

City of Manhattan Beach

Urban Forest Master Plan

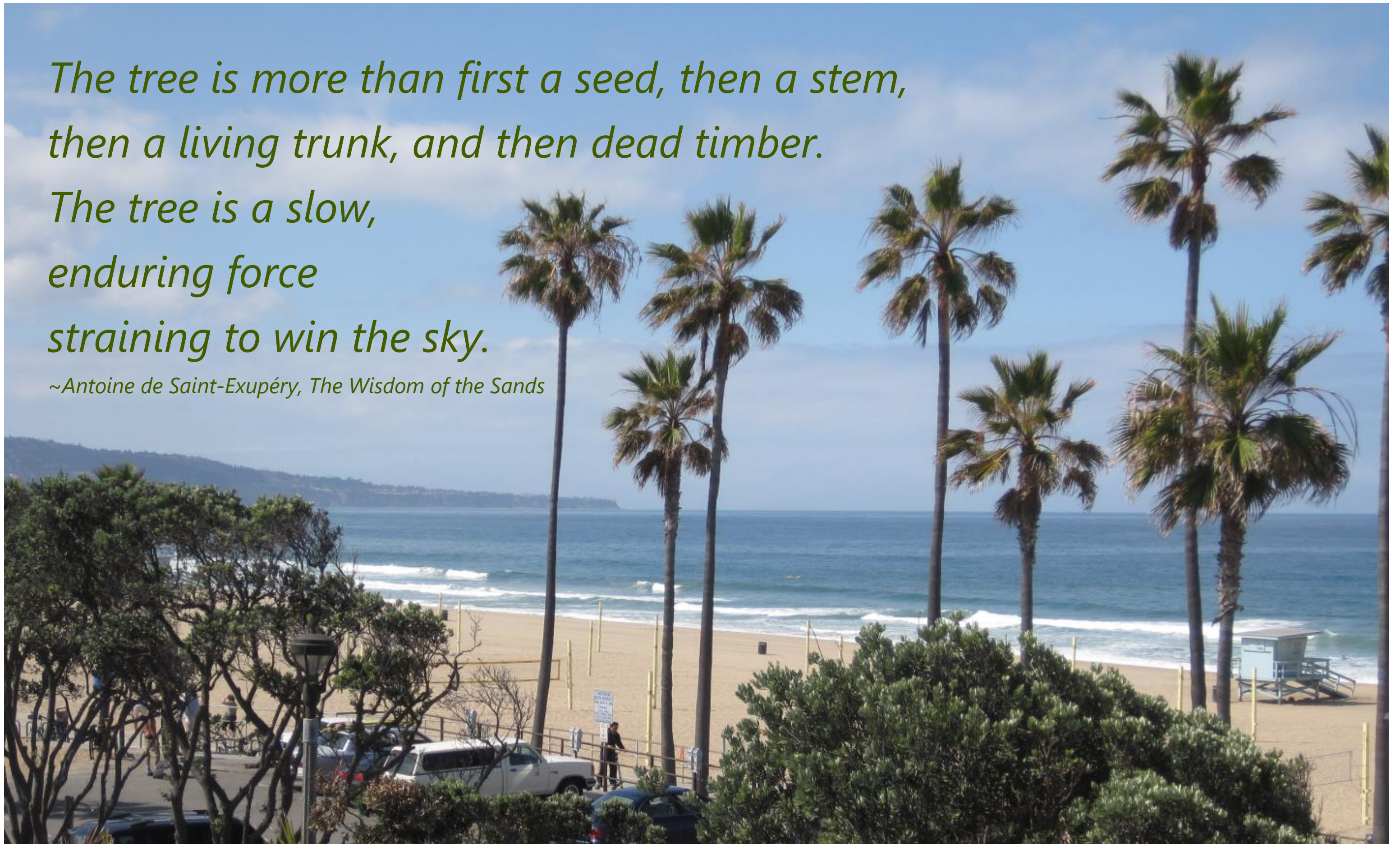
Planning for Beauty, Benefits, and Sustainability



*The tree is more than first a seed, then a stem,
then a living trunk, and then dead timber.*

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

~Antoine de Saint-Exupéry, The Wisdom of the Sands



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Planning for Beauty, Benefits, and Sustainability

2015



Prepared for:
City of Manhattan Beach
Public Works Maintenance Division
3621 Bell Avenue, Manhattan Beach, California 90266
310-802-5300
www.ci.manhattan-beach.ca.us

Prepared by:
Davey Resource Group
A Division of The Davey Tree Expert Company
6005 Capistrano Avenue, Suite A, Atascadero, California 93422
800-966-2021
www.davey.com/drg

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ACKNOWLEDGEMENTS

City Council

Mayor

Wayne Powell

Mayor ProTem

Mark Burton

Members

Tony D'Errico

David J. Lesser

Amy Thomas Howorth

City Personnel

Juan Price, Maintenance Superintendent

Idris J. Al-Oboudi, Recreation Services Manager

Bonnie Shrewsbury, GIS Analyst

Laurie Jester, Planning Manager

Community

Craig Crotty, Consulting Arborist

Manhattan Beach Residents

Photos

City of Manhattan Beach

Manhattan Beach Historical Society

Davey Resource Group



SCOPE & PURPOSE

The purpose of the Manhattan Beach Urban Forest Master Plan (UFMP) is to provide a framework for the long-term management and preservation of the community urban forest. The City of Manhattan Beach manages 11,575 trees in the public right of way, including 4,116 City-maintained trees and 7,459 public property or parkway trees that are, by ordinance, maintained by the adjacent property owner. The Plan recognizes the significance of environmental and socio-economic benefits from community trees and their relationship with community values and expectations for a high quality of life. This Plan is intended to support and guide urban forest programming over the next 25 years.

Specifically, the Plan aims to:

- Provide an overview of the existing public tree inventory, including species, age distribution, condition, and benefits provided
- Identify best management practices that support the health, benefits, and safety of the Community Urban Forest
- Ensure that tree protection ordinances and policies are clear, impartial, and supportive of community values and expectations
- Encourage community engagement, involvement, and appreciation for the urban forest and its environmental values
- Maintain a tree palette that compliments community aesthetics and increases the resiliency of the urban forest to withstand drought, temperature extremes, pests, and disease
- Provide alternative planter designs to optimize below ground rooting area and promote the capture and retention of stormwater runoff
- Compliment the Manhattan Beach General Plan and other long-range and strategic plans, including the Veteran's Parkway Master Plan and the proposed Parks Master Plan

The Plan includes objectives and action strategies for long- and short-term goals in support of this purpose. It identifies appropriate resources to adequately manage community trees. It is intended to remain flexible and dynamic, exploring and implementing the recommended actions as funding and resources permit.

The development of the UFMP included a comprehensive review of existing policies and regulations, current funding and maintenance levels, analysis of the extent, condition, and composition of the existing resources (i.e., trees), stakeholder concerns, and community input.



EXECUTIVE SUMMARY

Manhattan Beach’s urban forest includes 11,575 publicly-managed trees on streets, in parks and at city facilities. In addition, privately-owned, established trees in front and side yards in the city’s tree protection zone are protected by City ordinance. Along with their aesthetic contribution, these trees provide valuable and critical services to the community including benefits to air quality, water quality, energy savings, wildlife habitat, and socioeconomics. This Urban Forest Master Plan (UFMP) provides long-term management goals and vision for preserving and improving the health, value, and environmental benefits of this public resource.

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

The Community Urban Forest is comprised of publicly-owned trees on streets, medians, and parkways, in parks, and at city facilities.

The plan development process involved a comprehensive review and assessment of the existing urban forest resource, including composition, value, and environmental benefits. This review found Manhattan Beach has a primarily established, young tree population in good condition, with good species diversity. The City’s commitment to maintenance of the tree resource is apparent from the ongoing contracted regular maintenance of trees, on a 1-2 year cycle, infrastructure maintenance, and emergency response.

The process explored community values and vision, including those expressed in the Veteran’s Parkway Master Plan Guidelines, and the report Working Toward a Greater, Greener Manhattan Beach, along with community design standards and existing regulations and policies that provide protection and preservation measures affecting the urban forest. This portion of the review found the existing reports internally consistent and supportive of preservation and enhancement of tree canopy in Manhattan Beach, while noting the community has several unique challenges related to trees which should be considered carefully if new tree sites are to be established.

The plan development process also evaluated funding and the current service levels for both in-house and contracted tree maintenance staff. The City’s commitment to maintenance of the tree resource is apparent from the ongoing contracted regular maintenance of trees, on a 1-2

year cycle, infrastructure maintenance, and emergency response. In addition to maintenance staff, there are multiple stakeholders, internal and external, who play a role in the planning, design, care, and advocacy of the urban forest. These stakeholders include City departments, residents, and contracted tree care personnel. Each of these stakeholders played a role and provided input for the development of this plan. Generally, the community expressed support for enhancing and expanding the urban forest, but residents requested greater transparency and clarity in tree permitting and policies.

Manhattan Beach’s Urban Forest Benchmark Values	
Community Urban Forest	
City Maintained Tree Population	4,116
Privately Maintained Tree Population	7,459
Total Tree Population	11,575
Replacement Value (2010)	\$20.6 million
Species Diversity	
Total number of unique species	182
Prevalence of top ten species	46%
Species exceeding recommended 10%	0
Benefits	
Total Annual Benefit	\$3.1 million
Annual Per Tree Benefit	\$266
Annual Per Capita Benefit	\$88
Urban Tree Canopy Cover (i-Tree Estimate)	
Overall Canopy Cover	2.1%
Environmental Benefits (i-Tree Estimate)	
Overall Carbon Storage	\$13,397
Annual Air Quality Benefits	\$121,944

What Do We Have?

Manhattan Beach City staff work to provide exemplary municipal services while preserving the small beach town character and enhancing the quality of life for residents, businesses and visitors. The community forest is an important element of the character, and contributes substantially to the quality of life.

The review process established that Manhattan Beach has strong regulation measures and protection requirements for trees, and a commitment to tree maintenance, balancing the interests of individual residents with the goals of the community as a whole. The community has a reputation for supporting environmental initiatives and many residents actively support continued and enhanced urban forest management.

The community urban forest is an established, relatively young population in good condition. Species diversity is nearly ideal with a wide range of species and genera. With continued maintenance and care, this resource has the potential to increase in value and provide even greater environmental and aesthetic benefits to area residents, visitors.



What Do We Want?

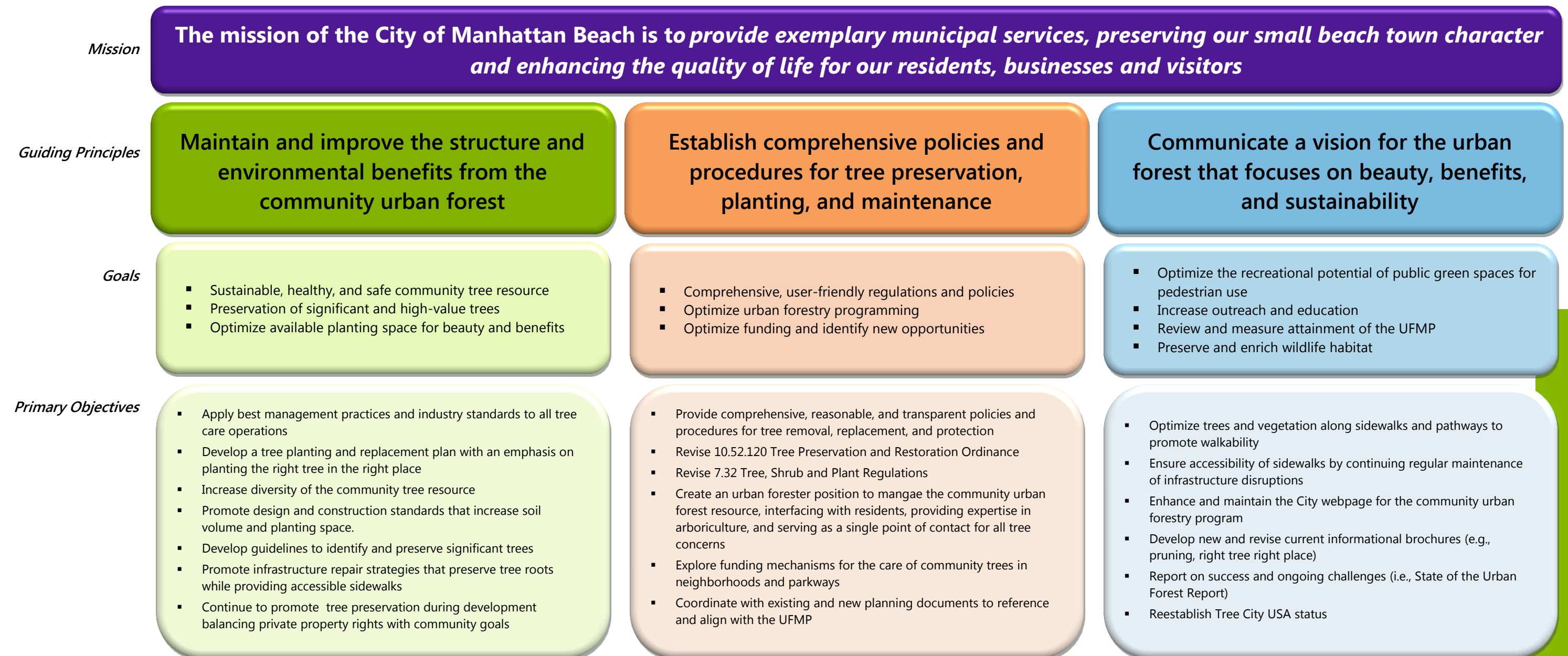
Interviews with internal and external stakeholders, community meetings, and an online survey were conducted to determine strengths of the existing program and opportunities for development. In gathering this information, several common themes were apparent. Increased communication and clarity, continued and enhanced tree maintenance and preservation, and planting the right tree in the right place were identified as important to many key stakeholders. These concepts were used to shape the guiding principles and goals of the UFMP.

How Do We Get There?

The UFMP identifies three (3) guiding principles and nine (9) goals for preserving the health, value, services, and sustainability of Manhattan Beach's urban forest. Each of these goals is supported by comprehensive objectives and actions. With this comprehensive plan, Manhattan Beach is poised to make some positive changes to the urban forestry program that will promote the enhancement and expansion of the urban forest with a focus on beauty, benefits, and sustainability.

How Are We Doing?

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





INTRODUCTION

Background

Trees play an essential role in the community of Manhattan Beach by providing numerous benefits, tangible and intangible, to residents, businesses, and visitors. Research demonstrates that healthy urban trees can improve the local environment and lessen the impact resulting from urbanization and industry (CUFR¹). Trees improve air quality, reduce energy consumption, help mitigate stormwater, reduce erosion, provide critical habitat for wildlife, and promote a connection with nature.

In addition to these environmental improvements, healthy urban trees increase the overall attractiveness of a community and have been proven to increase the value of local real estate by 7 to 10% (Dwyer et al, 1992). Trees in retail districts promote longer and more frequent shopping and greater sales (Wolf, 2007). Urban trees support a more livable community, fostering psychological health, and providing residents with a greater sense of place (Ulrich, 1986; Kaplan, 1989). In Manhattan Beach, street trees are an essential element in creating the small beach town character.

In 2013, the City completed an inventory of 11,575 public trees on streets, in parks, and at city facilities. In this plan, these inventoried trees are referred to as the "community urban forest". In addition to publicly-owned trees, some privately-owned trees are protected through City ordinance. These protected trees are trees over 12" diameter at breast Height (DBH) within the front 20' of residential properties, and 3-10' of a side yard. They cannot be removed without a permit, and must be pruned according to ANSI A300 pruning standards. The UFMP addresses management of both the community urban forest and protected trees. Yard trees less than 12" DBH and/or in back yards are not considered by this Plan.

In 2015, the City of Manhattan Beach contracted with Davey Resource Group (DRG) to develop the UFMP for the long term care and preservation of this resource. The project included analysis of the existing resource (inventory) in conjunction with i-Tree Streets, a STRATUM Analysis Tool (Streets v5.1.5; i-Tree v6.0.9). The analysis provides a comprehensive picture of the current structure, benefits, and value of this public asset. The community urban forest plays a prominent role in the environmental benefits provided to the community and residents rely on the City of Manhattan Beach to protect and enhance this vital resource. The UFMP, in conjunction with tree inventory data and the current resource analysis, provide a strong foundation for

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

managing the current health and sustainability of Manhattan Beach's urban forest.

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

Mission

"The City of Manhattan Beach is dedicated to providing exemplary municipal services, preserving our small beach town character and enhancing the quality of life for our residents, businesses and visitors."

Guiding Principles

The guiding principles for the Urban Forest Master Plan are:

- Maintain and improve the structure and environmental benefits from the community urban forest
- Establish comprehensive policies and procedures for tree preservation, planting, and maintenance
- Communicate a vision for the urban forest that focuses on beauty, benefits, and sustainability

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

Community

Manhattan Beach is a desirable coastal community. With a historic pier and well-groomed beach, a vibrant downtown core with unique shops and restaurants, and ample opportunities for outdoor recreation, residents embrace the charm of this small beach town in the South Bay. The city has several unique neighborhoods, or sections, each with its unique features and character. Major sections include the Tree Section (named for its tree street names), the Sand Section, which is closest to the coast, the Hill Section, Manhattan Village, and the Liberty Village Section. The Sand Section boasts the second highest mean household income in Los Angeles County. Across the city, the public schools are the third best performing district in the state of California. CNN Money

recently named Manhattan Beach as the top city for the “Rich and Single”. The median home price is approximately \$2 million.

As market demand for larger homes increases, older beach cottages and bungalows are being replaced by structures with larger footprints. As a result, space for trees and other landscaping is reduced. Some areas of the City have opted to route utilities underground, providing better views and more space for street trees. However, lots in these areas often have smaller setbacks, which can limit space for tree growth and make small and medium stature tree species the only appropriate choice. On designated walk streets, vegetation encroachment is limited to preserve the ocean view.

Along primary streets, space for trees is highly variable. Main commercial streets, including Rosecrans, Sepulveda, and Aviation Corridors, provide substantial space for trees in the public right-of-way. The 21 acre Veterans’ Parkway includes an established tree canopy in an enhanced median located between N. Ardmore and N. Valley Dr. In residential areas, the average parkway width varies, with an average of 4 feet.

Despite these limitations to vegetation, trees are still very important to many residents, as they help define the character of the community as a small beach town. Moreover, the community has a reputation for having strong environmental values and a desire to preserve trees. The City recently implemented a Going Green program with a goal to make Manhattan Beach the most environmentally responsible City it can be. In the coming years, Manhattan Beach intends to take these efforts to new levels as the city Council has made sustainability a priority goal. The 2008 report “Working Toward a Greater, Greener Manhattan Beach” outlines many environmentally friendly practices and policies the city currently employs and outlines additional actions to consider.

The City has many opportunities for outdoor recreation, and residents enjoy walking, running, biking, and exercising in parks and along the many pedestrian- friendly streets. Certain streets are designated bike routes, and year round, many residents and visitors are seen enjoying these amenities.

Public parks are regularly used and well maintained. In addition to the clean and regularly-groomed beach, the Veterans Parkway is a popular street with a 3-mile long, 20-acre trail, popular with joggers and dog-walkers. The City’s second largest park, Polliwog Park, features a small lake, an open-air concert amphitheater, playgrounds, picnic areas, and a fenced dog area. These parks are important to the City’s urban forest because they provide the most optimal locations for large-stature trees.

Definitions

Community Urban Forest: The Community Urban Forest is comprised of publicly-owned trees on streets, medians, and parkways, in parks, and at city facilities.

Protected Private Trees: In Manhattan Beach, trees over 12” DBH in the first 20’ of residential front yards, and 3-10’ of side yards on corner lots

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

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

City-maintained Tree: A tree located in a street median, park, or at a city facility

Resident-maintained Public Tree: A tree located on public property, typically neighborhood streets, and maintained by the adjacent property owner.

Right Tree - Right Place: The practice of installing the optimal species for a particular planting site. 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. Species considerations include mature stature, invasiveness of roots, drought tolerance, salt tolerance, flowering, and potential fruit production.

Parkway –Any area of the street that is not sidewalk or roadway.





Benefits of Urban Tree Canopy

Community urban forests work constantly to mitigate the effects of urbanization and development and to protect and enhance lives within the community in many ways.

Air Quality

As environmental awareness continues to increase, governments are paying particular attention to global warming and the effects of greenhouse gas (GHG)

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

emissions. As energy from the sun (sunlight) strikes the Earth's surface it is reflected back into space as infrared radiation (heat). Greenhouse gases absorb some of this infrared radiation and trap the 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 (CH₄), nitrous oxide (N₂O), carbon dioxide (CO₂), water vapor, and human-made gases/aerosols. An increase in the average temperature of the earth may result in changes in weather and weather patterns, sea levels, and land-use patterns, which together are commonly referred to as "climate change."

In the last 150 years, since large-scale industrialization began, the levels of some GHGs, including CO₂, have increased significantly (U.S. Energy Information Administration). California's Global Warming Solutions Act (AB 32), passed in 2006, set the 2020 GHG emissions reduction goal into law. In December 2007, the California Air Resources Board (ARB) approved the 2020 emission limit of 427 million metric tons of carbon dioxide equivalent (CO₂e). As of 2007, regulations require that the largest industrial sources of GHG must report and verify their emissions. In 2011, the ARB adopted the cap-and-trade regulation. Under a cap-and-trade system, an upper limit (or cap) is placed on GHG emissions. This cap can be applied to any source, industry, region, or other jurisdictional level (e.g., state, national, global). Regulated entities are required to either reduce emissions to the required limits or purchase (trade) emission offsets in order to meet the cap. In 2011, the ARB approved four offset protocols for issuing carbon credits under cap-and-trade including the Forest Offset Protocol (ARB, 2011). This Protocol recognizes the important role forests play in fighting climate change.

Urban trees improve air quality in five fundamental ways:

- Reducing particulate matter (dust)
- Absorbing gaseous pollutants

- Shade and transpiration
- Reducing power plant emissions
- Increasing oxygen levels

They protect and improve air quality by intercepting particulate matter (PM₁₀), including dust, ash, pollen, and smoke. The particulates are filtered and held in the tree canopy where they are eventually washed harmlessly to the ground. Trees and forests absorb harmful gaseous pollutants like ozone (O₃), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). Shade and transpiration reduces the formation of O₃, which is created during higher temperatures. In fact, scientists are now finding that some trees may absorb more volatile organic compounds (VOC's) than previously thought (Karl et al, 2010). VOC's are a class of carbon-based particles emitted from automobile exhaust, lawnmowers, and other human activities. In addition, by reducing energy needs, trees reduce emissions from the generation of power. And, through photosynthesis, trees and forests increase oxygen levels.

The USDA Forest Service's Urban Ecosystems and Social Dynamics Program (UESDP) (formerly called the Center for Urban Forest Research (CUFR)) recently led the development of an Urban Forest Project Reporting Protocol. The protocol, which incorporates methods of the Kyoto Protocol and Voluntary Carbon Standard (VCS), establishes methods for calculating reductions, provides guidance for accounting and reporting, and guides urban forest managers in developing tree planting and stewardship projects that could be registered for GHG reduction credits (offsets). The protocol can be applied to urban tree planting projects within municipalities, campuses, and utility service areas anywhere in the United States.

Water Quality

Trees and forests improve and reduce water pollution in the ocean, by reducing the impacts of stormwater runoff through:

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

Trees intercept rainfall in their canopy, which act as a mini-reservoir (Xiao et al, 1998). During rain events, this interception reduces and thus slows runoff.

By absorbing some stormwater and slowing the flow, trees in Manhattan Beach reduce pollution and contamination of oceans and beaches.

In addition to capturing stormwater, canopy interception lessens the impact of raindrops on bare soils. Tree roots can also increase the capacity and rate of soil infiltration. Through rainfall interception and

increased soil infiltration, flow and volume of stormwater runoff is reduced. This aids in preventing sediments and other pollutants from entering the ocean.

In Manhattan Beach, run-off water from storm drains flows directly to the ocean without any benefit of treatment. By absorbing some stormwater and slowing the flow, trees in Manhattan Beach reduce pollution and contamination of oceans and beaches. Requirements for stormwater management are becoming more stringent and costly. Reducing runoff and incorporating urban trees in stormwater management planning has the potential to turn pipes and paved culverts into green infrastructure assets.

Carbon Reduction

Trees and forests reduce atmospheric carbon dioxide (CO₂) in two ways:

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

Trees and forests directly reduce CO₂ in the atmosphere through growth and sequestration of CO₂ as woody and foliar biomass. Indirectly, trees and forests reduce CO₂ by lowering the demand for energy and reducing the CO₂ emissions from the consumption of natural gas and the generation of electric power.

As environmental awareness continues to increase, governments and individuals are paying particular attention to climate change and the effects of greenhouse gas emissions. Two national policy options are currently making headlines; the establishment of a carbon tax and a greenhouse gas cap-and-trade system, aimed at reducing atmospheric CO₂ and other greenhouse gases. A carbon tax places a tax burden on each unit of greenhouse gas emissions and would require regulated entities to pay for their level of emissions. Alternatively, in a cap-and-trade system, an upper limit (or cap) is placed on global (federal, regional, or other jurisdiction) levels of greenhouse gas emissions and the regulated entities are required to either reduce emissions to required limits or purchase emissions allowances in order to meet the cap (Williams et al, 2007).

In 2006, California adopted the Global Warming Solutions Act (AB32) which commits California to reduce its greenhouse gas emissions to 1990 levels by 2020.

Manhattan Beach's urban tree canopy is directly sequestering 343 tons of carbon each year.

On average, a single Aleppo pine annually sequesters 185 pounds of carbon.

~Manhattan Beach Urban Tree Resource Analysis, 2015





Beginning in 2013, a statewide cap on greenhouse gases places a mandatory limit on large businesses that emit more than 25,000 metric tons of CO₂. The limit is set to decline 2-3% each year and to expand the scope of businesses and industries that are regulated. Companies that are regulated must obtain an allowance (or permit) for each ton of carbon they emit. These allowances have value and can be traded on the open market.

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

Energy Savings

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

- Shading dwellings and hardscape
- Transpiration
- Wind reduction

Shade from trees reduces the amount of radiant energy absorbed and stored by hardscapes and other impervious surfaces, thereby reducing the heat island effect, a term that describes the increase in urban temperatures in relation to surrounding locations. Transpiration releases water vapor from tree canopies, which cools the surrounding area. Through shade and transpiration, trees and other vegetation within an urban setting modify the environment and reduce heat island effects. Temperature differences of more than 9°F (5°C) have been observed between city centers without adequate canopy cover and more vegetated suburban areas (Akbari et al, 1992).

Trees reduce wind speeds by up to 50% and influence the movement of warm air and pollutants along streets and out of urban canyons. By reducing air movement into buildings and against conductive surfaces (e.g., glass and metal siding), trees reduce conductive heat loss from buildings, translating into potential annual heating savings of 25% (Heisler, 1986). This benefit of lowering the energy needs from buildings in turn reduces carbon dioxide (CO₂) emissions from fossil fuel

power plants, which are a primary source of greenhouse gas emitted through human activity.

Aesthetics and Socioeconomics

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

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

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

Some of the benefits of forests are intangible and/or difficult to quantify, such as impacts on physical and psychological health, crime, and violence, however, empirical evidence of these benefits does exist. A 2012 study of crime, such as burglary and vandalism, by Donovan and Prestemon found that trees in the public right-of-way were associated with lower crime rates as long as the trees did not obstruct lines of sight for security and law enforcement personnel. This reinforced similar findings by Kuo and Sullivan in 2001, whose study focused on inner city areas. The authors speculated the trees indicated to criminals the house was better cared for, and therefore, subject to more effective authority than a comparable house with fewer trees. In a 1989 study, Kaplan and Kaplan found that views of trees and nature impacted people's emotional states positively. Ulrich (1986) found hospital patients with a view of trees and vegetation required less medication and recovered more quickly from injury.

In addition, trees and forests have positive economic benefits for retailers. There is documented evidence that trees promote better business by stimulating more frequent and extended shopping and a willingness to pay more for goods and parking (Wolf, 2007).

Finally, trees provide opportunities for recreation, offering a healthful respite from the pressures of work and everyday stress.





WHAT DO WE HAVE?

History of Urban Forestry in Manhattan Beach

Recognized today for its iconic pier and beachside promenade (a.k.a. “The Strand”), Manhattan Beach has its origins as a seaside resort in the South Bay. In the 1920s and 30s developers leveled uneven sandy sites, exported excess sand, and constructed modest homes for families, including many veterans after WWII. The population increased steadily from 859 residents in 1920 to 6,398 in 1940, as families moved into the Tree and Hill Sections. The greatest population growth occurred in the post WWII-war period as new sections were developed including Manhattan Village, Liberty Village, Bermuda Village, and Victory Village. By the mid-1950s, the Property Owners Association had established new schools, storm drains, a fire station, a post office, parks and a branch of the Los Angeles County Library.

Urban trees have been a part of Manhattan Beach history since the early 1900s. Historical records show that eucalyptus trees were planted along main streets for windbreaks, firewood, shade, and beauty. Rosecrans Avenue., El Camino Real (today Sepulveda Boulevard), and Center Street., (today Manhattan Beach Boulevard), were all lined with eucalyptus in the 1900s to 1930s. In the 1930s, during the widening of Center Street., 284 eucalyptus trees were determined to be hazardous, and removed. Eucalyptus are less widely planted today due to their large stature at maturity, and disease issues such as red gum lerp psyllids (*Glycopsis brimblecombei*). With the availability of a diverse palette of broadleaf evergreens, the urban forest has grown and expanded to include more medium stature, lower maintenance species, including some smaller-stature eucalyptus varieties.

Balancing Development with Open Space

Increased structure footprint size and reduced setbacks from streets are important components of increasing urban density and reducing sprawl, but these factors limit space for trees and landscaping. Over the years, as land prices have increased, larger homes are replacing many of the early bungalows. A greater portion of residential lots are covered by structures, leaving less plantable area. With new development, some areas of the City have opted to reroute utilities underground, improving views, and more space for street trees. However these areas often also have small lot setbacks, which can limit space for tree growth, and make small to medium stature trees more appropriate in the landscape. On designated walk streets, vegetation encroachment is limited to preserve the ocean view. Despite these limitations, urban forest managers are striving to preserve existing public trees and to promote the appropriate species where available space is limited.

The City and residents work together to ensure attractive landscaping on public and private property. In neighborhoods with mature trees, greater canopy cover creates a distinct character and feel, particularly within neighborhoods in the Tree Section and others along the Valley/Ardmore greenbelt of Veterans Parkway. Because of its beautiful and desirable neighborhoods, Manhattan Beach continues to be a desirable and popular coastal community.

Outdoor Recreation and Pedestrian Friendliness

Public parks are popular and regularly maintained. Large unpaved areas provide appropriate locations for large-stature trees, and residents enjoy many outdoor activities in well-shaded park areas. Residents enjoy running, biking, and exercising in parks and along the many pedestrian-friendly city streets. Certain streets are designated bike streets, and year round, many residents and visitors are seen enjoying these amenities. The trees and associated vegetation are an important element in creating a vibrant, beautiful community.

In some neighborhoods, parkways don’t provide adequate space for large-stature trees. In many instances where large-stature street trees are planted, inadequate root space results in the uplifting and displacement of sidewalks, streets and driveways. In the early 1990s, the city implemented a sidewalk repair program which included tree inspections for those trees that were causing infrastructure damage.

Through the sidewalk repair program, Public Works staff inspects sidewalks, and if a problem is found, work with a consulting arborist to assess the condition and health of the tree. If the tree is not dead, dying, diseased or exhibiting structural instability, it is most often preserved, and the sidewalk or road is scheduled for repair. Public Works staff notifies the property owner of the need for repairs, completes the work, and repair costs are forwarded to the property owner. This program keeps sidewalks safe and accessible for residents and visitors but there is interest in ensuring street trees planted in the future will create fewer infrastructure conflicts. One of the objectives of this UFMP is to address this through appropriate species selection while maintaining the high level of care the sidewalk repair program currently provides.

History of Inventories and Ordinances

To better manage and develop options for the maintenance of community trees, the City has periodically conducted public tree inventories. The trees were inventoried 2000 and in 2013. The 2013 inventory data was used to establish the value and benefits of existing trees and to provide benchmarks for the UFMP.

To guide residents and staff in the planting, maintenance, and removal of community trees, two main sections of the city code were established in 1970 and 1993. Street, park, and city facility trees are regulated by city Ordinance Section 7.32 – Tree, Shrub, and Plant Regulations, which was first established in 1970 and has been periodically updated over time. Trees under the jurisdiction of 7.32 are maintained by adjacent property owners or by the city, depending on their location. Typically, parkway trees are maintained by adjacent property owners. Trees on streets and medians, in parks and at city facilities are maintained by the City.

In 1993, the city established ordinance 10.52.120 – Tree Preservation and Restoration in Residential Zones, Area Districts I and II, which further regulates trees over 12" DBH in the front yards (20') of residential homes. The ordinance states that property owners are required to maintain these trees, and seek permission for removal from the city. Protecting these trees demonstrates Manhattan Beach's ongoing dedication to preserving the urban forest.

Community Tree Resource

Community trees play a critical role in the City of Manhattan Beach. They provide numerous benefits both tangible and intangible, to residents, visitors, and neighboring communities. With an inventoried urban forest of 11,575 trees, the City's Public Works Department has demonstrated that public trees are a valued community resource, an important component of the urban infrastructure, and a recognized part of the City's identity.

An urban forest is a living and dynamic resource, changing over time and in constant response to its environment. The health and stability of the urban forest can be influenced by many factors, including pruning, irrigation, climate fluctuations, emerging pests and disease, as well as development and new tree planting. A complete understanding of the current structure, condition, and maintenance needs is essential to making the best possible management decisions. To date, the City has inventoried all trees on streets (except walkstreets), in parks and at City facilities.

Composition of the Inventoried Urban Forest

Understanding the composition of an urban forest is essential to developing effective management strategies. The urban forest composition is defined by its population (species frequency and diversity), age distribution, condition, and replacement value.

Replacing Manhattan Beach's trees would cost over \$20.6 million.

The Urban Forest Resource Analysis (2015) found the following characteristics define Manhattan Beach's community urban forest:

More than half of Manhattan Beach's trees are broadleaf evergreens and over a quarter are palm species.

- 4,116 trees (36%) are located along major streets, medians, parks, and city facilities. These trees are city-maintained annually (palms) or on a two year cycle (non-palm species)
- 7,459 trees (64%) are in residential areas, maintained by adjacent property owners
- The inventory includes more than 180 unique species.
- Evergreen broadleaf trees comprise 54% of the population. 26% are palm species
- The ten most common species represent 46% of the population
- The resource is a young, establishing population with 60% of non-palm species in the 6-12" DBH range
- 92% of trees are in good condition
- Community trees are providing 54 acres of canopy cover, an average of 2.2% of the overall land area in Manhattan Beach
- To date, Community trees have sequestered 3,240 tons of carbon, valued at \$97,206
- Replacement of Manhattan Beach's 11,575 community trees with trees of similar size, species, and condition would cost over \$20.6 million

Tree Type

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

Figure 1 shows Manhattan Beach's tree types. More than half of the community trees are broadleaf evergreens and palms comprise over a quarter.

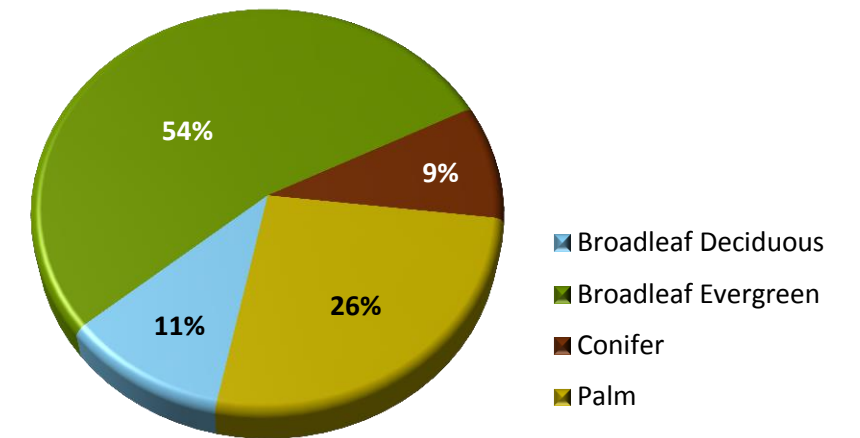


Figure 1. Tree Type Distribution

Tree Types

Broadleaf: Hardwood trees with flat leaves which may be either evergreen or deciduous

Evergreen: Leaves do not fall at one time, and last several years. This category includes both conifers and broadleaf trees.

Deciduous: Leaves fall at once, seasonally

Conifer: Usually bearing cones and needles or scale-shaped leaves

Palm: Unbranched evergreens with crowns of feathered or fan-shaped leaves



Species Distribution

The predominant tree species are queen palm (*Syagrus romanzoffianum*, 9.58%), and cajeput tree (*Melaleuca quinquenervia*, 6.76%). Species diversity in Manhattan Beach is relatively high. There is a widely accepted rule that no single species should represent greater than 10% of the total population, and no single genus more than 20% (Clark et al, 1997). The tree diversity in Manhattan Beach is well distributed and no species exceeds the recommended species threshold of 10%, although queen palm comes close. That genus of palm, *Syagrus*, is also the most common genus in the population, but is well under the 20% threshold for genera.

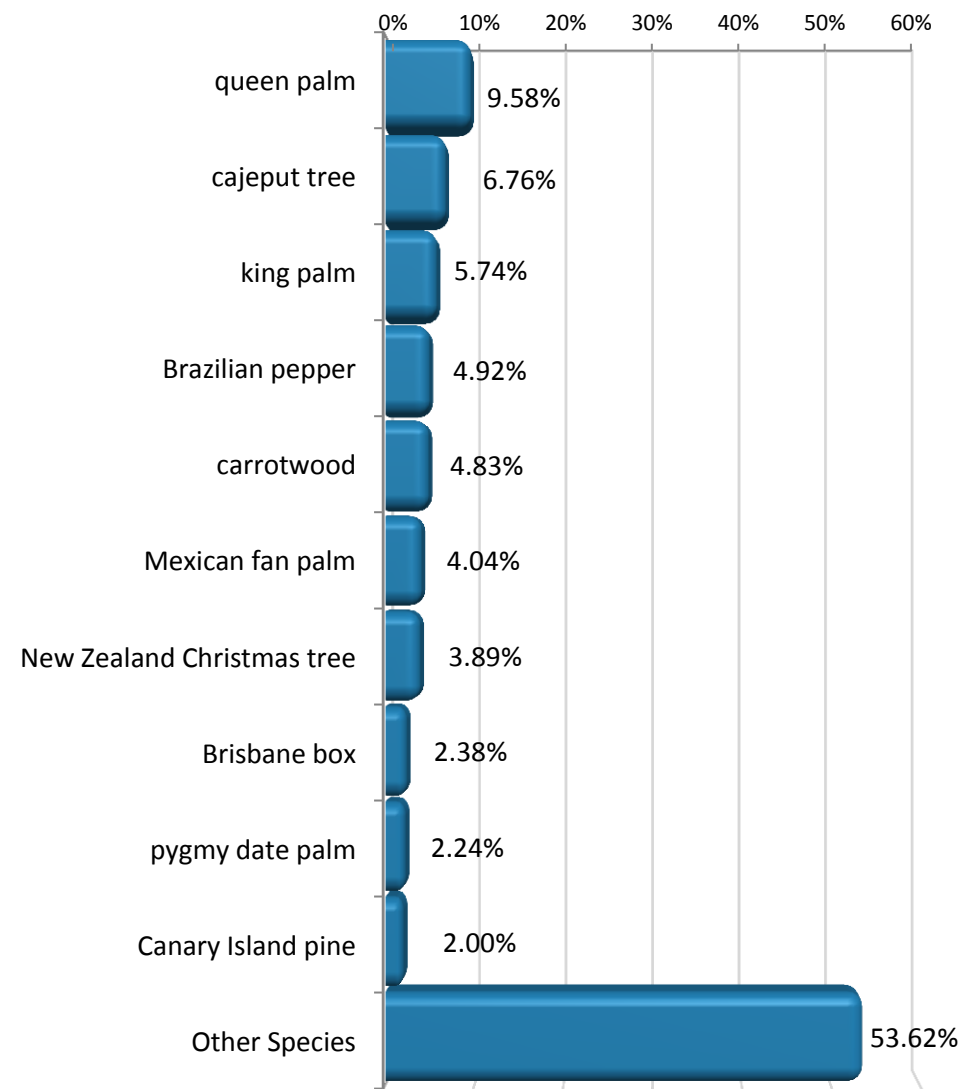


Figure 2. Prevalent species in Manhattan Beach's Urban Forest

Age Distribution

The age distribution of the urban forest is a key indicator, and driver, of maintenance needs. Palms are not included in this age distribution since the Diameter at Breast Height (DBH²) of palm species does not increase incrementally with age. Palm tree age is more closely correlated with height. Among hardwoods and conifers, which do increase in DBH over time, The age distribution of Manhattan Beach's public tree population is positively weighted in established but young trees, with 60% of the overall population 6-12" DBH (Figure 3). Twenty seven percent (27%) of the population consists of young trees with a DBH between 0 and 6 inches. Ten percent (10%) of the population is mature, in the 12 – 18" DBH Range and just 3% are over 18" DBH.

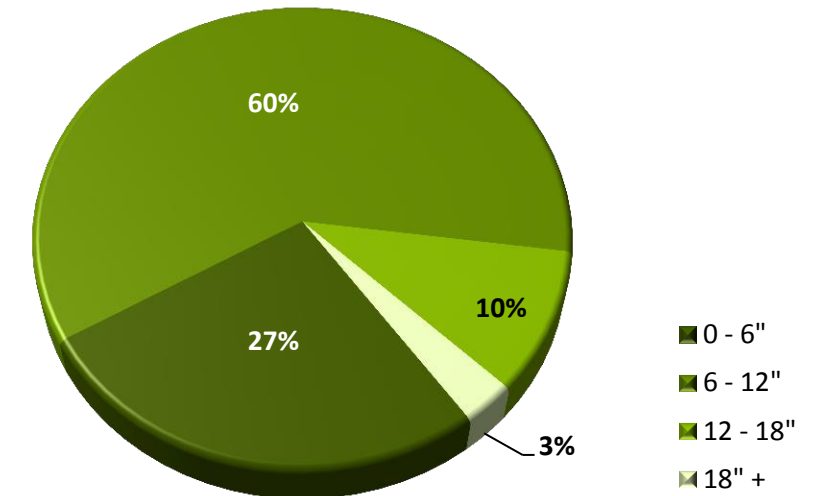


Figure 3. Relative Age Distribution of Non-Palm Species

² DBH (Diameter at breast height) is measured at 54 inches above grade.

Community Tree Benefits

Calculating Tree Benefits

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

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

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

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

Based on the 2013 inventory, Manhattan Beach's community trees provide cumulative benefits to the community at an average value of \$266 per tree, for a total gross value of \$3.1 million per year. There is potential for these benefits to increase over time as young, medium and large stature trees mature. Currently, this resource provides the following benefits each year:

Energy Savings

Through shading and modification of their immediate environment, community trees reduce electricity by 292 MWh and natural gas use by 2,122 therms for an overall benefit of \$42,933, an average of \$3.71 per tree.

Carbon Reduction

By converting carbon dioxide into woody and foliar biomass, Manhattan Beach's community trees sequester an additional 343 tons of atmospheric CO₂ for a net value of \$13,397 and an average of \$1.16 per tree.

Air Quality

Net air quality improvements, as a result of decreased ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and particulate matter (PM₁₀), are valued at \$121,944, an average per tree benefit of \$10.54.

Stormwater Management

Manhattan Beach's community trees intercept nearly 3.3 million gallons of stormwater annually for a total value of \$5,989, an average of \$0.52 per tree.

Aesthetic and Socioeconomic Benefits

The total annual benefits Manhattan Beach's community trees to property values, health, aesthetics, and socioeconomics is nearly \$2.9 million, an average of \$250 per tree.

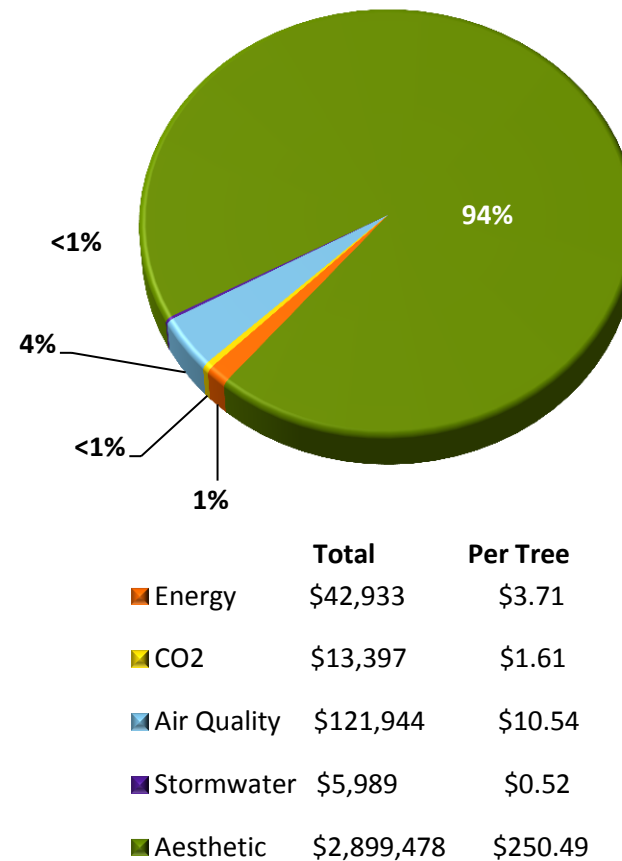
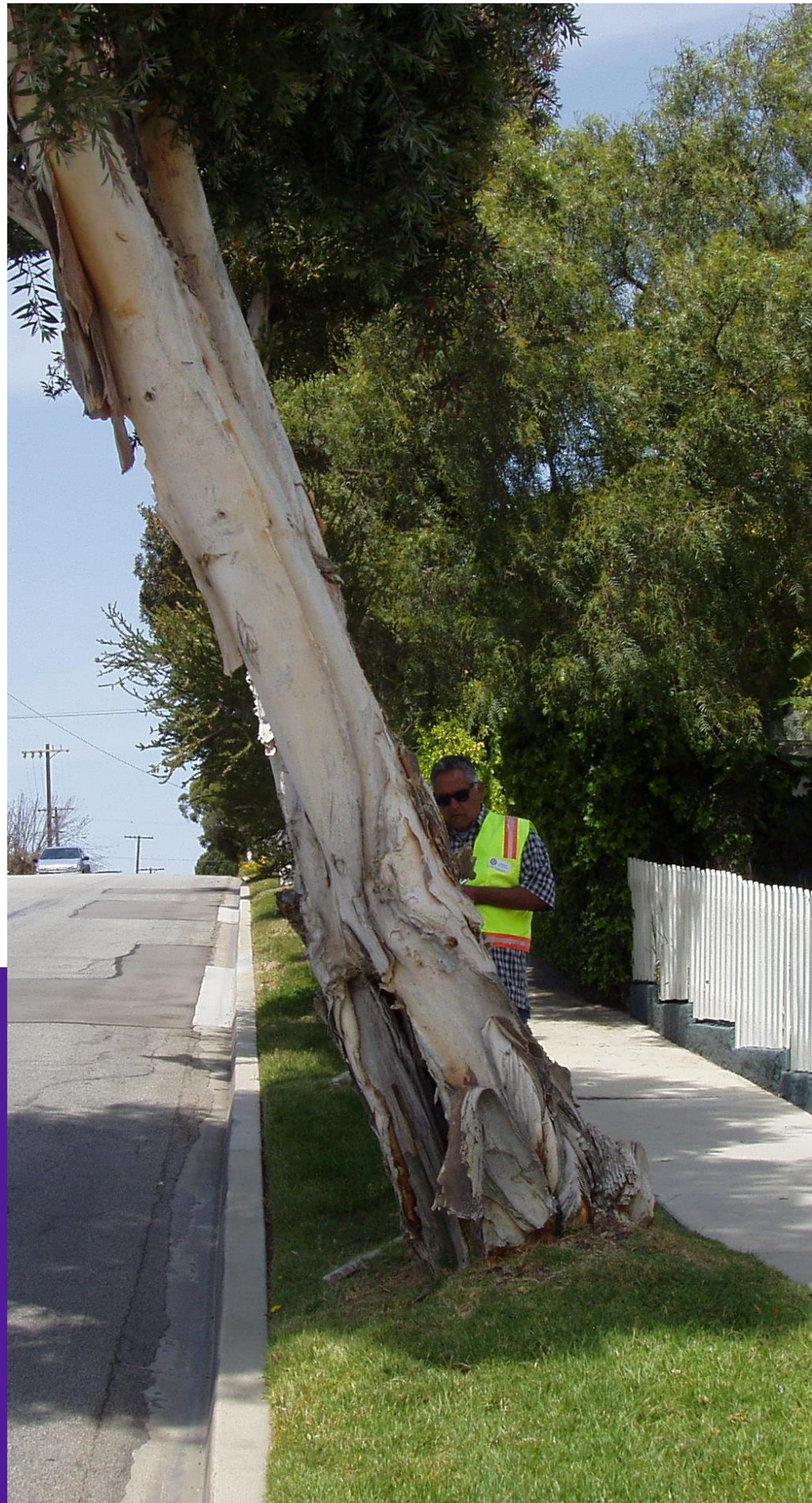


Figure 4. Annual Benefits of Community Trees

Benefits Versus Investment

In order to recognize the full value of the benefits from Manhattan Beach's public urban forest, it is important to take into account the investments (cost) of caring for this resource. Annually, the City invests approximately \$515,000 for public tree maintenance, including administration, liability claims, and infrastructure repairs resulting from tree roots. Considering this resource provided \$3.1 million in total benefits, **for every \$1 invested in caring for public trees, the community currently receives \$5.99 in benefits.**





The Urban Forest Program

The community urban forest includes 11,575 public trees, of which 4,116 are city-maintained trees and 7,459 trees are maintained by adjacent property owners. The Public Works Department is currently responsible for the care of Manhattan Beach's city-maintained trees.

The Manhattan Beach Municipal Code section 7.32 defines street trees as all trees or shrubs in public places along City streets, roads, boulevards, and alleys. Code section 10.52 defines protected trees as those over 12" DBH in the front 20 feet of each home. Protected trees are pruned and maintained by the resident while street trees in non-residential areas are maintained by City contracted crews.

Seven full-time City employees are responsible for managing portions of the public urban forest, depending on location and management issue. These positions include the Senior Planner, Associate Planner, Code Enforcement Officer, Street Maintenance Supervisor, Park Maintenance Supervisor, Public Works Secretary, and the Maintenance Superintendent. Management issues include, but are not limited to:

- Removal requests for both private and public trees
- Pedestrian and vehicular clearance compliance issues
- Sign obstruction and line of sight issues
- Infrastructure damage complaints both public and private
- Tree related construction issues

Each person spends a portion of their time on tree-related tasks, and an estimated 1,800 combined staff hours are expended annually on tree related issues. This amount of time is equivalent to one fulltime employee (FTE). City staff work closely with a contracted consulting arborist to conduct tree inspections. With the exception of emergency response, pruning and removal work is conducted by contracted crews. Park trees less than 30' tall are maintained by contracted landscape maintenance crews.

Public Works Staff provide the following services:

- Contract monitoring and quality control
- Pedestrian and vehicular clearance compliance issues
- Initial site visits for service requests and tree removal permit requests
- Emergency response
- Administration

A qualified consulting arborist provides the following service:

- Tree inspections
- Arborist reports

Contracted maintenance crews provide the following services for City-maintained trees:

- Tree pruning on a regular cycle
- Tree removals
- Maintenance of the tree inventory data
- Pest Management
- Tree planting
- Young tree establishment and care

Tree Planting

As trees are removed, the City maintains a 1:1 replacement policy. At this time, it is estimated there are fewer than 200 vacant tree sites in public areas. With an establishing population in good condition, the priority for tree planting is relatively low, however a few sites exist in parks and greenbelts for tree planting to shade benches, play areas, and trails.

Species selection is important to ensure diversity and to continually plant species that will provide beauty and benefits without being high-maintenance. The City currently provides a tree list for residents on the city website. Species are grouped by section of town, and the palette is limited. The City also maintains a species list internally (developed in 2000) that includes over 80 species.

For aesthetic reasons, palm trees are often a popular choice. However, broadleaf trees provide higher per-tree environmental and aesthetic benefits. With an established palm population that is over 26% of the community forest, there is an opportunity for future tree planting to emphasize non-palm species. Currently, there are no formalized planting programs or partnerships to plant additional trees.

Tree Care and Maintenance Cycles

City Maintained and Resident Maintained Trees

The City of Manhattan Beach manages all 11,575 public trees by maintaining an up-to-date inventory, responding to inspection requests, and providing emergency response pruning when limbs or trees block public streets or sidewalks. Southern California Edison (SCE) provides line clearance as needed to maintain the safety and reliability of power lines.

All 4,116 city-maintained trees are pruned by contracted crews in a regular pruning cycle to promote public safety, tree health, and good structure. Currently, pruning cycles are dependent upon species and location. Many palm trees, especially *Washingtonia* species, require annual pruning to manage fruit production, and to ensure that dead fronds do not fall and injure people or damage property. Areas of high-use, such as the Veteran's Parkway, receive annual inspections and trees

in need of pruning are tended to promptly. All other trees are on a 2-year pruning cycle.

In the event of a tree-related emergency, for example, when a tree fails and blocks the public right of way, City staff provide immediate response. The City maintains several chain saws and response staff are trained in chain saw safety. Because of the high level of regular pruning for city-maintained trees, emergencies are relatively rare.

Pest and Disease Control

Treatable insect and pest problems are also relatively rare in Manhattan Beach. Contracted crews who maintain park and city-maintained street trees employ integrated pest management strategies whenever possible to address pest problems that arise. In the past some pest issues have included eucalyptus lerp psyllids, eucalyptus long horn borers, pine pitch canker and beetles. Disease control often includes removal of infected limbs or material from otherwise healthy trees. The contracted consulting arborist assesses the potential for trees to remain in the landscape before recommending a course of action, which may include pruning to remove diseased material, modified horticultural practices, or other remediation efforts. Often, when pines have advanced pine pitch canker and beetles, removal of the entire tree is the only reasonable course of action because of both safety and aesthetic concerns.

Tree Care Standards

On neighborhood streets, where it is the adjacent property owner’s responsibility to prune trees, a tree trimming permit is required. ANSI A300 pruning standards are required to be followed. These include but are not limited to:

- Generally no more than twenty-five percent (25%) of living foliage should be removed annually, and
- Topping of trees is generally prohibited.

There is an opportunity for more uniform application of these standards through public outreach, and by working with permitted tree trimmers to standardize care.

Design and Construction Standards

The existing Tree Planting Standard (Appendix A) provides direction on proper tree planting. Information about the depth, location, nursery stock, and installation of root guards are included. Tree Protection During Construction or Development Guidelines provide details about the fencing requirements, irrigation, and root pruning requirements for protected trees.

Program Funding

Stable and predictable funding is critical to effective and efficient management of the urban forest. Trees are living organisms, constantly growing and changing over time and in response to their environment. There are a number of factors that affect tree health and structure, including nutrition, available water, pests, diseases, wind, and humidity.

While it might seem like most changes to trees take a long time to occur, some specific maintenance is critical at certain stages of life. For instance, young trees benefit greatly from early structural pruning and training. Minor corrections that are simple can be applied with low costs when a tree is young. However, if left unattended they can evolve into very expensive structural issues and increase liability as trees mature. At which point it may be impossible to correct the issue without causing greater harm.

Over-mature trees often require more frequent inspection and removal of dead or dying limbs to reduce the risk of unexpected failure. A stable budget allows urban forest managers to program the necessary tree care at the appropriate life stage when it is most beneficial and cost effective.

The City spends approximately \$515,000 annually to care for 4,116 publicly-maintained trees, and administer the urban forestry program. This accounts for approximately 0.8% of the municipal budget. Urban Forestry Program administration includes keeping the inventory of 11,575 trees up-to-date and responding to inspection requests and removal permits for the entire community tree resource. These funds are administered by the Streets Division and Buildings and Grounds Division as subsets of the general fund allocation to Public Works. A portion of these funds, generally between \$300,000 and \$365,000 per year are allocated to sidewalk repair, of which approximately one third is recovered back to the general fund in the form of payments from adjacent private property owners.

Landscape and Lighting Districts (LLDs) are tax assessment districts and are a commonly used source of funding. While Manhattan Beach collects lighting funds to maintain lighting infrastructure, historically this funding source has not been used for tree care in the past. In order to do so would require a ballot measure, be approved by voters.

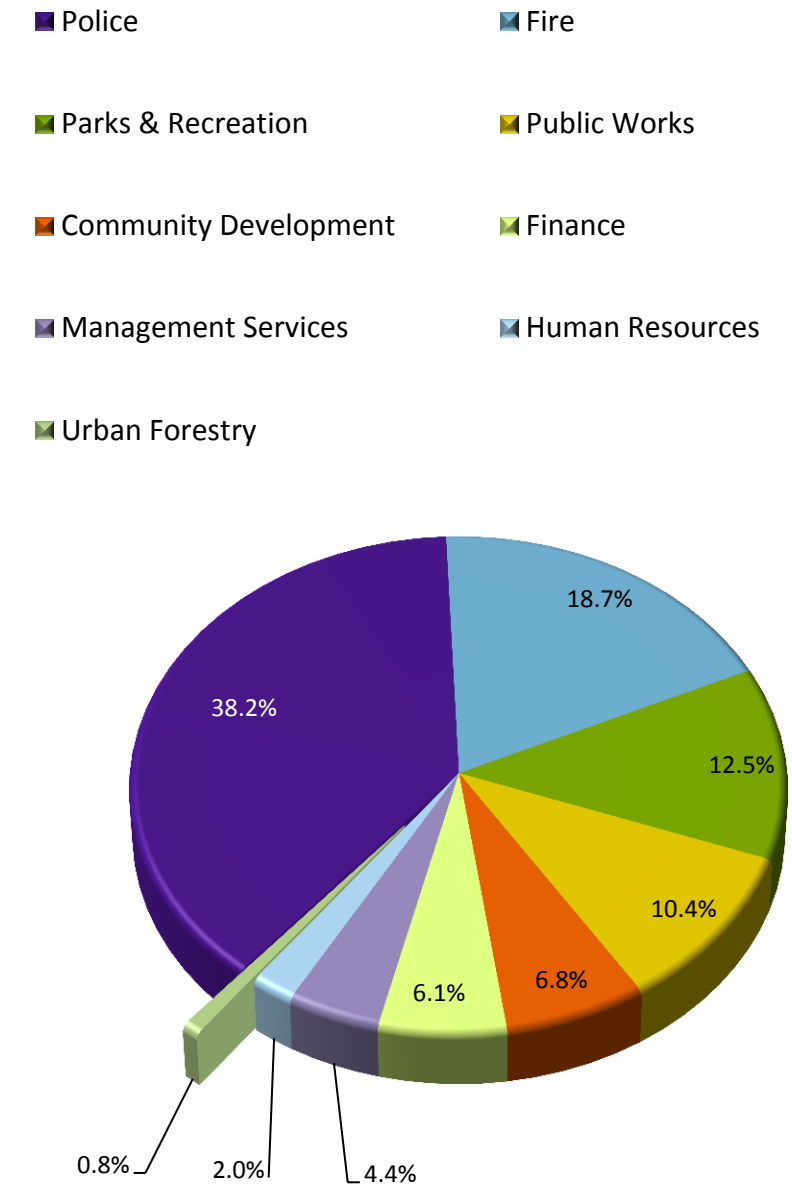
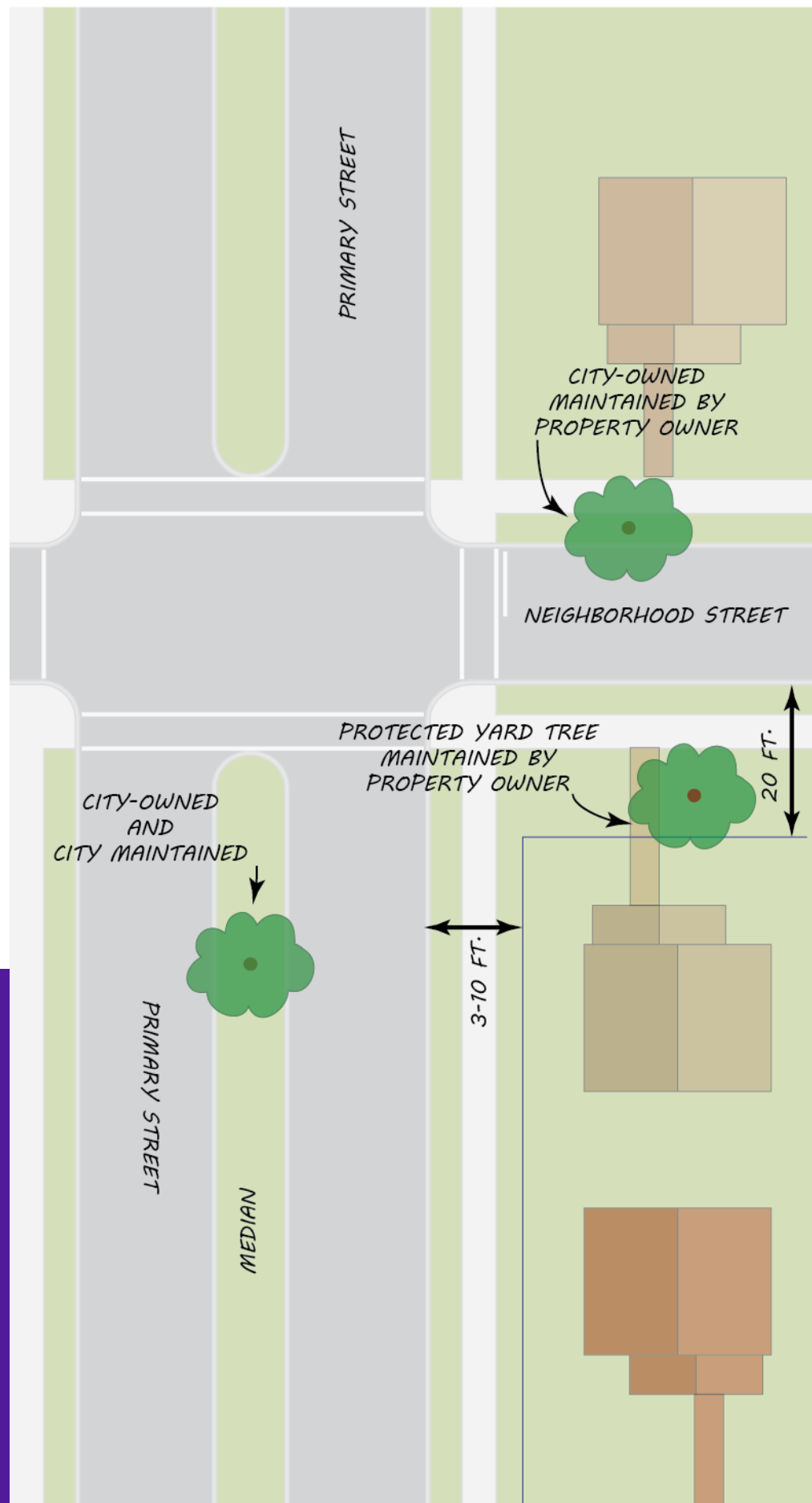


Figure 5. Manhattan Beach Municipal Budget



Policy and Regulations

There are currently three tree types regulated by City Ordinance.

- Publicly owned trees maintained by the city
- Publicly owned trees maintained by adjacent property owner
- Privately owned protected trees maintained by property owner

Tree Protection

Manhattan Beach Municipal Code – Chapter 7.32 – Tree, Shrub, and Plant Regulations

The purpose of these regulations is to serve the public health, safety, and general welfare. The city recognizes that trees, shrubs and plants improve the general aesthetics, reduce traffic noise, purify air, increase property values, and provide cooling shade and beauty.

The Tree, Shrub, and Plant Regulations apply to vegetation on public land or within the public right-of-way. Trees and shrubs are defined as “all woody vegetation now or hereafter growing, planted, or to be planted”. The regulations further define street trees as “trees or shrubs in public spaces along City streets, roads, boulevards, and alleys”.

The Regulations establish that it is unlawful to damage any tree or shrub along any public street or other public place of the City without first obtaining a written permit from the Public Works Director. While permits can be acquired at least five days in advance, the work has to be completed within 30 days. Tree removal requires payment of a fee but that fee is refunded if the tree is replanted within 90 days.

Property owners are responsible for the care and maintenance of trees, shrubs, lawns, and groundcovers within streets, avenues, highways, and parkways adjacent to their property including trimming and watering of plants and notifying the City if any tree or shrub in a public area adjacent to their property is in such condition as to be a risk to public safety or property.

In addition to regulations affecting plant care, the regulations explicitly prohibit malicious harm to trees. It is illegal to damage or injure the bark of any streets tree and to allow any gaseous, liquid, or solid substances harmful to trees to come in contact with any part of a street tree. It is also prohibited to damage, tear up or destroy plantings (grass, flowers, shrubs or trees) in any public space and to paint, tack, or otherwise attach or place any advertisement, notice, card, or announcements on trees and shrubs in public places.

Based on Sections 38771 and 38773 of the Government Code of the State of California, any of the following can pose a risk to persons or property and are subject to civil action or summarily as provided by law:

- Any dead, diseased, infested, leaning or dying trees on private property that are close enough to any street to create a danger to street trees, streets, sidewalks, or the life, health or safety of the public.
- Any tree, shrub or plant species on any private property or in a parkway capable of destroying, impairing or otherwise interfering with any street improvement, sidewalk, curb, approved street tree, gutter, sewer or other public improvements including water utilities or services.
- Any tree or shrub growing on private property but overhanging or interfering with the use of any street, parkway, sidewalk or public place of the City such that in the opinion of the Public Works Director endangers the life, health, safety or property of the public.
- Any plant on private or public property which interferes with visibility on, or free use of, or access to any portion of any street improved for vehicular or pedestrian travel.
- Trees on public property which constitute a public nuisance shall be removed, replaced or trimmed at the expense of the adjoining property owner as ordered by the Director of Public Works. If a tree on public property is ordered replaced under this section, the City shall pay the cost of the replacement tree, as established by the Council under separate resolution.
- It shall be the duty of all owners and persons having possession and control of real property within the City to abate any public nuisances referred to in this section that occur on their real properties.

The planting of trees should follow good horticultural practice as determined by the Public Works Director. Special permission by the Public Works Director is required for plantings on unpaved streets without curb, who will also determine the exact location of the tree to avoid any injury or damage to the tree during street improvement projects. Spacing of trees will also be determined by the Public Works Director depending on local conditions and tree species; trees are usually between 5 and 15 gallon in size.

A tree species list is provided by the Public Works Director to aid the public in the choice of trees to be planted. While this list can be modified, it has to be approved by the Public Works Director.

Manhattan Beach Municipal Code – Chapter 10.52.120– Residential Districts: Tree preservation and restoration in residential zones, Area Districts I and II

This regulation is intended to preserve and enhance the existing healthy tree canopy on individual residential properties and neighborhoods in order to support the health and welfare of the citizens of the City of Manhattan Beach. Trees are valuable for providing “cooling shade and beauty, increased property values, minimize spread of disease to healthy trees, conserve scenic beauty, prevent erosion of topsoil, protect against flood hazards, counteract pollutants in the air, and generally maintain the climatic and ecological balance of the area”. Neighborhood character should be maintained while allowing for removal of existing trees that may be inappropriate for an area or cause damages.

A protected tree is “any species of tree, (excluding deciduous fruit-bearing trees and *Washingtonia* (palm) species) whose trunk is located at least partially within the required front yard or streetside yard (on corner lots) of a site, with a DBH of 12” or greater or multiple trunks totaling 12” in DBH.

It is prohibited to directly or indirectly neglect, abuse, damage, mutilate, injure or harm any protected tree. If any protected tree needs to be removed or relocated, a permit needs to be acquired. However, there are exceptions such as removal in case of imminent emergency caused by the hazardous or dangerous condition of a tree.

Trees must be protected during demolition, grading, and construction operations by methods subject to the approval of the Community Development Director to avoid any damages to the trees. Advisory signs are to be clearly posted on the site.

No grading or construction, including structures, paving, and walls is permitted on private or public property without prior approval by the Community Development Director. As a guideline, no cutting of roots over 2” in diameter should occur within the drip line of the tree as measured at ground level. Where some root removal is necessary as approved by the City, the tree crown may require thinning to prevent wind damage.

Required replacement trees are 36” box trees at minimum for each protected tree removed of an appropriate species and must be planted within ninety 90 days after the removal of the tree, or prior to issuance of a building permit final. Actual sizes, species, location, and quantities of replacement trees are subject to the Community Development Director’s approval. The City street tree list may be used as a guideline by the Director in determining appropriate replacement trees. A combination of protected and replacement tree quantities is not to result in less than one protected tree per lot or 30’ of site frontage. If the Director of Community Development determines that there is not adequate room on the property for replacement trees due to the

number of existing trees to remain, then the requirement for replacement trees may be modified or waived.

Tree Permit Applications

Without Building Permit.

Any person desiring to remove or relocate one or more protected trees needs to obtain a Tree Permit from the Community Development Department; there is a fee associated with the permit.

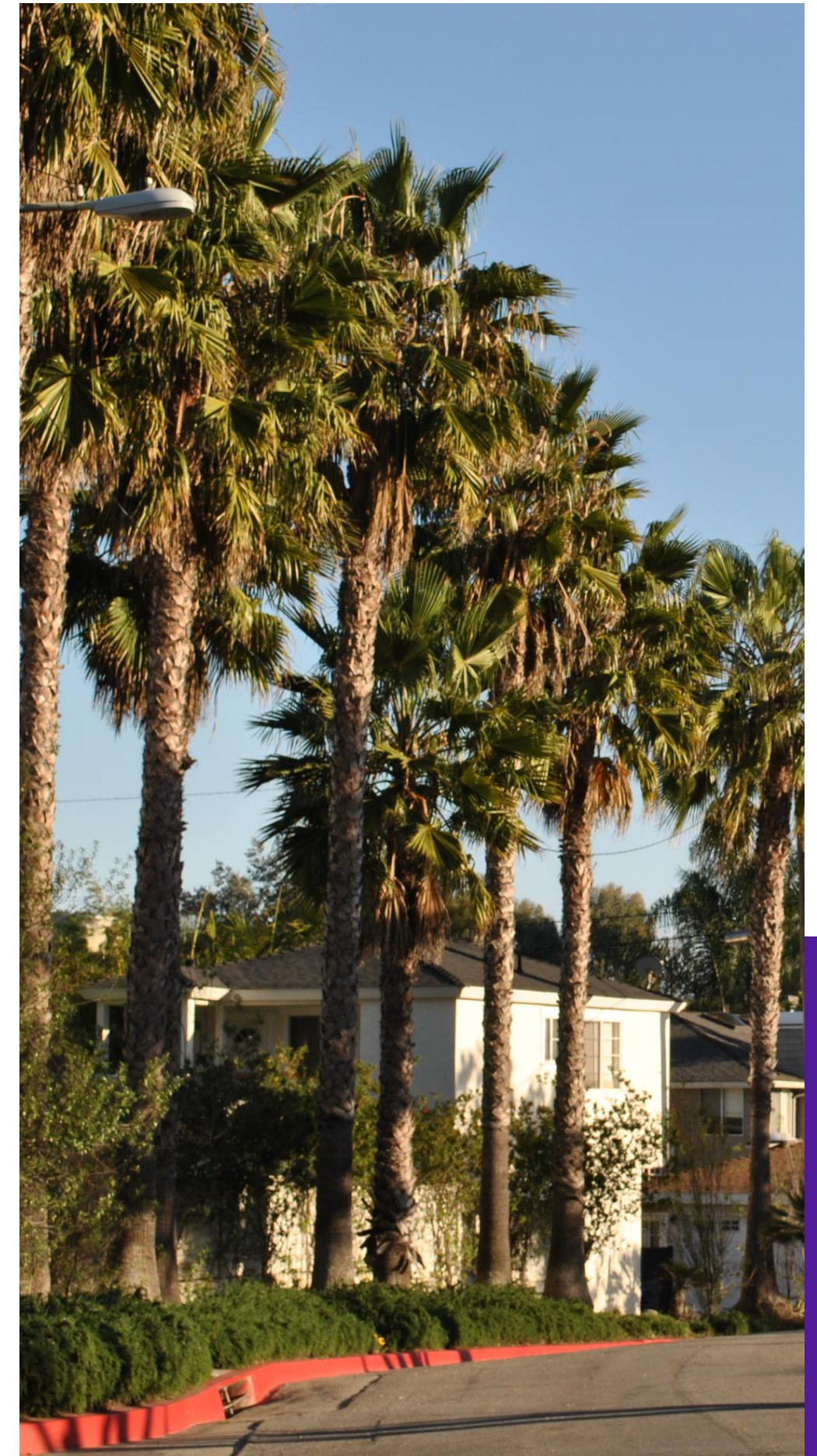
As part of the application, a tree plan has to be included as well as written proof of neighbor notification pursuant to applicable permit instructions and possibly an arborist's report, all of which have to be approved by the Community Development Director.

A tree plan is a plot plan (scale 1/8 inch = 1 foot, minimally) with all trees on the subject property as well as footprints of all existing and proposed buildings and/or additions to buildings on the property. Trees are to be identified by location, size and species. Locations of all trees within the front and streetside yards of the property as well as trees in the adjacent public right-of-way and on adjacent properties (within ten feet of the subject property) are to be included. The size (diameter and height) and species of each tree as well as location of their drip line are to be marked. Each tree has to be designated as to be removed, saved, relocated and/or replaced and the proposed location, size and type of replacement trees have to be included. Photos of all trees in front and streetside yards have to be part of the plan.

With Building Permit.

When applying for a building permit, a tree permit/acknowledgement and plan (see above) are required if protected trees are located on the property. A tree permit is required if the proposed project may impact existing trees in the front or streetside yard of the subject property even though removal is not planned. As above, a fee is associated with the tree permit.

Any new residential construction project in Area Districts I and II which exceeds fifty percent valuation (total estimated cost of reconstructing the entire structure) is required to plant a minimum of one new 36” box tree, unless the Director of Community Development determines that it is inappropriate to require additional trees on the property.





In most cases, where trees are designated to be protected, fencing and temporary irrigation are installed and maintained throughout the construction period. Generally, root pruning is avoided and the tree can be retained in the landscape. Community Development staff work with designers in advance to pursue the following strategies which can help maintain existing vegetation, and space for additional trees.

- Where feasible, the location of the existing driveway and pavement surfaces is retained.
- The soil grade in the tree protection zone is not altered.
- Compaction in planting areas is avoided by limiting machinery and weight.
- A code enforcement officer meets with the property owner and contractor on the site to discuss and explain tree protection measures.
- Large reductions of canopy or foliage are avoided.

Tree Removal Permit Process.

A Tree Permit application is required for the removal and replacement of protected trees. To be approved, at least one of the following criteria has to be met:

- The tree is dead
- The tree is a health or safety hazard, or is structurally unstable
- The tree is dying or in marginal condition and reasonable alternatives to preserve or rejuvenate the tree have been implemented unsuccessfully or have been analyzed, and are not feasible
- Residential buildings shall take priority over tree preservation, however alternative designs and materials, have to be considered and implemented, as feasible, with the proposed overall design of the project
- The tree is causing or will cause in the near future, significant damage to public or private property, which creates a liability, health or safety concern, and cannot reasonably be repaired, maintained or corrected. Trees causing damage to sewers, water lines or other similar private underground utilities, in itself are not considered to meet the criteria for removal and replacement
- The tree is obstructing protected solar access as regulated by California State law, Solar Shade Control Act, Public Resources Code 25980-25986, and the tree cannot be reasonably pruned or maintained in accordance with the State requirements.

The Director may require the applicant to submit a report from an International Society of Arboriculture (ISA) certified arborist or other horticultural professional, and/or historical or other support documentation in order to substantiate that the required criteria and

findings have been met. The City arborist and/or other City staff may review the information. All costs are the responsibility of the applicant.

If the applicant's arborist or other horticultural professional is not in agreement with the findings of the City arborist or staff, a third party ISA certified arborist, agreed to by the applicant and the City, may be contracted to mediate the situation. The cost of this third party arborist are shared between the applicant and the City.

Community Outreach

The City of Manhattan Beach values transparency and input from the community. Tree preservation is strongly supported by many community members, and residents identify strongly with environmental values. City personnel and community members agree that increased clarity and communication is beneficial. In response, the UFMP includes multiple strategies for outreach and public input.

Currently, much of the community outreach that occurs is through face-to-face interactions with city personnel when a tree removal permit is requested, a tree is being protected during construction, or a new street tree is being planted. City personnel assist individuals in species and location selection, and provide knowledge of local micro-climate conditions that impact different species capacity to thrive in a given location.

In addition to these personal interactions, the City website provides residents the following information:

- City of Manhattan Beach Street Tree List, organized by zone
- Tree removal permit form, clearly defining tree protection during construction requirements
- Background for this Urban Forest Master Plan (Listed as Street Tree Master Plan)
- Summary information about the Municipal Ordinance sections that impact trees (Section 10.52.120, and 7.32)
- A series of handouts from the Manhattan Canopy Tree Committee
- Information on pruning trees near power lines

Conclusion

Manhattan Beach has a primarily established, young tree population in good condition, with good species diversity. The city's commitment to maintenance of the tree resource is apparent from the ongoing contracted regular maintenance of trees, on a 1-2 year cycle, infrastructure maintenance, and emergency response. The next section discusses strategies to maintain and improve the structure and environmental benefits from the community urban forest for years to come. Opportunities include re-evaluation of urban forestry programming and maintenance practices, defining key attributes of significant and high value trees, and focusing on careful species selection to plant trees that will provide maximum beauty and benefits in the available space.

Periodic updates have created strong city ordinances that preserve and protect street trees in the public right-of-way, and private trees in development and construction. With minor changes and increased communication and clarity, these tree policies will continue to address individual property owners' needs, balanced by community benefits and values. Opportunities include developing summaries of policies that are user-friendly and comprehensive, evaluating the structure of the urban forest program and personnel roles, and optimizing funding.

Manhattan Beach personnel regularly meet with residents and developers to discuss tree conflicts, infrastructure disruption, and tree preservation. This ongoing outreach and along with other elements of urban forest management, has become a large task, requiring approximately 1,800 hours of dedicated staff time, spread among 7 individuals. The following section discusses strategies that will help Manhattan Beach maintain the high level of service to residents with some restructuring of staff responsibilities.

Understanding the current tree resource and urban forest program, benchmarks can be set so that improvement can be clearly quantified. With this UFMP, Manhattan Beach has the basis for continued performance evaluation of the tree resource and the urban forest program. The following section will provide methods for reviewing and measuring attainment of the UFMP goals, and ultimately, the community vision for the urban forest.

Altogether, Manhattan Beach is poised to enjoy increasing environmental benefits and socio-economic value from the community's urban forest. This growth will support the community's vision for a high quality of life. Considering that a healthy and vibrant urban forest is vital to supporting Manhattan Beach's small beach town character the community is fortunate to have a comprehensive plan for the preservation and management of this resource.

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



WHAT DO WE WANT?

Community Participation

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

The public meetings and the online survey were promoted through local newspaper, social media, the City's website as well as by e-mail to interested residents.

Public Meetings

During Plan development, three (3) community meetings were held to gather community input and provide updates as the Plan was in process. Meetings were held in the evening, on March 12, 24 and April 22, and included a 30-40 minutes prepared presentation followed by questions from participants, voting posters, and discussions. A total of 22 people attended one or more meetings.

Following the presentation attendees participated in a discussion and planning session to identify goals and objectives for the Urban Forest Master Plan.

Attendees discussed expectations for public tree maintenance and locations where additional trees are desired. Discussion also included what types of education and outreach residents would like to see along with ways to incentivize tree preservation and planting on private property.

Participants were asked to rank various ideas in consideration for the UFMP with colored dots that indicated their support or lack of support for different approaches. Participants identified Aesthetics and Wildlife habitat as very important (11 participants prioritizing each benefit), while Economics, Tourism, and Retail benefits were valued less by the majority (9 participants). The majority of participants supported optimal care for trees (13), and high species diversity (22 participants). Monocultures by streets or neighborhoods were very unpopular, with 19 participants not in favor. Popular locations for additional tree planting included streets (11) and greenbelts (10). Community outreach events about tree planting were supported by 12 participants and 10 were unsure or neutral about the concept of tree pruning workshops. A mixed response was given to the idea of outreach to encourage tree planting on private property with 5 neutral or unsure, 4 in favor, and 6 not in favor.

Online Survey

In addition, an online survey, available from February 27 through March 28, 2015, was completed by 36 individuals. This sample was a self-selected group of residents, and not a random sample. In addition, the participants represent just 36 residents in a city with a population of 35,135. Additional solicitation of community input will be a beneficial element of the adaptive management of the urban forest in coming years.

The 20 question survey polled participants about topics including:

- Which tree benefits were most important
- Perceptions of the current urban forest program
- Whether the city needs more trees
- Whether trees need more, or a different kind, of maintenance
- Participant demographics
- Other/ open-ended

When asked to rank tree benefits from most important to least important, Air Quality benefits were ranked most important by 19 participants, (50% of respondents), and, overall, in the top or second place by a total of 26 respondents, (72%) (Figure 6). The rankings of other environmental tree benefits showed high variability of opinion, with participants ranking energy savings and water quality with little overall discernable trend. Wildlife habitat was ranked less important, by 20 participants (55%) ranking it 4 or 5, indicating less importance than the other benefits. Carbon storage was also ranked less important, with 18 participants (50%) ranking the benefit 4 or 5, less, or least important, and just 2 respondents ranking it most important.

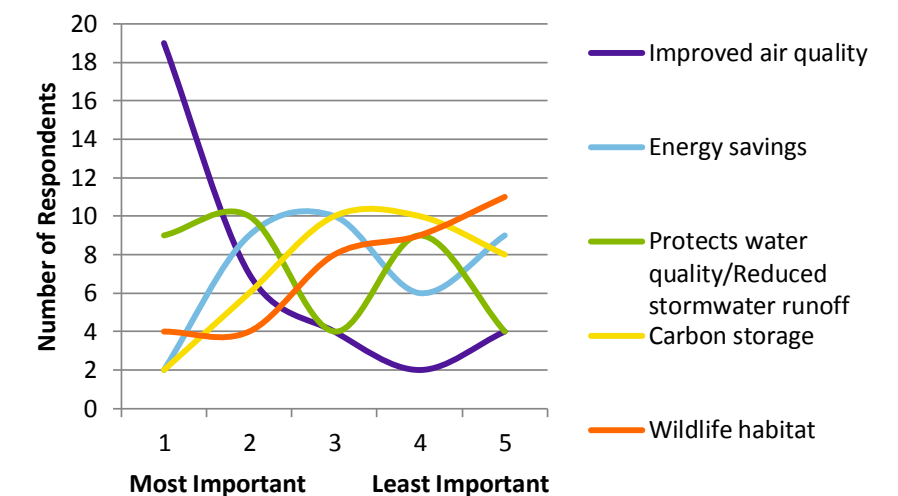


Figure 6. Online Survey Participant Ranking of Environmental Benefits

Considering aesthetic and socio-economic factors (Figure 7), participants ranked the following benefits most valuable:

- Attractive to residents and tourists
- Beauty/aesthetics
- Shaded trails, sidewalks, and bike trails

The following benefits received rankings that trended toward least important:

- Shaded parking
- Improve retail areas and neighborhoods
- Increased property values
- Passive recreation
- Shaded streets

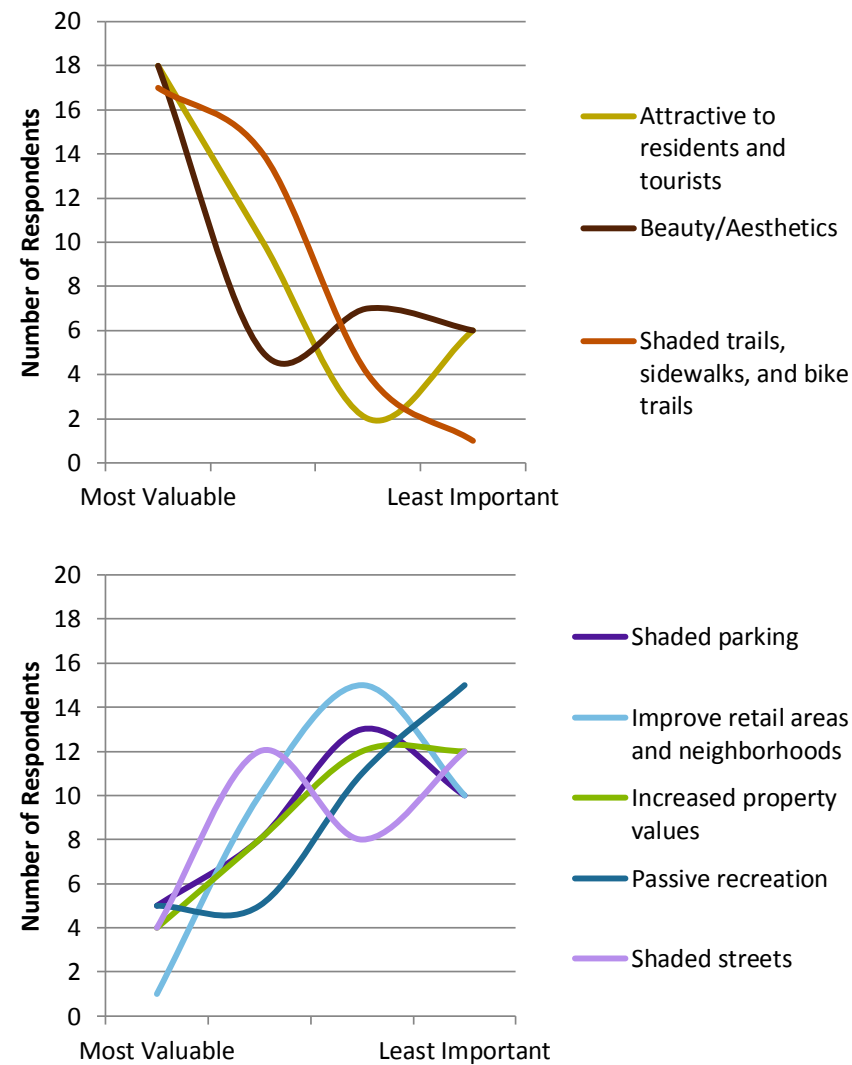


Figure 7. Online Survey Participant Ranking of Socio-economic and Aesthetic Benefits

When asked about their awareness of the City's urban forest program, 17 respondents (47%) said they were unaware the city had an urban forest program, 8 respondents (22%) had visited the city's webpage for information about trees and/or the urban forest, and 7 respondents had read a newspaper article that discussed public trees and/or Manhattan Beach's urban forest.

The next section of the survey asked participants about the importance of trees in Manhattan Beach. A majority of respondents (14 people, 67%) strongly agreed that trees are important to the quality of life. Ten (10, 28%) agreed. Fifteen respondents (42%) strongly agreed that Manhattan Beach needs more public trees, while 12 respondents (33%) agreed and 6 (17%) disagreed. When asked where more trees should be planted, the largest portion of respondents (22 people, 61%) indicated they would like to see more public trees in open space and natural areas, followed by parks (21 people, 58%) and streetscapes (19 people, 53%)

Half of respondents (18 people) agreed they were satisfied with the current level of maintenance provided for public trees, and 2 (6%) strongly agreed. Thirteen respondents (36%) disagreed (8) or strongly disagreed (5), and 3 respondents (8%) were unsure. When asked what level of maintenance trees should receive, the most popular approach was best possible care (clearance, structure, and health) selected by two-thirds of respondents (24 people, 67%)

For the two following questions, respondents were allowed to check all that applied.

When asked about types of education and public outreach participants would like to see offered by the urban forestry program, the most popular topics were tree care (23 people, 64%) and species information (22 people, 61%) followed by tree pruning (18 people, 50%, and tree planting (16 people, 44%).

Over three quarters of respondents (28 people, 78%) supported education and outreach as the best way to encourage tree planting and preservation on private property, followed by free trees (20 respondents, 56%).

Demographically, respondents were 42% male, 47% female, and 11% declined to state. Just two respondents, 6% were age 36-45, 22% were 46-55, and 72% were over 56 years old. All respondents stated they were residents of the city, and 58% also stated they appreciate public trees. Almost a quarter (22%) stated they had donated to a non-profit foundation in support of public trees.

Interviews

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

Davey Resource Group worked with the Street Superintendent to identify City departments and individuals who have a stake in the management of Manhattan Beach's public trees. Stakeholders were invited to participate in an interview and discussion about their role and perspective for the urban forest as well as their views, concerns, and ideas for the Urban Forest Master Plan.

Interviews were conducted with key city personnel including:

- Maintenance Superintendent
- Planning Manager
- Street Maintenance Supervisors
- Consulting Arborist
- Recreation Services Manager

These interviews provided important information about the current functions of the urban forestry program and potential areas for improvement. Concerns, requests, and suggestions from all stakeholders were of primary interest and were provided full consideration in the development of the Urban Forest Master Plan.

Key concepts gathered through the stakeholder interview process include the following:

- Tree species selection could be more intentionally guided so the right trees are planted in the right places.
- Infrastructure conflicts are becoming more common as large trees mature in small parkway planting areas.
- Residents express confusion about the rules and regulations related to trees.
- Urban forestry duties are performed as part of seven different personnel's duties.
- There is a need to balance individual property owner's desires with the community vision for the urban forest.
- Trees pruned by adjacent property owners receive inconsistent care, while city-maintained trees receive pruning as needed on a 1-2 year cycle.
- Consider broadening the tree species palette and contract growing hard to find species that have seaside success.
- The community utilizes parks and open space heavily for outdoor recreation and exercise.



Plan Goals and Objectives

Based upon review of the current urban forestry program and resources (What Do We Have?) and input from the community and other stakeholders (What Do We Want?), the UFMP identifies nine goals that represent what we want for the future of Manhattan Beach's community urban forest. The goals and objectives are intended to adequately manage the City's urban forest in a timely, cost-effective, and efficient manner. This includes the proactive identification of risk and mitigation strategies to promote public safety and reduce liability.

In addition, the UFMP considers objectives for optimizing the value and benefits of this resource through tree planting and replacement programs that will ensure the future resiliency of the resource and the maximization of environmental, social, and economic benefits from trees and canopy. Finally, the UFMP recognizes that community engagement is integral to successfully achieving the goals and objectives for the future of the community urban forest. Consequently, the UFMP includes well developed objectives for public engagement, outreach, and education.

Definitions

- Sustainable:** Ability to be repeated and performed at a desired level for an extended period of time
- Best Management Practices (BMPs):** National standards developed by industry leaders that represent the ideal actions and activities for the industry
- Tree Species Palette:** A list of suitable trees with traits and projections of performance at maturity based on local conditions
- High-Value Trees:** Trees in fair to excellent condition which contribute greatly to the urban forest and are exceptional because of their size, species, historic significance, ecological value or aesthetics as determined by city staff
- Accessible:** Free from obstructions or hazards that hinder public use
- Publicly Maintained Tree:** A tree located along main streets and/or in a city park or facility.
- Privately Maintained Tree:** A tree located on private property, or in the parkway of residential properties.
- Right Tree - Right Place:** The practice of installing the optimal species for a particular planting site. 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. Species considerations include mature stature, invasiveness of roots, drought tolerance, salt tolerance, and fruit production.

Urban Forest Structure

Goal: Sustainable, healthy, and safe community tree resource

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

Objectives for this goal include, optimizing pruning and maintenance cycles, and updating the species palette and planting design specifications, as well as encouraging innovative designs to increase soil volume and stormwater infiltration (Appendix)

Goal: Preservation of significant and high value trees

This goal and supporting objectives focus on helping city personnel identify trees that should be preserved regardless of infrastructure impacts and other nuisances. These significant and high value trees may be important because of their stature (DBH, height, and canopy width), unique species, or historical attributes.

Goal: Optimize available planting space for beauty and benefits

This goal and supporting objectives provide resources for residents and city personnel to select species based on unique site characteristic to plant the right tree in the right place. 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. Species considerations include mature stature, invasiveness of roots, drought tolerance, salt tolerance, and fruit production.

Urban Forest Policy

Comprehensive, user-friendly regulations and policies

Feedback from residents and city personnel indicated that the current municipal codes relating to trees are considered complex and difficult to understand. This goal and associated objectives focus on minor revisions to the municipal code, coupled with the production of online and print resources that help summarize and decipher the municipal code, using simple language and graphics to aid in understanding and communicating the regulations.

Optimize urban forestry programming

This goal is intended to optimize the structure and organization of Manhattan Beach's urban forestry program and provides the necessary support for day-to-day operations and the implementation of the UFMP. The objectives for this goal include optimizing the organizational

structure for urban forestry operations, consolidating tree-related tasks to a single staff position, and exploring opportunities to reduce costs with efficiencies in management.

Optimize funding and identify new opportunities

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

Communicate a Focus on Beauty, Benefits, and Sustainability

Optimize the recreational potential of public green spaces pedestrian use

In the online survey, a large portion of respondents indicated they would like to see more public trees in open space, natural areas, and parks. This goal and the supporting objectives prioritize identifying appropriate places for tree planting that will shade paths and recreational areas while maintaining visibility through parks for public safety.

Increase outreach and education

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

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

Review and measure attainment of the UFMP

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

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

Preserve and enrich wildlife habitat

This goal and supporting objectives promote education of tree maintenance providers to understand the seasonality of bird nesting, and follow state regulations regarding urban wildlife. Consideration is also given to butterflies and beneficial insect populations.



HOW DO WE GET THERE?

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

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



Maintain and improve the structure and environmental benefits from the community urban forest

Goal: Sustainable, healthy, and safe community tree resource

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

Objectives in support of this goal include:	Cost	Method of Measurement	Target
<p>1. Apply best management practices (BMPs) and industry standards to all tree care operations.</p> <p>The Tree Care Industry Association (TCIA) and the International Society of Arboriculture (ISA) partner with government agencies, tree care companies, and green industry organizations to develop and maintain comprehensive standards approved by the American National Standards Institute (ANSI). The ANSI A300 Series applies to tree care operations and ANSI Z133 safety requirements apply to employers and employees engaged in arboricultural operations. The ISA Best Management Practices (BMP) Series compliments these standards.</p> <p>The City of Manhattan Beach applies these standards, which are based on current science, to ensure the highest level of tree care, thereby promoting health and longevity, reducing the risk of tree failure, and minimizing liability.</p> <p>Actions:</p> <p>A) Ensure that all contract specification and in-house policies and directives require that tree care operations adhere to current industry and best management practices (BMPs).</p> <ul style="list-style-type: none"> o ANSI A300 Standards for Tree Care Operations o ANSI Z133 Safety Requirements o ISA Best Management Practices 	\$ Low	<p>1) Perform QA inspections & documentations on a routine basis.</p> <p>2) Review standards & BMPs on an annual basis.</p>	<p>2016-2017</p> <p>Annually thereafter</p>
<p>2. Increase diversity in the community tree resource</p> <p>Species diversity in an urban forest is an indicator of the overall health and stability of the resource. Greater diversity promotes greater resistance to pests, disease, and environmental stresses. High reliance on one or a few key species can result in devastating losses within the resource and to the benefits afforded to the community in the event of a major pest or disease outbreak (e.g., emerald ash borer, Dutch elm disease).</p> <p>Climate change is expected to have a significant effect on all forests (including urban forests) because of changes in temperatures (average, high, and low) and increases in pest and disease outbreaks. Species that are marginal now may experience either an advantage or a disadvantage from these changes. Increasing species diversity in the overall population will be critical to preparing for these changes and promoting sustainability of both tree canopy and benefits.</p> <p>Manhattan Beach's community tree resource includes more than 180 unique species with good diversity among non-palm species. Maintaining this high diversity and reducing planting of palm species will be important as increased urban density provides less space for high-benefit medium to large canopy non-palm species. This strategy promotes sustainability of the overall community tree resource and lessens the likelihood of catastrophic loss at the neighborhood level.</p> <p>Actions:</p> <p>A) Review and update the Tree Species Palette every 5 years, or as factors, such as pests or drought impact the current tree resource.</p> <p>B) Review the performance of existing species in the inventory to identify performance history and continued suitability and/or ideal distribution.</p>	\$\$ Medium	<p>1.) Conduct a species diversity analysis of the public tree resource every 5 years.</p>	<p>2016 - 2025</p>

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

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

Maintain and improve the structure and environmental benefits from the community urban forest

Goal: Sustainable, healthy, and safe community tree resource

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

Objectives in support of this goal include:

3. Transition pruning and removal duties from private property owners to city personnel

A large portion of the public urban forest (7,459 trees) is currently maintained by adjacent property owners. This has resulted in maintenance that is highly variable, occurring at different time intervals and with different pruning objectives. Manhattan Beach has an opportunity to make these intervals, and the quality of pruning more regular, and more in line with industry BMPs.

Actions:

- A) Conduct a cost analysis based on the current inventory
- B) Project costs of maintenance in 5 and 10 years.
- C) Conduct a poll of residents to determine support with a random sample of homeowners

Cost	Method of Measurement	Target
\$\$\$ High	1) Poll of randomly-selected residents to determine support	2020

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

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

Maintain and improve the structure and environmental benefits from the community urban forest

Goal: Preservation of significant and high-value trees

This goal is intended to provide guidelines and innovative site designs to allow for the preservation of significant, high-value trees as trees grow and conflicts arise. Medium and large-stature trees are crucial in providing urban forest benefits and promoting the community's desired values for the urban forest.

Objectives in support of this goal include:

Objectives in support of this goal include:	Cost	Method of Measurement	Target
<p>1. Develop guidelines to identify and preserve significant trees Trees identified for preservation should be in fair to excellent condition, which contribute greatly to the urban forest and are exceptional because of their size, species, historic significance, ecological value or aesthetics as determined by city personnel. Information about the thresholds for these trees should be provided in user-friendly formats so community members can determine if their tree is a good candidate for preservation.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Work with city personnel and the community to identify the qualities and character of trees desirable for preservation. Identify DBH, height, or canopy criteria that indicate a tree is significant or high-value B) Conduct inter-departmental training to share thresholds and qualities to ensure property owners and community members receive consistent information from all city personnel 	\$ Low	1) Report the number of trees preserved annually.	2017 - 2021
<p>2. Continue to promote tree preservation during development As property values increase, redevelopment becomes common and increasingly large buildings footprints are proposed as the market will bear larger and higher value structures. However, tree preservation or the preservation of space for vegetation also adds values to properties, and retains neighborhood character. In instances where tree preservation is not advised due to tree health, performance, or structure, space for new tree planting should be maximized, including providing sufficient soil volumes to accommodate large or medium stature trees at maturity.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Retain and enforce, existing tree preservation methods and standards B) Work with developers and property owners to adjust site designs to minimize root pruning or removal of major limbs 	\$ - Low	1) Report the number of trees preserved and removed as a result of development permits, as well as reasons removal was approved.	2016
<p>3. Promote infrastructure repair strategies that preserve tree roots while providing accessible sidewalks Retaining medium and large stature trees can be a challenge in Manhattan Beach, where planting space is often limited by hardscape. Since Manhattan Beach provides the sidewalk repair to residents, it may be possible in some instances to employ innovative repair strategies . If additional costs are incurred to employ these designs, the costs can be spread over the entire repair budget, or mitigated by tree preservation funds.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Consider pavement repair options to reduce repeated conflicts between trees and other infrastructure (Appendix A, <i>Alternative Planter Designs</i>) <ul style="list-style-type: none"> o Suspended pavement o Pervious pavement/rubberized pavers o Flexible (e.g., rubber) sidewalks 	\$\$ - Medium	1) Evaluate sidewalk repair sites for potential to accommodate innovative repair strategies.	2016

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

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

Maintain and improve the structure and environmental benefits from the community urban forest

Goal: Optimize available planting space for beauty and benefits

Planting the right tree in the right place means installing the optimal species for a particular planting site. 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. Species considerations include mature stature, invasiveness of roots, drought tolerance, salt tolerance, and fruit production. In addition, consideration of whether a location can support a tree is important. This goal provides tools to ensure trees are appropriate to planting sites, and adapting difficult sites so trees can thrive.

Objectives in support of this goal include:

	Cost	Method of Measurement	Target
<p>1. Develop a tree planting and replacement plan with an emphasis on planting the right tree in the right place.</p> <p>A revised tree palette was developed as part of this UFMP. This palette should be reviewed and updated as new cultivars become available, and new pests and stressors become apparent. Community values are important to consider, especially views, safety, and comfort for pedestrians and joggers. When new tree planting locations are identified, signage and stakes should be set out in advance and neighbors should be provided opportunity for input well in advance of tree planting. In parkways, conflicts can be avoided by limiting species selection to trees appropriate for parkway widths.</p> <p>Actions:</p> <p>A) Provide residents with a userfriendly tree palette for selection of parkway trees, including key metrics on tree stature at maturity, appropriate planter width, water use, and other useful information</p> <ul style="list-style-type: none"> o Avoid/reduce hardscape and utility conflicts o Match tree species to soil and water conditions o Match tree species to planter size and intended use/objective <p>B) Identify strategic locations for additional open space trees in parks and greenways</p> <ul style="list-style-type: none"> o Conduct an inventory of vacant sites and record possible conflicts such as line of sight and view obstruction for neighboring properties. o Plant trees where they will provide the most benefit to pedestrians and park users with minimal conflict. 	\$ - Low	<p>1) Produce print and online tree selection resources.</p> <p>2) Conduct an inventory of possible planting sites.</p> <p>3) Post signage and stakes to solicit neighborhood input about possible tree planting locations.</p>	2017
<p>2. When new sidewalks are installed, promote design and construction standards that increase soil volume and planting space.</p> <p>To reach full potential (i.e., a trunk diameter, height, and canopy spread typical of the species) and to provide the greatest benefits to the community, a tree must have enough soil volume to support healthy root growth and structure (Appendix A, Soil Volume & Tree Stature). This is particularly important in parking lots and other paved areas where the temperatures of surrounding asphalt can inhibit the natural spread of roots beyond planter boundaries. In addition to planter design, species selection is critical (e.g., right tree, right place) to ensuring that a tree will perform its intended role and function in the landscape in balance with other infrastructure.</p> <p>Actions:</p> <p>A) Supplement Planter Design Standards with options for increasing soil volume where above ground area is restricted by impervious surfaces (Appendix A, Alternative Planter Designs).</p>	\$ - Low	1) Adopt planter design standards.	2017
<p>3. Promote planter design and construction standards that reduce runoff and promote stormwater retention</p> <p>In Manhattan Beach, stormwater flows untreated directly into the ocean. This, coupled by the fact that California is experiencing drought conditions, limiting irrigation quantities and frequency make stormwater retention in vegetated areas even more beneficial to the immediate environment.</p> <p>Actions:</p> <p>A) Supplement Planter Design Standards with additional options for incorporating trees into stormwater management (Appendix A, Alternative Planter Designs).</p> <ul style="list-style-type: none"> o Stormwater tree pits and drainage plans o Interconnected tree pits o Bioswales 	\$ - Low	1) Adopt planter design standards.	2017

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

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

Establish comprehensive policies and procedures for tree preservation, planting, and maintenance

Goal: Comprehensive, user-friendly regulations and policies

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

Objectives in support of this goal include:	Cost	Method of Measurement	Target
<p>1. Provide comprehensive, reasonable, and transparent policies and procedures for tree removal permits</p> <p>Currently, tree removal permits are only approved for trees that are seriously diseased, dying, or hazardous. Community members have requested tree removal permits because trees are disrupting pavement, or to enhance views, and these are typically not granted. Subsequent appeals have not been successful. This objective is intended to make the tree permit policies more clear and comprehensive.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Create two tree permit applications. One form should address tree removal and replacement, and another should address tree protection during construction. B) Revise the tree Permit Application form to add information about reasons tree permits may be declined, including view enhancement, leaf or litter drop, and infrastructure disruption. Also include the five criteria for removal as specified in Ordinance Section 10.52.120. C) Provide a sample tree protection during construction plan on the City website. Include all the necessary information so it can be used as a template. D) Provide a diagram illustrating the tree protection zone in plan view. 	\$\$ Medium	1) Quantify personnel hours spent providing advice and instruction, and requesting additional information to process tree removal permits.	2016-2017 Review annually
<p>2. Revise 10.52.120 Tree Preservation and Restoration Ordinance</p> <p>Overall the ordinance provides strong protections to protected trees in the tree protection zone located on private property. Public input indicated confusion about the definitions and rules in this ordinance section. The proposed updates will help the ordinance to be more clear and consistent with section 7.32.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Strengthen the language describing the procedure for required replacement trees to require the replacement tree is an appropriate species from the Manhattan Beach Tree Species Palette, and that the tree is installed according to the city's tree planting detail. B) Create a clear definition for public nuisance trees and develop a species list of palms and deciduous fruiting trees that will be granted removal permits if replaced with a species recommended by the Manhattan Beach Tree Species Palette C) Remove reference to crown thinning to prevent wind damage. Instead, reference ANSI A300 pruning standards. 	\$ Low	1) Revise 10.52.120 Tree Preservation and Restoration Ordinance	2016 Review as needed
<p>3. Revise 7.32 Tree, Shrub and Plant Regulations</p> <p>Overall the ordinance provides strong protections to trees along streets, in parks and at city facilities. Public input indicated confusion about the definitions and rules in this ordinance section. The proposed updates will help the ordinance to be more clear and consistent with section 10.52.120</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Create a clearer, more detailed definition for "Street trees" and "Trees and shrubs" B) Require replacement trees be appropriate species from the Manhattan Beach Tree Species Palette, and that the tree is installed according to the city's tree planting detail. C) Provide rules for the installation of temporary lighting on street trees 	\$ Low	1) Revise 7.32 Tree, Shrub, and Plant Regulations	2016 Review as needed

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

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

Establish comprehensive policies and procedures for tree preservation, planting, and maintenance

Goal: Optimize urban forestry programming

A strong urban forestry program requires leadership and constancy of vision to accomplish community urban forestry goals. This goal, and the objectives that support it are designed to develop a strong program structure and communicate a consistent vision for the urban forest in all city documents.

Objectives in support of this goal include:

Objectives in support of this goal include:	Cost	Method of Measurement	Target
<p>1. Create an urban forester position to interface with residents, provide expertise in arboriculture, and serve as a single point of contact for all tree concerns.</p> <p>Currently, there are seven different city personnel who work together to manage tree-related issues in Manhattan Beach. At times this creates redundancy of work for personnel and multiple site visits to determine an appropriate course of action for a given tree based on site conditions, tree health and structure, and property owner requests. A single point of contact for tree related concerns would streamline this process and allow other personnel to focus on their assigned duties.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Secure funding for the position. B) Allow sufficient time to recruit the optimal candidate. C) Direct tree issues and concern to the urban forester. 	<p>\$\$ Medium</p>	<p>1) Hire an Urban Forester by 2015.</p>	<p>2015-2017 Annually</p>
<p>2. Coordinate with existing and new planning documents to reference and align with the UFMP</p> <p>The UFMP is complimentary and supportive of the Veteran’s Parkway Master Plan, and aligns with the values in the Community Resources section of the General Plan. As new planning documents and master plans are developed, and existing ones are reviewed, the Urban Forester will review them for consistency with the UFMP and the community’s vision for the urban forest.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) As revisions occur, recognize the value of the UFMP and the role of trees and tree canopy as implementation measures for goals identified in the various elements of the General Plan. B) Insure that all specific plans reference the UFMP Tree Care Standards and include consideration for the establishment of public trees, including the construction of planting sites that support tree maturity. 	<p>\$ Low</p>	<p>1) Update documents to reference and align with UFMP</p>	<p>2016 Ongoing</p>

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

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

Establish comprehensive policies and procedures for tree preservation, planting, and maintenance

Goal: Optimize funding and identify new opportunities

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

Objectives in support of this goal include:

Objectives in support of this goal include:	Cost	Method of Measurement	Target
<p>1. Explore feasibility of alternative funding strategies to fund the care of community trees in neighborhoods</p> <p>Landscape and Lighting assessment funds are currently only allocated to lighting expenses. If community support exists, the scope of these assessments could be expanded to include tree care and maintenance. Additional options include fees, fines, mitigation</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Conduct a poll of randomly selected voting residents to determine support. B) If insufficient support exists, develop and provide outreach and education to residents about how regular pruning improves tree health, longevity and structure. <ul style="list-style-type: none"> o Illustrate the benefits of the urban forest and the potential results and costs of irregular maintenance. C) Conduct research to identify alternative funding sources. 	<p>\$ Low</p>	<p>1) Conduct a poll of randomly selected voting residents.</p>	<p>2016-2017 Annually</p>

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

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

Communicate a vision for the urban forest that focuses on beauty, benefits, and sustainability

Goal: Optimize the recreational potential of public green spaces for pedestrian use

This goal is intended to support outdoor recreation and use of public space by maintaining existing trees at an optimal level and plant new trees in strategic locations to maximize benefits.

Objectives in support of this goal include:	Cost	Method of Measurement	Target
<p>1. Optimize trees and vegetation along sidewalks and pathways to promote walkability.</p> <p>Many Manhattan Beach residents and visitors enjoy outdoor recreation and the aesthetics of well-landscaped areas. Trees and vegetation are important to maintaining pedestrian friendly, human scale streetscapes and park landscapes. Strategic locations for additional tree planting to reinforce these values has not been recently assessed.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Conduct an inventory of vacant sites in conjunction with the next regularly scheduled inventory with the following in mind: <ul style="list-style-type: none"> o Increase shade on paths while maintaining safety and line of sight along greenways. o Ensure appropriate parkway locations are planted with species that will provide optimal benefits for the available soil volume, accommodating infrastructure and signage. 	\$ Low	1) Inventory vacant sites	2018 Every 5 years
<p>2. Ensure accessibility of sidewalks by continuing regular maintenance of infrastructure disruptions</p> <p>Established in the mid-1990s, the pavement repair program identifies and repairs pavement areas disrupted by trees and other infrastructure issues. This program provides a review every 7 years. A systematic approach to this problem allows the city to address work that has the greatest potential to increase risks and liability.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Conduct a city-wide inventory of pavement disruptions concurrent with the next tree inventory update B) Prioritize repair work to decrease risk and liability, and promote public safety. 	\$\$\$\$ Very High	1) Inventory pavement disruptions in conjunction with the next tree inventory update.	2015 Ongoing

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

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

Communicate a vision for the urban forest that focuses on beauty, benefits, and sustainability

Goal: Increase outreach and education

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

Objectives in support of this goal include:	Cost	Method of Measurement	Target
<p>1. Enhance and maintain the City webpage for the community urban forestry program</p> <p>The urban forestry webpage is the first place residents and others consult for information about community trees, and tree care information. It should be engaging, user-friendly, and a comprehensive resource for everything about trees in Manhattan Beach.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Incorporate Information and images that illustrate the state of the urban forest and Manhattan Beach’s canopy cover, including composition and benefits. B) Include active links and engaging articles for residents and property managers, including: <ul style="list-style-type: none"> o How to plant a tree o How to prune a tree o How to fertilize and mulch o How to irrigate and care for trees in times of drought o How to hire an arborist or tree care company B) Include links to electric and natural gas utility websites that explain safety and Right Tree, Right Place concepts. C) Include information about the City’s pruning cycle for community trees so that residents can see when their neighborhood is scheduled for maintenance. D) Include facts and links to the City’s tree protection regulations, requirements, policies, and necessary forms. <ul style="list-style-type: none"> o Accessible database of pending and active requests for Heritage Tree removal permits o Benefits and responsibilities of private property owners for parkway trees E) Include the revised species palette. F) Include information and links on habitat enhancement and wildlife protection: <ul style="list-style-type: none"> o Non-native and invasive species o Wildlife and habitat 	<p>\$ Low</p>	<p>1) Collect analytics to determine number of users accessing content.</p>	<p>2015 Quarterly or as needed.</p>
<p>2. Develop informational brochures</p> <p>Not all residents have easy access to online information, and much of the current urban forest outreach and education is provided by City personnel at site visits, so additional brochures and literature can be useful tools.</p> <p>Actions:</p> <p>Develop brochures for the following topics:</p> <ul style="list-style-type: none"> o How to plant a tree o How to prune a tree o How to fertilize and mulch o How to irrigate and care for trees in times of drought 	<p>\$ Low</p>	<p>1) Monitor brochure distribution rates and locations.</p>	<p>2015 - 2016</p>

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

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

Communicate a vision for the urban forest that focuses on beauty, benefits, and sustainability

Goal: Preserve and enrich wildlife habitat

Urban trees and forests provide critical habitat (foraging, nesting, spawning, etc.) for the wildlife who share our environment. Where possible, the City incorporates tree species that specifically support foraging and cover in the urban landscape.

Federal and state regulations protect endangered and migratory species and nearly all common wild birds in the U.S. During nesting season (February through mid-September), tree trimming and other maintenance operations can reduce valuable nesting sites and potentially cause harm to birds, eggs, and fledglings. When possible, scheduling major tree trimming operations (e.g., block side pruning) to occur between late September through January can greatly reduce the likelihood of harm. In addition, contractors and in-house staff must be made aware of regulations and be properly trained to identify and avoid disruption to active nests.

Objectives in support of this goal include:

Objectives in support of this goal include:	Cost	Method of Measurement	Target
<p>1. Develop and implement forestry practices and policies that protect birds and other wildlife. Urban trees provide shelter and homes for many bird and wildlife species. Forestry operations should provide adequate consideration to the protection of these species and their habitat.</p> <p>Actions:</p> <ul style="list-style-type: none"> A) While not always possible, it is preferable to schedule major tree care operations like block-side pruning to occur from late September through January. This will greatly minimize interference or harm to nesting birds. B) When tree trimming and other potentially disruptive activities must occur during the nesting period, all contracted and in-house personnel participating in the activity shall be aware of state and federal regulations protecting nesting birds and be properly trained to identify and avoid the disturbance of any active nests. <ul style="list-style-type: none"> o Ensure that contract specifications require appropriate training and certification to comply with all state and federal regulations that protect endangered and migratory species and nesting birds. <ul style="list-style-type: none"> - Federal Migratory Bird Treaty Act (MBTA) - Federal Endangered Species Act - California Fish and Game Code, Section 3503 	\$ Low	1) Track phenology of nesting of desirable species and bloom times of nectary plant species.	2015 Annually
<p>2. Promote important habitat tree species for cover, foraging and nesting Whenever possible, tree planting and preservation projects will provide consideration for habitat enrichment by planting and preserving species that provide critical nesting, foraging, and cover resources for birds and wildlife</p> <p>Actions:</p> <ul style="list-style-type: none"> A) Whenever possible, landscape and tree planting projects should incorporate species to enrich wildlife habitat within the community by providing important cover, nesting, and foraging sources. B) Parks and other open spaces should be prioritized as fruit, litter or other potential nuisance factors are typically not an issue in these areas 	\$ Low	1) Track species distribution for new tree plantings annually.	2015

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

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

Communicate a vision for the urban forest that focuses on beauty, benefits, and sustainability

Goal: Review and measure attainment of the UFMP

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

Objectives in support of this goal include:

	Cost	Method of Measurement	Target
<p>1. Annually, review the UFMP and the attainment status of goals and objectives.</p> <p>The UFMP is intended to be an active tool that can and should be adjusted in response to available resources and changes in community expectations. In addition to serving as a day-to-day guide for planning and policy making, the Urban Forest Master Plan should be reviewed annually for progress and integration of objectives into the annual work plan.</p> <p>Actions:</p> <p>A) Review UFMP annually and adjust targets as necessary. B) Integrate current objectives and actions into the annual work plan.</p>	\$ Low	1) Annual UFMP Updates	2016-2017 Annually
<p>2. Reestablish Tree City USA status.</p> <p>Tree City USA is a nationally recognized program that helps communities strategically focus resources toward improving and enhancing the community urban forest. Applying for TCUSA status demonstrates a community's commitment and care for the urban forest and provides metrics for measuring growth and effectiveness. In some years, the city may also qualify for a TCUSA Growth Award.</p> <p>Actions:</p> <p>A) Identify a Tree Board or Department B) Maintain the Tree Ordinance C) Calculate the annual Community Forestry Program Budget. (The requirement is at least \$ per capita. Manhattan Beach's current rate is already greater.) D) Celebrate Arbor Day and issue a Proclamation. California cities often celebrate Arbor Day in early March.</p>	No cost.	1) Reestablish TCUSA status 2) Review programs to determine Growth Award Eligibility.	2015/2016
<p>3. Develop a State of the Urban Forest Report.</p> <p>Public support is critical to a successful and sustainable urban forest program. Keeping stakeholders well informed is the best way to generate support and engagement. The annual State of the Urban Forest Report will provide residents and city personnel with metrics on the number of community trees planted, maintained and removed annually.</p> <p>Actions:</p> <p>A) Present an update to the Urban Forestry Board and residents on the overall condition of the community forest:</p> <ul style="list-style-type: none"> o Highlight services (e.g., number of trees pruned/replaced, service calls responded to, etc.) o Summarize progress towards canopy goals and trees planted (public and private) o Accomplishments towards UFMP objectives 	\$ Low	1) Publish report.	2018 Every 5 years
<p>4. Conduct a Canopy Study to establish baseline canopy on both public and private property</p> <p>Tree Canopy studies calculate the amount and distribution of canopy, and can provide managers with valuable data, and help measure canopy gains and losses.</p> <p>Actions:</p> <p>A) Use i-Tree Canopy or remote sensing (aerial imagery) to map the extent and location of tree canopy in Manhattan Beach. B) Review changes and improvements to overall canopy cover, land use, neighborhoods, etc. C) Consider results with periodic review and alignment of UFMP goals, objectives, and actions. D) Report changes in the State of the Urban Forest Report.</p>	\$\$ Medium	1) Publish Canopy Study.	Every 5 years

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

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



HOW ARE WE DOING?

Monitoring and Measuring Results

With appropriate care and planning, the urban forest is an asset that has the potential to increase in value over time. Considering that just over 46% of the public tree population is comprised of young, medium and large stature trees, Manhattan Beach is well positioned to realize this potential. As these young trees mature and their leaf surface and canopy grows, so too will the overall benefits and value of the community's urban forest. The guiding principles, goals, and objectives of the UFMP are intended to support this process in an appropriate manner that provides for the sustainable stewardship of public trees with consideration for cost efficiency and community values. The UFMP includes goals and objectives for measuring the success of planning strategies over time.

Annual Review

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

Resource Analysis

By maintaining up-to-date tree inventory data Manhattan Beach can quickly and easily complete future updates to the tree resource analysis. Comparison of the updated structure, benefits, worth, and benefit vs. investment values can be measured against the benchmarks set by the 2015 analysis to demonstrate progress and improvements to health (condition), species diversity, benefits, and overall resource value. An objective of the UFMP is to complete this analysis every 5 years to illustrate progress and success towards UFMP goals.

Canopy Analysis

The City does not currently have a baseline tree canopy and land cover analysis to evaluate changes to the extent and location of tree canopy over time. Using GIS analysis, the City can measure and illustrate changes in overall land cover as well as by neighborhood and land-use. This information can be used to inform canopy goals and monitor attainment. The UFMP intends to update the canopy and land cover analysis on a 10 year basis.

i-Tree Eco

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

State of the Urban Forest Report

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

Community Satisfaction

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

Manhattan Beach's Urban Forest Benchmark Values

Community Urban Forest (Public Tree Resource)

City Maintained Tree Population	4,116
Privately Maintained Tree Population	7,459
Total Tree Population	11,575
Replacement Value (2010)	\$20.6 million

Species Diversity (Inventoried Trees)

Total number of unique species	182
Prevalence of top ten species	46%
Species exceeding recommended 10%	0

Benefits (Inventoried Trees, 2010)

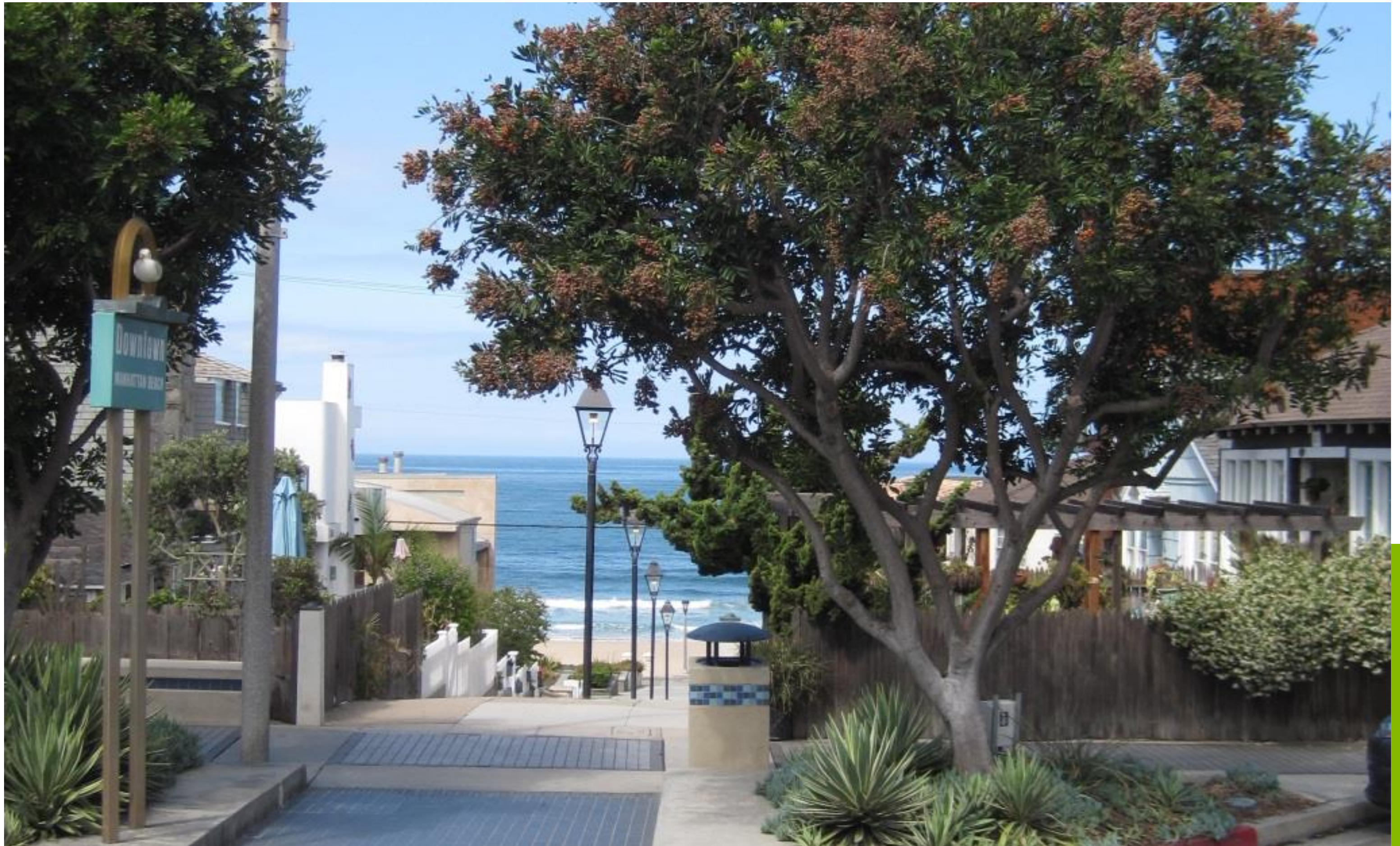
Total Annual Benefit	\$3.1 million
Annual Per Tree Benefit	\$266
Annual Per Capita Benefit	\$88

Urban Tree Canopy Cover (i-Tree Estimate)

Overall Canopy Cover	2.1%
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Environmental Benefits (i-Tree Estimate)

Overall Carbon Storage	\$13,397
Annual Air Quality Benefits	\$121,944



APPENDICES

A. References

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B. Map



C. Online Survey Results

Manhattan Beach's Community Urban Forest: Planning for Beauty, Benefits, and Sustainability

Introduction:

The City of Manhattan Beach's community urban forest (publicly-owned trees) consists of nearly 12,000 trees in parks, streetscapes, and municipal facilities. This includes 4,116 city-maintained trees as well as 7,459 trees maintained by adjacent property owners. An analysis of this resource shows that community trees provide more than 3 million dollars worth of annual benefits to our community, including benefits to air and water quality, energy savings, carbon storage, clean drinking water, creating and enhancing wildlife habitat, as well as socio-economic benefits such as recreational and aesthetic use. To replace these trees with trees of similar size and species would cost more than 20.6 million dollars.

With proper care, the value and benefits of community trees will increase over time. In order to manage this important resource sustainably, long-term strategic planning is needed. As a responsible steward of the community's urban forest, the City of Manhattan Beach is working with Davey Resource Group to develop a Street Tree Master Plan to promote sustainable management. The Plan will focus on safe and healthy trees through proper care, cost efficient maintenance, tree preservation, and reforestation. The intent will be to maximize the beauty, benefits, and sustainability of this public resource.

Manhattan Beach's community trees are an important part of our community. They enhance the quality of life for residents, visitors, and neighboring communities.

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

We encourage you to complete this brief survey to help us understand how residents view public trees and to identify which urban forest management services and benefits are most important to you. This survey will take approximately 5-10 minutes. Please note, to move forward in the survey, each question must be answered.

Your feedback will help us write a comprehensive Street Tree Master Plan that recognizes community values and supports the quality of life in our community.

The Benefits of Urban Tree Canopy:

Trees and urban forests work 24/7 to mitigate the effects of urbanization and development and to protect and enhance life and the community within Manhattan Beach.

Trees have long been appreciated for their contributions of shade and beauty to our landscapes. Now, science and technology has made it possible to quantify the environmental benefits to:

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

The following statements reflect the level of annual benefits currently provided by Manhattan Beach's community urban forest. Please rate these benefits according to their level of importance to you.

1. Manhattan Beach's public trees improve air quality by filtering pollutants such as dust, ash, pollen, and smoke. How important is this benefit?		
Answer Options	Response Percent	Response Count
Very important	66.70%	24
Somewhat important	13.90%	5
Not important	11.10%	4
Not sure	8.30%	3
answered question		36
skipped question		0

2. By shading, reducing wind speeds, and lowering the outside air temperature, Manhattan Beach's public trees reduce energy use (electricity and natural gas). How important is this benefit?		
Answer Options	Response Percent	Response Count
Very important	61.10%	22
Somewhat important	25.00%	9
Not important	11.10%	4
I'm not sure	2.80%	1
answered question		36
skipped question		0

3. Since carbon is necessary for tree growth, trees absorb excess carbon from the air. Because of this process, trees are a major source of carbon storage for our planet, helping to lower carbon dioxide levels in the atmosphere. How important is this benefit?		
Answer Options	Response Percent	Response Count
Very important	61.10%	22
Somewhat important	27.80%	10
Not important	8.30%	3
I'm not sure	2.80%	1
answered question		36
skipped question		0

4. Trees and urban forests increase property values by 7-10% and have a profound effect on psychological health and well-being. For instance, trees in retail locations have been shown to influence shoppers buying habits, causing a greater willingness to shop and increased spending. In Manhattan Beach, the estimated aesthetic and socio-economic benefit of the community urban forest is almost \$2.9 million. How important is this benefit?

Answer Options	Response Percent	Response Count
Very important	50.00%	18
Somewhat important	36.10%	13
Not important	11.10%	4
I'm not sure	2.80%	1
answered question		36
skipped question		0

5. By reducing the flow of stormwater runoff and the pollutants that are carried with it, urban trees protect the water quality of streams, rivers, lakes and oceans. Manhattan Beach's public trees intercept almost 3.3 million gallons of stormwater each year. How important is this benefit?

Answer Options	Response Percent	Response Count
Very important	66.70%	24
Somewhat important	25.00%	9
Not important	8.30%	3
I'm not sure	0.00%	0
answered question		301
skipped question		0

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

Answer Options	1-most valuable	2	3	4	5-least valuable	Response Count
Improved air quality	19	7	4	2	4	2.03
Energy savings	2	9	10	6	9	3.31
Protects water quality/Reduced stormwater runoff	9	10	4	9	4	2.69
Carbon storage	2	6	10	10	8	3.44
Wildlife habitat	4	4	8	9	11	3.53
Other (please specify)						6
answered question						36
skipped question						0

Other:

do not remove trees to build parking structures only to replace with smaller ones.

This question would not allow me to rate each issue with a similar choice so not all answers are correct. All should be " 1 "

We are a BEACH community, not a forest. don't lose sight of that.

Aesthetics of the environment
Downside: causes allergies and hives
respect owners property rights

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

Answer Options	1-most valuable	2	3	4	5	6	7	8-least important	Rating Average	Response Count
Attractive to residents and tourists	8	10	7	3	1	1	5	1	3.19	36
Beauty/Aesthetics	10	8	5	0	6	1	2	4	3.42	36
Shaded trails, sidewalks, and bike trails	10	7	5	9	3	1	0	1	2.89	36
Shaded parking	1	4	3	5	7	6	5	5	5.11	36
Improve retail areas and neighborhoods	1	0	5	5	11	4	5	5	5.28	36
Increased property values	2	2	3	5	5	7	5	7	5.36	36
Passive recreation	4	1	1	4	1	10	5	10	5.69	36
Shaded streets	0	4	7	5	2	6	9	3	5.06	36
Other (please specify)										6
<i>answered question</i>										36
<i>skipped question</i>										0
Other (Please Specify)										
most important are the environmental issues										
Same issue as question # 6 (answers would be 1-3 for all)										
Where are the trees east of Sepulveda? No one wants their views impeded. So the east side shouldnt be adversely impacted by more tree rules.										
As long as roots do not damage house foundation										

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

Answer Options	Response Percent	Response Count
I was not aware that the City has an urban forest program	47.20%	17
I have visited the City's webpage for information about public trees and/or the urban forest	22.20%	8
I have heard about tree care or urban forestry in Manhattan Beach on the radio	5.60%	2
I have seen a program about tree care or urban forestry in Manhattan Beach's on television	5.60%	2
I have read a newspaper article that discussed public trees and/or Manhattan Beach's urban forest	19.40%	7
I have seen an article about the community urban forest in Manhattan Beach's Recreation Guide	11.10%	4
I have participated in a volunteer tree planting project in Manhattan Beach	2.80%	1
None of the above	11.10%	4
<i>answered question</i>		36
<i>skipped question</i>		0

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

	Response Count
	14
<i>answered question</i>	14
<i>skipped question</i>	22
Comments	

Years ago Manhattan Beach had earned the designation of Tree City USA, but by its inactivity failed to maintain it. More recently, our city did a particularly poor job of supporting residents' efforts to promote tree preservation, replacement and proper care via the volunteer Tree Committee. Community Development staff so discouraged residents' efforts that the Tree Committee eventually disbanded. Suggestion that an "urban forest program" currently exists is laughable. Enforcement of even just reasonable tree maintenance and trimming standards (let alone ANSI A300) on street trees maintained by residents is absolutely non-existent. Still, no one on city staff is even a certified arborist, despite repeated resident suggestions to upgrade staff capabilities. A few weeks into the new tree trimming contract with West Coast Arborists, Public Works staff directed WCA, against WCA's will and superior, expert knowledge, to inappropriately over prune a number of trees on Veteran's Parkway (right in front of the city's Public Safety Facility!) -- and then when this obviously flawed process was challenged, a pathetically excuse-filled explanation from Public Works staff was offered to, and sadly accepted by City Council. It's looong overdue time to significantly step up the game, folks, before attempting to lay claim to having any real "urban forest program".

The MONARCH butterfly needs over wintering spots.

I do not like to see tree removal for improved sidewalks and to build parking structures only to see the trees replaced with smaller or non-native trees. I would like to see innovative solutions to the challenges that mature trees present. Flexible sidewalks...build around trees, etc.

It was difficult to rank the items in 5 and 6 because they are all valuable. Also, I know a little about the MB tree program in relation to having to replace a front yard tree. Trees provide such remarkable benefits across all areas it is disappointing to see so few street trees in MB. They turn a concrete jungle into a neighborhood.

Where exactly are the 7,459 publicly owned trees? Are they on or off private property?

Don't force the startup and maintenance costs for the proposed MB urban forest program onto the property homeowner like the ridiculous sidewalk repair program.

Quit over regulating. 2/3 of the trees in this city are on private property. Leave them alone!!

Tons of people use the Green Belt regularly. Work needs to be done to help Oleanders, some of the Trees. More Shade Trees please.

I do not believe that residents should allow their trees adjoining the street (such as the trees at 1038 and 1038 1/2 on Duncan Avenue) to grow to unrestricted heights and widths. There should be a height and width limit for trees adjoining our streets.

This is the most leading and ridiculous survey the city has ever posted, and that says a lot. I would not use the results in any meaningful way in decision making. If it cost anything to post this, whoever authorized the expenditure should be ashamed. Its only use it to educate the respondent on the known benefits of trees and that is better done in other ways. And Manhattan Beach does not have an urban forest program, all it has is stuff on paper. It allows its own trees to be butchered, and has never done anything proactive in recent years for any sort of tree protection except for construction sites.

Since healthy trees are so beneficial, as pointed out above, the City of MB should not make it so difficult for a resident to spend their own money to replace an unhealthy tree for a healthy one.

This survey is incredibly biased. Trees have many benefits, but there also costs associated with them. Ie hard scraping damage, infrastructure damage, risk of injury and or loss of property due to falling leaves, leaf debris causing excess waste, leaf debri clogging gutters, drains, and runoff channels, the expense of maintaining trees. Exotic trees compete with native plants and trees. Trees use water, a limited resource. Eucalyptus can be a significant fire hazard(ie Oakland hills). Your survey is incredibly biased than only can lead to one conclusion. Shame on you!

This is not a survey - its an opinion and used as a tool to propagate unfounded and unsupported opinion. Trees use up valuable water, not all trees are natural to the so cal environ and have become nothing more than weeds (eucs for ex). Also some are dangerous as they drop limbs with no warning etc. Safety should be a huge factor in determining the value of a tree. Just because someone thinks a tree is beautiful, doesnt mean the next person does. Dont become overly zealous please. Be reasonable, unlike the past 2-3 versions of our tree ordinances.

Trees are pretty in Manhattan Beach. We don't want all cement, but in the sand section we need to maintain our views and in East Manhattan we need to maintain our sidewalks, so tree choice is important. I'd like to see more native trees on the Greenbelt and a better choice of trees on Highland between 15th and Rosecrans.

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

Answer Options	Response Percent	Response Count
Strongly Agree	66.70%	24
Agree	27.80%	10
Disagree	5.60%	2
Strongly Disagree	0.00%	0
Not sure	0.00%	0
answered question		36
skipped question		0

11. Manhattan Beach needs more public trees.

Answer Options	Response Percent	Response Count
Strongly agree	41.70%	15
Agree	33.30%	12
Disagree	16.70%	6
Strongly disagree	0.00%	0
Not sure	8.30%	3
answered question		36
skipped question		0

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

Answer Options	Response Percent	Response Count
Strongly agree	5.6%	2
Agree	50.0%	18
Disagree	22.2%	8
Strongly disagree	13.9%	5
Not sure	8.3%	3
answered question		36
skipped question		0

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

Answer Options	Response Percent	Response Count
Parks	58.3%	21
Landscapes	41.7%	15
Open space and natural resource areas	61.1%	22
Streetscapes	52.8%	19
Golf courses	13.9%	5
Downtown	41.7%	15
Trails and bike paths	50.0%	18
Manhattan Beach has enough public trees	13.9%	5
Other (Please specify)		
Manhattan Village Mall	2.80%	1
Not sure if we have enough	2.80%	1
	answered question	36
	skipped question	0

14. What level of maintenance do residents expect for public trees? Please rank the following options according to your preference (1-best strategy; 6-least preferred)

Answer Options	1-best strategy	2	3	4	5-least preferred	Rating Average	Response Count
None - Keep them natural	2	0	2	5	27	4.53	36
Best possible care (clearance, structure, health)	19	5	2	6	4	2.19	36
Clearance only (over streets and sidewalks)	4	2	10	16	4	3.39	36
Pruning for health and safety	9	13	12	1	1	2.22	36
Plant health care (pest and disease management)	2	16	10	8	0	2.67	36
Other (please specify)						6	6
					answered question	36	36
					skipped question	0	0

Other

- Incredibly inappropriate choices! (Disregard ranking -- ranked ONLY because survey continuation required it.) How about using appropriate, professional standards, i.e. ANSI A300?!? Duh!
- MB prunes TOO MUCH AND TOO OFTEN. The Landscape contractors really SNOWED MB with "required" pruning theories
- Same issue as #6 Last issue here should be "1"
- What a silly question. Who came up with the choices here?
- Isnt the 2nd on the list the same as the 3-5th on the list??
- It depends the type if tree. The mall's sycamores are over-pruned.

15. What types of education and public outreach would residents like to see offered by the urban forestry program? Please check all that apply.		
Answer Options	Response Percent	Response Count
Seminars and workshops	36.1%	13
Interpretive trails and displays	38.9%	14
Species information	61.1%	22
Tree care	63.9%	23
Tree planting	44.4%	16
Tree pruning	50.0%	18
Guided nature walks	25.0%	9
Other	5.6%	2
	answered question	36
	skipped question	0
Other		
public education blitz about the stupidity of excessive pruning, PROPER pruning, about advantages of tree canopy, before and after photos of pruning and a "tree muskateer group" like el segundo		
None		
As budget allows		
none		
please ensure information provided is accurate and without bias.		

16. What are the best ways to encourage tree planting and preservation on PRIVATE property? Please select as many as apply.		
Answer Options	Response Percent	Response Count
Education and outreach	77.8%	28
Information about how to hire a professional tree care company	33.3%	12
Require tree care companies to have a certified arborist on staff	27.8%	10
Free trees	55.6%	20
Other	13.9%	5
	answered question	36
	skipped question	0
Other		
Enforce existing business license requirements, pruning standards, etc.		
give everyone a phone number so we can report illegal cutting down of trees		
Need to balance with neighbors' view, property rights & maintenance		
Get rid of tree ordinance		
Honor the fact that some residents might want to change their existing trees for valid reasons!!!!		
There should re-evaluation of the MB tree laws for residents, such as tree policy should allow home owner to remove damaged or diseased trees.		
Services such as Tree Muskateers that can provide free advice on trees		

Directed mail and proactive enforcement of existing laws is the best prevention, which seems intentionally left off. Geez, guys, at least pretend to be objective with your questions.
Allow diseased trees to be removed and replaced with healthy trees in a far more efficient process.
Create reasonable regulations that encourage tree planting and tree preservation but also balance a homeowners right to protect their property, or enhance their properties use or utilization
Charge less property taxes for

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

Answer Options	Response Percent	Response Count
	28.57%	8
	answered question	8
	skipped question	28

Comments

PLEASE let trees and SHRUBS be natural, native or native adapted. Hermosa's greenbelt is so much prettier because it looks natural not like ours with the ridiculous AND DANGEROUS wood shrapnel lumber yard waste on the paths and the pruned to death shrubs and trees.
"Public" trees need to be maintained by the city and not forced upon the private homeowner that happens to have the public tree on their sidewalk area.
should pursue more trees as a defense as global warming increases
It would be helpful if the City had an easy way to see and select a tree for the parkways in front of their properties - showing growth information such as root intrusion, speed and max height, flowering, spurs, are they messy or easy to maintain, etc. Just knowing there is one place to go to look at the selection of trees allowed, and to be able to find all the information about each species allowed, would be a really useful tool, and might encourage more people to add trees to the parkways at their own expense. I am that type of person who won't move forward on a project if I think it will take a lot of research on my part - yes, I'm lazy that way. If I had a place to look at all the information at once, it would make it so much easier for me to select a tree. Maybe there are lots of people like me who put things off for this same reason.
Trees a great, don't be so overzealous that you do not accept reasonable input as to the scope and extent of your urban Forrest program.
Dont be limited to just trees, scrubs etc are also important to educate.
Public trees help define the character of our town. Trees in our wild areas should be allowed to remain wild and grow to stately status. Street trees must be maintained with aesthetics, tree health and public safety in mind.
Charge less property taxes for having greater density of tree coverage.

18. Gender

Answer Options	Response Percent	Response Count
Male	41.7%	15
Female	47.2%	17
Prefer not to answer	11.1%	4
	answered question	36
	skipped question	0

19. Age group		
Answer Options	Response Percent	Response Count
under 35	0.0%	0
36 to 45	5.6%	2
46 to 55	22.2%	8
56+	72.2%	26
answered question		36
skipped question		0

20. What is your current involvement with Manhattan Beach's urban forest. (Choose all that apply)		
Answer Options	Response Percent	Response Count
I am a resident of Manhattan Beach	100.0%	36
I am a frequent visitor to Manhattan Beach	2.8%	1
I own a business in Manhattan Beach	2.8%	1
I appreciate public trees	58.3%	21
I have planted public trees as a volunteer	19.4%	7
I help care for a public tree adjacent to my property	19.4%	7
I have donated money to a non-profit foundation in support of public trees	22.2%	8
None of the above	0.0%	0
Other (please specify)	5	5
answered question		36
skipped question		0
Other		
I raise monarch butterflies that NEED trees and milkweed		
I am a member of the Manhattan Beach Tree Canopy Committee (dissolved by David Lesser)		
I am an owner of over a dozen trees and on a corner lots. Proceed with caution when thinking about the impact of your actions on residents. Most of the trees you have in the city belong to residents!!!		
Manhattan beach botanical garden volunteer		
I have many trees in my property which I have planted and I continue to maintain. I would appreciate some breaks for those efforts when others contribute little or nothing.		

D. Additional Public Comments

The following comments and input were submitted by email to city personnel, or collected at public meetings. Some comments have been summarized or abridged. This input was taken into consideration in the development of the Urban Forest Master Plan.

1. The biggest problem in developing a master plan for residential streets is the distinction between trees on city (street) property and those on property owned by residents living on those streets. Often trees on either "side" of the property line abut or flow over the other's property, and coordination is handicapped by the legal ramifications thereof. I'd like to see an agreement developed by the city and volunteer groups that includes a contract that each could sign that provides mutual coordination and includes trees in residential backyards that abut on city-owned alleys.
2. The City needs to have flexibility to react to political situations.
3. We want to contribute to the new tree ordinance process
4. Plans must consider street lighting/ tree conflicts
5. Need clear definition (e.g. public/private trees)
6. City has not done a good job of informing residents of (current) tree ordinance
7. Tree ordinance = confusion
8. People are not planting trees because of problems with tree ordinance
9. Manhattan Beach is not unified: recognize need for city zone differences
10. Resident safety must be considered
11. Liability exposure of trees
12. Administrative, appeals and enforcement must be addressed in ordinance
13. Define public versus private trees. Information is hard to find and understand. Permits & doing the right thing is difficult and confusing.
14. Palette considerations (size, safety) right tree in the right place
15. UFMP must align with Mobility Plan (example: sidewalks)
16. Hardscape: Increase hardscape allowed for house, not enough room for trees and water runoff
17. Lot development needs integrative planning
18. Need user friendly education and information sharing
19. Onerous requirement and process. It is complicated and complex. (+ expensive, time consuming)
20. Trees vs Views. We have no view ordinance. This is a HUGE issue.
21. Include natives with tree palette
22. Mediterranean palette – look into this
23. Give consideration to reclaimed water, but be mindful of possible negative consequences (saline)
24. Look at botanical garden for examples of long term survivors
25. Trees are a valuable commodity. The cost pays off with quality of life.
26. The way we take care of public trees is questionable, and the care of the public trees is not always a good example for the public to replicate.
27. Every city that embraces trees ends up with a high quality of life
28. Developers want to maximize space. This is in conflict with tree health needs.
29. It breaks my heart to see trees that have been topped.
30. Topped trees are a liability.
31. The city has done a great job of caring for our trees.
32. Consider outreach to neighborhood watch newsletter. It is sent monthly to residents.
33. General frustration of utility line trimming/ "lack of standards", EDISONs pruning practices need to be complainant with city ordinance. The utility is the #1 pruner of trees in Manhattan Beach.
34. Two arborists are required to prune or remove a tree!
35. Residents would like the Plan to address different "rules" for the different zones.
36. Tree Ordinance - The MB tree ordinance should be on the agenda for open discussion. Certain parts of the ordinance require complex coordination with the city bureaucrats. I believe ordinance may have the unintended effect of discouraging planting new trees while protecting existing trees. The city has punished violators with draconian measures that have led knowledgeable residents in my neighborhood to not plant what would become large mature trees in the private front or side yard protected spaces. So, the result might be fewer beneficial large trees in the future than would otherwise exist.

Street Light Blockage - Manhattan Beach residential crime prevention is an important current topic in the city. Streetside trees planted near street lights can partially or completely block the street lights thereby, providing the cover of darkness for potential criminal behavior. The city currently takes no action to preclude this from happening and is unable/unwilling to take corrective measures. Planting trees near street lights that have the potential for light blockage should be prohibited. Trees currently blocking street lights should be trimmed regularly or removed.

Pedestrian Safety - The city is in the process of preparing a Mobility Plan which addresses walking/sidewalks. Frankly, the sidewalk situation in the city is a jumbled mess with parts of the city having no sidewalks and other parts having incomplete or poorly planned sidewalks. There are few sidewalks that are properly planned and installed. Residents plant trees near the roadway edge where there are no sidewalks forcing walkers into the street (Hill Section and East Manhattan) and into traffic lanes if cars are parked adjacent to the trees. The tree Master Plan must address this issue as pedestrian safety (school kids) should be first priority.
37. Residents of Manhattan Beach in general are very anti-consultant because consultants are not paid sufficiently to have enough time to understand the many unusual or unique aspects of living in Manhattan Beach. We had the Urban Land Institute come in January. They made a number of good recommendations but many people felt that suggesting Manhattan Beach price it's downtown parking like San Francisco (where it fluctuates up to \$15 an hour depending on demand) was absurd. It did not make sense for so many reasons, not the least is that it would hurt businesses and the Downtown area is under the Coastal Commission jurisdiction. It is unlikely the Commission would approve it. The Council is planning on a major upgrade for the Downtown business district which I hope will include some new attractive colorful trees.

The City of Manhattan Beach can often be the exception to the general rule. Your quote "if you have a beautiful tree it will increase

the value of your property by 10%" does not ring true here. Manhattan Beach residential property values are more dependent on ocean views that are not blocked by trees, excellent public schools and safe child friendly walk streets rather than whether or not you have a tree. In Manhattan Beach having a tree on your property especially in the tree ordinance area can be considered to be a liability rather than an asset. Your presentation inspired me to imagine what Manhattan Beach will likely look like in the years leading up to 2040. Manhattan Beach residents generally have no backyard and little or no front yard. In areas of Manhattan Beach that do have backyards newly developed homes are required to have a 10-12 foot deep back yard. Manhattan Beach is obviously not a planned community and if a resident wants to paint their house purple they can. On the other hand it is a very wealthy community with a median income level of \$100,000. Residents have home movie theaters and elevators for their multiple cars. At Christmas the city supports trees by allowing a commercial company that *rents* live Christmas trees to display them on the pier for a week. Thinking outside the box, perhaps renting could be done with regular trees.

I have lived in Manhattan Beach for 25 years when it was a typical beach town. Almost all of the homes were one-story and the downtown business district included a drug store, a liquor store, an appliance store and a car parts store. Now Manhattan Beach has foreign tourists, the Raieigh Studios, where TV shows are filmed, and a new library with a panoramic view. On the residential side it has gone from almost all one story homes to a community with an ever increasing number of three-story homes with basements. Most new home in Manhattan Beach are built by developers. Developers make their money by building on every square foot they are allowed to build on. In 1992 Manhattan Beach voters passed a 26 foot height building restriction by initiative. To have more build-able space for private theaters, basements were built. These homes are owned by celebrities, athletes, and very rich people. Twenty five years ago residents were residents and now for many homeowners their Manhattan Beach home is just one of their homes. Short of an earthquake or another Great Recession the building boom in Manhattan Beach will remain extremely high. Residents with homes that are considered to be teardowns receive frequent letters in the mail from developers offering to pay cash with no real estate commissions which further accelerates these changes.

Things that make it difficult to have a residential urban forest in Manhattan Beach in the next twenty five years:

1. Drought - *Currently with Stage 3 drought conditions residents can only legally water one day a week either Wednesday or Friday for 15 minutes. They can use a drip system. This is not enough overhead water to keep newly planted native plants alive.*
2. Less open space due to smaller homes replaced by larger homes
3. Less sunlight because larger taller homes will block the sun
4. More part-time rather than full-time residents
5. Trees block ocean views
6. Existing trees will be removed for new homes or die due to the drought

Steps to make a resident urban forest in Manhattan Beach more likely:

1. Educate Developers about landscaping. Make tree selection and tree placement by Developers something the city oversees so that right tree - right location is more likely to be achieved. Require the installation of drip irrigation
2. Re-write tree ordinance to be more flexible and so that residents will be encouraged rather than afraid to plant a tree.
3. Educate residents and nurseries about best trees for Manhattan Beach
4. Require the planting of trees in large open spaces i.e. parks and commercial areas i.e. parking lots

Reasons for more city trees in city controlled areas

1. City has ability to consult experts to select better trees and detect diseased trees early
2. City is in a better position to use reclaimed water and deal with other drought related issues. Currently the city has these signs showing they used recycled water.
3. City property is much less likely to lose the sun trees need due to new higher buildings

Manhattan Beach will continue to be an even denser city with the passage of time. Residents with little to no yards still want to own dogs, have a place for their children to run/play and experience nature. Parks are popular now and will become even more valued in future years. Even the parks in Manhattan Beach are not typical. Sand Dune Park like its name is more about the Sand Dune than the small normal park area below the dune. Bruce's Beach Park and the Green Belt are a result of past city history of racism and a former rail line. Valley Oaks park was built on a landfill. Marine Park and Manhattan Heights Parks are for sports activities. Polliwog Park was never developed because it serves as water catch basin. Only

residents who have lived in Manhattan Beach when we had El Nino rain would even be aware of this. The Manhattan Beach Mall was built above an oil tank farm. The City of Manhattan Beach has a number of challenges to maintain and expand their urban forest that other cities do not have to overcome. Manhattan Beach residents are very well educated and appreciate the many benefits of having trees in their city. However, because of limited open space and competing values without very conscious decision making on the part of city officials the size of city's urban forest is at risk.

Bruce Beach Park
website http://en.wikipedia.org/wiki/Bruce's_Beach

Here is a park that was mentioned at our meeting. It is very underutilized. It could sure use some more trees. This park cannot be used as a playing field because of the slope of the terrain. There are homes on both sides of the park so it is likely that there would be some residents complaining about possible future obstructed views. There is approximately an acre of land at the base of the park that is above a parking lot and the lifeguard headquarters building. The areas could use some more trees.

E. Design Details
Soil Volume and Tree Stature

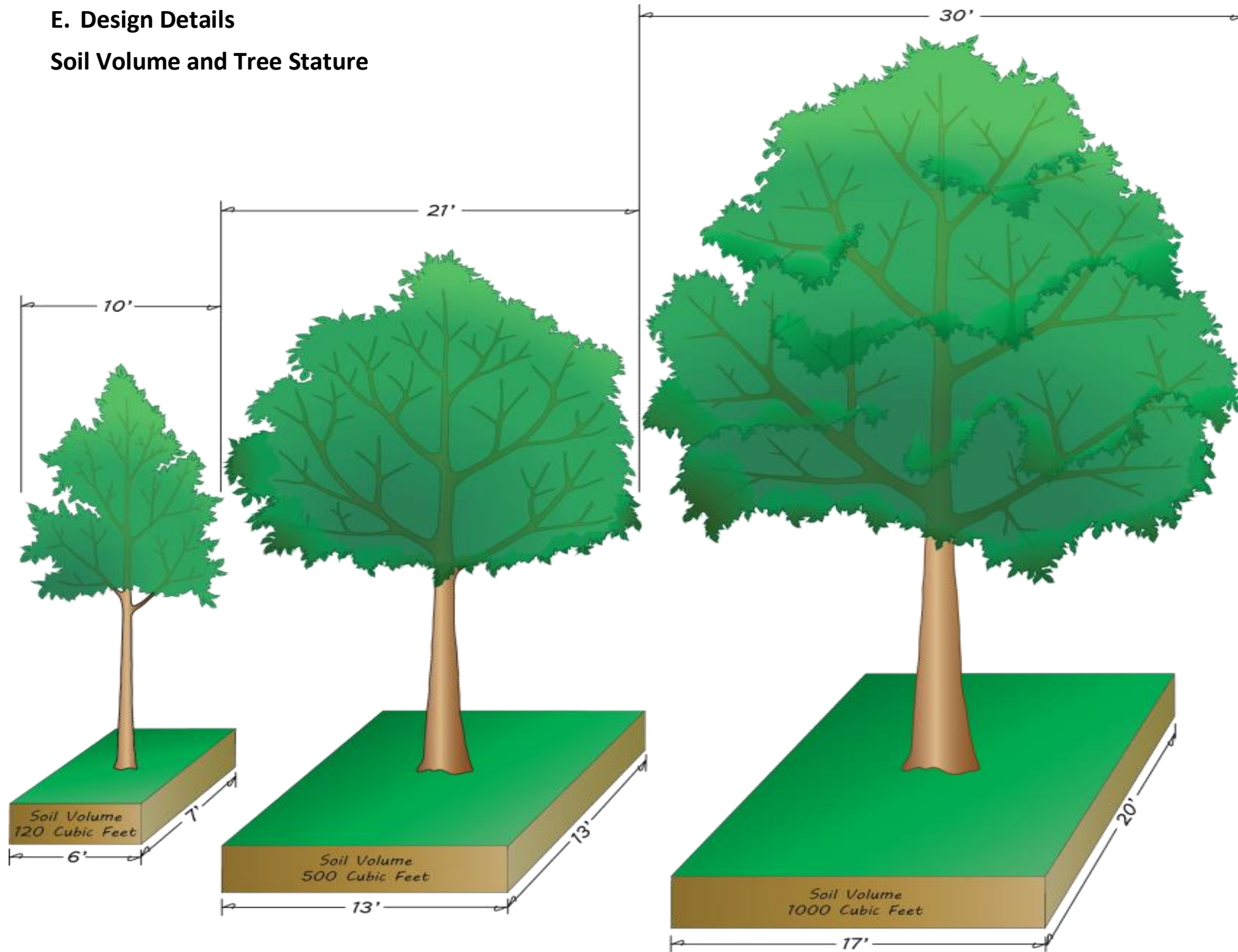


Figure 20. Tree growth is limited by soil volume. Larger stature trees require larger volumes of uncompacted soil to reach mature size and canopy spread (Casey Trees, 2008).

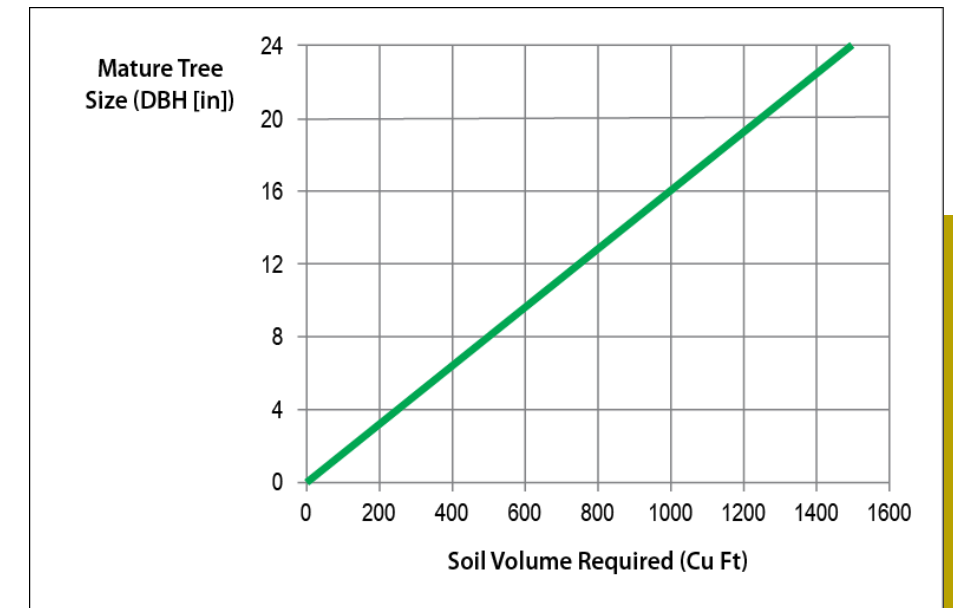


Figure 21. General relationships between soil volume requirements and mature tree size (James Urban, various sources, 1992)

Alternative Planter Designs

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

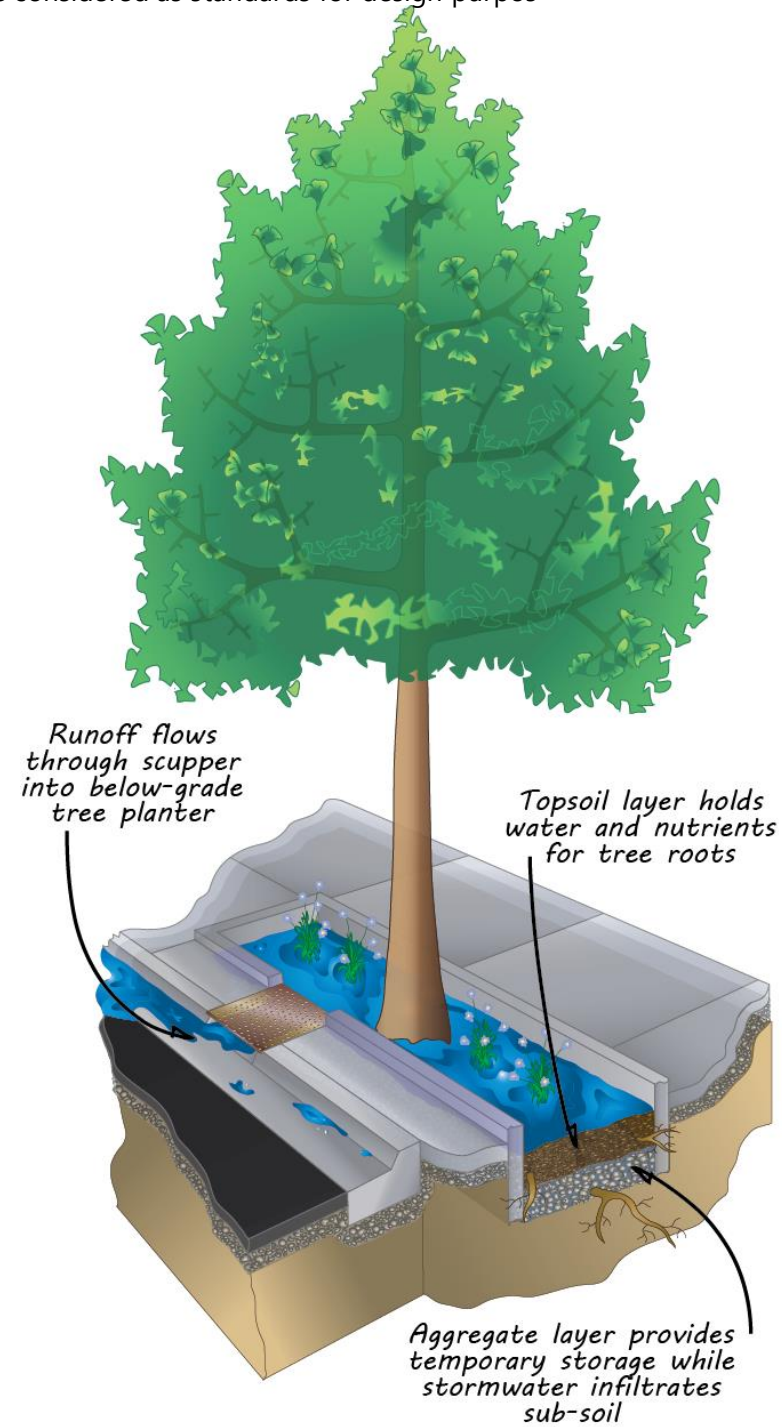
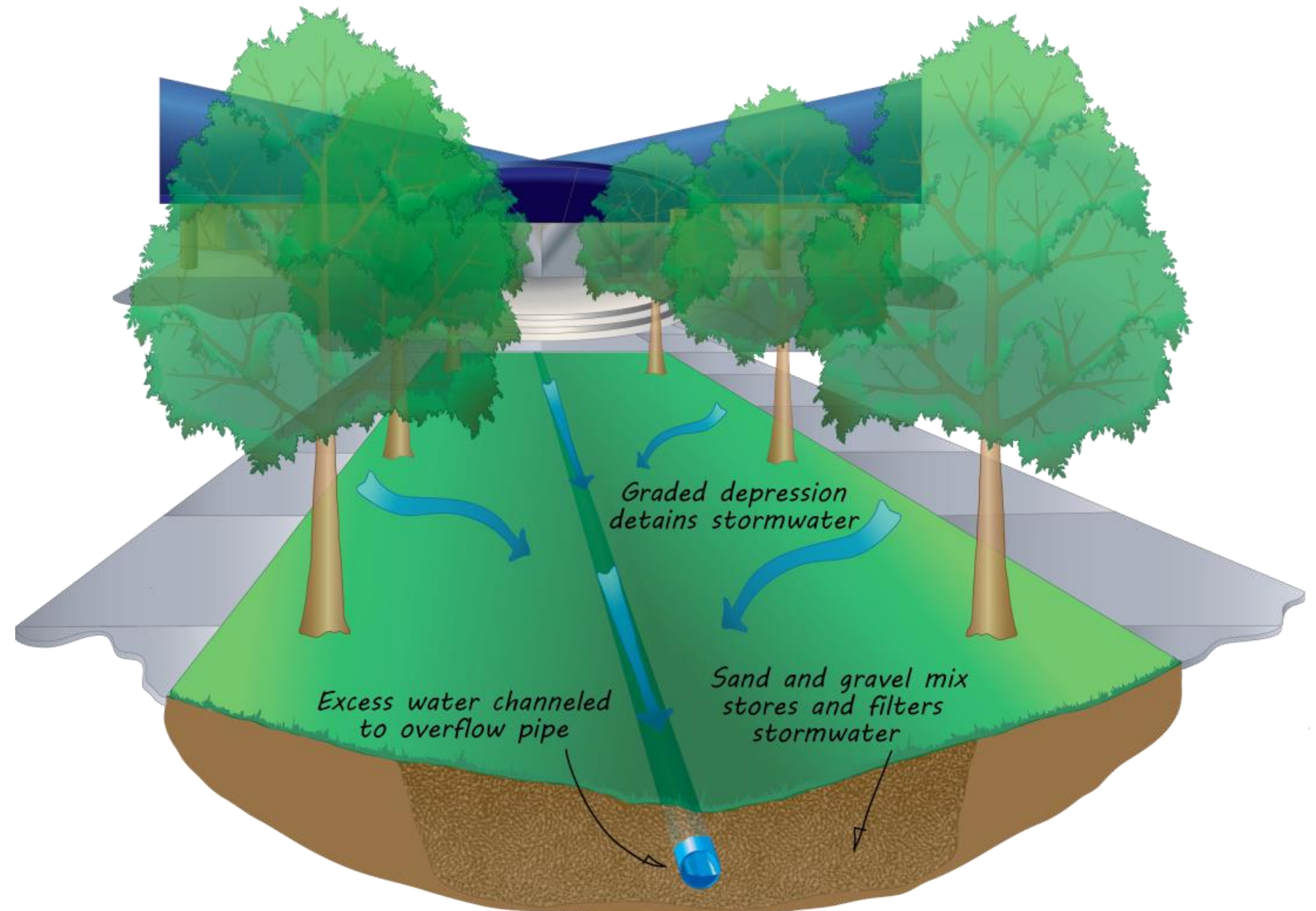


Figure 22. Stormwater tree pits are designed to collect runoff from streets, parking lots, and other impervious areas. Stormwater is directed into scuppers that flow into below-grade planters that then allow stormwater to infiltrate soils to supplement irrigation.



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

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

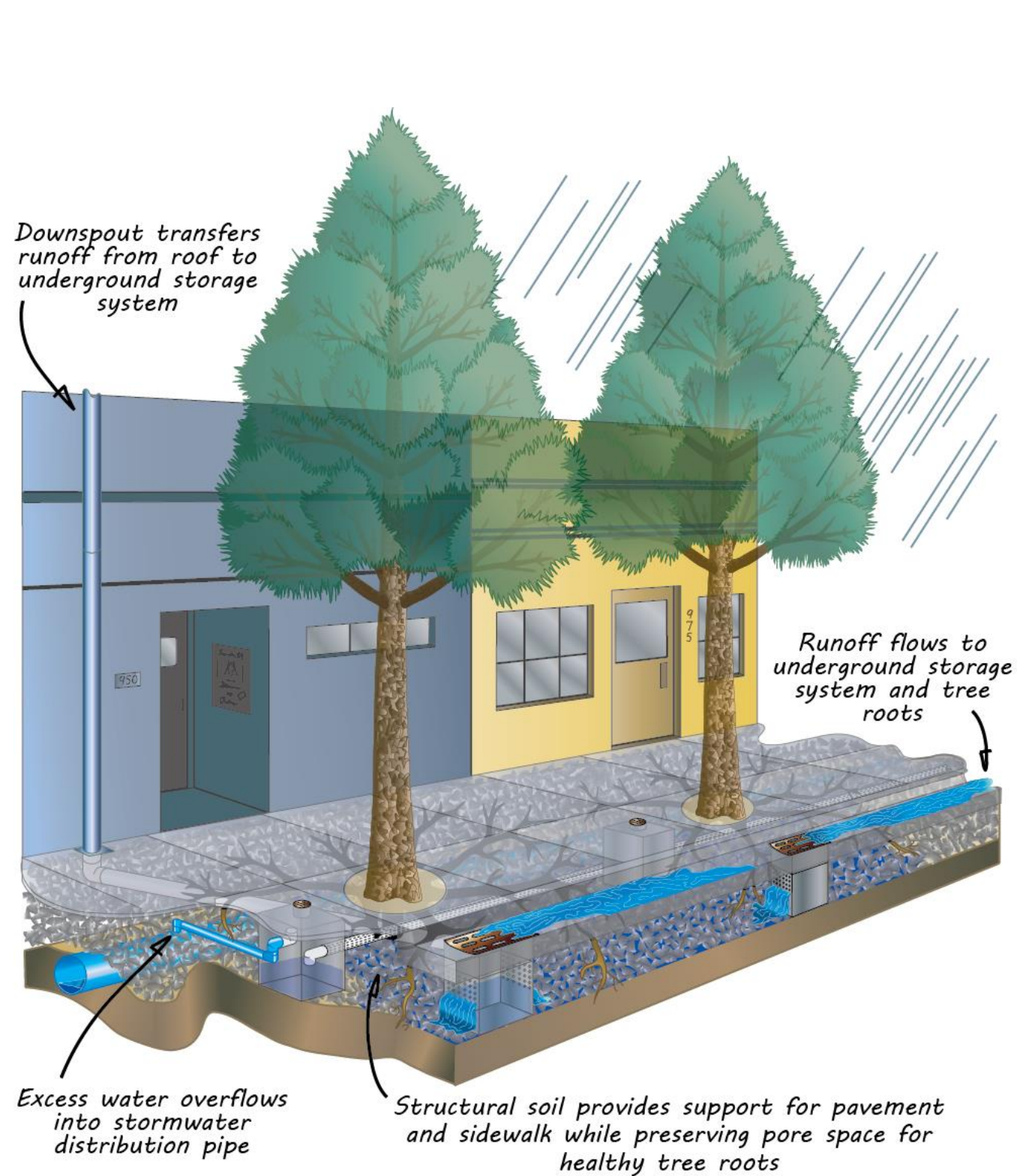


Figure 24. Structural soil is a highly porous, engineered aggregate mix, designed for use under asphalt and concrete as a load-bearing and leveling layer. Pore spaces allow for water infiltration and storage and also root growth.

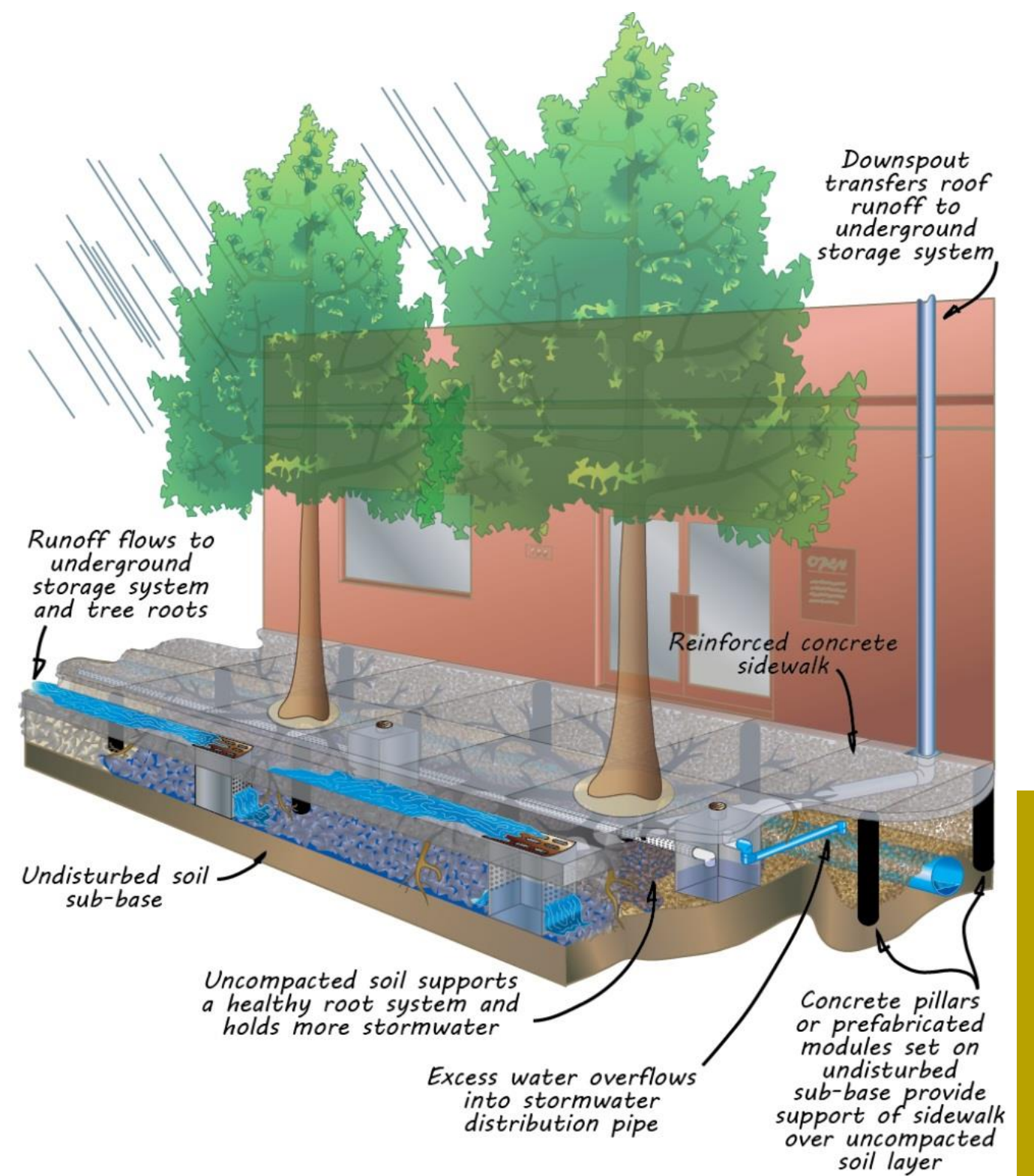


Figure 25. Suspended sidewalks use pillars or structured cell systems to support reinforced concrete, increasing the volume of uncompact soil in subsurface planting areas and enhancing both root growth and stormwater storage.

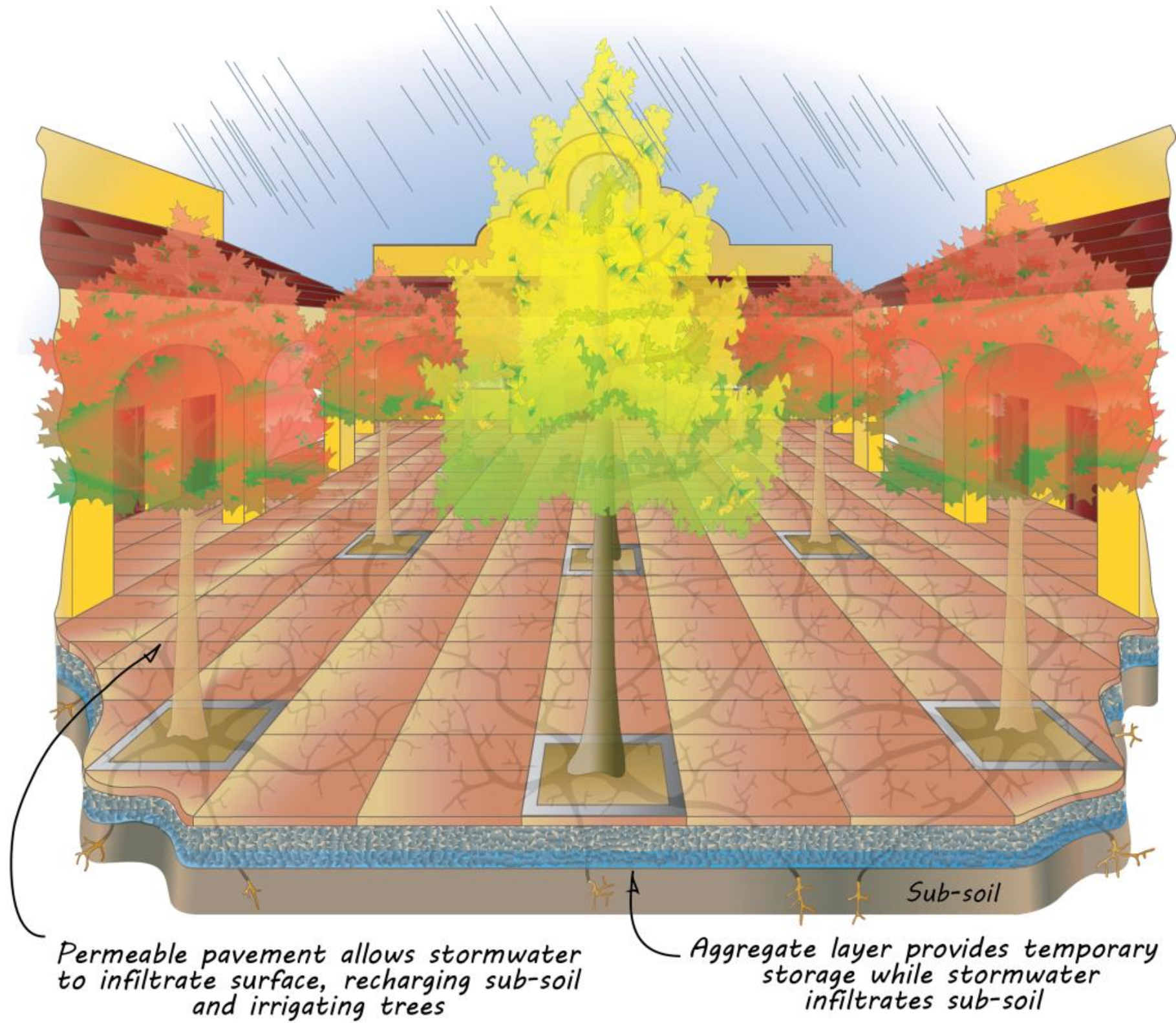


Figure 26. Pervious pavements allow stormwater and oxygen to infiltrate the surface, promoting tree health and groundwater recharge.

