



SANTA MONICA

URBAN FOREST MASTER PLAN

REVISED 2017



SANTA MONICA'S URBAN FOREST MASTER PLAN

TABLE OF CONTENTS

VISION	5
EXECUTIVE SUMMARY & MISSION STATEMENT	6
CHAPTER 1 - BACKGROUND OF THE URBAN FOREST	9
HISTORY OF SANTA MONICA'S URBAN FOREST	10
RELATIONSHIP TO OTHER CITY DOCUMENTS	14
BASELINE ENVIRONMENTAL CONDITIONS	15
WATERSHED AND WATER QUALITY	15
TOPOGRAPHY AND SOILS	16
CLIMATE AND MICRO-CLIMATES	17
ECOLOGY, PLANT, AND WILDLIFE COMMUNITIES	18
THE SANTA MONICA FREEWAY	19
DESCRIPTION OF SANTA MONICA'S URBAN FOREST	20
TOP 15 SPECIES	20
GROWSPACE	22
RIGHT TREE IN THE RIGHT PLACE	24
CANOPY COVERAGE	26
ENVIRONMENTAL BENEFITS OF THE URBAN FOREST	28
COMMUNITY VIEWS OF THE URBAN FOREST	32
FOOTNOTES	37

CHAPTER 2 - GUIDING PRINCIPLES	39
DEVELOPING POLICY AND STANDARDS FROM THE GUIDING PRINCIPLES	40
GUIDING PRINCIPLES:	
1. THE URBAN FOREST AND ITS ENVIRONMENT	42
2. UNDERSTANDING THE URBAN FOREST	44
3. ECONOMICS OF THE URBAN FOREST	46
4. COLLABORATING ON URBAN FOREST MANAGEMENT	48
5. SUSTAINABLE MANAGEMENT OF THE URBAN FOREST	50
6. ENHANCING THE URBAN FOREST	56
THE FUTURE OF THE URBAN FOREST	59



20th Street at Georgina, looking north.

Santa Monica's coastal setting and physical beauty offer a desirable quality of life to those who live, work and visit here. Two hundred and fifty years ago the area was blanketed by grasslands and coastal sage scrub. As various cultures inhabited the land, they adjusted their lives to fit the landscape and adjusted the landscape to fit their needs, tastes, and sensibilities.

The urban forest of today is the result of the decisions by those who managed the forest before us, and is greater than the sum of individual trees outside our homes, shops and offices. It is the environment in which we work and play and through which we travel daily. It is the aesthetic setting for our schools, businesses, cultural attractions, and places of recreation and renewal. It is our ecosystem; the habitat in which we thrive. It is our shared community resource.

We owe it to ourselves and future generations to secure and enhance the benefits of a thriving urban forest in Santa Monica. We can do this only if we understand its importance and utilize new knowledge of environmental science and arboricultural technology in order to adapt nimbly to changes in the environment.

This Urban Forest Master Plan seeks to increase age and species diversity in the public tree population, augment biomass and canopy coverage citywide, enhance the character and aesthetics of our neighborhoods and achieve exemplary stewardship of the forest from all who live and work here. The Master Plan must be regarded as both a long range policy guide and a living document that will respond to changing conditions over its life. It requires a close partnership between policy makers, staff and the community.

Santa Monica has established an international reputation for enlightened environmental policies and the respectful conservation of natural resources. Adoption of this Master Plan is the next significant step in Santa Monica's continuum of sustainability policies.

EXECUTIVE SUMMARY

URBAN FOREST MASTER PLAN MISSION STATEMENT

To ensure that all benefits of a healthy urban forest are available to Santa Monica residents and visitors for generations to come, to guide the perpetuation and enhancement of public tree canopy for the entire city, and to inform the community of the importance of the urban forest and the best practices to follow to help it thrive.

The City of Santa Monica is committed to improving and enhancing its urban forest. Establishing, maintaining and enhancing a healthy urban forest is a complex and multi-layered endeavor. It affects and is affected by many factors. This document examines the context of Santa Monica's urban forest and develops guiding principles, goals, strategies and guidelines for its management to ensure its on-going improvement.

Urban Forestry, as defined by the Dictionary of Forestry, is the "art, science, and technology of managing tree and forest resources in and around community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society.¹" In 2009, the American Planning Association expanded the Urban Forestry definition to include "a planned and programmatic approach to the development of the urban forest, including all elements of green infrastructure within the community, in an effort to optimize the resulting benefits in social, environmental, public

health, economic and aesthetic terms, especially when resulting from a community visioning and goal-setting process.²"

There are two important distinctions between these definitions. Although the first definition mentions resources and ecosystems, it does not directly emphasize the environmental benefits of the urban forest. The second definition places emphasis on the "planned and programmatic approach" resulting from a community process.

This shift in definition parallels the City's shift from the Community Forest Management Plan, approved by City Council in 2000, to a long range Urban Forest Master Plan (Master Plan). This Master Plan document updates and expands upon the Community Forest Management Plan 2000 and provides a living document containing measures for cultivating a successful urban forest and recommendations for ongoing improvements.

As expressed in the Urban Forest Master Plan Mission Statement, the Master Plan will serve as a guide for perpetuating and enhancing Santa Monica's urban forest. The Master Plan establishes guiding principles and associated goals that result in specific strategies for addressing the needs of the urban forest. These strategies take into consideration environmental and urban conditions that fluctuate over time, and are flexible enough to account for future changes that will affect the trees of the urban forest, such as insects, disease, climate shifts and other factors. The Master Plan sets guidelines for periodic tree species performance evaluations and adjustments in the use of individual species. By using an adaptive management approach, new research and technologies will be incorporated into the appendices of this Master Plan as they become available. As the City and other agencies revise and refine their methods for tree care and other City documents are updated, the Master Plan will also evolve.

The Master Plan describes the City's urban forest, analyzes its condition and compares its growth to previous years. This snap shot in time provides the community and future managers of the urban forest with an historical account of the forest and a Street Tree Designations List to create neighborhood street tree environments. The analysis of the forest calculates the value of the environmental benefits it provides.

The value of these benefits justifies the need for effective urban forest management goals supported by sound arboricultural strategies. The baseline data provided will help future managers of the urban forest make informed decisions, and promote a better understanding of the environmental and aesthetic benefits provided by public trees, which will lead to increased community investment in the stewardship of its trees.

The appendices of this Master Plan establish guidelines for the care of the urban forest, lay out specific street tree designations and include a glossary with references that will be updated routinely to incorporate new maintenance practices.

ROLE OF THE URBAN FOREST TASK FORCE

Task Force meetings will be held approximately every two months. To help ensure a focused and effective advisory body during its tenure, the Task Force would advise staff in the following areas related to the urban forest:

Administrative

- Form standing committees and ad hoc committees as needed and as staff resources permit.
- The Species Selection Subcommittee shall be an ongoing standing committee concerned with tree species selections in the city's parkways, medians, parks and public improvement projects, reporting to the Task Force as a whole body.

Capital Projects

- Provide input on proposed tree planting activities in City public improvement projects.

Street Tree Species Selection

- Provide input on street tree species designation, including those adjacent to designated city landmarks and within historic districts. The latter will be accomplished in conjunction with the Landmarks Commission.

Education

- Provide input on the development of the Heritage Tree educational program.
- Encourage responsible stewardship of trees on private property.
- Provide input to staff on written materials sent to residents regarding trees.

Funding

- Advocate and support funding initiatives including grant funding opportunities.

Report Evaluation

- Evaluate biennial reports and the first seven-year report on achieving the stated environmental performance goals as specified in the Master Plan. As needed, the Task Force will advise staff on recommended changes to the Master Plan's goals and strategies, including the appeals processes, tree species designations, tree valuation, the public review process for tree removals, and tree relocations as part of City public improvement projects.

Public Liaison

- Listen to public concerns about tree related

issues and convey those concerns to City staff.

- Advocate for transparency in City operations and for best practices in their interactions with outside contractors.
- Act as representatives of the Urban Forest Task Force before other appointed bodies and before the City Council on matters agreed upon by the Task Force.
- Provide input on tree planting for School District property.

Advisory Recommendations

- Hear reports and provide advisory recommendations.
- Hear reports from City Departments concerning tree aspects of ongoing projects.
- Provide input on implementation of LUCE including input zoning ordinance and development requirements related to public and/or private trees.

ROLE OF THE PUBLIC WORKS DEPARTMENT

The Public Works Department's strategic and systematic stewardship of the urban forest seeks to maximize the sustainable environmental benefits it delivers to the community while minimizing the associated risk. The Department works in close partnership with the Urban Forest Task Force in its endeavors to fulfill the vision of the Urban Forest Master Plan.

CHAPTER 1 - BACKGROUND OF THE URBAN FOREST

HISTORY OF SANTA MONICA'S URBAN FOREST

The cultural life in the area which is now Santa Monica shifted radically during the 125 years before the City was incorporated in 1886. This shift had a major effect on the land that now supports Santa Monica's urban forest.

Over many generations, the Tongva People inhabited this terrain of grassland and coastal sage scrub on the bluffs. Sycamores, cottonwood, and willow may have grown on the banks of streams, with grassland and oak woodland further inland.³

During the 16th century, the Spanish explored and claimed the region. The colonization of Alta California by the Spanish began in 1769. Following Mexico's independence from Spain in 1821, local land grants were made and the land was used mostly for grazing cattle and sheep.

By 1875 Colonel R. S. Baker and Nevada Senator John P. Jones owned the land that is now Santa Monica and laid out the City, numbering the north/south streets from the Pacific Ocean to 26th Street, and naming the east/west streets, from Colorado Avenue on the south to Montana Avenue on the north, after states of the Union. They sold residential lots, and by the time Santa Monica was incorporated into an 8.3 square mile city in 1886, trees were planted and the land that was once a bluff with few trees gave birth to what is now Santa Monica's emerging urban forest.^{4 & 5}



Ocean Avenue circa 1900.

From 1893-1900 other areas of the City were developed. Smaller lots were allocated with the idea of making affordable neighborhoods near the beach. With the smaller lots, less space was allocated for street trees. The choices that early developers made regarding growspace for trees continue to affect today's urban forest.



The estate of Senator John P. Jones became the current Fairmont Miramar Hotel. Its fig tree still exists, over 100 years later, and is one of the City's four current designated Landmark Trees.

THE SANTA MONICA URBAN FOREST TIMELINE

Prior to the 16th century	1542 -1821	1874-1875	1887	1890
The Tongva People, later called the Gabrielinos, lived in villages in what is currently known as "The Westside." These hunter gatherers coexisted with the native plants.	Spanish colonizers introduced exotic plants and animals, changing the ecology of the area.	Colonel Baker and Senator Jones laid out the City of Santa Monica, establishing an infrastructure for the future urban forest.	Abbot Kinney established the nation's first forestry station in Rustic Canyon for experimentation with eucalyptus propagation.	The Santa Monica Forestry Station distributed 76,000 eucalyptus seedlings to encourage use in nurseries.

During the 1880s, experimentation with trees originating in climates similar to Santa Monica was actively pursued. Abbot Kinney, known for his development of the Venice canals, had a profound impact on Santa Monica's urban forest. He served as the Chairman of the State Forestry Board (1886-1888) and as roadmaster of Santa Monica.



Abbot Kinney, a prominent land developer in the area, was an expert on eucalyptus trees and a friend of John Muir.

Abbot Kinney established the nation's first forestry station in Rustic Canyon in 1887 where he conducted studies on close to 100 species of eucalyptus, a very popular species at the time. He knew the work of Ellwood Cooper (of Santa Barbara) who lectured in 1875 that the planting of eucalyptus forests could mitigate wind and increase rain, and that eucalyptus was "needed for the planet's well-being".⁶ Several eucalyptus species identified in Abbot Kinney's book, *Eucalyptus* (1895), exist in Santa Monica today, including *E. ficifolia*, *E. citriodora*, *E. globulous* and *E. leucoxyton*.⁷

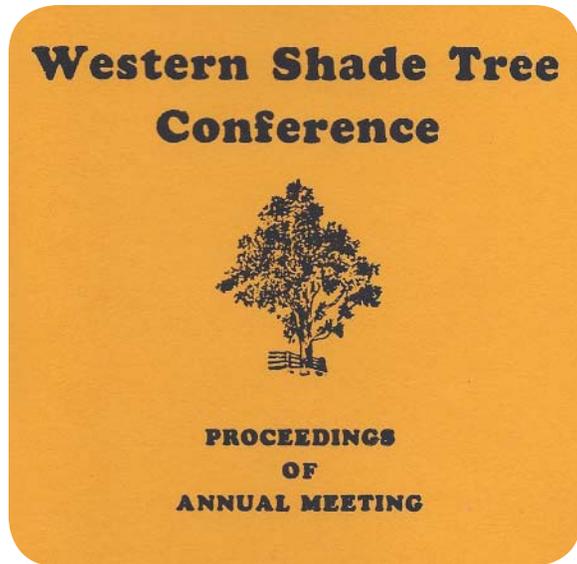
Local nurseries were established to take advantage of the temperate climate. In 1899, a fifteen acre site in south Santa Monica was developed as a growing ground for flowers and became one of the City's best known industries.⁸ In 1923, nurseryman Hugh Evans established a garden in Santa Monica and began importing plants from the South Pacific, Australia and South Africa.

One of the City's beloved parks, Palisades Park, was donated to the City as a park forever in 1892 by Senator Jones and Arcadia Bandini de Baker. In 1908, Santa Monica's Park Commissioner stipulated that his salary be spent on trees in the park. Palms are shown in a 1908 photo of the park, and in 1976 in the book *Trees of Santa Monica*, author Grace Heintz recognized that five species of palms and six species of eucalyptus dominated the park.



Santa Monica aerial photo circa 1919. Canopy trees can be seen in the upper edge of this photo.

1890 - 1900	1892	1900	1923	1944	1953
The city was plotted and a grid of tree-lined streets was created.	Senator Jones and Arcadia Bandini de Baker donated 16 acres of oceanfront land, now known as Palisades Park, to the City for use as public space forever.	Community groups and residents participated in tree planting activities.	Nurseryman Hugh Evans established his garden in Santa Monica at 501 24th Street and began importing plants.	George Hastings published <i>Trees of Santa Monica</i> , acknowledging the City's significant trees.	The City of Santa Monica began a Master Street Tree Planting Program and adopted a Tree Code to be added to the Santa Monica Municipal Code.



The Western Chapter of the International Society of Arboriculture held its first Western Shade Tree Conference in Santa Monica in 1934.

Street tree planting has been part of the City of Santa Monica since the development of its first subdivisions. In the early 1900s, JW Scott, a prominent builder, donated funds for the planting of trees on Ocean Avenue. Other tree planting efforts included the use of eucalyptus as windbreaks to protect crops.

Many of the street trees that exist today were planted during the postwar urban redevelopment of Santa Monica. In 1953, the City of Santa Monica began a Master Street Tree Planting Program and later the same year a Tree Code was adopted “to regulate the planting, maintenance, and removal of street trees in Santa Monica.” The Tree Code established 27 districts in the City and a list of approved trees for planting along streets throughout Santa Monica.⁹



The majority of Santa Monica's current street trees were planted in the 1950s.

In 1956, the City of Santa Monica Master Plan included a five-year tree planting program that resulted in the planting of thousands of street trees. That program continued with a 1962 inventory of existing street trees and recommendations to develop streetscapes on streets without trees.

Since 1981, Santa Monica's comprehensive urban forestry program has been recognized each year by Tree City USA, based on standards set by the Arbor Day Foundation for cities that have a tree board or department, a tree care ordinance, an annual urban forest budget of at least \$2 per capita and an annual Arbor Day event.



In 2011, Santa Monica celebrated its 30th consecutive year of being recognized as a Tree City USA by the Arbor Day Foundation.

1961	1962	1982	1987	1999	2000
A beautification committee initiated by the Chamber of Commerce addressed the need for street trees in the Central Business District.	Santa Monica conducted its first inventory of its trees.	Santa Monica received its first recognition as a Tree City USA by the Arbor Day Foundation.	The City's first electronic tree inventory revealed a total of 28,767 trees in Santa Monica.	The City Council adopted the Community Forest Management Plan 2000.	The Millennium Tree Planting Project added 2,000 trees to the urban forest.

In 1987, Santa Monica began keeping an electronic tree inventory to provide data on Santa Monica's trees and street segments that need replacement trees. The inventory helps to prioritize maintenance requirements and to establish a multi-year tree trimming schedule, both which help set long-term budget needs. The electronic inventory is an educational tool, providing information regarding tree species in any particular location. This inventory served as the foundation for the development of the Community Forest Management Plan 2000 which is in use as of the writing of this Master Plan. In Fiscal Year 1999-2000, the City Council commemorated the new millennium by providing funds to plant 2,000 public trees throughout the City.

In 2001, the U.S. Forest Service's Center for Urban Forest Research analyzed Santa Monica's urban forest and produced a "Benefit-Cost Analysis of Santa Monica's Municipal Forest." The report concluded that for every \$1 Santa Monica spends on the care of its forest, the residents receive \$1.62 in environmental benefits. The report also pointed out that "Santa Monica's urban forest is an aging forest that is in a period of transition." The analysis revealed the need for a long term plan that includes diversifying the number of species and ages of trees in the forest.

The assessment of Santa Monica's urban forest in this Master Plan is based on the 2010 inventory of the City's public trees. It provides base-line information necessary to define a plan to achieve the diversity and stability that was called for in the 2001 U.S. Forest Service analysis and it identifies best practices for tree care that will sustain a healthy urban forest.

Today's forest is the outcome of the horticultural choices by all those who have planted trees in the City, maintained them, and studied their growth and success in the past. That knowledge is now augmented with the insights and practices of those more recently charged with the responsibility and care of the forest, including staff professionals along with input from community members.

This Master Plan is developed from an understanding of the historical context of Santa Monica's urban forest, existing forest conditions, and current best management practices that will serve as guidelines for tree care. The process to develop this Master Plan will serve as a model to be refined and improved on by future generations of managers of Santa Monica's urban forest.



A HISTORY OF LOOKING TOWARD THE FUTURE

In the 1950s, the City of Santa Monica began its citywide planting program with a focus on benefiting future generations. Below, the dramatic effects of the City's efforts from more than 50 years ago are apparent.



San Vicente Boulevard in the 1950s.



San Vicente Boulevard current day.

RELATIONSHIP TO OTHER CITY DOCUMENTS

The Urban Forest Master Plan is supported by and reinforces City policies outlined in the elements of Santa Monica's General Plan and in other planning documents that establish broad policies for the physical character of Santa Monica. There are separate elements of Santa Monica's General Plan, many of which establish policies, supporting the need for a strong urban forest program.

The City's Land Use and Circulation Element (LUCE) provides policy direction for physical development throughout the community. The LUCE addresses the need to protect and systematically expand the forest through tree planting programs on city streets, in parks and other public spaces. The LUCE highlights the community's goals for protecting neighborhood character and it recognizes the importance of the streetscape by encouraging neighborhoods to function as gathering places that feature a landscaped environment with tree-lined sidewalks. It recommends new trees for proposed residential districts through the City's urban forest program.

The Open Space Element and Parks and Recreation Master Plan also contain policies that support the long term health and expansion of the urban forest.

The urban design philosophy of the City's specific plans and the implementation of projects reflect the many policies that impact the urban forest. The Civic Center Specific Plan identifies public spaces, including tree-lined streets with landscaped parks and plazas, as key features in creating a vibrant and pedestrian-oriented urban village. The various projects to be built in and adjacent to the Civic Center include a six-acre park with groves of trees including specimen trees appropriate for this coastal climate, and the Colorado Esplanade which includes a tree lined streetscape connecting the new EXPO light rail terminus to the Santa Monica Pier and downtown.

Additionally, through its goals, objectives and policies, the Historic Preservation Element recognizes that streetscapes can establish a context for historic buildings and districts, and encourages consideration of history including the protection of historic views and landscapes in designing public improvement projects.

As elements of the General Plan are updated and specific plans and other public landscape projects are implemented, they should be guided by the principles of this Master Plan. Periodic updates of this Master Plan will ensure the progression of a continuous improvement cycle.

RELATED CITY DOCUMENTS

- 2010 - Land Use and Circulation Element
- 2010 - Historic Resources Inventory
- 2006 - Downtown Urban Design Plan
- 2006 - Sustainable City Plan
- 2005 - Watershed Management Plan
- 2005 - Civic Center Specific Plan
- 2002 - Historic Preservation Element
- 1997 - Parks and Recreation Master Plan
- 1997 - Open Space Element

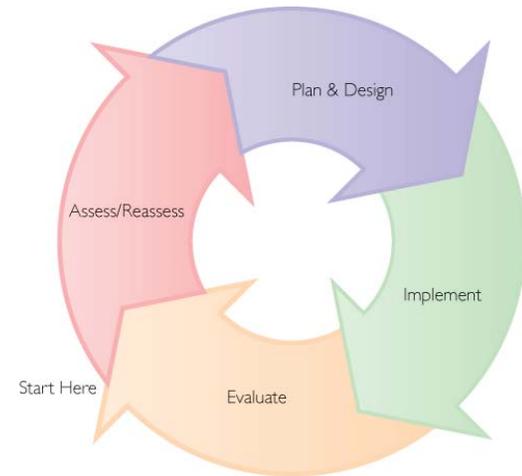


Fig. 1 - Continuous improvement cycle.

BASELINE ENVIRONMENTAL CONDITIONS

WATERSHED AND WATER QUALITY

When looking at Santa Monica's urban forest, it is important to look beyond the City limits and recognize the role that trees play within a regional context. The City is located within the Santa Monica Bay Watershed. Urban stormwater runoff is a major source of pollution entering local rivers and the Santa Monica Bay. Santa Monica's urban forest helps to reduce the amount of runoff and pollutant loading into receiving waters. The trees intercept and store rainfall on their leaves and branch surfaces, thereby reducing runoff volumes and delaying the onset of surface runoff. Urban forest canopy cover also reduces soil erosion as it diminishes the impact of rainfall on bare or landscaped surfaces.

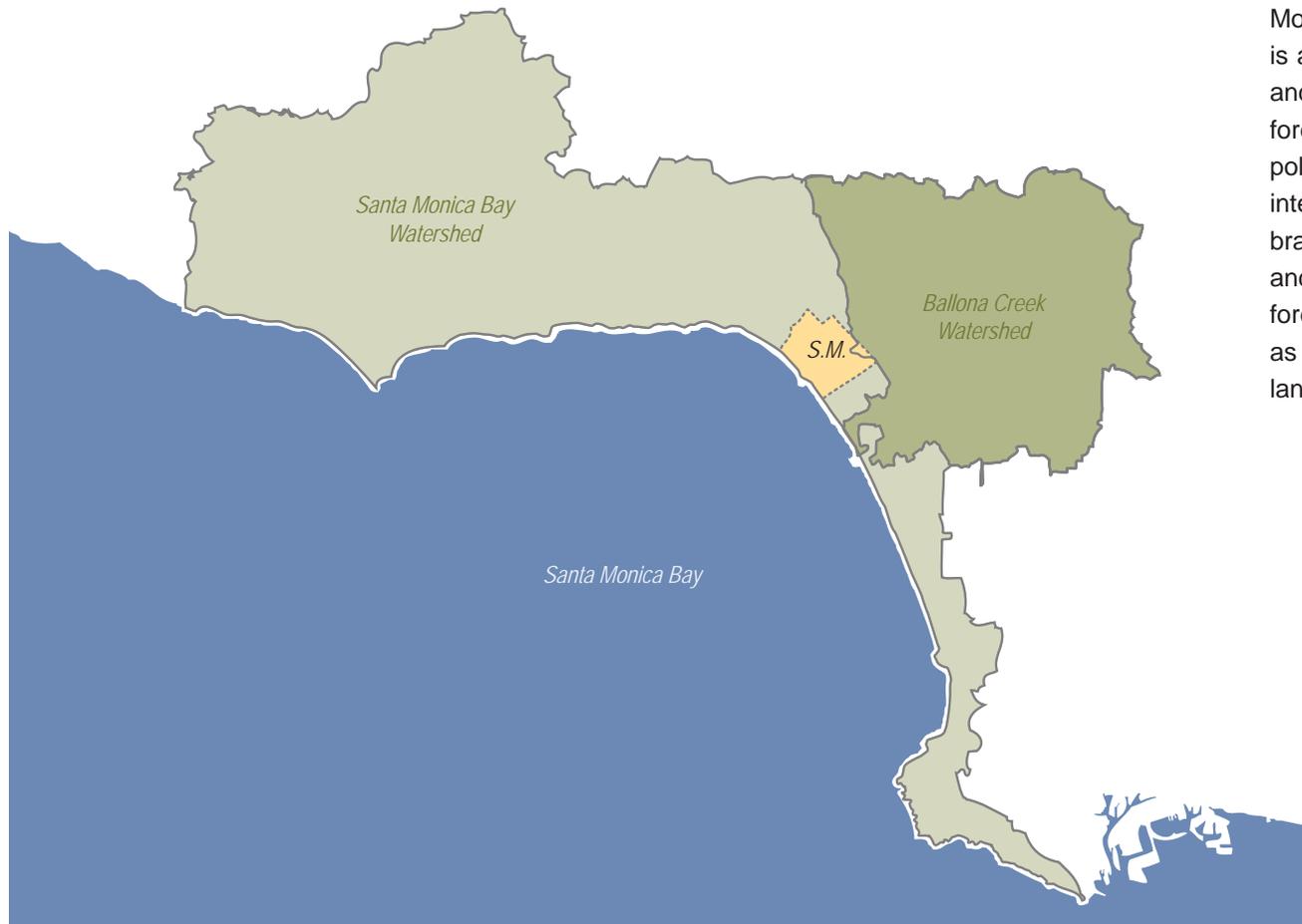


Fig 2 - Santa Monica Bay Watershed is formed by a natural divide, in this case the Santa Monica Mountains and surrounding topography, that separates one drainage area from another. A portion of the Ballona Creek Watershed is within the City of Santa Monica.

TOPOGRAPHY AND SOILS

The topography of Santa Monica is generally flat with the elevation of the City rising as it approaches its eastern boundary. The majority of Santa Monica's elevation is higher than 100 feet above sea level and is separated from Santa Monica State Beach by the Palisades bluffs. The southwest corner of the City slopes gently to sea level and allows unimpeded access to the beach. The slope is more pronounced on the northeast side of the City where homes sit high enough to have views of the ocean.

The California Department of Food and Agriculture has identified three major soil types in Santa Monica, as illustrated in Figure 3:

- 1** **Diablo Altamont Soils**
 Composed of clays that overlie soft, fractured shales. These soils are well drained and have a moderate erosion potential and a high expansion potential.
- 2** **Hanford Soils**
 Tend to be sandy loams and loamy sands on alluvial fans and plains. These soils are well drained and have low potential for expansion and erosion.
- 3** **Ramona Placentia Soils**
 Well drained with low potential for expansion and erosion. These soils are located on terraces and alluvial fans and vary from fine sandy loam to a fine sandy clay loam.¹⁰

In coastal areas of low slope, street trees need to be able to withstand the sea winds and ocean influence that continuously batter them, especially when they are planted on streets perpendicular to the ocean.

City trees are planted in native soil with no additional amendments, so careful consideration of the compatibility of the tree type with the existing soil results in healthier long term tree growth.

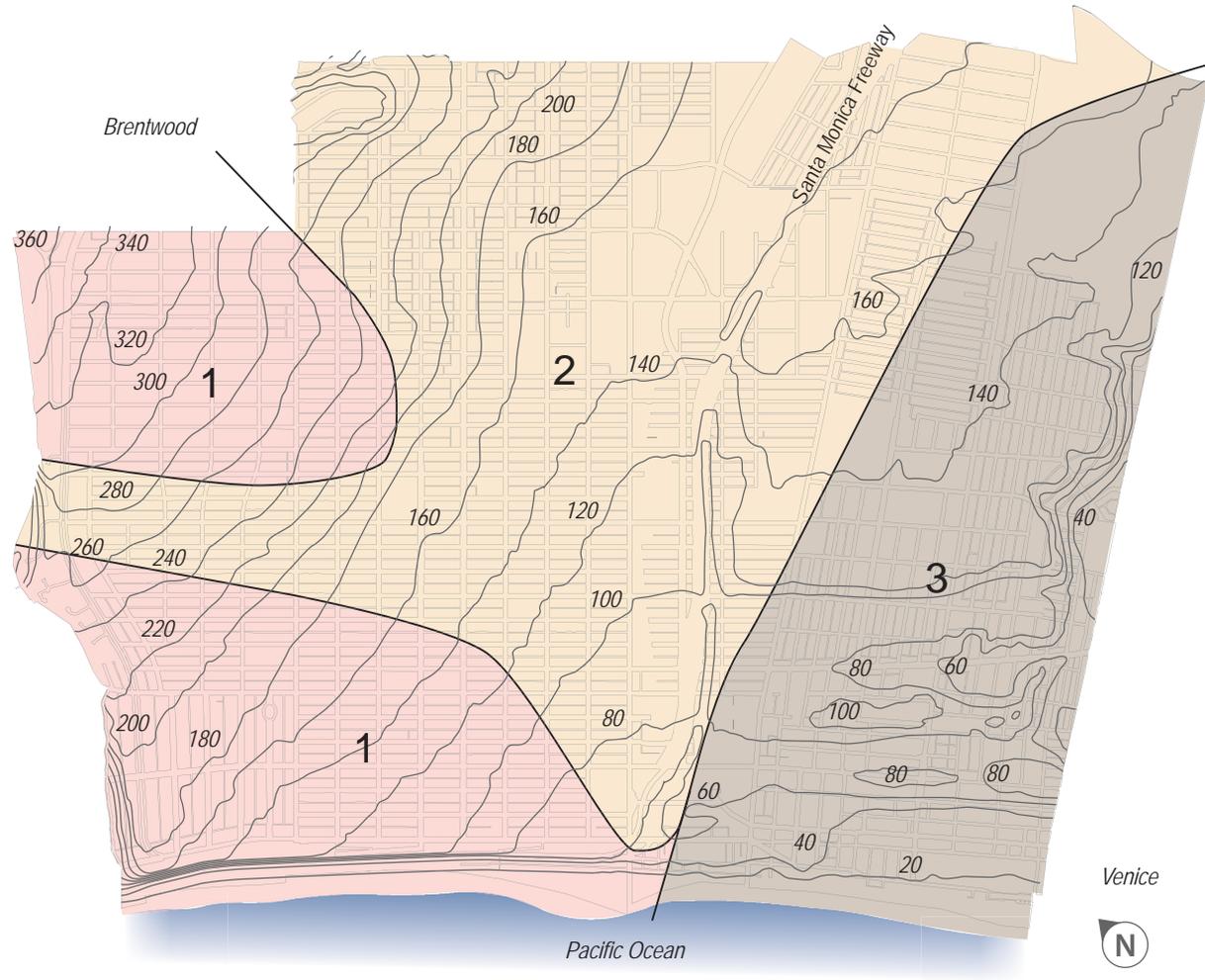


Fig 3 - The topography of Santa Monica is mostly flat, with a slope that angles down towards Ocean Avenue and towards the south. High bluffs separate the north side of the city from the beaches. Numbers show the elevations above sea level at the adjacent contour line.¹¹

CLIMATE AND MICRO-CLIMATES

Santa Monica enjoys a classic Mediterranean climate with cool ocean breezes and over 300 days of sunshine a year. Because of its location on the Santa Monica Bay, morning fog is a common phenomenon in May, June and early July. The sun usually burns the fog off in the afternoon, however it sometimes remains cloudy and cool all day, even as sunny skies and warmer temperatures are found further inland. At times, the sun shines east of 20th Street, while the beach experiences coastal fog. As a general rule, the beach temperature is five to ten degrees cooler than it is inland. The highest temperatures are usually in late summer, although unseasonably warm weather can occur periodically through the winter when Santa Ana wind conditions bring the hot dry inland air to the coast.

Winter rains bring over eleven inches (11") of rain annually with an average of two inches (2") of rain during the months of November through March and less than one-quarter inch (1/4") of rainfall the rest of the year. Winter storms usually approach from the northwest and pass quickly through the southland. Yearly rainfall can be unpredictable as rainy years and drought years are intermittent.

Most trees listed in the *Sunset Western Garden Book* as being suitable for coastal conditions grow well in the majority of the City. However, as seen in Figure 4, the southwestern most neighborhoods receive first ocean exposure and require trees that can withstand strong winds and salt spray.

In the northernmost and easternmost edges of Santa Monica the micro-climate transitions to a warmer zone and the City can introduce trees that require more summer heat and winter chill, including trees which exhibit showy foliage.



Fig. 4 - Micro-climates within the City are defined by the land's topography, elevation and proximity to the ocean. Five separate micro-climates have been identified, allowing for climate appropriate species designations. This is especially useful in designating species in "tricky areas" such as the First Ocean Exposure.

ECOLOGY, PLANT AND WILDLIFE COMMUNITIES

The City of Santa Monica is unique in that it is a coastal plain nestled between the Santa Monica Mountains to the north, the Ballona Wetlands to the south and the Pacific Ocean to the west. Because of the City's proximity to the ocean and the mountains, temperate climate and well-drained soils, a wide variety of plant communities would naturally thrive within the City limits. Figure 5 shows a topographical cross-section of the City and the related ecological communities that may have grown here in the past. Marine life, mammals, birds and insects coexisted with these plant communities creating a complex network of relationships that depended on each other for survival.

Today, the City of Santa Monica is fully developed and lacks the undisturbed native habitat to support a diverse native terrestrial animal population. Due to their mobility and range of travel, birds are more abundant than other wildlife in the City¹². Resident birds that are common to the area include the northern mockingbird (*Mimus polyglottos*), Anna's hummingbird (*Calypte anna*), house finch (*Carpodacus mexicanus*), and the snowy plover (*Charadrius alexandrinus*).¹³

The City of Santa Monica is located on the Pacific Flyway and is also host to migratory birds. Birds that migrate to and from Santa Monica include the white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Dendroica coronata*), and the ruby crowned kinglet (*Regulus calendula*) in winter, and swallows such as the barn swallow (*Hirundo rustica*) and northern rough-winged swallow (*Stelgidopteryx serripennis*), and the hooded oriole (*Icterus cucullatus*) in spring and summer.¹⁴

Monarch butterfly (*Danaus plexippus*) winterroosting sites have been reported within open space and landscaped areas of the City, as the environmental conditions and the micro-climate in groves of trees suit the needs of the butterflies. Eucalyptus trees provide a nectar source and are most frequently used as wintering sites by monarchs.¹⁵

The continued observation of birds and insects, including the relationship of native plant material to beneficial insects and other wildlife, will ensure that the resources that supply the urban forest are used wisely. Observation of new tree introductions and their contributions to the ecology of the City should also be continued.

Understanding the balance of human, plant and wildlife associations is key to a healthy environment. The 150 miles of streets of the City constitute its largest open space making up twenty-three percent (23%) of the City's area.¹⁶ Thoughtful selection of trees planted in environmentally friendly infrastructure can contribute to the health of the ocean by reducing urban stormwater runoff and while improving habitat for many species that can exist in the built environment.

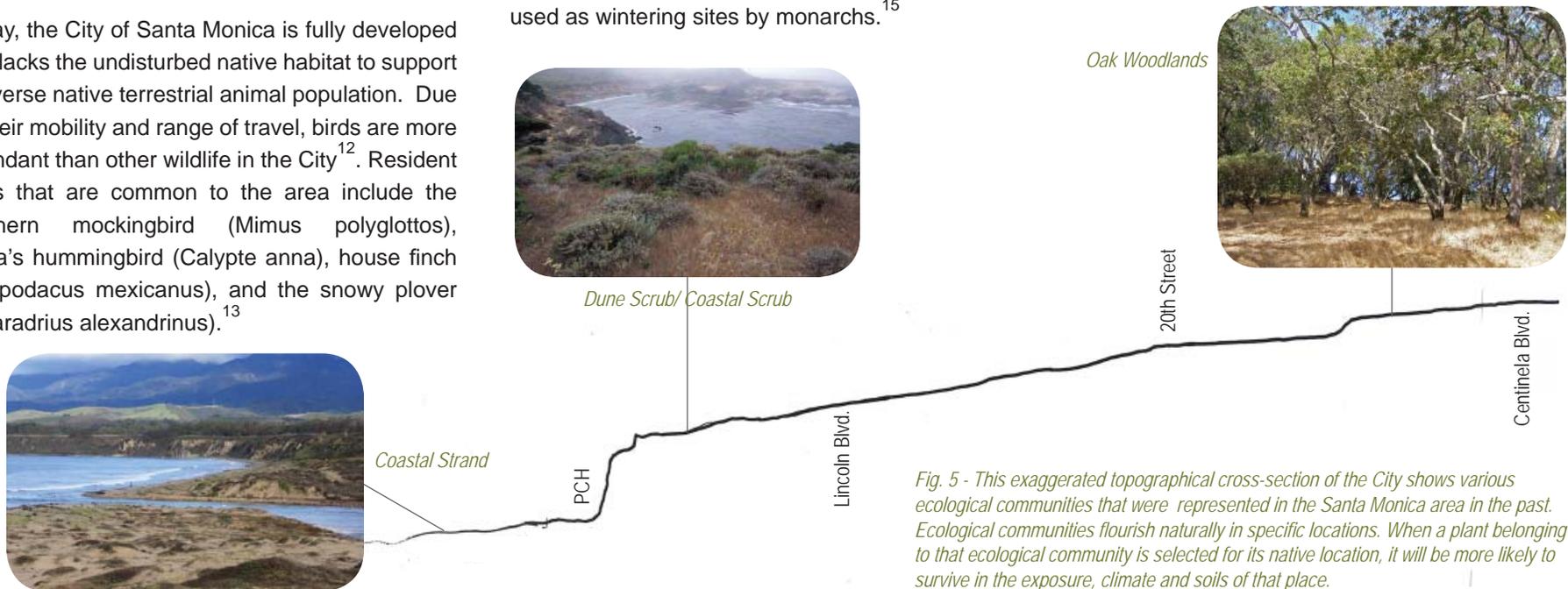


Fig. 5 - This exaggerated topographical cross-section of the City shows various ecological communities that were represented in the Santa Monica area in the past. Ecological communities flourish naturally in specific locations. When a plant belonging to that ecological community is selected for its native location, it will be more likely to survive in the exposure, climate and soils of that place.

THE SANTA MONICA FREEWAY

The Santa Monica Freeway cuts through the center of the City, creating both a literal and figurative divide between the northern and southern neighborhoods. Access to and from the neighborhoods directly adjacent to the freeway is difficult and the presence of the freeway results in elevated levels of noise and air pollution.

The freeway and its embankments are the property of Caltrans, and therefore tree planting does not fall under the purview of the City. However, a “mitigation corridor” supporting the planting of larger stature trees, faster growing trees, and using new technologies to install these trees in growspaces that would normally be too small for them will reduce the impacts of dirt and noise. The City’s Open Space Element encourages the establishment of a freeway forest. A recent example of the ability to accomplish this is the recent relocation of six large Ficus trees to the City-owned embankment just north of City Hall.



Fig. 6 - A freeway “mitigation corridor” can address the unique impacts created by urban freeways, including dirt and noise.

DESCRIPTION OF SANTA MONICA'S URBAN FOREST

The initial phase of this Master Plan was the preparation of an inventory of approximately 33,800 public trees in 2010. Using a Geographic Information System (GIS), the locations of trees, size of growspace, canopy spread, overall health, proximity to objects, root pruning history and other characteristics were recorded.

TOP 15 SPECIES

Data from the 2010 tree inventory indicates that Santa Monica's urban forest is comprised of over 250 different species of trees, with the majority of the forest consisting of the 15 species identified numerically in Figure 7 and graphically in Figure 8. In Figure 8, the individual colored dots represent surveyed trees and the correlating colors represent the tree species shown in the legend.



The Washingtonia robusta is currently the most common tree in the City. Planting within the coastal zone is restricted by the California Coastal Commission because of its tendency to reseed.

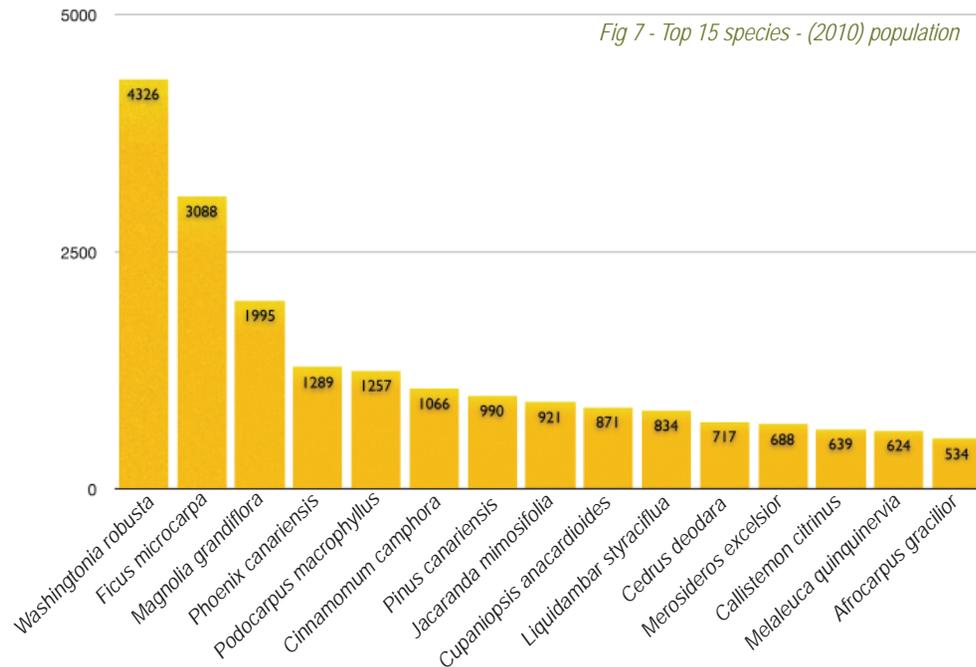


Fig 7 - Top 15 species - (2010) population

Washingtonia robusta (Mexican Fan Palm) is the most common species in Santa Monica's urban forest. This species lines major commercial thoroughfares like Wilshire Boulevard and is also planted throughout beach neighborhoods where it thrives under harsh coastal conditions. The palm species is long lived and can reach heights in excess of 100 feet but provides very few environmental benefits. Also, it reseeds readily, so planting this palm within the Coastal Zone is currently banned by the California Coastal Commission.

Another heavily used species is Ficus microcarpa 'Nitida' (Indian Laurel Fig). This evergreen species provides significant environmental benefits and produces year-round shade for many residential streets and the three main business districts. However, the trees drop leaves and berries and have invasive roots that tend to lift sidewalks when planted in too small of a growspace. The challenge for the City is to maximize the environmental benefits that the Ficus trees bring to the urban environment by planting them strategically and to minimize their nuisance potential by employing new technologies during the planting process which may help to control root growth in the future.



Fig 8 - Top 15 species map. This 2010 map and all other maps in this section can be viewed at full size at the Urban Forest website (<http://www.santamonicatrees.com>).

GROWSPACE

Growspace is defined as the ground level space that a tree is allotted to grow. As shown in Figure 9, growspaces range from small tree wells or narrow parkways to wide-open spaces. A key element in the success of a tree in an urban environment is its ability to expand its root mass to an appropriate size and dimension. Root conflicts with urban infrastructure are mostly due to trees being placed in a growspace that does not adequately accommodate that species as it matures.

During the 2010 tree inventory process, growspace was measured for each public tree. Figure 10 shows the range of current growspace and Figure 11 shows the distribution of growspace sizes throughout the City. The northern parts of the City were originally laid out with larger lots and larger parkways, which has allowed larger tree specimens to grow there.

As seen in Figure 10, a large number of the City’s trees are planted in 3’ and 4’ growspaces. This presents a particular challenge for achieving diverse tree selection and robust canopy coverage because there are a limited number of tree species appropriate for a small growspace, which tend to be smaller statured trees.

New emerging technology in tree growth management will allow larger trees to grow in confined locations without disrupting and displacing sidewalks or streets. These specialized products will support pedestrian and traffic loads and provide uncompacted, engineered soil for large trees. The use of new technologies, planting methods and identifying areas available for infrastructure modification (e.g., widening parkways, adding curb extensions and medians when streets are redesigned) will bring much needed tree canopy to parts of the City historically lacking large trees.

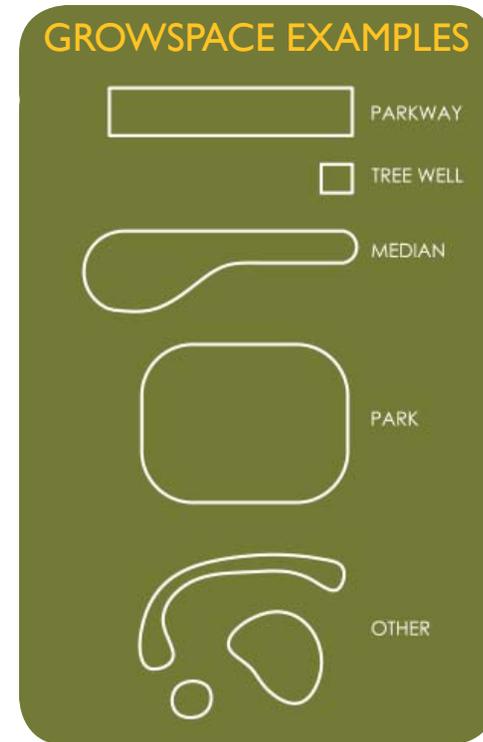


Fig 9 - Growspace examples.

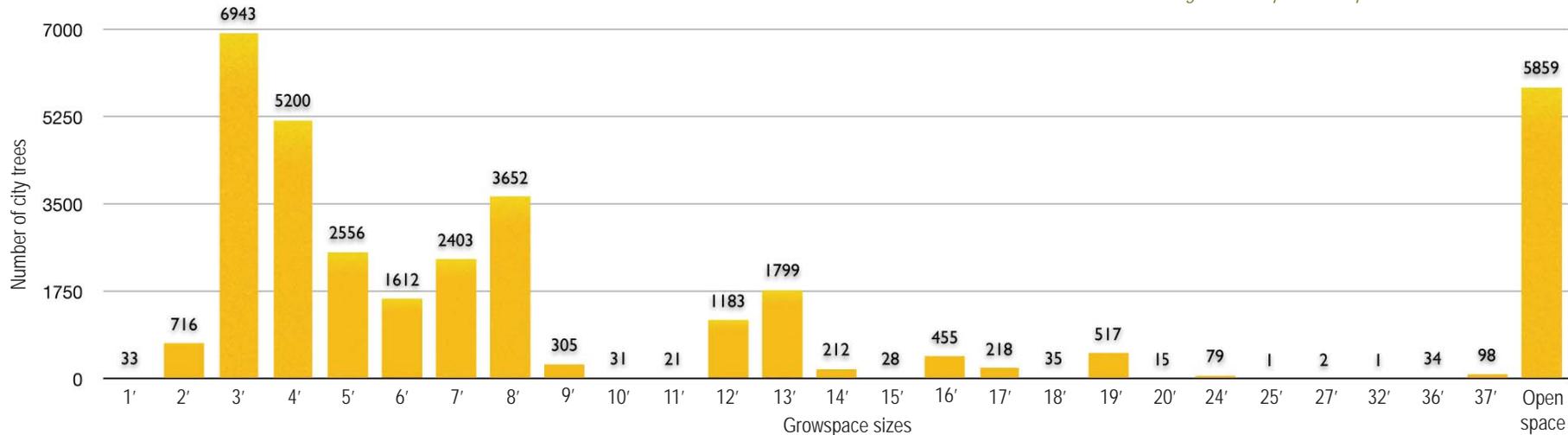


Fig 10 - Growspace inventory. The graph above shows the number of street trees planted in various growspace sizes and the number of “open space” trees. These trees are located at parks, beach, and cemeteries.



Fig 11 - Growspace sizes map. This 2010 map and all other maps in this section can be viewed at full size at the Urban Forest website (<http://www.santamonicatrees.com>).

RIGHT TREE FOR THE RIGHT PLACE

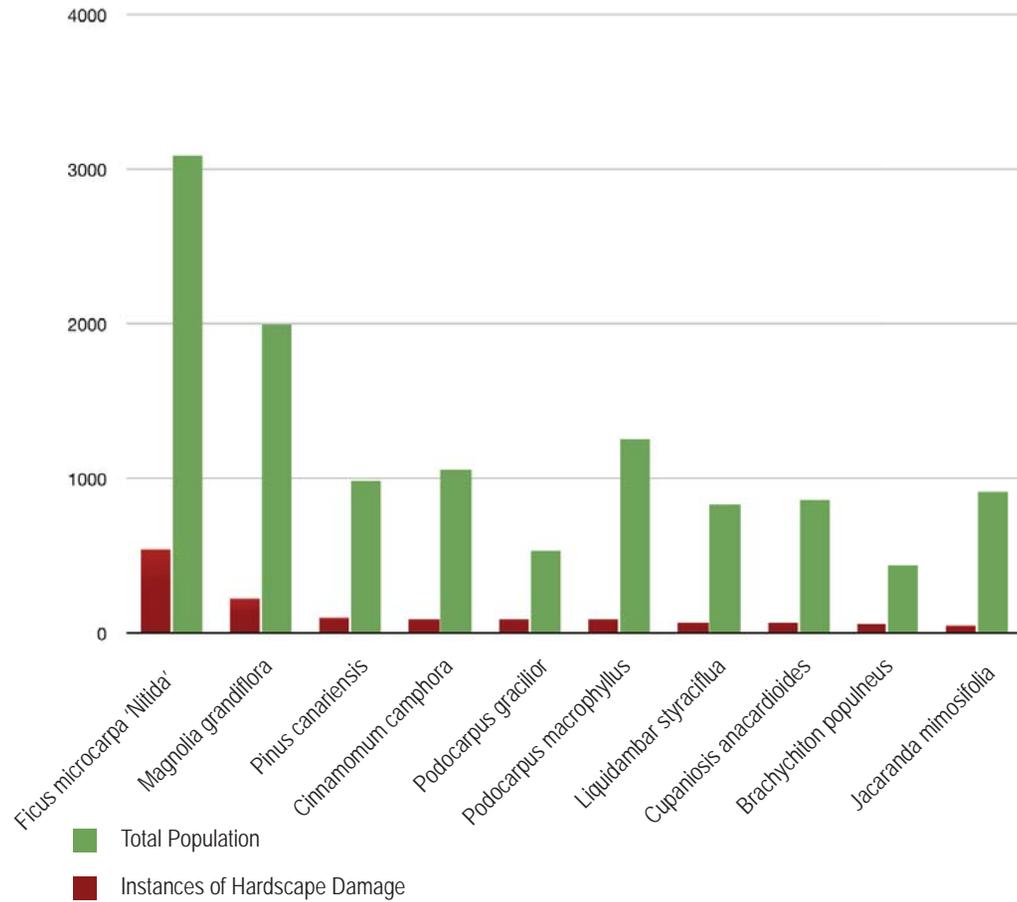
“The right tree for the right place” is a term used in urban forestry for planting a species of tree that is appropriate for its location. The most important factor to consider when planting a tree is to make sure it has enough room to grow. Each tree species requires a certain amount of space to grow and thrive without causing damage to its surroundings.

While most of Santa Monica’s trees are planted in a suitable location, many trees are growing in spaces that cannot accommodate their growing requirements. This usually results in damage to streets, sidewalks or utilities that ultimately increase maintenance costs.



Displaced sidewalk and driveway surfaces. When trees are planted in growspaces that are too small, their root mass will eventually outgrow the space which results in hardscape damage.

Fig 12 - Frequency of Infrastructure Damage Compared to Species Population.



Infrastructure damage was assessed as part of the 2010 tree inventory. Figure 12 above shows the species that have caused the most infrastructure damage, along with their population in the City for comparison.

The individual colored dots shown in Figure 13 represent each tree surveyed. The correlating red or green color on the map represent whether or not a particular tree is in a suitable site or if there is or will be, a potential need for future hardscape repair.



Fig 13 - Right tree for the right place map. This 2010 map and all other maps in this section can be viewed at full size at the Urban Forest website (<http://www.santamonicatrees.com>).

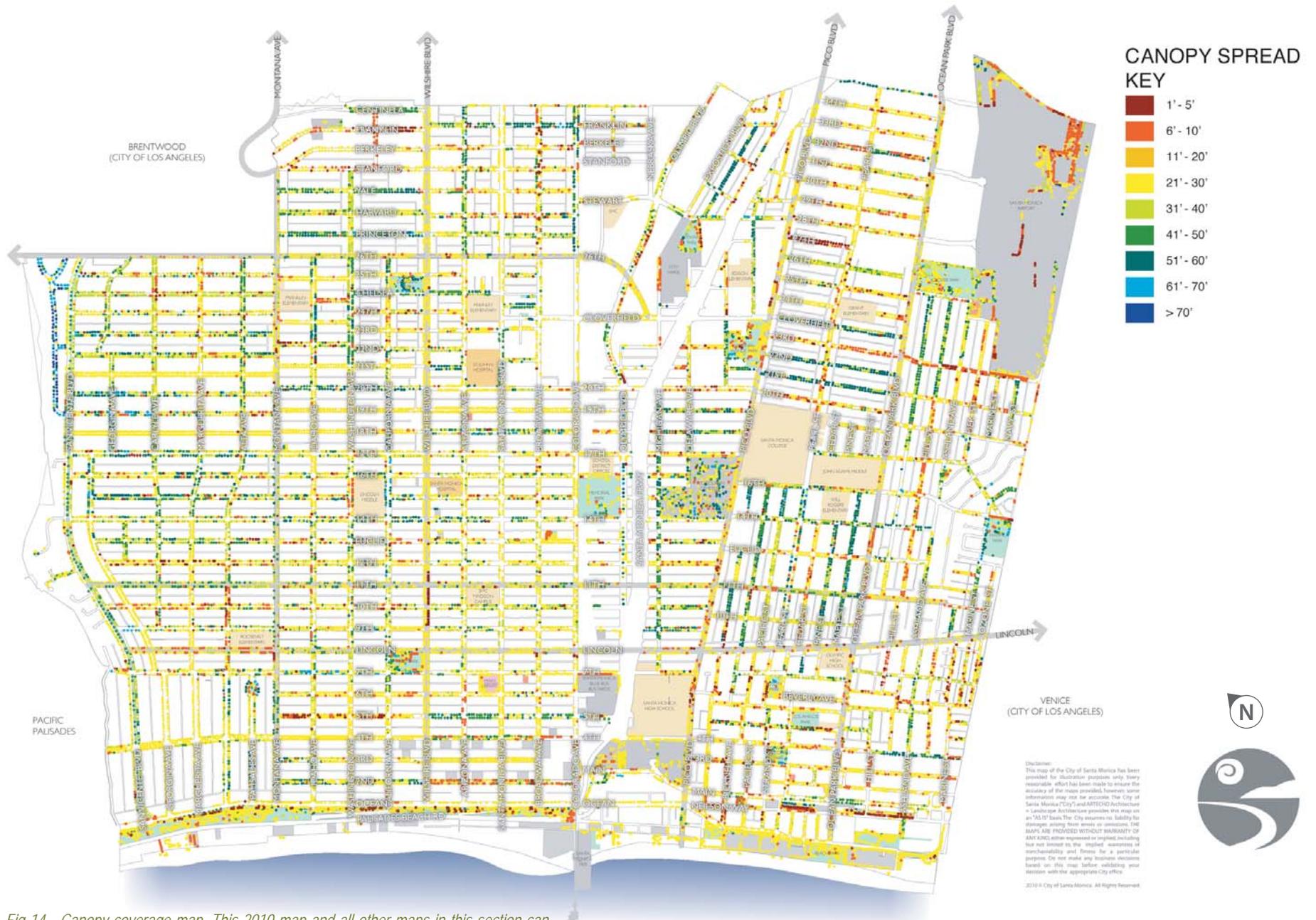
CANOPY COVERAGE

Tree canopy provides shade and oxygen, which cools the City's streets as well as homes and buildings. These contributions also create improved conditions for pedestrians. A full and healthy urban forest canopy can be an effective and efficient means of reducing pollution, the heat island effect and the need for air-conditioning.

The benefits have always been tangible but with new analysis software they are now quantifiable. During preparation of the City's 2010 tree inventory, the canopy spread of each public tree was measured. Figure 14 on the next page shows individual colored dots representing each tree surveyed. The correlating colors represent the range of canopy coverage shown in the key.



Cedars on Brentwood Terrace. Mature trees shade homes and cars, reducing the need for air-conditioning. They also reduce the heat island effect from roofs and asphalt and shade parked cars.



ENVIRONMENTAL BENEFITS OF THE URBAN FOREST

Santa Monica's 2010 tree inventory establishes baseline data for a complete analysis of its street tree population by using new software developed by the U.S. Forest Service called iTree. The analysis provides a dollar value indication of the environmental benefits provided by each tree. An analysis of the City's publicly owned trees and the proposed species that will eventually be in the top 15 shows how the individual species provide cumulative benefits to the community.

While iTree analysis provides information on the environmental performance of the entire forest, analyzing individual species provides detailed information on the performance of individual species. Figures 15 and 16 show the environmental benefits of the existing top 15 species and the environmental benefits of the proposed top 15 species.

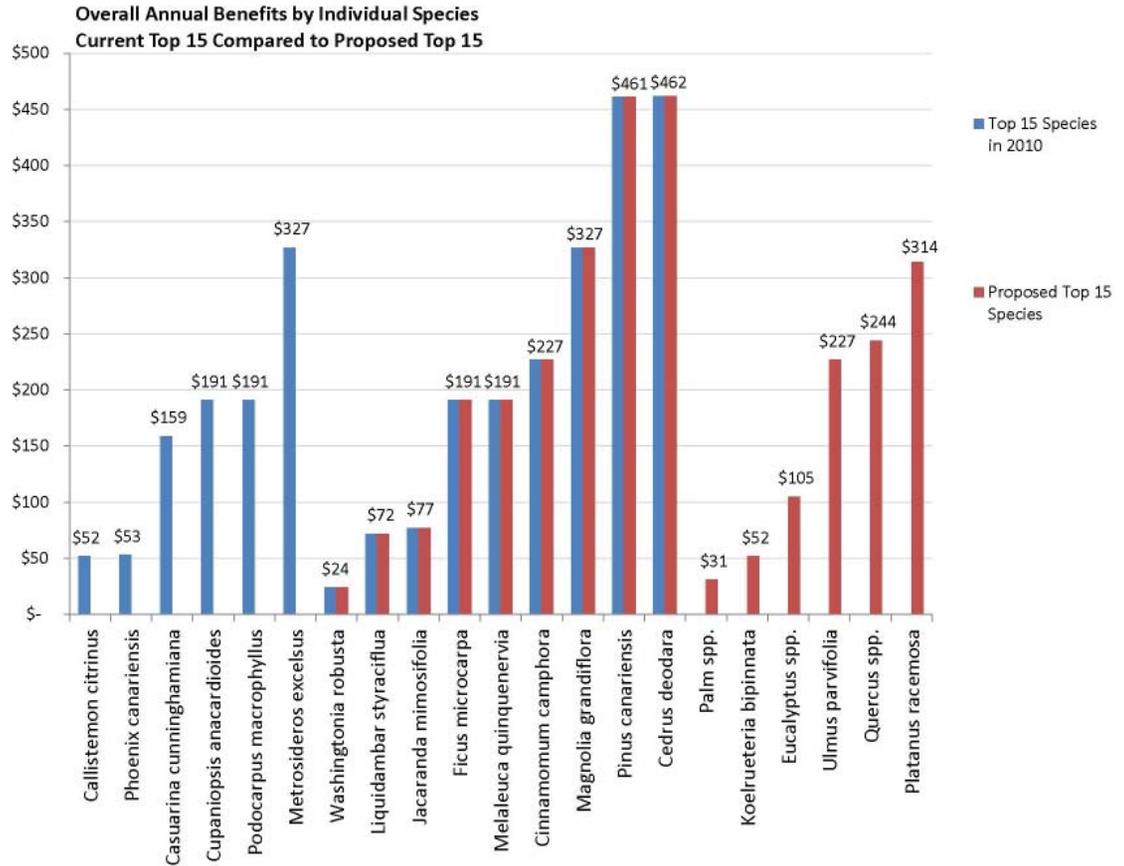
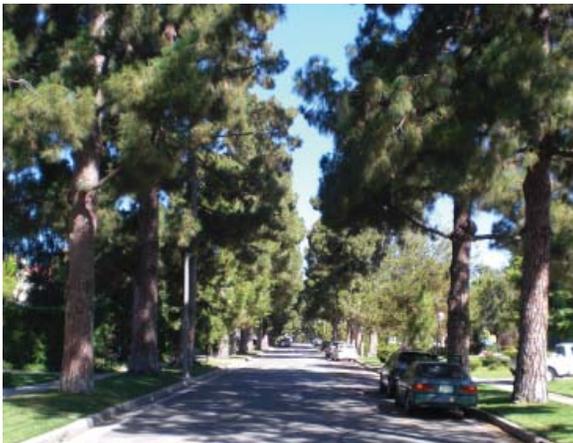


Figure 15 - Overall Annual Benefits by Individual Species. The table above measures the overall annual benefits from trees in regards to stormwater retention, property value increase, energy savings, air quality improvement and carbon sequestration.



The Pinus canariensis (Canary Island Pine) shown in the photo above ranks as one of the highest overall performing trees in Santa Monica's urban forest. Large canopy trees like these alter their environment by reducing reflected heat from asphalt which in turn cools the street. This cooling effect reduces water consumption for irrigating front yard landscapes.

Carbon sequestration is the process where carbon dioxide (CO₂) is absorbed out of the atmosphere by trees through photosynthesis. The carbon is stored in tree trunks, branches, foliage and roots. Urban forests can act as a carbon sink when there are enough trees to store more carbon than is released over time. The *Pinus canariensis* (Canary Island Pine) seen in the photo below absorbs as much carbon as the *Cedrus deodara*, however it ranks higher in the tree population making it an important contributor to the environment.

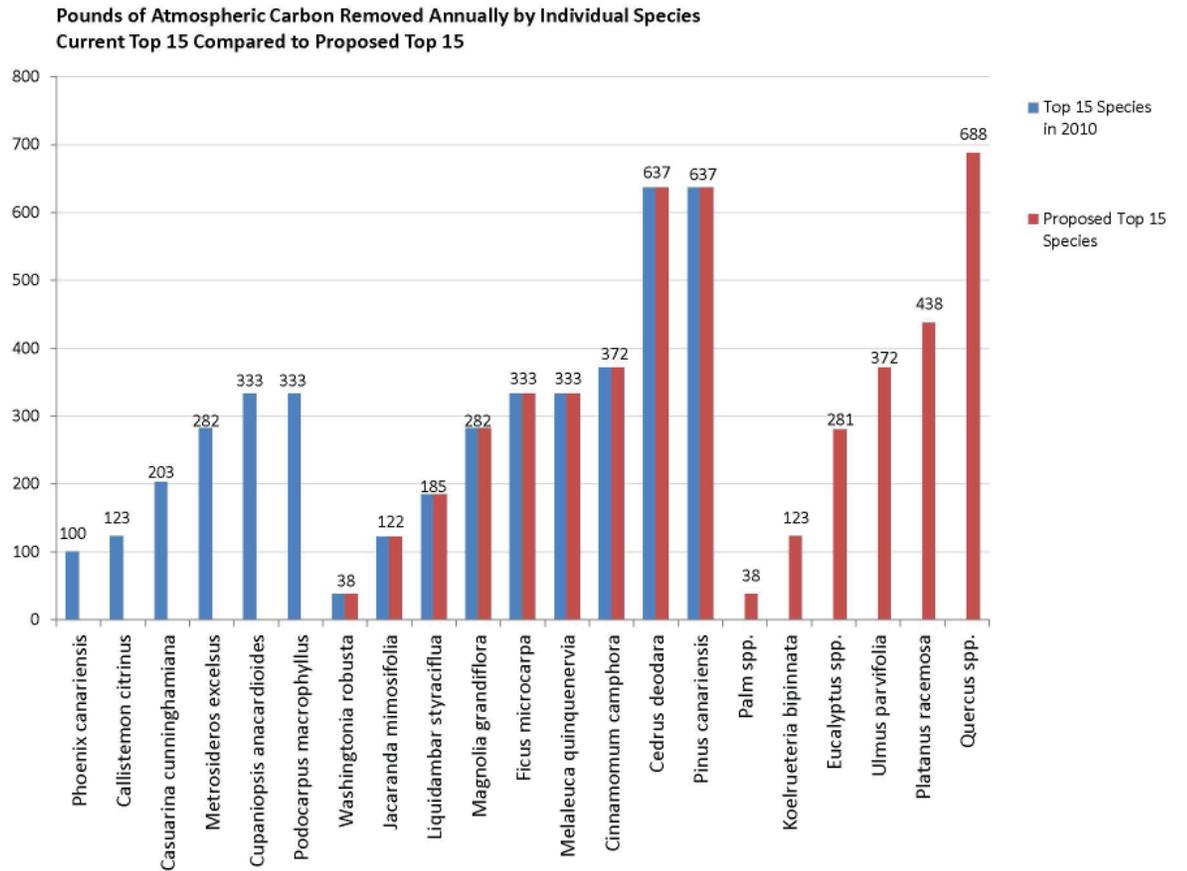


Fig 16 - Pounds of Atmospheric Carbon Removed Annually by Individual Species. Trees in Santa Monica reduce atmospheric CO₂ by directly sequestering CO₂ in their woody and foliar biomass. The energy needs of homes and commercial buildings for heating and air conditioning are reduced, which in turn reduces emissions associated with generating electricity. Of the top 15 species, the best performing trees are the large conifers and broadleaf evergreen trees.

*Large evergreen trees like the *Pinus canariensis* (shown at left) and the *Cedrus deodara* sequester more carbon than other top 15 species.*



The *Liquidambar styraciflua* (Liquidambar) is the highest ranking deciduous tree of the top 15 species in 2011 to reduce annual energy consumption.

Trees modify climate conditions and temperatures and conserve building energy use. The shade from tree canopies cools an area and reduces the amount of heat absorbed and stored by buildings. Evapotranspiration converts liquid water to water vapor which cools air that would otherwise result in heated air from the sun.

Tree canopies slow cold winter winds thereby reducing the amount of heat loss from a home, especially where conductivity is high such as through windows or skylights. Deciduous trees play an important role in the winter when they drop their leaves and allow the sun's radiant energy to warm the surrounding area. The *Liquidambar styraciflua* (Liquidambar) is the highest ranking deciduous tree of the top 15 species in 2011 to reduce annual energy consumption.

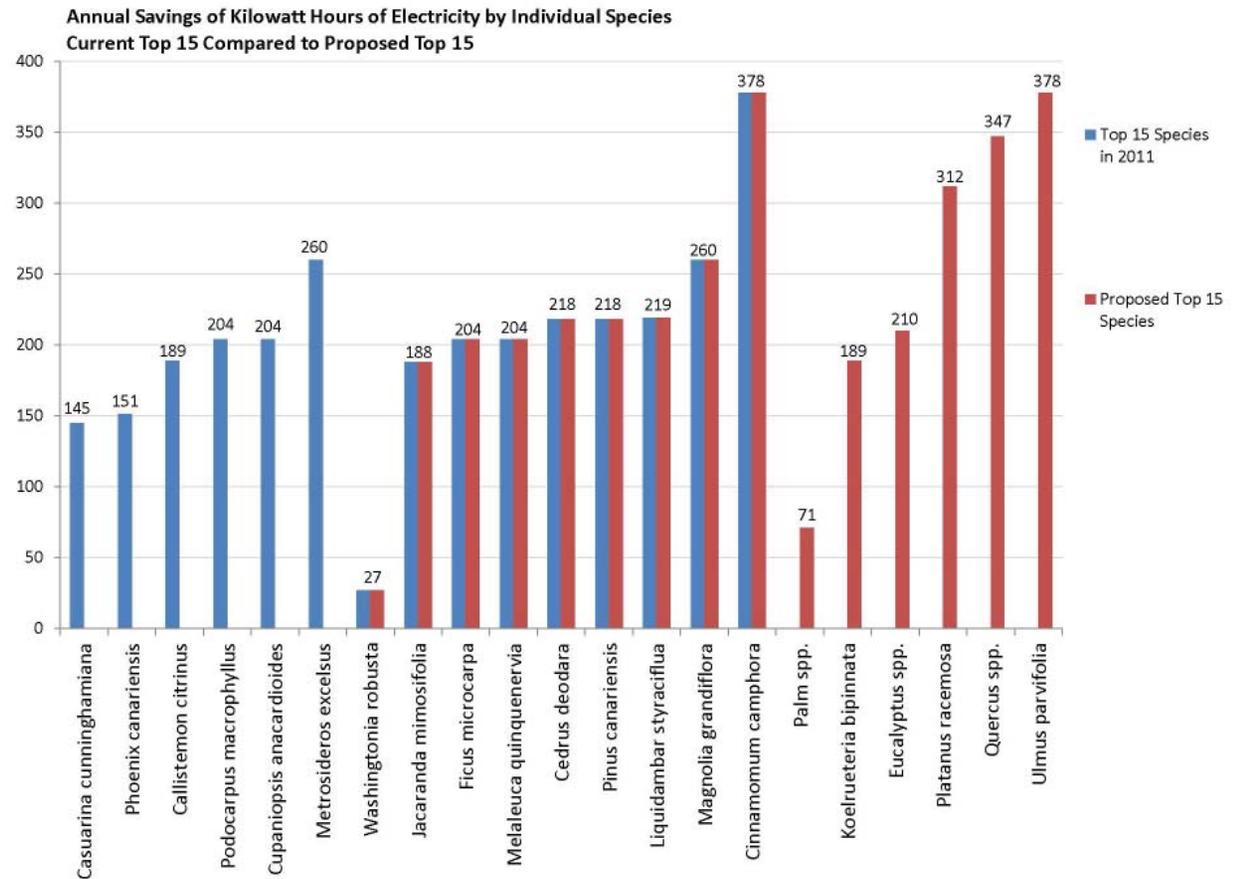


Fig 17 - Annual Savings of Kilowatt Hours of Electricity by Individual Species. The chart above shows how existing tree species will eventually no longer be among the top 15 species in the City's urban forest.

A mature *Cinnamomum camphora* (Camphor), like the one shown in the photo below, can retain over 8,000 gallons of rainfall a year and reduce energy consumption by as much as 378 kilowatt hours, as shown in Figure 17.



A mature Cinnamomum camphora (Camphor) saves 378 kilowatt hours per year.

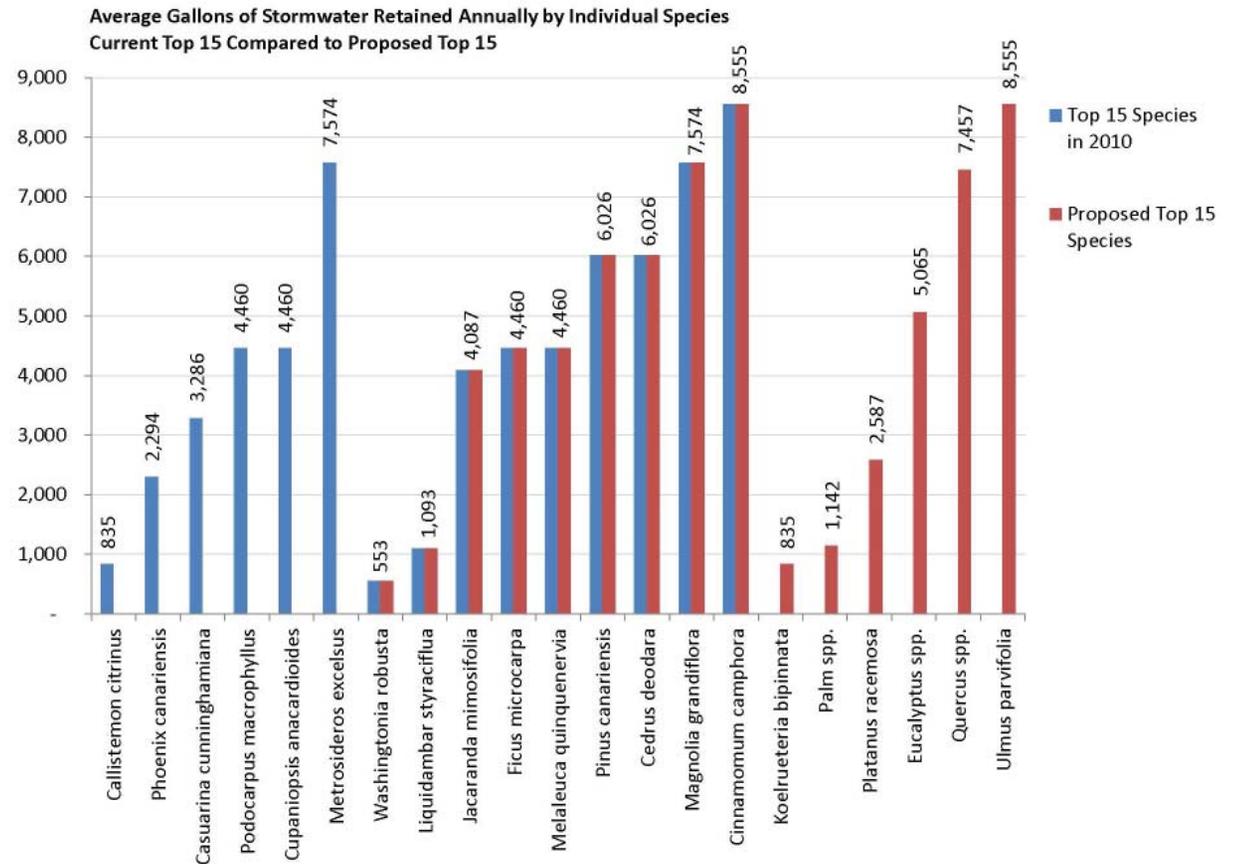


Fig 18 - Average Gallons of Stormwater Retained Annually by Individual Species. Urban stormwater runoff significantly impacts the Santa Monica Bay, and the urban forest plays an important role in reducing the amount of pollutants entering the Bay. Urban trees intercept and store rainfall on their leaves and branches thereby reducing the volume of stormwater and urban water runoff.

COMMUNITY VIEWS OF THE URBAN FOREST

Community outreach for the Urban Forest Master Plan was done in two stages. The first stage occurred in 2010 before any proposed street tree designations were made, and consisted of online and mailed-in surveys as well as resident input at community workshops. This first stage was used to understand the general feelings from the residents toward the current urban forest and to help them describe the qualities and characteristics that they liked and disliked in potential new tree species.

Survey results identified environmental benefits, aesthetics and neighborhood character as very important qualities of Santa Monica's urban forest. When it came to tree characteristics within the urban forest, large canopy, evergreen and flowering trees were preferred by residents. When asked specifically about the importance of street trees, environmental benefits and aesthetics were very important as well as shade and neighborhood character.

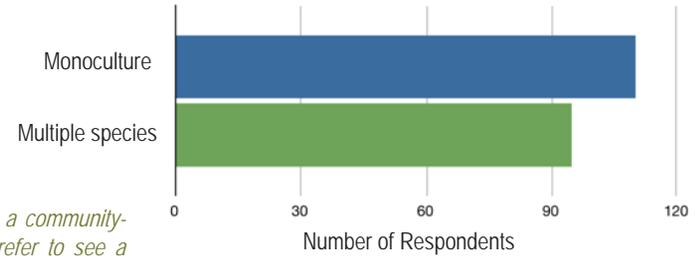


Fig 19 - Residents were asked via a community-wide mailer whether they would prefer to see a monoculture or multiple species planted on their street. A majority of people who responded to the survey said they would prefer a monoculture.



Broad-leaved Evergreen Monoculture. - This was the most popular choice at each community workshop. Participants liked the form, environmental benefits, and year round foliage of the broad-leaved evergreen monoculture.



Broad-leaved Evergreen & Deciduous. - Close behind the broad-leaved evergreen monoculture, the combination of broad-leaved evergreen and deciduous trees was second-most popular because of its seasonal variation.



Narrow-leaved Evergreen & Deciduous. - Another combination offering seasonal variation as well as foliage contrast is the narrow-leaved evergreen and deciduous combination. This was the third most popular planting profile.

Fig 20 - At the 2010 community workshops, the participants were asked to indicate their preference for tree patterns from a group of over 25 possibilities.

Fig 21 - Survey respondents were asked what their favorite street tree was.

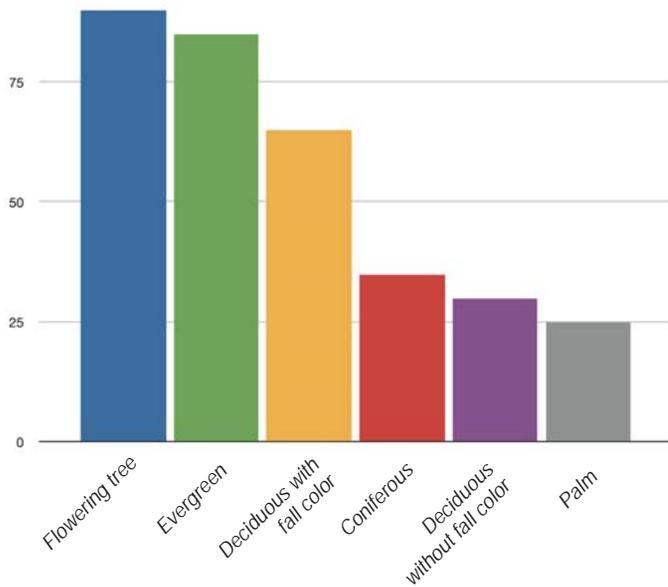
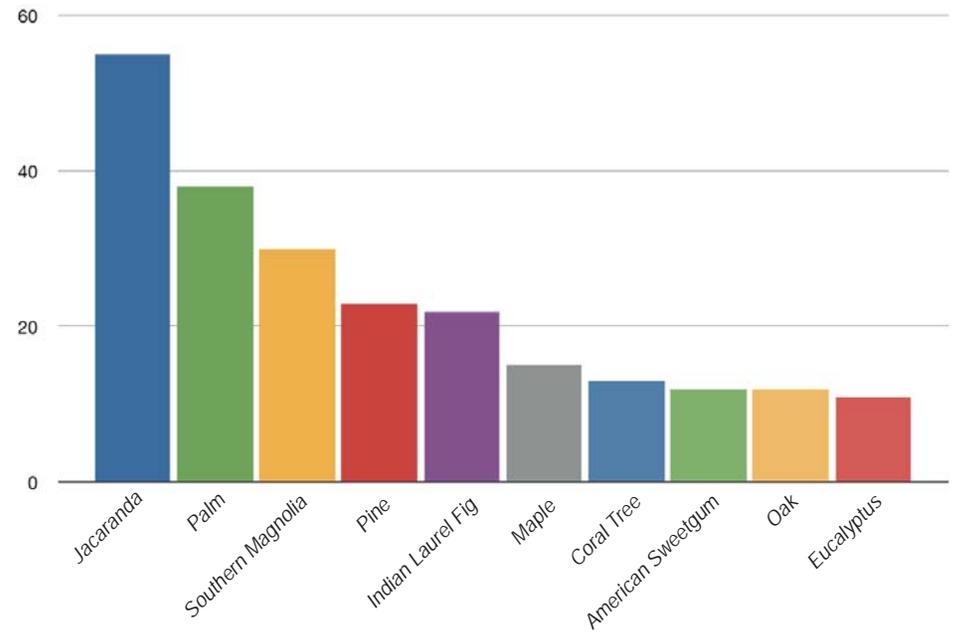


Fig 22 - Survey respondents were asked specifically what type of tree they would like to have in front of their house. Flowering trees (like the jacaranda and magnolia), evergreens and deciduous trees with fall color got high marks. In contrast, conifers, deciduous trees without fall color, and palms were preferred by fewer residents.

Fig 23 - Survey participants were asked how important the following tree benefits are to them.

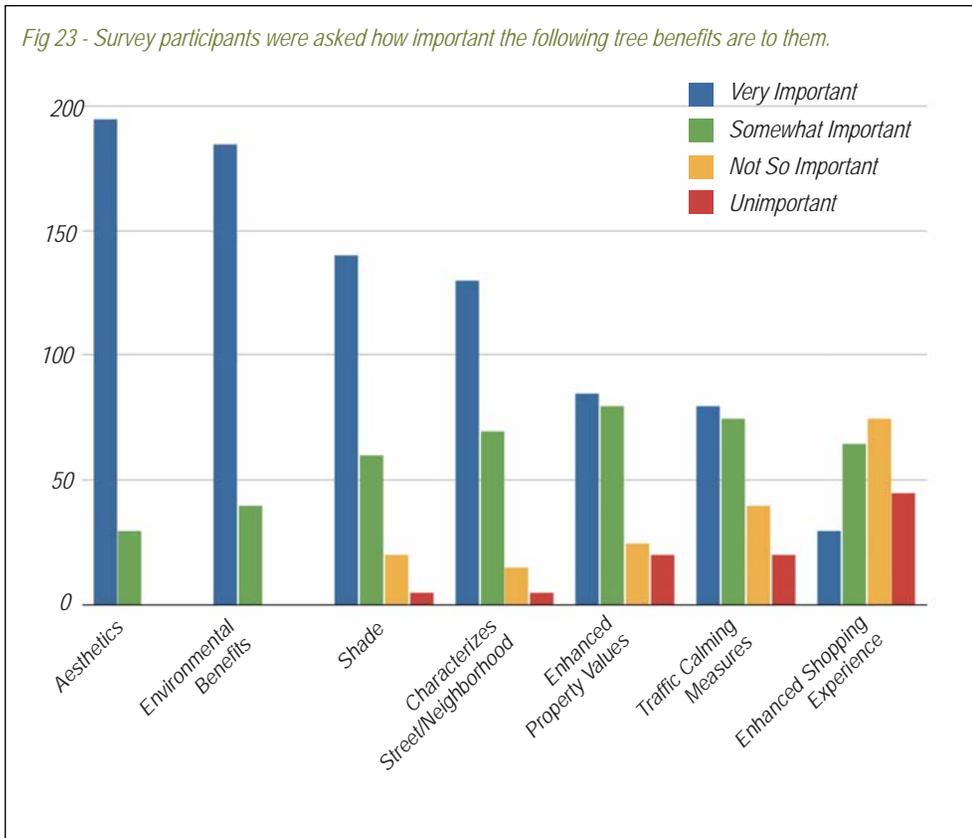


Fig 24 - Survey participants were asked what they liked about trees on their block.

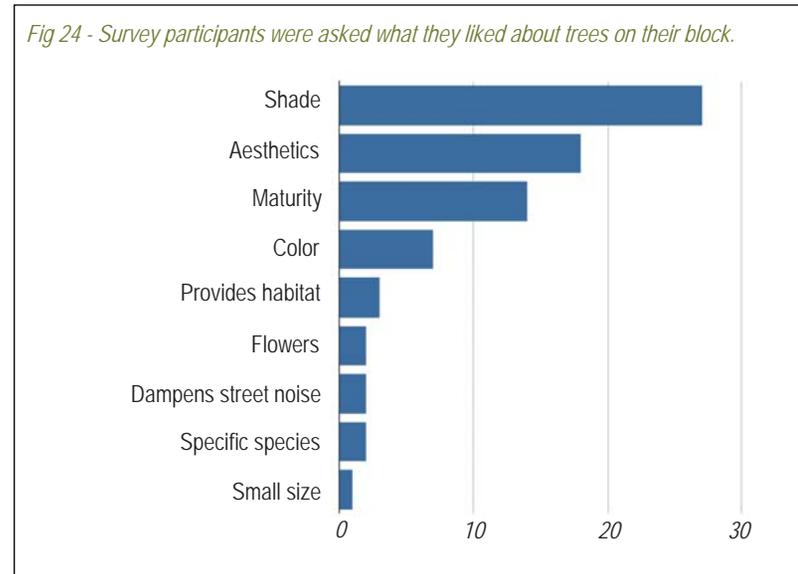
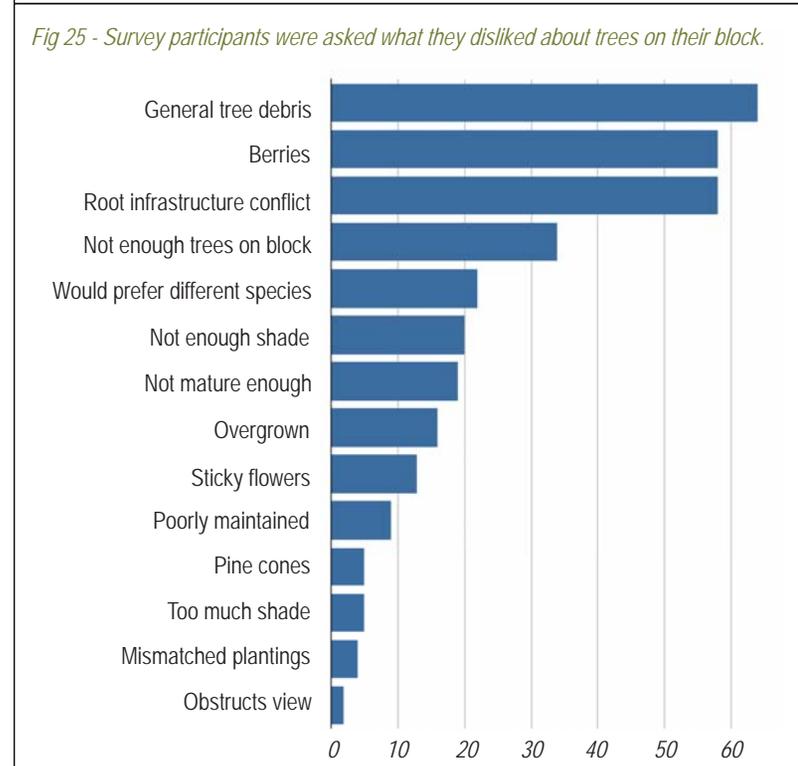


Fig 25 - Survey participants were asked what they disliked about trees on their block.



Figs 23-25 - Qualitative questions helped to weigh potential benefits and drawbacks of trees when the Master Plan process moved into specific street tree designations.

Figure 23 shows which potential tree benefits the respondents of Santa Monica value most. Survey respondents were asked to weigh positive and negative tree aspects. All potential trees have good and bad qualities, so it was important for the City to know if certain benefits were more important than others to residents (Figure 24), and whether they could live with some drawbacks more easily than others (Figure 25).

FAVORITE TREE LINED STREETS OF SANTA MONICA:
THE COMMUNITY PARTICULARLY LIKED THESE STREETS BECAUSE OF THE TREES

COMMON COMMUNITY CONCERNS

- Aesthetics
- Sustainability
- Water Conservation
- Promoting Organized Diversity
- Utilizing Native Species
- Enhancing a Walkable City
- Enhancing Public Transportation Stops
- Expanding Growspace & Parkways
- Size of Newly Planted Trees
- Pruning/Maintenance
- Fruit Trees/Public Orchards
- Creating an Urban Forest Advisory Body
- Public Outreach and Communication

Community input ranged from broad ideas to specific policies, which are expressed in the Master Plan. During the community workshops, residents were asked to share additional concerns they felt had not been brought up in the surveys. The topics that workshop participants brought up most often are listed above as common community concerns.

All data collected from the surveys and workshops was brought back to the Urban Forest Master Plan Task Force's Species Selection Subcommittee to aid in their decision making concerning the proposed species selection for each street segment in the City.



Coral trees on San Vicente Boulevard.



Pines and Palms on Ocean Avenue.



Ficus on 4th Street.



Magnolias on 11th Street.



Moreton Bay Figs on La Mesa Drive.



Ficus on Montana Avenue.



The second stage of community outreach.



The second stage of community outreach occurred in 2011 after preliminary street tree designations were proposed. To ensure effective outreach, every Santa Monica household received a postcard directing them to the urban forest website, where the name and photo of all proposed street tree designations were listed and broken down into 394 street segments. Hard copies were also available upon request at the public libraries. Residents were then invited to comment via the internet or telephone about the individual tree designations, and to attend two community meetings scheduled to gather more feedback from the community.

Community interest in the designated trees was very high. The City staff received over 800 comments, positive and negative, and over 100 people attended the two community meetings to personally voice their desires and concerns.



After the community feedback period, the Species Selection Subcommittee met again to make revisions to the recommendations list based on the comments that the City received. Community feedback resulted in changes to 69 street segments. After the Urban Forest Master Plan Task Force discussion on October 5, 2011, changes were made to the proposed list in response to public input.

FOOTNOTES

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7. Kinney, Abbot. *Eucalyptus* (Los Angeles, CA: B. R. Baumgardt & Co., 1995), p. 35-36, 80, 89-90, 109.
8. Ingersoll, Luther A. *Ingersoll's Century History, Santa Monica Bay Cities* (Luther A. Ingersoll, Los Angeles, CA, 1908) p. 254.
9. PCR Services Corporation for the City of Santa Monica. "Supplemental Information Memorandum", Jan 11, 2008.
10. City of Santa Monica Planning and Community Development Department. *Land Use and Circulation Element Environmental Impact Report, Volume I: Draft EIR* (Santa Monica, CA 2010), p. 4.5-2.
11. City of Santa Monica Planning and Community Development Department, *Land Use and Circulation Element Environmental Impact Report, Volume I: Draft EIR* (Santa Monica, CA 2010), p. 4.5-1.
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14. Cooper, Daniel S. (President, Cooper Ecological Monitoring, Inc., Formerly with Audubon California) Email correspondence October 20, 2011.
15. City of Santa Monica Planning and Community Development Department, *Land Use and Circulation Element Environmental Impact Report Volume I: Draft EIR* (Santa Monica, CA 2010), p. 4.3-10-11.
16. Roma Design Group for City of Santa Monica, *Open Space Element* (City of Santa Monica 1997), p. 19.

CHAPTER 2 - GUIDING PRINCIPLES

GUIDING PRINCIPLES



DEVELOPING POLICY AND STANDARDS FROM THE GUIDING PRINCIPLES

The vision for the urban forest is refined in Chapter 2 through Guiding Principles, Goals and Strategies. Standards and criteria appear in the appendices and serve as management tools to implement specific goals and strategies.

In order to construct policy that is in line with the Urban Forest Master Plan's Guiding Principles, corresponding goals were developed. The written goals express a desired result and establish a purpose but are not necessarily quantifiable and measurable. Goals provide opportunities for continuous improvement and flexibility in the future. Strategies identified from each goal are more specific and measurable and can be used to evaluate the implementation of goals in this Master Plan at any point in time. As the urban forest continues to evolve, new strategies that develop will be incorporated as part of this living Master Plan.

THE URBAN FOREST MASTER PLAN TASK FORCE CREATED GUIDING PRINCIPLES FOR THE 2011 MASTER PLAN TO ESTABLISH ITS OVERALL VISION. GROUPED TOGETHER, THESE PRINCIPLES PROVIDE THE FRAMEWORK FOR THE GOALS AND STRATEGIES OF THE MASTER PLAN.

THE URBAN FOREST AND ITS ENVIRONMENT



The urban forest heightens the quality of the City's environment.

UNDERSTANDING THE URBAN FOREST



Public awareness of the benefits that an urban forest provides is crucial to its vitality.

ECONOMICS OF THE URBAN FOREST



The urban forest needs equitable budget levels consistent with its value to the City.

COLLABORATING ON THE MANAGEMENT OF THE URBAN FOREST



Collaboration between and communication with the community and all City departments whose work affects the urban forest is critical.

SUSTAINABLE MANAGEMENT OF THE URBAN FOREST



The urban forest will thrive through persistent attention to its management.

ENHANCING AND PRESERVING THE URBAN FOREST



The future of the forest begins now. With conscientious foresight, it can evolve into an even greater treasure.

GUIDING PRINCIPLE

GOAL

1. THE URBAN FOREST AND ITS ENVIRONMENT

The Urban Forest is a living element of the City that contributes to the quality of life and surrounding environment. The City’s public trees, found throughout the various neighborhoods and parks, offset the impact of the built environment and provide residents and visitors healthy and pleasant places for recreation and social interaction while providing habitat for urban wildlife. A healthy and functioning urban forest is a hallmark of a world class sustainable city.

To enhance the understanding of the ecosystem services provided by the City’s urban forest. These services encompass stormwater management, mitigation of the urban heat island effect, reduction of air pollution, erosion control, storage and sequestration of carbon, and the provision of human and wildlife habitat. To assess and report on the progress regarding the sustainability and environmental benefits gained from the urban forest.

SUSTAINABLE FOREST MANAGEMENT

“A dynamic and evolving concept, aims to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations.” - United Nations Forum on Forests

STRATEGIES

1. REPORTING ON THE STRATEGIC MANAGEMENT OF THE URBAN FOREST

The Public Landscape Division will adjust the methodology for establishing periodic evaluations of publicly owned trees to assess progress in achieving environmental performance goals. Based on records kept by the Public Landscape Division, the following reports will be submitted annually to the Urban Forest Task Force and with the City's biennial budget on the publicly owned urban forest:

- Number of trees in the urban forest
- Number of trees planted annually
- Number of trees pruned annually
- Number of trees removed annually
- Number of young tree care visits
- Number of tree emergencies
- Number of tree-related Government Outreach requests

2. REPORTING ON PERFORMANCE AND SUSTAINABILITY OF THE URBAN FOREST

The Public Landscape Division will adjust the methodology for establishing additional periodic evaluations to assess progress in achieving a sustainable and highly functioning urban forest. Each time the opportunity presents itself, the City will work with the US Forest Service to conduct a benefit-cost analysis of the urban forest. Also, the Urban Forest Task Force will continually evaluate the effectiveness of the goals and strategies of the Master Plan including the Street Tree Designations List, the effectiveness of the public tree removal appeals process and the effectiveness of the public review process for tree relocations and removals in City public improvement projects. The Public Landscape Division will prepare and make available to the community the following reports in an effort to measure and record sustainability metrics and environmental benefits of the urban forest:

- Urban Tree Canopy (UTC) percentage across differing land-uses. UTC will be reassessed every ten years.
- Ecosystem services provided by the urban forest including energy savings,

reduction of stormwater runoff, air quality improvements, aesthetic benefits and carbon sequestration. Quantified ecosystem services will be reassessed every five years.

- Young tree mortality to understand the success rate of new plantings. Young tree mortality rates will be assessed every five years.
- Street tree stocking level to determine the proportion of existing street trees to the total number of potential street trees. Street tree stocking will be reported on annually.
- Species diversity will be reported on annually.
- Net tree gain or loss will be reported on annually.
- Ratio of deciduous to evergreen trees, native to exotic species, and medium to low water demand trees will be reported on annually.



3. PUBLIC ADVISORY BODY

The Urban Forest Task Force will continually evaluate the implementation and effectiveness of the Urban Forest Master Plan.

GUIDING PRINCIPLE

2. UNDERSTANDING THE URBAN FOREST

The public will become better aware of the urban forest if there is a general understanding of its value and the benefits it provides. To that end, an ongoing public education process appropriately tailored to different age levels is essential.

GOAL

To ensure that residents, business owners and merchants are aware of the benefits trees offer the community and that residents, property owners, architects, engineers, planners, developers, and landscape and tree contractors are familiar with current industry standards and Best Management Practices (BMPs) for tree planting and tree care. To also ensure that residents are included as stakeholders in decision making.

STRATEGIES

1. PUBLIC EDUCATION

The City will develop an effective marketing campaign to raise awareness of the urban forest within a wide audience. Educational efforts will be targeted, informative and proactive. The City will do the following as part of this campaign:

- Conduct periodic public workshops on tree care.
- Provide residents with information that is specific to the newly planted street trees adjacent to their homes and their care.
- Provide public information on current industry standards and BMPs for tree management and the City's Municipal Code governing public trees.
- Include information regarding current industry standards and BMPs for tree preservation in City publications related to private development that impact the urban forest.
- Develop tree care programming for CityTV and other current media outlets.
- Strategically utilize social media in disseminating information about the urban forest and its care.
- Make the street tree inventory available online through the City's Open Data Portal.
- Initiate a periodic Seascope column focused on the urban forest and topics relating to tree care and benefits from trees.
- Biennially evaluate outreach method efficacy and adjust methods as necessary.
- Create educational programs about the urban forest for youth.

2. OUTREACH TO RESIDENTS AND BUSINESSES IN SANTA MONICA

The City will make a targeted effort to educate residents, landscape contractors, tree care contractors, landscape architects, architects, developers, and real estate agents who work in Santa Monica on the City's urban forest policies, and the penalties for not adhering to them. The public education program will clarify the responsibilities of the City and adjacent residents and merchants on the care of newly planted street trees.

3. HERITAGE TREES

- The Heritage Tree program will be implemented and overseen by the Public Landscape Division with input from the Urban Forest Task Force. The

program will define the process for the nomination and designation of public trees. It will also define the means by which they will be recognized and used to raise community awareness about their exceptional characteristics and contributions to Santa Monica's urban environment. This designation will not include regulatory restrictions and will not be governed by the Landmarks Ordinance but will emphasize educating the community through creative educational outreach strategies. The definition of, and the criteria for a public Heritage Tree may include but is not limited to:

- Trees that represent specimens that are particularly rare in the Los Angeles basin and are of considerable size and age.
- Trees that possess unique characteristics or special significance.
- Trees that are of a significant size and/or make a significant and outstanding aesthetic impact on the setting and are exceptional specimens in good condition and health.
- Trees that give special significance to a historic building or district because of their age.

4. COMMUNITY TREE PLANTING

The City will continue to celebrate Arbor Day each year and provide the opportunity for community participation in tree plantings. Involvement in such activities will cause members of the community to gain an appreciation for the urban forest of tomorrow and take an active role in creating the forest's green legacy. In addition, the City will integrate community awareness activities into City events as appropriate. The Public Landscape Division will coordinate these activities.

5. OTHER AGENCIES

The City will promote cooperative relationships with the Santa Monica-Malibu Unified School District, Santa Monica College and other agencies located in Santa Monica to promote urban forest awareness and the contribution it makes to the community. In addition, the City will share tree planting opportunities with these institutions that will include educational programs for youth.

GUIDING PRINCIPLE

GOAL

3. ECONOMICS OF THE URBAN FOREST

The urban forest is a capital asset of the City valued at well over \$155 million. Furthermore, according to a 2015 assessment by the United States Forest Service, it annually delivers \$5.1 million of ecosystem services. It is the only element of the City’s infrastructure that actually increases in value as it ages.

The value of each tree was calculated based on the 2016 tree inventory data, the total number of trees, average size, replacement value and an average rating value for species, condition, and location. These average numbers were entered into a formula to give the average tree value. The number was then multiplied by the total number of trees inventoried and gives an estimated value of the forest.

A healthy and aesthetically pleasing urban forest enhances tourism, business and property values. Stable City funding levels should be provided to sustain the maintenance and development of this important community asset. Contingent upon available funding, the City’s budget should ensure consistent maintenance and annual renewal of the forest. Supplemental fundraising efforts could also be intensified to complement the City’s efforts. Management of the urban forest should be fiscally responsible to maximize the benefits of this City asset while taking into account its sustainability.

To achieve sufficient financial resources to enhance and preserve the urban forest, and to raise awareness of its economic importance.

 STRATEGIES **1. CITY FUNDING**

As part of the City's ongoing budget process and contingent upon available funding, the City will approve adequate capital and operating funds to ensure a healthy and diverse urban forest. The funds will be sufficient to accomplish the following:

- Provide for adequate annual maintenance of publicly owned trees dependent upon species, age, class and location.
- Support street tree planting in order to fill all vacancies within a five-year period while replacing those trees removed to achieve a 100% stocking level. Once achieved, planting will be sustained at the rate necessary to maintain a 100% stocking of street trees.
- Provide for park tree planting at a level that will maintain or enhance an appropriate percentage of Urban Tree Canopy (UTC) in City parks.
- Support the use of qualified independent consultants as needed.
- Provide ongoing marketing support to ensure there is widespread awareness and education about the urban forest and its care.

2. EXTERNAL FUNDING

The City will make all efforts to identify and obtain external sources of funding to support the goals and strategies of the Master Plan, including the following:

- Grants from county, state, and federal sources to extend tree planting and infrastructure improvements.
- The City's Give Santa Monica program, providing opportunities for members of the public to make donations for the planting and care of new public trees.
- Fundraising by interested residents or non-profit groups to supplement City funds.

GUIDING PRINCIPLE

GOAL

4. COLLABORATING ON URBAN FOREST MANAGEMENT

The urban forest may be impacted by multiple factors, including both public and private work activities, on any given day. There must be a collaborative process in place where urban forest staff communicate effectively with other city departments, private contractors, developers, property owners, local businesses and utility providers on proposed work that may impact publicly owned trees. The collaborative process should aim to preserve and enhance the urban forest, rather than diminish its value, during development and maintenance activities.

When development plans for private projects are reviewed by the City, special attention must be provided to existing public trees impacted by the proposed project and the potential for adding new public trees. A collaborative process must be in place to protect and preserve existing trees that are to be retained, and to support the planting of new trees where appropriate.

On large private development projects, the process should include opportunities for community input during the design phase. To further support these efforts, architects, developers and real estate companies should receive clear guidelines stating the City’s requirements in regard to trees and tree care. The Urban Forest Master Plan will act as a centralized reference.

Maintain an inter-departmental process to review all development plans, to ensure appropriate public tree preservation, identification and exploitation of new planting opportunities and optimum tree care in compliance with current industry standards. Additionally, to ensure that City staff and contractors impacting public trees are familiar with and are following current industry standards and Best Management Practices (BMPs) in the selection, planting, and maintenance of public trees.

STRATEGIES

1. INTERNAL COLLABORATION

The Public Landscape Division will involve the staff of the Planning and Community Development and Public Works Departments in implementing the policies of the Urban Forest Master Plan. Ongoing interdepartmental communication will ensure a heightened focus on actions that preserve and enhance the urban forest. City departments will receive the following support from the Public Landscape Division:

- Plan review and the provision of technical advice on both public and private development projects.
- Training on current industry standards and BMPs for other city departments as deemed appropriate.
- Provision and regular updating of clear guidelines, specifications and details for all types of tree care.
- Sharing of tree pruning and tree planting schedules in an effort to coordinate routine maintenance projects between departments and prevent conflicting schedules.

2. COORDINATION WITH PRIVATE ENTITIES

The City will include requirements for the development of adequate parkway infrastructure and the planting of public trees as part of private development by implementing the following:

- Inclusion of the Public Landscape Division staff in the interdepartmental Pre-Submittal Review process for all public and private development projects.
- Inclusion of the Public Landscape Division staff in interdepartmental planning for projects seeking development agreements to ensure that “green streets” and enhanced parkway tree planting and soil volume enhancements are considered for inclusion as a public benefit.
- Working with the Architectural Review Board to ensure that development projects under its purview do not negatively impact public trees, through collaboration with the Public Landscape Division.
- Exploration on the feasibility of the Public Landscape Division staff to review tree care contractor bid documents in advance of building permit issuance for consistency with current industry standards and BMPs for tree care.

3. PARKWAY MANAGEMENT GUIDELINES

The management and design of parkways have a significant impact on a high proportion of the City’s urban forest. Santa Monica has voluntary guidelines to educate residents regarding planting and maintaining the parkway that include information on climate-appropriate plant materials, irrigation, mulch, grading, access and visibility. The correct management of the parkway, coupled with the appropriate selection of plants with similar requirements will positively contribute to the health of street trees. The City will review these guidelines periodically to ensure they support the urban forest and will make the guidelines part of the education and marketing efforts. The Parkway Landscaping Guidelines are outlined in the appendices.

4. COMMUNITY AND NEIGHBORHOOD COLLABORATION

In addition to the Public Landscape Division working collaboratively with the Urban Forest Task Force, presentations will also be regularly made to neighborhood groups on urban forest management and challenges. Tree species selected for planting on street segments or within parks within these neighborhoods will be detailed and discussed.

5. SCHOOL DISTRICT COLLABORATION

The Public Landscape Division may initiate tree planting activities in the schools for Arbor Day. Additional educational activities may be conducted at other times throughout the year to promote the benefits of trees. By involving youth and the general public in Arbor Day activities and other community events, they will gain an appreciation for the urban forest.

GUIDING PRINCIPLE

5. SUSTAINABLE MANAGEMENT OF THE URBAN FOREST

The urban forest includes all public trees, and this important resource should be protected and sustainably managed for both present and future generations. Urban forest sustainable management includes:

- Data management and analysis of relevant urban forest metrics
- Research-based decision making
- Adherence to current industry standards for tree care, tree planting and tree preservation
- Strict criteria for the removal of public trees
- Appropriate industry recognized tree valuation to provide for necessary mitigation planting to maintain UTC after public tree removal or loss through an accident or vandalism

GOAL

To sustainably manage the City’s publicly owned urban forest in a fiscally responsible manner and to maximize its potential in delivering ecosystem services to the community.

STRATEGIES

1. LEGALLY PROTECT PUBLIC TREES

The Santa Monica Tree Code (7.40) protects trees on public property within the city. The Tree Code states the public's obligation to obtain a permit to plant, remove or maintain any public tree; outlines intentional damage to public trees; and enforces protection of public trees throughout construction activity. Any person(s) who violate any provision of the Tree Code shall be subject to criminal penalty, civil action, and/or other remedies or penalties by law.

The City will encourage the reporting of illegal tree work and vandalism through public outreach, education and local media. The Public Landscape Division will actively pursue enforcement of the Tree Code as necessary to protect the urban forest.

2. STRICTLY ADHERE TO CURRENT INDUSTRY STANDARDS AND BEST MANAGEMENT PRACTICES (BMPs) FOR TREE MANAGEMENT

The Public Landscape Division is responsible for the management of the City's publicly owned urban forest. Current industry standards and BMPs will be referenced and specified in contracts, planning documents, permits and any other documentation pertaining to public trees. These industry standards and BMPs include, but are not limited to:

- American National Standards Institute (ANSI) A300 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices
- ANSI Z60.1 - American Standard for Nursery Stock
- International Society of Arboriculture (ISA) Best Management Practice Companion Publications to ANSI A300

3. TREE INVENTORY

The Public Landscape Division will maintain a comprehensive GIS-based inventory of all public trees in the City's urban forest. Data on public trees will be made available through the City's Open Access Portal. The tree inventory will be continually updated with tree work records. These work records will include prunings, removals and plantings. A comprehensive field survey

and update of the database will be performed every seven years if deemed necessary to keep the data accurate.

4. ANNUAL URBAN FOREST PRUNING & PLANTING PROGRAM

Each fiscal year the Public Landscape Division will publish an urban forest work plan detailing the tree pruning and planting schedule for the next 12 months. Additionally, the work plan will be presented to the Urban Forest Task Force for review during the first meeting of the fiscal year.

The urban forest tree pruning program cyclically inspects and prunes trees based on species, location and maintenance requirements. The Public Landscape Division will inspect those trees scheduled for pruning during the current year and take appropriate steps to:

- Manage and enhance the tree resource
- Mitigate infrastructure conflicts
- Responsibly manage risk

Street tree planting will be prioritized based on three key factors:

- Urban forest tree population dynamics
- Environmental need
- Human need

5. RISK MANAGEMENT PROGRAM

Every public tree in the City is inspected once a year as part of a Tree Risk Management Program implemented in July 2015. Two assessors with ISA Tree Risk Assessors (TRAQ) qualifications identify tree work and generate work orders. The City's Tree Risk Management Program will follow the guidelines and protocols presented by current industry standards and BMPs including:

- American National Standards Institute (ANSI) A300 Part 9: - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices
- International Society of Arboriculture (ISA) Best Management Practice Companion Publications to ANSI A300 (Part 9)

Further information on the City's tree protection during construction


STRATEGIES

requirements are provided in the appendices.

6. MANDATORY TREE PROTECTION DURING CONSTRUCTION

All public trees will be protected and preserved when impacted by construction activities. This is necessary because the movement of building materials onto construction sites, the use of heavy building equipment, grading and/or trenching for underground utilities can cause irreparable physical damage to any adjacent public trees, both above and below ground, and their associated soil resource. The City mandates that, during the demolition or construction phase of a development project, a Tree Protection Zone (TPZ) is established around all public trees prior to the commencement of such activities. The management of public trees impacted by construction or demolition will follow current industry standards and BMPs including:

- American National Standards Institute (ANSI) A300 Part 5: - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction)
- International Society of Arboriculture (ISA) Best Management Practice Companion Publications to ANSI A300 (Part 5)

7. PUBLIC TREE REMOVAL, COMMUNITY NOTIFICATION AND APPEALS

The City of Santa Monica's Municipal Tree Code (Chapter 7.40) defines that the Director of Public Works has the duty to oversee public tree removals. The City's public trees will only be removed if they meet any of the following criteria:

- Tree is dead
- Tree is dying and the severe decline cannot be reasonably reversed
- Tree presents an unreasonable structural failure risk that cannot be reasonably mitigated
- Tree is in an unavoidable conflict with a construction project that

cannot be mitigated through design and restitution planting can be performed to mitigate its loss based on the City's tree valuation protocol

Except in emergency situations involving imminent tree failure with potential for harm to life and property, the City will publicize a notice of intended public tree removals at least ten (10) working days in advance of the removal date by:

- Attaching a notice to the actual tree to be removed
- Publishing a notice online detailing the public trees listed for removal
- Distributing a notice to the Public Landscape Division's urban forest contact list

The notice will include the reason for the intended removal and provide community members with an opportunity to provide comment or ask questions of Public Landscape Division staff. Additionally, the decision to remove a public tree can be appealed to the Urban Forest Task Force. The same appeal process also applies when a request to remove a public tree has been denied by the Public Landscape Division. The Urban Forest Task Force will hear the appeal at the next available bi-monthly Task Force meeting. Based on the hearing and with input from City staff, the Urban Forest Task Force will make a recommendation on the tree to the Director of Public Works, who will then communicate their decision in writing to the appellant within 30 days.

Public trees removed in compliance with the removal criteria with a diameter of five inches (5") or less, at a height of four feet and six inches (4'6") from ground level, will be exempt from the noticing requirement detailed above.

Further information on the City's tree removal criteria and the tree removal appeal process is outlined in the appendices.

8. TREE VALUATION PROTOCOL

Tree valuation is a vital component of sustainable urban forest management as it ensures the UTC is not negatively impacted by healthy tree loss. If a healthy public tree is removed or destroyed, its loss will be accounted for by sufficient levels of replacement tree planting. Often, a replacement tree of a similar size as the one removed or destroyed cannot be planted as it would be impractical and/or cost prohibitive. As a result, the Council of Tree & Landscape Appraisers have suggested a number of recognized methodologies for valuing trees. Their Trunk Formula Method calculates the number of standard sized new trees needed to replace a larger tree. As part of the valuation process, the methodology takes into account:

- Tree size
- Tree species
- Tree condition
- Tree location

The methodology is therefore comprehensive and detailed in determining the number of replacement trees required to mitigate the UTC loss of a larger tree. Additional information on how the City of Santa Monica uses this tree valuation methodology is available in the appendices.

9. PROTECTION OF URBAN WILDLIFE

The protection of urban wildlife is critical and required through the Migratory Bird Treaty Act and the Endangered Species Act. Urban forest management operations will be performed in a manner to avoid disturbing urban wildlife. City and contractor staff will be trained in inspecting for and protecting urban wildlife prior to performing tree work. Trees containing urban wildlife will not be scheduled for work until the end of the breeding/nesting season or such time as the work will not disturb urban wildlife. The only exception to this is when public safety is threatened; in such cases, local subject experts will be consulted to assist in minimizing the impact to urban wildlife.

10. NEW TECHNOLOGIES, RESEARCH AND DATA ANALYTICS

The Public Landscape Division will keep abreast of current research and implement new technologies where practical for the tree care industry that

can benefit the urban forest. Administrative data on urban forest metrics will be regularly reviewed to improve understanding of the function and health of the urban forest and its interaction with the community. Strategic planning, operations and budgeting will use data to inform and drive the decision-making process.

11. PUBLIC TREES AND CITY PUBLIC PROJECTS

The City will incorporate existing healthy trees in the design of City public improvement projects, wherever consistent with the project's design objectives and after a community design process where proposed tree relocations and removals are identified. The City Planning Department, Architecture Services Division, Civil Engineering Division, and other applicable City operations that affect the wellbeing of trees, will work in consultation with the Urban Forester to formulate initial recommendations.

Where tree removal is included as part of the proposed design, the City will consider relocation of trees with good survival prospects. If relocation is not feasible, replacement mitigation tree planting in accordance with the City's tree valuation protocol will be built into the project scope to offset the UTC loss. In addition to design illustrations, a proposed Tree Relocation and Removal Plan (the Plan) will be presented at project community design workshops and the information made available to the general public through the use of communication strategies such as project websites, project e-blasts, and press releases to the local media and via the Urban Forest email distribution lists. The proposed Plan will be included in the project design submittals to the required advisory and regulatory review bodies and will also be included in project staff reports and design presentations to the City Council at the appropriate stages of the project. The Plan will clearly state the trees to be impacted and the reasons for the proposed removals or relocations. If, during the design process, there are proposed changes to the Plan as the overall design evolves and becomes more specific, including resident input, these changes will be clearly noted in a revised Plan for review by the public and the other review bodies. The final tree relocation, tree removal and replacement


STRATEGIES

planting plan will be approved by the City Council as part of the project's final project design and is not subject to the tree removal appeal process outlined in the appendices.

Additional information on the City's tree valuation protocol can found in the appendices.

12. LANDMARKS AND HISTORIC DISTRICTS

In the case of street tree designations adjacent to currently designated landmarks or within currently designated historic districts, City staff will consult with the Species Selection Subcommittee of the Urban Forest Task Force for their recommendations. Staff may also confer with the Landmarks Commission in an advisory capacity to address contextual issues prior to selecting replacement species.

The Director of Public Works will review and must approve any modifications to species specified in the Urban Forest Master Plan's street tree designations due to landmarked properties or designated historic districts.

13. UPDATING THE APPENDICES OF THE URBAN FOREST MASTER PLAN

The first two chapters of the Urban Forest Master Plan define the urban forest and the City's strategic goals for managing this important resource. The Master Plan's appendices detail urban forest operational procedures, street and park tree species designations and protocols to achieve these strategic goals. The flexibility to modify these procedures, designations and protocols, due to environmental change, operational challenges or new research, is essential in maintaining an optimal and sustainable urban forest program. Therefore, the content of the appendices may be modified by City staff if approved by the Urban Forest Task Force after review at a public meeting. However, updating of the Master Plan's first two chapters will require approval by City Council.



GUIDING PRINCIPLE

GOAL

6. ENHANCING AND PRESERVING THE URBAN FOREST

To enhance the urban forest by expanding canopy coverage and species diversity throughout the City.

The urban forest is in a constant state of change. This Master Plan considers the life cycle of the urban forest and recognizes that it is a dynamic, natural system. This Master Plan will retain flexibility for addressing the inevitable growth and decline of the City's trees. The enhancement of the urban forest and its sustainability enables the City to enjoy a highly functioning, healthy and low risk urban forest that provides a myriad of ecosystem services and benefits to the community.

Optimizing and enhancing the City's total urban forest biomass is also of primary importance in achieving the City's sustainability goals. The Master Plan promotes creating a maximally functional urban forest, by increasing both current total canopy coverage and total biomass. Canopy coverage in Santa Monica neighborhoods varies greatly, depending on parkway size. The strategies of this plan ensure the maximum feasible urban forest biomass on every street, given the specific conditions and limitations of each site, and recommends increasing parkway size where feasible to improve canopy equity in the City.

Trees should be a primary consideration in the City's planning process. Future development in the City should require adequate space for public trees that will produce the desired canopy coverage. When urban forest enhancement is in conflict with other goals, tree loss should be balanced with appropriate levels of replacement planting in the locality based on the City's tree valuation protocol. This will minimize the impact of tree loss in a neighborhood and thus mitigate UTC loss. Factors that should be considered in planning development include: the site, economic constraints, how existing and replacement species fit into the streetscape and the neighborhood character, the life span and condition of existing trees, their historic context and related environmental benefits.

Species diversity is vital in achieving overall urban forest health and adds resilience to the urban landscape. The Master Plan will strategically plan to increase species diversity so that the urban forest is not unduly affected should one or more individual species suffer due to pathogens or environmental stress.

STRATEGIES

1. INCREASE URBAN TREE CANOPY

The City of Santa Monica's UTC was estimated as being 15% in 2001. An updated UTC assessment will be completed in 2017. The Public Landscape Division will endeavor to increase UTC by 5% in 10 years over parkland and over City streets.

The street tree stocking level was estimated to be 96% in 2001 but has now dropped to roughly 93% in 2016. This is most likely due to an aging urban forest, historically insufficient tree planting and the impact of environmental stress such as drought and disease. Therefore, the Public Landscape Division will strive to fully stock 100% of the potential locations for street trees through escalating tree planting efforts and improved preservation of existing trees.

2. SPECIES DIVERSITY

In the City's urban forest, no genus will exceed ten percent (10%) and no species will exceed five percent (5%) of the total public tree population. When considering individual parks, no genus will exceed 40% and no species will exceed 20%. Overall, this species diversity will be achieved through the strategic planning of new tree planting both on City streets and in parks. Healthy trees will not be removed to facilitate the introduction of new species. They will be planted as existing public trees reach the end of their useful life expectancy and require replacement.

3. SPECIES SELECTION AND DROUGHT RESILIENCE

Planting the right tree in the right place is essential to the success of the urban forest and its sustainability. Species will be selected for planting based on the following factors:

- Size of the growing space including the width of the parkway and presence of adjacent buildings or infrastructure
- The volume of available soil
- The presence of utilities, both overhead and below ground
- Community safety including traffic visibility

Furthermore, one of the ways the City will build environmental resilience to drought is through careful species selection. At least 75% of the species selected

for the 2017 Street Tree Designations list require low water, and drought resilient/low water use species have been selected where possible. At least one low water use species will be assigned to each street segment across the City. Additionally, species with known environmental concerns, pathogen issues or that are invasive to natural areas will not be selected for planting.

The street tree species selected for individual blocks is available for review in the appendices.

4. IMPLEMENTATION OF AND UPDATING THE STREET TREE SPECIES DESIGNATION LIST

The City will implement and adhere to the street tree designations contained in the Urban Forest Master Plan appendices. The City will evaluate the species designations list every five years in conjunction with assessing the success of newly introduced species. Significant updates to the species designations will be made in conjunction with the Species Subcommittee of the Urban Forest Task Force and impacted neighborhood groups.

5. PLANTING PRIORITIZATION

Planting of public trees will be prioritized based on numerous factors including urban forest metrics as well as environmental and human need. These factors include:

- Tree age diversity and planting space availability (planting vacancies)
- Population density and average age
- Proximity to schools and early learning centers
- The urban heat island effect
- Transport corridors and their associated air pollution


STRATEGIES
6. NEW SPECIES INTRODUCTIONS

To ensure the urban forest diversity goal fosters a resilient and healthy functioning urban arboretum, it is recognized as important to trial new species introductions. The City will plant new species in parks, or other appropriate locations; upon observance of successful establishment over time the new species will be considered for street tree species designation.

7. MODIFICATION OF INFRASTRUCTURE TO ACCOMMODATE LARGER CANOPY TREES

In addition to planting trees in existing parkways, the City will continue to identify opportunities to increase canopy coverage in the following ways:

- Incorporating landscaped medians and/or increasing the width of existing parkways where feasible
- Exploring new techniques designed for greater soil volume as an opportunity to increase the balance of canopy coverage throughout the City
- In street redesign projects, maximizing parkways and tree wells to enhance the street tree growspace
- Making provisions for larger street tree growspaces in private development projects in conjunction with implementation of the City's Land Use and Circulation Element (LUCE), and through the zoning code, developing standards to provide for the inclusion of more trees in better growspaces with greater canopy potential on private properties

8. LARGER TREES

The City's policy is to plant a 24" box tree of the designated species. The City will establish procedures for residents to have larger specimens of the designated tree when planting occurs in front of the resident's house. The resident can opt to make up the cost difference between the installed cost of a standard tree and the installed cost of a larger tree, and the City will plant the larger tree.

9. TREE SUPPLY

To the extent feasible, the Public Landscape Division will ensure new tree stock planted into Santa Monica's public urban forest meets current industry standards, specifically ANSI Z60.1. Only trees of the highest quality should be planted. This will be achieved by staff selection and approval of new tree stock.

10. SOIL RESOURCE

Urban trees require access to sufficient quality soil to support high-level growth and function. Soil must be able to provide adequate water and nutrients and improve a tree's resilience to drought and pathogen attack. Therefore, the Public Landscape Division will establish recommendations to protect the soil resource during construction projects. The increased use of air tools to decompact soil and the application of organic mulch within the root zones of trees will be promoted.

Additional information on the City's tree planting recommendations and protection of trees during construction can found in the appendices.

10. IRRIGATION

Adequate water is essential to healthy tree growth; however, it is recognized that potable water is a valuable and limited resource in Santa Monica. To preserve the urban forest, the City will use water-efficient irrigation technology. The greater use of stormwater capture and recycled water distribution will be encouraged coupled with increased public education on the importance of watering during young tree establishment and supporting drought-stressed trees.

THE FUTURE OF THE URBAN FOREST

The future of Santa Monica's urban forest can be assured and its benefits realized by future generations if City policy makers, staff and the community are responsible stewards. An urban forest is a dynamic natural system. The careful tracking of its sustainability metrics, as detailed in this Master Plan, will provide guidance on its health and function. Periodic updates to the goals, strategies and standards in this Master Plan are inevitable to meet the needs of the community, transcend the effects of future climate change and incorporate improvements in strategic tree management. City staff will work in partnership with the Urban Forest Task Force and the community as a whole to maximize the benefits delivered by the urban forest while managing risk and remaining fiscally responsible.



LONG RANGE URBAN FOREST TIMELINE

