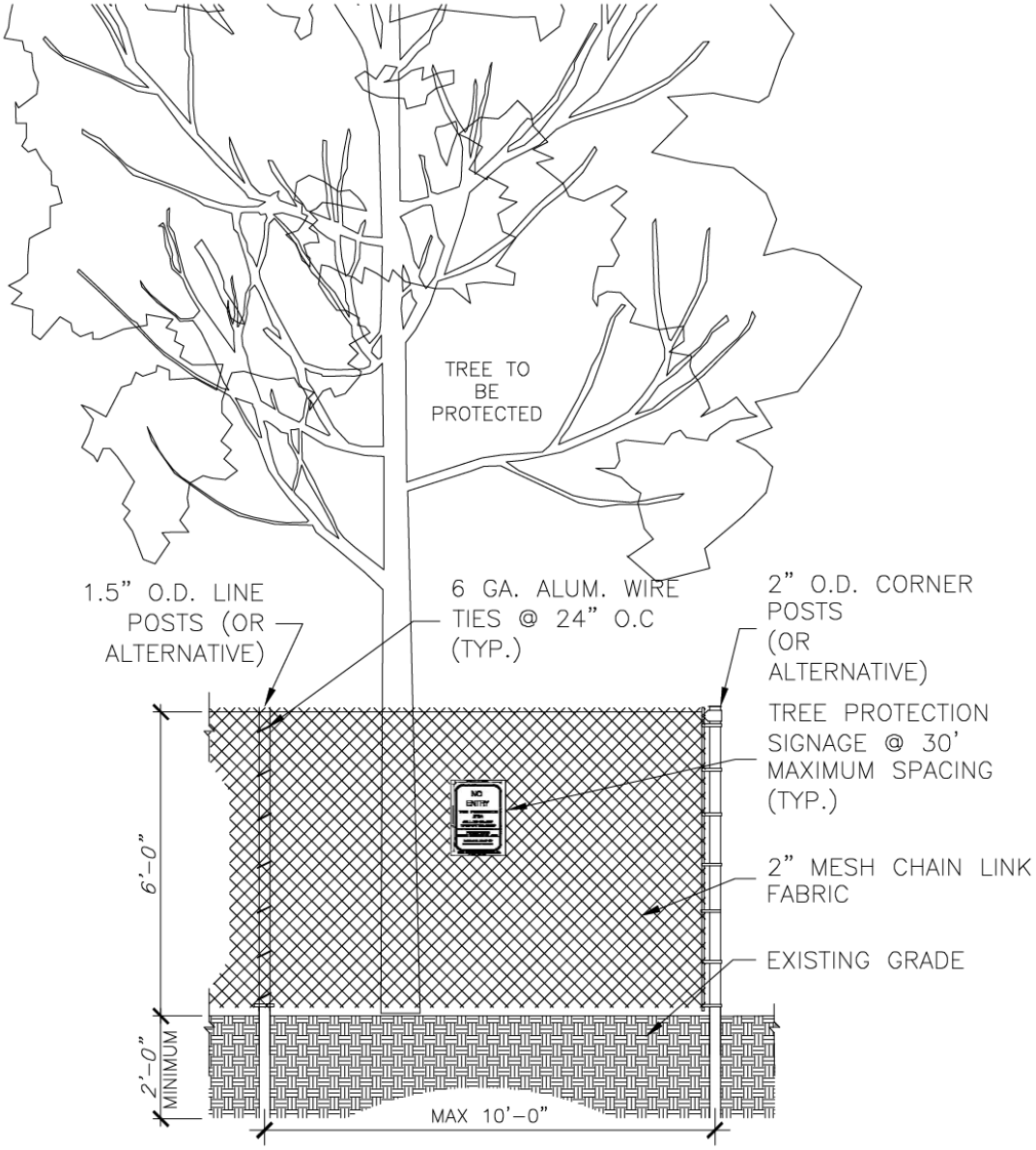
- Plant deep rooting trees that are proven to be non- or minimally invasive.
- Over soil that shrinks and swells, install a sidewalk with higher strength that has wire mesh and/or expansion slip joint dowel reinforcement.
- Fracture soil with an air spade and backfill with sand prior to planting to promote 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 material 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.

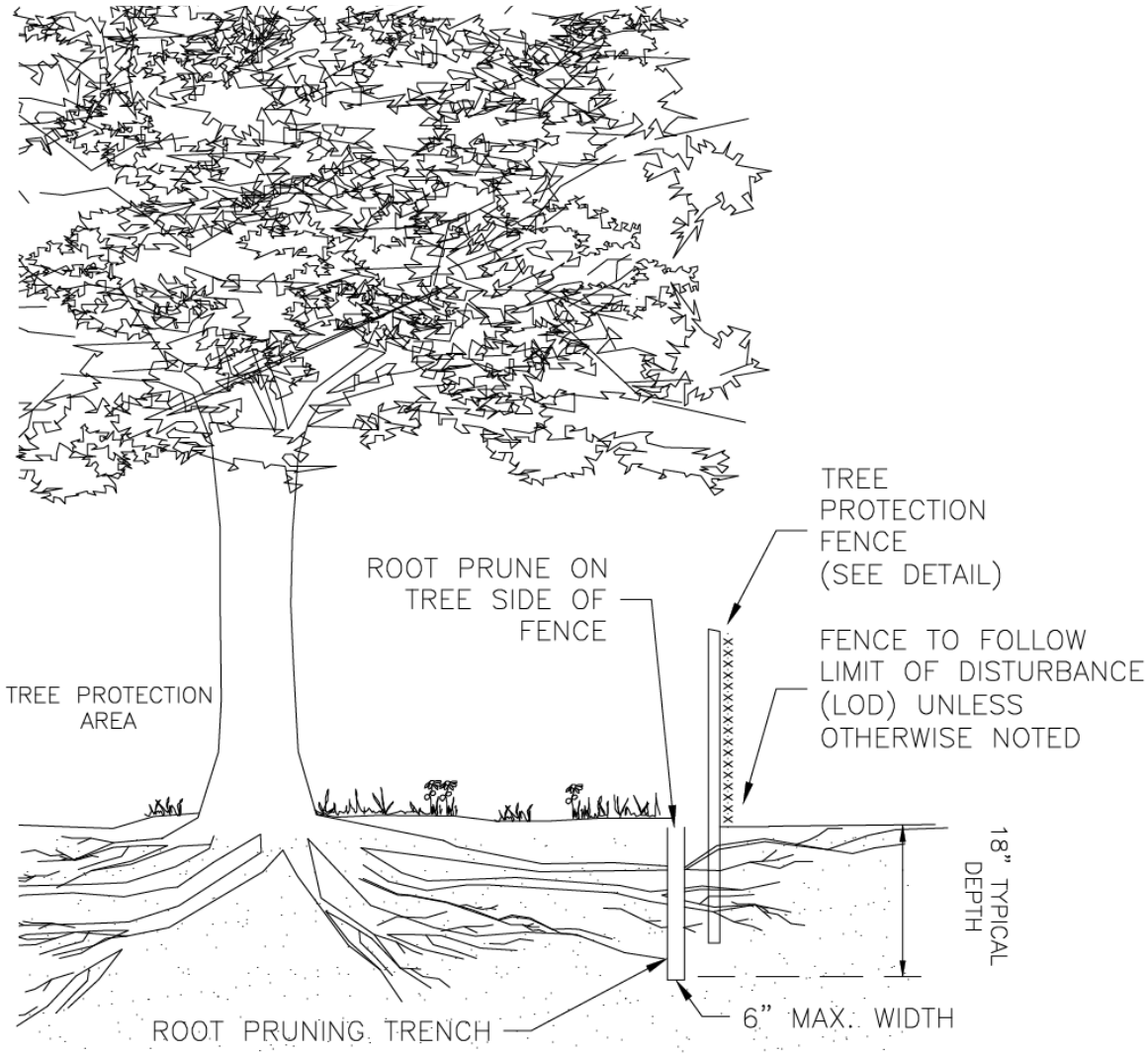


NOTES:

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

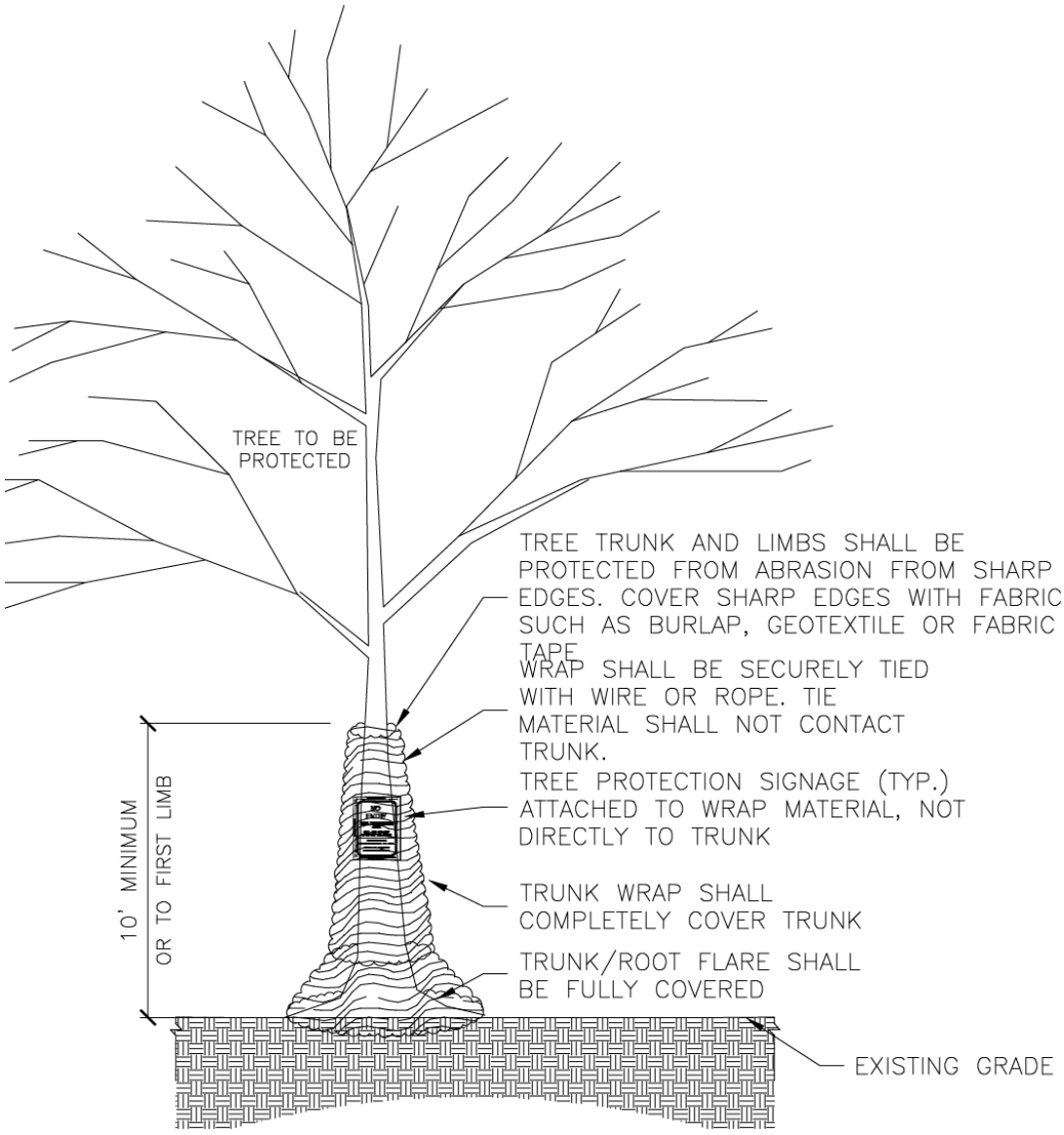


NOTES:

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

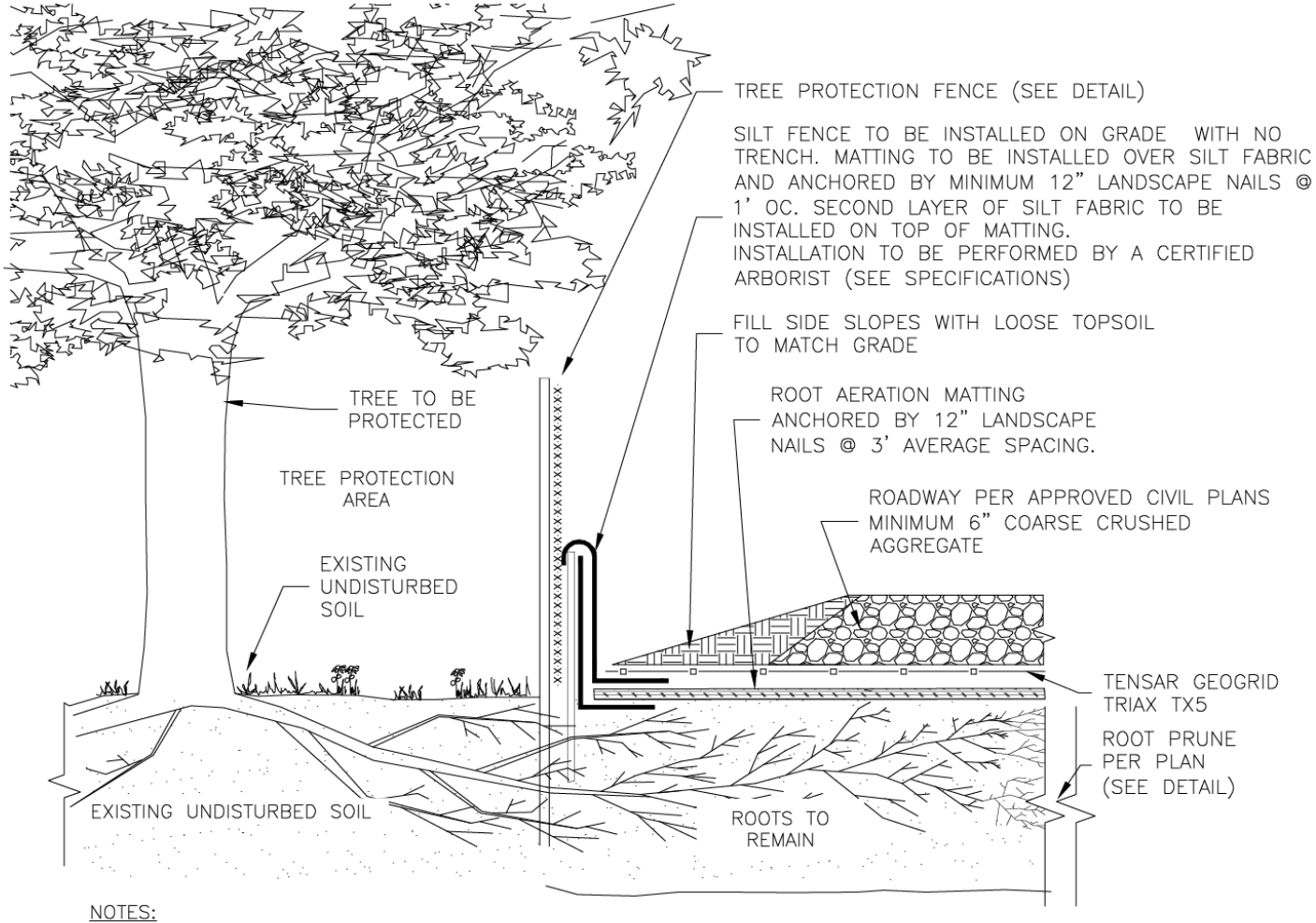


NOTES:

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

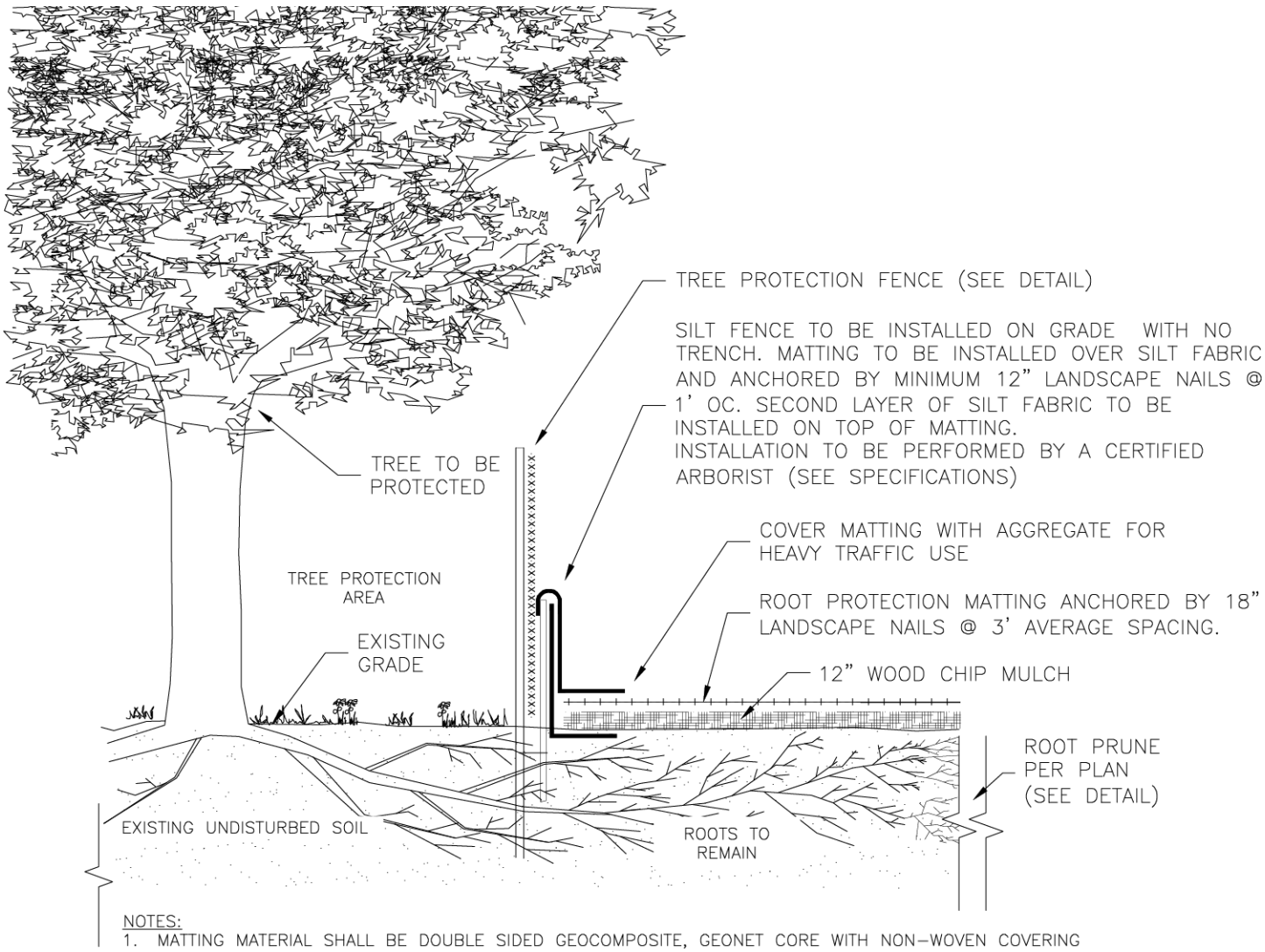


NOTES:

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

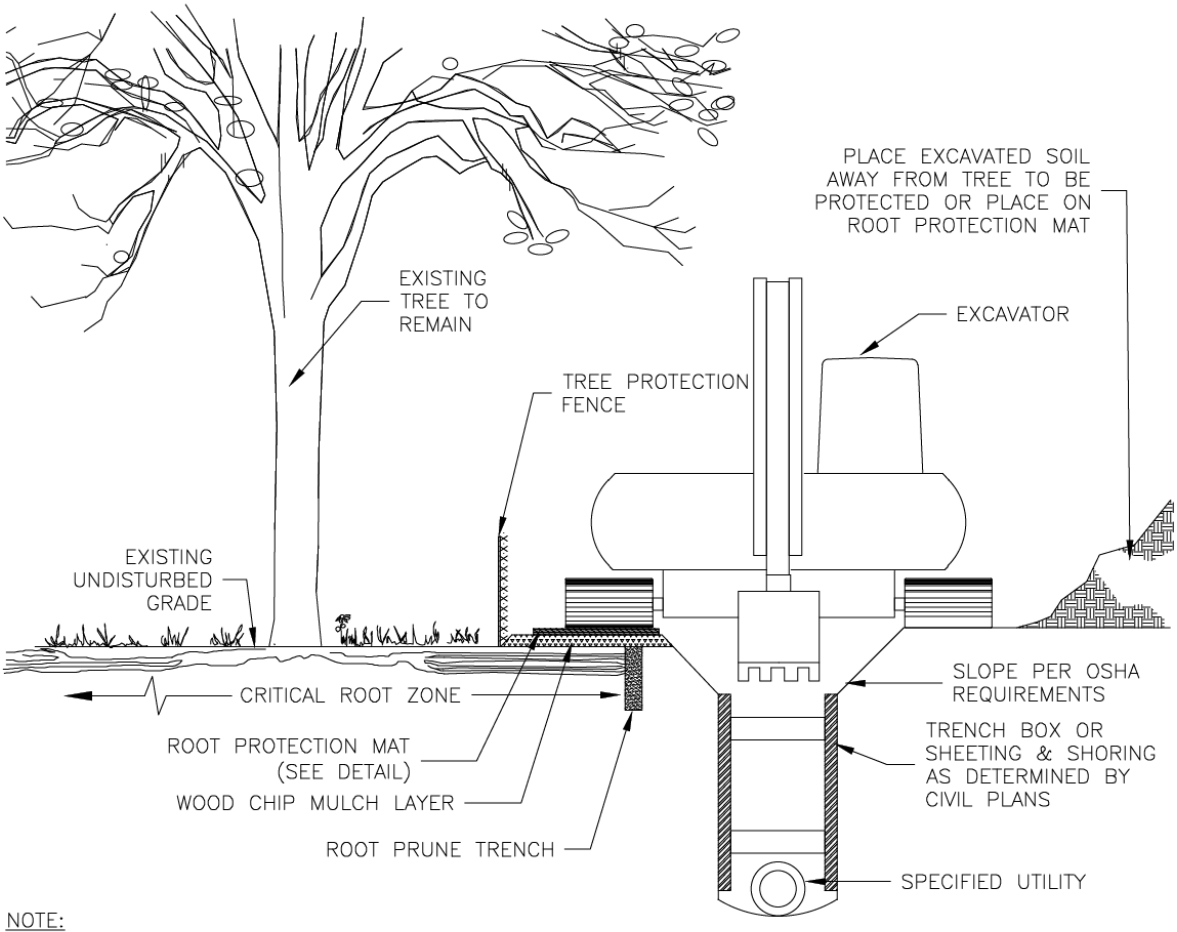


NOTES:

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:

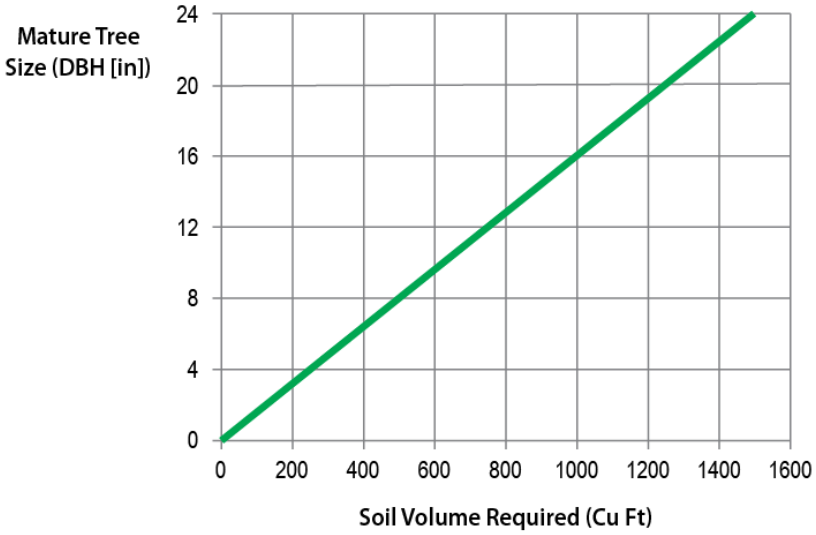
1. EXACT RPM DIMENSIONS TO BE DETERMINED BY PROJECT ARBORIST
2. ARBORIST TO COORDINATE WITH SITE SUPERINTENDENT FOR PIPE LAYOUT, DEPTH,SIZE OF EQUIPMENT, WIDTH OF TRENCH, AND OVERDIG TO DETERMINE LOCATION AND LAYOUT OF TREE PROTECTION.
3. ARBORIST TO COORDINATE WITH SITE SUPERINTENDENT FOR OVERHEAD CLEARANCE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

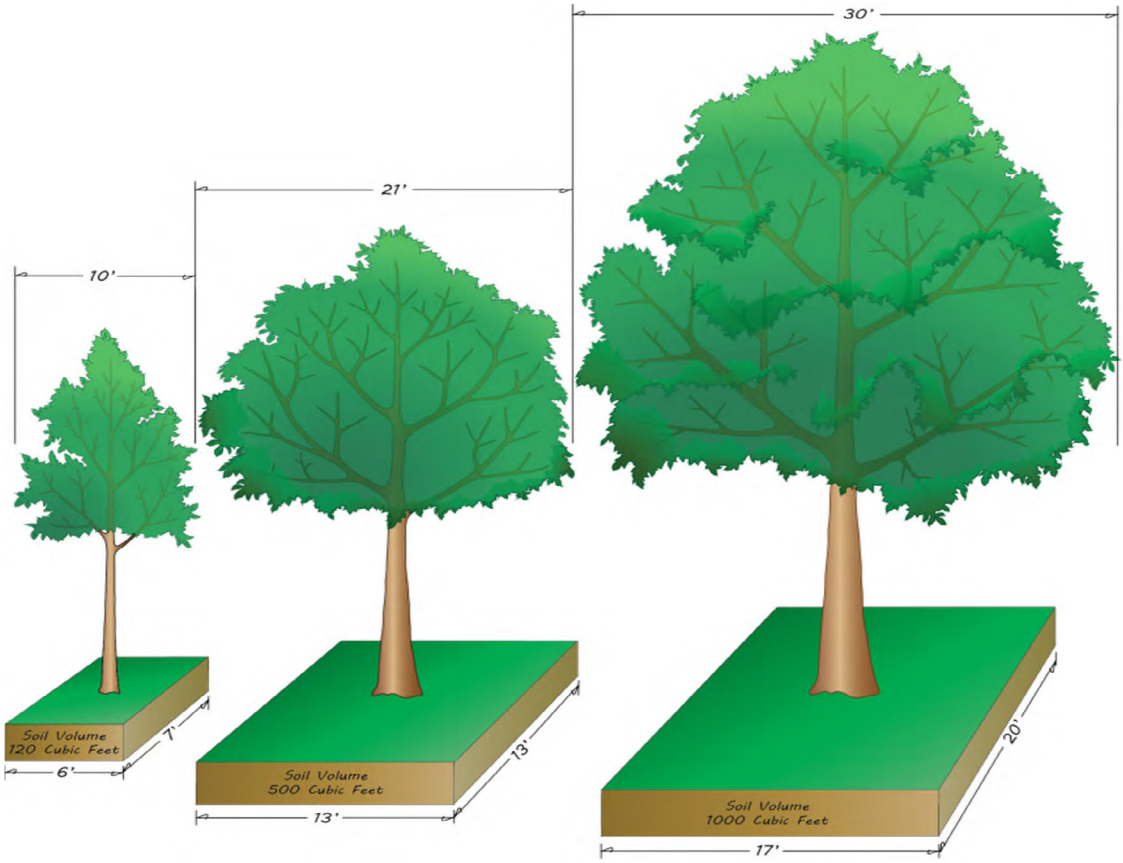
6 / TP1 TREE PROTECTION FOR UNDERGROUND UTILITY (TYP)

SCALE: NTS

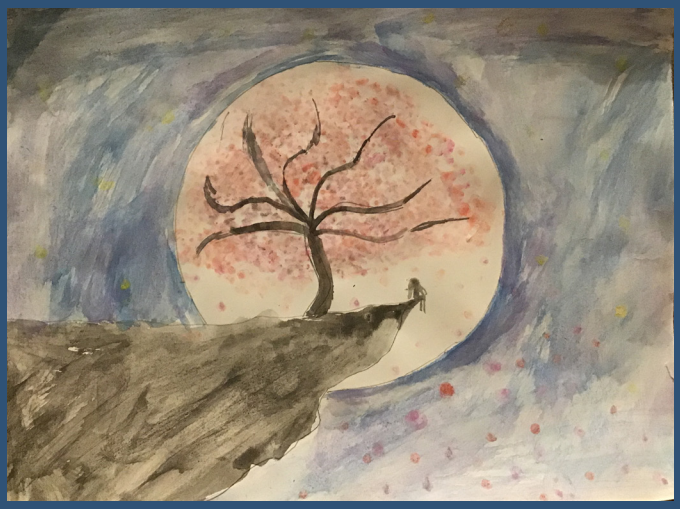
Appendix F: Soil Volume and Tree Stature

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).





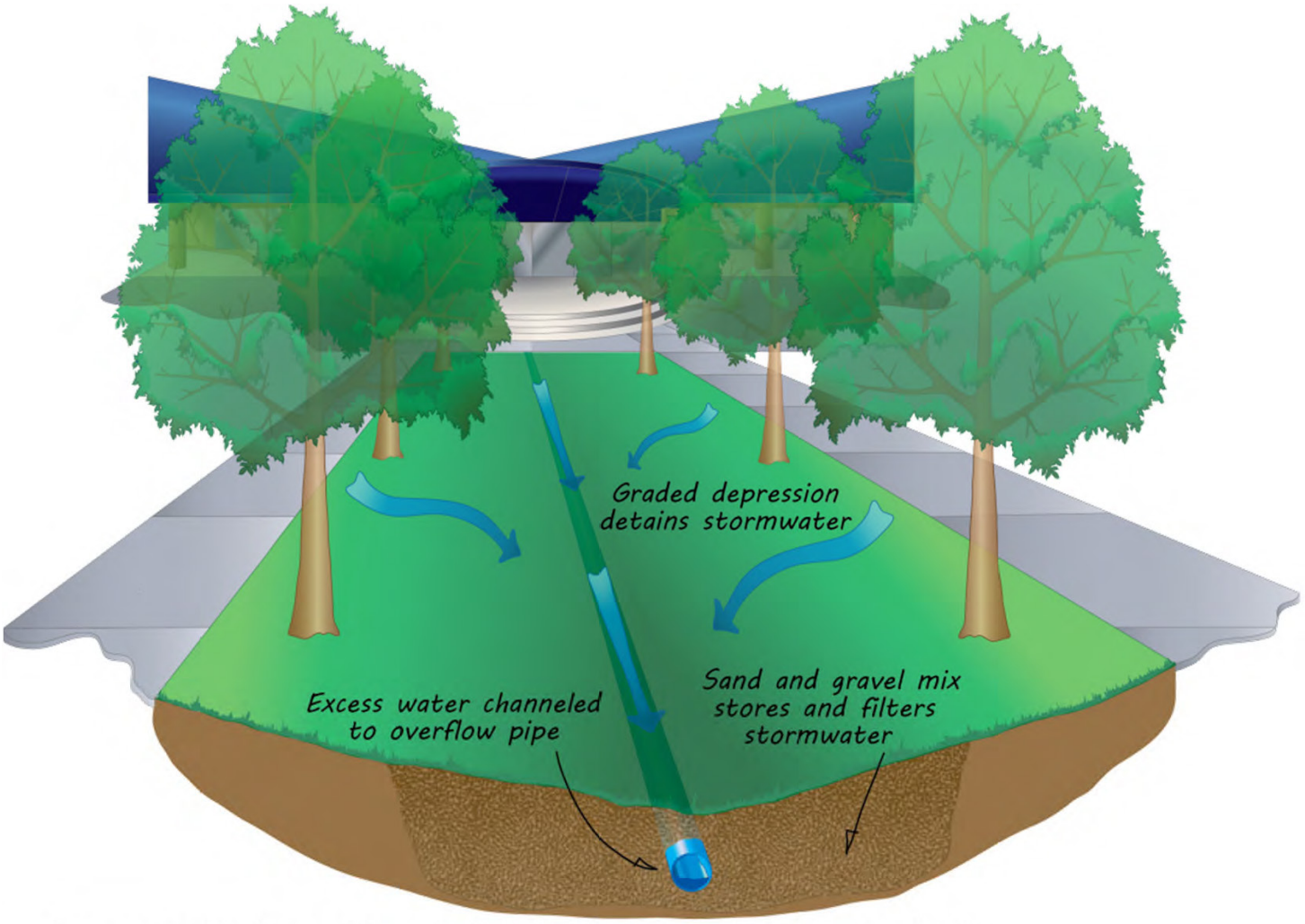




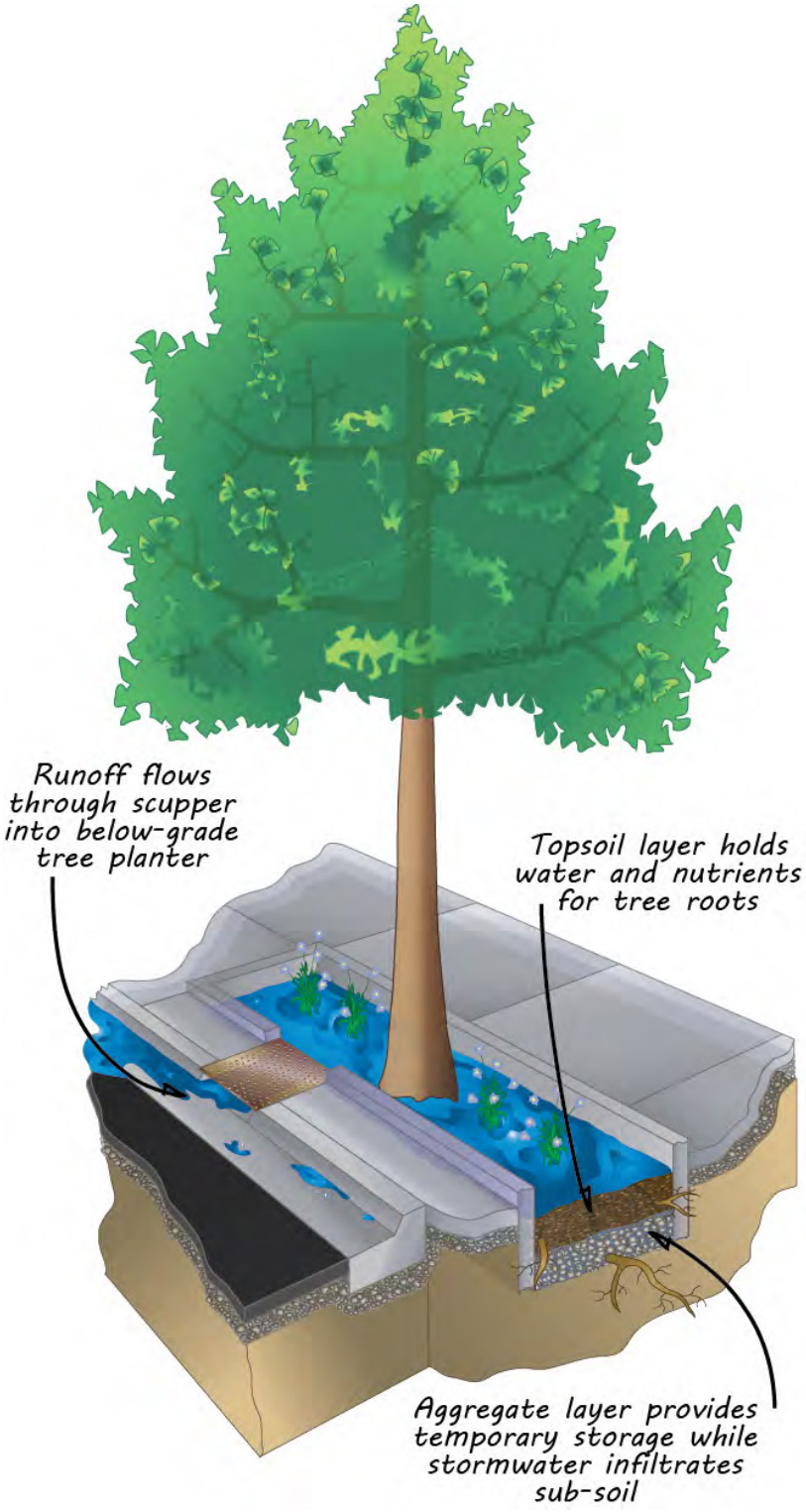




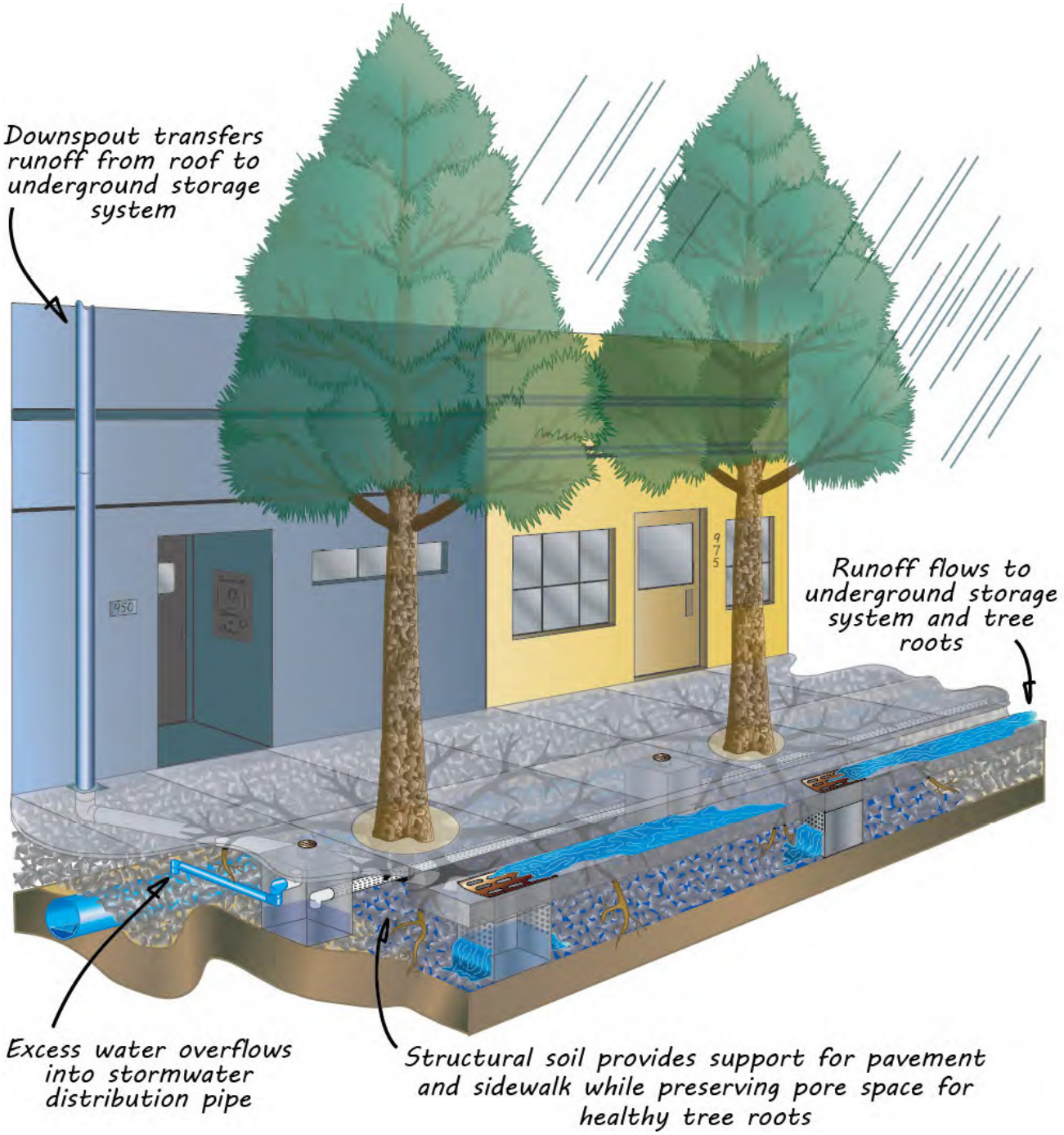
Appendix G: Alternative Planter Designs



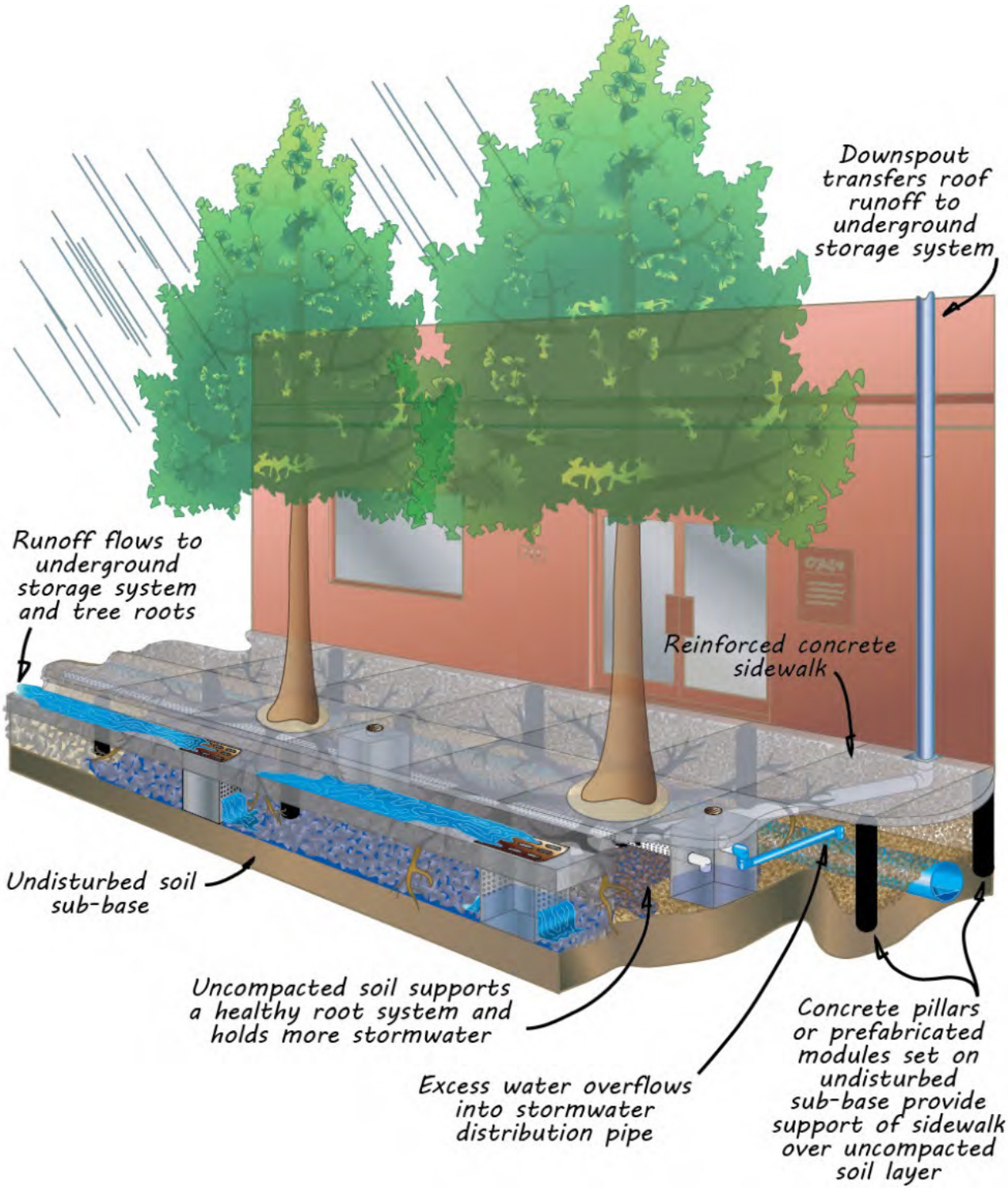
Above: Bioswales are landscaped drainage areas with gently sloped sides designed to provide temporary storage while runoff infiltrates the soil. They reduce off-site runoff and trap pollutants and silt.



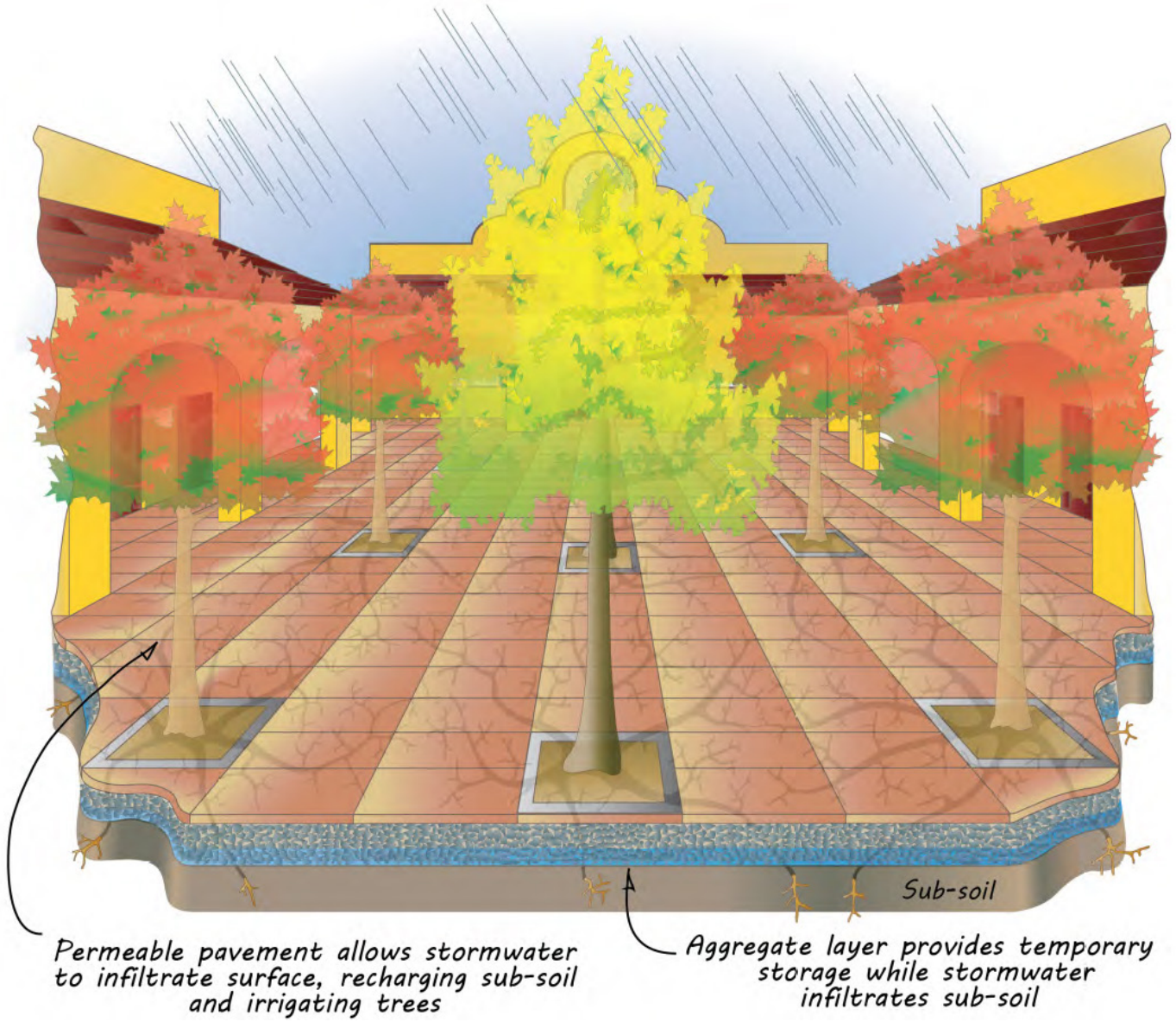
Above: Stormwater tree pits are designed to collect runoff from streets, parking lots, and other impervious areas. Stormwater is directed into scuppers that flow into below-grade planters that then allow stormwater to infiltrate soils to supplement irrigation.



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.

Appendix H: Community Survey

1. Trees are important to the quality of life in Garden Grove.

	Response %	Response Count
Very true	93.1	285
True	5.9	18
Not sure	0.3	1
Not true	0.3	1
Definitely, not true	0.3	1
Total		306 (0 skipped)

2. Trees provide numerous benefits to the community and the environment. Understanding which benefits are most appreciated by residents can help guide long-term management strategies. Which benefits provided by trees do you value most? Please select the top three (3) benefits.

	Response %	Response Count
Improved air quality	68.3	209
Bird, butterfly, other wildlife habitat	55.9	171
Privacy/screening	8.8	27
Energy savings	8.5	26
Increased property values	15.0	46
Reduced greenhouse gases	27.5	84
Improved human health	31.7	97
Reductions in stormwater	3.6	11
Improved water quality	2.3	7
Shade	37.6	115
Noise buffering	10.1	31
Aesthetics	27.8	85
Other (please specify)	2.9	9
A tribute to California agricultural past		
All of the above		
All of the above! They are essential! Please keep Riverview a natural green setting. Do not develop it into another concrete monstrosity.		
Climbing		
Fruit		
Fruit bearing		
None		
Oxygen		
The idea that is not just helping us humans survive but helping our birds, bugs, butterfly's etc. ; not only that but keeps our environment clean and safe the animals we have here in garden grove.		
Total		306 (0 skipped)

3. Optional. Use this space to provide additional comments on the benefits of Garden Grove's trees.

- Can we add additional trees to our background
- 30 years ago, my mother visited Garden Grove during her travels to the US from Australia, where she had citizenship. The greenery and community informed her decision to immigrate here in 2009, yet she tells me of the disappointment with the increased urbanization she saw compared to her initial impression of Garden Grove. We are both residents who value nature and greenery, and want to see a future Garden Grove that places community gardens, parks, conservation, horticulture, and the community cultivating these values at its pride.
- A city called garden grove has ugly mixed match random gardens. Poor watering system and no landscape services.
- A focus on indigenous trees and other plants is important. The birds and insects from this area cannot often make use of non native plants as food. It would be nice to restore the native environment and limit artificial irrigation to establishing new plants.
- a good variety of trees makes our city beautiful and provides homes for many types of wildlife that are needed to keep our city green and exciting
- A green area foe walking would be great!
- Adding the right trees will help. Or cherry blossom like in Washington DC. This will represent our community well, among other trees.
- Aesthetic
- All the options above apply. I'm just unable to check them all.
- Beautifies the city
- Beautiful
- Beautify the city
- Beauty
- Beauty increases property value and attract visitors
- Beauty, property value, tons more
- Besides additional trees, the city should have as part of its building permits large amounts of green space between street and buildings if for nothing else, than to help with water retention.
- Better air quality and much needed greenery, shade and a haven for wildlife. We need more trees and greenery to mitigate the concrete and urban atmosphere that is pervasive in Garden Grove.
- Breaks up the monotony of buildings
- can be better place to visit with family.
- City beautification
- Drainage, shade, aesthetic value as well as reduced energy costs . Beautify city getting rid of concrete sprawl appearance. Allows shade and cleaner air for all but promotes more foot traffic.
- Focus on improving city safety instead
- Fruit trees could also benefit food banks.
- GG is in desperate need of more green open space. It's such a shitty city right now. No trails. Nothing. Need more parks!!!
- Green Peace!
- Have lived in GG my whole life. Would LOVE to beautify our city, but I am very concerned about the safety of this new endeavor. I foresee people sleeping in this urban forest, leaving discarded needles, trash, danger.
- Help cool down the city during summer
- Help reduce heat
- Help to detract from unsightly back yards and alleys, maybe encourage property owners to maintain their space.

- Hopefully will stop over building!
- How beautiful it is looking out and seeing green trees vs building structures,
- I am so excited to hear of this urban forest plan! I think trees provide an overall peaceful feel to a city so I'm excited to see more of that around the city.
- I am very happy that the city of Garden Grove is doing this project. Bring Garden Grove back to what it once was many years ago.
- I like trees
- I lived on Morrie Ln as a kid and still live in the city. As kids we played at the tracks between lampson & Brookhurst. We had a lot of fun there! It would be nice if today's kids had a place better than a dirt path to play in.
- I love the idea of implementing smart concepts that have numerous benefits such as natural drainage & bioswales, cutaway curbs for medians that are planted as raingardens that prevent/minimize intersection flooding & run-off, planting trees/plants that are native to this area & help restore the ecosystem while being drought-tolerant, planting native trees that are allowed to grow tall & provide habitat for predatory birds that keep rodent populations down, etc. I also like the idea of public streets including beautiful design that creates a calming effect on people.
- I love the large trees in the city. My street is lined with Chinese Elm and try are beautiful. Plant more large trees. Coast live oaks are important to the native wildlife
- I noticed a bulk of these trees are slated for the PE right if way. Isn't that a bit short sighted given the likelihood the OC Streetcar and MTA plans will likely link by building rail here within a decade of planting these trees?
- I will be Garden Grove instead f Garbage Grove.
- I would also say trees provide a sense a peace as we balance our daily rush rush lives with the serene beauty of nature.
- I would love to see GG parks adopt the idea of food forests in our public spaces to help feed our hungry neighbors, organize collection for local food banks, and all the other benefits trees bring.
- I'm China the cherry blossom tree shows a lot of different meanings. Us in Garden Grove CA can have different kinds of free even if they come from different cultures. This shows we are open to any idea of different plants and tree in order to have us citizens happy and feel welcome in our home. The trees provide so much for us that we should not take advantage of them but help them survive in new climate with global warming it's hard to keep trees and plants alive now but this shows we just need to put in a little more effort.
- If you look at a city like Irvine, there is no reason (except budget) why we should not be green and beautiful like that type of city. We need more clean air which means more green!
- Improve health
- Investment in nature in our city is important and related to see this come to fruition.
- It all depends on where and how. And how they are maintained.
- It makes our city more aesthetically pleasing.
- it nice to walk around and have some shade and fresh air
- It provides more nature into an urban area without many scenic nature views
- It seems important to plant more native plants, but trees especially as they tend to be the apex of plant life.
- It will encourage residents to go outside, enjoy the scenery, and appreciate the landscape. We don't have a lot of beautiful areas that create this level of appreciation that more folks could enjoy.
- It would work best in very busy commercial intersections to counteract the impact of so many cars in that area (ie. Westminister Blvd and Brookhurst St).
- Let's beautify the city!
- Living in a forest (albeit an artificial one) is a delight compared to living in a desert.
- Look at other cities such as mission Viejo and how it has enhanced the community
- Looks nice

- make people relax when see trees
- Makes our habitat more pleasant
- Many dog walkers appreciate the trees for tree cover.
- Mature, well-placed trees can offer benefits for generations.
- More nature walks and time with.the family
- More trees and butterfly friendly habitat improve our quality of life as well as encourage outdoor exercise.
- More trees will contribute to the "Garden Grove" look.
- N/a
- Na
- Nature makes us feel more human
- On our Purdy St they put in the worst messiest trees ever. Every season left a bug mess. The city cut some down and never replaced them. The street looks so empty and plain without some nice trees. Will we ever get them again???
- Our city should live up to its name and not become cement city. Greenery is important to mental and physical health.
- Our properties in West Grove would look so much nicer with more trees, but neighbors keep cutting them down as nuisance
- Please create a residential city tree program like Riverside, Ca.
- Please plant more trees!
- Quality of Life
- Reduce crime. Emphasize use of natives like scrub oak and Coast live Oak
- Reduces heat island effect
- Seriously? Trees were here before humans. They are worth every penny imaginable.
- Shade, aesthetics, depends on the type of tree- privacy
- Thank you for focusing on this important issue!!
- The city should encourage property owners in Garden Grove to plant trees by offering help purchasing them at a discount. Maybe even provide help planting the trees on their property.
- The percent of quality green space in Garden Grove is incrementally diminishing with no consistant replenishment seen on the horizon. This would be a welcome relief for our beleaguered city. Garden Grove...where's the garden...where's the grove?????
- The trees can help us to get shade and more green
- The trees on our street is what made us buy the house 15 years ago.
- They are also very helpful in providing learning opportunities for underserved communities when local wildlife interact with the trees.
- They are beautiful and needed
- They provide an all around improved quality of life.
- TheyCities name is Garden Grove so shouldn't have lots of trees
- This is an excited time to hear the city of Garden Grove investing in trees for the community. Trees will provide better landscape and more air quality.
- This is going to bring out so many people as there will finally be something different to look forward to in Garden Grove!
- This will go a long way in improving Garden Grove.
- To have nice landscape n to provide air quality
- To make our vity feel and seem more homey, friendly, and inviting
- Tree lined streets are so lovely and makes communities look rich, even if they are not.

- Trees = Life
- Trees also add shade and make a statement. We would never buy a home on a barren street.
- Trees also improve property values as nice trees will also make the city more appealing
- Trees are beautiful. More trees please. Fruit trees would be amazing.
- Trees are calming and add beauty to our community
- Trees are life
- Trees are life
- Trees are life
- Trees benefit overall health
- Trees help alleviate impact of noise and air pollution from the 22 fwy.
- Trees increase the beauty of the city and should be everywhere.
- Trees lower greenhouse effects, improve air quality and provide Shaw as well as beauty.
- Trees require maintenance but the benefits are worth the resources.
- Trees show that garden grove cares about its community and residents with beautiful and fu yup so trees
- Trees that are esthetically pleasing would be nice. The type that are mostly green and do not leave too much trash behind.
- Trees would help "soften" the visual environment of our city.
- Tress are needed! For life. We need trees
- Tribute to the past garden grove
- Two concerns. 1. Addressing water conservation at the same time, understanding our arid climate and being responsible to the changing water supply, 2. Connections/integration with greenways to the ocean, river trails would add great value for all
- Vegetable and fruit trees feed our community in a healthy manner!!
- Walkable Garden Grove Streets
- Walking paths
- We could use more nice trees that provide shade for our streets. We could also consider converting overhead power lines for power and street lighting to underground placement. This would avoid the problem of trees growing into the lines.
- We desperately need more trees in our city.
- we have fresh air in the park.
- We need more trees! We also need to carefully trim trees rather than completely cutting them down to branches
- We need this forest!
- We need to avoid trees unfriendly because of roots to sidewalks
- We need trees but a city tree is tearing up my sidewalk and driveway. Big problem
- We purchased our house 50 years ago partially because of the tree lined street. Through the years we have valued the shade, the beauty, the birds and every aspect of Garden Grove trees. I mourn as I drive down the city streets and see tree after tree removed. It takes years to grow replacements. I strongly urge Garden Grove decision makers to plant more and more trees in our city!!! Thank you for caring for the stately, beautiful trees we have!
- Well kept trees making area more pleasing to living.
- West Garden Grove needs more residential trees
- Why aren't there fruit trees being grown?
- Will help beautify the city's landscape
- With the city name being Garden Grove, one would think it would be a very green city.

4. Are there enough trees in Garden Grove?

	Response %	Response Count
Yes, there are enough trees	2.4	7
No, there are not enough trees	89.2	263
There are too many trees	0.3	1
Not sure	8.1	24
Total		295 (11 skipped)

5. Where would you like to see more trees planted? Select your top three (3) areas.

	Response %	Response Count
Parks	61.0	180
Retail/Commercial areas	45.8	135
Private property	30.2	89
Streets	74.6	220
Trails	40.3	119
Schools	43.1	127
Other (please specify)	5.1	15
All of the above!		
along all street with or without sidewalks		
Along Springdale and Chapman. The bushes are dying and privacy to those home is extremely important, especially with children.		
Any open space		
By “streets”, I mean the parkway strips along the sidewalks.		
Everywhere. Make it mandatory at shopping centers.		
Garden Grove Park		
In neighborhoods instead of removing our trees in front of our houses!!		
Nature center or path in the city		
near bus stops		
On the city side of the sidewalks in front of our homes with nearby property owner permission		
On the side of freeways where its mostly dirt and litter		
The CORRECT types of trees should be planted along sidewalks and along thoroughfares in this city. Through the years, there apparently have been too many, mostly “cheaper” trees planted that guzzle water, destroy sidewalks, and do absolutely nothing to improve habitat for NATIVE wildlife, birds, butterflies, etc		
There are enough! Too many pulling up sidewalks and streets		
Trees and other plants should be planted in vacated or city owned plots. It will look nicer and also contribute to the over all health of residents.		
Total		295 (11 skipped)

6. What canopy goal should Garden Grove adopt?

	Response %	Response Count
15%	66.2	217
10%	11.9	39
8%, no net-loss / maintain the current level of canopy cover	3.4	11
Other (please specify)	18.6	61
20%		
20%		
20 %		
20%		
20%		
20%		
25%		
25%		
29%		
30%		
40%		
40%		
50%		
20 to 25% canopy		
20%.		
20-25%		
30% or more. We have far too few trees in our city. Disneyland has more trees than our city.		
35% is an attainable goal to achieve better health.		
50% We're named Garden Grove. Why is it a misnomer?		
As great a canopy as is possible while incorporating smart and beautiful design that also allows for enough light (dappled, choice of tree for specific areas, etc.) to grow as much (safe, non-poisonous) native plants species as possible...greater than 15%		
As much as feasible, 15% minimum		
as much as is feasible		
at least		
Don't know		
Follow Fullerton and Orange for older cities with trees		
I would encourage as high a percentage as possible. We should not be happy reaching a goal of some %. That just encourages us to stop planting when we reach it.		
I'm too ignorant on ideal canopy covers for particular milieus.		
Minimum 17%		
more if posible		
no opinion		
Should be similar to mission vijeo		
the Jacarandas are all dying and messy. Replant in front of homes. Advertise more		
The more, the better		
Total		295 (11 skipped)

7. Optional. Please use this space for any additional comments about canopy cover in Garden Grove.

- 15% minimum
- A large Eucalyptus tree was recently removed from our street and there was no replacement...There is now a baren spot where the stump was ground down. Make this city green (like other well highly regarded cities i.e. Laguna Niguel, Pasadena, Yorba Linda and more).
- Add tree canopy to the new bike path on the Pacific Electric Right-of-way
- Bike trails should be ample distant and well shaded. The trail on Stanford is a waste of money and never ever utilized by the locals and unsafe for families.
- Canopies can cool the climate and help reduce cooling cost in homes and businesses
- Canopies provide shade and aesthetics. Please plant more.
- City should mandate new construction to reserve a large percentage of street frontage property be lined with flora. Required in all high valued areas in Orange County.
- Community gardens would also be a good spot for more trees
- Elaborated in a prior response
- Employ more traffic diet strategies to create more spaces to plant more trees.
- Garden Grove is very plain and landscaping is needed to improve the look of the city. It's needs a cleaning as well. Remove old trees that doesn't fit to the overall city aesthetic. Lots of people needs to clean and cut their front and backyard tree as well
- Garden Grove leads the Nation as Tree City
- Garden Grove Park is very sparse. If we could add more trees, with a paved path for strollers & wheelchairs and picnic tables, more residents can enjoy that park.
- Garden Grove should become known for its large number of trees
- Great protection for seniors from sun heat
- I agree we should have more canopy. Thank you!!
- I feel that there should be more opportunities for canopy covers especially for summer months. This includes retail spaces like the Promenade off Chapman Ave, Main St, etc.
- I have lived in GG from 20 years and have seen many trees removed, especially in residential neighborhoods but have seen very few new trees planted. I would like to see this change.
- I know that a lot of the hesitation about trees is always a concern that they will damage a property in the case of wind or storms. If there was a way to alleviate those fears I think people would be more excited about increasing the number of trees.
- I think it's great that we have this but too much of everything can over power and dominate and I don't think we want that
- I would encourage the city to plant trees along streets in the city to provide shade for cooler temperatures and cleaner air.
- If nearby communities have an average of 14% canopy cover, we must aim to reach BEYOND that. It is disappointing that Garden Grove is at the low end of this range.
- It would be lovely to see more native trees that provide greater canopy such as oaks and pines as well as colorful trees such as sycamores. Variety is beautiful. It would be AWESOME if ALL palms were to be removed from city, county, & public spaces to allow native trees to replace them & provide greater canopy coverage, be drought-tolerant, and benefit this ecosystem.
- It's nice to have some park space without trees (for kite flying) but more trees overall are welcome. It makes the neighborhoods look nicer to have large beautiful trees on the parking strip
- It's axiomatic that if we are trying to create an urban forest we adopt canopy coverage minimums that at least reflect the baseline of coverage of a park. Our city should put forward best efforts to maximize the amount of carbon sequestration that takes place during this project.

- I've lived here 35 years, and GG has gotten uglier and uglier. We keep cutting down mature trees and replacing them with little twigs (or don't replace them at all). None of the street trees that blew down in storms in the last 5 years have been replaced. :(
- Let's live up to the name of our city. Let's put the garden and the grove back in Garden Grove!!
- Library
- Like to see more canopy at the park where the kid play ground n exercise equipment
- Make a difference in climate and public health
- More flowering trees
- More trees please in West Garden Grove
- more tress on sidewalks and near bus stops and commercial center with more trees
- NA
- NA
- Need education to GG about importance of greenery
- None
- PARTNER WITH OTHER GOVERMENT LIKE OCTA/PRIVATE FUND BY GGCF LEADER TO ACCEPT DONATIONS EVEN A BRICK BY BRICK DONATION DOLLAR TAX WRITE OFF
- Plant tree canopies in the correct locations, if space is limited, small canopies, if space is open, large canopies.
- private areas
- Remove the tall ugly non native palms that provide no shade and make a mess with dropping seeds. Plus they do not provide wildlife much of a habitats except for rats and sometimes crows.
- Should not be near power lines. Ones that have the least amount of debris fallout
- Spread idea to other cities...corridor of trees for wildlife.
- Stop building houses and ADU's
- Studies show crime goes down with more nature
- Thank you for this opportunity
- The benefits are immense! We should go above and beyond a proposed 15%
- The city doesn't need to be a forest, but places for birds and insects to live, plus, provides natural cooling via shade. Dappled light is best, and ideally not more Jacaranda trees!!
- The city needs to strive for the Arbor Foundation's "Tree-City USA" designation
- The mini park, 76, on Lampson and Brookhurst is an excellent example of drought resistant and butterfly friendly plants with large, established trees.
- The more canopy we can achieve, the better for us all. Trees beautify areas.
- The more the better
- The more the better!!!!
- The shade is nice on a hot day
- The sooner the better, we need to grow more trees while we can
- The streets with canopy cover are the prettiest of all. But when you choose trees please use those that have a beautiful benefit such as colorful fall leaves such as chinese pistache or flowers like crepe myrtle. Forget the ones planted on 9th street. They have some kind of nuts that drop and people fall on them. So dirty and such a nuisance .
- There are a lot of tree just not enough
- There is not enough canopy in garden grove. Every home should have at least one or two trees in front of the house. Owners cannot cut down mature trees in the house.

- To realize anything like that photo (which is probably taken where there is three times the rain So Cal gets), the city will need to maintain an adequate water supply to the area.
- Trees and greenery cool the land and actually conserve water. We are closer to being a costal area more than a dry arid land. Being back trees!!
- Trees are not trimmed properly...they are butchered. Trees should be allowed to grow in a manner that they look natural and offer a good size canopy.
- Trees reduce green house gas
- We need more
- We need more trees planted on residential streets in West Garden Grove
- We need more trees! :)
- We need shade to reduce energy costs
- We need to double our existing canopy
- We need trees, more greenery and the canopy is a great idea .
- What
- Will there be resources to clean up the leaves/maintenance? Clogged storm drains from leaves? Tree trimming?
- Would be nice as a resident to have credits for % cover relative to a residential goal.
- Would like to see it doubled, of what we currently have.

8. Do you support the petition process for the removal of public trees that are otherwise healthy?

	Response %	Response Count
Yes	30.6	88
No	35.4	102
Not sure	11.8	34
Need more information	22.2	64
Total		288 (18 skipped)



9. Garden Grove Municipal Code requires the removal of dead, decayed, diseased or hazardous trees on public and private property. For public trees, Code prohibits releasing pollutants that are harmful to trees, restricts electrical wires from coming into contact with trees, and outlines tree protections during construction. What other items would you like to see revised or defined in future tree protection policy (public trees)? Please check all that apply.

	Response %	Response Count
Higher standards for removal	36.8	106
Replacement requirements	66.3	191
Fines for illegal removals	43.1	124
I am satisfied with the current Municipal Code	19.1	55
None of the above	3.8	11
Other (please specify)	6.6	19
Aesthetic reasoning should not be enough to remove a tree.		
And		
Education		
Greater standards for tree trimming as well		
I don't feel sufficiently informed to choose the best answer here. Please educate us further.		
If roots disrupt sidewalks the trees might need to be moved, if no other option, but replacement tree should be planted.		
If you want a healthy public tree removed you should be required to replace the tree or, pay a fine equal to the cost of replacement. Public trees are just that, public, and the money used to plant them is also public, ergo, the public at large is losing the benefit of the tree, and the city increases its carbon foot print in its removal.		
indigenous species, more regular maintenance, sidewalk/road/parking lot issues		
is there a list of approved tress what are the costs		
Need to force people to clean their backyard trees		
Private trees should not negatively public space, or city appeal		
Putting electrical wires underground		
Remove ALL palms & invasive water-guzzlers. Plant native trees that provide as much canopy as possible to reduce heat, clean the air, provide habitat for native species...& do so in a well-designed, beautiful way.		
Replacement tree must have a similar canopy		
Some trees present safety hazards such as regular falling palm fronds		
The trees should be replaced with other trees.		
W		
When a tree is removed from a city parkway in front of a house, a tree should be REQUIRED to be replaced. It should not be left to the resident to refuse a repkacement but rather ONLY to chose what tree type to have replanted.		
Wildlife preservation.		
Total		288 (18 skipped)

10. If a public tree is removed, do you support the requirement to replace the tree or an optional contribution to a tree fund?

	Response %	Response Count
Yes	76.7	221
No	4.9	14
Not sure	7.6	22
Need more information	10.8	31
Total		288 (18 skipped)

11. Do you support fines for illegal removal of public trees?

	Response %	Response Count
Yes	74.3	214
No	8.0	23
Not sure	11.5	33
Need more information	6.3	18
Total		288 (18 skipped)

12. Would you support stronger standards for the issuance of tree removal permits?

	Response %	Response Count
Yes	51.4	148
No	13.2	38
Not sure	16.0	46
Need more information	19.4	56
Total		288 (18 skipped)





13. Describe your awareness and/or interactions with Garden Grove's urban forest program. Please check all that apply.

	Response %	Response Count
I was aware that the city responds to tree emergencies.	38.2	108
I have seen City crews working on trees.	65.4	185
I have used the city website or called for tree information.	14.5	41
I did not know that the city had a program to care for trees.	37.5	106
I have read about the program in city-wide newsletters.	8.1	23
Other (please specify)	3.5	10
adopting a tree or purchasing a city tree is not something that I think is publicized enough. when I purchased my two trees I had several neighbors excited to hear about it.		
City crews have responded to tree emergencies at my home and i have interacted with them. They are wonderful.		
I hadn't noticed, but naturally assume tree maintainance is regular		
I have had a tree removed and cooperated in the replacement program. Very satisfied until someone stole our new tree in the middle of the night! Wow!		
I have had my rotting tree replaced.		
I purchased 8 trees to line my residential street through the discount program		
I was made aware about city's program through Tree Art Contest booth at latest Art in the Park event		
My grandparents' house in GG is located in a neighborhood with no sidewalks & very few trees. Increasing the canopy should include installing sidewalks & creating median strips that are planted with native, drought-tolerant trees - designed to descend in the center, layered with small rocks, smaller pebbles, sand, and drainage to clean rainwater as it soaks into the ground...that include cut-out curbs that allow rainwater to drain into the raingarden median strips. Also built including a drip system if possible (could GG provide minimal water to these new trees by using drip system?). Native plants surrounding the new trees - NOT invasive grass.		
Need to have trained tree trimmers so as not to trim at wrong time of from too aggressively		
Want to know more about tree program		
Total		283 (23 skipped)

14. What level of care for public trees would you prefer?

	Response %	Response Count
Current (service request, contractor scheduled pruning, emergency response)	30.7	87
Reduced service (address hazards, clearance, reactive maintenance)	2.5	7
Increased service (pruning cycles, care for significant tree populations)	62.9	178
None	1.1	3
Other	2.8	8
Other (please specify)		11
Dont prune trees at the wrong time of the year. I have seen trees pruned when they are in full bloom. We wait all years to see the flowers only for them to be cut at their prettiest time. So disappointing.		
I'm not familiar enough with the program to have an opinion.		
Increased service so long as wildlife shelter is surveyed and protected.		
Not well enough informed to know what is best for caring for a greater # of trees. I do think that there should be a large variety of native plants (especially milkweed) planted with the trees & in a beautiful landscaped/ designed way. Not just a random tree every so many meters standing lonesome next to the curb/street.		
Please plant more trees, especially at parks and commercial intersections with lots of cars like Brookhurst St and Westminister		
Pruning at the correct time of year.		
Some trees need more care, others less. Can funds be designed per tree (type of tree)?		
Tree pruning should be done better as usually what is left after the trimming looks odd and the tree is left way too thin and unnatural looking.		
Trees trimmed, not hacked by untrained workers		
Use certified artists to supervise tree pruning and care. Lot of our trees not pruned correctly.		
Years ago they used to run a root cutting saw along the edge if the sudewalk to keep the tree roots from lifting the sude walks and curbs. Many years ago.the		
Total		283 (23 skipped)





15. Optional. Please use this space for any additional comments about the care of trees.

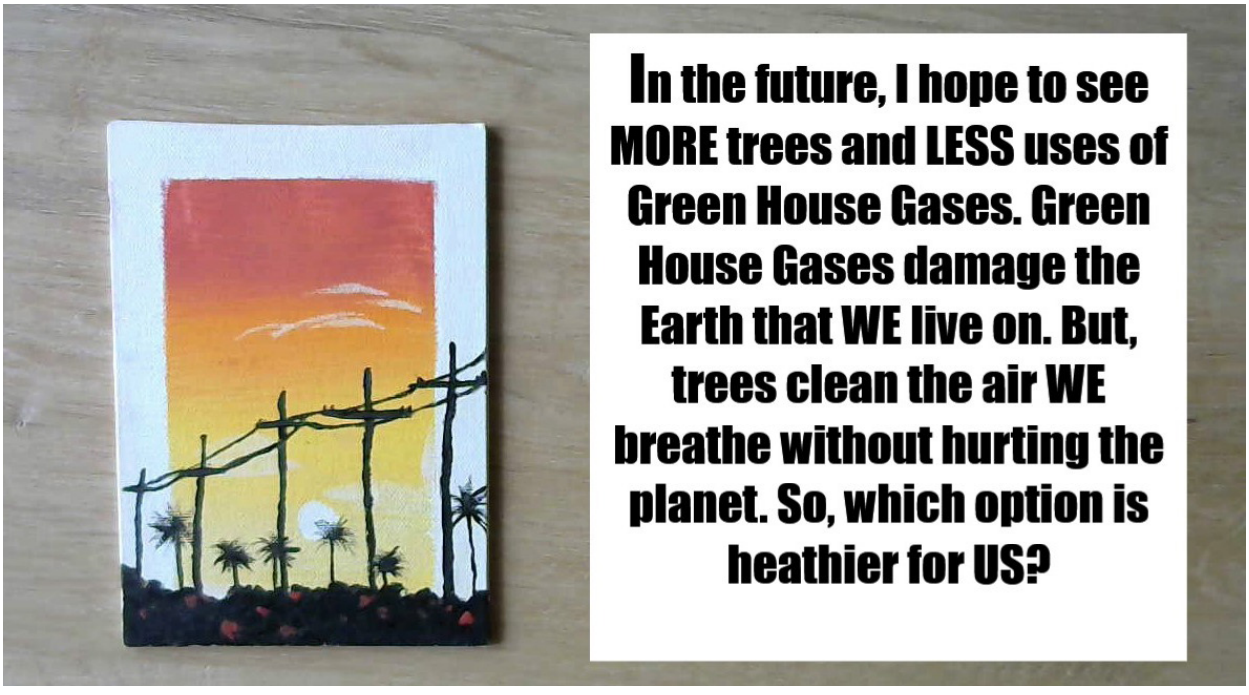
- A healthy society needs trees and greenery.
- A public tree in front of our property was not pruned in a timely manner and a limb fell on one of our family vehicles, requiring repair. An improved pruning cycle would be recommended, not just to protect resident's property, but also to protect the city from liability in case of similar incidents happening in the future.
- AVOID WIND SAIL FROM LACK OF TREE MAINTANCE/ AND PINE TREES NEED MORE CARE
- Careful consideration of tree type and long term effect to sewers and oavement
- Cities with tree lined streets have greater property calues
- Cleaning up dead foliage from trees is important.
- Education
- Garden grove needs to be better about maintenance
- Healthy trees should not be removed because the resident is tired of cleaning up leaves. A healthy tree needs to stay and the petition process not apply.
- I don't love the "slashing" method of tree trimming. (I'm a real bird lover.). I don't put birds over people, but in public land, we might consider animal habitats.
- I live on Central and frequently drive on Galway. Not a tree in sight except at the Episcopal church. Galway needs a tree on every lawn. I cry (mourn) when trees are cut down as 3 or 4 were at the corner of Central and Gilbert. And what were they replaced with - NOTHING! What is the legal line between home owners and the city when trees are removed? There should be a law that requires tree replacement. That I would support!!!
- I see houses in my neighborhood with no trees. This is an undesirable look.
- I talked to the tree crew and they informed us that they have 4 employees ful time for the entire city and that is about half of what is needed
- I think that the design element surrounding the trees is really important. When the tree is presented beautifully (whether with a nicely patterned iron grate at its base or enclosed in a jasmine hedge or large planter), it might encounter more appreciation & less vandalism.
- I would be interested in creating a community tree care program and have community members work with professionals on caring for their local neighborhood trees.
- I've lived here for 5 years. I never knew we could call for tree pruning in public spaces.
- if several trees are being removed from a street, the neighborhood should be notified why there are being removed.
- If they would use the root saw on the tree lawn trees the sidewalks wouldn't lift and they wouldnt have to replace them.
- If you plant trees as described you're going to have to care for and protect them.
- Increased care is an investment in the community. Raise property values
- Introduce a program for trees on private property to be included with the public tree maintenance. Perhaps the property owner could pay a fee to be included. This would encourage private tree maintenance.
- It is important to provide the replacement of trees that get cut down.
- Make tren trimming and maintenance a standard. I have neighbors whos tree is leaning to my yard and also to the electrical.
- Making sure sidewalks are safe... tree roots
- NA
- Na
- Need to do a better job clearing power lines of trees
- None

- Please continue maintaining trees.
- Please make sure that those who prune trees are properly trained to do so for the species they are caring for.
- Please remove tall trees that has things falling off damaging properties
- Please stop the hacking of trees they do not look good and it is not beneficial. And it is always during the warm months when shade is valued
- Pruning should be done more often
- Replacement of trees would be more important than contributing to a fund.
- The city need to have regular landscape and watering programs. In addition, they should hire professionals to beautify the city. Sadly proper value does not reflected in the city landscape and physical appeal. More flowering trees and colors needs to liven up the city. Drought resistant doesn't have to be ugly. Look at Costa Mesa and Santa Ana or west gg for examples
- The guy in charge of trees knows his business.
- They should be allowed to grow naturally and cared for to encourage healthy growth. However, maintenance should be reserved for hazard prevention rather than routine pruning for aesthetics.
- Topping is horrible
- Trees are trimmed at the wrong time of year and by crews that have no clue how to properly trim trees
- Trees that are removed need to be replaced, not a cop out contribution to a fund instead of teplacing.
- Trim trees according to their optimum requirements.
- Upgrade. There are lots of public trees without care. Perhaps an updated schedule to get to each tree and replace those damaged ASAP.
- We have a very tall palm tree on city property in front of our house and it needs pruning more often. During any wind there is always fronds crashing to the ground - could do damage if hit anyone
- West Garden Grove residents seem to not know of your services. The cost to add etc. More advertisements



16. What education topics about trees interest you? Please select up to three (3).

	Response %	Response Count
Species selection	67.3	189
How to plant a tree	29.9	84
Irrigation and watering	47.3	133
How to water a tree during drought	37.7	106
Basic pruning for young/small trees	52.7	148
Benefits of trees	30.6	86
Other (please specify)	4.3	12
All of the above and city sponsored tree plant program.		
Benefits of trees re climate change and city's carbon footprint		
Correct fertilizing & care		
GGUSD TREE CITY EDUCATION CAMPAIGN		
How the public can contribute (time or funding)		
How to safely rid trees of pests. (insects)		
I would like to see a focus on trees that do not need irrigation.		
None		
Private property codes and requirement to up keep especially for neighbors who bring down property value and park on lawns even		
protecting from disease and tree killing insects		
Tree Identification would be so lovely! I would love to see educational tools/resources for the widespread use of field guides.		
Where to plant trees in relation to structures/houses, what types & sizes to plant in various locations of a yard & why...to provide shade/ windbreak/privacy/prevent soil erosian/etc.		
Total		281 (25 skipped)



17. What methods for education/outreach do you prefer? Please select up to three (3).

	Response %	Response Count
Web or App-based (electronic)	70.46	198
Pamphlets, Newsletters (hard copy)	26.69	75
Workshops	31.67	89
Public tree plantings (Arbor Day, etc.)	50.18	141
Farmers Market (urban forestry info booth)	19.93	56
Self-guided tours or demonstration gardens	27.76	78
Engagement through schools	44.84	126
Other (please specify)	2.85	8
email newsletters, not hard copy		
Emails		
Establish volunteers in each neighborhoods to go door to door to educate home owners and businesses		
Online web		
Reimagine events, public TV, partnership with other cities, counties and state.		
Teach school kids benefits and care so they'll hopefully he disinclined to damage them		
There are these old-fashioned word-squares called "books".		
Urban garden regular training or meeting at the library		
Total		281 (25 skipped)



18. Optional. What other challenges or opportunities do you think the Management Plan should address?

- As stated in a previous response: the city needs to INTELLIGENTLY select trees for the vicinity in which they are to be planted. Too many that exist in our city are water-guzzling, destructive, and are not correct species for our current climate-challenged environment
- Citizens remove trees thinking cost of maintenance is too expensive. Teach benefits of lower energy costs: a/c, heating, noise reduction, property value and beautification of city. Provide wildlife like birds, bees, squirrels safe living nesting which helps reseed, pollinate and teach children of their usefulness to a healthy environment.
- City should make having or planting a parkway tree a requirement for any building permit exceeding $1,000 in value. Other cities have this requirement and it helps repopulate the urban forest.
- community farming to increase local produce and healthy produce for healthy diets.
- Discounts on trees for residential planting in our homes
- drought-tolerant landscaping, landscape design around/including the trees, install drip systems in public spaces/median strips, remove invasive water-guzzlers (including palms), prevent water run-off, prevent flooding by designing planting areas to be efficiently permeable, incorporate cut-out curbs at intersections & flood-prone areas, install solar-powered lighting to enhance trees & provide sidewalk safety lighting (ambiant instead of harsh), diversity of tree/plant selection (of native species), discard invasive species from "approved" tree/plant lists for government/public spaces, run info. booths on the benefits of trees, native trees/plants, etc. at community festivals/events.
- For example, encouraging home owners along Galway to plant trees. I'd be happy to knock on doors and if the city would provide the trees, I'd be happy to talk to my neighbors about tree maintenance, watering, tree value, etc.
- Give people an opportunity to ask for more questions. Where to find info and who they can reach out to.
- Graffiti, RV/trailers parking in streets- more than a week, fireworks-safety, noise, trash, trees on condo/townhome complexes should be trimmed especially if the trees are very tall and may fall on houses nearby
- Homeless encampments in forested areas should be considered.
- how can the trees be planted and not have the sidewalks be damaged during growth?
- How to contact city to help with their own trees that are on public property
- I live in west Garden Grove off Knott and Stanford. Our homes were built in about 62 or 63 and the city planted matching trees along our parkways. By the early 80s, when I was a little girl, many of our parkway trees on my street were damaged and removed. The spots remained bare and I have always been sad my tree in front was gone. I JUST learned a few months ago, in 2020 that the city will bring me a new tree to our family home and I can even choose the type! I'm mentioning this because it took decades to learn that we were allowed to A. Replace our tree on the city parkway and B. That the city even had a program for providing trees to residents! Someone mentioned it in a fb group with the info. I think that the city could be more proactive about letting residents know about their trees, the replacement and maintenance programs and general care of trees on our property. Maybe some infor 2x a year in our water bills would be helpful to pass along this information to residents. Also, we are all terribly confused about what to do regarding trees and wires in our backyards. Facebook neighborhood groups are scrambling for answers on a regular basis about tree/wire hazards in their yards and who is responsible to assist with trimming them. Residents also need to be better informed about this subject either via the city or SCE/utility companies.
- Idk
- If there is a Urban Forestry Booth at the Farmer's Market, how will the citizens of Garden Grove know?
- Introduce a program for trees on private property to be included with the public tree maintenance. Perhaps the property owner could pay a fee to be included. This would encourage private tree maintenance. Many privately owned trees become dilapidated as the owner's maintenance lapses.
- Lack of public awareness of a management plan.
- More thought on which trees are chosen.
- Native Plants and trees that are drought resistant need to be the priority for future landscaping on public and private property.

- Native trees versus other ornamental trees. Focus should be on planting natives like oaks.
- Non native trees that require constant watering may need to be replaced.
- None
- Not aure
- Nothing. At. All. Do not expand your mission, please. No mission-creep!
- Notification of website availability
- OCTA OWNS 95 % OF PE RIGHT AWAY ACCROSS The city OF GARDEN GROVE SINCE STATE OF CALIF GOVERNOR NEWSOM EXCETIVE ORDER ON CLIMATE CHANGE IN SEPT 2019. REQUEST A LETTER FROM THE MAYOR STEVE JONES WITH CITY COUNCIL WRITE IN SUPPORT ASKING OCTA ADDRESS THE BUS ROUTES AND THE RAIL CORRIDOR TO PLANT TREES AND FUND THE WATERING AND MAINTANCE. MOST CITIES WITH SCHOOLS ARE FACING FINANCIAL HARD SHIPS THUS HAVING NEGATIVE IMPACT ON CLIMATE CHANGE. THUS CREATES SHADE FOR COOLER TO WALK/BIKING.
- Opportunity to plant trees at Garden Grove Park, with additional picnic tables and paved path so residents can enjoy.
- Overhead wires are the reason we have fewer trees in GG. The reason people remove healthy public trees is because the species is wrong for the neighborhood. I have a very ugly and annoying tree outside my house that drops leaves half the year. Most of this unsightly species have been removed from my street but mine is the biggest and does offer some shade although it's barely worth keeping. Species selection is very important. We can't just go with whatever people chose 60 years ago.
- Patrol for vandalism
- pest prevention/monitoring--bees, rats, etc. that inhabit trees
- Places with no sidewalks. Sidewalks cracked a raised up by roots.
- Plant more trees!
- Please reduce paper products
- Private palm trees not maintained causing fire danger to neighbors.
- Provide assistance to residence who would like trees planted in the area between the sidewalk and the street in front of there homes.
- Providing a list of correct trees for the area and/or region.
- Removal of all sycamore trees and replanting of less allergenic species
- Rental housing tends to remove all greenery including grass as well as cementing in front yards. This needs to be addressed. It creates blight and impacts property values.
- Replacing trees on streets where trees have been removed and not replaced afterwards.
- Residential tree removal ordinance and enforcement.
- Right now? Social distancing is obviously key.
- The amount of open space left in the cuty
- The city needs solar panels on ALL of its government buildings i.e. city hall, police stations, public works etc. which will lower energy costs and help mitigate climate change
- The homeless taking over the areas
- The management plan should be executed using local labor. There should be a public program aspect that encourages community participation/ educating the youngsters
- There are many private brush hanging over public walkways, there should be more control here so we can walk freely without physical damage. Thank you.
- There are too many bare spots on public and residential streets where trees once stood. Every residential street should have at least one street tree in front of the home.
- Type of trees along streets... particularly finding types that do not drop seeds, pods or other things into bike lanes that can cause flats, slips, or other problems. The Carrotwood trees for instance are a big mess most months of the year!

- Underground pipes and tree roots.
- We need to encourage the planting and replacement of trees
- Well thought out long term maintenance plan. Some native trees can die from too much summer water. After established and adequate winter rain. summer water not needed. Look up technique Afforestation.
- West Garden Grove needs trees to look nicer. We have so many shopping centers nearly closed. If the City Manager can't help that at least plant more trees
- When people remove trees to build a second home on their property, replacement trees should be planted.

19. What is your age?

	Response %	Response Count
Under 18	1.08	3
18-24	8.99	25
25-34	19.78	55
35-44	23.02	64
45-54	14.03	39
55-64	21.22	59
65+	11.87	33
Total		278 (28 skipped)

20. Please check all that are true about you.

	Response %	Response Count
I live in Garden Grove	0.917	255
I work in Garden Grove or I come to Garden Grove often	0.266	74
I have planted public trees as a volunteer	0.094	26
I have participated in the Adopt a Tree Program or the Memorial Tree Program	0.058	16
I have planted trees in my own yard or I've convinced neighbors to plant trees in their yards	0.486	135
None of the above	0.011	3
Total		278 (28 skipped)

21. Optional. Please provide any additional comments or feedback.

- As a woodwork an urban logging program would be phenomenal. Trees that have to come down anyway should be available to woodworkers/furniture makers/etc ...
- CITY OF GG FLAWED EFFORTS/COMMUINTY RELATION MEDIA RELATIONS
- Garden grove needs more trees. It's in our name, but the neighborhoods and businesses are so stark and cold
- Home owners need to know more about Garden Grove services
- i am excited about having more trees in GG!
- I do not use garden grove park fir family outings. There are no parks with nice playground, bike route, picnic areas or rental equipments like a Central Park area. We end up spending money in another city. In addition, we live up to our public image of "Garbage Grove" and not proud to say I live in this city. The city needs to revamp the image, have professional logos, artist and profession artwork or display more colors to brighten up the city. I recommend street lights on every street and more garden or holiday attractions to bring in more visitors. Recommend street light displays, holiday decorations or festivities and city wide walk way like Irvine or decorated intersections like Newport Beach.
- I have started a comprehensive workforce development program through my agency that involve farming and community gardens. I would love for an opportunity to present and partner with the city to reimagine Garden Grove with urban forest throughout the city.
- I just happened to run into a city employee and was told about this Urban Forest Meeting by accident. Somehow the public needs to be well informed in a timely manner.
- I like that certain streets are subject to certain trees. It looks uniform. Some homeowners not knowing of the program planted their own trees. Less desirable.
- I love that GG is performing this survey!!! I wish that Santa Ana would do the same. I maintain the website for the neighborhood (bordering GG) in which I live & would like to provide more information on how to improve our community with more trees & plants. Please keep me informed! RiverviewWest.weebly.com
- If the city were to advertise tree planting opportunities I would help when possible.
- It is a burden on families seniors to afford the water needed for trees and bushes when the city structures fees for water use without taking into account how much water is needed to keep trees and bushes healthy and stress free!
- Need more parks and trails
- None
- Pest control is essential. I have lost four pine trees to a bark beetle.
- Please provide a parkway tree free as do the other cities. Residents feel that they are already paying for water and fertilizer and should not be charged for a tree planted on city property in front of their home. Long Beach and other cities give SEVERAL trees free to their residents so why can't Garden Grove?
- Please, let's plant more trees!
- Provide tree information, such as: a photograph; how to plant, prune, and water; type of soil additives; provide information on the maximum trunk, height, and canopy size.
- So glad you are embarking on this!
- Thank you for asking our residents through this survey.
- Thank you for bringing knowledge about the importance of our urban forests to Garden Grove! Thanks also for giving residents the opportunity to be informed and give their input about it!
- Thank you for the work you do.
- Thank you for this!
- The city desperately needs more trees, having grown up in Lakewood/Long Beach I was shocked by the lack of trees here when I moved here. Poor urban areas like Compton and Watts have similarly sparse trees, conversely areas like Rossmoor and Pasadena have numerous trees. What kind of city do we want to be?

- The tree department is doing their best but they lack the personnel to be effective in the city
- Three children attend St. Columban school and we care for family that reside in Garden Grove.
- Too many trees are cut down. They might be older, or "in the way" but if that is the case they should be replaced. Too many homes are covering their yards with cement.
- Too many trees in Garden Grove have destroyed sidewalks and streets but the city does not remove them
- Trees are important
- Trees near electrical lines, who to call? City? SCE? Cost?
- We need pro active environmental people on the City Council and in all positions of leadership, especially the planning department.

"REPLACING ALL OF GARDEN GROVE'S COMMUNITY TREES WITH TREES OF EQUIVALENT SIZE, SPECIES, AND CONDITION WOULD COST MORE THAN $62.7 MILLION."

URBAN FOREST FACT







Appendix I: Indicators of a Sustainable Urban Forest for Garden Grove

Indicators of a Sustainable Urban Forest		*Assessed Performance Level*		
		Low	**Medium**	**High**
The Trees	Urban Tree Canopy			
	Equitable Distribution			
	Size/Age Distribution			
	Condition of Public Trees - Streets, Parks			
	Condition of Public Trees - Natural Areas			
	Trees on Private Property		NA	
	Species Diversity			
	Suitability			
	Space and Volume			
The Players	Neighborhood Action			
	Large Private & Institutional Landholder Involvement			
	Green Industry Involvement			
	City Department/Agency Cooperation			
	Funder Engagement			
	Utility Engagement			
	State Engagement			
	Public Awareness			
	Regional Collaboration			
The Mgmt Approach	Tree Inventory			
	Canopy Assessment			
	Management Plan			
	Risk Management Program			
	Maintenance of Publicly-Owned Trees (ROWs)			
	Maintenance Program of Publicly-Owned Natural Areas		NA	
	Planting Program			
	Tree Protection Policy			
	City Staffing and Equipment			
	Funding			
	Disaster Preparedness & Response			
	Communications			
	Totals	*18*	*5*	*6*

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 citywide 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: 0-8" DBH: 40% 9-17" DBH: 30% 18-24" DBH: 20% 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.
Condition of Publicly-Owned Natural Areas *(trees managed extensively)*	Possess a detailed understanding of the ecological structure and function of all publicly-owned natural areas (such as woodlands, ravines, stream corridors, etc.), as well as usage patterns.	No current information is available on tree condition or risk.	Publicly-owned natural areas are identified in a sample-based "natural areas survey" or similar data.	Information from a current, GIS-based, 100% complete natural areas survey is utilized to document ecological structure and function, as well as usage patterns.
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 citywide.	No species represents more than 20% of the entire tree population citywide.	No species represents more than 10% of the entire tree population citywide.
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.

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 citywide 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 citywide 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 citywide 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 inter-agency working teams on all city projects.
Funder Engagement	Local funders are engaged and invested in urban forestry initiatives. Funding is adequate to implement citywide 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 citywide 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 citywide 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.

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.

THE MANAGEMENT				
Indicators of a Sustainable Urban Forest	**Overall Objective or Industry Standard**	**Performance Levels**		
		Low	**Medium**	**High**
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.

Appendix J: Gantt Chart

City of Garden Grove Urban Forest Management Plan

Goals & Objectives

Goal 1: Plan for trees before planting.

- Objective 1.1: Set emphasis on the right tree in the right place.
- Objective 1.2: Develop planter improvement and design strategies for mitigating conflicts and increasing soil volume.

Goal 2: Support tree health and good structure.

- Objective 2.1: Ensure community trees are maintained according to industry standards to promote tree health, longevity, and public safety.
- Objective 2.2: Establish a risk management policy.
- Objective 2.3: Employ multiple tools and strategies to prevent and/or manage pests and pathogens.

Goal 3: Repurpose woody materials whenever possible.

- Objective 3.1: Identify a wood reutilization policy.

Existing Policy 1: Understand the structure and composition of Garden Grove's community tree resource.

- Objective 1.1: Maintain a tree inventory that can be used to manage the community tree resource.

Goal 4: Increase uniformity between City policies, documents, and Departments.

- Objective 4.1: Communicate and coordinate with other city departments.
- Objective 4.2: Unify guiding documents to transcend departmental changes, promote consistency, and shared vision.

Goal 5: Recognize trees as green infrastructure.

- Objective 5.1: Plan for trees to limit future grey infrastructure conflicts.
- Objective 5.2: Create and enforce policies that protect trees.

Existing Policy 2: Encourage a culture of safety.

- Objective 2.1: Implement policies and procedures that make that tree work as safe as possible.
- Objective 2.2: Encourage employees to engage in professional development.

Goal 6: Promote tree preservation and protection.

- Objective 6.1: Revise and amend Municipal Code to promote the protection of community trees.
- Objective 6.2: Monitor contractor services.
- Objective 6.3: Optimize the Trees Division's ability to address maintenance needs.
- Objective 6.4: Monitor for pests and pathogens.

Goal 7: Enhance community aesthetics.

- Objective 7.1: Encourage the expansion of the urban forest through tree plantings on public property.
- Objective 7.2: Encourage the expansion of the urban forest through tree plantings on private property.

Goal 8: Expand and diversity tree canopy to increase the environmental benefits received by the community.

- Objective 8.1: Reach 15% tree canopy cover by 2040.
- Objective 8.2: Promote species diversity to build a more sustainable community tree resource.

Existing Policy 3: Encourage the establishment of trees through efficient and sustainable irrigation solutions.

- Objective 3.1: Promote the efficient use of tree planting funds.
- Objective 3.2: Support established and mature trees.
- Objective 3.3: Establish a more water-wise urban forest.
- Objective 3.4: Ensure trees receive adequate water.

Goal 9: Celebrate the importance of community trees.

- Objective 9.1: Re-establish the Tree City USA designation.

Goal 10: Support community engagement and stewardship of the urban forest.

- Objective 10.1: Promote the Urban Forest Management Plan.
- Objective 10.2: Update the website for the Trees & Flood Control Section on the city Website.
- Objective 10.3: Encourage community involvement and stewardship for the urban forest.
- Objective 10.4: Encourage the expansion of the urban forest through tree plantings on both public and private property.
- Objective 10.5: Support the formation of a community-led tree ad-hoc committee.

$ = less than $25,000 $$ = $25,000-$100,000 $$$ = more than $100,000


2020 – 2024
2025 – 2029
2030 – 2034
2035 – 2039
2040 – 2044
2045 – 2049
2050 – 2054
2055 – 2060
Cost
Timeframe
Priority
$ Ongoing High
$-$$ 1–5 Years Moderate
$ Ongoing High
$ 1–5 Years High
$ Ongoing Moderate
$ 5–10 Years Low
$ Ongoing Moderate
$ Ongoing High
Ongoing Moderate
$ 10 Years High
$ 1–5 Years High
$ 1–5 Years High
$ Ongoing Low
$ 1–5 Years High
$ Ongoing Moderate
$-$$ Ongoing High
$ Ongoing Low-Moderate
$ Ongoing High
$ Ongoing Moderate
$ Ongoing Moderate
$ Ongoing Moderate
$ Ongoing Moderate
$ Ongoing High
$-$$ 10 Years High
$ 1 Year Low-Moderate
$ Ongoing Low
$ 1 Year Moderate
$ Ongoing Low
$ Ongoing Moderate
$ 10 Years Low

Appendix K: Photo Credits

As part of the development of the UFMP, the city organized the "Tree Art Contest" a youth art and photo contest with help from the Garden Grove Unified School District and the Boys and Girls Club. The city created the contest to highlight the different ways that Garden Grove youth appreciate and celebrate the city's urban forest. Approximately 100 photo and art entries were submitted to the Tree Art Contest.

GRADES K-3



PAGE ii
Adam Guidry



PAGE viii
Alexander Rivera Sosa



PAGE 127
Alexis Cori



PAGE iii
Amore' Ma'ae



PAGE 14
Andrew Nguyen



PAGE 100
Anthony Huynh



PAGE COVER
Audrey Gigi LHeureux



PAGE 100
Audrie Trachier



PAGE 53
Aurora Shein



PAGE 33
Aveline Lee



PAGE 103
Avery Nichols



PAGE 79
Brandon Phanel



PAGE 48
Camila Pineda



PAGE 111
Camilla Hernandez



PAGE 75
Celine Tran



PAGE 99
Charlotte Phanel



PAGE 18
Dahlia Kinno



PAGE 100
Damian Barajas



PAGE 65
Dave Luu



PAGE 13
Diana Lam



PAGE 89
Dulce Cuevas



PAGE 12
Edwards Escamilla



PAGE 18
Eli Olea



PAGE 108
Elizabeth Yu



PAGE 89
Emily Zamora



PAGE v11
Emmanuel De Gante



PAGE 156
Eva Hidalgo



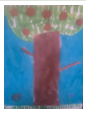
PAGE 146
Gabriel Hernandez Chavez



PAGE 33
George Rhoades



PAGE 63
Hannah Nguyen



PAGE 69
Harmony Blair



PAGE 18
Helen Le



PAGE 109
Iyanna Sanata



PAGE 111
Jason Lai



PAGE 100
Jayden Ngo



PAGE 146
Jesabelle Nava



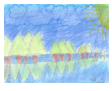
PAGE 144
Julian Alvarez



PAGE 57
Keon Nguyen



PAGE 100
Lando Ngo



PAGE 147
Leilanie Ayapantecatl



PAGE 93
Lily Muratalla



PAGE 137
Logan Mendez



PAGE 36
Lolbeh Ayala



PAGE 67
Makenzie Lee



PAGE 89
Matilda Thieu



PAGE 111
Michaela Montano



PAGE 127
Monika Cantoran



PAGE 31
Noah Clarke



PAGE viii
Pedro Argenal



PAGE 75
Royce Amavizca



PAGE 156
Sage Singleton



PAGE 87
Sofia Arzate



PAGE 18
Sydney Freeman



PAGE 127
Valerie Lee



PAGE 2
William Richardson



PAGE 79
Yareli A. Sandoval

GRADES 4-6



PAGE 85
Abigail Enriquez



PAGE 149
Addie Fajardo



PAGE 150
Adrian Vera



PAGE 37
Alyson Hensley



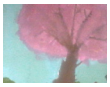
PAGE 79
Amelia Maczynski



COVER
Analia



PAGE 83
Andrea Binkes



PAGE 83
Aylin Velazquez Melendez



PAGE 65
Crystal Clarke



PAGE 72
Ivy Nguyen



PAGE 48
Jamie Lee



PAGE 77
Jaqueline Morales



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Jessalyn Nguyen



PAGE 144
Katie La



PAGE 85
Lucille Lai



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Michael Perez



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Muska Momand



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Paige Dalton



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Simran Sharma

GRADES 7-9


PAGE 12
Anh Nguyen


PAGE 19
April Funk


PAGE 93
Courtney Do


PAGE 65
Edgar


PAGE 94
Grace Fleischmann


PAGE 2
Joshua Munger


COVER
Katelyn Seidmeyer


PAGE 1
Lauren Nguyen


PAGE 42
Lily Nguyen


COVER
Madeleine Huang


PAGE 88
Marcy Bernal


PAGE 23
Niema Hussain

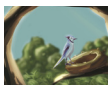

PAGE iv
Ryan Thach

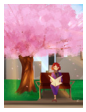

PAGE 29
Sally Montano

GRADES 10-12


PAGE 77
Abel Bernal

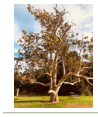

PAGE 29
Amy Joo


PAGE 56
Daniel Tran


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Evelyn Serrato


PAGE iv
Jhoana Jimenez


PAGE 26
Kylie Favro


PAGE 127
Mireyda Marin


PAGE 18
Natalia Nguyen




KATE
S.

